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Staff is fully aware of the potential bias due to moisture and CO₂ when conducting tests using AQMD Method 25.1. Numerous experiments had been conducted in the past to determine the magnitude of the bias. The highest bias detected was 11 ppm, which is insignificant compared to the ppm levels encountered in the source tests (i.e., 39,000 - 131,000 ppm for junction boxes with positive flows). Therefore, staff believe that field blanks are not critical for the purpose of these tests.

Staff is also aware that the turbine flow meter used would not detect flows below 4 actual cubic feet per minute (acfm). This was a source of low flow bias for the tests. However, this low bias would actually result in underestimated emissions estimate that, in turn, would give a more conservative (i.e., higher) cost-effectiveness figures.

Comment: Cost-effectiveness of the proposed rule amendment is not based on "good" data. Emission benefits is overstated and capital estimates for control technologies do not adequately consider capital expenditures and O & M costs.

Response: As discussed above, staff believes that conservative emission estimates have been made for rule cost-effectiveness analysis purposes. The cost estimates were also conducted in a manner which would tend to give conservative results. While not all elements of individual engineering projects could be analyzed in detail for cost estimates for each site, staff did take a standard "budgetary" cost estimate approach and apply appropriate costing factors where available. Staff's cost estimate approach is consistent with EPA's recommended approach (EPA Handbook - Control Technologies for HAPs, June 1991). In addition, staff assumed that each junction box that would require venting to an air pollution device had its individual control device installed. This assumption tends to be very conservative because most facilities would probably connect several junction box vents to a common control device wherever possible.

The uncertainties about the cost-effectiveness analysis lie mostly with the junction boxes that require venting to air pollution devices. Nevertheless, staff accounted for some of these uncertainties in estimating the number of junction boxes that would require installation of APC devices, and therefore, this uncertainty has limited impact on the overall rule cost-effectiveness when all other elements of the rule are considered. Staff does not anticipate that additional studies would result in a significantly different overall rule cost-effectiveness.

Comment: Rule language is confusing and overly complicated.

Response: Since the proposed rule language was released for public review, staff has received requests to clarify and/or simplify rule requirements. In response, staff arranged a special meeting with representatives of the industries on August 6, 1996, to receive and discuss their specific comments. As a result and subsequent to that meeting, many sections of the rule have been rewritten for clarity and simplicity without significantly changing the content or rule effectiveness. Some of these changes include: 1) elimination of weekly monitoring requirements for high-emitting DSCs, 2) reduced monitoring frequency from monthly to quarterly for all low-emitting DSCs, 3) providing less frequent DSC monitoring for facilities with demonstrated good performance, and 4) reduced DSC monitoring frequency from monthly to quarterly for non-refinery facilities.

Comment: WSPA proposes a delay of the rule amendments or an exclusion of the control requirement for junction boxes until such time that WSPA and AQMD staff can jointly develop and conduct long term sampling program.

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Response: As discussed above, staff does not believe that a long term sampling program for junction boxes would significantly change the overall cost-effectiveness of the rule. In addition, the effectiveness of this rule in reducing emissions from wastewater systems will be compromised if the junction box vents are left uncontrolled. This is due to the fact that many process drains, junction boxes and manholes are interconnected. The level of emission reductions anticipated by sealing the openings on process drains and manhole covers will not be achieved if the junction box vents are left uncontrolled.

Nevertheless, staff has agreed, and has incorporated in the final draft rule, an additional three months, for a total of nine months after the amended rule adoption, for the refineries to study the emission characteristics of their junction box vents and develop various control strategies to utilize the most cost-effective and appropriate control measures.

Comment: Additional alternatives are suggested for use as DSC controls. This includes carbon screen caps, low pressure check valves, pinched hose-end check valves, water purge systems, low vapor pressure hydrocarbon purge systems, negative pressure drain systems, and slotted membrane fabric covers.

Response: Staff welcomes suggestions of any control measures that may effectively reduce emissions from wastewater systems. In order to leave options open, staff has identified alternative control measures as one of the items to be included in the initial compliance plan to encourage refineries to obtain approval in advance. Staff believe that a certain level of review of these alternatives is required to assure that the desired emission reduction efficiencies are maintained consistently.

D. PUBLIC COMMENTS RECEIVED BEFORE THE SET HEARING PACKAGE

Comment: Could the concept of scrapping cars be applied for Rule 1176?

Response: Rule 1610 provides an alternative Old-Vehicle Scrapping for compliance with designated rules with future compliance dates within AQMD Regulation XI, Source Specific Standards. In order to use any compliance alternative, one needs to identify what the emissions are from process drains. The present method of calculating drain emissions and the one the refineries are currently using is the use of correlation equations and factors. If the applicable sources can devise an equivalency between the number of cars to be scrapped and the emission reduction that facilities would have gotten from implementing the selected control option in Rule 1176, vehicle scrapping as provided in Rule 1610 may be implemented as an alternative compliance.

Comment: An existing pipeline source would like to use the 1610 program but is prohibited from removing covers and controls because of rule language. It is more cost effective to crush old cars than to continue using the current covers and controls required by Rule 1176. How can this issue be addressed?

Response: The current Rule 1610 prohibits the removal of existing APC devices. Rule 1610 applies to the requirements with future compliance dates in Rule 1176.

Comment: Is the AQMD requiring the use of a Century OVA 108 analyzer for monthly inspections and repairs? It is preferred to use a Cosmos for unit inspections because they are less expensive and more user friendly than the Century.

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Response: ... Method 21 analyzer can be used except that Rule 1176 requires methane as a calibration gas. This would most likely require a FID type analyzer.

Comment: There is a concern regarding water drained from a tank exempt from Rule 463. If there is no concern about low volatility from the material in the tank is there still a need to focus on water drained from that tank?

Response: Some sources subject to this rule could have tanks exempt from Rule 463 perhaps by size, but still have products with associated water draws capable of emitting VOC emissions.

Comment: There is a concern that paragraph (i)(1) does not deal with all safety problems and only deals with explosions. If explosions can hurt people, fires and sudden pressure releases could too. Therefore, it is requested to extend the exemption to any documented safety hazard such as fire or pressure release that may shatter the weak link in the system.

Response: The AQMD's concern is that this paragraph not be used to justify exempting pieces of equipment for things such as slip and fall accidents, carpal tunnel syndrome, and other similar concerns. In addition, there is a specific exemption in subparagraph (i)(5)(A) of the proposed rule which deals with safety hazards.

Comment: It is suggested that paragraph (i)(1) be modified to read as follows: The provisions of paragraph (e)(3) shall not apply to equipment which, if covered, would present ~~unavoidable~~ the potential for explosion or fire hazards, subject to approval by the Executive Officer.

Response: All exemptions in subdivision (i) require the person seeking the exemption to supply proof that its wastewater system meets the applicable specified criteria for that specific exemption. Paragraph (e)(3) requires sewer lines connected to wastewater separators to be enclosed so that no liquid surface is exposed to the atmosphere except where drains occur. Any enclosed water sewer system with hydrocarbon may have the potential to explode or develop a fire, especially if there is a high VOC content in the sewer line. The intent of the rule is to have the VOC emissions collected and controlled from wastewater systems including the sewer lines. However, if the person seeking the exemption provides adequate information to the AQMD that their particular process will unavoidably cause an explosion or fire, then the AQMD will provide the exemption from paragraph (e)(3).

Comment: The word blower has been removed from the rule referring to APC devices. It is our understanding that the reason the blower criteria was in there originally was because of the difficulty in actually doing a performance test on a system that doesn't have a blower.

Response: The word blower was removed so the 95 % control efficiency requirement of the proposed rule could apply regardless if the APC is active with a blower or passive without a blower or similar device. Method 25 is an appropriate test for APC devices if there is enough flow. Some of the APCs are large enough to have sufficient flow to conduct the test even though they are passive.

Comment: Do high-emitting drains switch back to low-emitting drains after six months?

Response: Yes, AQMD agrees with the concept that if it is not a repeat-emitting drain, then one shouldn't be monitoring that drain as often. Each DSC category has a specific definition

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and once the high-emitting DSC falls into a different category it would be subject to the new category requirements.

Comment: Is the corrective action for a repeat-emitter two months?

Response: Yes, but facilities are still subject to the three-day temporary fix which could include flushing with water.

Comment: API separators based on gravity are clearly defined wastewater separators but in a certain class of sumps you don't really have oil/water separation because there is no physical device on it. Additional language is requested to clarify separation to mean physically removing oil. The separation of oil should be removed from the definition of sump.

Response: The separation of oil could be with any physical device and/or by gravity. The intent of the proposed amendments are to reduce the VOC emissions from wastewater systems, regardless of the name of the equipment involved. Therefore, if a sump is used to separate water from petroleum liquid, oil emulsification, VOC, or any other hydrocarbon it should be controlled. Exemptions provide relief from those facilities with sumps that do not emit VOC emissions.

Comment: What if a tank is too small to be subject to Rule 463? Is it exempt from Rule 1176?

Response: The reason an exemption was provided for the tanks subject to Rule 463, wasn't because these tanks have no emissions, and therefore, shouldn't be regulated. The reason for the exemption was, they are being regulated under another rule. So, if a piece of equipment is not regulated under 463 or any other rule, then it would be subject to this rule. The criteria in Rule 1176 is fugitive emission sources and leaks or emission points, not the size of equipment to exempt from the rule. A similar analogy would be to say that each drain should be exempt because alone it does not have any emissions of significance.

Comment: Definition (c)(1) should be changed to read as follows: CATCH BASIN is an open basin which serves as a single collection point of rainwater or stormwater run-off directly from ground surfaces, and could have the potential to collect hydrocarbon spills.

Response: Catch basins are exempt from all provisions of Rule 1176 in subparagraph (i)(5)(G) if they exclusively receive, hold, or discharge rainwater, stormwater runoff, or non-contact water. By adding and could have the potential to collect hydrocarbon spills, the catch basin would now become a sump by definition. If a sump meets the requirements in (i)(5)(J) the sump would also be exempt from the rule.

Comment: PAR 1176, specifically subparagraph (e)(2)(A) for Sumps and Wastewater separators actually establishes that systems under negative pressure (vacuum) or with holes for air inlet would be in violation of the amended Rule. We believe these types of systems (equipment requiring vents for operating at negative pressure) need to be exempt under the provisions in subdivision (i) of the Rule amendment. They are not sources of emissions and have zero incremental cost effectiveness.

Response: The original adopted rule has the same requirement. However, in PAR 1176 exemption in subparagraph (i)(4)(B), tank pressure-vacuum valves are exempt when open due to a vacuum produced within the wastewater system.

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Comment: The addition of the word "storage" in the definition of sump will capture our refinery's storage containers that are not currently regulated in accordance with Rule 1176. A recent survey of the underground storage containers showed that the majority of the containers, approximately 70, are used to store water from surface runoff and cooling towers. Approximately 19 containers are used to control occasional spills from sample stations, pump pad drains, compressor pad drains, and the occasional venting of a PSV. One of the underground storage containers is used in the maintenance equipment wash down area and another is used as a fuel tank for an emergency generator.

Response: For those storage containers used to store water from surface runoff and cooling towers the proposed amendments specifically exempt equipment that exclusively receives, holds, or discharges rainwater, stormwater runoff, or non-contact water. Those storage containers used to contain petroleum liquids and/or VOC containing liquids would be subject to the rule. Underground storage containers used to provide fuel for an emergency generator are specifically exempted from having to have a permit under Rule 219. Since the primary use for the tank is fuel storage and not wastewater, the tank would also not be subject to Rule 1176.

Comment: The County Sanitation Districts of Los Angeles County (LACSD) has estimated that 1.7% of VOC emissions reduced (about 3 tons per day) would be transferred to the wastewater discharge. Although this level of water quality impacts is not significant, LACSD has some reservation because this figure is calculated using the assumption that all affected facilities will continue to ventilate their drainage systems. If the affected facilities choose to completely seal the systems, a larger portion of the air emission reductions could be transferred to the wastewater discharge. LACSD will continue to monitor the water quality impacts after the amended rule is implemented to determine if there is any significant increase in VOC discharges associated with the proposed amendments to Rule 1176.

Response: The AQMD does not believe that the additional VOC transferred into the wastewater will result in a significant adverse water quality impact. The above estimate of 1.7% is based on the following conservative assumptions:

1. It is unlikely for the operators of the affected facilities to choose to completely seal their drainage systems because of issues involving safety, engineering complexity, and costs.
2. The estimate is based on physical and chemical data for benzene. AQMD's recent analyses of vapor samples taken from the drainage systems of several refineries showed that 93% of VOCs are straight-chain hydrocarbons which are less likely to be dissolved in water.

LACSD agrees with the AQMD that based on the best available estimate at this time, the potential adverse water quality impacts would be insignificant. To address the uncertainties in the assumptions used for the analysis, LACSD will continue to monitor water quality of the wastewater discharge. If based on LACSD long term observation, it is determined that the water quality impacts as a result of the proposed amendments to Rule 1176 conflicts with Sanitation District's National Pollution Discharge Elimination System ("NPDES") permit conditions, AQMD will cooperate with and assist LACSD to examine all the possible measures to mitigate the impacts. Some of these measures may include providing assistance to LACSD in meeting with the Regional Water Quality Control Board to resolve any potential matters related to their waste discharge limits, or reexamining the analysis conducted for this rule amendment.

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Comment: While the AQMD has incorporated an exemption for process drains, this exemption is limited. It applies to process drains "When receiving hydrocarbon containing and/or VOC containing process liquid." [See paragraph (3)(2)]. From the language, it appears as if the exemption does not apply if the process drain is not receiving liquid. However, process drains are least likely to release VOCs when they are not receiving liquids. When the system is stagnant, the release of VOCs from process drains should be negligible. The exemption should be expanded to include stagnant conditions.

Response: At this time a methodology and research to estimate VOC emissions coming from active drainage of a process drain while receiving wastewater has not been developed. The issue is quite complex due to different drain configurations at each facility and emissions are generally a function of the VOC content in the liquid, flow rate of the liquid, drop height of the liquid, material temperature and vapor pressure, exposed area for evaporation, ambient temperature and wind conditions. The VOC emissions submitted to the AQMD and used to develop this rule were those reported from drains not receiving wastewater. If the AQMD was able to quantify the VOC emissions from drains receiving wastewater, the inventory of VOC emissions from process drains could potentially be much higher. However uncontrolled drains could and do result in VOC emissions during stagnant conditions due to liquid left in the drain or conveyed through the sewer lines.

Comment: Junction box vents should be deleted from the definition of a DSC and exempted from monitoring requirements in Rule 1176. Supporting reasons are as follows:

In the proposed amendments, junction boxes are required to meet specified construction standards (i.e. totally enclosed with a solid, gasketed, fixed cover, open vent pipe no more than four inches in diameter and at least three feet in length). These construction standards are consistent with federal NSPS, Subpart QQQ for junction boxes. As explained below, implementation of these standards on all junction boxes will effectively control VOC emissions from the vents.

In the EPA Federal Register for NSPS Subpart QQQ, the potential for buildup of explosive vapors in sealed junction boxes is discussed. Because of this potential safety problem, EPA allowed vent pipes to provide a safe and effective emissions control from junction boxes. Also, EPA pointed out that molecular diffusion and convection are the primary factors affecting VOC emissions from junction boxes. Since VOC diffusion is inversely proportional to the diffusion path length, the greater the vent pipe length, the lower the rate of VOC emission into the air. Also, the diameter of the vent pipe opening affects the emissions due to convection. EPA concluded that a vent pipe having a maximum diameter of four inches and minimum length of three feet would effectively restrict VOC emissions and, at the same time, avoid the potential safety problem.

Another reason for excluding junction box vents is that many are located 10-20 feet above grade and, therefore, inaccessible.

Response: Since very little data was available on emissions from junction box vents and manhole cover openings, staff conducted a series of surveys, monitoring and source tests on such sources at all major refineries in 1996. Based on the results of the surveys, staff has concluded that emissions from these sources are significant and emissions can be reduced cost effectively. In addition, the original intent of the rule was to reduce VOC emissions from the entire

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wastewater system. Please refer to the staff report both Chapter IV for further emission impacts and Chapter V for cost-effectiveness.

As far as the potential for buildup of explosive vapors in sealed junction boxes, the proposed amendments do not require junction box vents to be controlled unless they exceed 500 ppm VOC. If the junction box needs to be controlled because of excess emissions, sealing is only one of the options, and one may use control equipment which does not seal off the wastewater system. In addition some refineries have already completely sealed their junction boxes, while others have added controls to their junction boxes.

Comment: After a repeat emitting DSC has been identified, sixty days is an insufficient time period for implementation of controls. In order to meet this time constraint, the selection, engineering and installation of the DSC control may have to be done on an expedited basis resulting in higher costs. Therefore, this is not justified.

Response: The proposed amendments that require repeat emitting DSCs to be controlled to eliminate excess emissions within 60 days are flexible in that they also provide for any other date approved by the AQMD, and allow for up to six months after a Permit to Construct is issued, if it requires the use of APC devices which require a Permit to Construct or Operate.

Comment: Under the proposed amendments, a facility would be in violation of the rule if a single DSC with excess emissions were discovered by AQMD inspection. In effect, this enforcement mechanism is gauging the effectiveness of the inspection and maintenance program by whether there is a single DSC with excess emissions. This is inappropriate. There are thousands of DSCs at a refinery making it virtually impossible to ensure that each DSC does not have excess emissions at any given time. Because of this situation, we believe that the effectiveness of the inspection and repair program should be gauged by whether the number of DSCs with excess emissions is maintained below a reasonable threshold number. In lieu of allowing a Notice of Violation (NOV) for a single DSC with excess emissions, we recommend that an NOV be allowed only if the total number of DSCs with excess emissions, as discovered by AQMD inspection, exceeds a threshold number. We would like to work with the AQMD in determining an appropriate threshold.

Response: This is the same situation as the current rule, where the facility is considered in violation if it has emission. The proposed rule, however, now implicitly allows self-correction upon facility discovery without being subject to a violation. In addition, in order for the AQMD inspector to issue a NOV, the proposed rule now requires that a "grab sample" procedure be followed. The sample would then be analyzed in a qualified lab using EPA Method 25 or AQMD Method 25.1 to verify that the VOC content does exceed the rule's limit of 500 ppm. While this process improves the certainty of VOC emissions determinations, it hinders the AQMD's ability of issuing multiple NOVs. Therefore, the proposed amended rule is, by design, focused on self-compliance activities using the much more convenient OVAs or other portable instruments.

Comment: Definition of Wastewater Separators: The proposed definition will significantly expand the universe of units covered. WEMCOs, DAFs etc., will now be subject to Rule 1176 under the proposed definition of wastewater separators. These units would not only be required to be covered and vented to an air pollution control device achieving a 95% control efficiency, they will also be subject to the prohibition of excess emissions. This appears to impose a more

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stringent standard on water treating units than on tanks subject to Rule 463. WEMCOs, DAFs and other similar water treatment units should be either deleted from the definition of wastewater separators or be provided with a standard that is not more stringent than Rule 463.

Response: The intent of the new definition for wastewater separators was to clarify that any tanks used in the treatment of wastewater be subject to Rule 1176. Also subparagraph (i)(5)(E) of the proposed rule provides an exemption for tanks which are already subject to Rule 463.

Comment: Paragraph (c)(19) Process Drain Definition. Process drain definition must be revised to be consistent with the exemption provided in Rule 1176(f)(2).

Response: The definition for process drain defines the physical opening in the wastewater system, rather than the activity of whether or not the opening is receiving liquid as the exemption does.

Comment: Subparagraph (e)(2)(C), requires mandatory fixed covers on dissolved air flotation tanks by December 31, 1996. Emissions from an AFU tank that complies with the current 500 ppm limit should not be required to be covered. Covering this equipment would not provide any significant reductions in VOC and could in fact produce an exposure hazard for personnel assigned to visually inspect the function of the AFU skimmer. The cost effectiveness of covering low-emitting equipment becomes prohibitive in light of the pounds of emissions not reduced.

Response: The existing rule requires air flotation units in refineries to be covered as these units are emission sources of VOCs and odors. The proposed amendments do not impose additional requirements, thus no cost analysis was necessary. Most air flotation units in refineries in this area have been covered with vapors vented to various air pollution devices. Staff understand that these refineries have been able to operate these covered air flotation units safely.

Comment: Subparagraph (g)(1)(A), recordkeeping. This recordkeeping requirement becomes severe for Title V facilities who must maintain records for five years. The current method of recordkeeping provides adequate documentation of inspections and emission levels. One must consider cost effectiveness of these changes for both the facilities and the AQMD.

Response: Subparagraph (g)(1)(A) is essentially the same requirement as the current Rule 1176 which requires recordkeeping for two years. Also, not all facilities subject to Rule 1176 are subject to Title V.

Comment: Paragraph (f)(3)-The requirement to take "all necessary steps to minimize emissions" is open to interpretation. This calibration requirement precludes the use of the photoionization detectors (PIDs), and essentially mandates the use of flame ionization detectors (FIDs). There are ergonomic improvements and reduced costs of PIDs over FIDs. You requested data regarding the reproducibility of volatile organic compound (VOC) monitoring data retrieved from PIDs before further consideration would be given to eliminate the methane calibration criteria. The report titled "Method 21 Evaluation for the Hazardous Operations NESHAP (HON) (90-ME-07)" used an abundant amount of experimental and historical data to conclude that both PIDs and FIDs can be recommended to accurately and precisely monitor refinery related VOCs.

Response: This study simply compares response factors (and some instrument parameters like hysteresis) among different kinds of portable analyzers to see if some are better to use on

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specific HONs than others (their criterion is a response factor <5). Method 21 assumes that the stream being monitored is a single component stream or one that can be well characterized as to the partitioning of more than one compound. Method 21 has been carried over to leaks where this doesn't hold, in Rules 1173 and 1176. That's why the correlation equations have been developed and probably one of the reasons why they show such a large variability. In addition, comparing only six aromatics and using this to justify that the data should be comparable is inadequate, when the core data itself indicated that the aromatics only comprised about 23% of the total gasoline sample. The only way to resolve this issue is to do a study of side-by-side comparisons of FID response and PID response on typical leaking components on typical facility processes. If associations representing facilities subject to this rule would like to conduct the study, the AQMD would be ready to assist with the technical side. Also, presently all of the fugitive emissions correlation equations and factors used by EPA and industry were based on using FIDs.

Comment: Subparagraph (i)(5)(G)- Existing facilities that are already permitted by other regulatory agencies such as the Permit by Rule Department of Toxic Substances should also be exempted from Rule 1176.

Response: Rule 1176 amendments have been incorporated as an element of the region's attainment strategy in meeting the air quality standards for ozone. Regulations of other agencies usually have different purposes. In addition, as part of the rule development process, a finding must be made that the rule is not duplicative to any existing state or federal regulations. However, a facility operator through compliance with other regulatory agency's requirements, may demonstrate that they meet the requirements of Rule 1176.

Comment: Subparagraph (e)(1)(B): Semiannual Monitoring of Non-Sealed DSCs with Excellent Monitoring Records Should Be Allowed. The AQMD proposes that sealed DSCs be monitored on a semiannual basis, apparently due to the fact that such DSCs have not had emissions which have exceeded background levels for at least six months. We appreciate the relaxation of monitoring standards based on historical performance for drains with gas tight barriers. However, the presence of barriers on drains does not preclude the fact that other drains exist which have had excellent monitoring records without the need for drain retrofits. Process source control activities, operational controls, and/or unit feed changes may have been sufficient reasons for the absence of emissions above background concentrations. Institutional controls should be considered reason enough to reduce monitoring periods to a semiannual basis. To account for air quality benefits achieved by having background concentrations of emissions from drains without air tight seals, we request that all drains with background vapor concentrations for the previous six months be granted the provision of semiannual monitoring.

Response: In monitoring DSCs once a month, the assumption is made that for the other 29 or 30 days of the month the DSC was not emitting VOCs. In reality the same DSC could have been emitting several times during the same month. To allow a DSC that is not controlled to be inspected only twice a year, would be assuming that for the other 363 days of the year that that particular DSC was never emitting VOCs above background. Emission data has shown that even DSCs with controls such as a water seal do have emissions and only control their emissions by an average of 50%. However, the AQMD has proposed the monitoring frequency for all low-emitting DSCs at refineries and all DSCs at other facilities to be reduced from monthly to quarterly to provide for additional flexibility and cost savings to the affected sources.

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Comment: Subparagraph (i)(5)(J): There are Effective Means to Obtain Samples from Sumps or Wastewater Separators Without Installing Sample Ports. Installing sample ports at sumps or separators is an unnecessary expense for facility operators. Samples may currently be taken from any sample hatch or from an uncovered sump using standard "sample thieves," used more commonly for sampling above ground storage tanks. Sample ports also provide additional, potential release sources for fugitive emissions. The proposal to require sample ports at sumps and separators should be removed from the rule.

Response: The samples to determine whether or not a wastewater system is exempt from the proposed amendments to Rule 1176 are taken from each inlet to all the sumps or wastewater separators at that facility. It is very difficult to see the inlet entry to most sumps and wastewater separators let alone if there is more than one. Therefore, it is essential that AQMD staff have access to each inlet to determine whether or not the facility is exempt at all times.

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Table I-1: Refinery Process Drains Emission Inventory¹

Facility Name	1992		1993		Jan-Jun '94		Jul '94-Jun '95	
	No. of Drains	Emissions (lb/yr)	No. of Drains	Emissions (lb/yr)	No. of Drains	Emissions (lb/yr) ²	No. of Drains	Emissions (lb/yr)
Refinery 1	1,765	702,470	3,419	722,628	3,421	330,128	3,418	443,716
Refinery 2	894	200,703	1,021	206,393	894	200,702	1,101	60,446
Refinery 3	2,891	525,552	3,048	424,581	2,990	211,550	3,184	482,651
Refinery 4	278	55,322	93	37,014	93	37,014	68	27,064
Refinery 5	85	9,722	123	6,369	120	7,366	121	1,868
Refinery 6	2,508	110,854	2,819	124,577	2,819	124,577	2,768	16,679
Refinery 7	491	195,418	491	195,418	491	195,418	491	195,418
Refinery 8	1,581	339,029	1,591	32,794	1,609	82,718	2,036	98,026
Refinery 9	1,898	174,316	1,898	174,316	1,898	167,042	1,898	83,521
Refinery 10 ³	203	80,794	203	80,794	241	40,000	265	105,470
Refinery 11	2,228	103,508	2,228	103,508	2,228	129,700	2,228	37,482
Refinery 12	70	27,860	49	19,502	49	6,501	49	6,501
Refinery 13	1,439	177,069	1,439	125,302	1,439	125,302	1,439	34,998
TOTAL	16,131	2,702,617	18,422	2,253,196	18,292	1,658,018	19,066	1,593,850
TONS/YR		1,351.3		1,126.6		829.0		796.9
TONS/DAY		3.70		3.09		2.27		2.18

Notes:

- ¹ Based on partially reviewed Annual Emission Fee Billing (EFB) Reports.
- ² The 1994 emissions were estimated by doubling the Jan-Jun '94 reported emissions. Starting July '94, EFB reports were submitted on a fiscal year basis.
- ³ Refinery 10's Jan-Jun '94 report was adjusted based on AQMD review.
 - Shaded figures in half year 1994 and fiscal year 1994-95 were adjusted data from previous reports since data were not available or there were discrepancies.
 - Shaded figures for 1992 were adjusted data from the 1993 reports. The 1992 data for drains were lumped together with emissions from other fugitive components.
 - Refineries 4, 7, 10 & 12 are partially shutdown.

Appendix I

Rule 1176 Emission Calculations

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Table I-2: Estimated Universe for Junction Boxes & Manhole Covers

Facility Name	JBox	MHC	Total
Refinery 1	12	150	162
Refinery 2	20	50	70
Refinery 3*	410	670	1080
Refinery 6	25	235	260
Refinery 7	16	26	42
Refinery 9	20	630	650
Refinery 10	15	8	23
Refinery 11**	1	0	1
Refinery 13	20	380	400
Total Count (All Refineries)	539	2149	2688
less: Controlled JBs & MHCs from Refinery 3	406	670	1076
Total uncontrolled from all refineries	129	1479	1608
Add:			
All Industrial Sources	17	0	17
All Chemical Plants	30	0	30
Total Uncontrolled (AQMD)	176	1479	1655

Notes: * Refinery 3 reported 395 JBs with loop seal control, 15 JBs with carbon canisters, and 670 manhole covers, all of which are controlled. Out of 15 JBs with carbon, 4 cannot meet the 500 ppm limit, according to Refinery 3. It was assumed that 4 JBs will need new controls.

** Refinery 11 reported only 1 junction box in oily wastewater service. Their wastewater system is hard-piped and vented to a vapor control device. Likewise, there were no MHCs reported for oily water service.

- Shaded figures are best estimates. Some refineries reported only total and did not differentiate between JBs and MHCs.

Table I-3: Estimated Emission Inventory for Junction Boxes & Manhole Covers in the AQMD

Source Type	Survey Count	Ave. Em. (lb/yr)	Percent	Est'd. Universe	Total Em. (lb/yr)	Total Em. (ton/yr)	Total Em. (ton/day)
JBox (Regular)	24	17.03	86	158	2,691	1.35	0.004
JBox (Pos. Flow)*	4	37,769.01	14	18	680,202	340.10	0.93
Total (JBox)	28			176		341.45	0.94
MHC (Regular)	69	93.77	96	1410	132,216	66.11	0.18
MHC (Pos. Flow)	3	19,798.87	4	62	1,220,105	610.05	1.67
Total (MHC)	72			1479		676.16	1.85
Grand Total	100			1655		1,017.61	2.79

Note: * In calculating the estimated universe for JBox (Pos. Flow), the percentage was multiplied by the refinery total uncontrolled count (129). It was assumed that all the JBs from non-refinery sources are regular flow.

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Table I-4: Summary of AQMD Rule 1176 Survey

Facility	JBox (Reg. Flow)		JBox (Pos. Flow)		Total JBox		MHC (Reg. Flow)		MHC (Pos. Flow)		Total MHC	
	Count	Em. (lb/yr)	Count	Em. (lb/yr)	Count	Em. (lb/yr)	Count	Em. (lb/yr)	Count	Em. (lb/yr)	Count	Em. (lb/yr)
FIRST INSPECTION												
Refinery 1	4	34.67	3	92,432.76	7	92,467.43	11	2,157.19	1	22,736.63	11	2,157.19
Refinery 2	3	1.64	1	33,110.76	4	33,112.40	17	498.23	2	27,379.23	17	498.23
Refinery 6	5	1.55			5	1.55	20	4,642.60			22	27,379.23
Refinery 9	7	242.34			7	242.34	14	193.85			14	193.85
Refinery 13	5	247.64			5	247.64	7	291.33	1	26,330.27	8	26,621.60
TOTAL	24	527.84	4	125,543.52	28	126,071.36	69	7,783.20	3	49,066.90	72	56,850.10
2ND INSPECTION												
Refinery 1	4	120.62	3	109,588.37	7	109,708.99	11	9.66			11	9.66
Refinery 2	3	0.23	1	67,180.22	4	67,180.45	17	326.18			17	326.18
Refinery 6	5	4.99			5	4.99	20	4,442.33	2	59,474.68	22	63,917.01
Refinery 9	7	115.85			7	115.85	14	168.47			14	168.47
Refinery 13	5	48.04			5	48.04	7	210.80	1	10,251.64	8	10,462.44
TOTAL	24	289.73	4	176,768.59	28	177,058.32	69	5,157.44	3	69,726.32	72	74,883.76
AVERAGE	24	408.79	4	151,156.06	28	151,564.84	69	6,470.32	3	59,396.61	72	65,866.93
AVE. EMIS./UNIT		17.03		37,789.01		5,413.03		93.77		19,798.87		914.82

Note:

- Data from Refineries 3 and 11 were not included because they are either already controlled or from storm drain system.

Table I-5: Comparison of Manhole Cover and Junction Box Emissions
 Predicted by Screening Value Correlation vs. Measured

Sample No.	Type	Screening Value	Mass Rate by S.Test (lb/hr)	Mass Em.by Drains Corr. Eq.* (lb/hr)	Mass Em. by Other Corr. Eq.** (lb/hr)
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JUNCTION BOX (POSITIVE FLOW)

Average			1.21	2.43	0.0049
104	JB	8333	3.38	3.14	0.0059
110	JB	6000	0.49	2.25	0.0049
128	JB	10000	0.85	3.78	0.0066
136	JB	1500	0.11	0.55	0.0022

JUNCTION BOX (REGULAR FLOW)

Average			4.23E-03	3.68E-01	1.66E-03
125	JB	800	5.40E-03	2.88E-01	1.49E-03
232	JB	500	6.60E-03	1.78E-01	1.13E-03
345	JB	1750	6.80E-04	6.39E-01	2.36E-03

MANHOLE COVER (POSITIVE FLOW)

233	MHC	1050	0.36	0.38	0.0017
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MANHOLE COVER (REGULAR FLOW)

Average			2.13E-02	7.05E+00	8.78E-03
445	MHC	5150	7.70E-04	1.92E+00	4.46E-03
124	MHC	20000	2.40E-03	7.67E+00	9.92E-03
446	MHC	40000	6.60E-02	1.56E+01	1.49E-02
346	MHC	8100	1.60E-02	3.05E+00	5.82E-03

* AQMD (1980 EPA) Drains Eq. = $7.553E-03 \times (SV)^{1.02}$
 ** 1995 EPA Other Eq. = $1.32E-05 \times (SV)^{0.589}$

Table I-6: Rule 1176 Survey - Refinery 1

Component ID	Type	Date	PPM	Back- grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Rechk Date	PPM	Back- grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Comments
E Box	JB	4/11/96	200	7	5.65		4/25/96	6	6	0.08		Vent
		4/11/96	500	8			4/25/96	6	6			Plate (Disregard)
		4/11/96	10000	7			4/25/96	5000	6			Pipe (Disregard)
C Box 1	JB	4/11/96	3000	7	28.37		4/25/96	16	6	0.08		
C Box 2	JB	4/11/96	11	7	0.58		4/25/96	6	6			
A Box	JB	4/11/96	9000	40	29,632.38		4/25/96	9000		29,767.32		Positive Flow
81	MHC	4/11/96	12	12		0.08	4/25/96	150	6		0.73	
511	MHC	4/11/96	12	12		0.08	4/25/96	12	12		0.08	
1*4	MHC	4/11/96	4000	15		33.59	4/25/96	8	8		0.08	
#1 Lift St. Ovfto.	JB	4/11/96	9000	8	29,740.33		4/25/96	15000	6	50,101.21		Positive Flow
#1 Lift St. Inlet	JB	4/11/96	8	8	0.08		4/25/96	20000	10	86.83		
Main St./ J St.	MHC	4/11/96	5	5		0.08	4/25/96	12	12		0.08	
#9 API Sep. Inlet	JB	4/11/96	10000	25	33,060.05		4/25/96	9000	20	29,699.85		Positive Flow
#132	MHC	4/11/96	10	10		0.08	4/25/96	10	10		0.08	
#42	MHC	4/11/96	10	10		0.08	4/25/96	10	10		0.08	NESHAPS
#159	MHC	4/11/96	8000	15		2.11	4/25/96	10000	10		2.40	
#130	MHC	4/11/96	200	15		0.23	4/25/96	1000	10		0.62	
Subst. #63	MHC	4/11/96	100,000	20		2,119.92	4/25/96	40000	20		5.44	
#20	MHC	4/11/96	2000	15		0.93	4/25/96	20	10		0.04	
#21	MHC	4/11/96	20	15		0.03	4/25/96	20	11		0.04	Benzene/NESHAPS
Total (Regular Flow)					34.67	2,157.19				86.99	9.66	
Total (Positive Flow)					92,432.76					109,568.37		
TOTAL					92,467.43	2,157.19				109,655.36	9.66	

Notes:

- Shaded figures are those with positive flow. The 1980 EPA/Radian correlation equation for "Drains" was used in the calculation.
- Emissions from Regular flow Junction Box (JB) and Manhole Cover (MHC) were calculated using the 1995 EPA correlation equation for "Others".

Table I-7: Rule 1176 Survey - Refinery 2

Component ID	Type	Date	PPM	Back-grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Rechk Date	PPM	Back-grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Comments
No. of Pump 70P8B	MHC	4/1/96	80,000	10		196.51	4/19/96	10	10		0.08	hole sealed
NE of ESP's	MHC	4/19/96	500	5		9.83	4/26/96	10	10		0.08	
SE of ESP	MHC	4/19/96	4	4		0.08	4/26/96	10	10		0.08	
So. in FCC Pump Row	MHC	4/19/96	4	4		0.08	4/26/96	10	10		0.08	
So. in Gas Pump Row	MHC	4/19/96	4	4		0.08	4/26/96	3,000	7		28.37	
No. of Delisob.	JB	4/19/96	15	5	0.99		4/26/96	10	10	0.08		
SW of 84Tk 1	JB	4/19/96	8	4	0.58		4/26/96	10	10	0.08		
P16 Sump	JB	4/19/96	10,000	10	33,110.76		4/26/96	20,000	10	67,180.22		Positive flow
E of TK 9015	JB	4/19/96	5	5	0.08		4/26/96	500	10	0.08		
So. of Cool Tower	MHC	4/19/96	30,000	10		110.27	4/26/96	10	10		0.08	plugged w/ sealant
So. of T 9001	MHC	4/19/96	5	5		0.08	4/26/96	5	5		0.08	
So. of T9009	MHC	4/19/96	3,000	5		28.39	4/26/96	5	5		0.08	plugged w/ sealant
So. of T9006	MHC	4/19/96	5	5		0.08	4/26/96	5	5		0.08	
No. of Control Rm.	MHC	4/19/96	6,000	15		42.68	4/26/96	8,000	10		50.59	
No. of Derrick Flare	MHC	4/19/96	15,000	10		73.29	4/26/96	10,000	10		57.71	
E. of Cont. Rm.	MHC	4/19/96	5	5		0.08	4/26/96	10	10		0.08	
NE of Cont. Rm.	MHC	4/19/96	400	5		8.61	4/26/96	10,000	10		57.71	
E of New Sub. St.	MHC	4/19/96	500	4		9.84	4/26/96	15,000	10		73.29	
NE of New Sub. St.	MHC	4/19/96	300	4		7.26	4/26/96	8,000	10		50.59	
NW of Sub. St.	MHC	4/19/96	20	5		1.25	4/26/96	200	8		5.63	
NE of Sub. St.	MHC	4/19/96	500	5		9.83	4/26/96	30	8		1.57	
Total (Regular Flow)					1.64	498.23				0.23	326.18	
Total (Positive Flow)					33,110.76					67,180.22		
TOTAL					33,112.40	498.23				67,180.45	326.18	

Notes:

- Shaded figures are those with positive flow. The 1980 EPA/Radian correlation equation for "Drains" was used in the calculation.
- Emissions from Regular Flow Junction Box (JB) and Manhole Cover (MHC) were calculated using the 1995 EPA correlation equation for "Others".

Table I-8: Rule 1176 Survey - Refinery 6

Component ID	Type	Date	PPM	Back- grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Reck. Date	PPM	Back- grnd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Comments
	MHC	4/11/96	8,000	4		50.62	4/26/96	100	15		3.48	
W 12D3	MHC	4/11/96	30,000	8		110.27	4/26/96	100,000	15		2,119.92	
N 12C2	MHC	4/11/96	10	10		0.08	4/26/96	15	15		0.08	
N 12G2A	MHC	4/11/96	8	8		0.08	4/26/96	15	15		0.08	
N 12J3	MHC	4/11/96	8	8		0.08	4/26/96	10	10		0.08	
W LTB-1	MHC	4/11/96	100,000	5		2,119.92	4/26/96	15	15		0.08	
N 12D1	MHC	4/11/96	200	5		5.68	4/26/96	10	10		0.08	
W 800X130	MHC	4/11/96	100	4		3.74		100	4		3.74	No data on recheck; Assume same as first insp.
N 300X28	MHC	4/11/96	10,000	8		57.72		10,000	8		57.72	No data on recheck; Assume same as first insp.
5th/D St.	MHC	4/11/96	15	15		0.08	4/26/96	25	10		1.25	
5th/D St.	MHC	4/11/96	100	15		3.48	4/26/96	50	15		2.07	Crack near manhole
5th/D St.	MHC	4/11/96	15	15		0.08		15	15		0.08	No data on recheck; Assume same as first insp.
AI 4th St.	MHC	4/11/96	9,000	5		54.25	4/26/96	9,000	5		54.25	No data on recheck; Assume same as first insp.
E 7C6	MHC	4/11/96	900	5		13.94	4/26/96	1,000	10		14.79	
ETC9	MHC	4/11/96	250	10		6.42	4/26/96	900	10		13.89	
N 7G22	MHC	4/11/96	100,000	7		2,119.92	4/26/96	100,000	15		2,119.92	
S API Sep.	MHC	4/11/96	5	5		0.08		5	5		0.08	No data on recheck; Assume same as first insp.
N 24C40	MHC	4/12/96	5,000	4		16,330.79	4/26/96	8,000	10		26,363.92	Positive flow
N 24ED4	MHC	4/12/96	10,000	4		57.73	4/26/96	10	10		0.08	
N 24C50	MHC	4/12/96	2,000	4		6,405.84	4/26/96	10,000	10		33,110.76	Positive flow
N 24F1	MHC	4/12/96	4	4		0.08	4/26/96	10	10		0.08	
N Blk Hse	MHC	4/12/96	5,000	4		38.37	4/26/96	8,000	10		50.59	
Pump row	JB	4/23/96	0	8	0.08		4/26/96	15	15	0.08		2 vent pipes, 30' high
Bel. KCR/Pk. 24	JB	4/23/96	0	5	0.08		4/26/96	10	10	0.08		1 vent pipe,
N. 24F1	JB	4/23/96	15	10	0.66		4/26/96	150	10	4.67		2 vent pipes, 30' high
N. of 22K41	JB	4/23/96	0	10	0.08		4/26/96	10	10	0.08		2 vent pipes, 30' high
N. of caustic	JB	4/23/96	15	10	0.66		4/26/96	10	10	0.08		2 vent pipes, 30' high
Total (Regular Flow)					1.55	4,642.60				4.99	4,442.33	
Total (Positive Flow)						22,736.63					59,474.68	
TOTAL					1.55	27,379.23				4.99	63,917.01	

Notes:

- Shaded figures are those with positive flow. The 1980 EPA/Radian correlation equation for "Drains" was used in the calculation.
- Emissions from Regular flow Junction Box (JB) and Manhole Cover (MHC) were calculated using the 1995 EPA correlation equation for "Others".

Table I-9: Rule 1176 Survey - Refinery 9

Component ID	Type	Date	PPM	Back-gmd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Rechk Date	PPM	Back-gmd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Comments
154	MHC	4/18/96	5,000	7		38.36	4/26/96	20,000	12		86.83	
155	MHC	4/18/96	15,000	20		73.26	4/26/96	5,000	28		38.26	
236	MHC	4/18/96	4,000	22		33.55	4/26/96	100	20		3.36	
139	MHC	4/18/96	30	4		1.73	4/26/96	50	12		2.17	Plug Covered
135	JB	4/18/96	2	2	0.08		4/26/96	8	8	0.08		
136	JB	4/18/96	500	4	9.84		4/26/96	10,000	40	57.61		
146	MHC	4/18/96	50	4		2.43	4/26/96	20	15		0.66	Plug Covered
145	MHC	4/18/96	200	8		5.63	4/26/96	400	12		8.52	Plug Covered
268	JB	4/18/96	20	10	0.99		4/26/96	10	10	0.08		
14	MHC	4/18/96	30	10		1.49	4/26/96	10	10		0.08	Plug Covered
13	JB	4/18/96	32	20	1.10		4/26/96	8	8	0.08		
134	MHC	4/19/96	1000	5		14.83	4/26/96	10	3		0.80	
245	MHC	4/19/96	5	5		0.08	4/26/96	13	3		0.08	Plug Covered
64	MHC	4/19/96	1300	12		17.27	4/26/96	10	4		0.73	Plug Covered
18	JB	4/19/96	200	10	5.59		4/26/96	3,200	25	29.38		
147	JB	4/19/96	15	10	0.66		4/26/96	8	7	0.25		
149	JB	4/19/96	100,000	40	224.08		4/26/96	3,000	7	28.37		
329	MHC	4/19/96	8	8		0.08	4/26/96	10	10		0.08	Plug Covered
364	MHC	4/19/96	100	40		2.84	4/26/96	1,000	25		14.66	Plug Covered
150	MHC	4/19/96	50	10		2.23	4/26/96	400	10		8.54	Plug Covered
142	MHC	4/19/96	7	7		0.08	4/26/96	100	5		3.72	Plug Covered
Total (Regular Flow)					242.34	193.85				115.85	168.47	

Note:

- Emissions from Regular flow Junction Box (JB) and Manhole Cover (MHC) were calculated using the 1995 EPA correlation equation for "Others".

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Table I-10: Rule 1176 Survey - Refinery 13

Component ID	Type	Date	PPM	Back-grd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Rectk Date	PPM	Back-grd.	JB Emis. (lb/yr)	MHC Emis. (lb/yr)	Comments
D001	JB	4/19/96	5000	25	38.27		4/26/96	1200	15	16.44		
308	MHC	4/19/96	1500	25		18.70	4/26/96	1500	30		18.67	
307	MHC	4/19/96	4	4		0.08	4/26/96	5	5		0.08	APU shut
309	MHC	4/19/96	8000	28		50.53	4/26/96	20	20		0.08	
319	MHC	4/19/96	8000	20		26,330.27	4/26/96	3,200	35		10,251.64	Positive Flow
318	MHC	4/19/96	13000	20		67.33	4/26/96	10000	20		57.68	
306	MHC	4/19/96	50000	22		148.96	4/26/96	40000	15		130.62	
303	MHC	4/19/96	200	7		5.65	4/26/96	100	10		3.60	
302	MHC	4/19/96	5	5		0.08	4/26/96	10	10		0.08	
J018	JB	4/12/96	10	5	0.66		4/26/96	8	5	0.49		
S-40	JB	4/12/96	1500	10	18.82		4/26/96	3,500	30	30.96		
D002												
D002 No.	JB	4/12/96	70000	30	181.62		4/26/96	20	20	0.08		APU shut
D002 So.	JB	4/12/96	400	30	8.28		4/26/96	20	20	0.08		APU shut
Total (Regular Flow)					247.64	291.33				48.04	210.80	
Total (Positive Flow)						26,330.27					10,251.64	
TOTAL					247.64	26,621.60				48.04	10,462.44	

Notes:

- Shaded figures are those with positive flow. The 1980 EPA/Radian correlation equation for "Drains" was used in the calculation.
- Emissions from Regular flow Junction Box (JB) and Manhole Cover (MHC) were calculated using the 1995 EPA correlation equation for "Others".