Middle Fork Eel TMDL
Comment Responsiveness Summary
December 22, 2003

Commentors:

1. David Drell, The Willits Environmental Center
2. James Fenwood, Mendocino National Forest
3. Ranjit Gill, North Coast Regional Water Quality Control Board (NCRWQCB)
4. Bryan McFadin, NCRWQCB

1. David Drell, The Willits Environmental Center.

Comment 1.1: The Regional Board staff's reasoning for removing the mainstem channel of the Middle Fork Eel, especially between the Yolla-Bolly Wilderness and the Eel River Work Station downstream of Bar Creek, is not supported. As described in the Middle Fork Eel River Watershed Analysis (USFS, 1994), the increased temperature in the mainstem is a result of human-caused disturbances in the watershed, including grazing in the late 19th & early 20th centuries, and an increase in road building prior to 1955 that resulted in sediment delivery in the 1955 flood. Timber harvest was also a contributing cause to erosion, landsliding, sedimentation and loss of riparian vegetation. This human-caused disturbance exacerbated the damage from the 1964 flood. Furthermore, extensive logging and destructive grazing continued after 1964 and did not diminish until the mid to late 1980s. Watershed recovery has not yet occurred. Because of this, you must conclude that destructive grazing and logging increased the severity of watershed damage and increased temperatures in the mainstem resulting from the 1955 and 1964 storms. Thus, we recommend that the Temperature TMDL Alternative 2 be selected. This is even more critical since the adult summer steelhead only live in the mainstem during the crucial summer holding period when increased temperatures can negatively affect the fish.

Response: EPA agrees. The final TMDL selected Temperature TMDL Alternative 2. We have added some supporting text to the background section of the document.

Comment 1.2: With regard to the Sediment TMDL, we are skeptical of the US Forest Service (USFS) analysis of natural versus human-caused sediment. As a result we recommend that the more protective Alternative 2 be selected now and be revised as necessary as sediment-reducing practices including road maintenance bear fruit.

Response: EPA agrees. The sediment source analysis has been revised with USFS and NCRWQCB input, and presents an improved understanding of the current sediment delivery conditions in the basin. Sediment TMDL Alternative 2 has been selected, using the updated sediment source analysis. The NCRWQCB may consider revising the sediment source analysis in the future if more information becomes available, or if future practices result in changed

conditions.

Comment 1.3: The USFS Watershed Analysis (USFS, 1994) states (p. 41) that lack of maintenance of roads has set the stage for catastrophic road failures as a result of another 1964 flood. Such maintenance must occur now to prevent such an outcome.

Response: The NCRWQCB has indicated that they intend to include road maintenance measures in their implementation program for the basin.

2. James Fenwood, Mendocino National Forest

Comment 2.1: USFS notes that EPA and the NCRWQCB question some of the methods and results of the draft sediment source analysis (SSA) prepared by the USFS for the Middle Fork Eel River. Because standard methods were used, USFS considers the SSA to be generally sound, and the proposed methods and key assumptions were discussed and agreed upon during consultations with EPA and on some occasions the NCRWQCB. It is problematic for the methods and assumptiosn to be questioned after the investigation is complete. With respect to the results of the draft SSA, USFS appreciates the need for a technical review, and therefore welcomes comments from EPA and the NCRWQCB. USFS agrees with some of the comments and disagrees with others. We believe these issues should have been resolved between the parties and the draft SSA should have been finalized prior to the release of the draft TMDLs. We recommend several procedural changes to avoid these problems in the future, especially when EPA staff turnover is involved, as occurred during the development of the Middle Fork Eel TMDLs. These include more clearly defined and documented expectations of all parties involved in the TMDL development, time and resources commensurate with these expectations, and additional coordination among the various parties. More consistent documentation of key decisions and assumptions, adherence to these decisions and assumptions, participation in Quality Assurance/Quality Control procedures, and formal review and revision of draft SSA and other technical documents prior to their use in TMDLs are also recommended.

Response: Comment noted. EPA appreciates the assistance of the USFS and NCRWQCB in improving the sediment source analysis for the final document. EPA, NCRWQCB and USFS are jointly addressing these issues for the development of the Upper Eel River TMDLs.

Comment 2.2: USFS is concerned with the data used in the temperature modeling of the tributaries for the TMDL. It is unclear what tree plot data was obtained from the Six Rivers National Forest, but the data supplied does not agree with FIA *(sic)* plot data for the Mendocino National Forest. We are providing you data from five Forest FIA inventory plots located in riparian reserves of perennial fish bearing streams. The size of the tree plots ranged from 0.1-0.25 acres. Although the plots contained hardwoods and conifers, only conifer data is shown.

The draft TMDL recommends a forest stand in natural full growth of 48 inch dbh trees (EPA table 3, page 20). However, Forest plot data shows that there are only a few 48 inch or larger

diameter trees in riparian areas. Average diameter of trees in these plots ranged from 18 to 27 inches. Averaging the height of 48 inch diameter trees yields a height range of 115 to 156 feet. Averaging the height of a 39 inch (100 cm) diameter tree yields a tree height range of 90 to 122 feet.

Response: EPA obtained USFS GIS vegetation coverage from Jeff Jones at Six Rivers National Forest, a USFS vegetation expert. It is our understanding that this adequately represents current conditions in the basin. EPA determined that full natural growth in the basin would best be represented using 48 inch dbh trees as the maximum dominant tree height by holding discussions with Jeff Jones from the USFS, and with several staff at the NCRWQCB. We have confirmed through further communications that this is a reasonable and protective proposal on which to base the Temperature TMDL and Allocations. EPA would not expect to see trees of full growth size throughout the basin at this time, largely because the basin has not had adequate time to reach its full growth potential. It is appropriate for EPA to set the TMDL conservatively, at a level expected to attain full natural growth rather than current conditions. The model is presented as a guideline to determine the amount of shade that can be expected with full natural growth; as described in the TMDL, the model indicates that only 2-3% more shade in riparian areas will achieve this condition, which suggests that the TMDL is calling for relatively minor improvements in shade conditions. Furthermore, the NCRWQCB has indicated that it intends to implement the TMDL by preserving site-potential tree height in riparian areas; in practice, some sites may yield trees that are less than 48" dbh. The intention is to achieve full natural growth, on a site-by site basis, in order to attain natural temperature conditions. Thus, the TMDL is only requiring obtainable improvements to riparian areas in order to protect and restore water temperatures, consistent with water quality standards. A brief clarification has been added to the final TMDL.

Comment 2.3: The QUAL2E-SHADE temperature model was developed for southern Oregon Douglas fir. Growing conditions on the Mendocino National Forest are not representative of southern Oregon due to differences in rainfall amounts, rainfall distribution, and temperature. USFS believes the model over-calculated the potential tree diameter and height. In the QUAL2E-SHADE technical appendix, Figure 6 shows a 48 inch diameter tree having a height of 174 feet and a 39 inch diameter tree a height of 164 feet. Comparing forest plot data with model data, tree height was over estimated by 20 to 40 feet. Thus, the model predicted a larger diameter and taller tree than what the land is capable of growing. This is especially true on low potential growth sites, where the model over predicts by 50%.

Response: EPA acknowledges that the diameter-height relationship curve was developed using data for southern Oregon Douglas fir forests. This curve was used because it was the best and most complete data that were available to EPA. We have some concerns about the appropriateness of using the data provided by the USFS with this comment, and we have determined that the modeling results presented in the draft are preferable, given the uncertainty of the data and modeling, in order to be protective of water quality. For example, the new data covers only five plots ranging in size from 0.1-0.25 ac each. The total area of the plots is only 0.5-1.25 ac, which represents less than one hundredth of one percent of the entire basin. This

may not be adequately representative of the basin. Furthermore, while these plots presumably have not been harvested since the Northwest Forest Plan has been initiated, this only represents a decade of growth, which EPA does not consider to necessarily represent a "full growth" or late seral stage forest. It may take many decades to reach a full growth stage. Finally, the data provided include only conifers, so it is not known how the curve may change if the diameter/height relationship for hardwoods were also to change.

Despite our concerns outlined above, EPA tested the new USFS data to determine how it would affect our analysis. We developed a new diameter/height relationship using the data USFS provided, and ran the model for the current condition and full growth scenarios in the Upper Black Butte subbasin. As expected, the results showed that the trees would be shorter: under the full growth scenario, for example, the maximum tree height would be reduced by about 10 m (greater than 30 ft). With shorter trees, the amount of shade would be reduced by about the same amount for all scenarios, since the diameter/height relationship is changed by the same relative relationship. Thus, using the alternative diameter/height curve, the model predicts a similar reduction in shade, and corresponding increase in heat, for both the current condition and full growth scenarios.

For current conditions, the model predicts that six percent of the total stream miles would move from the marginal to the stressful temperature category, suggesting that, on average, current conditions may be slightly worse than originally predicted. The corresponding solar radiation would change from 109.5 ly/day to 116.6 ly/day, and shade would decrease from about 72% on average to about 70% on average.

Using the alternative diameter/height relationship for full growth conditions, the model predicts that solar radiation would change from 100.3 ly/day to 107.6 ly/day, and the corresponding shade conditions would change from about 74% to 72% using the alternative curve. Thus, using the alternative diameter/height relationship would suggest that full growth conditions would require about 2% more shade than current conditions, or an 8% reduction in heat over current conditions (from 116.6 ly/day to 107.6 ly/day). This is similar to what is predicted using the original diameter/height relationship (9% heat reduction) to determine the improvements needed to meet water quality standards. Similar results would be expected if the model were to be run for the North Fork Middle Fork subbasin, although there would be some variation, since the vegetation characteristics are slightly different (the change may be more pronounced, since the distribution of conifers is more widespread in the North Fork Middle Fork). However, since all the changes would be based on the same alternative diameter/height relationship, the changes would be relatively similar: the model would predict that current conditions are somewhat worse than originally predicted, and similar heat reductions, which would be attained by increases in shade, would be required to reach full growth conditions.

In practice, as discussed in the Response to Comment 2.2, attainment of the TMDL and water quality standards will be achieved with full growth riparian conditions on a site-by-site basis, which will vary from that predicted by the model. Given that greater confidence would be needed to use the alternative diameter/height relationship proposed by USFS, that the TMDL and

allocations as proposed in the draft TMDL would essentially result in similar improvements in shade, and that the analysis suggests that the draft TMDL is slightly more protective than the alternative of using this new data for the diameter/height relationship (i.e., the draft TMDL proposed slightly lower heat thresholds and slightly greater heat reductions for the TMDL), EPA has determined that the proposed TMDL and allocations are appropriate, and will not change them using the data provided by USFS with this comment. However, we have added discussion in the text regarding the uncertainties in the model and acknowledging that the diameter/height relationship may over-predict tree heights by over 30 ft on average.

Comment 2.4: Forest plot data shows that our growing conditions would more represent an 18 to 24 inch diameter tree. USFS recommends that this tree diameter be interpreted as "current condition" (EPA table 3). USFS also recommends that tree height be revised downward to between 55 and 88 feet.

Response: EPA has no data to support describing current conditions as 18-24 inch diameter trees; the data used to develop the TMDL shows that current conditions are slightly better, on average, than they would be if current conditions were dominated by 18-24 inch diameter trees; i.e., currently, there is more shade, and more stream miles in better temperature categories for salmonids, than there would be under 18-24 inch growth. This can be found in Table 3 of the TMDL. These data were provided by USFS. As discussed in Response to Comment 2.3, the new data provided by USFS may not adequately represent the watershed; therefore, EPA has no basis on which to change our description of current conditions. Moreover, while we acknowledge that the data used for the diameter/height relationship may inaccurately predict heights that are greater than current conditions, it is neither necessary nor appropriate to revise the discussion to show a height between 55 and 88 ft. However, we have added discussion in the text regarding the uncertainties in the model and uncertainties in the prediction of height. See also response to Comment 2.3.

Comment 2.5: Three decades of past Forest Service timber harvest records were reviewed to determine how much timber removal occurred along streamside zones. GIS plots were made using the Forest timber harvest layer and perennial streams. Since not all perennial streams have been identified on the forest, stream order 3 and larger streams were used as a proxy (assuming all order 3 streams are perennial is probably an over estimation, thus over estimating timber harvest along perennial streams.) Once the GIS layers were combined, streams adjacent to or within timber harvest units were measured for length.

USFS Data in Table 2 [attached to comment] shows that in the early decades there was timber removal by tractor or skyline logging systems along perennial streams. In the last decade under the Northwest Forest Plan, there was no timber harvest along perennial streams in the watersheds except Elk Creek. In this watershed, 1987 Mendenhall fire salvage operations carried into this decade.

The Forest agrees with the Draft report that the main stem rivers should be separated from their tributaries. For example, the Middle Fork Eel River from Dos Rios to inside the wilderness has

a wide open north-south orientation with few trees that can provide shade to the water and the Black Butte River from the confluence to Spanish Creek has a southeast-northwest orientation with little shading by conifers and broad reaches with areas of no vegetative shade. Meanwhile, the tributaries are deeply incised and have an orientation to the sun that allows more shading.

Response: Comment noted. No response required.

Comment 2.6: The Forest supports alternative 1 (current condition) for the main stem rivers of Middle Fork Eel and Black Butte River. However, the Forest does not support a temperature reduction in the tributaries. As previously discussed, these streams are at maximum shade potential and the land is not capable of growing trees of the size used in the model. We recommend that shade for these tributaries remain at current conditions.

Response: EPA disagrees. The final TMDL calls for a 9% reduction in heat for the mainstem rivers. There is no evidence to suggest that existing conditions are adequately protective of water quality, or that riparian areas have achieved full growth conditions, either in privately owned areas or on federal land under the first decade of Northwest Forest Plan implementation. Furthermore, data provided by USFS (see Comments 2.2 and 2.3) suggest that current conditions may be more degraded than EPA originally estimated. EPA is required to err on the side of protecting the resource, by providing a Margin of Safety, which will be provided in this case by requiring a heat reduction in mainstem areas (alternative 2) as well as tributaries. This is not to imply that every tree in the riparian zone will grow to a 48 inch diameter, and it certainly does not imply that heat reductions must be greater than could be achieved under natural conditions. In practice, as discussed in Response to Comment 2.2, the NCRWQCB is likely to implement the TMDL by requiring trees in the riparian areas to reach their full growth potential, as recommended in the TMDL. We have added text to the discussion in the Implementation and Monitoring Measures section to clarify this issue.

Comment 2.7: USFS recommends that EPA choose neither option proposed for the sediment TMDL. Instead, we recommend that EPA base its TMDL on USFS's revised SSA, which will be submitted in separate correspondence. Revisions to the draft SSA are based on some of EPA's and the NCRWQCB's comments and subsequent discussions regarding the draft analysis. The revisions also include final determinations of management associations for landslides originally classified "other" (a category in the draft SSA that was necessitated by a data entry error). USFS considers Alternative 1 to be particularly problematic, since it relies on data from other basins, rather than available site-specific, quantitative data from the Middle Fork Eel River watershed. Alternative 2 is also problematic because it does not include revisions to the SSA, described above.

Response: EPA agrees that utilizing revised information from the sediment source analysis (SSA) provided by USFS and the NCRWQCB improves the TMDL. We have selected Alternative 2, updating it to include revisions to the SSA, based on information and discussions with USFS and NCRWQCB.

Comment 2.8: USFS recommends that EPA and the NCRWQCB consider: 1) removing all or parts of the waterbodies associated with USFS lands in the Middle Fork Eel River watershed from the list of impaired waterbodies; or 2) require relatively minor, if any, changes in management on USFS lands as part of the TMDL Implementation Plan. This suggestion is based the following statements from the draft TMDL:

- "some of USFS lands in the Middle Fork Eel may be meeting water quality standards" (p.29)
- "some management under the Northwest Forest Plan appears to be generating little sediment above natural conditions" (p.29)
- "USFS lands will probably continue to meet TMDL limits" (p.29)
- "anecdotal information suggests that the watershed is in relatively good condition" (p.30)
- "the basin is in relatively good condition regarding its sediment load" (p.50)

Response: EPA has determined that at this time there is not adequate evidence to propose removing all or parts of the waterbodies associated with USFS lands in the Middle Fork Eel River watershed. USFS may propose such changes to the NCRWQCB during the upcoming or future 303(d) listing cycles. EPA recommends that USFS consult the NCRWQCB to provide adequate data to support taking such an action. Implementation of the TMDL is the responsibility of the NCRWQCB, who will determine what management changes may be required for USFS lands.

Comment 2.9: USFS discusses EPA concerns with the original USFS SSA in detail and provides suggestions for future SSA work.

Response: Comments noted. We have revised the text to include the updated information provided by USFS and NCRWQCB. EPA, USFS and NCRWQCB are working together to develop information for the Upper Eel River TMDLs, in order to ensure high-quality data that is available in a format that is readily usable by all parties. EPA considers USFS and NCRWQCB to be partners in development of these TMDLs.

Comment 2.10: USFS questions the need for a 25% Margin of Safety, when the Middle Fork Eel River watershed is in relatively good condition (see Comment 2.8)

Response: EPA agrees; setting the TMDL at 105% of natural loaading is adequately protective considering the low current loading.

Comment 2.11: USFS does not believe that more instream sediment data is warranted for the Middle Fork Eel River watershed (EPA 2003, p.52), especially given its relatively good condition. The cost associated with this monitoring exceeds its benefits due to extreme variability in instream parameters, large time lags between altered hillslope processes and channel response, and significant difficulty in establishing cause & effect relationships. USFS considers source assessment and remediation and hillslope monitoring to be a higher priority for scarce federal and state watershed protection and restoration funding.

Response: EPA believes that additional instream sediment data would provide stronger evidence for current conditions, including support for the relatively good condition of the watershed. However, EPA agrees that continuing improvements to hillslope condition are a greater priority in order to ensure attainment of water quality standards.

Comment 2.12: Aquatic insect production is listed as one of the proposed sediment indicators and targets, but EPT, taxa richness and percent dominant taxa are listed under the description of this indicator (p.31). If EPT, taxa richness, and % dominant taxa are the desired measures, the indicator should be referred to as "macroinvertebrate community composition." While USFS does not believe this monitoring is necessary for this watershed, if it is required, USFS proposes that its bioassessment methods, rather than those of California Department of Fish and Game (CDFG), should be used on its lands. Field and lab protocols used by USFS can be found at http://www.usu.edu/buglab/. These methods are generally consistent with those used by the EPA Environmental Monitoring and Assessment Program and results have been shown to be consistent with CDFG methods (Herbst 2003, Ode 2003). In addition, USFS suggests that multivariate approaches to bioassessment based on the presence and absence of macroinvertebrate species (e.g, River Invertebrate Prediction and Classification System, RIVPACS) could be used to analyze monitoring results.

Response: EPA agrees that "macroinvertebrate community composition" is a better descriptor for that indicator, and has changed the text to reflect this. EPA has added text to include USFS methods as an alternative to that proposed in the draft TMDL.

3. Ranjit Gill, North Coast Regional Water Quality Control Board

Comment 3.1: Staff of the NCRWQCB recommend the Middle Fork Eel River and its tributaries continue to be listed as temperature impaired water bodies under Clean Water Act Section 303(d) and a temperature TMDL be established, because: (1) adverse impacts to beneficial uses of water have occurred; (2) the cause of adverse impacts to beneficial uses is, in part, due to high stream temperatures; (3) high stream temperatures are the result of both natural and anthropogenic factors; and (4) current anthropogenic activities are, at a minimum, limiting the recovery of beneficial uses. Information and data that documents the adverse impacts and links the beneficial use impact to high stream temperatures is found in the draft TMDL and in our October 9, 2003 Memorandum. The Watershed Analysis Reports for the Middle Fork Eel River (USFS 1994) and the Black Butte River (USFS 1996) document that elevated stream temperatures are the result of both natural and anthropogenic factors. The Middle Fork Eel River Watershed Analysis Report describes sheep and cattle grazing in the late 1800s and early 1900s that damaged riparian values and the fisheries, and failed to recover decades later. The Black Butte River Watershed Analysis documents poor soil conditions that have resulted in sparse vegetation cover in some areas, and is a continuing erosion problem. Past timber harvest practices also caused many problems, including destablizing stream banks. The loss of riparian vegetation results in a direct increase in solar radiation and thus, stream temperatures. Increases in sediment load fills in pools and limits the recovery of aggraded conditions. Thermal

stratification and lower water temperatures are often lost when stream channels are aggraded and pools are filled. The Watershed Analysis Reports also describe the natural causes and processes that have resulted in elevated stream temperatures. The 1964 flood caused extensive erosion, landsliding, stream scour, channel aggradation, and the lossof riparian vegetation. It was for the most part a natural event, and the resulting temperature impairment was caused by natural processes. However, timber harvest, which started in the watershed in 1954, was one of the contributing causes of the high sedimentation. Thus, anthropogenic activities exacerbated the channel aggradation and loss of riparian vegetation that resulted from the flood. The reports also demonstrate that current anthropogenic activities are, at a minimum, limiting the recovery of beneficial uses. Damage to soil conditions from historical grazing activities continue to cause erosion today. As of 1994, unauthorized cattle grazing was negatively impacting the riparian vegetation of about five miles of the North Fork Middle Eel river. Roads on both federal and private lands are contributing to current sedimentation problem. In the Black Butte River watershed, high road densities and numbers of road and stream crossings affect riparian values, and if another flood similar to the 1964 flood were to occur, the road system would be a major source of sediments, which would destroy fish habitat and riparian vegetation.

My October 9, 2003 memorandum states that mainstem temperatures are elevated primarily by natural causes, but the Watershed Analysis Reports contradict and supercede that statement. The Watershed Analysis Reports lack detail and data needed to determine the degree to which anthropogenic activities contributed to the impairment.

Response: Comments noted. Relying largely on the NCRWQCB's and David Drell's comments, EPA has selected Temperature Alternative 2.

Comment 3.2: The NCRWQCB will likely focus implementation attention on (1) preserving, enhancing, and restoring riparian vegetation throughout the watershed, and (2) reducing sediment discharges to the Middle Fork Eel River and its tributaries.

Response: Comment noted. The Implementation Recommendations Section makes a note of this.

Comment 3.3: The State Water Resources Control Board (State Water Board) is developing a Water Quality Control policy for Guidance on Developing California's Clean Water Act Section 303(d) list. The public review draft, dated October 3, 2003, states that "if it is documented that natural conditions or processes cause a segment of a water body to be considered a water quality limited segment then the segment shall not be placed on the section 303(d) list. . . . Human-caused sources . . . can generally be ruled out where the excursions beyond objectives would occur in the absence of the human caused sources." Upon finalization of this draft policy, Regional Water Board staff will consider de-listing the Middle Fork Eel River Watershed, or portions thereof, for temperature should evidence show that the impairment would have occurred in the absence of the human caused sources (i.e. the 1964 flood would have caused the impairment and the sediment eroded, transported, and deposited by the flood were from natural sources andwere significant enough to cause the impairment in the absence of anthropogenic

sources) and that existing and threatened anthropogenic sediment discharges do not impede recovery.

Response: Comment noted. No changes to the TMDL are required. EPA notes, however, that human-caused sources of impairment do not justify de-listing, and EPA would disapprove such an action. In order to de-list a waterbody, even if it is impaired solely by natural causes, it must meet water quality standards. EPA recommends that site-specific water quality standards be developed, or the beneficial uses re-defined, for sources of impairment that are wholly natural.

4. Bryan McFadin, North Coast Regional Water Quality Control Board

Comment 4.1: NCRWQB staff revised lengths of privately-owned roads in the Round Valley (except for the floor of Round Valley, since those roads are not significant sediment contributors), Wiliams/Thatcher, and ElkCreek/Dos Rios subwatersheds. These subwatersheds are primarily privately owned. The road network thus identified were characterized as unpaved county, primary, secondary, and rarely used road categories, based on the land use associated with the road. Regional Board staff then developed estimates of sediment delivery from surface erosion of those privately owned roads, using a modified version of the surface erosion mudoule of the Washington Forest Practices Board's *Standard Methodology for Conducting Watershed Analysis* (1997). Regional Board staff surveyed eleven miles of roads to estimate hydrologic connectivity, and used the results of the road surveys, best professional judgement, and knowledge of the watershed to make assumptions about road characteristics that then were used to estimate road surface erosion volume (yd^3/mile) and mass (t/mi). The estimated rates of sediment delivery for the three subwatersheds was presented.

Road-related gullies were surveyed along 8 miles of roads, and gully volumes were estimated, to determine an estimated gully volume (yd^3/mile) and mass (t/mi) rates, which was then applied to private roads in the three subwatershed areas. The estimated rates are likely to be conservative (toward the high end of actual road-related sediment delivery from gullies). The fact that the estimate is skewed is partly ofset by the fact that some of the surveyed gullies had triggered mass wasting that could not be quantified.

Regional Board staff provided a revised sediment source analysis that combined their findings with those of USFS.

Response: EPA appreciates the improvements to the sediment source analysis that are provided by both Regional Board and USFS staff. Further consultations with staff of both agencies during the finalization of the TMDL resulted in additional revisions, improving the accuracy and utility of the sediment source analysis. These revisions are included in the final TMDL, with explanatory and supporting text.

Comment 4.2: We believe that the estimates of sediment delivery caused by stream crossing erosion and road-related landslides are low across the watershed. We believe that the sediment

delivery related to surface erosion of USFS roads, road-related gullying on USFS lands, and timber harvest on private lands is also low. We base this evaluation on experience conducting sediment source analyses in other north coast watersheds, as well as our knowledge of conditions in the MFER watershed. Verifying and/or refining these estimates will require data collection in the field. Due to the limited time available, we were unable to collect the necessary data, however we believe that field data should be collected to strengthen the analysis.

Response: Comment noted. Text consistent with this comment was added to the final TMDL. EPA believes that despite these low estimates, the Margin of Safety adequately provides for attainment of water quality standards in the watershed.

Comment 4.3: Another issue related to in-stream sediment conditions in the Round Valley sub-watershed relates to gravel levees. In Round Valley a significant length of stream reaches have had gravel levees constructed along the streambanks. These levees deliver sediment during times of high water, and are a source of water quality impairment. The issue of gravel levees and their associated impacts is not addressed in the TMDL.

Response: Comment noted. See also Response to Comment 4.2. The TMDL is based on the best available information, and provides an adequate Margin of Safety to ensure attainment of water quality standards. EPA has added text regarding this issue to the Implementation Recommendations.

References Cited

USFS. 1994. Middle Fork Eel River Watershed Analysis.