

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Richard Looker)
MEETING DATE: April 11, 2007

ITEM: 10

SUBJECT: **Letter to Petroleum Refineries Requiring Technical Reports on the Mass Balance and Fate of Mercury in Crude Oil** –Status Report on Intent to Issue CWC 13267 Letter

CHRON- September 2004 - San Francisco Bay Mercury TMDL adopted by Board
OLOGY: February 2005 - 13267 letter issued by Executive Officer in response to Mercury TMDL
November 2005 - Sampling Plan required by 13267 letter approved

DISCUSSION: We intend to issue a new California Water Code (CWC) section 13267 letter (Appendix A) to the five Bay Area petroleum refineries, requiring technical reports on the mass balance and fate of mercury in crude oil that they process. This letter would replace and supersede a similar 13267 letter issued in 2005. This item is to inform the Board regarding the content of the new letter, provide background information on this issue, and allow the Board and the public an opportunity to endorse the letter or suggest modifications.

As stated in the Mercury TMDL implementation plan adopted by the Board in 2004, additional information is needed to assess the significance of petroleum refineries as a source of mercury discharges to the Bay. As such, we issued a 13267 letter to the petroleum refineries in February 2005, requiring the submittal of information on the fate of mercury in the refineries' air emissions. The February 2005 letter required a number of submittals, leading to the submittal of a final report on mercury air emissions and fate by May 2007. Based on the refineries' progress report submitted in February 2007, a pilot project designed to determine the appropriate emissions sampling method has been completed. However, that report requests an extension of the May 2007 date to February 2009. The new letter addresses this delay, as well as the lack of progress in securing information on the mercury content in crude oil necessary for the Board to assess the completeness and quality of the characterization of possible mercury release pathways. The new letter provides a revised time schedule for submitting the final report on mercury in the refineries' air emissions, requires some modifications to the air emissions sampling plan, and requires monitoring of and reporting on the amount of mercury in crude oil.

Since 2005, we have gathered additional information about petroleum refinery processes that suggests important modifications to the original study requirements are needed. We now estimate that there are about 1700 kg/yr of mercury entering the petroleum refineries in crude oil (versus our earlier estimate of 380 kg/yr), and we only have reliable information to account for the fate of less than 10 kg/yr of this amount. Some of this unaccounted for mercury is likely being discharged to the Bay either directly or indirectly, such as through atmospheric deposition or other pathways.

Figure 1 (attached) is a generalized “mass balance” illustration of estimated mercury inputs and outputs associated with the petroleum refining process. Mercury enters petroleum refineries only in one pathway, as crude oil, so it is possible to account for the amount of mercury in this one pathway. By contrast, mercury can leave the refineries through a variety of pathways. Because it is possible that a very large amount of mercury is entering Bay Area petroleum refineries but that only a fraction of it can be accounted for in the pathways of automobile fuels, wastewater, and solid waste, we need further information both on the amount of mercury entering and leaving the refineries.

There has been recent progress in measuring mercury in crude oil, including a joint study by the American Petroleum Institute (API) and USEPA. Unfortunately, Bay Area petroleum refineries apparently did not submit samples for analysis in this study so we do not have specific information about the mercury content of their crude stocks. We do know that 40% of the crude oil processed in California refineries comes from California oil fields, and some types of California crude oil have extremely high mercury content, especially that coming from the San Joaquin Valley oil fields. Our revised estimate of 1700 kg/yr of mercury entering the refineries is based on the new API/USEPA dataset that includes San Joaquin Valley crude.

As required in the February 2005 letter, the refineries have made progress in assessing the air emission pathway for mercury. The new letter in Appendix A builds on this work, tightens the refineries’ proposal for an extension to complete this work, and adds new requirements for measuring the amount of mercury in crude oil. We will be meeting with refinery representatives before the Board meeting to discuss this draft letter, but we anticipate that some of these representatives may wish to address the Board about the letter. Additionally, a number of stakeholder groups have been tracking this issue and may wish to comment.

RECOMMEN- Status report – no action needed.
DATION

APPENDIX A: 13267 Letter to Petroleum Refineries

Figure 1. “Mass Balance” Schematic of Mercury Inputs and Outputs for Bay Area Petroleum Refineries showing estimated amounts of inputs and outputs. We can currently account for only a small fraction of the approximately 1700 kg/yr of mercury contained in crude oil inputs to these refineries.

