BAY AREA AIR QUALITY MANAGEMENT DISTRICT

BOARD OF DIRECTORS
STATIONARY SOURCE COMMITTEE MEETING

COMMITTEE MEMBERS

MARK DeSAULNIER –CHAIRPERSON
JULIA MILLER
JOHN SILVA
GAYLE UILKEMA
JERRY HILL - VICE CHAIRPERSON
MARK ROSS
MARLAND TOWNSEND
SHELIA YOUNG

MONDAY
MAY 24, 2004
9:30 A.M.

7th FLOOR BOARD ROOM

AGENDA

1. **CALL TO ORDER - ROLL CALL**

2. **PUBLIC COMMENT PERIOD** *(Public Comment on Non-Agenda Items Pursuant to Government Code § 54954.3) Members of the public are afforded the opportunity to speak on any agenda item. All agendas for regular meetings are posted at District headquarters, 939 Ellis Street, San Francisco, CA, at least 72 hours in advance of a regular meeting. At the beginning of the regular meeting agenda, an opportunity is also provided for the public to speak on any subject within the Board's authority. Speakers will be limited to five (5) minutes each.*

3. **APPROVAL OF MINUTES OF MARCH 22, 2004**

4. **REPORT ON PROPOSED AMENDMENTS TO REGULATION 8, RULE 8: WASTEWATER (OIL - WATER) SEPARATORS**
J. Roggenkamp/4646
jroggenkamp@baaqmd.gov

Staff will give a status report on the development of proposed amendments to Regulation 8, Rule 8: Wastewater (Oil - Water) Separators. The proposed amendments are the result of information developed pursuant to Further Study Measure FS-9 from the 2001 Ozone Attainment Plan. This is an informational item only.

5. **SUMMARY OF SUPPLEMENTAL ENVIRONMENTAL PROJECT (SEP) DISTRIBUTION**
J. Roggenkamp/4646
jroggenkamp@baaqmd.gov

Staff will give a status report on the distribution of SEP funding to select projects.

6. **COMMITTEE MEMBER COMMENTS/OTHER BUSINESS**

Any member of the Board, or its staff, on his or her own initiative or in response to questions posed by the public, may: ask a question for clarification, make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter or take action to direct staff to place a matter of business on a future agenda. (Gov't Code § 54954.2)

7. **TIME AND PLACE OF NEXT MEETING –-JULY 26, 2004**

8. **ADJOURNMENT**

JPB:mag

AGENDA NO. 3

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

DRAFT MINUTES

Summary of Board of Directors
Stationary Source Committee Meeting
9:30 a.m., Monday, March 22, 2004

1. **Call to Order – Roll Call:** 9:30 a.m.

   Roll Call: Mark DeSaulnier, Chairperson; Roberta Cooper, Jerry Hill, Julia Miller, Mark Ross, John Silva, Marland Townsend, Gayle Uilkema, Shelia Young .

   Absent: None.

   Also Present: Scott Haggerty (9:40 a.m.).

2. **Public Comment Period:** There were none.

3. **Approval of Minutes of January 26, 2004:** Director Townsend moved approval of the minutes; seconded by Director Miller; carried unanimously without objection.

4. **Report on Renewal of Title V Permits to Pacific Gas & Electric Company (PG&E) and Consideration of Recommendation to Support PG&E's Proposed Shut Down of the Hunters Point Power Plant:** *Staff presented a report on renewal of Title V Permits to PG&E and the Committee considered staff recommendation to support PG&E's proposed shut down of the Hunters Point Power Plant.*

   Brian Bateman, Director of Engineering, presented information on the Title V Permit Program and the Mirant Potrero and PG&E Hunters Point Power Plants, and discussed the following:

   - Background information on the Mirant Potrero and PG&E Hunters Point Power Plants.
   - Proposed permit renewals to be issued by the end of March 2004.
   - Information meetings scheduled for April 6 and April 8, 2004; and Public Hearings scheduled for May 4 and May 6, 2004, respectively.
   - BAAQMD Regulation 9, Rule 11 – NOx Emission Limits for Utility Boilers.
   - NOx Emissions from Hunters Point S-7 and Potrero S-1 Utility Boilers.

There were three public speakers on this agenda item:

R. Terry Nelson
Director, Power Generation – Fossil Generation
PG&E
San Francisco, CA

Gary DeShazo
California Independent System Operator (ISO) Grid Planning
Folsom, CA

Karl Krupp
Community Health Advocate
Greenaction
San Francisco, CA

In response to concerns expressed by Mr. Krupp, Jack Broadbent, Executive Officer/APCO stated that there is a great deal of public outreach being scheduled for this matter - an informational meeting for public comment is to be held on April 6, 2004, and there will be a public hearing on May 6, 2004 when community members may attend and express their comments.

Committee Action: Director Townsend moved approval of the staff recommendation to support PG&E's proposed shut down of the Hunters Point Power Plant; seconded by Director Hill; carried unanimously by acclamation.

5. Report of Proposed Amendments to District Regulation 3: Fees: *Staff presented a report on proposed amendments to District Regulation 3: Fees.*

Mr. Bateman provided a report on the proposed amendments to District Regulation 3: Fees, and discussed the following:

- Various fee categories and the proposed amendments to the various fee structures.
- Projected revenue for fiscal year 2003/2004.
- Fee increases over the last five years.
- Fiscal Year 2004/2005 Fee Proposal.
- Title V Permit Fees.
- Fiscal Year 2004/2005 Projected Fee Revenue and Program Costs.
- Rule Development Schedule.

Mr. Bateman stated that a public workshop was held on Friday, March 19, 2004, and informed the Committee that staff is proposing to bring this agenda item to the April 21, 2004 Board of Directors' meeting for the first public hearing and to the June 2, 2004 Board of Directors' meeting for the second public hearing.

In response to Committee members' questions and concerns, Staff responded as follows:

Mr. Peter Hess, Deputy Air Pollution Control Officer, explained that staff had looked at the total time spent on the Title V program, and had decided to cap the increase in fees at 20% for this year because staff did not want to overburden any one entity. He stated that the District is still under-collecting the amount for the Title V permit process and that next year staff would like to look throughout the Title V permit fee process and determine where staff can even out the collection of the fees. Some of the sources, as Mr. Bateman mentioned, are paying $200 and other facilities are paying much more. Mr. Hess also pointed out that, prior to 1999, the Board of Directors, for about four years, did not increase the permit fees. Therefore, the District started with a deficit and, as indicated in this presentation, had a 15% increase later, to try to catch up. The District is still in the catch up mode of trying to get the revenues to match up with the costs. The costs are increasing because mandated programs from the California Air Resources Board and the Environmental Protection Agency demand more and more resources for their operations.

Mr. Bateman explained that the Title V facilities also hold District operating permits and that the Title V is their federal operating permits. All of the Title V facilities pay fees under District operating permits and those fees are substantially more than their Title V fees. For example, all the refineries pay an average of about $1 million a year in total permit fees and the Title V portion of that is about $100,000 (one-tenth of the total amount). Therefore, the Title V facilities are paying a very significant part of the overall permit fees.

In response to Director Haggerty's inquiry, Mr. Bateman stated that the South Coast Air Quality Management District's fees are quite a bit higher. The receipt of County revenues subsidizes the Bay Area Air Quality Management District's fees.

Mr. Broadbent added that if the Committee would like staff to investigate how the District can better recover its costs in the Title V program, it would go back and review the figures. He shared the concerns of several Committee members that the District is not collecting as much revenue to cover its total costs in terms of the federally-mandated program. However, Mr. Broadbent felt that basically the District is trying to be modest and prudent in its proposed increases at this point in time. He pointed out that the District is spending a lot of time and resources on the Title V program.

In response to Director Townsend's inquiry on the large gap in the Operating/New & Modified Permit Fees Revenue vs. Costs, Mr. Broadbent stated he would like to initiate the cost recovery study at the District as soon as possible. As a result of this study, staff will make some recommendations to the Board of Directors. Also, there is a fairly sizeable amount allocated in next year's budget for the J.D. Edwards transition – basically taking the IRIS Databank program and transitioning it to a new system. Once the transition is fully completed, the District will start to experience some efficiency and this, in turn, will lower the overall operating costs. The transition will take all of next fiscal year and probably go into the following fiscal year to be completed.

Mr. Broadbent stated that if the District tries to match the total Revenues to total Costs for the Operating/New & Modified Permit fees at this time, there would have to be a significant increase in the permit fees, and he did not feel comfortable recommending such an increase to the Board of Directors at this time.

Chairman DeSaulnier suggested to Mr. Broadbent that staff consider the input provided by Committee members, their concerns and recommendations, and incorporate them into the final recommendation that will be made to the full Board of Directors. Mr. Broadbent responded that staff will consider and incorporate all of the Committee members' suggestions and come back with a final proposal to the full Board, as per the Committee's request.

There was one public speaker on this agenda item:

Dennis Bolt
Western States Petroleum Association
Concord, CA

Committee Action: Director Townsend moved to recommend the Committee's recommendations, including the concerns and comments expressed by Committee members to the Board of Directors; seconded by Director Cooper; carried unanimously by acclamation.

6. **Committee Member Comments/Other Business:** Director Young requested that copies of both Supervisor Maxwell's letter and ISO's response to that letter, mentioned by Mr. DeShazo, be made available to the Board members in their packet for the next Board of Directors' meeting.

   Chairman DeSaulnier requested that the workshop notices and notices for other meetings on the PG&E plant be sent to Supervisor Maxwell.

7. **Time and Place of Next Meeting:** 9:30 a.m., Monday, May 24, 2004, 939 Ellis Street, San Francisco, California 94109

8. **Adjournment:** 10:42 a.m.

Neel Advani
Deputy Clerk of the Boards

STATIONARY SOURCE COMMITTEE

Follow-Up Items for Staff

March 22, 2004

1. Director Young requested that copies of both Supervisor Maxwell's letter and ISO's response to that letter, mentioned by Mr. DeShazo, be made available to the Board members in their packet for the next Board of Directors' meeting.

2. Chairman DeSaulnier requested that the workshop notices and notices for other meetings on the PG&E plant be sent to Supervisor Maxwell.

3. Staff to consider the Committee's recommendations and concerns regarding the large gap between Title V Permit Fees' total Revenues and total Costs; and in the total Revenues vs. total Costs for the Operating/New & Modified Permit fees. Staff to look into either increasing the Title V Permit fees for this year, so that total Revenues would cover the total Costs, or reducing the total Costs so that the Revenues match the Costs.

AGENDA: 4

BAY AREA AIR QUALITY MANGEMENT DISTRICT
Memorandum

To: Chairperson DeSaulnier and Members of the Stationary Source Committee

From: Jean Roggenkamp
Director of Planning and Research

Date: May 17, 2004

Re: Report on Proposed Amendments to Regulation 8, Rule 8: Wastewater (Oil-Water) Separators

RECOMMENDED ACTION:

Informational report. Receive and file.

BACKGROUND:

The 2001 Ozone Attainment Plan included Further Study Measure FS-9 to examine the possibility for volatile organic compound (VOC) emission reductions from refinery wastewater systems. The proposed amendments to Regulation 8, Rule 8: Wastewater (Oil-Water) Separators are the result of that study. Staff has worked with industry, environmental groups, Air Resources Board staff and Regional Water Quality Control Board staff to develop sampling plans, computer modeling, emissions estimates and the proposed amendments.

DISCUSSION:

The proposed amendments to Regulation 8, Rule 8 include:

- Expanding Regulation 8, Rule 8 to encompass refinery wastewater collection systems.
- Imposing a 500 ppm leak standard on wastewater collection components (process drains, trenches, manholes, junction boxes, reaches, sumps and lift stations).
- Requiring refineries to control equipment found leaking in excess of the 500 ppm standard.
- Requiring refineries to perform inspection and maintenance programs on wastewater components under the regulation.
- Requiring accurate and timely documentation of maintenance performed at facilities to ensure compliance with the 500 ppm leak standard.

These amendments will reduce emissions of organic compounds, including toxics, from wastewater system components by approximately 65% or 1.9 tons per day. The cost effectiveness is approximately $1,900 to $4,200 per ton of organic compound emissions reduced.

The draft rule amendments and staff report are attached. Staff conducted two public workshops on April 27 and May 18, 2004. Staff intends to bring the proposal to the full board for a public hearing on July 7, 2004.

BUDGET CONSIDERATION / FINANCIAL IMPACT:

None.

Respectfully submitted,

Jean Roggenkamp
Director of Planning and Research

Forwarded: _____

Prepared by: Damian Breen
Reviewed by: Daniel Belik

Attachments:
Draft Regulation 8, Rule 8
Draft Staff Report for Regulation 8, Rule 8 (Appendices omitted)

REGULATION 8
ORGANIC COMPOUNDS
RULE 8
WASTEWATER ~~(OIL-WATER) SEPARATORS~~ COLLECTION, SEPARATION AND TREATMENT SYSTEMS

INDEX

8-8-100 GENERAL

8-8-101 Description
8-8-110 Exemption, Less Than 760 Liters
8-8-111 Deleted November 1, 1989
8-8-112 Exemption, Wastewater Critical OC Concentration And/Or Temperature
8-8-113 Exemption, Secondary Wastewater Treatment Processes and Stormwater Sewer Systems
8-8-114 Exemption, Bypassed Oil-Water Separator or Air Flotation Influent
8-8-115 Exemption, Municipal Wastewater Collection. Separation and Treatment Facilities

8-8-200 DEFINITIONS

8-8-201 Organic Compounds
8-8-202 Wastewater (Oil-Water) Separator
8-8-203 Wastewater Separator Forebay
8-8-204 Vapor-tight
8-8-205 Oil-Water Separator Slop Oil
8-8-206 Oil-Water Separator Effluent Channel/Pond
8-8-207 Full Contact Fixed Cover
8-8-208 Secondary Treatment Processes
8-8-209 Air Flotation Unit
8-8-210 Critical Organic Compound (OC)
8-8-211 Wastewater
8-8-212 Pre-Air Flotation Unit Flocculation Sump, Basin, Chamber, or Tank
8-8-213 Oil-Water Separator Slop Oil Vessel
8-8-214 Oil-Water Separator Effluent
8-8-215 Sludge-dewatering Unit
8-8-216 Stormwater Sewer System
8-8-217 Junction Box
8-8-218 Sewer Line
8-8-219 Biological Treatment Unit
8-8-220 Leak Minimization
8-8-221 Leak Repair
8-8-222 Lift Stations
8-8-223 Manholes
8-8-224 Process Drains
8-8-225 Petroleum Refinery
8-8-226 Reaches
8-8-227 Sumps
8-8-228 Trenches
8-8-229 Vent pipe
8-8-230 Wastewater Collection System
8-8-231 Water Seal or Equivalent Control
8-8-232 Weirs

8-8-300 STANDARDS

8-8-301 Wastewater Separators Designed Rated Capacity Greater Than 760 Liters per Day and Smaller Than 18.9 Liters per Second
8-8-302 Wastewater Separators Rated Capacity Larger Than or Equal to 18.9 Liters per Seconds
8-8-303 Gauging and Sampling Devices
8-8-304 Sludge-dewatering Unit
8-8-305 Oil-Water Separator And/Or Air Flotation Unit Slop Oil Vessels
8-8-306 Oil-Water Separator Effluent Channel, Pond, Trench, or Basin
8-8-307 Air Flotation Unit
8-8-308 Junction Box
8-8-309 Deleted October 6, 1993
8-8-310 Deleted October 6, 1993
8-8-311 Deleted October 6, 1993
8-8-312 Wastewater Collection System Components at Petroleum Refineries
8-8-313 Alternative Compliance, Wastewater Collection System Components at Petroleum Refineries
8-8-314 New Wastewater Collection System Components at Petroleum Refineries

8-8-400 ADMINISTRATIVE REQUIREMENTS

8-8-401 Deleted (October 6, 1993)
8-8-402 Wastewater Inspection and Maintenance Plan at Petroleum Refineries
8-8-403 Petroleum Refinery Compliance Schedule

8-8-500 MONITORING AND RECORDS

8-8-501 API Separator or Air Flotation Bypassed Wastewater Records
8-8-502 Wastewater Critical OC Concentration And/Or Temperature Records
8-8-503 Inspection and Repair Records
8-8-504 Portable Hydrocarbon Detector
8-8-505 Records for Wastewater Collection System Components at Petroleum Refineries

8-8-600 MANUAL OF PROCEDURES

8-8-601 Wastewater Analysis for Critical OCs
8-8-602 Determination of Emissions
8-8-603 Inspection Procedures

REGULATION 8
ORGANIC COMPOUNDS
RULE 8
WASTEWATER ~~(OIL-WATER) SEPARATORS)~~ COLLECTION AND TREATMENT SYSTEMS

~~(Adopted January 17, 1979)~~

8-8-100 GENERAL

8-8-101 **Description**: The purpose of this Rule is to limit the emissions of precursor organic compounds from wastewater collection, separation and treatment systems which handle liquid organic compounds from industrial processes. ~~(oil-water) separators, forebays, and air flotation units which remove floating oil, floating emulsified oil, or other liquid precursor organic compounds.. (Amended November 1, 1989)~~

8-8-110 **Exemption, Less Than 760 Liters:** The requirements of Section 8-8-301 shall not apply to any wastewater separator which processes less than 760 liters (200 gals.) per day of wastewater containing organic liquids. This exemption shall not apply to wastewater separators at petroleum refinery complexes after March 1, 1980.

8-8-111 **Deleted November 1, 1989**

8-8-112 **Exemption, Wastewater Critical OC Concentration And/Or Temperature:** The requirements of Sections 8-8-301, 302, 306, 307, and 308 shall not apply to any wastewater separator that processes influent wastewater less than 20 degrees C (68 ^{o}F) and/or wastewater comprised of less than 1.0 ppm (volume) critical organic compounds, as defined in Section 8-8-210, dissolved in the water samples, provided that the requirements of Section 8-8-502 are met. The provisions of this section will not apply to petroleum refineries.

8-8-113 **Exemption, Secondary Wastewater Treatment Processes And Stormwater Sewer Systems:** The requirements of Sections 8-8-301, 302, 306, and 308 shall not apply to any secondary wastewater treatment processes or stormwater sewer systems, as defined in Sections 8-8-208 and 216, which are used as a wastewater polishing step or collection of stormwater which is segregated from the process wastewater collection system. (Adopted November 1, 1989)

8-8-114 **Exemption, Bypassed Oil-Water Separator or Air Flotation Influent:** The requirements of Sections 8-8-301, 302, and 307 shall not apply for wastewater which bypasses either the oil-water separator or air flotation unit provided that: (1) the requirements of Section 8-8-501 are met; and (2) on that day the District did not predict an excess of the Federal Ambient Air Quality Standard for ozone. (Adopted November 1, 1989)

8-8-115 **Exemption, Municipal Wastewater Collection, Separation and Treatment Facilities:** The requirements of Sections 8-8-301, 302, 303, 304, 305, 306, 307, and 308 shall not apply to any publicly owned municipal wastewater treatment facility. (Adopted November 1, 1989)

8-8-200 DEFINITIONS

8-8-201 **Organic Compounds:** ~~For the purposes of this Rule, any organic compound as defined in Section 8-8-210.~~ (Amended November 1, 1989)
Any compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate.

8-8-202 **Wastewater (Oil-Water) Separator:** Any device used to separate liquid organic compounds from oil-water waste streams (excluding Wastewater Separator Forebay, Air Flotation (AF) units, Sludge-dewatering Units, Oil-Water Separator and /or AF Unit Slop Oil Vessels, and Junction Boxes). (Amended November 1, 1989)

8-8-203 **Wastewater Separator Forebay:** That section of a gravity-type separator which (a) receives the untreated, contaminated wastewater from the preseparator flume, and (b) acts as a header which distributes the influent to the separator channels. (Amended November 1, 1989)

8-8-204 **Vapor-tight:** The concentration of ~~precursor~~ organic compounds, measured ~~one centimeter from~~ as per Section 8-8603 at the source, ~~shall not exceed~~ of no more than 500 ppm (expressed as methane) above background.

8-8-205 **Oil-Water Separator Slop Oil:** Floating oil, flocculant sludge, and solids which accumulate in an oil-water separator or air flotation unit.
(Adopted November 1, 1989)

8-8-206 **Oil-Water Separator Effluent Channel/Pond:** An open channel, trench, pond, or basin which handles wastewater downstream of an oil-water separator that has not been treated by an air flotation unit (usually located between the separator and the air flotation unit). (Adopted November 1, 1989)

8-8-207 **Full Contact Fixed Cover:** A stationary separator cover which is always in full contact with the liquid surface of the oil-water separator.
(Adopted November 1, 1989)

8-8-208 **Secondary Treatment Processes:** Any wastewater treatment process which is downstream of the air flotation unit, any other biological treatment process at a refinery, or any treatment process which is regulated by the EPA National Categorical Pretreatment Standards. These treatment processes are considered to be wastewater polishing steps and include: activated sludge tanks/basins, trickling or sand filters, aerated lagoons, oxidation ponds, rotating biological contactors, and other biological wastewater treatment processes. (Adopted November 1, 1989)

8-8-209 **Air Flotation Unit:** Any device, equipment, or apparatus in which wastewater is saturated with air or gas under pressure and removes floating oil, floating emulsified oil, or other floating liquid precursor organic compounds by skimming. Also included in this definition are: induced air flotation units and pre-air flotation unit flocculant sumps, tanks, or basins. (Adopted November 1, 1989)

8-8-210 **Critical Organic Compound (OC):** Any compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, carbonates and ammonium carbonate~~., or non-precursor organic compounds (Methylene chloride, 1,1,1 trichloroethane, 1,1,2 trichlorotrifluoroethane (CFC-113), trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), dichlorotetrafluoroethane (CFC-114), and chloropentafluoroethane (CFC-115),~~ emitted during separation, processing, transportation or storage of wastewater, and having a carbon number of C-14 or less (excluding phenolic compounds).
(Adopted November 1, 1989)

8-8-211 **Wastewater:** Any process water which contains oil, emulsified oil, or other organic compounds which is not recycled or otherwise used within a facility.
(Adopted November 1, 1989)

8-8-212 **Pre-Air Flotation Unit Flocculation Sump, Basin, Chamber, or Tank:** Any facility which pretreats the air flotation unit's influent with chemical coagulants, and/or adjusts the influent's pH. (Adopted November 1, 1989)

8-8-213 **Oil-Water Separator Slop Oil Vessel:** Any vessel which, as its sole function, treats or dewaters oil-water separator slop oil. (Adopted November 1, 1989)

8-8-214 **Oil-Water Separator Effluent:** Any process wastewater downstream of the oil-water separator that has not been treated by an air flotation unit.
(Adopted November 1, 1989)

8-8-215 **Sludge-dewatering Unit:** Any device which, as its sole function, is used to dewater oil-water separator and air flotation slop oil/sludge. (Adopted November 1, 1989)

8-8-216 **Stormwater Sewer System:** A drain and collection system designed and operated for the sole purpose of collecting stormwater and which is segregated from the wastewater collection system. (Adopted November 1, 1989)

8-8-217 **Junction Box:** Any structure where sewer lines meet and one or more wastewater streams are co-mingled. This co-mingled effluent flows downstream as one flow from the junction box structure. ~~A manhole or access point to a wastewater sewer system line.~~

8-8-218 **Sewer Line:** A lateral, trunk line, branch line, ditch, channel, or other conduit used to convey wastewater to downstream oil-water separators.
(Adopted November 1, 1989)

8-8-219 **Biological Treatment Unit:** Any structure which uses micro-organisms to metabolize organic compounds aerobically resulting in the production of energy and biomass.

8-8-220 **Leak Minimization:** Reducing the leak to the lowest achievable level using best modern practices and without shutting down the process the equipment serves.

8-8-221 **Leak Repair:** The tightening, adjustment, or addition of material, or the replacement of the equipment, which reduces the leakage to the atmosphere below the applicable standard in Section 8-8-312.

8-8-222 **Lift Stations:** Any structure whose function is to provide sufficient pressure to transport collected wastewater to the treatment system.

8-8-223 **Manholes:** Any service entrances into sewer lines that permit inspection and cleaning. They are normally placed at periodic lengths along the sewer line. They may also be located where sewers intersect (such as junction boxes) or where there is a significant change in direction, grade, or sewer line diameter. The opening is typically covered with a heavy cast-iron plate.

8-8-224 **Petroleum Refinery:** A facility that processes petroleum, as defined in the North American Industrial Classification Standard No. No. 32411 (1997).

8-8-225 **Process Drains:** Any point in the wastewater collection system where streams from a source or sources enter the collection system. They maybe connected to the main process sewer line or to trenches, sumps, or ditches.

8-8-226 **Reaches:** Any segments of sewer pipe that convey wastewater between two manholes or other sewer components such as lift stations or junction boxes.

8-8-227 **Sumps:** Any structure typically used for collection and equalization of wastewater flow from trenches prior to treatment.

8-8-228 **Trenches:** Any open toped culvert used to transport wastewater from the point of process equipment discharge to subsequent wastewater collection units such as junction boxes and lift stations. Trenches are often interconnected throughout the process area to accommodate pad water runoff, water from equipment washes and spill cleanups, as well as process wastewater discharges.

8-8-229 **Vent Pipes:** Any piping used to ventilate junction boxes or manholes.

8-8-230 **Wastewater Collection System Components:** Any structure or part of structures used to collect and transport wastewater prior to any treatment. These structures are usually located before oil/water separators and may include but are not limited to process drains, trenches, manholes, junction boxes (including their vent pipes), reaches, sumps and lift stations.

8-8-231 **Water Seal or Equivalent Control:** Any seal pot, p-leg trap, or other type of trap filled with any non-VOC containing liquid to create a barrier between the sewer and the atmosphere or an equivalent physical seal, enclosed piping or abatement device that meets the criteria of Regulation 2, Rule 1.

8-8-232 **Weirs**: Any structure that act as dams in open channels in order to maintain constant water level upstream. The weir face is normally aligned perpendicular to the bed and walls of the channel. Weirs provide some control of the level and flow rate through the channel.

8-8-300 STANDARDS

8-8-301 Wastewater Separators Greater than 760 Liters per Day and Smaller than 18.9 Liters per Second: A person shall not operate any wastewater separator and/or forebay with a design rated or maximum allowable capacity greater than 760 liters per day and smaller than 18.9 liters per second (oil-water separators and/or forebays between 200 gals per day to 300 gals per min.) unless such wastewater separator and/or forebay is operated within its design rated or maximum allowable capacity and is equipped with one of the following:

301.1 A solid, gasketed, fixed cover totally enclosing the separator tank, chamber, or basin (compartment) liquid contents, with all cover openings closed, except when the opening is being used for inspection, maintenance, or wastewater sampling. Roof seals, access doors, and other openings shall be checked by visual inspection initially and semiannually thereafter to

ensure that no cracks or gaps greater than 0.32 cm (0.125 inch) occur in the roof or between the roof and wall; and that the access doors and other openings are closed and gasketed properly; or

301.2 A floating pontoon or double-deck vapor-tight type cover. All floating roofs must rest entirely on the liquid surface. The floating roof shall consist of two seals, one above the other, the one below shall be referred to as the primary seal, while the other seal shall be referred to as the secondary seal.

2.1 Oil-Water Separator Liquid-Mounted Primary Seal Gap Criteria: No gap between the separator wall and the liquid-mounted primary seal shall exceed 3.8 cm (1.5 inch). No continuous gap greater than 0.32 cm (0.125 inch) shall exceed 10 percent of the perimeter of the separator. The cumulative length of all primary seal gaps exceeding 1.3 cm (0.5 inch) shall be not more than 10 percent of the perimeter and the cumulative length of all primary seal gaps exceeding 0.32 cm (0.125 inch) shall be not more than 40 percent of the perimeter.

2.2 Oil-Water Separator Secondary And Wiper Seals Gap Criteria: No gap between the separator wall and the secondary and wiper seals shall exceed 1.5 mm (0.06 inch). The cumulative length of all secondary and wiper seals gaps exceeding 0.5 mm (0.02 inch) shall be not more than 5 percent of the perimeter of the separator. The secondary and wiper seals must exert a positive pressure against the separator such that the seal surface in contact with the separator wall does not pull away from the separator wall more than the gaps allowed.

2.3 Primary And Secondary Seal Gap Inspection: The primary seal shall be inspected within 60 calendar days after initial installation of the floating roof and once every 5 years thereafter in accordance with the requirements of Subsection 8-8-301.2.2.1. The secondary seal shall be inspected within 60 calendar days after initial installation of the floating roof and once every year thereafter in accordance with the requirements of Subsection 8-8-301.2.2.2. The owner or operator shall make necessary repairs within 30 calendar days of identification of seals not meeting the requirements listed in Subsections 8-8-301.2.1 and 301.2.2.2.; or

301.3 An ~~OC~~ organic compound vapor recovery system with a combined collection and destruction efficiency of at least 95 percent, by weight.

301.4 Deleted October 6, 1993

(Amended November 1, 1989; October 6, 1993)

8-8-302 Wastewater Separators Larger than or Equal to 18.9 Liters per Second: A person shall not operate any wastewater separator and/or forebay with a rated or maximum allowable capacity larger than or equal to 18.9 liters per second (300 gals per min.) unless such wastewater separator and/or forebay is operated within its design rated or maximum allowable capacity and is equipped with one of the following:

302.1 A solid, vapor-tight, full contact fixed cover which totally encloses the separator tank, chamber, or basin (compartment) liquid contents, with all cover openings closed and sealed, except when the opening is being used for inspection, maintenance, or wastewater sampling; or

302.2 A floating pontoon or double-deck vapor-tight type cover. All floating roofs must rest on the liquid surface. The floating roof shall consist of two seals, one above the other, the one below shall be referred to as the primary seal, while the other seal shall be referred to as the secondary seal.

2.1 Oil-Water Separator Liquid-Mounted Primary Seal Gap Criteria: No gap between the separator wall and the liquid-mounted primary seal shall exceed 3.8 cm (1.5 inch). No continuous gap greater than 0.32 cm (0.125 inch) shall exceed 10 percent of the perimeter of the separator. The cumulative length of all primary seal gaps exceeding 1.3 cm (0.5 inch) shall be not more than 10 percent of the perimeter

and the cumulative length of all primary seal gaps exceeding 0.32 cm (0.125 inch) shall be not more than 40 percent of the perimeter.

2.2 Oil-Water Separator Secondary And Wiper Seals Gap Criteria: No gap between the separator wall and the secondary and wiper seals shall exceed 1.5 mm (0.06 inch). The cumulative length of all secondary and wiper seals gaps exceeding 0.5 mm (0.02 inch) shall be not more than 5 percent of the perimeter of the separator. The secondary and wiper seals must exert a positive pressure against the separator such that the seal surface in contact with the separator wall does not pull away from the separator wall more than the gaps allowed; or

2.3 Primary And Secondary Seal Gap Inspection: The primary seal shall be inspected within 60 calendar days after initial installation of the floating roof and once every 5 years thereafter in accordance with the requirements of Subsection 8-8-302.2.2.1. The secondary seal shall be inspected within 60 calendar days after initial installation of the floating roof and once every year thereafter in accordance with the requirements of Subsection 8-8-302.2.2.2. The owner or operator shall make necessary repairs within 30 calendar days of identification of seals not meeting the requirements listed in Subsections 8-8-302.2.2.1 and 302.2.2.2.; or

302.3 A vapor-tight fixed cover with an ~~OC~~ organic compound vapor recovery system which has a combined collection and destruction efficiency of at least 95 percent, by weight, inspection and access hatches shall be closed except when the opening is being used for inspection, maintenance, or wastewater sampling, or

302.4 A solid, sealed, gasketed, fixed cover which totally encloses the separator tank, chamber, or basin (compartment) liquid contents, with all cover openings closed and sealed, except when the opening is being used for inspection, maintenance, or wastewater sampling. The cover may include a pressure/vacuum valve. The concentration of ~~precursor~~ organic compounds, measured one centimeter from the roof seals, fixed cover, access doors, pressure/vacuum valve, and other openings shall not exceed 1,000 ppm (expressed as methane) above background. At petroleum refineries these concentrations shall not exceed 500 ppm (expressed as methane). Roof seals, fixed cover, access doors, and other openings shall be inspected initially and semiannually thereafter to ensure that there are no emission leaks greater than 1,000 ppm. Any emission leak greater than 1,000 ppm must be reported to the APCO and repaired within 15 days. At petroleum refineries roof seals, fixed cover, access doors, and other openings will follow the same inspection frequency but must not leak in excess of 500 ppm (expressed as methane). Any emission leak greater than 500 ppm (expressed as methane) must be minimized within 24 hours and repaired within three days.

302.5 Deleted October 6, 1993

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-303 **Gauging and Sampling Devices:** Any compartment or access hatch shall have a vapor tight cover. Any gauging and sampling device in the compartment cover shall be equipped with a vapor tight cover, seal, or lid. The compartment cover and gauging or sampling device cover shall at all times be in a closed position, except when the device is in use for inspection, maintenance, or wastewater sampling.

(Amended, Renumbered November 1, 1989)

8-8-304 **Sludge-dewatering Unit**: Any sludge-dewatering unit, equipment, machinery, apparatus, or device shall be totally enclosed and vented to a control device which has a minimum combined collection and destruction efficiency of 95 percent by weight; or shall have vapor-tight covers on the unit, conveyer belts, and storage bins or tanks except during inspection, maintenance or when the solids storage bin is in

use. Sludge must be maintained in vapor tight containers during transport and storage.

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-305 Oil-Water Separator And/Or Air Flotation Unit Slop Oil Vessels: A person shall not store any oil-water separator and/or air flotation unit sludges in an oil-water separator slop oil vessel unless such oil-water separator slop oil vessel is equipped with one of the following:

305.1 A solid, gasketed, fixed cover totally enclosing the vessel liquid contents, with all cover openings closed, except when the opening is being used for inspection, maintenance, or wastewater sampling. The cover may include an atmospheric vent or a pressure/vacuum valve. Roof seals, access doors, and other openings shall be checked by visual inspection initially and semiannually thereafter to ensure that no cracks or gaps greater than 0.32 cm (0.125 inch) occur in the roof or between the roof and wall; and that the access doors and other openings are closed and gasketed properly; or

305.2 An ~~Oc~~ organic compound vapor recovery system with a combined collection and destruction efficiency of at least 70 percent, by weight.

305.3 Deleted October 6, 1993

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-306 Oil-Water Separator Effluent Channel, Pond, Trench, or Basin: A person shall not operate any oil-water separator effluent channel, pond, trench, or basin a design rated or maximum allowable capacity greater than 25.2 liters per second (any oil-water separator effluent channel, pond, trench, or basin greater than 400 gals per min) unless such oil-water separator effluent channel, pond, trench, or basin is operated within its design rated or maximum allowable capacity and is equipped with one of the following:

306.1 A solid, gasketed, fixed cover totally enclosing the oil-water separator effluent channel, pond, trench, or basin (compartment) liquid contents, with all cover openings closed, except when the opening is being used for inspection, maintenance, or wastewater sampling. Roof seals, access doors, and other openings shall be checked by visual inspection initially and semiannually thereafter to ensure that no cracks or gaps greater than 0.32 cm (0.125 inch) occur in the roof or between the roof and wall; and that the access doors and other openings are closed and gasketed properly; or

306.2 An ~~OC~~ organic compound vapor recovery system with a combined collection and destruction efficiency of at least 70 percent, by weight.

306.3 Deleted October 6, 1993

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-307 Air Flotation Unit: A person shall not operate any air flotation unit and/or pre-air flotation unit flocculation sump, basin, chamber, or tank with a design rated or maximum allowable capacity greater than 25.2 liters per second (air flotation units and/or pre-air flotation unit flocculation sump, basin, chamber, or tank greater than 400 gals per min.) unless such air flotation unit and/or pre-air flotation unit flocculation sump, basin, chamber, or tank is operated within its design rated or maximum allowable capacity and is equipped with one of the following:

307.1 A solid, gasketed, fixed cover totally enclosing the air flotation and pre-air-flotation-unit flocculation tank, chamber, or basin (compartment) liquid contents, with all cover openings closed, except when the opening is being used for inspection, maintenance, or wastewater sampling. The cover may include an atmospheric vent or pressure/vacuum valve. Roof seals, access doors, and other openings shall be checked by visual inspection initially and semiannually thereafter to ensure that no cracks or gaps greater than 0.32 cm (0.125 inch) occur in the roof or between the roof and wall; and that the access doors and other openings are closed and gasketed properly; or

307.2 An ~~OC~~ organic compound vapor recovery system with a combined collection and destruction efficiency of at least 70 percent, by weight.

307.3 Deleted October 6, 1993

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-308 **Junction Box:** Any junction box shall be equipped with either a solid, gasketed, fixed cover totally enclosing the junction box or a solid manhole cover. Junction boxes may include openings in the covers and vent pipes if the total open area of the junction box does not exceed 81.3 cm^2 (12.6 in^2) and all vent pipes are at least 3 feet in length.

(Adopted November 1, 1989; Amended October 6, 1993)

8-8-309 **Deleted October 6, 1993**

8-8-310 **Deleted October 6, 1993**

8-8-311 **Deleted October 6, 1993**

8-8-312 **Wastewater Collection System Components at Petroleum Refineries:** Effective January 1, 2005, except as provided by Section 8-8-313, all sewer lines at petroleum refineries shall be completely enclosed so that after no wastewater is exposed to the atmosphere after entering the collection system. All drains at petroleum refineries must be vapor tight. Manhole and junction box covers in petroleum refineries must be vapor tight except when in use for active inspection, maintenance, repair or sampling. All openings in sewer line manhole and junction box covers must be completely sealed but may include openings for vent pipes. Vent pipes must be vapor tight. Any wastewater system component leak in excess of 500 ppm (expressed as methane) must be minimized within 24 hours and repaired within 3 days.

8-8-313 **Alternative Compliance, Wastewater Collection System Components at Petroleum Refineries:** Effective January 1, 2005, in lieu of compliance with Section 8-8-312, petroleum refineries may elect to comply with one of the following alternative compliance provisions:

313.1 All wastewater collection system components must be equipped with water seals or equivalent control technology according to the schedule in Section 8-8-403. Upon installation of water seals or equivalent controls, the provisions of Section 8-8-312 will apply.

313.2 All wastewater collection system components shall be subject to an inspection and maintenance plan that meets the provisions of Section 8-8-402. Any wastewater collection system component that is discovered to leak in excess of 500 ppm (expressed as methane) shall be identified, minimized within 24 hours and re-inspected every 30 days. Following three consecutive 30-day inspections where the component is vapor tight, it maybe returned to a semi-annual inspection schedule. Any wastewater collection system component that has been identified to leak in excess of 500 ppm (expressed as methane) during any three inspections must be equipped with a water seal or equivalent control within 30 days after the third inspection. Upon installation of the water seal or equivalent control, the provisions of Section 8-8-312 shall apply. Unless previously identified, any wastewater system component discovered by the APCO to leak in excess of 500ppm must be minimized within 24 hours and repaired within 3 days.

8-8-314 **New Wastewater Collection System Components at Petroleum Refineries:** Effective January 1, 2005, any new process wastewater collection system component at petroleum refineries shall be equipped with a water seal or equivalent control.

8-8-400 **ADMINISTRATIVE REQUIREMENTS**

8-8-401 **Deleted October 6, 1993**

8-8-402 **Wastewater Inspection and Maintenance Plan at Petroleum Refineries:** By January 1, 2005, all petroleum refineries must implement an inspection and maintenance plan that meets all the following requirements:

402.1 All wastewater collection system components must be identified.

402.2 A list and detailed diagrams showing the location of these components.

402.3 All wastewater collection system components must be inspected by January 1, 2005. The frequency of inspections thereafter for all components will be semi-annually.

402.4 The plan must provide for a reinspection after minimization or repair of components.

402.5 Any petroleum refinery electing to comply with Section 8-8-313 shall inform the APCO of the subsection for which alternative compliance is sought and shall submit any information required.

402.6 For petroleum refineries that elect to comply with Section 8-8-313.2, the plan must provide for minimization of leaking components and an inspection within 30 days of discovery. The plan must also provide for reinspections every thirty days until the affected component is either controlled or is returned to a semi-annual inspection frequency.

402.7 Records must be maintained as per Section 8-8-505.

8-8-403 Petroleum Refinery Compliance Schedule: Any petroleum refinery electing to comply with Section 8-8-313.1 shall install controls on wastewater collection system components according to the following schedule:

403.1 Install controls on 25% of uncontrolled wastewater system components by July 30, 2005.

403.2 Install controls on 50% of uncontrolled wastewater system components by December 31, 2005.

403.3 Install controls on 75% of uncontrolled wastewater system components by July 30, 2006.

403.4 Install controls on 100% of uncontrolled wastewater system components by December 31, 2006.

8-8-500 MONITORING AND RECORDS

8-8-501 API Separator or Air Flotation Bypassed Wastewater Records: Any person who bypasses wastewater past their API Separator or Air Flotation unit shall maintain records on the amount of bypassed wastewater, duration, date, causes for bypasses, and dissolved critical OC concentration (volume). These records shall be retained and available for inspection by the APCO for at least 24 months. (Adopted November 1, 1989)

8-8-502 Wastewater Critical OC Concentration And/Or Temperature Records: Any person who exempts their wastewater separator because of either wastewater critical OC concentration or temperature shall sample and test the wastewater initially and semiannually thereafter and maintain records on the date, time of test, location, and wastewater temperature and/or critical OC concentration (volume). These records shall be retained and available for inspection by the APCO for at least 24 months. (Adopted November 1, 1989)

8-8-503 Inspection and Repair Records: Records of inspections and repairs as required by Sections 8-8-301, 302, 305, 306 or 307 shall be retained and made available for inspection by the APCO for at least 24 months. (Adopted October 6, 1993)

8-8-504 Portable Hydrocarbon Detector: Any instrument used for the measurement of organic compounds shall be a gas detector that meets the specifications and performance criteria of and has been calibrated in accordance with EPA Reference Method 21 (40 CFR 60, Appendix A). Adopted June 15, 1994)

8-8-505 Records for Wastewater Collection System Components at Petroleum Refineries: Any person subject to the requirements of this rule shall maintain records that provide the following information:

505.1 The component type and the location of the component.

505.2 The date of all wastewater collection system component inspections, reinspections and leak concentrations measured.

505.3 A description of the minimization or repair efforts on each leaking component in excess of 500ppm.

505.4 Records shall be maintained for at least 5 years and shall be made available to the APCO for inspection at any time.

8-8-600 MANUAL OF PROCEDURES

8-8-601 **Wastewater Analysis for Critical OCs:** Samples of wastewater as specified in this rule shall be taken at the influent stream for each unit and analyzed for the concentration of dissolved critical organic compounds as prescribed in the Manual of Procedures, Volume III, Lab Method 33.

(Amended November 1, 1989; October 6, 1993)

8-8-602 **Determination of Emissions:** Emissions of precursor organic compounds as specified in Sections 8-8-301.3, 8-8-302.3, 8-8-304, 8-8-305.2, 8-8-306.2, and 8-8-307.2 shall be measured as prescribed by any of the following methods: 1) BAAMQD Manual of Procedures, Volume IV, ST-7, 2) EPA Method 25, or 25A). A source shall be considered in violation if the VOC emissions measured by any of the referenced test methods exceed the standards of this rule.

(Amended November 1, 1989; October 6, 1993, June15, 1994)

8-8-603 **Inspection Procedures:** For the purposes of Sections 8-8-301, 302, 303, 304 ~~and 312,~~ 312, 313 and 402 leaks shall be measured using a portable gas detector as prescribed in EPA Reference Method 21 (40 CFR 60, Appendix A).(Adopted June 15, 1994)

Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109

Proposed Revision of
Regulation 8, Rule 8:
Wastewater Collection Systems

Staff Report

March 17, 2004

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Table of Contents

I. EXECUTIVE SUMMARY 1

II. BACKGROUND 3

A. Process Description 3
B. Regulation 8, Rule 8: Wastewater (oil-water) Separators 6
C. Applicable Federal Regulations 6

III. APPLICABLE CONTROL TECHNOLOGY 7

Water Seals 7
Vent Control Devices 9
Hard Piping 9
Emissions or Performance Based Standards 9
Pollution Prevention Strategies 10

IV. REGULATORY PROPOSAL 11

A. Proposed Amendments and Emissions Reductions 12
B. SUMMARY OF PROPOSED AMENDMENTS 13

IV. EMISSIONS AND EMISSION REDUCTIONS 16

A. Emissions 16
B. Emissions Reductions 17

V. ECONOMIC IMPACTS 18

A. Introduction 18
Water Seals on Drains 18
Water Seals on Junction Boxes 20
Other types of Vapor Recovery and Control Equipment 21
Performance Based Standards 22
Hard Piping 22
B. Cost-Effectiveness 22
C. Socioeconomic Impacts 23
D. Incremental Costs 23
Incremental Cost-Effectiveness for Waterseals on Drains 23
Incremental Cost-Effectiveness for Sealing Manholes 24
Incremental Cost-Effectiveness for Waterseals on Junction Boxes 24
E. Staff Impacts 24

ENVIRONMENTAL IMPACTS 25

REGULATORY IMPACTS 26

Existing Requirements 26
New Requirements 26

CONCLUSION 28

REFERENCES 30

COMMENTS AND RESPONSES 31

I. EXECUTIVE SUMMARY

The Bay Area 2001 Ozone Attainment Plan contained a commitment (Further Study Measure 9) to examine wastewater collection and treatment systems at refineries, for potential volatile organic compound (VOC) emission reductions. Due to the size of these systems, many spanning hundreds of acres, a technical assessment document (TAD) was first prepared for the collection portion of these systems. The collection system consists of drains from process units piped to mechanical separation such as oil/water separators. As a result of the findings in the TAD, prepared jointly with the California Air Resources Board (CARB), the Bay Area Air Quality Management District (the District) was moved to a control measure.

Throughout this process the District staged numerous technical working group meetings that included industry, environmentalists and the Regional Water Quality Control Board. The development of the current emissions estimate was greatly dependant on the co-operation staff received from the refineries. This collaborative technical process has been highly successful and is presently continuing in an effort to assess emissions from the refinery wastewater treatment systems.

VOC emissions from wastewater collection systems are generated when organic liquids are entrained in waters used in refinery processes. These partial petroleum products are volatilized during transport to an onsite wastewater treatment system by exposure to high temperatures and turbulence in the transport structures (pipes, manholes, junction boxes, sumps and lift stations). The emitted vapors collect in the headspaces of these transport structures and are passively vented to the atmosphere through uncontrolled system openings.

Currently, the only District control on wastewater emissions is Regulation 8, Rule 8. This limits organic emissions from oil/water separators and dissolved air flotation units at refinery, chemical and other plants throughout the Bay Area. It also limits emissions from sludge dewatering and slop oil vessels.

The proposed amendments to Regulation 8, Rule 8 would result in a reduction of VOC emissions of at least 1.9 tons per day, including the reduction of toxic compounds such as benzene, toluene and xylene.

The major proposed amendments to Regulation 8-8 include:

- A 500ppm leak standard measured with an Organic Vapor Analyzer (OVA) for all wastewater collection components.
- Control equipment mandate for leaking components
- An inspection and maintenance program for wastewater components under the regulation.

It is estimated that the cost-effectiveness to reduce emissions from drains, manholes, and junction box vents ranges from $1900 to $4200 per ton of VOC reduced. This is within the range of cost-effectiveness determined for other VOC control measures adopted by the District.

II. BACKGROUND

A. Process Description

In the Bay Area 2001 Ozone Attainment Plan for the San Francisco Area air basin, the District committed to examine potential VOC emissions reductions from further control of refinery wastewater collection and treatment systems. In order to achieve this goal, staff of the California Air Resources Board (CARB) led a joint effort to quantify these emissions and suggest possible controls.

Refinery wastewater systems exist to separate and process organics entrained in water during the making of petroleum products. Water has many uses in the refining process, including crude oil washing, process unit cooling, component cooling, steam production and vessel and tank cleaning. During these and other processes, volatile organic compounds (VOC's) become entrained in the water due to direct contact. Other sources of wastewater at the refinery include water condensate drawn off refinery tanks and ground water extraction wells.

The five Bay Area refineries each have unique wastewater systems, however, each of these systems have common components. In the refinery, process block drains provide the entryway for water containing organics into the wastewater collections system. These drains feed a network of pipes that transport the wastewater in a segregated system to an onsite treatment facility. Along this piping network there are a series of manholes and junction boxes. Manholes allow access to the piping network to clear line blockages and perform maintenance, and junction boxes allow separate effluent steams to be combined. In addition to these structures, refinery wastewater collection systems may contain pumping or "lift" stations and low point or gravity sumps.

All of the wastewater gathered by the collection systems at each refinery is routed to wastewater treatment. The first system in refinery wastewater treatment is oil/water separation. Wastewater flow is introduced to a quiescent environment where heavy organics and particulates settle out under gravity and lighter oils and organics float to the surface to be removed to slop tanks by mechanical skimmers. Following oil/water separation, wastewater is routed to dissolved nitrogen or dissolved air flotation units. Here gas is percolated through the wastewater to float organics to the tank surface where it is removed to slop tanks. Both oil/water separation and dissolved gas flotation are enclosed as required by Regulation 8, Rule 8.

It is at this stage the wastewater again comes in contact with the ambient air. This usually occurs at the biological treatment unit. There are a host of other steps in many of the refinery wastewater treatment trains. These steps include flow equalization, pH balancing, chemical and nutrient addition are all designed to protect the living organisms in the biological treatment unit. These organisms feed on the organic content of the wastewater and are designed to clean the

water until it complies with Regional Water Quality Control Board (RWQCB) discharge standards.

Refineries may also employ additional polishing steps in their treatment processes, such as the addition of activated carbon to their biological treatment units, selenium treatment, wetlands and carbon filtration. These steps ensure that the water discharged into the bay meets all applicable standards.

Refinery collection, separation and treatment systems can span hundreds of acres. Quantifying emissions from the various collection and treatment components can be difficult. There is little available direct measurement data on some parts of the system and sophisticated models developed by EPA and industry are not adequate for many of these system aspects. As a result, it was decided that the best way to approach the task of quantifying and controlling emissions was to break the refinery wastewater system into sections. Analysis of the systems showed that a partition could be made after physical separation (following the oil/water separators and dissolved air or gas flotation). The following two divisions were made:

Collection and Separation: This is the portion of the system that collects wastewater from process units and tankage, and performs physical separation of oil from water. Effluent is then directed via a series of wastewater collection components (process drains, pipes, manholes, junction boxes, sumps and lift stations) to the oil/water separator for initial treatment. The oil/water separator slows the water flow down and allows the settling and flotation of light and heavy hydrocarbons out of the waste stream. These hydrocarbons are removed by skimming to slop oil tanks. The effluent then goes through dissolved air flotation units (DAF) or dissolved nitrogen flotation units (DNF). Here gas is bubbled through effluent to remove any residual gross oil or particulates not removed in the oil/water separator.

Treatment: This is the portion of the system after physical separation deals with the treatment of wastewater to remove entrained or dissolved organic compounds. The components in this portion of the system may include:

activated carbon injection tanks, flocculation tanks, biofilters, filters, screens, clarifiers, sludge thickeners, bioreactors, sludge presses, selenium removal and carbon filtration.

The Technical Assessment Document prepared by District and CARB staff deals exclusively with emissions from the collection portion of the wastewater system. The majority of emissions from this portion of the system are generated in the following two ways:

Volatilization : This occurs when wastewater that contains petroleum or partially processed petroleum products is exposed to the atmosphere. When this happens, compounds biodegrade and volatize from the water into the air. The factors that effect this process are temperature, concentration, the gas/liquid partition coefficient, biodegradability, the affinity for adsorption, ventilation of the system and turbulence or splashing.

Air Entrainment: When liquid that contains petroleum or partial petroleum products is transmitted in contact with air to a transportation system (from a process outlet into a drain) ambient air is entrained in the liquid. Air pockets may become trapped below the water surface and will return to the surface to off-gas later. This off-gassing will include the release of captured VOC's.

The TAD for the refinery wastewater collection systems quantified, through field sampling and emissions modeling, a VOC emissions estimate of at least three tons per day. The decision on the most appropriate methodology to assess these emissions was greatly assisted by a technical working group that included industry, environmentalists and the Regional Water Quality Control Board. In addition to this group, the industry provided access to their facilities and staff, and helped shoulder the technical burden of the TAD by both providing resources and consultants (Brown and Caldwell) to assist staff in the development of the best available emissions estimate. A similar process is already underway to assess emissions from refinery wastewater treatment systems.

Several technologies are available to control these emissions. They can be largely grouped into two categories, pollution prevention and emissions controls. Pollution prevention strategies can reduce emissions at their source by changes in operation, while emission controls are designed to reduce emissions after VOC containing materials have entered the wastewater system. Examples of emissions controls are gasketed or sealed collection system components, water sealed collection system components, activated carbon scrubbers, water impingement scrubbers, vacuum stripping columns and thermal oxidizers.

B. Regulation 8, Rule 8: Wastewater (oil-water) Separators

Regulation 8, Rule 8 was first adopted by the District on January 17, 1979, amended March 17, 1982, October 8, 1989, and last amended on June 15, 1994. The regulation requires controls on small wastewater separators and junction boxes, enclosure of sludge dewatering facilities, and required the retrofit of larger refinery wastewater oil-water separators. The amendments in 1994 corrected EPA policy deficiencies.

Reg. 8-8 inspections at refineries are conducted unannounced to the facility. The responsible inspector will visit the regulated oil/water separator and ensure that all accesses to it are sealed and gasketed. If the oil/water separator tank area is enclosed and the flow through the system exceeds 18.9 liters per second, then no sealed gasket shall exceed an emission standard of 1,000 ppm (methane) measured at the affected component. The inspector will also check any floating roof-seals which may be present for the correct spacing and will also check to see that all oil/water sludge dewatering operations are completely enclosed and under vapor controls.

C. Applicable Federal Regulations

Two federal regulations also may affect refinery wastewater systems. They are NSPS (New Source Performance Standards) for VOC Emissions from Petroleum Wastewater Systems (Subpart QQQ) and NESHAP (National Emission Standards for Hazardous Air Pollutants) for Benzene Waste Operations (Subpart FF). Both regulations pertain to the emissions of VOCs and toxic compounds from refinery wastewater systems.

Under Title 40 CFR Part 60, Subpart QQQ, performance standards have been established for individual drain systems, including:

- Each drain shall be equipped with a water seal
- Junction boxes shall be equipped with a cover and may have an open vent
- Sewer lines shall not be open to the atmosphere
- Regular inspection and maintenance requirements.

Also under Title 40 CFR Part 60, Subpart QQQ, performance standards have been established for closed vent systems and control devices, including:

- Any control device shall operate with an efficiency of 95 percent or greater to reduce VOC emissions vented to them
- All control devices shall be operated with no detectable emissions, as indicated by an instrument reading of 500 parts per million VOC above background.

The National Emission Standards for Hazardous Air Pollutants (NESHAP) for refineries were promulgated in August 1995. These regulations are applicable at refineries that emit 10 tons per year (tpy) of any one hazardous air pollutant

(HAP), or 25 tons per year or more of total HAPs. The refineries in the District meet this threshold requirement and are subject to the refinery NESHAP requirements.

Under Title 40, CFR, Part 61, Subpart FF, the benzene NESHAP regulations require, among other things, that petroleum refineries use maximum achievable control technology (MACT) to control emissions of benzene from waste operations, including certain wastewater systems. Typically, refineries use carbon absorption or collection and venting of wastewater gases to the refinery flare system (vent flap system) to control benzene emissions from wastewater systems in compliance with the refinery NESHAP requirements.

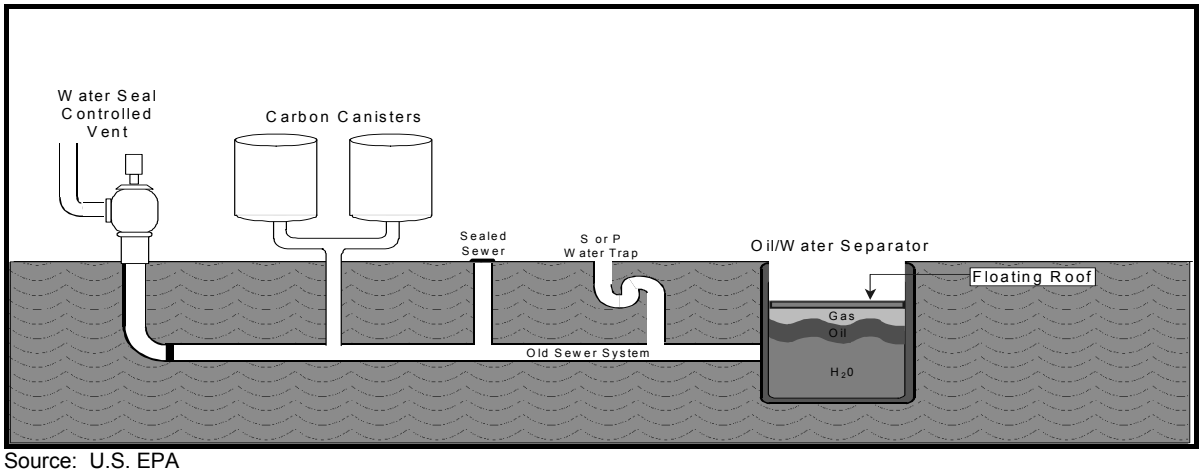
District inspectors enforce the provisions of federal NESHAP (National Emission Standards for Hazardous Air Pollutants) Subpart FF for Benzene Waste Operations. This entails conducting visual checks of controlled water trap drains in affected units.

III. APPLICABLE CONTROL TECHNOLOGY

VOC emissions from wastewater collection systems can be controlled in a variety of ways including enclosing or controlling all openings to the atmosphere, changing the operation of the units that are feeding the wastewater collection system, having a rigid inspection and maintenance (I&M) program or using a combination of controls.

Equipment control strategies can require the installation of new equipment or devices, or can include physical changes to the wastewater system. Potential equipment control strategies applicable for refinery wastewater systems can include a number of different components. Figure 1 schematically shows the application of these control strategies in a wastewater system.

Figure 1: Potential Equipment Control Strategies



Source: U.S. EPA

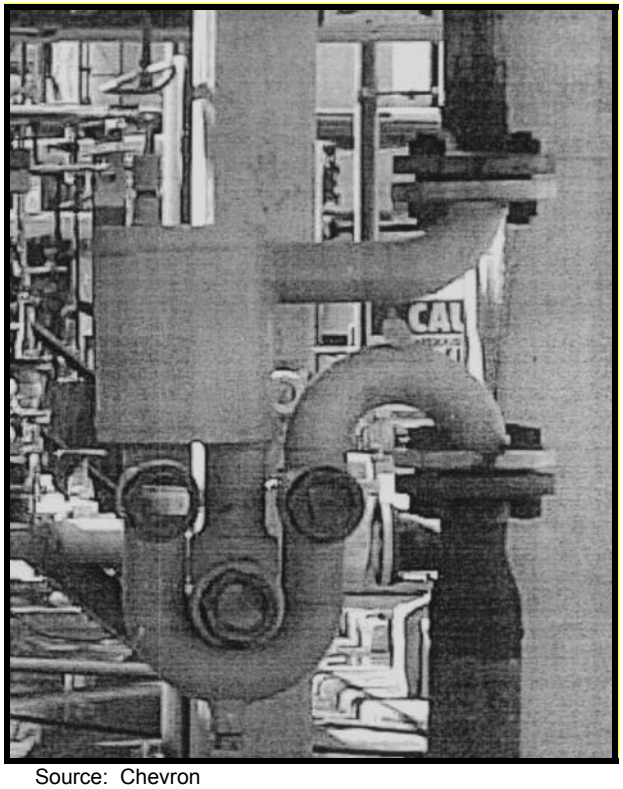
Water Seals

Installing water seals on process drains and vents open to the atmosphere would help prevent emissions from downstream sewer lines from escaping back out of the drain or vent opening. However, even with water seals installed in drains, emissions have been reported from VOC-containing liquid left standing in the water seal that was not flushed into the sewer line. In addition, if the water were allowed to evaporate from the water seal control, the emissions from the drain or vent would be similar to those from uncontrolled units. Below are two types of water seal configurations:

- P-leg seal configuration (similar to a kitchen sink drain).
- Liquid seal inserts that can be placed in existing process drains and junction box vents (Figure 2).

The overall control efficiency of this method is estimated at 65%, but varies depending on the degree of maintenance of the water seal.

Figure 2: Typical Design of a Liquid Seal Insert For Junction Box Vents



Source: Chevron

Control measures such as water seals require an extensive inspection and maintenance (I&M) program in order to be effective. I&M programs are also useful and necessary tools to ensure that the emission reductions achieved through the use of equipment controls are realized. An effective I&M program is designed to inspect (on a regular basis), maintain and repair (as necessary) the pertinent components of a pollution control system for proper operation. These

inspections are usually performed by refinery personnel and could include:

- Inspection of sealed manholes for corrosion and leaks
- Inspection of water seals for evaporated water or accumulation of trapped VOC containing material
- Inspection and repair of visible leaks from a sealed wastewater system
- Measurement of VOC concentrations in and around controlled systems (leak detection program)

Vent Control Devices

Collecting and venting the emissions to a control device can achieve a control efficiency of greater than 95%. Potential emission control devices for wastewater collection systems (predominately junction box vents) include:

- carbon adsorption
- thermal oxidation
- catalytic oxidation
- condensation

Hard Piping

Enclosing open weirs and lines with direct piping (also called hard piping) is the most stringent control option and could result in the greatest amounts of VOC emission reductions. Complete drainage system enclosure can be accomplished in the following manner:

- Hard-pipe process units to the wastewater separator and then remove or cap all existing process drains.
- Hard-pipe process units to a drain box enclosure.
- Hard-pipe those process units identified as the largest contributors to process drain emissions.
- Hard-pipe junction boxes that are completely covered and sealed with no openings.

This method is considered to have up to 100% control efficiency[1]. However, the safety issues and reconstruction complexity may be two prohibiting factors that reduce the likelihood of converting an existing open drainage system to a totally enclosed system.

Emissions or Performance Based Standards

An emissions or performance based standard would set a limit on the emissions

[1] "Final Staff Report for Proposed Rule 1176 – VOC Emissions from Wastewater Systems", South Coast Air Quality Management District, September 13, 1996.

from specific emission points in a wastewater system. Such a limit might consist of the amount of organic compounds that could be emitted in pounds per day or a limit on the concentration of emissions in parts per million (ppm).

Setting performance based standards allows a wastewater system operator to consider the optimal type(s) of control strategies that meet a particular need based upon system design and emission levels from each wastewater component. By establishing performance-based standards, such as setting an emission limit of 500-ppm VOC from a drain or vent, equivalent emission reduction can be achieved without specifying a particular control technology.

Pollution Prevention Strategies

In addition to the use of equipment control strategies to reduce VOC emissions from wastewater collection systems, there are also several control strategies that could be implemented to reduce emissions from these systems. This approach differs from the equipment control strategies in that it is designed to reduce the source of the VOC emissions (pollution prevention) through operational changes in the refinery, as opposed to controlling the emissions themselves with equipment. Additional measures, such as the use of I&M programs, can further serve to reduce emissions from wastewater collection systems.

For refinery wastewater collection systems, the following pollution prevention control measures have been identified as potential control measures to reduce VOC emissions :

- Reduce the generation of tank bottoms (these are the residues left in tanks containing petroleum products prior to cleaning)
- Minimize solids leaving desalter units to prevent organic from entering the wastewater collection system (a desalter unit removes mineral salts from crude oil using a water washing technique)
- Minimize and/or segregate cooling tower condensate from wastewater collection
- Minimize fluid catalytic cracking unit decant oil sludge (this sludge oil is the residue produced during the clean up following the catalytic cracking process)
- Control heat exchanger cleaning solids and sludge
- Minimize discharge of surfactants into wastewater collection system
- Thermally treat petroleum sludges to prevent the evaporation of organic vapors
- Reduce use of open pits, tanks, and ponds
- Remove unnecessary storage tanks from service
- Segregate storm, process, and septic wastewater collection

- Improve recovery of petroleum products from wastewater collection systems
- Identify VOC sources and install upstream water treatment and/or

separation
- Use oily sludges as feedstock (feedstock is the material used as the raw material of “feed” in various petroleum production processes)
- Control and reuse fluids from coking units and coke fines. Coke fines are the granular carbon particulates produced by the coking process
- Train personnel to reduce solids disposal to sewers

An I&M program, in addition to that discussed for equipment controls, can be designed to ensure that pollution prevention programs, such as reduced waste generation and solids control, are being followed. These types of procedures could include monitoring of waste generation, either through continuous samplers or regular testing, monitoring the use of open pits and ponds, and regular training of refinery inspectors**.**

IV. REGULATORY PROPOSAL

In analyzing the best method for achieving the maximum emissions reduction from these systems allowing for the greatest flexibility for the affected facilities, staff recommend a combination of emissions controls, a performance based standard (500 ppm) and a mandated I&M program.

The use of one or more of these techniques can result in the reduction of emissions from the wastewater transportation system. Currently, the only District standard that deals with wastewater is Regulation 8-8. This standard mandates gasket-sealed covers for both oil/water separators and DAF units.

To get the emissions reductions desired, Reg. 8-8 will be modified to include a strict concentration limit, an inspection and maintenance program and an equipment control standard for refinery wastewater collection systems.

Based on the Districts review of the available materials, a 500 ppm standard for drains, manholes, junction boxes, trenches, reaches, sumps, lift stations and oil/water separators has been determined to be the best concentration limit standard currently achievable by the industry. While the wastewater collection systems are not designed to the standards of other refinery product transportation systems, this standard is thought to be achievable due to lack of high pressures and temperatures in these systems.

This conclusion has also been supported by limited sampling by the District staff, consultations with the South Coast AQMD staff and information supplied through the workgroup process by the refineries. During discussions with the South Coast staff the derivation of the 500 ppm standard contained in the comparable South Coast Rule was reviewed. This standard is based on the Federal Regulation for Benzene waste (40 CFR 61 subpart FF). Provisions in this regulation mandate a 500 ppm limit on emissions from individual refinery drains. The federal requirement has demonstrated that 500 ppm is an achievable

standard for existing refinery wastewater processes.

This proposal mandates that each affected facility must either install controls on all wastewater collection system components (drains, manholes and junction boxes) or institute an extremely rigorous inspection and maintenance plan. In addition, both of these options are also subject to a 500 ppm emissions standard.

A. Proposed Amendments and Emissions Reductions

Proposed Sections 8-8-219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230 and 231. The proposed amendments are intended to clarify the definitions in the regulation and seek uniformity with USEPA definitions. No emission reductions are expected from these changes, although they are necessary to make other requirements enforceable.

Proposed Section 8-8-302. The proposed amendment is intended to control the emissions from oil/water separators at refineries to a level consistent with the wastewater collection system. Currently all refinery facilities are meeting and in most cases keeping emissions well below the 1,000 ppm standard, this amendment would have minimal emissions reductions associated with it.

Proposed Sections 8-8-312. The proposed amendment is intended to minimize emissions from wastewater transported in any manner that exposes it to the atmosphere. The provision would have a significant emissions impact as it is intended to control emissions from sewer drains, manholes and junction boxes. This proposed amendment mandates a 500 ppm standard for all Wastewater Collection System Components and ensures an emissions reduction estimated at 65%.

Proposed Section 8-8-313. This section mandates a choice between a District prescribed inspection and maintenance plan for Wastewater Collection Systems components and a compliance schedule for control installation. This program in conjunction with the 500 ppm limit is essential to achieving the projected 1.9 tons of emissions reductions.

Proposed Section 8-8-314. This proposed amendment mandates that all new wastewater Collection System components installed in the future would have water-seals. While it is difficult to predict the emissions reduction that would be achieved by this provision, staff believes that these controls would result in a 65% emissions reduction from all future process drains

Proposed Sections 8-8-402. This section mandates a stringent inspection and maintenance plan for all refineries and the requirements for those refineries who choose alternative compliance plans. This program in conjunction with the 500 ppm limit is essential to achieving the projected 1.9 tons of emissions reductions.

Proposed Section 8-8-403. This section proposes a compliance schedule for the installation of controls on all uncontrolled by December 30, 2007. This provision in conjunction with the provisions of the 300 Section would result in a 65% emissions reduction from Wastewater Collection System components.

Proposed Section 8-8-505. This section contains new recordkeeping requirements associated with other proposals. No emission reductions are

expected from these requirements although they are necessary to make other requirements enforceable.

B. SUMMARY OF PROPOSED AMENDMENTS

The following is a summary of proposed amendments to Regulation 8-8. Minor changes are not included.

Summary of Proposed Amendments to Regulation 8, Rule 8

Regulation Section #	Change
101	Changes description and extends the regulation to incorporate collection and transportation systems at refineries.
112	Changes exemption to exclude refinery collection and transportation systems
201	Changes the definition of Organic Compounds consistent with other Regulation 8 rules
204	Modifies definition of vapor tight to be less than 500 ppm as measured with an OVA at the source interface
217	Modify definition of junction box in line with United States Environmental Protection Agency (USEPA) definition
219	Adds new definition of Biological Treatment Unit
220	Adds new definition of Leak Minimization
221	Adds new definition of Leak Repair
222	Adds new definition of Lift Stations in line with USEPA definition
223	Adds new definition of Manholes in line with USEPA definition
224	Adds new definition of Process Drains in line with USEPA definition
225	Adds new definition of Petroleum Refinery
226	Adds new definition of Reaches in line with USEPA definition
227	Adds new definition of Sumps in line with USEPA definition
228	Adds new definition of Trenches in line with USEPA definition
229	Adds new definition of Vent Pipes
230	Adds new definition of Wastewater Collection System
231	Adds new definition of Water Seal or Equivalent Control
232	Adds new definition of Wiers
301.3	Modifies section to apply to organic compounds instead of critical organic compounds.

Regulation Section #	Change
302.3	Modifies section to apply to organic compounds instead of critical organic compounds.
302.4	New language reduces concentration limit for Oil/water separators from 1,000 ppm to 500 ppm total organics as measured with an OVA calibrated with methane
304	Modifies section to limit emissions from sludge during transportation and storage
305.2	Modifies section to apply to organic compounds instead of critical organic compounds.
306.2	Modifies section to apply to organic compounds instead of critical organic compounds.
307.2	Modifies section to apply to organic compounds instead of critical organic compounds.
312	New language requires wastewater can not be transported in a manner which exposes it to the atmosphere and that drains, manholes and junction boxes into sewer lines must be vapor tight
313	New language requires the refineries to choose between a compliance with the standards set in Section 8-8-312 or two alternative compliance provisions
313.1	New language requires the refineries to choose to install controls in compliance with the schedule listed in Section 8-8-403
313.2	New language requires the refineries to choose an Inspections and Maintenance plan. This section also requires that components leaking over 500 ppm be minimized and reinspected within 30 days. If the component passes three consecutive 30-day inspections without leaking in excess of the standard it can be returned to a semi-annual inspection schedule. Also, new language requires that any component found to be leaking over 500 ppm in three inspections be controlled in 30 days
314	New language requires that all future Wastewater Collection System Components at refineries be controlled by water seals or an APCO approved equivalent.
402	New language mandates a Wastewater Collection System Components inspection and maintenance plan by January 1, 2005
402.1	New language requires that all wastewater collection system components must be identified
402.2	New language requires a list and detailed diagrams showing the location of Wastewater Collection System components
402.3	New language requires all wastewater collection system components must be inspected by January 1, 2005. The frequency of inspections for all components thereafter will be semi-annually
402.4	New language requires a plan that provides for a reinspection after minimization or repair of components

Regulation Section #	Change
402.5	New language requires petroleum refineries electing to comply with Section 8-8-313 shall inform the APCO of the subsection for which alternative compliance is sought and shall submit any information required.
402.6	New language requires petroleum refineries that elect to comply with Section 8-8-313.2, the plan must provide for minimization of leaking components and an inspection within 30 days of discovery. The plan must also provide for reinspections every thirty days until the affected component is either controlled or is returned to a semi-annual inspection frequency.
402.7	New language requires records must be maintained as per Section 8-8-505.
403	New language provides a compliance schedule for the control of Wastewater Collection System Components at Petroleum Refineries.
403.1	New language requires that petroleum refineries choosing this option control 25% of all uncontrolled drains by July 30, 2005
403.2	New language requires that petroleum refineries choosing this option control 50% of all uncontrolled drains by December 31, 2005
403.3	New language requires that petroleum refineries choosing this option control 75% of all uncontrolled drains by July 30, 2006
403.4	New language requires that petroleum refineries choosing this option control 100% of all uncontrolled drains by December 30, 2006
505	Requires that refineries keep records for their Wastewater Collection Systems
505.1	Requires records be kept for equipment subject to Sections 8-8-312, 313, 314 and 401
505.2	Requires records of the date, location and concentration recorded during any Wastewater Collection Systems inspection
505.3	Requires that all records pertaining to these inspections be kept on site for five years

IV. EMISSIONS AND EMISSION REDUCTIONS

A. Emissions

To determine the emissions from wastewater collection systems District and CARB staff conducted a series of extensive site visits to the five Bay Area refineries. During these visits, the staff established how the collections system worked at each refinery. It was determined that to estimate the emissions from the collection system, that a combination of emissions modeling (TOXCHEM+ and United States Environmental protection agency (USEPA Water9) and best available control technology/lowest achievable emissions rate (BACT/LAER) emissions determination equations should be used.

Initially, District and CARB staff performed extensive wastewater sampling at all five Bay Area refineries. Utilizing these sampling results emissions estimates for refinery wastewater collection system emissions were developed. TOXCHEM+ emissions modeling based on field data collected (such as drain inventories, systems layouts, wastewater flow-rates) and observed wastewater petroleum concentrations, as identified from the laboratory analytical analysis was then performed. A comprehensive explanation of this modeling and the associated sampling results is provided in the TAD. This modeling provided the following partial emissions estimates for refinery wastewater collection systems:

Table 3: VOC Emission Estimates for Refinery Wastewater Drains, Manholes, and Junction Box Vents (By Refinery)

Refinery	Drain Emissions (tpd)	Manhole Emissions (tpd)	Junction Box Vent Emissions (tpd)	Total [2] (tpd)
1	0.411[1]	0.166	0.126[1]	0.70
2	0.270	0.048	0.168	0.49
3	0.140	0.164	0.168	0.47
4	0.123	0.034	0.084[1]	0.24
5	1.164	0.076	0.168	1.41
Total	2.107	0.488	0.714	3.31

[1] Partial emissions. Additional information is needed to complete the assessment of drain and junction box vents from these facilities.

[2] The emissions reported in this table do not represent the total emissions from the wastewater collection system. As discussed earlier, additional work is needed to estimate emissions from wastewater treatment and TPHd compounds.

By comparison the Districts emissions inventory (see Table 4) lists a total of approximately 1.3 tpd of total VOC emissions from refinery wastewater process drains. These numbers are derived from historical data and sampling, as well as emissions factors. Due to the comprehensive nature of the TAD it is assumed that the VOC estimates it contains, though incomplete, are more reflective of the current situation at Bay Area refineries.

Table 4: VOC Emission Estimates for Refinery Wastewater Collection Systems from the BAAQMD Inventory (By Refinery)

Refinery	Wastewater Collection System Emissions (tpd)
1	0.16
2	0.969
3	0.206
4	0.006
5	0.001
Total	1.342

In evaluating the data in Table 3, it is important to note that the VOC emission estimates for Refineries 1 and 4 are incomplete. For Refinery 1, only part of the refinery was sampled during the source tests due to ongoing maintenance to the wastewater system. This did not allow for the full implementation of the refinery sampling plan at Refinery 1 during the source test period. For Refinery 4, it was discovered after the source tests had been completed that a significant portion of the wastewater collection system was not sampled, and consequently not included in the refinery VOC emission calculation. Therefore, data was not collected to estimate any VOC emissions from vents associated with this portion of the wastewater system.

In addition, this emissions estimate was only developed for the gasoline range compounds (C_2 to C_{10}) identified during sampling. Significant amounts of diesel range materials were found in the wastewater samples analyzed as part of this TAD. The significance of emissions from these materials has not been established as part of this assessment and has been recommended for further study.

B. Emissions Reductions

It is estimated that the implementation of the District's regulatory proposal which includes controls on all wastewater collection system components (drains, manholes and junction boxes) or a District prescribed inspection and maintenance plan and a 500 ppm emissions standard can achieve approximately 1.9 tpd of VOC reductions. Emissions reductions estimates are based on control of uncontrolled refinery drains, manholes and junction boxes of 65%.

While not specifically targeted by this regulation, a reduction in VOC will also decrease the amount of toxic air contaminants released by wastewater collection system components. The toxic compounds reduced will include benzene, toluene and xylene (identified as part of the water analysis performed for the TAD). Based on the TAD analysis, other toxic compounds may also be present,

including ethylbenzene and naphthalene. It is anticipated that this proposal would also lead to a significant reduction in the emissions of these compounds.

V. ECONOMIC IMPACTS

A. Introduction

In estimating the costs associated with the potential control strategies identified in the previous chapter, both the capital costs and the recurring annual costs were considered.

The methodology used to evaluate the capital costs consisted of considering the annualized capital costs using the capital recovery method. The annualized capital costs were determined using the following equation:

$$\text{Annualized Cost} = (\textit{Capital Recovery Factor}) \times (\textit{Capital Expenditure})$$

Where:

Capital Expenditure – Equipment and installation costs
Capital Recovery Factor – 14.2% (7% per year over 10 years)

In evaluating the recurring annual costs, cost considerations were provided for such expenditures as operating costs (i.e. utilities, adsorption material replacement, etc.) and potential I&M compliance costs.

Water Seals on Drains

Capital costs associated with sealing inserting water seals in drains are not significant in terms of the cost per emission point. It is estimated that the capital costs are between $400 and $1000 per drain. However, in considering this cost, it is important to consider that a refinery wastewater collection system may contain over one thousand uncontrolled drains.

The total anticipated capital costs to install wastewater water seals on all of the existing uncontrolled refinery process drains in the District are estimated to be between about $3.4 million and $8.6 million, as shown in Table 4. When annualized over ten years, these costs are between $540,000 and $1.5 million per year, including annual I&M costs. Table 5 shows these costs by refinery.

Annual recurring costs are comprised mainly of an anticipated need for an I&M program and equipment depreciation. The I&M program will likely be necessary to ensure the operability of each control device (this is already required for drains under the U.S. EPA's NSPS). It is estimated that the annual costs of employing an inspector, who would be a refinery employee, is about $65,000 per year. It is possible that some refineries will need more than one inspector per facility. Also, each inspector will require the use of monitoring equipment (such as an organic vapor analyzer) which costs about $3,000 per unit. It is assumed that inspectors

could be hired part-time or be included in current I&M programs if an annual I&M program for wastewater systems would require less than one full-time position, so pro-rated costs are shown in Table 5. (Note: Appendix M provides a more detailed listing of the cost estimate calculations.)

Table 5: Annual Costs for Water Seals on Uncontrolled Drains[1] (By Refinery)

Refinery	Number of Uncontrolled Drains	Capital Cost (Thousand Dollars)	Annualized Capital Cost (Thousand Dollars per Year)	Annual I&M Costs (Thousand Dollars per Year)	Total Annual Cost (Thousand Dollars per Year over 10 years)
1	1,677	670 – 1,700	100 – 240	10 – 60	100 – 300
2	1,100	440 – 1,100	60– 160	6– 40	70 – 190
3	572[2]	230 – 570	30 – 80	3 – 20	40 – 100
4	500[2]	200 – 500	30 – 70	3 – 20	30 – 90
5	4,750	1,900 – 4,800	270 – 680	30 – 160	300 – 840
Total	8,599	3,400 – 8,600	490 – 1,200	50 – 290	540 – 1,500

1 Numbers may not due to rounding.
2 Estimated from field data.

Sealing Manhole Structures

Capital costs associated with sealing manholes and inserting water seals are typically not significant in terms of the cost per emission point. It is estimated that the capital costs are between $400 and $1000 per manhole. Installing gaskets or seals and plugging holes in manhole covers is a straightforward maintenance operation. However, in considering this cost, it is important to consider that sealing a manhole structure may require replacement of the complete manhole structure due to cracks and gaps in the manhole chimney. Sealing emission sources from a failed manhole structure can require significant underground repair and expense.

The total anticipated capital costs to seal manhole structures on all of the existing refinery manholes in the District are estimated to be between about $2.3 million and $5.8 million, as shown in Table 5. When annualized over ten years, these costs are between $360,000 and $1 million per year, including annual I&M costs. Table 5 shows these costs by refinery.

Annual recurring costs are comprised mainly of an anticipated need for an I&M program and equipment depreciation. The I&M program will likely be necessary to ensure the operability of each control device (this is already required for drains under the U.S. EPA's NSPS). It is estimated that the annual costs of employing an inspector, who would be a refinery employee, is about $65,000 per year. It is possible that some refineries will need more than one inspector per facility. Also, each inspector will require the use of monitoring equipment (such as an organic vapor analyzer) which costs about $3,000 per unit. It is assumed that inspectors could be hired part-time or be included in current I&M programs if an annual I&M program for wastewater systems would require less than one full-time position,

so pro-rated costs are shown in Table 6.

It is important to note that these annual I&M costs are dependent upon the frequency of inspections necessary. As such, costs for a monthly, quarterly and semi-annual inspection program were estimated. These range of annual costs (by refinery) for an I&M program are shown in Table 6, along with the total anticipated annual costs associated with controlling manhole emissions from refinery wastewater systems. (Note: Appendix M provides a more detailed listing of the cost estimate calculations.)

Table 6: Annual Costs for I&M and Sealing Manholes[1] (By Refinery)

Refinery	Number of Manholes	Capital Cost (Thousand Dollars)	Annualized Capital Cost (Thousand Dollars per Year)	Annual I&M Costs (Thousand Dollars per Year)	Total Annual Cost (Thousand Dollars per Year)
1	1,965	790 -2000	110 - 280	11 – 70	120 – 350
2	570	230 -570	30 - 80	3 – 20	35 – 100
3	1941	780 -1900	110 - 280	11 – 70	120 – 340
4	400	160 - 400	20 - 60	2 – 14	25 – 70
5	900	360 - 900	50 - 130	5 – 30	56 – 160
Total	5,778	2,300-5,800	330 - 820	30 - 200	360 - 1000

[1] Numbers may not sum due to rounding.

Water Seals on Junction Boxes

Unlike the case for water seals on drains, the total number of uncontrolled junction box vents at refineries is unknown. Because of this, a conservative approach was taken to assume that all junction boxes would need controls. In reality, this is not likely the case as some junction boxes are already controlled, or are not vented to the atmosphere. As such, the costs identified below are likely higher than could be expected to comply with any future rule.

Capital costs associated with water seals for junction box vents are estimated to be between $2000 and $2500 per vent, based on data provided by refiners. It was indicated that these costs include installation costs. The total anticipated capital costs to install wastewater water seals on all of the existing uncontrolled refinery junction box vents in the District are estimated to be between about $3.9 million and $4.8 million, as shown in Table 6. When annualized over ten years, these costs are between about $560,000 and $750,000 per year, including annual I&M cost. Table 7 also shows these costs by refinery.

Annual recurring costs are comprised mainly of an anticipated need for an I&M program. It is estimated that the annual costs of employing an inspector, who would be a refinery employee, dedicated to monitoring and maintaining the water seals is about $65,000 per year, with potentially more than one inspector being required per facility. Also, each inspector may require the use of monitoring

equipment (such as an organic vapor analyzer) which costs about $3,000 per unit. It is assumed that inspectors could be hired part-time or be included in current (such as fugitive) I&M programs if an annual I&M program for wastewater systems would require less than one full-time position, so pro-rated costs are shown in Table 7.

It is important to note that these annual I&M costs are dependent upon the frequency of inspections necessary. As such, costs for a monthly, quarterly and semi-annual inspection program were estimated. These range of annual costs (by refinery) for an I&M program are shown in the previous tables, along with the total anticipated annual costs associated with controlling uncontrolled junction box vent emissions from refinery wastewater collection systems. (Note: Appendix M provides a more detailed listing of the cost estimate calculations.)

Table 7: Annual Costs for Water Seals for Wastewater Junction Box Vents[1] (By Refinery)

Refinery	Number of Junction Boxes	Capital Cost (Thousand Dollars)	Annualized Capital Cost (Thousand Dollars per Year)	Annual I&M Costs (Thousand Dollars per Year)	Total Annual Cost (Thousand Dollars per Year)
1	655	1,300 – 1,640	190 - 230	4 - 22	190 – 260
2	190	380 – 480	54 – 67	1 – 6	55 – 73
3	647	1,300 – 1,600	180 - 230	4 – 22	190 – 250
4	134	270 - 340	38 - 48	1 – 5	39 – 53
5	300	600 - 750	85 - 110	2 - 10	87 - 120
Total	1,926	3,900 – 4,800	550 - 690	12 - 65	560 - 750

[1]Numbers may not sum due to rounding.

Other types of Vapor Recovery and Control Equipment

While a detailed cost analysis was not performed on all types of emission control devices potentially available for use with wastewater junction boxes, Table 8 provides some generic cost information on other potential vapor recovery and control equipment. In general, it is expected that the costs associated with the application of control equipment to junction box vents are significantly higher than with the use of water seals, although larger emission reductions could be achieved.

Table 8: Operating Costs for Potential Vapor Recovery and Control Equipment (Cubic Feet per Minute)

Control Technology		Capital Cost ($)	Annual Operating Cost ($)
Carbon Absorption		15-120/cfm	10-35/cfm
Thermal Oxidation	Recuperative	10-200/cfm	15-90/cfm
	Regenerative	30-450/cfm	20-150/cfm
Catalytic Oxidation	Fixed bed	20-250/cfm	10-75/cfm
	Fluidized Bed	35-220/cfm	15-90/cfm
Condensation		10-80/cfm	20-120/cfm

Source: Shen, Almon M. "Stationary Source VOC and NOx Emissions and Controls", Presentation at the 1995 Air Pollution Prevention Conference, Taipei, Taiwan, October 1995.

Performance Based Standards

While the costs associated with implementing performance based standards are difficult to quantify, in general, the establishment of performance based standards provides one of the lowest cost options for control. This is because performance based standards allow each refiner to utilize the control option or options that result in the lowest cost (both in terms of capital costs and operating costs). As such, it is believed that the costs associated with performance based standards would be in the range of, or even less than, the costs identified above for specific prescriptive control strategies.

Hard Piping

The costs associated with hard piping are uncertain at this time. This is because additional work is needed to identify the specific requirements at each refinery if this control strategy was considered. Costs would be dependent on a number of variables, including the physical characteristics of the piping necessary (length, diameter, material), as well as any necessary construction requirements, such as minimum required depth and soil/ground conditions in the area.

B. Cost-Effectiveness

This section describes the overall cost-effectiveness to control emissions from drains, manholes and junction box vents with water seals.

Based on the estimates of 3.3 tpd of VOC emissions (Table 3) from drains, manholes, and junction box vents, it is expected that 1.9 tpd of emission reductions can be achieved by sealing manholes and installing water seals in drains and junction box vents. The estimated total annual costs for control at each of the refineries in the District is in the range of $1.4 million to $3.3 million. It is estimated that the cost-effectiveness to reduce emissions from drains, manholes, and junction box vents ranges from $1900 to $4200 per ton of VOC reduced. This is within the range of cost-effectiveness determined for other VOC control measures adopted by the District, as well as by the ARB.

Additionally, in considering cost-effectiveness, it is important to consider that the emission estimates for two of the refineries, as discussed, are not complete, and that characterization of emissions from TPHd in the wastewater still needs to be evaluated. As such, the cost-effectiveness numbers above are conservative, and likely to improve as additional data is developed. In addition, as discussed above, it is likely that all of the junction box vents will not need controls. As such, the capital cost estimates, and by default the cost-effectiveness numbers, are likely overestimated and likely to improve with additional information.

C. Socioeconomic Impacts

Section 40728.5 of the California Health and Safety Code (H&SC) requires districts to assess the socioeconomic impacts of amendments to regulations that, "...will significantly affect air quality or emissions limitations." TO BE DEVELOPED…

D. Incremental Costs

Under California Health and Safety Code Section 40920.6, the District is required to perform an incremental cost analysis for a proposed rule under certain circumstances. To perform this analysis, the District must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the District must "calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option."

In considering incremental cost-effectiveness, it is important to consider that the emission estimates for two of the refineries, as discussed in the TAD, are not complete, and that characterization of emissions from wastewater treatment and emissions from TPHd in the wastewater still need to be evaluated. As such, the cost-effectiveness numbers bellow are conservative, and the cost-effectiveness of control measures will improve as additional data is developed.

Incremental Cost-Effectiveness for Waterseals on Drains

Based on the estimates of 2.1 tpd of VOC emissions (Table 3) from refinery drains, it is expected that 1.37 tpd of emission reductions can be achieved. With estimated total annual costs for control of all uncontrolled drains at each of the refineries in the District of $540,000 to $1.5 million (Table 4), it is estimated that the cost-effectiveness to require water seals on uncontrolled drains is between $1,100 and $3000 per ton of VOC reduced. This is in the range of cost-effectiveness determined for other VOC control measures adopted by the District, as well as by the ARB.

Incremental Cost-Effectiveness for Sealing Manholes

Based on the estimates of 0.49 tpd of VOC emissions (Table3) from refinery manholes, it is expected that 0.32 tpd of emission reductions can be achieved. With estimated total annual costs for control of all unsealed manholes at all of the refineries in the District of $360,000 to $1 million (Table 5), it is estimated that the cost-effectiveness to seal manholes is between $3100 and $8800 per ton of VOC reduced. This is in the range of cost-effectiveness determined for other VOC control measures adopted by the District, as well as by the ARB.

Incremental Cost-Effectiveness for Waterseals on Junction Boxes

Based on the estimates of 0.71 tpd of VOC emissions (Table 3) from junction box vents, it is expected that 0.46 tpd of emission reductions can be achieved. With estimated total annual costs for control of all junction box vents at all of the refineries in the District of $560,000 to $750,000 (Table 6), it is estimated that the cost-effectiveness to require water seals on junction box vents is between $3300 and $4400 per ton of VOC reduced. This is in the range of cost-effectiveness determined for other VOC control measures adopted by the District, as well as by the ARB.

E. Staff Impacts

Implementation of the proposed amendments will have a moderate impact on the District's resources. These changes are necessary to achieve the necessary emission reductions and to verify compliance.

ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act, the District's environmental consultant, Environmental Audit, Inc., is preparing an initial study for the proposed rule amendments to determine whether rule adoption would result in any significant environmental impacts.

One of the perceived impacts of this proposal would be a decline in wastewater quality. Through field visits, interviews and the wastewater workgroup, staff has ascertained that each refinery treatment system has been designed to cope with large fluxuations in influent. Based on this excess capacity and on the review of literature as part of the TAD, staff believes that the entrainment of VOC's in the water as a result of this measure will not adversely affect water quality standards.

REGULATORY IMPACTS

Section 40727.2 of the Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and district air pollution control requirements for the equipment or source type affected by the proposed change in district rules. The district must then note any differences between these existing requirements and the requirements imposed by the proposed change.

Existing Requirements	New Requirements
Reg. 8-8 requires that fixed roof Oil/water separators at refineries larger than or equal to 18.9 liters per second must meet a 1,000 ppm leak standard	Regulation 8-8 will now require that fixed roof Oil/water separators at refineries larger than or equal to 18.9 liters per second must meet a 500 ppm leak standard
Under Title 40 CFR Part 60, Subpart QQQ, junction boxes on new sources at refineries shall be equipped with a cover and may have an open vent	Regulation 8-8 will now require that new or existing junction boxes at refineries be controlled with a sealed closed cover but may have an open vent.
Under Title 40 CFR Part 60, Subpart QQQ, standards for drains, junction boxes and oil/water separators do not apply during startup, shutdown or Malfunction.	Regulation 8-8 will now require that control and emissions standard apply during these periods
Under Title 40 CFR Part 60, Subpart QQQ, broken seals or gaps on junction boxes must be repaired within 15 days.	Regulation 8-8 will now require that upon discovery of any leak over 500 ppm on junction boxes that leak must be minimized within 24 hours.
Under Title 40 CFR Part 60, Subpart QQQ, broken seals or gaps on drains must be repaired within 15 days	Regulation 8-8 will now require that upon discovery of any leak over 500 ppm on drains that leak must be minimized within 24 hours.
Under Title 40 CFR Part 60, Subpart QQQ, broken seals or gaps on oil/water separators must be repaired within 15 days	Regulation 8-8 will now require that upon discovery of any leak over 500 ppm on oil/water separators that leak must be minimized within 24 hours and repaired within three days.
Under Title 40 CFR Part 60, Subpart QQQ, the EPA Administrator will determine if a control measure meets equivalency for a process.	Regulation 8-8 will now require that the APCO also approve equivalency.

Under Title 40, CFR, Part 61, Subpart FF, the benzene NESHAP regulations require visual checks on all controlled water seal drains identified as containing benzene	Regulation 8-8 will now require that all drains also be subject to biannual VOC emissions testing.

Based on this review staff believes that no conflict or duplication of District or Federal requirements exists and that the amendments to Reg. 8-8 should be adopted.

CONCLUSION

A working group was formed that included representatives from California Air Resources Board, Industry, the Regional Water quality Control Board, Communities for a Better Environment (CBE), and District staff. The workgroup has met seven times to discuss technical issues related to this regulation. The issues discussed included refinery sampling plans and modeling, wastewater emissions estimation, regulatory concepts and planning for analysis of refinery wastewater treatment systems.

The main issue raised in the workgroup was in relation to the refinery wastewater treatment systems. Two schools of thought surfaced with CBE requesting immediate control action on wastewater treatment processes in addition to control of the collection system and the refineries requesting that the District staff study emissions from the treatment process prior to proposing controls. Staff are of the opinion that, based on the efforts made by industry to quantify emissions from the collection portion of the system, the ongoing workgroup process is the first step towards understanding and quantifying emissions from refinery waste water treatment.

The proposed amendments to Regulation 8, Rule 8: Wastewater (Oil – Water) Separators will exceed the commitment for study made as part of 2001 Ozone Attainment Plan. It is intended to limit the amount of organic compounds released during the collection of refinery wastewater during transport to on-site treatment. Pursuant to the Health and Safety Code Section 40727, new regulations must meet necessity, authority, clarity, consistency, non-duplicity and reference. The proposed regulation is:

- Necessary to protect public health by reducing ozone precursor emissions. The amendments also reduce exposures to toxic air contaminants.

- Authorized by California Health and Safety Code Section 40702.

- Clear, in that the new regulation specifically delineates the affected industry, compliance options and administrative requirements for industry subject to this rule,

- Consistent with other District rules, and not in conflict with state or federal law,

- Non-duplicative of other statutes, rules or regulations, and

- The proposed regulation properly references the applicable District rules and test methods and does not reference other existing law.

While this current revision is targeted at refineries only, it is recommended that other industries subject to this rule be studied and if necessary controlled in a

similar manner so that emissions reductions can be obtained. Also, both the TAD and this rule making effort identified a number of other areas where further potential emissions reductions could be achieved. These are as follows:

- Better characterization of the contribution of heavier hydrocarbons (i.e., diesel fuel, fuel oils, etc.) in the wastewater stream to VOC emissions from the wastewater collection system.
- Study of emissions from wastewater treatment
- Study of emissions from oil-water, or API, separators
- Study of emissions from coke cutting operations and vacuum trucks

REFERENCES

1. California Air Resources Board Draft Technical Assessment Document "Potential Control Strategies to Reduce Emissions for Refinery wastewater Collection and Treatment Systems" January 2003.

2. Bay Area Air Quality Management District, "Best Available Control Technology (BACT) Guideline for Water Treating – Oil/Water Separator", October 1991.

3. South Coast Air Quality Management District, "Proposed Amended Rule 1176 – VOC Emissions From Wastewater Systems", Final Staff Report, September 13, 1996.

4. United States Environmental Protection Agency, AP-42 "Waste Water Collection, Treatment And Storage", January 1995.

COMMENTS AND RESPONSES

To be added

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Interoffice Memorandum

To: Chairperson DeSaulnier and
Members of the Stationary Source Committee

From: Jean Roggenkamp
Director of Planning and Research

Date: May 17, 2004

Re: Summary of Supplemental Environmental Projects Distribution

RECOMMENDED ACTION

None. Information only.

BACKGROUND

The Board of Directors has adopted a policy regarding the circumstances in which projects that prevent or remediate the adverse public health or environmental consequences of air pollution may be included in the settlement of an enforcement case. As part of a settlement, the size of the final cash penalty may be reduced by an amount paid to the Air District to fund, or a commitment of the violator to undertake, supplemental environmental projects (SEPs). SEPs are defined as expenditures that are beneficial to air quality that are not otherwise required by law. Even where conditions exist which justify the approval of a SEP, the Air District must still negotiate an adequate monetary penalty at a level consistent with California law. It is solely within the Air District's enforcement discretion to approve or deny any SEP and to approve or deny any condition of a SEP.

As noted above, the Board of Directors has adopted a policy for supplemental environmental projects. The policy establishes that where a SEP is to be described in a settlement or funds collected for a SEP are to be committed, a proposed project must be examined to determine if it qualifies as a SEP. In performing this evaluation, Air District Counsel, in consultation with other Air District staff, is to use the following five-step process:

1. Ensure that the project meets the basic definition of SEP;
2. Ensure that all guidelines, including nexus, are satisfied;
3. Ensure that the project fits within one (or more) of the designated categories of SEPs;
4. Ensure that the cost of the project does not exceed more than 25 percent of the total settlement, exclusive of administrative costs; and
5. Ensure that the project satisfies all of the implementation and other criteria.

The purpose of this report is to provide information on recently negotiated SEP funds that will be used for projects that will benefit the Cities of Martinez, Rodeo, East Palo Alto and Livermore.

DISCUSSION

Air District Counsel has recently negotiated funding of SEPs in Martinez, Rodeo, East Palo Alto, and Livermore for a total of $395,000. The Martinez SEP funds ($270,000) are from a legal settlement with the Shell Martinez Refinery, the Rodeo SEP funds ($50,000) are from a legal settlement with the Conoco Philips Refinery, the East Palo Alto SEP funds ($50,000) are from a legal settlement with Romic, Inc., and the Livermore SEP funds ($25,000) area from a legal settlement with Hexcel.

Projects receiving SEP funding must conform to the Air District's SEP policy. The policy sets forth general criteria for projects, spells out acceptable types of projects and lists specific types of projects ineligible for the funds. The general criteria are:

1. *All projects must have adequate nexus. Nexus is the relationship between the violation and the proposed project. This relationship exists only if the project remediates or reduces the probable overall environmental or public health impacts or risks to which the violation at issue contributes, or if the project is designed to reduce the likelihood that similar violations will occur in the future.*

2. *A project must advance at least one of the declared objectives of the environmental statutes or regulations that are the basis of the enforcement action.*

SEP projects must come from one of seven categories: Public Health, Pollution Prevention, Pollution Reduction, Environmental Restoration and Protection, Environmental Compliance Audits, Comprehensive Environmental Training, and Emergency Planning and Preparedness.

City of Martinez SEPs

A public workshop was conducted in Martinez on October 30, 2003 to explain the Air District's SEP policy and to discuss potential projects for the Shell Martinez Refinery SEP funds. Written project proposals were accepted through December 15, 2003. The Air District received 25 proposals for funding. A coordinating meeting was held on January 26, 2004 with EPA staff. The meeting also included representatives from the Shell Martinez Refinery and the Contra Costa County Health Department.

EPA is allocating an additional $500,000 in SEP funds to projects in the Martinez area. The SEP funding being allocated by EPA, Region 9 is more constrained than the Air District's because of more limited types of eligible projects and a June 2003 deadline to allocate funds. Air District staff worked with EPA staff to identify suitable projects for their more constrained funding. EPA, Region 9 will be allocating their $500,000 in SEP funds towards an asthma screening and treatment program at local schools and low-emission vehicle purchases by local government agencies.

Air District staff identified from the remaining projects those that best met the Air District's SEP policy and internal funding priorities. Projects that were either ineligible or could be funded via other Air District grant programs were excluded from SEP funding.

Table 1 presents the projects selected for implementation with the Martinez SEP funding. These are projects that are eligible for SEP funds, can be fully implemented with a tangible result and do not require additional resources from the Air District for project development or implementation. The projects are expected to begin implementation within the next few months.

Cities of Rodeo and East Palo Alto SEPs

The Air District conducted public workshops in Rodeo on September 4, 2003 and in East Palo Alto on September 10, 2003. A portion of the workshops was used to review the Air District's SEP policy and to solicit input from workshop participants on ideas/proposals for expending SEP funds. The Air District received a number of ideas during the meetings and subsequently received four written proposals. Additional proposals were received from the Air District's Enforcement and Public Information and Outreach Divisions. Many of the ideas were either ineligible for SEP funds or would have required considerable effort to translate into well-defined projects. In formulating grant recommendations, staff focused on those projects that could be completed with the requested financial resources, or extended existing Air District efforts. Tables 2 and 3 present the projects that were approved for implementation using the Rodeo SEP funding and the East Palo Alto SEP funding respectively. These projects will begin implementation in the next few months.

City of Livermore SEP

Table 4 lists the project that was approved as a SEP in the Livermore area. Hexcel agreed to a $25,000 portion of their settlement to fund the extension of the Clean Air Challenge curriculum to be taught in Alameda County school districts, including those in the vicinity of Hexcel's facility located in Livermore. The Air District is currently conducting coordinating outreach efforts to educators in that area, in order to implement the Clean Air Challenge training workshops in the fall of 2004.

BUDGET CONSIDERATION / FINANCIAL IMPACT

There is no impact on the Air District's budget. The SEPs will be covered with settlement funds negotiated by Air District Counsel.

Respectfully submitted,

Jean Roggenkamp
Director of Planning and Research

FORWARDED: _____

Prepared by: Juan Ortellado
Reviewed by: Jean Roggenkamp

Table 1

Projects Selected for Implementation with the Martinez SEP Funding

Sponsor	Project Description	Allocation of SEP funds
Contra Costa County	Expansion of sirens for the Community Warning System	$65,000
Contra Costa County	Preparation of a Clean Air Plan for Northern Contra Costa County	$20,000
City of Martinez	Replacement of two pedestrian bridges in Hidden Lakes Open Space	$40,000
Air District	Establish up to two air toxics monitoring station in the Martinez area	$98,000
Air District	Development and distribution of a foreign language brochure on how to register pollution complaints	$20,000
Air District	*Clean Air Challenge* curriculum training and *Smogzilla* performances at Martinez Unified School District campuses	$27,000

Table 2

Projects Selected for Implementation with the Rodeo SEP Funding

Sponsor	Project Description	Allocation of SEP funds
Carquinez Regional Environmental Education Center (CREEC)	Planting trees in the Rodeo/Crockett area	$20,000
Air District	*Lawn-Mower Buy Back* Individuals will be offered a discounted electric or push lawn mower in exchange for a gasoline mower. Gas mower to be destroyed	$10,000
Air District	*Woodstove Change Out* Individuals will be offered rebates for purchasing compliant wood stoves or gas fireplace inserts.	$10,000
Air District	*Clean Air Challenge* curriculum training and *Smogzilla* performances at John Swett Unified School District campuses	$10,000

Table 3

Projects Selected for Implementation with the East Palo Alto SEP Funding

Sponsor	Project Description	Allocation of SEP funds
East Palo Alto Environmental Justice Team for Air Quality	Air Monitoring and Community Education Program	$10,000
American Lung Association, Family Support Center of the Mid-Peninsula and the East Palo Alto Asthma Task Force	Conduct an assessment of resources in East Palo Alto for dealing with asthma and other respiratory ailments. Recommend improvements	$10,000
Air District	*Lawn-Mower Buy Back* Individuals will be offered a discounted electric or push lawn mower in exchange for a gasoline mower. Gas mower will be destroyed	$20,000
Air District	*Clean Air Challenge* curriculum training and *Smogzilla* performances at Ravenswood Unified School District campuses	$10,000

Table 4

Livermore Area SEP

Sponsor	Project Description	Allocation of SEP funds
Air District	*Clean Air Challenge* curriculum training at Alameda County, including Livermore, school campuses	$25,000