Responsiveness Summary
Copper TMDL for Pinto Creek, AZ
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Introduction

Staff from EPA and ADEQ have been discussing the TMDL for Pinto Creek with interested stakeholders since 1999. Two public meetings have been held in the community to discuss TMDL development. EPA and ADEQ provided a formal opportunity for the public to review and comment on the proposed TMDL for Pinto Creek. A newspaper advertisement was published in a local newspaper on July 19, 2000 which announced the availability of the proposed TMDL for review and requested public comments on the draft TMDL. A 60 day comment period was provided, and four written comments were received. The following responsiveness summary summarizes comments received and EPA's responses to each comment, identifying changes in the final TMDL which were made in response to comments. Some lengthy or repetitive comments are paraphrased in this responsiveness summary.

Comment 1: Kimberly Graber and Roger Flynn, National Wildlife Federation and Western Mining Action Project, September 19, 2000.

1.1. The TMDL must be written so that the public can understand it. The draft TMDL is too difficult to understand and should be clarified. The TMDL should list the actual data used to calculate the TMDLs for each reach and flow level.

Response: We agree that the TMDL should be written clearly in a manner the public can understand. The final TMDL has been revised to clarify the TMDLs and associated allocations. In addition, certain sections of the TMDL have been revised to clarify the analyses which support the TMDL. The specific concentration data used to calculate the TMDL for each reach are described in Appendix B of the TMDL and associated documents reporting the raw data, which are included in the administrative record for this action. EPA does not normally include complex calculations used to derive TMDLs in the TMDL decision documents themselves, but rather in supporting technical reports included in the administrative records.

1.2. The TMDL should be based on analysis of total copper, not dissolved copper. The focus on dissolved copper underestimates the true copper loadings by failing to account for particulate copper which settles out in the stream. The analysis also would miss dissolved copper loadings associated with acidic mine discharges which would precipitate when they mix with higher pH stream water in Pinto Creek. The TMDL would be more conservative if it were revised using total copper data. At a minimum, the TMDL must present specific information to demonstrate the partitioning relationships between dissolved and total metal fractions.

Response: The TMDL must be structured to result in compliance with currently applicable water quality standards (40 CFR 130.7). Arizona standards applicable for copper are expressed in

dissolved form; therefore it is appropriate that the TMDL focuses on dissolved copper. Further, it makes sense from the standpoint of beneficial use protection to focus principally upon dissolved copper. Because only the dissolved fraction of copper is normally bioavailable, beneficial use impacts are expected to be associated with the dissolved copper concentrations in the water body. No evidence was provided by the commenter to support the assertion that aquatic life may consume particulate copper or that a focus on dissolved copper is not protective of designated beneficial uses. To the contrary, the EPA national guidance documents state that particulate copper is relatively unlikely to bioaccummulate (see, e.g. EPA, 1985 and EPA, 1986).

We do agree that the TMDL must consider all significant sources of copper in the stream. To the extent that particulate copper is loaded to the stream or contained in the stream sediments at significant levels, the TMDL must account for it. However, EPA did not find data reporting levels of copper in Pinto Creek sediments. Nor did the commenter provide sediment data or additional total copper data for consideration in the TMDL analysis.

Although there is no reliable data showing that significant amounts of particulate copper remain in Creek sediments or will be discharged to the stream in the future, the TMDL does account for particulate copper which may be discharged to or present in the stream (including streambed sediments) in two ways. First, the TMDL identifies maximum levels of dissolved copper which may be present in the stream at several discreet stream reaches, under all possible flow levels for each reach. To the extent to which particulate copper is converted to dissolved copper in the stream, it would use a portion of the available assimilative capacity present in the stream, thereby leaving a lower amount of copper capacity available for allocation to other sources. The TMDL accounts for this by identifying the background loading to each reach based on different possible flow levels, and expected loading amounts from individual discharge sources to each reach based on actual water quality data collected at those locations. That data accounts for any portion of particulate copper which may have gone into dissolved form at the time the data were collected. All available ambient water quality data were considered in this analysis. This approach incorporates very conservative assumptions with respect to the amounts of dissolved copper present in the water column under different flow regimes (e.g., through the very conservative hardness assumptions used). Therefore, the TMDL directly accounts for any amounts of copper which may transform from particulate to dissolved form in Pinto Creek.

Moreover, to the extent any sources are discharging high levels of dissolved copper in acidic flows, these discharges would be limited by the wasteload and load allocations identified in the TMDL for individual sources. In addition, the point source discharge permits also contain limitations on effluent pH which would further reduce the possibility that highly acidic discharges would occur. As a result, the suggested scenario that high levels of copper present in acidic discharges would be discharged to the stream and precipitate as particulate copper following contact with lower acidity stream water is accounted for (and essentially eliminated) in the TMDL. Moreover, EPA identified no evidence of significant pH swings within the receiving water which would trigger the dissolution of particulate copper as hypothesized by the commenter.

Second, the TMDL provides for instream sources by including an explicit Margin of Safety to account for uncertainties in the analysis. One source of uncertainty in the TMDL is the relationship between total and dissolved copper in the waterbody. Insufficient information was available to estimate or model the actual relationship between total and dissolved copper in Pinto Creek for this analysis (e.g., through the development of a site-specific water effects ratio or partitioning coefficient). In the absence of data needed to accurately calculate the relationship between total and dissolved fractions of copper, it is appropriate to account for total metals through the upstream loading analysis described in the preceding paragraph and in the margin of safety provisions of the TMDL.

1.3. The TMDL should be based on actual data, not the results of modeling analysis. The TMDL ignores actual data. The TMDL seldom used real field data. There is no reason to believe the flow modeling results are accurate or precise. The State and EPA should collect adequate field data and revise the TMDL accordingly. The data should include a field survey of temperature, specific conductance, and pH measurements along all of Pinto Creek. Data should be collected during and following storm events. Samples of leachates from mining wastes should be collected and analyzed. Commenter supports the use of the 101 mg/L hardness value assumption in calculating the TMDL, but recommends collection of additional site specific data to confirm the conservatism of this assumption.

Response: EPA used all available data in the preparation of the TMDL. The TMDL is based on an analysis of all possible flows and direct application of applicable Arizona water quality standards. The division of the TMDLs among sources and tributaries was based on actual data.

There is no requirement that TMDLs be based on actual flows, particularly when a specific design flow is not used to express the TMDL. Very limited local flow data were available for the TMDL analysis. None of the available data were paired with associated precipitation or runoff data, which limited their utility for analysis of the local hydrograph in response to runoff events. Moreover, the available flow data were very limited in terms of temporal and spatial coverage.

The TMDL is expressed in terms of flow tiers which account for all flow levels from zero flow to the highest possible flow. The draft TMDL expressed the TMDLs in terms of flows associated with storms of different sizes in order to show the relationship between the TMDLs and allocations and NPDES permit provisions. However, this approach appeared to confuse several commenters. Therefore, the final TMDL has been revised to clarify that the TMDL, loading capacities, and allocations are based on specific estimated flow levels which are believed to be associated with storms of a particular intensity. The concentration values used to calculate the TMDL are the applicable Arizona water quality standards for chronic exposures to copper. The use of chronic standards for all flow regimes instead of the less conservative acute standards provides an important implicit margin of safety in the calculation. The available loading capacity for each reach was allocated among known and unknown sources based on a combination of actual water quality data collected in the watershed and modeled loading estimates to represent loads from different tributary and specific loading locations.

1.4 The TMDL inappropriately assumes the Carlota Copper Mine is operational. The TMDL should be determined based on current copper loading sources, which must be cleaned up before allocations can be made for the Carlota Copper Mine. The draft TMDL reflects that the authors did evaluate TMDL elements without considering discharges from the Carlota mine. The absence of analysis based on the existing state of affairs (Carlota's non-existence) should be explained and the TMDL should be revised to reflect proper allocations assuming Carlota is not operational.

Response: Federal regulations provide for consideration of both "existing and future point sources" in the development of TMDLs and associated wasteload allocations (40 CFR 130.2(h)). Federal regulations also require that TMDLs account for "critical conditions for stream flow, loading, and water quality parameters." (40 CFR 130.7(c)(1)). At this time, Carlota has received a final NPDES permit. Future copper loads from Carlota facilities should be considered in the analysis of potential critical loading conditions. EPA is required to account for this expected source in the TMDL as part of the analysis of all present and expected future copper loads to Pinto Creek. Neither Clean Water Act section 303(d) nor its implementing regulations require that existing sources be cleaned up prior to provision of allocations for new discharge sources. Nevertheless, Carlota Copper Company has agreed to carry out a remedial action at the Gibson mine to remove substantial sources of copper loading prior to initiating any discharges from the Carlota facility.

During drafting of the TMDL, EPA's contractor SAIC evaluated an alternative scenario in which the Carlota mine was not factored into the TMDL analysis because it was not assured during development of the TMDL that the Carlota mine discharge permit would actually be issued. Therefore, we believed it was appropriate to account for this possibility in conducting the TMDL analysis. However, by the time the draft TMDL was ready to be public noticed, it was clear the Carlota permit would be issued. Therefore, it was appropriate to account for the Carlota project in the draft TMDL issued for public review. References to the alternate scenario were included in error and have been removed from the final TMDL.

1.5. Carlotta would have to obtain an NPDES permit for discharges in connection with the proposed "offset" work by Carlota at the Gibson mine. Before the TMDL can allocate discharges to the Carlota mine, sufficient remediation must be performed at the Gibson, with attendant legal responsibilities for that clean up effort.

Response: The comment concerning a permit for "offset" work at Gibson mine is beyond the scope of the TMDL decision and therefore requires no response. With respect to the second comment, see the response to comment 1.4.

1.6. The TMDL process cannot be used to justify the destruction of beneficial uses of Pinto Creek associated with the stream diversions proposed in connection with the Carlota mine project. The diversions would violate State water quality standards and federal requirements with respect to water quality standards attainment. A TMDL meant to meet water quality standards for copper cannot in the process destroy the fundamental water quality standard of

protecting beneficial uses. Because the draft TMDL assumes the incorporation of activities that violate Arizona's water quality standards for Pinto Creek, the TMDL cannot be issued as drafted.

Response: The TMDL has been set at levels which, when implemented, will result in attainment of State water quality standards for copper. It is not the purpose of a TMDL analysis to second guess regulatory decisions by EPA and ADEQ taken pursuant to other Clean Water Act (CWA) authorities. The TMDL action does not have the effect of endorsing or approving the diversion project discussed in this comment. We disagree that the TMDL assumes the incorporation of activities that violate Arizona's water quality standards. The diversion project was reviewed by ADEQ in conjunction with the development and issuance of the NPDES permit for the Carlota project pursuant to CWA Section 402. The State issued a CWA Section 401 certification indicating the State's finding that the project is consistent with State water quality standards.

1.7. The TMDL invalidly excuses the Carlota mine from the requirement that sources comply with water quality standards under low flow conditions.

Response: As discussed in TMDL Section 9.2, the Carlota mine and all other sources for which wasteload and load allocations are identified have received allocations which will result in attainment of water quality standards under all possible flows, including low flows. The allocations under the lowest flow tier are expressed on a concentration basis. The final TMDL has been revised to clarify how the TMDL and associated allocations operate at low flows. We apologize for any confusion created in the draft TMDL with respect to low flow allocations.

1.8. The TMDL disingenuously asserts that BHP does not contribute copper from sources other than its NPDES permitted outfall. Commenter cites unauthorized releases from the facility in 1993 and 1997. Have any detailed studies been performed to quantify non-point source loads on the BHP property? These types of discharges must be considered in developing allocations for the Pinto Creek TMDL.

Response: Possible future releases of copper associated with unauthorized spills or accidents are not required to be accounted for in the TMDL analysis as they are impossible to analyze and are prohibited by the NPDES permits applicable to BHP. The final TMDL has been revised to include specific wasteload allocations for discharges from BHP stormwater outfalls regulated by BHP's individual NPDES and by the Arizona multi-sector general permit. The TMDL also accounts for background loads from the BHP facility in its calculation of background load allocations for these areas. We are unaware of specific detailed studies which quantify non-point source loads on the BHP property, and no such studies have been provided by commenters. The TMDL considers potential ongoing and future discharges from BHP and other sites in the watershed, but is not required to consider discharges from unpredictable and unauthorized releases. The TMDL also provides an explicit margin of safety to account for potential discharge sources which were unidentified or could not be characterized for the TMDL.

1.9. It is inappropriate for the TMDL to rely on removal of the Cactus Breccia ore body or the proposed stream diversions.

Response: The TMDL analysis assumes all Carlota facilities are in place because that is consistent with the provisions of the existing NPDES permit for the facility. The TMDL does not include a specific implementation timeline; instead, the TMDL identifies load and wasteload allocations that, when met, should result in attainment of water quality standards in Pinto Creek. We note that the provisions of the NPDES permit provide that the remedial action at Gibson mine must be completed prior to initiation of any discharges from Carlota– a requirement which should result in a substantial net reduction in overall copper loading to the stream, even accounting for temporary copper loads which may occur from the naturally occurring Cactus Breccia formation prior to the diversion of Pinto Creek around the formation.

With respect to the comment concerning the stream diversions, see response to comment 1.6.

1.10. The TMDL should provide for meaningful monitoring and adaptive management practices as necessary to implement, review and revise the TMDL until Pinto Creek meets water quality standards. The new TMDL regulations require an implementation plan with the TMDL. The TMDL is misleading in that it suggests that the purpose of the TMDL is only to establish "goals" necessary to achieve water quality standards.

Response: Currently applicable federal regulations do not require the inclusion of a monitoring and adaptive management plan or implementation plan as part of a TMDL. However, EPA strongly supports State development of monitoring, implementation, and adaptive management plans and schedules to assist in TMDL implementation and review. We understand that ADEQ intends to develop these elements as part of the phase 2 copper TMDL currently under development for Pinto Creek.

The new TMDL regulations cited by the commenter are currently not in effect, and EPA was barred from implementing the new regulations by a Congressional appropriations act passed in 2000.

We apologize for any confusion created by the use of the term "goals" in the draft TMDL. The TMDL establishes specific load and wasteload allocations which EPA expects to be implemented in order to bring about attainment of water quality standards.

1.11 The TMDL does not consider seasonal variations, as required by federal law.

Response: The draft TMDL was structured to provide for attainment of water quality standards under all flow and loading conditions, during all seasons of the year. Therefore, we believe the TMDL adequately accounts for seasonal variations. However, we have added a separate section to the final TMDL which specifically describes how the TMDL accounts for seasonal variations and critical conditions in the analysis and its conclusions.

1.12 The draft TMDL's 10% allocation for margin of safety is insufficient to account for the sources of uncertainty in the analysis, including (1) unidentified copper sources, (2) the

intermittent and ephemeral properties of the watershed, (3) data uncertainties impacting the effectiveness of the allocations, (4) data limitations, (5) unanticipated discharge events (e.g., tailings dam failures), (6) uncertainties concerning the relationship between dissolved copper and total copper, (7) modeling errors, and (8) limitations in future monitoring procedures.

Response: The Clean Water Act requires inclusion of a margin of safety in each TMDL which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality (CWA Section 303(d)(1)(C)). The margin of safety can be identified through implicit analytical assumptions or explicit reservations of loading capacity. It is a common practice in TMDL development to supplement implicitly conservative analytical assumptions with provision of an explicit margin of safety to account for sources of analytical uncertainty cannot readily be addressed through implicit analytical assumptions. The Pinto Creek TMDL contains both an implicit and explicit Margin of Safety. The explicit Margin of Safety in the final TMDL has also been revised to be 20% in the downstream target site areas where many suspected but uncharacterized copper sources are located. The 10-20% explicit Margin of Safety is based on the professional judgement of EPA and its contractors. EPA has concluded that the TMDL includes numerous analytical assumptions which provide a substantial margin of safety in the TMDL analysis which addresses most of the key sources of uncertainty in the TMDL analysis concerning data sufficiency. The Margin of Safety section of the TMDL has been revised to explain sources of uncertainty in the analysis and conservative implicit assumptions and approaches for addressing these sources of uncertainty. Also, see responses to comments 1.2, 1.3, and 1.8.

There is also uncertainty regarding two other analytical issues: whether the source analysis identifies all significant historical sources which may still discharge copper to the watershed, and whether the precipitation and runoff scenario modeled for the TMDL adequately accounts for other possible precipitation and runoff scenarios (i.e, precipitation and runoff in only a portion of the basin). EPA has concluded that the degree of uncertainty associated with these two issues is not very high. First, the watershed as a whole, and the mainstem of Pinto Creek in particular, have been surveyed in a fairly intensive manner in connection with many studies conducted in connection with the Carlota project and other research projects. Few additional potential copper loading sources have been identified and none have been confirmed as significant loading sources as a result of these surveys. Second, the precipitation and runoff scenario used to calculate the TMDL is, in some ways, a worst case scenario in that it estimates the maximum total copper loads to the watershed associated with nonpoint source loadings. However, it is possible that localized effects associated with localized storm events could result in different copper loading patterns. It was not feasible for this analysis to characterize the likely effects of different copper loading patterns associated with localized precipitation events. However, EPA does not expect that the water quality effects associated with different precipitation and runoff events would be substantially different from the modeled scenario because there are not a large number of significant, verified sources of ongoing copper loading in the basin. The most significant copper loading sources are expected to be addressed in connection with the onsite operation of the Carlota mine (i.e., diversion of waterbodies around and removal of the Cactus Breccia formation) and Carlota's offsite mitigation work at Gibson mine. Therefore, we expect

the remaining copper loading sources to be relatively modest in extent. Even if future copper loads and loading capacity at a localized scale are different from the scenario modeled in this TMDL, we do not expect the differences to be large. Given that the many implicit assumptions contained in the TMDL analysis provide a large overall margin of safety in the TMDL, EPA has concluded that these remaining sources of uncertainty do not warrant a larger margin of safety at this time.

We understand that ADEQ intends to conduct additional monitoring and analysis to support a revised second phase TMDL for Pinto Creek. Depending upon the results of ADEQ's followup work, it may prove appropriate to revise the margin of safety analysis to account for the level of analytical uncertainty identified by the State. EPA believes it is highly likely that followup monitoring and review will occur on a timely basis, based on ADEQ's stated intentions to do so. This commitment to followup monitoring and review provides an additional margin of safety for the TMDL.

1.13 The TMDL should not ignore the lower reaches of Pinto Creek just because they appear to meet copper water quality standards.

Response: In the course of developing the TMDL, we evaluated water quality for lower Pinto Creek and concluded that available data show that the lower reaches of the Creek are in compliance with applicable copper water quality standards. We also identified no significant existing or potential sources of copper in the lower part of the watershed. The analysis concluded that upon implementation of the wasteload and load allocations in the upper part of the watershed, the lower watershed will continue to meet water quality standards. Further analysis to address the lower watershed is therefore unnecessary at this time. However, EPA supports recommendations of another commenter to continue or perhaps enhance water quality monitoring in the lower basin.

1.14 What were the roles of ADEQ, EPA, SAIC, and mining companies in directing technical decisions, choosing sampling locations, etc., for the TMDL?

Response: EPA is solely responsible for the analysis, technical decisions, and conclusions of the TMDL. We were assisted by a contractor, SAIC and ADEQ in compiling and evaluating all available data and information to assist in developing the TMDL. Some of this data was provided by the dischargers. These data were collected for the purposes of other planning and regulatory processes, including NPDES permit development and enforcement actions, and sampling locations were selected to meet the needs of those other programmatic decisions. EPA's contractor recommended the selected delineation of target site locations for calculating TMDLs for different reaches of Pinto Creek. No mining companies or any other stakeholder interests were involved in the selection of TMDL methods, data analysis techniques, or in the development of TMDLs or specific allocations.

1.15 It is unreasonable to assume future samples will better define background in the area of the proposed Carlota facilities.

Response: This comment may raise reasonable concerns about the viability of assessing background loadings from the Carlota property based solely on sampling in that property area. EPA recommends that ADEQ consider this concern in designing followup monitoring intended to validate or revise background copper loading estimates in its phase 2 analytical effort.

1.16 Future monitoring should be required of Carlota and other mining operations to address other metals.

Response: As this comment does not address the copper TMDL, EPA will simply forward the suggestion for consideration by ADEQ in the context of monitoring program design. The existing NPDES permits for Carlota and BHP require monitoring for a broad suite of metals.

1.17 The TMDL inappropriately relies on the draft NPDES permit. Because EPA has issued a final NPDES permit for Carlota which includes a new outfall, the TMDL should be revised to reflect the actual provisions of the permit (i.e., the new Outfall 008).

Response: The TMDL has been revised to incorporate a WLA equal to the water quality standard for the 008 outfall. This WLA is not derived as a function of stream flow tiers because potential discharges from this outfall are not expected to be associated with rainfall/runoff events. Because discharges from this outfall may occur even under low flow conditions, EPA concluded that it would be appropriate to express the WLA in the same manner that the WLAs and LA s for the lowest flows are expressed for other sources in the watershed. This WLA for outfall 008 is consistent with the provisions of the NPDES permit.

1.18 A note to table 7-2 in Appendix A indicates data for several sites were evaluated but not compiled as part of the TMDL process. What does this mean?

Response: Some data obtained for the TMDL analysis were not relevant to the TMDL calculation process because they were too old, were not reported with adequate precision as to location and timing of sample collection, or were reported in summary form.

1.19 Remediation of copper in Pinto Creek will not be sufficient to address its impairment and achieve Clean Water Act goals. Monitoring for sediment, pH, turbidity, flow, sulfates, chloride, and other metals should be done and these parameters should be considered during formulation of the copper TMDL.

Response: As this comment does not address the copper TMDL, EPA will simply forward the suggestion for consideration by ADEQ in the context of monitoring program design. If the commenter has data or information showing that Pinto Creek water quality standards are exceeded due to other pollutants, this data and information should be forwarded to ADEQ for consideration in the Section 303(d) listing process.

1.20. For the reasons described in the comment letter, the TMDL should be revised to meet ensure a reduction of copper to achieve all water quality standards in the water body.

Response: For the reasons discussed in the responses to these comments and to comments made by other parties, EPA believes the final TMDL will, upon implementation, result in attainment of Pinto Creek water quality standards for copper.

Comment 2: Robert C. Walsh, Carlota Copper Company, September 19, 2000

2.1. The flow regime presented in the TMDL analysis reflects storm water flows only, for which the acute water quality standards would be more appropriate. The Pinto Creek watershed reflects a variety of flow regimens including ephemeral, intermittent and perennial flow conditions. It is recommended that the draft TMDL be expanded to address loading conditions under each of these flow regimens, with the application of the appropriate water quality standards (i.e. acute standards for storm water flows - chronic standards for low water flow events). If insufficient data is available, ADEQ should identify data needs and develop an implementation plan to collect the required data.

Response: We agree that Pinto Creek exhibits ephemeral, intermittent and perennial flow conditions. However, we believe that both acute and chronic standards are applicable to Pinto Creek under low water and storm water flow conditions because hydrographs at the USFS gage stations indicate that elevated storm water flow conditions can extend beyond the minimum four consecutive day criteria pursuant to Arizona Administrative Code (A.A.C.) R18-11-120.C.

2.2 It should also be noted that as part of the triennial review process, ADEQ has proposed to modify the enforcement provisions for chronic standards. Commenter quotes an ADEQ document as stating: *"Because of budget, time and other resource constraints, ADEQ staff cannot stay at a single sampling site for 4 consecutive days to take water quality samples at the rate of I grab sample per day. Consequently, ADEQ does not (and cannot) meet the minimum data requirements to determine compliance with chronic A& W water quality standards. "* Modeling the Pinto Creek TMDL on the basis of a standard, which ADEQ, by its own admission, finds difficult to enforce does not seem to be an appropriate course of action.

Response: The proposed rule modification to which the commentator refers, actually broadens the time frame of data that ADEQ can review and consider when determining compliance with the chronic standards. Additionally, there is no proposal to rescind the chronic standards. Unlike ADEQ's Fixed Station Network monitoring program, the TMDL program has and will collect sufficient samples to assess streams for compliance with the current four consecutive day chronic criteria where appropriate. Therefore, we expect that ADEQ will carefully consider the minimum four consecutive day criteria in A.A.C. R18-11-120.C in future TMDL monitoring and modeling efforts of Pinto Creek.

2.3. There is no justification provided for selection of one hardness value from which to develop copper loading allocations or waste load allocations. Hardness values probably vary with stream discharge, and consequently the stream water quality standards will vary with discharge. Arizona Administrative Code Title 18, Chapter 11 requires that hardness based standards be computed using the hardness of the receiving water. Further data are necessary to

justify the application of hardness values obtained during low flow conditions to storm flow conditions, particularly the applicability of a single hardness value to a broad range of stream flow conditions. A more robust data set is required to determine the copper loading capacity and waste load allocations for copper in Pinto Creek over the broad range of stream flow and hardness conditions likely to be encountered.

Response: We agree with the commenter on the potential variability of hardness in Pinto Creek. The 5th percentile observed hardness value was used to calculate the TMDL, and was considered to be a conservative assumption (i.e., results in a lower dissolved copper standard). We expect ADEQ will consider the variable hardness issue in future TMDL monitoring and modeling efforts. Also see response to comment 3.6 below.

2.4. Storm water flows represent only a portion of the flow regimen of Pinto Creek. While much of the watershed is characterized by ephemeral flow conditions, extended periods of low flow conditions, particularly following El Nino winters, have been documented on Pinto Creek. Loading capacity at low flow is not presented in the draft TMDL. Only storm water flows have been modeled for the purpose of the draft TMDL.

Response: We agree that storm flows represent a small fraction of flow over the course of a typical year. However, the TMDL accounts for loading capacity at low flows by establishing concentration based allocations for the lowest flow tier (see response to comment 1.7). We understand that ADEQ intends to address this issue in future TMDL monitoring and modeling efforts.

2.5. The storm flow conditions derived from the HEC-1 model do not conform with storm flow conditions prepared as part of the Carlota NEPA studies, or the BHP CERCLA response measures. There are now 3 estimates of storm flow discharge at various flow tiers. Copper loading allocations and waste load allocations vary tremendously depending on which of these storm flow models are used.

Response: We recognizes that all models are inaccurate to some degree, and that different modeling efforts will invariably yield different results, therefore the question becomes, is the model an adequate tool to make a regulatory decision. The final TMDL analysis acknowledges that actual precipitation intensity and a synoptic set of stream flow discharge measurements for the entire watershed were not available to calibrate the HEC-1 model. However, the model was calibrated to correspond with the peak discharges presented in the final EIS for the Carlota project. We judged that these peak flow discharge estimates were the best available information available for use in developing the HEC-1 model. We agree that additional monitoring and, perhaps, modeling work would be useful to more fully address model calibration and validation issues.

2.6. The background values used in the draft TMDL require further development. The values presented appear to have been arbitrarily selected at ½ the Method Detection Limit of water quality samples collected in 1981. Review of the available data, including water quality data,

geologic and hydrogeologic data suggest that further analysis of existing data and development of additional data are required. Rather than the blanket application of a single background value, it may be appropriate to develop multiple background values by segment and by flow tier, to accurately model the influence of naturally occurring sources of copper loading.

Response: The presence of "Non-Detect" values in a data set is frequently problematic when it comes to data analysis. The ½ Method Detection Limit (MDL) method is a compromise between assuming the constituent is present at the MDL and assuming the constituent is not present at all. We believe this is a valid method for addressing uncertain data results and is appropriate for the purpose for which it was used in the TMDL analysis. With regard to use of a single value for the background concentration, we believe the uniform background concentration was a reasonable starting point, and that all subsequent reaches have additional loads for natural sources based on observed water quality. We agree that more water quality data could be used in future TMDL revisions along with information on local geologic and hydrologic conditions to evaluate possible revisions to the background loading estimates.

2.7. The available data shows that removal of the copper sources from the Gibson Mine will allow Pinto Creek to attain and maintain the dissolved copper standard. For this reason, Carlota requests that, as additional data for Pinto Creek is collected, ADEQ regularly review this data and promptly delist Pinto Creek when the data shows that the dissolved copper standard has been attained and maintained. The recently revised TMDL regulations, 40 C.F.R., Part 130, allow a state to remove a water body listed for a particular pollutant if new data or information indicate that the water body is attaining and maintaining the applicable water quality standard for that pollutant (40 C.F.R. § 130.29(c)). In such circumstances, no TMDL is required. See, e.g., 65 Fed. Reg. 43586, 43616 (July 23, 2000).

Response: This comment does not directly address the TMDL decision, and will be forwarded to ADEQ for future consideration. The regulatory requirements in effect at the time of future Section 303(d) list revisions will govern the removal of listed waters from the Section 303(d) list. Pinto Creek is currently on the States's 303(d) list and the TMDL analysis found elevated copper levels in Pinto Creek above Pinto Valley Weir; therefore, the TMDL is being established at this time.

2.8. ADEQ should be responsible for developing the Pinto Creek TMDL. The Clean Water Act does not contain an independent grant of authority to EPA to promulgate TMDLS. Rather, EPA is limited to approving or disapproving TMDLS, which the states "shall establish" 42 U.S.C. § 1313(d)(1)(C). Thus, ADEQ should take the lead role in developing the Pinto Creek TMDL and EPA's role should be limited to reviewing the Pinto Creek TMDL.

Response: EPA disagrees that its authority to establish TMDLs is limited to circumstances in which we have disapproved TMDLs. In deciding whether to exercise our discretion to establish the Pinto Creek TMDL and thereby supplement the state's overall TMDL efforts, EPA considered the following factors:

(1) Arizona supports the prompt establishment of this TMDL (in a letter to EPA dated March 14, 2001, ADEQ Water Quality Division Director Karen Smith stated: "Thank you for agreeing to finalize the Pinto Creek TMDL analysis... We support EPA completing the TMDL for Pinto Creek.");
(2) Arizona and EPA together worked together as partners to develop the TMDL and together published the proposed TMDL for public comment;
(3) The TMDL is now complete and ready to be established. The TMDL analysis was based on an analysis of the most recently available data and information. Delaying establishment of the TMDL for a significant period of time could require wasteful repetition of analytical effort in the future. Because the TMDL analysis was funded with federal funds, a delay in TMDL establishment could therefore result in a waste of federal funds.
(4) By EPA accepting responsibility to issue the final TMDL, Arizona was able to devote more of its own resources to other TMDL activities;
(5) Arizona intends to re-examine the TMDL in 2002 and to establish its own TMDL for Pinto Creek if it deems appropriate (see ADEQ letter to EPA dated March 14, 2001; and
(6) Establishment of this TMDL at this time facilitates the implementation of other important Clean Water Act programs, notably the issuance of timely and environmentally sound NPDES permits to point sources discharging copper to Pinto Creek.

Regarding the last point, EPA issues NPDES permits in the State of Arizona. Carlotta Copper Mine is seeking an NPDES permit to address new stormwater discharges to the Pinto Creek and its tributaries from its new proposed open pit copper mine. The BHP Pinto Valley mine is also currently seeking reissuance of its NPDES permit for discharges to Pinto Creek and its tributaries. The Carlotta and BHP facilities are very close to each other. Completion of the TMDL at this time will provide the water quality analysis and associated wasteload and load allocations needed to ensure that the effluent limitations in these permits will result in attainment of water quality standards after upstream discharges are taken into account.

For these reasons, EPA believes it appropriately exercised its authority to establish this TMDL for Pinto Creek.

Comment 3: Evelyn L. J. Bingham, BHP Copper, Inc., September 14, 2000.

Comment 3.1. The TMDL should not be finalized and a stakeholder group should be formed to review the current study. A public input process was missing in the development of the draft TMDL for Pinto Creek.

Response: ADEQ and EPA have provided several opportunities for public discussion, review, and comment on the TMDL, including two meetings with watershed stakeholders (one before and one after the draft TMDL was public noticed) and a formal 60 day public comment period. These public participation activities exceed the minimum State and federal requirements. ADEQ has indicated that it intends to work intensively with a local stakeholder group to conduct more monitoring, analysis, and discussion of the TMDL and make revisions if warranted. ADEQ and

EPA have determined that it is appropriate to complete the first phase TMDL now in order to provide analytical support for currently pending NPDES permitting issues involving the BHP and Carlota mines.

We received very detailed technical comments from two commenters, which suggests sufficient time was available to conduct a detailed review of the draft TMDL.

Comment 3.2. It is impossible to tell how the draft TMDL was performed and if the process and data used were valid and appropriate. The TMDL does not give detailed information on guidance documents used or how the study protocol relates to recent updates of TMDL guidance by EPA. BHP was not afforded sufficient time to review and validate the TMDL analysis.

Response: The TMDL document describes the methods used to develop the TMDL in some detail. The administrative record for the decision also provides additional supporting information. EPA believes the TMDL document and supporting documents in the TMDL provide an adequate description of the methods and data used to develop the TMDL and an adequate discussion of why these methods and data analysis approaches were valid.

The documents in the administrative record were available for inspection upon request during the comment period, but the commenter did not request access to those materials. Nor are we aware of efforts by the commenter to contact EPA or ADEQ to ask questions about the TMDL development methods. The commenter was not specific as to which aspects of this description were not detailed enough; therefore, no further response to this issue is necessary.

The TMDL was developed consistent with existing EPA regulations and guidance including 40 CFR 130.7 and EPA's 1991 TMDL program guidance. No specific technical guidance was consulted with respect copper TMDL development because EPA has issued very little guidance which is germane to this type of TMDL. We do not know which "recent updates of TMDL guidance" the commenter is referencing. EPA has finalized no TMDL development guidance applicable to Arizona for several years. The commenter may be referring to draft guidance prepared in support of the recent revisions to the national TMDL regulation. The draft guidance has not been completed because the national TMDL regulation is not yet in effect.

With respect to the question of whether sufficient time was provided to review the draft TMDL analysis, see the response to comment 3.1.

Comment 3.3. Should a TMDL be based solely on storm water flows? If so, is it appropriate to apply chronic water quality standards since storm flows are intermittent, short term events. Shouldn't acute standards be used for storm flows?

Response: The TMDL was developed to apply at all possible flows, not just higher flows associated with stormwater runoff. However, we recognize the tables in the draft TMDL which presented the TMDLs for different flow tiers did not include the TMDLs for the lowest tier associated with flows from zero to the lowest modeled flow level for each target site. We

understand that this omission may have been confusing, and have revised the TMDL tables in the final TMDL to incorporate the TMDLs and associated allocations for all target sites under the lowest flow conditions. We apologize for any confusion the presentation of the draft TMDL may have created in this regard.

It may be appropriate to apply only acute standards in situations where discharges and creek flow associated with precipitation related runoff are very short in duration. However, we are not aware of data or information indicating that storm flow-related discharges and flows are shorter in duration than the 4 day duration identified in Arizona water quality standards for chronic conditions. Some information is available indicating that the Creek may flow for days or weeks following significant storms, especially if repeated precipitation events occur in the watershed. Therefore, we made the conservative assumption that chronic water quality standards should be applied in order to ensure that the TMDL is consistent with the provisions of applicable State water quality standards.

Comment 3.4. Were background concentrations estimated correctly? They appear to be based on old, unreliable measurements. Were any background measurements based on storm flow samples, and were the data used applicable to background concentrations in storm flows?

Response: TMDL Section 8.5 describes data used to estimate natural background conditions. It is not clear whether these data were collected during storm flow conditions. Very limited data were available from undisturbed areas of the watershed which would be appropriate for calculating natural background conditions because historical monitoring in the watershed is limited overall, and few areas were sampled which were not associated with mining-related or other human-caused ground disturbances. In EPA's judgement, it is appropriate to use local data, even if it is limited, to estimate background loadings for TMDL calculation. It may be appropriate, as part of followup monitoring efforts, to identify and sample areas which are undisturbed in order to review and validate the background loading estimate used for this TMDL.

Comment 3.5. Is it appropriate to calculate storm flows based on precipitation data from the Rainfall Frequency Atlas? Why weren't actual measurements of precipitation in the watershed used?

Response: As discussed in TMDL Section 8.3, climatic data for the Pinto Creek watershed are very limited, and are insufficient to describe precipitation depths and rates, the duration of precipitation events, and the distribution and timing of rainfall throughout the watershed for specific storm events. The Rainfall Frequency Atlas provided the necessary information to estimate precipitation depths for several storm durations and recurrence intervals, which were used to develop the hydrologic model used to develop the TMDLs for different flow levels.

Comment 3.6. Were the proper hardness values used to set the standard for copper? Is it appropriate to use a single, worst case hardness value for all scenarios? Wouldn't it be more technically correct to estimate standards based on real-time hardness values?

Response: As discussed in Section 8.2, we requested comment on two alternative approaches for considering hardness in setting the numeric targets for the TMDL. The first approach was to select a single conservative hardness factor for all TMDL calculations. The second approach was to express the TMDL in a functional form which would provide for calculation of the TMDL based on real-time data collected at different flow levels. The final TMDL is based on the first approach-- a conservative hardness factor of 101 mg/L (the 5^{th} percentile hardness factor based on available watershed data) for several reasons. First, this approach identifies specific TMDLs associated with different flow tiers, which is clearer and more understandable by the public than a TMDL expressed in a functional form. Second, this approach provides a firmer basis for planning of discharge controls and remedial action projects. Third, there are no assurances that real-time hardness data would be collected at each of the locations where it would be necessary to calculate TMDLs and specific allocations. Fourth, there could be significant hardness variability within a target site reach or among specific discharges to individual reaches. Therefore, it would not be assured that the sum of calculated allocations for discharges to that reach would be less than or equal to the locally calculated TMDL for the reach. In summary, we are concerned that the second approach for addressing the hardness issue raises difficult issues in terms of clarity, implementation planning, and followup monitoring assurances.

Comment 3.7. Are historical data used to develop the TMDL unreliable because "clean techniques" were not used?

Response: There is not good documentation regarding the quality of data which was available when the TMDL was developed; however, we believe most data were collected consistent with approved quality assurance plans. We are aware of the possibility that data collected through other than "clean techniques" may be less reliable than data collected with current, state-of-the-art methods. Very limited water quality data were available for this TMDL, and we were obliged to consider all available data and information in conducting the TMDL analysis. EPA supports recommendations to implement a comprehensive followup monitoring effort to support the phase 2 TMDL being planned by ADEQ and to track compliance with the TMDL and associated allocations in the future. Followup monitoring should be conducted using the best available analytical methods.

Comment 3.8. If the TMDL is based on storm flows, should the water quality data for the TMDL be based on samples taken during storm flows?

Response: Ideally, water quality data used to calculate TMDLs and allocations for higher flows should be collected during storm flows. However, as discussed above, very limited water quality data were available for this TMDL. We used careful judgement and appropriate analytical assumptions in applying this available data to develop TMDL calculations which should result in attainment of water quality standards under different flow scenarios.

Comment 3.9. Although not a required element of the TMDL, shouldn't implementation provisions be discussed in greater depth in the TMDL?

Response: Ideally, the TMDL would be developed concurrent with a detailed implementation plan. ADEQ has indicated its plans to develop a more detailed implementation plan concurrent with the phase 2 TMDL it has underway. Insufficient information is available at this time to provide a detailed implementation plan as part of the phase 1 TMDL decision. As noted by the commenter, TMDLS are not required to include implementation provisions at this time.

Comment 4: Thomas Sonandres, Friends of Pinto Creek, September 19, 2000.
(Note: duplicative comments have been addressed once, and lengthy comments were paraphrased in order to reduce the length of the responsiveness summary.)

4.1. Figures 1-1 and 2-1 are not listed in Table of Contents.

Response: These figures are properly listed in the table of contents in the final TMDL.

4.2. Table 1-4, TMDL Elements for Dissolved Copper by Target Site, Assuming Carlota is Not Constructed and Table 1-5 Dissolved Copper Load Allocations and WLAs by Flow Tier Assuming Carlota is Not Constructed are not included in the TMDL.

Response: References to these tables were in error. The tables were not included in the TMDL because the TMDL analysis included provisions for the Carlota mine, which was a reasonably foreseeable future source. See response to comment 1.4 above.

4.3. Table 1-6 LA s and WLAs by Flow Tier assuming Carlota is Constructed is not included in the TMDL.

Response. Table 1-4 on p. 7 in the final TMDL is the table referred to by the comment. The table was misnumbered in the draft TMDL in error.

4.4. Commenter identifies several page numbering and table labeling errors, as well as a few typographical errors.

Response: These errors have been corrected in the final TMDL.

4.5. Pinto also has perennial stretches.

Response: The text was changed to reflect the comment.

4.6. BHP is not the only active mine in the area.

Response: The TMDL refers to mines active in the Pinto Creek watershed. The mine discussed in the comment is in the neighboring Pinal Creek watershed.

4.7. Commenter suggests alternative wording for Lake Roosevelt "is on the Salt River."
Response: Comment raises a minor semantic point which does not require a change.

4.8. Commenter suggests minor changes in references to Pinto Valley mine ownership and timing of 1993 spill.

Response: The TMDL reference to BHP ownership and dates of spills are retained for clarity, but we acknowledge Magma was the owner at that time and that the spill event may have begun in December, 1992.

4.9. Haunted Canyon is not included in the discussion of criteria for Powers Gulch and Pinto Creek.

Response: No change was made to the TMDL because the same criteria apply to Haunted Canyon as apply to the other tributaries of Pinto Creek.

4.10. On p. 22, change reference to "eastern" tributaries to western tributaries.

Response: The change was made.

4.11. Commenter suggests revision of the phrase "a distance of approximately 1 mile" to 1.4 miles.

Response: No change was made to address this minor semantic issue.

4.12. Table on p. C-4 has no heading.

Response: A heading has been added for this table.

4.13. Define "abandoned precipitation launders" on p. 19.

Response: Where used in the TMDL, this term refers to abandoned mining equipment used to process copper ores.

4.14. Define "areally restricted" on p. 19.

Response: This term has been removed from the final TMDL. It refers to a small area.

4.15. What is a "non-detected value"? How does it differ from a detected value.

Response: This term refers to the lowest data analysis value below which the analytical method used to detect the presence of the chemical is unable to detect its presence. In contrast, a detected value is above the analysis value which the analytical method is capable of detecting.

4.16. What is "chronic water quality criteria"?

Response: See Section 6 of the TMDL for discussion of water quality criteria. A "chronic" exposure would be an exposure of lengthy duration, usually defined as 4 days or longer. State water quality standards often are different for lengthy periods of pollutant exposure because lower pollutant levels may cause adverse impacts if they persist for long periods. In contrast, "acute" exposures are associated with very short term exposures to pollutants in the water.

4.17. What is an "unclaimed" facility?

Response: The term has been changed to unreclaimed, which means the facility has not been removed or remediated such that it will not contribute to future pollutant discharges.

4.18. What is an "upset"?

Response: The term "upset" refers to an unplanned, accidental discharge or spill from mine facilities.

4.19. What are "runon control measures"?

Response: The term refer to management practices to reduce or avoid flows of stormwater into or across specific mine site facilities.

4.20. Where is the Carlota Crossing site? Is it the same as the Cactus Crossing?

Response: We could not find references to the Cactus Crossing in documents we reviewed.

4.21. Is the boundary of the TMDL project the entire Pinto Creek watershed?

Response: The entire Pinto Creek watershed was considered for the TMDL analysis. Because existing data found that water quality standards are being met below Pinto Valley Weir, TMDLs and associated allocations were set for the area above and including the Pinto Valley Weir. These TMDLs and allocations consider conditions in all tributaries to Pinto Creek and all known copper loading sources upstream from Pinto Valley Weir in Pinto Creek and its tributaries. Implementation of these TMDLs should ensure that the reach of Pinto Creek downstream from Pinto Valley Weir continues to meet water quality standards.

4.22. What is the significance of dividing Pinto's tributaries into eastern and western tributaries?

Response: The TMDL analysis did not specifically divide the tributaries into eastern and western tributaries. Instead, the TMDL analysis considered whether differences in geology and extent of exposed mineralization in different areas of the Pinto Creek were significant enough to warrant estimation of different background loading levels in different areas of the watershed. The analysis concluded that there was insufficient evidence to warrant the development of different background loading levels.

4.23. It is important to distinguish between the two Henderson Ranches in the watershed.

Response: The TMDL's references to Henderson Ranch generally refer to the upstream location. The reference in a footnote on p. A-11 is to the downstream Henderson Ranch crossing.

4.24. Clarify references to Spring Creek.

Response: This comment appears to address a letter from ADEQ to commenter and a reference to the EIS. The relevance of this comment to the TMDL is not clear, so no changes were made to the TMDL.

4.25. Lake Roosevelt supplies water to the Lake Roosevelt community, which is an important recreation site.

Response: We agree, but no change to the TMDL is warranted.

4.26. Mining disturbances include placer mining and over 50 historical mine workings.

Response: The TMDL description of mining activity in the area is consistent with this comment.

4.27. Add to the TMDL that perennial reaches may occur downstream of some confluences.

Response: As this comment was unsupported by specific data and does not appear to impact the TMDL analysis, no change was made to the TMDL.

4.28. TMDL description of perennial reaches should coincide with USFS descriptions.

Response: The TMDL's description of perennial reaches is generally consistent with the USFS descriptions, and does not appear to impact the TMDL analysis, so no change was made to the TMDL.

4.29. The description of Pinto Creek's flood plain downplays the significance of the flood plain that would be affected by Carlota's operation.

Response: We did not intend to downplay the significance of the Pinto Creek flood plain. As this comment does not appear to impact the TMDL analysis, no change was made to the TMDL.

4.30. Is a TMDL "technical support document" provided which describes TMDL calculation and modeling methods and assumptions?

Response: The TMDL document describes TMDL calculation methods and assumptions. A copy of the technical document prepared by EPA's contractor SAIC is included in the administrative record for this action.

4.31. Did the HEC-1 modeling consider data from the largest rain event of the past 110 years from 1906? How did it calculate the largest potential rain events?

Response: No local data for rainfall events from 1906 were available for use in this TMDL. The TMDL calculated precipitation depths for several durations and recurrence intervals based on data from the Rainfall Frequency Atlas for Arizona. We did not imply that this analysis accounted for the largest potential rain events, but rather, the events with estimated recurrence intervals up to and including once per 100 years. See Section 8.3 for details.

4.32. Commenter references concerns about the adequacy of Carlota project facility to withstand large flood events.

Response: These comments do not refer to or address the TMDL itself.

4.33. Why doesn't the TMDL also address the surface waters of Haunted Canyon and Powers Gulch?

Response: The TMDL focuses upon Pinto Creek because that is the only waterbody within the watershed which is listed on the Section 303(d) list. The TMDL analysis does consider discharges from each of the tributaries named by the commenter.

4.34. Does the loading capacity formula convert the maximum six hour average stream discharge used to calculate flow tiers to a 24 hour figure since the TMDLS are expressed in kg/day?

Response: The comment is correct.

4.35. Do the 26 site locations referred to on p. 16 refer to the 25 sites listed in Table 7-2?

Response: The text refers to general sampling locations. Table 7-2, which actually refers to more than 25 monitoring stations, reflects the fact that samples collected at different times at these sampling locations were not collected at exactly the same spot as some previously collected samples.

4.36. Why are loading capacities established for the lowest flow value for each flow tier? Shouldn't they be established for average flow values.

Response: We decided to establish loading capacities and TMDLs for different flow tiers based on the lowest flow value for each tier in order to provide an additional implicit margin of safety in the TMDL to account for uncertainties in the analysis. TMDLs based on lower flows within a flow tier are lower and more environmentally conservative than TMDLs based on average flows would be. The margin of safety analysis discussion has been revised to discuss this and numerous other analytical assumptions which provide an implicit margin of safety to augment the explicit 10-20% margin of safety.

4.37. Does the TMDL subtract upstream allocations before determining the TMDLs for the lower segments? How is the stream's total allocation for all reaches calculated and where does this figure appear?

Response: As illustrated in Table C-1, the TMDL subtracts upstream allocations before determining the TMDL and associated allocations for lower target sites. The stream's total allocations are summarized in Table 1-4. The sum of total allocations for the different flow tiers has been added to the bottom of Table 1-4.

4.38. As the stream flow becomes smaller following storm flows, does the loading capacity increase, decrease, or stay the same? Does the TMDL allow for copper transported in alluvium? Please clarify the passage.

Response: The TMDL itself assumes that loading capacity would decrease following storm events as stream flow decreases.

The commenter refers to a passage on pp. 23-24 in the draft TMDL which discusses possible sources of uncertainty in the analysis. It discusses a scenario considered in determining the margin of safety, but not used to calculate the TMDL itself. This section focused on the possibility that a storm event could occur in part of the watershed, producing runoff, stream discharge, and copper loading, but not in other parts of the watershed. If this scenario occurred, it would be possible that a copper load could occur in part of the basin without having any upstream flow to dilute the load. The TMDL document is simply saying that this possibility is an uncertainty in the analysis which warrants consideration through the TMDL margin of safety. The TMDL accounts for this possible scenario by providing an explicit margin of safety and by calculating separate TMDLs for 9 target sites under all possible flows, which helps to minimize the possibility that a storm event in a small part of the watershed would cause copper loadings which exceed water quality standards but not the TMDLs.

It is important to note, however, that the TMDL made the conservative assumption in calculating runoff, discharge, and copper loads that storms would occur across the entire watershed, causing copper loading throughout the basin. This is a conservative planning assumption for the Pinto Creek watershed because the most significant loading source is located high in the watershed (Gibson Mine), and the TMDL analysis assumes its loads are transported through the system along with other less significant sources— conclusions which reduce the loading capacity available at downstream locations.

4.39. Provide a specific example for two adjacent reaches. How does the formula account for upstream loads, natural background, the margin of safety, and sources within the reach?

Response: Based on data in Tables C-1 and C-3, an example calculation is provided for target site TS-2 for the highest flow tier (all figures in kg/day except where noted). As the example indicates, natural background copper is accounted for in the TMDL as a specific factor in the calculation.

Data Needed for TMDL Calculations

Upstream load allocation from TS-1: (Henderson Ranch Load Allocation + 10% MOS for TS-1)
6.92(+ 2.67)= 9.59
Total loading capacity for TS-2: 176.64
Natural background for TS-2: 148.14
Sources in TS-2 (Gibson Mine LA): 17.02
Margin of Safety for TS-2: 1.89

Loading Capacity Derivation

Loading Capacity for TS-2 = (stream discharge * water quality standard * unit correction factor)
(1863 cfs * 38.7 µg/l) / 408.16
176.64 kg/day

TMDL Calculation

TMDL for TS-2 = loading capacity for TS-2 – prior allocated loads in TS-1
176.64 - 9.59
167.05 kg/day
Margin of Safety = (Net Loading capacity – natural background) * 10%
(176.64 – 148.14) * 10%
1.89 kg/day
TMDL for TS-2 = [WLA + LA + Natural Background + Margin of Safety]
[0 + 17.02 + 148.14 + 1.89]
167.05 kg/day

4.40. How does alluvium compute in the TMDL allocation formula? Could alluvial flow account for some unexplained copper sources?

Response: The TMDL analysis uses the HEC-1 model to estimate surface flows associated with precipitation and runoff associated with storms of different intensities. It does not directly account for alluvial flow although it does account for infiltration as described in Section 8.3. Copper loads which reach the stream through alluvial flow could account for "unexplained" copper sources, although there is not data available to evaluate or confirm this hypothesis. The TMDL accounts for this potential route of pollutant loading through its explicit margin of safety, and by providing TMDLS for all flows from zero to the highest possible flows at each target site location.

4.41. Is it true that monitoring sites used in the TMDL do not detect alluvial flow? Does alluvial flow get past Pinto Valley Weir undetected?

Response: Most of the water quality data available for the TMDL analysis were obtained from surface water samples. The extent to which alluvial flow is accounted for in surface water samples is unknown because the degree of hydrologic connectivity between surface and alluvial groundwater at different locations in the watershed is unknown. To the extent alluvial flows

were sampled in past monitoring efforts, they were considered in the TMDL analysis. For example, alluvial groundwater from Haunted Canyon was sampled quarterly from 1993-1998. No dissolved copper was detected in these 18 samples (see Table 7-2).

It is unknown whether alluvial flow "gets past the Pinto Valley Weir undetected" because the design characteristics of the Weir were not evaluated as part of the TMDL analysis, and no alluvial groundwater samples were available from that location for the TMDL analysis.

4.42. Groundwater moving through Powers Gulch and Pinto Creek alluvium has detectable amounts of copper.

Response: The significance of this information for the TMDL is unclear. As discussed in the response to comment 1.2, the TMDL focuses upon surface water conditions because the water quality standard is expressed for surface water only. No information compiled and assessed for the TMDL analysis supports a conclusion that groundwater loadings of copper in Pinto Creek are significant. Absent such data and information, the technical approach used for the TMDL which focuses on dissolved copper loads to surface water is appropriate and consistent with Clean Water Act requirements.

4.43. The alluvium-surface water interplay is extensive and the alluvium copper component of the draft TMDL needs more work.

Response: The commenter provided no specific data or evidence to support this contention, and no specific suggestions are provided regarding changes in the TMDL analysis or conclusions. See response to comment 4.40.

4.44. What water quality data was used to determine whether background concentrations of dissolved copper are similar in different areas of Pinto Creek watershed? The data cited in the TMDL report does not inspire great confidence.

Response. See response to comment 3.4.

4.45. Develop biocriteria to determine what level of copper causes biota to change.

Response: This recommendation will be forwarded to ADEQ for consideration in the development of follow-up monitoring plans.

4.46. "Has anyone measured the one time and ongoing?" What data exist for Lake Roosevelt bottom biota? High concentrations of copper have obviously flowed to Lake Roosevelt via repeated mine releases, runoff, and natural stream mineralization.

Response: The first comment is unclear. This TMDL analysis focuses on the listed stream—Pinto Creek. Analysis of conditions in Lake Roosevelt is beyond the scope of this TMDL. Lake Roosevelt is not listed on the Section 303(d) list for copper.

4.47. EPA and ADEQ need to specify the numeric triggers that they will use to halt the (Carlota) project if the TMDL does not work.

Response: This comment addresses TMDL implementation and oversight of the NPDES permit for the Carlota mine, both of which are beyond the scope of this TMDL establishment decision. Currently applicable federal regulations do not require the inclusion of TMDL implementation provisions in TMDL decision documents (40 CFR 130.2 and 130.7). The NPDES permit provisions must be consistent with wasteload allocations established in the TMDL (40 CFR 122.44).

4.48. What are the numeric triggers for reopening the TMDL?

Response: Although EPA supports the periodic review and, if necessary, revision of TMDLs by the State following their establishment, federal regulations do not require the inclusion of specific triggers which would prompt review and revision of TMDLs. Therefore, this TMDL decision document does not include such triggers.

4.49. Commenter raises concerns about why local data are insufficient to describe precipitation/runoff/flow discharge relationships, and cites several monitoring locations. Did EPA and ADEQ consider all available data, including data from the FEIS?

Response: Although some local rainfall and flow data were available and were considered in the TMDL, most of these data were concentrated in the area near Miami. These data are insufficient to calculate rainfall runoff relationships throughout the sizable Pinto Creek watershed which are needed to estimate copper loading and calculate TMDLS for the entire Creek. All available data, including data reported in the FEIS, were considered in the TMDL analysis. See TMDL Section 8 for further discussion of data issues.

4.50.What hard data on copper and flows were gathered at each of the five flow tiers for each data source? Why are no hard data available after 1998 or before 1993?

Response: Data used to develop the TMDL are summarized in Table 7-2 of the TMDL. Specific data are included in the administrative record for this action and may be inspected upon request. Data collected in 1999-2000 by ADEQ were also considered in the analysis and are summarized in Table 7-2. All readily available data were compiled and considered in the analysis.

4.51. What spikes in copper loads were recorded at Pinto Valley Weir at the time of massive releases from Pinto Valley Mine in the 1990s and 1980s?

Response: Available data are summarized in Table 7-2 and included in the administrative record. Information about releases from Pinto Valley Mine is provided in Section 5.0. As this question does not clearly relate to the TMDL or methods used to establish the TMDL, it is beyond the scope of this decision and requires no further response.

4.52. How do the flow rates used to calculate the TMDL at Pinto Valley Weir compare with mean annual peak flow rates at the Weir of 3,230 cfs?

Response: The highest flow tier used to establish the TMDL for TS-9, near the Weir, is 34,144 cfs. The lowest flow rate used to calculate a TMDL at site TS-9 is 1,915 cfs.

4.53. It would be useful to report water quality data collected by flow tier.

Response: As discussed in the TMDL document, in most cases flow information was not collected at the time historical water quality data were collected, so the requested information is unavailable. One reason the HEC-1 model was used to model flows and assist in calculating pollutant loads is that insufficient local flow and water quality data were available to directly estimate loads.

4.54. Why do NPDES 005 and TS-9 have the same statistics for all four flow tiers in Table 1-4? Is there no increase in copper in the higher flow tiers?

Response: Table 1-4 identifies specific wasteload allocations and load allocations for individual discharge sources. The wasteload allocations cited by the commenter do not increase as the stream flows increase.

4.55. In the list of Carlota's non-contributory drainage areas, why is Eder North Pit not on the list?

Response: The final TMDL has been revised to include Eder North Pit.

4.56. What does it mean that the 005 discharges are "independent of storm runoff."

Response: The discharges from the 005 outfall did do not contain and do not appear to be influenced by storm runoff.

4.57. BHP monitoring station AMP-2 appears over a mile downstream from outfall 005. Can AMP-2 monitor 005? At what flow tier levels? The cited maximum .33 cfs is in which flow tier? What is the date of this reading?

Response: The question concerning the relationship between the outfall location and the location of AMP-2 does not appear to address the TMDL itself. Because the question is beyond the scope of this action, no further response is required. The cited maximum flow from outfall 005 was taken from data collected by BHP**.** EPA believes these data were probably collected in a non-storm period which would have been in Tier 1 although we do not have specific flow data for that location for the date the sample was collected.

4.58. Were all 8 years of above average rainfall excluded from the reported 005 data, which covered 1993-1996?

Response: The commenter is correct that the data which were available for this site were collected between 1993-96. Summary data was also available for the period 1993-98. We are unaware of any other data for this site, and cannot comment on the relationship between the periods for which data were collected and local rainfall patterns.

4.59. Is there a monitoring station at outfall 005? If not, is flow from this outfall measured in Pinto Creek, perhaps at station PC-2?

Response: The outfall 005 is monitored at the point of discharge.

4.60. How is it possible that no load or wasteload allocations are anticipated from Carlota at flows less than the 10 year, 24 hour storm?

Response: No discharges from the Carlota facility are permitted below the 3rd flow tier; therefore, the WLAs for these outfalls and flow tiers is zero. The facility intends to collect any runoff from its facilities in retention ponds at lower flows, which enables to facility to avoid discharges under these flow conditions. An exception is the Carlota 008 wellfield outfall, which has WLAs for all flow tiers as explained in the final TMDL.

4.61. The TMDL assumes all Carlota facilities are in place during the length of the TMDL. This is not the case. The Pinto Creek diversion will not be operational until the 3rd or 4th year of operations. Is the TMDL proposing to allow Carlota to operate a mine for 5 years in which the Cactus Breccia area continues to contribute copper to creek overexceedence in copper?

Response: See response to comment 1.9.

4.62. Which Carlota disturbed earth acres are being used to compute the load and wasteload allocations? Why are Main Dump and Eder Dump considered to be non-contributory areas if they discharge in the higher flow tiers? Which acres of the total 1428 to be disturbed were considered contributory?

Response: Main Dump and Eder Dump are assumed not to contribute to background loadings from the tributary areas in which they are located. Instead, loadings from these two Dumps are accounted for in specific wasteload allocations which apply in the higher flow tiers. Although there are several wasteload allocations identified for discharges from the Carlota mine, there are no load allocations identified specifically for the Carlota facility. To the extent Carlota owns some of the tributary watershed areas not associated with its mine facilities, background level copper loads are accounted for in the estimates of background loads to those tributary watersheds which are factored into the TMDL calculations for sites TS-5 and TS-6. Approximately 1000 acres of Carlota property which are not occupied by mine facilities were accounted for in the background loading estimate.

4.63. On what scientific basis was a 10% factor added. How is it divided between discharges from historic mining and from selected natural areas.

Response: The commenter appears to be referring to the 10% explicit margin of safety described in Section 8.7. As discussed in the final TMDL, the explicit margin of safety for target sites TS-5 - TS-9 has been raised to 20%, and the implicit margin of safety has been explained in more detail. The explicit margin of safety was not divided among specific causes of uncertainty. See response to comment 1.12 for additional discussion of margin of safety provisions of the TMDL.

4.64. Why does the TMDL for the TS-3 site not account for copper loadings from the Bronx mine site, given information provided by the commenter that copper laden runoff from that mine site is entering Pinto Creek?

Response: The commenter has provided insufficient information and data to support the inclusion of a specific allocation for this site at this time. Data for a single sample event was attached to the comment, but no information was provided as to the location samples were taken, the analytical methods used and quality assurance/quality control practices used in collecting the data, and the degree to which discharges from this mine site were actually entering Pinto Creek or its tributaries. EPA recommends that as part of the followup monitoring plan to be designed by the State of Arizona, further investigation of this site may be warranted.

4.65. Why does the TMDL for the TS-3 site not account for copper loading from the Yo Tambien mine site, given information cited by the commenter that there could be some potential for discharge of copper-laden runoff from the site?

Response: EPA staff visited this site at time the NPDES permit for Carlota mine was being developed and concluded it was not likely to be a significant copper loading source. Available data do not support a conclusion that water quality standards are being exceeded due to discharges from this site. The sources cited by the commenter provide no specific information to support the assertion that this is a significant loading source. There is no basis for EPA to establish an allocation for this source at this time based on the information provided.

4.66. Is a calculation made to determine the potential point and nonpoint sources for each stretch of the Creek irrespective of what if any unallocated loading capacity may exist? Can a margin of safety be assigned irrespective of any scientific basis, as long as it does not exceed unallocated loading capacity?

Response: The TMDL analysis includes estimates of loadings from point and nonpoint sources, including background loading levels irrespective of the amount of unallocated loading capacity which exists at particular target sites. The second question is unclear. EPA has identified both implicit and explicit margins of safety in its analysis which are factored into the overall allocation of available loading capacity. The basic equation used for this calculation is:
$LC \geq TMDL = \sum$wasteload allocations + $\sum$load allocations + background + margin of safety

where:
LC = loading capacity
TMDL = total maximum daily load

background = upstream loads and watershed loads not associated with allocations
margin of safety = 10% (TMDL - background)
$\sum$ = sum

4.67. The discussion of tailings releases since 1989 is misleading. Compile and include a list of all tailings releases.

Response: The TMDL analysis already includes a list of recent tailings releases. The commenter did not identify older tailings releases to be listed or explain the purpose of such a listing. Since the comment does not directly address the TMDL itself, no further response is necessary.

4.68. The TMDL should address the NPDES 008 outfall.

Response: See response to comment 1.17.

The listing of sources and associated allocations have been modified to include the 008 outfall as a source in this area.

4.69. How can copper added in the TS-7 reach be calculated if the TMDL has no monitoring station upstream of the TS-7 reach?

Response: The TMDL analysis calculates the TMDL for this reach based on modeling results, not water quality data collected in the reach. Recall that the TMDL is based on hydrologic modeling which accounts for water inputs and infiltration, and the applicable water quality standard.

The TMDL itself establishes no specific monitoring points as implied by the commenter.

4.70. There appear to be copper sources to TS-6, TS-7, and TS-9 associated with the wellfield mitigation water and other sources discussed in the comments. How can it be said that there are no significant copper sources below the Cactus/Carlota pit monitoring point TS-4?

Response: The wellfield outfall 008 has been assigned a wasteload allocation, as discussed above in the form of a concentration based allocation. Although there may some other minor sources of copper to the reaches listed by the commenter, no reliable information has been provided to support a conclusion that these are significant sources which warrant establishment of load or wasteload allocations at this time.

4.71. Commenter lists several potential sources, which are believed to be copper loading sources, including:
- Carlota 008 outfall discharge points,
- historical mining sites,
- seeps and other sources from tailings and/or natural mineralization,
- placer mining,

- airborne dust
- remnants of the 1997 BHP spill,
- infiltration from dumps, catchment basins, and pits,
- tailings on floodplain from previous spills,
- other sediment runoff, and
- groundwater and alluvial subsurface flow.

Response: The commenter does not indicate how this information should be considered in the TMDL analysis. We presume the commenter believes these sources should be accounted for in the source analysis and allocation process. EPA agrees that the TMDL should account for all significant copper loading sources. The TMDL has been revised to provide a wasteload allocation for Carlota's 008 outfall. The TMDL accounts for all historical mining sites for which there is reliable information available to estimate the extent of potential future loadings. As described in the margin of safety section, the TMDL provides an explicit margin of safety to account for potential, but unverified loading sites. The commenter has provided no data or information to support a conclusion that the remaining potential copper loading sources are significant and must be addressed in the TMDL. EPA recommends that in future reviews and revisions of the TMDL, the State should consider all information available at that time and account for any newly identified or verified loading sources and revise the TMDL and allocations if necessary.

4.72. Construction of the Carlota project will generate substantial copper laden sediment which will enter the watershed. What weight did the TMDL give to this source?

Response: The TMDL accounts for runoff from disturbed areas of the Carlota site which are not covered by specific WLAs though the background loading estimate used in the TMDL calculations. No evidence is provided by the commenter or presented in the FEIS cited by the commenter which indicates that sediment runoff from these disturbed areas during the construction or operation phases of the project are significant sources of copper which require special consideration in the TMDL analysis beyond the background loading analysis.

4.73. A margin of safety is required for contingencies such as landslides, tailings dam failures, pipeline breaks, seepage flows, conveyance blockages, and stormwater overflows associated with the Carlota project.

Response: The commenter includes a discussion of dam failures and high magnitude rainfall events, but the conclusion based on this discussion is not clearly stated and its relevance to the TMDL is unclear.

The TMDL identifies maximum allowable loads from Carlota facilities through its wasteload allocations. The TMDL also provides a margin of safety to account for potential unidentified copper sources. Discharges from sources which are do not receive allocations in the TMDL would be inconsistent with the TMDL they exceed the background loading rates incorporated in the TMDL calculations. Moreover, many of the types of discharges discussed by the commenter

are prohibited or otherwise regulated by NPDES permits.

The potential sources listed by the commenter appear to be accidental discharges which are unpredictable, but which would be addressed through future compliance actions pursuant to the Clean Water Act and applicable State laws. TMDLS do not provide allocations for unauthorized, unpredictable future spills or discharges.

4.74. The Carlota NPDES permit and the TMDL do not adequately address or control non-dump disturbed areas of the mine operation.

Response: Comments on the NPDES permit are beyond the scope of the TMDL decision. See responses to comments above with respect to allegations that runoff from non-dump areas of the Carlota operation are significant copper sources which the TMDL must specifically address. As discussed above, there is insufficient evidence provided by commenters or assembled in the development of the TMDL to support the conclusion that the other disturbed areas of the Carlota operation warrant development of specific allocations at this time.

4.75. A discharge from Miller Spring #2 should be added to the TMDL for site TS-3.

Response: The commenter and the cited references provide insufficient information and data to support the conclusion that this alleged discharge location is a significant copper loading source which should receive separate consideration and/or an allocation in the TMDL. The TMDL contains a general load allocation to account for several possible loading sources in this area of the watershed (see Section 9.1) based on increases in copper loading in the Creek based on water quality data collected from this reach. EPA believes this allocation should be sufficient to account for loadings from undefined sources which discharge to this reach. EPA encourages the State to further investigate and, as necessary, seek to remediate specific source identified in this area.

4.76. Discharges from historic mine sources in the reach above site TS-4 should be added to the TMDL. The TMDL should also be revised to identify copper loadings from the Cactus Breccia deposit prior to the completion of the diversion channel.

Response: The commenter and the cited references provide insufficient information and data to support the conclusion that these alleged discharge locations are significant copper loading sources which should receive separate consideration and/or allocations in the TMDL. Concerning the comment about loadings from the Cactus Breccia formation prior to completion of the diversion project, see the response to comment 4-61.

4.77. Discharges from several mine related sites in the vicinity of sites TS-5, TS-6, TS-7, TS-8, and TS-9 should be added to the TMDL.

Response: With the exception of the discharge points associated with Carlota outfall 008, the commenter and the cited references provide insufficient information and data to support the

conclusion that the alleged discharge locations cited are significant copper loading sources which should receive separate consideration and/or allocations in the TMDL. The WLA for outfall 008 is discussed in the response to comment 4.68.

4.78. What is in the reach covered by site TS-8?

Response: This reach covers the area downstream of the confluence with Haunted Canyon. No significant sources have been identified in this reach.

4.79. Campaign Creek should receive more attention in the TMDL since it is Pinto Creek's longest tributary.

Response: The TMDL does not focus upon this tributary to lower Pinto Creek because our review of available data indicates that Lower Pinto Creek is meeting water quality standards for copper at this time.

4.80. Monitoring should be conducted in lower Pinto Creek below the Pinto Valley Weir to help ensure that TMDL compliance can be measured and that potential sources in the lower portion of Pinto Creek do not go undetected.

Response: Monitoring provisions are beyond the scope of the TMDL decision. EPA will forward the commenter's recommendation to ADEQ for consideration in development of the followup monitoring plan.

4.81. Are comments addressed to ADEQ also considered by EPA?

Response: Yes.

4.82. Why does the TMDL not require an implementation plan? When will an implementation plan be done?

Response: The currently applicable federal regulations do not require development of an implementation plan at the time a TMDL is adopted or established. ADEQ will determine the format, content, and timing of an implementation plan for the TMDL.

4.83. Why does the TMDL say it provides WLAs to BHP and Carlota because they contribute minimally to exceedences of water quality standards. Were the 008 outfall discharges excluded here? Why were the load allocations not referenced here?

Response: The referenced statement was focusing upon the point source discharges and was not intended to exclude the other sources. As discussed above, a WLA has been established for the 008 outfall. Load allocations have been established for the other sources known to be significant which, when combined with background and point source loads, and accounting for a margin of safety, will provide for attainment of water quality standards.

4.84. Why isn't the second phase TMDL, which would benefit from additional data collection, completed before the preliminary TMDL is issued?

Response: EPA determined that it was important to complete the TMDL now in part in order to provide the analytical framework necessary to evaluate the proposed Carlota mine NPDES permit application and evaluate the application for reissuance of the BHP permit. We made use of the best available data, information, and modeling tools in developing the TMDL and are confident that the TMDL represents an environmentally protective assessment and allocation plan. We believe this assessment will be further strengthened by additional data collection and analysis as part of the 2nd phase TMDL under development by ADEQ.

4.85. What will be done with the material removed from the Gibson mine site pursuant to the clean up activities identified in the NPDES permit? What cleanup level must be attained?

Response: This comment addresses provisions of the NPDES permit, which is beyond the scope of the TMDL. The TMDL contains no specific conditions which address the Carlota action to address the Gibson mine site since these are implementation provisions not addressed by the TMDL.

4.86. Commenter questions the reliability of data used to develop background copper loading levels and links it to the calculation of Gibson copper contributions to Pinto Creek.

Response: The background loading rate developed for the TMDL was based on the best available information. This background loading rate could be revised based on future sampling in other areas of the watershed. However, the background loading rate had a relatively insignificant effect on the load allocation for Gibson since the LA was based on a very conservative, probably worst case data assumption for loading levels from Gibson which dwarf background loads from the Mineral Creek tributary.

4.87. What facilities and ponds are located at Gibson Mine?

Response: See the ADEQ investigations of Gibson Mine issued in 1991 for details of Gibson Mine facilities. These documents are included in the administrative record for this action.

4.88. Why does Gibson Mine receive a load allocation? Is it not a point source? Would the allocations be different if it were a point source?

Response: The TMDL provides a load allocation to Gibson Mine because it is not now regulated by, and is not expected to receive, an NPDES permit. The allocation approach would have been identical if the Gibson Mine were identified as a point source.

4.89. What is the quantity and quality of discharge from Gibson adits? Is this a significant discharge? How is it referenced in the consent decree? Are EPA and ADEQ saying Gibson

Mine is to be mostly cleaned up, but not entirely? How are Gibson discharges covered between EPA/ADEQ and Carlota, and between Carlota and the Gibson owners?

Response: Existing data measuring the quality of discharges from Gibson are summarized in Table B-2, and reported in ADEQ reports on the Gibson mine found in the administrative record. Discharge quantity was not reported because flows or water volumes were not measured at the time the water quality data were collected at Gibson. We consider potential discharges from Gibson to be significant. Questions concerning the legal arrangements underlying Carlota mine's expected actions to clean up Gibson mine facilities concern NPDES permit and TMDL implementation and are beyond the scope of the TMDL. However, the fact that Carlota plans to carry out clean up actions at Gibson bolsters EPA's confidence that the load allocation for Gibson mine discharge can be implemented. The question concerning a consent decree is not clear but does not appear to address TMDL elements, so we are unable to address it.

4.90. Given the significance of the Gibson discharge, why was no new discharge data collected? The TMDL could overestimate the Gibson discharge, which could result in nonattainment of water quality standards in Pinto Creek even if Gibson is cleaned up.

Response: It was infeasible to collect additional discharge data from Gibson for this TMDL because discharges from Gibson mine appear to occur only in response to precipitation events. We made very conservative, worst case assumptions concerning Gibson's potential discharge by using the highest reported copper concentrations in the tributary downstream from Gibson to calculate the load allocations under each flow tier. If the TMDL overestimates the magnitude of the Gibson discharge, it does not mean the chances increase that the TMDL will not be met since few other significant copper sources in the watershed have been identified and verified. Instead, if the actual future Gibson mine discharges are lower than estimated for the LA, the LA would be easier to achieve (i.e., a lower percentage reduction of copper loadings from Gibson would be needed). EPA will recommend that additional monitoring should be conducted at the Gibson mine site in conjunction with the followup monitoring plan to be identified by ADEQ as part of phase 2 of the TMDL.

4.91. The commenter raises several issues concerning the possibility that Gibson mine may serve as a water source for the Carlota project.

Response: These comments do not appear to address the TMDL or its underlying analysis, so no further response is necessary.

4.92. The commenter suggests that it would be easier for the agencies and U.S. Government to decide to deny Carlota a permit or find that the conditions under which it can be permitted are insurmountable, and compensate the company.

Response: Commenter appears to be implying that the TMDL should indicate that it is infeasible to identify wasteload allocations for the Carlota project which can be met. We disagree. The

TMDL analysis found that it is possible to establish workable wasteload allocations for the mine which, when implemented along with other allocations, will result in attainment of copper standards for Pinto Creek. The other comments do not appear to address the TMDL or its underlying analysis, so no further response is necessary.

References

U.S. Environmental Protection Agency, 1985. *Ambient Water Quality Criteria for Copper - 1984*. EPA 440/5-84-031, January 1985.

U.S. Environmental Protection Agency, 1986. *Quality Criteria for Water 1986.* EPA 440/5-86-001, May 1, 1986.