

**Response to Public Comment for  
One TMDL for Zinc in Oyster Tissue, For Segment 2484**  
September 22, 2006

<b>Tracking Number</b>	<b>Date Received</b>	<b>Affiliation of Commenter</b>	<b>Summary of Request or Comment</b>	<b>Summary of TCEQ Action or Explanation</b>
001	7/8/2006	Nueces River Authority	All available data were not used in the loading calculations.	Sufficient amounts of recent data were not available during the formulation of the TMDL. The revised document will incorporate some of this information.
002	7/8/2006	Nueces River Authority	Quality of the recent data better than the historic data.	Agree
003	7/8/2006	Nueces River Authority	List of permitted discharges is incorrect.	The list of permitted discharges will be corrected to accurately reflect the discharges to the Bay.
004	7/8/2006	Nueces River Authority	All sources not considered.	The revised TMDL will address levels of zinc in sediments.
005	8/14/2006	Topaz Group	TMDL does not identify ASARCO site as a source.	The revised TMDL document will incorporate this as a legacy source of zinc in sediments.
006	8/14/2006	Topaz Group	Older zinc data upon which analysis was developed is of poor quality and does not represent ambient levels in the Bay or Inner Harbor.	The revised document uses the more recent data for the development of the TMDL.
007	8/14/2006	Topaz Group	The TMDL does not address levels of zinc in the sediment. No analysis of TSS and zinc tissue levels.	The revised TMDL will address zinc in sediment. Relationships between TSS and zinc tissue levels are difficult since there has not been a comprehensive study of water column and oyster tissue zinc. Existing water column zinc data was not collected at the same time or in the same place as the oyster tissue data.
008	8/14/2006	Topaz Group	The CSTR is an idealized process that does not consider processes such as tidal exchange and water sediment interactions.	Although simplistic the CSTR model provides a starting point to develop estimations of loading scenarios. More advanced modeling techniques which incorporate these factors could add uncertainty due to additional assumptions. Revisions to this TMDL de-emphasizes the use of the CSTR model.

009	8/14/2006	Topaz Group	Loading calculations for scenario with zinc removal fails to remove the affects of the flow from the NBPS. This assumes that the NBPS would be required to remove zinc from the discharge.	When both the flow and zinc concentrations are removed from the model presented in the draft TMDL, ambient zinc levels increase dramatically. A mass balance approach using recently collected ambient data from the Inner Harbor provides a more realistic estimation of the levels of zinc in the Bay. Estimated ambient concentrations are higher than those actually observed, however, this approach does not account for interactions with tides, wind and sediment, all of which could affect the resulting ambient concentrations.
010	8/14/2006	Topaz Group	Total zinc does not account for sediment interactions due to the poor data quality and the fact that total zinc does not provide information on sources	Through the use of total zinc this TMDL takes a conservative approach to loading estimations. The revised TMDL will utilize recent sources of data and consider sediment sources of zinc.
011	8/14/2006	Topaz Group	The TMDL should address zinc as a legacy pollutant from the historic ASARCO site discharges.	This is now included in the revised TMDL
012	8/14/2006	Topaz Group	Recent data collection is producing high quality water and sediment data.	This data is being considered in the revised TMDL
013	8/11/2006	The Port of Corpus Christi	The proposed revised water quality standard of 29 ug/L of total zinc in the water column is not scientifically supported because oyster exposure to metals, including zinc, is primarily through ingestion of bottom sediments, not dissolved and suspended zinc in the water column.	The primary pathway of zinc to the sediments is through the water column. In controlling levels of zinc via water quality criteria it is anticipated that zinc levels in sediment and tissue will be below acceptable criteria.
014	8/11/2006	The Port of Corpus Christi	The current (2000-2006) Texas Surface Water Quality database for Nueces Bay documents that ambient zinc concentrations are well below the proposed criterion of 29 ug/L. The fact that oyster tissue concentrations still exceed the zinc targets demonstrate that the proposed correlation between water column concentrations and oyster tissue concentrations is not predictive.	The resulting tissue levels of zinc in oysters is likely to be due to legacy sediment deposits. Attenuation of this zinc will require depuration over time. At this point the Water Quality criteria will ensure that additional loadings to the sediment will not result from the water column.
015	8/11/2006	The Port of Corpus Christi	Maximum zinc concentrations are substantially greater in Nueces Bay than in other Texas Bays. This fact strongly points to sediment concentrations as the most probable causative influence on oyster tissue concentrations in Nueces Bay.	The revisions to the TMDL will account for sediment as a source of zinc. <i>Total zinc was used to account for both dissolved and total</i>

016	8/11/2006	The Port of Corpus Christi	The assumption that the total/dissolved zinc concentrations in the water column are at equilibrium with the zinc concentrations in the sediment has not been validated for Nueces Bay. TCEQ should sample for zinc in the water column at a height of one foot (or less) above the sediment surface, and sample surface sediments for zinc at the same location. These data can be used to determine the total zinc concentrations in the water column at the depth utilized by oysters for feeding and will allow equilibrium calculations for water column and sediment zinc concentrations.	For the purposes of this TMDL it is reasonable to assume that equilibrium exists between zinc in sediment and water. The conditions in the Bay due to shallow depths, minimal tides and persistent winds support this assumption. The ongoing sampling effort by Texas A&M Corpus Christi will attempt to incorporate depth as a factor when sampling for zinc in water.
018	8/11/2006	The Port of Corpus Christi	The TMDL zinc standard should be revised to address the physical-chemical correlations between water and sediment quality and oyster tissue concentrations. This means developing a biota-sediment accumulation factor (BSAF) for zinc in oyster tissue, and applying it to generate allowable sediment concentrations.	This would require a change to the water quality standards similar to that of a water effects ratio. Revisions to standards will need to be proposed during the upcoming triennial standards revision.
019	8/11/2006	The Port of Corpus Christi	The trend in historical dissolved zinc concentrations and oyster tissue concentrations in Nueces Bay is ample evidence that the sediments are the cause of the elevated oyster tissue concentrations, not the water column concentrations of zinc.	As mentioned in comment #13 it is likely that the current concentrations observed in oysters are the result of zinc in sediment. However, in order to ensure that additional loading to sediment is minimized, it is necessary to control zinc in the water column through the water quality criteria.
020	8/11/2006	The Port of Corpus Christi	If TCEQ implements a TMDL based on a water column concentration of total zinc in Nueces Bay, the results will be disappointing because the available data demonstrate that sediment concentrations are the cause of elevated zinc in oyster tissues.	The water column concentrations will ensure that there is minimal loading to the sediment. Revisions to the TMDL will incorporate sediments as a potential source of the contamination.
021	8/11/2006	The Port of Corpus Christi	The most probable major source of zinc for oyster bioaccumulation is the existing sediment inventory of the metal. This source is not considered in the TMDL's Source Analysis and therefore the fundamental basis of the proposed TMDL is flawed.	Sediment sources will be included in the revised document. These sources will be treated as legacy since there are no current zinc loadings from permitted facilities.
022	8/11/2006	The Port of Corpus Christi	The continuously stirred tank reactor (CSTR) model that was used for the TMDL did not include historic sediments as a source. The assumption that there is equilibrium between the sediments and the particulate/dissolved zinc concentrations in the water column has not been validated and is likely incorrect, because oysters feed at the bottom, not one foot below the water surface.	The revised TMDL de-emphasizes the use of the CSTR model. Zinc in sediments should be addressed as a legacy concern where attenuation will be documented through decreasing levels of zinc in oyster tissues.

023	8/11/2006	The Port of Corpus Christi	The comparison of equilibrium concentrations (Figure 8) in the TMDL report does not validate TCEQ's assumption that the CSTR model can adequately simulate the sediment contribution to total zinc concentrations in the water column.	The revised TMDL incorporates more recent data collected in the absence of the ASARCO discharge. As a result the levels of zinc in the water column are lower than in the 1980-1989 time period. The legacy effects of zinc in the sediment will be a consideration in the revised TMDL.
024	8/11/2006	The Port of Corpus Christi	The accurate load allocation cannot be made in the absence of a proper accounting for the inventory of zinc in the Nueces Bay sediments that is the result of historic (legacy) discharges.	Zinc in sediments will be considered in the revised document.
025	8/11/2006	The Port of Corpus Christi	The concept of pollutant trading, as suggested in the TMDL, is not applicable to the Inner Harbor zinc loadings.	Pollutant trading is a tool which could be considered if actions specified in the I-Plan do not result in restoration of the uses. Details pertaining to trading will be included in the I-Plan if necessary.
026	8/11/2006	The Port of Corpus Christi	The draft TMDL needs to include an estimated date when the Nueces Bay oysters are expected to meet the TMDL.	This information will be included in the Implementation Plan.
027	8/11/2006	The Port of Corpus Christi	The draft TMDL should address the age\life stage of the oysters used to assess zinc tissue levels.	This level of analysis is not necessary for this report.
028	8/11/2006	The Port of Corpus Christi	The 2000-2006 Texas Surface Water Quality zinc data do not appear to have been cited or evaluated during TMDL development	This data is now available and considered in the revised TMDL document.
029	8/11/2006	The Port of Corpus Christi	References are made to June 2004 and May 2005 monitoring on page 20 without citation.	Citation included.
030	8/11/2006	The Port of Corpus Christi	New clean sampling data are well below 29 ug/L and support the position that the sediments should be the focus of the TMDL.	Sediments as legacy sources of zinc will be considered in the revised TMDL.
031	8/11/2006	The Port of Corpus Christi	The new clean data indicate water zinc levels well below those presented in the TMDL (about 2/3 lower). Based on this, why does the TMDL call for a 50% reduction.	The revised TMDL incorporates recently collected data which precludes the need for additional reductions.
032	8/11/2006	Port Industries Of Corpus Christi	TMDL analysis does not consider the sediment as a source of zinc.	Sediment will be considered as a source in the revised TMDL document. Attenuation is more practical than remedial measures.

033	8/11/2006	Port Industries Of Corpus Christi	Discussions of the “Banking and trading” framework is premature and should be removed from the document.	If oyster tissues do not indicate attenuation of zinc levels then additional controls may be necessary. Under this scenario “banking and trading” options will be explored especially in the case where loads from air deposition (the second highest source) will need to be controlled. Pollutant trading is an established practice for emission controls.
034	8/11/2006	Port Industries Of Corpus Christi	Why was the recent data not included in the TMDL analysis.	The most recent data has been incorporated into the TMDL. The original draft of the TMDL was completed almost a year before the data was to be analyzed.
035	8/11/2006	Port Industries Of Corpus Christi	Since conditions within Nueces Bay currently represent adverse conditions for the survival of viable oyster populations the oyster water use should be removed.	The Coastal Bend Bays and Estuaries - State of the Bay Plan states that the public supports restoration of the oyster water use. Changes to uses associated with Nueces Bay should be addressed during the triennial revision process.
036	7/27/2006	CBBEP	Loading calculations in the TMDL do not reflect loading experienced by oysters in the sediment in the Bay. As a result, reductions in the loads presented in the TMDL will not necessarily reduce zinc in oyster tissue.	The revised TMDL will incorporate recent data which realistically characterizes water column zinc levels. This has eliminated the need for load reductions called for in the previous draft.
037	7/27/2006	Port Industries Of Corpus Christi (Sherwin Aluminum)	The zinc TMDL should be treated as a legacy issue and the recent data is not considered in the TMDL.	Through inclusion of sediment as a source , the revised TMDL considers zinc as more of a legacy issue. Recent data is included in the revised TMDL.
038	7/27/2006	Elementis Chromium	The TMDL is unclear with respect to implementation of the pollution trading strategy.	If total zinc levels in Nueces Bay do not remain below the criteria (29 ug/L) then effluent trading would be considered as part of the implementation. This is current practice used to comply with federal air quality standards so it would not be unrealistic to consider this for permitted effluents. In addition, it is envisioned that trading would involve air deposition sources. Details of the water quality trading program would be documented in the implementation plan following the TMDL. This would be a much later phase of implementation if the zinc levels in oysters are not reduced.