UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

SEP 19 2006

Mr. Dan Eden, Deputy Director
Office of Permitting, Remediation & Registration (MC-122)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Dear Mr. Eden:

The Environmental Protection Agency (EPA) has completed its review of several provisions in the *Texas Surface Water Quality Standards* (TX WQS). These standards were adopted by the Texas Natural Resource Conservation Commission, now the Texas Commission on Environmental Quality (TCEQ), on July 26, 2000, and submitted to the EPA for approval on September 27, 2000. In today's action, EPA is approving the copper site-specific criteria for segment 2481 in Appendix E of the TX WQS pursuant to §303(c) of the Clean Water Act (CWA) and the implementing regulation at 40 CFR Part 131. EPA is also disapproving the zinc site-specific criteria for segment 2481, but is approving alternate values. Finally, EPA is disapproving the site-specific selenium criteria for Linnville Bayou (unclassified water body in segment 1304).

Copper and zinc criteria

The City of Ingleside discharges to Kinney Bayou tidal/Jewel Fulton Canal. Due to the water quality characteristics of the discharge and receiving water body, a water effect ratio (WER) study was performed to determine if site-specific water quality criteria for copper and zinc would be more appropriate than the statewide aquatic life criteria. Our review of the WER study indicates that the State of Texas water quality criteria for copper and zinc may be adjusted to account for site-specific physical and chemical interactions which mitigate the toxicity to aquatic organisms.

The toxicity test methods used to determine the copper and zinc site-specific criteria are consistent with EPA's WER guidance.[1] However, the facility interpreted the toxicity test results in a manner similar to a biotic ligand method. This interpretation resulted in a larger value for the zinc WER (produces less stringent criteria) and a smaller value for the copper WER (produces more stringent criteria). Based on the biotic ligand interpretation, WERs of 2.0 for both copper and zinc and the associated site-specific criteria were adopted in Appendix E of the TX WQS. EPA's review of the study found that the interpretation was not appropriate because the test species in this study is less sensitive than the species on which the statewide criteria are

[1] U.S. EPA. 1994. *Interim Guidance on Determination and Use of Water Effects Ratios for Metals.* Office of Water. Washington, DC. EPA-823-B-94-001.

based. The result of this interpretation is that toxicity abatement is extrapolated beyond the proportional relationship that represents the basis for WER and site-specific criteria development.

Although the facility's interpretation is not approvable, the original study is acceptable and can be used to develop site-specific criteria. Following the WER guidance, EPA calculated WERs of 2.17 and 1.14 for copper and zinc, respectively. EPA is approving the site-specific criteria for copper for segment 2481 in Appendix E as these values are more stringent than criteria calculated with the procedures in EPA's WER guidance. While EPA is disapproving the zinc criteria of 185 ug/l (acute) and 168 ug/l (chronic) in Appendix E, the toxicity tests used in the original study are acceptable and can be used to calculate site-specific criteria. In accordance with the previously-approved WER provision at §307.6(c)(9) of the TX WQS, EPA is approving alternate site-specific criteria for zinc based on a WER of 1.14. In the next revision of the TX WQS, the WER of 1.14 should replace the WER of 2.0 for zinc in Appendix E. At that time, TCEQ may wish to adopt site-specific criteria for copper based on a WER of 2.17, which is the value obtained following EPA's WER guidance.

Based on the above WERs, site-specific criteria for copper (27 ug/L - acute, 7.2 ug/l - chronic) and zinc (111.7 ug/l - acute, 101.5 ug/l - chronic) have been demonstrated as appropriate to protect aquatic species. EPA has completed informal consultation on the site-specific criteria with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service under §7 of the Endangered Species Act. The Services concurred with EPA's finding that approval of the site-specific criteria is not likely to adversely affect endangered/threatened species or critical habitat. The site-specific criteria discussed herein applies within the discharge mixing zone for this facility.

Selenium criteria

In the 2000 TX WQS, the selenium criteria for Linnville Bayou were revised from 20 ug/l to 219 ug/l (acute criterion) and from 5 ug/l to 23 ug/l (chronic criterion). The submission included a study conducted by the Phillips 66 Company (now the ConocoPhillips Company) which includes water chemistry, sediment and tissue data, and assessment of the aquatic habitat and the fish community. Since the adoption of the 2000 TX WQS, the facility has ceased discharge to Linnville Bayou and effluent is piped to the tidal portion of the Brazos River (segment 1201).

The Agency has conducted an extensive review of the submission package in order to understand whether the new criteria are scientifically-defensible and protective of the designated uses of Linnville Bayou. In the case of selenium, EPA is in a unique situation, because although the existing, published §304(a)-recommended criteria are based on concentrations of selenium in the water column, EPA has recently issued a draft fish tissue-based criterion for selenium.[2] Accordingly, in reviewing the submission, we considered not only the data the TCEQ submitted

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[2] U.S. EPA. 2004. *Draft Aquatic Life Water Quality Criteria for Selenium - 2004*. Office of Water, Washington D.C. November 2004. 334 pp. EPA-822-D-04-001.

to EPA but also data and information EPA has gathered on the aquatic risks of selenium as part of the process of revising the existing EPA-recommended criteria. However, at this time, the Agency has concluded that the available supporting documentation does not provide sufficient scientific support to demonstrate that the site-specific selenium criteria will protect the aquatic life uses designated by the state for Linnville Bayou. Thus, EPA is disapproving the proposed site-specific criteria for Linnville Bayou.

In conducting its review, the Agency evaluated water column concentration data, fish tissue concentration data, biological assessment data for the habitat of interest, and Index of Biotic Integrity scores. EPA focused primarily on the extent to which selenium in Linnville Bayou would bioaccumulate in fish tissue in Linnville Bayou. EPA used the chronic value, 23 ug/l, because for selenium, this lower value is more pertinent to the toxic effects of selenium and the derivation of permit limits and assessing of attainment of water quality standards. The chronic fish tissue criterion that EPA has developed represents the latest science regarding selenium concentrations that would be protective of aquatic life. Accordingly, EPA views this criterion (7.9 ug/g dry weight) as an appropriate value for purposes of evaluating the adequacy of the Texas site-specific criteria to protect aquatic life uses.

For this evaluation, EPA assessed the fish tissue concentrations in Linnville Bayou, both upstream and downstream of the confluence of the discharge. The submitted data (from the ConocoPhillips study) show elevated water column levels of selenium in Linnville Bayou downstream of the discharge for the ConocoPhillips refinery, with levels close to or exceeding EPA's currently recommended water column-based aquatic life criteria for selenium of 5 ug/L. Concentrations ranged from 13 ug/L downstream of the discharge (stations L2) to 7.11 ug/L at a sampling point more than 15 miles below the discharge (station L5).

EPA then considered available fish tissue data and compared selenium levels in fish tissue from Linnville Bayou to the 7.9 ug/g dry weight criterion (hereafter, the "reference value") that EPA has issued in draft form. The submitted data show that the fish tissue samples in Linnville Bayou exceeded 7.9 ug/g dry weight in 18 of the 23 samples at stations L2 and L3 downstream of the discharge. At the stations further downstream (L4, L5 and L6), two of 21 fish samples exceeded 7.9 ug/g. In the upstream areas of Linnville Bayou, no samples exceeded the tissue criterion. Thus, the available data suggest that water column concentrations in Linnville Bayou (levels that were close to or exceeded 5 ug/L when they were collected) may be associated with elevated (exceeding the reference value) fish tissue levels in portions of Linnville Bayou.

The Agency also considered the biological assessment data provided in the ConocoPhillips study. Linnville Bayou is designated with a limited aquatic life use (see Appendix D of 2000 TX WQS). The fish community was assessed in 1994, 1996 and 1998 with TCEQ's Index of Biotic Integrity (IBI) scores. These IBI scores use metrics describing the species richness and diversity to assess the biological condition of a site. However, the IBI scoring does not directly address effects such as decreased reproduction, teratogenic defects, and impacts on growth. For example, to detect teratogenic effects or reduced growth effects from selenium exposure, evaluation of the physical condition of individual fish to report disease or other anomalies present would be needed. Age-class distribution would also serve as an

indicator of reproductive success within the fish community. Aquatic habitat was evaluated but TCEQ's assessment procedures were not used to provide a numeric habitat score.

Use of the statewide IBI indicated that limited to high fish communities occur in Linnville Bayou. The fish community was also assessed with the IBIs developed for Texas ecoregions, which indicated that intermediate to high quality fish communities were present in Linnville Bayou. While these IBI scores are positive indicators of the quality of the biological communities, the scores provide only a snapshot of the biological community. There is uncertainty as to how well these sampling events represent the quality of the biological communities present in these waters. Because the metrics used in IBI scoring do not cover the spectrum of potential endpoints of concern, this information is not viewed as sufficient scientifically to support an aquatic life criterion of 23 ug/L.

Under 40 CFR §131.21(c), new and revised standards do not go into effect for CWA purposes until approved by EPA. Therefore, the statewide selenium criteria in Table 3 of the TX WQS will continue to apply to Linnville Bayou. The selenium criteria in Table 3 were not revised in the 2000 TX WQS. The site-specific criteria in Appendix E of the TX WQS should be removed at the time of the next interim or triennial revision.

The EPA previously approved the human health provisions in the TX WQS; new and revised language in §307.2, §307.3 and §307.5; revised minerals criteria for numerous segments in Appendix A - Site-specific Uses and Criteria for Classified Segments; the revised standards for segment 0230 - Pease River in Appendix A; all new and revised provisions in Appendix C - Segment Descriptions and Appendix D - Site-specific Receiving Water Assessments; and, criteria based on seven of the water effects ratios for copper in Appendix E - Site-specific Criteria. The EPA will take separate action on the remaining new and revised parts of the TX WQS.

I would like to commend the TCEQ staff for its commitment in completing the task of reviewing and revising the state's water quality standards. If you have any questions or concerns, please contact me at (214) 665-7101, or have your staff contact Diane Evans at (214) 665-6677.

Sincerely yours,

Miguel I. Flores
Director
Water Quality Protection Division

cc: Jim Davenport, TCEQ - Water Quality Assessment Section (MC-150)
Allen White, USFWS - Austin Ecological Services Office