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October 5, 2007

Sonoma County Board of Supervisors
C/O Sonoma County Permit Resources and Management Department
575 Administration Drive,
Santa Rosa, California 95403

Attn.: Ken Ellison

Subject: Comment - Application (File - UPE 04-0040) from Henry Alden, Gualala Redwoods, requesting Amendments to Aggregate Resources Management Plan and ordinance revising mining standards for the mining reach of the Gualala River-zone change to add the MR combining district to the instream portion of the affected parcels; use permit to extend the permit term for an additional 10 years; Reclamation Plan update for instream operation and gravel processing site on various parcels at 39900, 40400 Annapolis Dr.

Notice: This comment is given to the Board of Supervisors and the Permit and Resource Management Department of Sonoma County. Coast Action Group requests that the information contained herein be considered, at public hearing, prior to any final decision - as part of the decision making process.

General

This a proposed project has been recommended for approval by the Planning Commission and for final approval by the Board of Supervisors. This recommendation fails to acknowledge ongoing and historic conditions extant in the Gualala River and conditions (noted in the file and existing and referenced documents) at the site of the proposed project that pose more than significant risk to the resources of the Gualala River - including properly functioning conditions necessary to support the cold water fishery - beneficial use of the Gualala River. The fact is that conditions, information, and data have not been appropriately addressed and that this information supports

the argument, or meets the “Fair Argument Standard” that the project, as assessed and mitigated, can and will likely have significant adverse effect to the Gualala River. Included in this document is discussion and reference to related facts, to be found in the file and/or are readily accessible to PRMD, that will support the argument that the proposed Negative Declaration is insufficient and proposed findings can not be supported by evidence in the file - where existing omission, inconsistency, and evidence actually supports a finding that further environmental review in the form of an EIR must occur - to comply with legal standards under CEQA.

Conditions on the Gualala River

All the evidence at hand indicates that the Gualala River (most reaches and especially the reaches proposed for mining by bar skimming) are impaired - not supporting beneficial use of the cold water fishery and are failing to meet Water Quality Standards (See Basin Plan for the North Coast) - due to excessive sediment loading and excessive temperatures due to thermal loading. The Gualala River was once a prodigious producer of salmon and steelhead. The Gualala is listed on Clean Water Act Section 303 (d) List for Water Quality Limited Segments for such impairment. The documentation for such listing and what would be considered properly functioning conditions can be found in various sources - including: North Coast Watershed Assessment Program (NCWAP), Gualala Watershed, 2002, Gualala River Total Maximum Daily Load for Sediment, USEPA, Region IX, (EPA web site) 2001, Assessment of Aquatic Conditions in the Mendocino Coast Hydrologic Unit, Regional Water Quality Control Board, Region 1, and in KRIS Gualala (also available on the web).

Nowhere in the documentation of the Negative Declaration file can be found appropriate assessment of the conditions of the Gualala River with any discussion of the impaired conditions and the relationship with proposed activity and related mitigations. This on its face is a major flaw, under CEQA, to fully describe the project and mitigate for attainment of Water Quality Standards.

Documentation in the file (including NCWAP, impaired listing data, and EPA TMDL) indicates the section of the Gualala River proposed for mining is a deposition reach which is historically impacted with many millions of tons of accrued sediment and aggregate that has been flushed down from higher elevation reaches. Acknowledgment of this condition does not necessarily mean that removal of aggregate is the answer to the problems resulting in such impaired status. With this historic inundation of aggregate and sediment the river's natural process of recovery

tries to establish a channel and bars to focus flows that represent a more natural function of bed load movement - while providing habitat for fish and other species of concern. The literature notes that mining and mining techniques by bar skimming can have serious detrimental effects to stream function, equilibrium status, fish habitat, and recovery.

Conditions and Findings of the proposed Negative Declaration

The proposed project includes a request for zoning change to Mineral Resource - combining district. Should not such a change in zoning be subject to environmental review. Discussion in the Negative Declaration fails to address issue of public access and use of the Gualala River as a recreational resources. The land owner, Gualala Redwoods, has at times restricted access by the public to the river in the area near or adjacent to mining zone. This access limitation occurred during the winter period when no mining was taking place.. Such limitations to recreational use should be part of environmental review.

In part, the mitigatory process relies on the programmatic ARM Plan and EIR (1994). This information is old and out of date - and - found to be insufficient in terms of Best Management Practices to be relied on as mitigations - according to NMFS Biologic opinion on same (this is noted in the Neg. Dec.).

Findings (and issues) in the Negative Declaration and Resolution before the Supervisors:

Existing channel of the Gualala River is adversely impacted by historic land use and does not currently support salmonids. In this case the Negative Declaration fails to note, discuss, and mitigate for temperature loading impaired condition.

NMFS biologic opinion states that ARM Plan BMPs are not the best management approach to enhance recovery of salmonids. Thus, NMFS has historically reviewed and recommended mining methods which depart from the ARM Plan standards. (See review and recommendations in Appendix).

The Negative Declaration acknowledges that the Army Corps (via the 404 permitting process) is expected to include NMFS recommendations in their permitting process. Under CEQA this is reliance on deferred mitigation. The assessment process and related mitigations should be discussed and committed up front - not after the fact through another permitting process.

Issue #1 Mining Without Permits - Staff decided to wait for Biologic Opinion on the Army Corps permit. The Corps Permit is still in process. Such related issue should be part of the total project review and must be assessed before project approval.

Issue #2 Comment Letters - Support shown by employees or others that would economically benefit from the project have no scientific bearing on the project. Evidence in the file and easily available to PRMD staff must be considered and take precedent over worker sentiment - for environmental review. There are huge gaps in environmental review undertaken to date - including failure to address impaired listing status, cold water fishery beneficial uses and conditions, the Basin Plan for the North Coast, etc... These issues, including evidence added to the file and evidence that should be considered that is already in the file, and failure to discuss all pertinent issue and to fully mitigate this project - when considered in total - all indicate the necessity for additional environmental review - EIR.

It should be pointed out to the Sonoma County decision makers that economic issue related to this project have not been correctly stated. 1) The greater percentage (almost all of) the economic benefit (wages, salaries, sales tax, etc.) related to this project will accrue to Mendocino County - as Bedrock, the operator, and its employees reside in Mendocino County. 2) The Gualala River is not the only source of gravel in the local, thus the economy and building industry are not dependent on the Gualala River as a gravel source. Bedrock owns a nearby quarry with a permit to mine substantial quantities of gravel. The location of the quarry is in Alder Creek, about 20 miles north of the Bedrock processing plant. Also, Bedrock prices their gravel at the same rate as gravel that would be hauled in from other sources (Fort Bragg, Elk, and the lower Russian River). Thus, there is no advantage for consumers to purchase from any one source. 3) There is no information in the file (or that could be found anywhere) that indicates that gravel mining by bar skimming would result in any benefits for the Gualala River.

Issue #3 Base Line - As noted in the file (Report by Matt O'Conner, etc.), it is difficult to make determinations of effects of recent mining activity as the monitoring was intermittent and the baseline cross sections were not consistently maintained. Failure to get accurate information from operation over the last 13 years is not a justification for fixing new base lines at current status. It is impossible to assess or make conclusion with such intermittent and insufficient performance in monitoring. Staff can not assess or discuss what the effects of past mining have been as the historic baseline is not dependable. There is no argument (see - NMFS biologic opinion and other docs) that the beneficial uses, the cold water fishery, are impaired - water quality standards

are not being met - and - properly functioning riverine conditions are not extant. Continued riparian and bar disturbance that would lead to thermal loading and disturb habitat conditions or impeded recovery can not be allowed to continue from disturbance associated with bar skimming activity. Additional environmental review (EIR) is needed to establish new base line protocol, monitoring regime, and mitigations for protection of beneficial uses. (see suggestions in Appendix).

Resolution Relies on Out of Date ARM Plan (1994)

The Resolution to approve the Mitigated Negative Declaration relies, to a significant extent, on the old and out of date ARM Plan. The ARM Plan was adopted utilizing mining standards that are no longer viable as supporting the beneficial uses of water and that are actually detrimental to same. The file notes that National Marine Fishery Service Biologic Opinion on the ARM Plan indicates methods and mitigations in the plan are not the best management practices. Other evidence in the file (including documents in the attached bibliography and including Recovery Strategy for California Coho Salmon, Report to the California Fish and Game Commission, 2004) indicate such methods and mitigation process need additional assessment and scientific basis as part of the decision making process. Failure to fully disclose impaired conditions and discuss operational and mitigatory processes that would address such impaired status - and - failure to address a rational and scientifically based (omission of review and response to necessary documents and potential impacts - noted in bibliography and appendix) approach to deal with site specific conditions on the Gualala and related potential impacts from proposed operations supports the fact the “Fair Argument Standard” has been met and further environmental review is needed.

The Initial Study fails to address all potential impacts related to conditions on the Gualala River. Thus, proposed mitigations are not rationally or scientifically based. There is substantial evidence in the file that indicates that all impacts have not been considered and that proposed mitigations do not fully address the issues related to potential adverse impacts. Reliance of the Army Corps 404 and/or a NMFS/Army Corps Section 7 Consultation (which has not yet occurred) for additional mitigation is not acceptable for project review and mitigation under CEQA.

Failures in Findings and Conditions

Finding - The Resolution finds that bar skimming operations at 2% slope were harmful - that such operations contribute to adversely effecting riverine properly functioning conditions in the area of the project. Assessment of conditions and mitigations to avoid such impacts have not been thoroughly investigated nor have they been made part of the project plan. This is not consistent with appropriate environmental review and other evidence in the file.

Finding - “Project will improve connectivity and provide deeper holes.” While absence of holes in area of the project and reaches of the Gualala River up and down stream of the project is noted in the file (and associated documents), there is absolutely no evidence in the project file that the project as mitigated will provide for deeper holes.

Condition - “May waive or modify monitoring standards” - Failure in ability to assess due to substandard historic monitoring standards have left assessment of this project in a precarious situation. The need to adjust proposed standards as they may not be sufficient is an admission, in part, that thorough environmental evaluation has not been completed. Further environmental review is needed to establish appropriate standards for monitoring and assessment of what might be appropriate baseline conditions.

Section 26A-09-020 to be amended to state that - “No processing operations in the flood plain zone (FEMA)”: It is appropriate that processing operations should be excluded from the flood plain zone. The historic plan design and current plan design need to be assessed to assure just where the 100 year flood plain is and operations, in reality, are not in the 100 year flood plain. This assessment, with maps and drawings, needs to be disclosed as part of the plan for public and agency review and comment - prior to project approval.

Operational Condition - "Drainage improvements shall be subject to Grading Permit": We agree. However, such permitting and related assessment and review process should be part and parcel (one package) of this project - to comply with CEQA disclosure mandates and avoid project piecemealing issue.

Pre Operational Conditions - What are the baseline standards for riparian function (this item is not appropriately considered in the Neg. Dec.) and what are the protective standards (and project conditions) for maintaining or attaining properly functioning riparian conditions. Implementation

of such standards are necessary to address temperature loading issue and other riverine function issue (and impaired status). These conditions and standards (targets) are not part of the plan assessment and review process. Instead, reliance on NMFS and Army Corps 404 permitting and Section 7 consultation and Biologic Opinion to come up with additional protective standards is assumed to be the, after the fact, bridge to the final implementation of such conditions that are needed to protect or enhance the resource. Again, this is deferred mitigation and is not consistent with CEQA mandates.

Operational Conditions - #20 - Potential adverse impacts are noted in the proposed Negative Declaration. The Negative Declaration fails to show how such adverse impacts will be mitigated to meet the following conditions listed in this section:

- c) Avoid impact to infrastructure - bridge down-cutting. (no assessment or reasonable assurance)
- d) Avoid lateral bank erosion. (erosion issue noted in the file - See O'Conner and other docs)
- e) Maintains or enhances aquatic habitat for salmonids (this in the face of failing to deal with thermal loading issue).
- f) Maintain channel structure. (improperly functioning channel conditions noted - braiding channel as a result of mining noted)
- g) Maintain riparian vegetation. (impacts to riparian are noted in the file)
- i) Not consistent with federal or state ESA (NMFS), federal Clean Water Act, Basin Plan (and Anti-degradation clause)

Standards should be set up for adaptive management on the basis of what the literature and historic data (historic cross sections) indicate. This necessarily should be a front loaded aspect of project review - in this case an EIR is need to establish appropriate base line conditions and standards.

Mining Methods - Conditions and standards for mining show an unclear nexus with the ARM Plan standards with some new or additional conditions and standards to be applied. Review and assessment on what and what should not be applied (with potential reliance on the NMFS/Army Corps process) leaves large areas of ambiguity. It is not defined as to the standards (and how such standards were determined) for vegetative retention - with related accrued benefits for armoring, filtration, habitat, and thermal loading and micro-climate control. What are the base line

standards here and how were they arrived at? Had not the base line been diminished by historic operations (evidence in the file)?

There is no in-depth disclosure, assessment, and discussion of impaired condition of the Gualala River and the relationship of mining with such conditions - including temperature loading considerations. What is the potential of mining by bar-skimming to effect riparian and instream conditions and to allow for thermal loading? How will mining by bar-skimming, as mitigated, effect project compliance with the Basin Plan and Basin Plan Anti-Degradation language? How are water temperature effects included in the proposed monitoring and mitigation regime?

Other historic and recent history documents in file

The Negative Declaration does not fully consider the historic EIR (1994) and other reports (Matt O’Conner, 2003) in the review and decision making process. The file notes that the ARM plan guidelines are not sufficient BMPs according to NMFS.

The historic EIR notes potential effects of mining by bar-skimming that include: channel degradation, reduction of bar height, destabilization of channel bank, and removal a needed armoring, alteration of stream bed geomorphology, potential to increase water surface areas to solar input (thermal loading) via loss of riparian, stream channel widening and braiding. Salmonid temperature science and data in the EIR is out of date and incorrect. (See Temperature paper - attached) Other factors noted are: removal of vegetation and LWD is an issue, removal of aggregate can cause changes in percentage of fines left in the gravel bed (high fine percentage can effect salmonid redd and egg survival), road construction and stream crossings can effect river morphology. State and EPA CWA impaired status is not noted. Notes potential for impact to fishery - but states that fish must be listed before consequence of impacts considered. This listing of coho salmon and steelhead trout has occurred - but has not been addressed in the current project documentation.

The Matt O’Conner Hydrology Report (2003) in the file notes effects of more recent activity - including: Some bank erosion, not many holes, “reasonably” stable channel, more defined channels in areas of - and attributed to vegetated bars, there may be lowering of sediment/aggregate inputs (see NCWAP findings). Interpretation of cross section plots hard to interpret due to number of varying (changing) cross section locations. Replenishment estimate of 23,000 ton per year (16,000 cy/year). This estimate is less that 50% of the yearly mining amount allowed by the current permit. Thus, this proposed permit is inconsistent with the DFG Coho Recovery rec-

ommendations for instream mining and other notable recommendations. Given that the river is impacted by excessive gravel inputs; The natural riverine process has established a form of equilibrium, including channel and bar construct, that allows for recovery. Harvesting beyond limits of recruitment can destabilize this whole process.

Thus, in whole, the current status of the river, potential from impact from mining, amount allowed for mining, and effectiveness and sufficiency of proposed mitigations are not consistent with information in the file, nor has sufficient environmental review taken place to assure minimization of noted potential impacts.

Basin Plan for the North Coast - Compliance

Not only has the review of this project failed to fully note impaired conditions on the Gualala River, compliance with elements the Basin Plan for the North Coast has not been considered.

There is no relevant discussion of impaired listing and how this project can effect temperature loading and/or how this project may effect properly functioning conditions for salmonids.

Actions, as described, for mitigation of potential water quality impacts do not meet Cal Water Code/Basin Plan and CEQA mandates - they are not consistent with the Basin Plan Anti-degradation Policy (which is amended into the Basin Plan and is enforceable):

Basin Plan Anti-degradation Policy: "Controllable water quality factors shall conform to the water quality objectives contained [in the Basin Plan]. When other factors result in the degradation of water quality beyond the levels or limits established [in the Basin Plan] as water quality objectives, then controllable factors shall not cause further degradation of water quality. Controllable water quality factors are those actions, conditions, or circumstances resulting from man's activities that may influence the quality of waters of the State and that may reasonably be controlled."

In this case :

- Temperature, Sediment, and Nutrients are pollutants for which this waterbody is listed as impaired - with flows be a major component of the problem
- Temperature and sediment pollutant inputs are controllable factors in relationship with this proposed project.

- Discharge of additional amounts of these pollutants as a result of land use practices is subject to the anti-degradation policy (the Basin Plan for the North Coast as well as State and Federal water code),
- And, in the case of a reduction in shade that would cause introduction of additional pollutant - such additional introduction of pollutants are not allowable, and must be prohibited, under the anti-degradation language.

The Anti-degradation language was added to the Basin Plan by Resolution No. R1-2004-0092.

CONSISTENCY WITH GENERAL PLAN

This project, as assessed and mitigated, is not consistent with goals and policy of the General Plan - which seeks protection of riverine and fishery resources. A General Plan consistency review should be part of additional environmental review required for this project - during the EIR phase.

Fair Argument Standard

Evidence in the record indicates there are substantial issue and impacts that have yet been considered and have yet to be resolved.

The Initial Study and proposed Negative Declaration is not complete in its assessment of the project, nor has there been full assessment and implementation of appropriate mitigatory technique and monitoring standards. The plan fails to consider all impacts. The plan fails to consider input from all experts and responsible agency (including NMFS and the Army Corps). The plan fails to address pertinent information in the file (or information this is not in the file, but should be in the file) and is not consistent with information noted in the file. These outstanding issue have been noted in the comment, above, and comment added to the file by other experts.

Outstanding, conflicting, and unresolved issue with potential adverse effects to fish and wildlife, appropriate riverine function, and to water quality values (compliance with the Basin Plan and impaired status assessment) - are all existing unresolved issue that support the contention that "Fair Argument" can be made that the project is not fully mitigated and that there are potential adverse environmental consequences. Thus an EIR must be completed.

Sincerely,
for Coast Action Group

Bibliography

Previous EIR - Gravel Mining South Fork and Wheatfield Fork, Gualala River 1994 (in file).

Hydrology Report - Assessment of Hydrologic Conditions and Gravel Recruitment, Matt O,Conner, 2003 (in file).

Recovery Strategy for California Coho Salmon, Report to the California Fish and Game Commission, 2004

North Coast Watershed Assessment Program (NCWAP), Gualala Watershed, 2002

Gualala River Total Maximum Daily Load for Sediment, USEPA, Region IX, (EPA web site) 2001

Assessment of Aquatic Conditions in the Mendocino Coast Hydrologic Unit, Regional Water Quality Control Board, Region 1

Biologic Opinion, Instream Mining in the Russian River by Shamrock Materials, Inc., National Marine Fishery Service, 2002

Upper Russian River Aggregate Resources Management Plan for Mendocino County, 1997

Fluvial Geomorphology and Gravel Mining: a guide for Planners. California Division of Mines and Geology Special Publication 98. Collins, B., and T. Dunne. 1990.

Fluvial Geomorphology and River-Gravel Mining: A Guide for Planners, Case Studies Included, California Department of Conservation - Division of Mines and Geology, 1990

Coho Salmon Considerations for Timber harvesting under the California Forest practice Rules, California Department of Forestry, 1997

Coastal Salmon Conservation: Working Guidance for Comprehensive Salmon Restoration Initiatives on the Pacific Coast, NMFS, 1996

Methods for Evaluating Stream, Riparian, and Biotic Conditions, William S. Platts, Walter F. Megahan, G Wayne Minshall, 1983

An Ecosystem Approach to Salmonid Conservation, B. Spence, G. Lomnickey, R. Hughes, R. Novitzki, for Management Technology (MANTECH), 1996

Influence of Forest and Rangeland management on Anadromous Fish Habitat in the Western United States and Canada, William R. Meehan, Technical Editor, 1. habitat Conditions of Anadromous Salmonids , D.W. Reiser and T. C. Bjornn, 1979

Note:

Above documents should be secured by the County (some of these documents are in County files) for evaluating in and near stream effects of proposed projects. These documents can be secured by calling the North Coast Regional Water Quality Control Board , 576- 2220 .

Referenced documents: ARM Plan, EPA TMDL for Gualala River, North Coast Watershed Assessment Program - Gualala, KRIS Gualala, etc.. These documents are all in possession of PRMD and/or available on the web. .

APPENDIX

Coast Action Group Paper on Temperature Impaired listing - Science and Gualala Data, Attached.

Introduction of the NMFS Biological Opinion (as part of NMFS/USACE Section 7 Consultation). on some Russian River mining by bar-skimming projects is not site specific. However, the NMFS Biological Opinion does note biologic conditions and needs of salmonids, mining effects on stream conditions and habitat - including temperature effects, and specific standards for moni-

toring pre and post operation baselines as well as in and near stream targets to be maintained, bar by bar assessment of conditions related to each bar and differing proposed extraction activity methods and mitigations based on specific needs. It should be noted that not all of the NMFS suggested targets, operational, and monitoring standards have been assessed for implementation in this project. This and the site specific nature of this plan and related monitoring indicate that further study in the form of an EIR should be part of this project. The NMFS' document shows the County has not addressed many of the key management issues.

General Impacts of instream mining on cold water habitat; as listed in the Bibliography (above) and resources in the file of this project:

Problems: Impacts of Instream Gravel Extraction

A. Effects on River Stability - Incision caused impacts

1. " Channel incision, or lowering of thalweg elevations. This reduces diversity of aquatic habitat by reducing the relative elevation change between pools and riffles."
2. " Incision or head-cutting in tributaries in response to a lower base level in the main channel."
3. "Increased bank heights, bank erosion, and channel capacity due to channel incision."
4. "Threat to infrastructure such as bridges due to incision that undermined bridge piers or supports. ... (efforts may be made by the State to recover bridge repair costs from legally responsible parties)"
5. "Exposure of clay substrate layer within or below gravel deposits due to incision may remove gravel that is a necessary component of habitat."
6. "Incision can cause a lowering of the groundwater table in the adjacent flood plain aquifer. This may effect local wells, reduce the aquifer storage and impact riparian vegetation by isolating roots above the water table."

Morphological changes caused by changes to local morphology and hydrology

7. "Local widening and flattening of the low flow channel in gravel extraction area where bar skimming occurs. This leads to braiding of the low flow channel, and increased potential for bank erosion."
8. "Downstream channel changes including reduced sediment supply to downstream bars, widening and flattening of low flow channel, and increased potential for braiding."
9. "Upstream channel changes including incision or lowering of the thalweg elevation due to head-cutting upstream of the mining area."
10. "Removal of riparian vegetation reduces habitat and may cause channel instability and increase bank erosion."
11. "Degradation of habitat from the removal of the armor layer or coarse sediment from bars and release of fine material to the channel downstream." *This impact is reduced but not eliminated.*

Flood plain skimming would result in temporary loss of riparian vegetation and the potential loss of stability. *impact not eliminated.*

B. Effects on Fishery Resources - This is a listing of the more direct impacts to fish.

1. "A reduction in salmonid spawning gravel, protective cover, food resources and deep pools if gravel is depleted at a greater rate than it is replenished."
2. "Increased proportion of fine grain sizes." *not fully mitigated*
3. "Increased siltation."
 - a. "Increased sediment input due to construction of road crossings and spur roads."
 - b. "Increased erosion and sedimentation due to ... culverts in summer road crossings."
 - c. "Settling of fine-grained sediment could occur in fish food-producing areas, thereby smothering fish food organisms, if the streamflows are not adequate to move and deposit sediments to normal depositional areas."
4. "Increased water temperatures, eroded banks, and reduced food availability, if the riparian habitat is altered and/or destroyed." *Not fully discussed - impacts not addressed.*

5. "Decreased habitat for both fish and fish food organisms, if large woody debris and/or vegetation growing on gravel bars are removed during the annual gravel bar skimming."
6. "Diminished habitat quality (reduction in pool size) and quantity, if the stream bed geomorphology is altered."
7. "Direct kill, if any fish are present in the excavation area."
8. Possibility of fish stranding in off-channel pools.
9. "Blockage of migration of salmonids ... as a result of summer road crossings."
10. *De-watering of stream channel or inadequate water depths due to water use in gravel washing and processing.*

C. Effects on Riparian Habitat - Coho salmon are dependent on riparian habitat.

1. "Bar skimming disturbs the existing riparian vegetation, providing opportunities for invasion by non-native species ..." *Mitigatable with buffer and revegetation/irradication program.*
2. "Bar skimming mechanically removes habitat at the early to mid-successional stages, interrupting the natural formation of landforms which develop habitat complexity and a diversity of age classes." *Even with a buffer the opportunity to build a higher bar and establish a more complex habitat is gone. May be unmitigatable.*
3. "Downcutting of the river channel ... can increase stream velocity and bank erosion, resulting in impacts to all habitat stages." *Mitigatable, perhaps, by limiting extraction to recruitment.*
4. Modification of the substrate within the zone of seedling establishment. "Substrate modifications of most concern are those which result in loss of gravels and exposure of the clay layer." *Largely mitigatable by extraction limitations but there still is an unavoidable change to the substrate.*

Other limiting factors effecting gravel mining in the Gualala River

Temperature Impairment:

Information in the file on temperature impairment and related effects on salmonids is insufficient. Information included in the historic documents in the file is inaccurate. Temperature measurements in the reaches of the Gualala River proposed for gravel extraction activity by bar skimming are well beyond the concern level limit and are in the approximate detrimental, if not lethal range. Bar skimming effects and related mitigations for temperature have not been appropriately considered in the proposed Neg. Dec. Please see - Clean Water Act Section 303 (d) List for Water Quality Limited Segments - and - Science and Monitoring Listing paper (attached).

III. Solutions: Mitigation for Instream Gravel Extraction

Solution 1: Cease Instream Mining

"All instream gravel mining methods effect channel stability, riparian habitat, and fish, primarily through channel destabilization, substrate modification and direct loss of riparian vegetation. The best way to reduce these impacts to channel stability and habitat is to minimize or cease instream mining."

OR - Solution 2: If mining continues, the following mitigations will reduce most, but not all, of the above mentioned impacts:

Permit mining Volume Based on Measured Annual Replenishment -This should be based on 50% or less of transport rate AND the actual replenishment at the site. "In many cases of instream gravel management, an estimate of average annual bedload transport is used to define a "safe yield" or the volume of gravel that can be safely extracted without depleting the gravel supply in the stream and causing channel changes and negative environmental effects and other impacts. This concept is not accurate in many cases, particularly on the Garcia River, where a significant volume of bedload is not available for extraction and must move through the project reach to retain equilibrium channel morphology and substrate conditions. In these cases, the actual gravel replenishment rate at a particular bar or for the entire project reach may be calculated with the sediment transport continuity equation: ... Unless the sediment trap efficiency of the extraction site is 100% (not the case with bar skimming operations), then the bedload transport rate will always exceed actual replenishment with the latter defined as the volume actually de-

posited on the extraction site." "A key concept of gravel replenishment is that it must originate from sources upstream of the project reach in order to avoid depletion of local supply. If, for example, flood conditions are hydraulically adequate to scour the low water channel and riffles, but not substantial enough to mobilize upstream sources, then gravel deposited on bars which appears as replenishment may have come from the low water channel and riffles in the immediate reach. Extraction of this gravel would cause a net depletion of gravel supply in local reach. Therefore, new gravel deposits on the bar in this case would not represent actual replenishment. **Actual replenishment** on gravel bars must come from upstream sources in order to add material to the gravel bars while maintaining gravel supplies and related environmental quality in the low water channel and riffles." Finally this method indicates a need for cross sections and a maximum limit to yearly extraction that is a fraction of bedload; "Estimates of bedload transport provide only a rough estimate of the *maximum* volume of aggregate available each year on average, and as explained above, do not account for storage effects nor year-to-year variability in flow and sediment transport. Because future flood events during the project life cannot be accurately predicted, use of bedload transport as a "safe yield" is a flawed concept. Over-extraction within one reach or within the river over an extended period without floods and replenishment can cause the greatest response and possible harm. Consequently, it is preferable to extract gravel at the **actual rate of replenishment** as measure by volumetric changes between adequately spaced topographic cross sections of the affected portions of the river, while not depleting local supplies. Therefore, the extraction rate should only be a fraction of the estimated annual bedload yield."

"It is important for the County and the Data Evaluation Team to develop a system to allocate the total estimated annual replenishment between all of the operators."

Establish an Absolute Elevation below Which No Extraction May Occur - This is known as the "redline" and it is a permanent line drawn in the gravel it does not change from year to year. "A redline elevation should be at least one foot above the low flow water surface elevation (at the edge of the bar closest to the low flow channel) during the first year following adoption of the gravel management plan..." *To be effective, this line should have some hydrologic reasoning with the intent of retaining the structure of the low flow channel and bar rather than an arbitrary low flow measurement.* "A one-foot minimum elevation as a buffer with a 4% grade toward the bank or a two-foot minimum elevation with a 2% grade is consistent with that recommended by the National Marine Fisheries Service."

Limit In-channel extraction methods to "Bar Skimming" or an Alternative Method Recommended by the Data evaluation Team

bar skimming - limited to the downstream end of the bar with a riparian buffer on both the channel and hillslope (or floodplain) side.

excavation of trenches or pools in the low flow channel - is discouraged because of associated incision, widening and braiding, and because of direct disturbance of the low flow channel substrate, it also is found to have little habitat benefit because artificially constructed pools, not associated with hydraulic factors such as large woody debris are temporary and fill in during subsequent floods.

trenching on bars - may or may not be beneficial and only for severely aggraded, flat, shallow, and braided streams with few invertebrates

Grade Slope of Excavated Bar to Prevent Fish Entrapment - 2 to 4 % depending on the height above the lowflow channel

Extract Gravel from the Downstream Portion of the Bar - "Retaining the upstream one to two thirds of the bar and riparian vegetation while excavating from the downstream third of the bar is accepted as a method to promote channel stability and protect the narrow width of the low flow channel necessary for fish."

Concentrate Activities to Minimize Disturbance and Avoid Expansion of Instream mining Activities Upstream of River - mining should be concentrated to a few, already mined bars because "skimming decreases habitat and species diversity - these effects should not be expanded over a large portion of the study area."

Sensitive Habitat Areas should be defined and identified in EIR.

Review Cumulative Effects of Gravel Extraction - "The cumulative impact of all mining proposals should be reviewed on an annual basis to determine if there are potential cumulative riverine effects and to ensure that permits are distributed in a manner that minimizes long-term impacts and inequities in permits between adjacent mining operations."

Establish a Long-term Monitoring Program

Evaluate Need for In-channel Reclamation on an Annual Basis - "Currently, in-channel re-vegetation is not recommended, provided that skimming operations follow recommendations for a 2% to 4% slope (from bank to low flow channel edge) on the downstream third of the bar without depressions that could trap fish." ... "Revegetation with native species should be planted adjacent to access roads in the riparian zone to act as a buffer and to retain fine sediment. Retention of all naturally recruited woody debris should be encouraged." *In order to mitigate impact there should be included an eradication program for non-native, invasive species.*

Minimize Activities that Release Fine Sediment to the River - "No washing, crushing, screening, stockpiling, or plant operations should occur at or below the streams 'average high water elevation'.

Retain Vegetation Buffer at Edge of Water and Against Bank - "CDFG frequently suggests a buffer of 100 feet back from the top of bank of the channel (Cox, pers. comm., 1995)." The plan also recommends a riparian buffer on the upper 1/3 to 2/3 of the bar, along the channel and the hillslope (floodplain) side.

Avoid Dry Road Crossings - "Dry road crossings disrupt the substrate and can result in direct mortality or increased predation opportunity of fry. The preferred type of crossing is the free-span seasonal bridge (Macedo, DFG 1996)." ... "Any structure placed across a river or recreationally navigable stream should be designed and installed so as to provide sufficient overhead clearance to allow unobstructed and safe passage for small recreational craft (California State Lands Commission, pers. comm., 1996)."

Limit In-channel Operations to the Period Between June 15 (July 15)* to October 15 "Gravel extraction for outside this window may interfere with salmonid incubation and migration." *The start date must be later than June 15 to avoid impact to these late spawners.*

An Annual Status and Trends Report Should be Produced by the County, the Data Evaluation Team or Agent of the County - results of monitoring, extraction volumes, recommendations for reclamation.

Maintenance flows - Establish minimum by-pass flow at mining and processing sites.