

**STATE OF CALIFORNIA  
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION**

**STAFF REPORT FOR REGULAR MEETING OF FEBRUARY 10, 2005**

Prepared on January 20, 2005

**ITEM: 4**

**SUBJECT: PROPOSED TIMBER HARVEST MONITORING AND REPORTING PROGRAM**

**SUMMARY:**

At the December 3, 2004 Regional Board meeting, staff presented a status report titled "Summary of Timber Activities and Proposed Actions". The report described the status of timber harvest activities managed through individual conditional waivers and monitoring and reporting associated with individual conditional waivers. At the conclusion of the presentation, Regional Board staff asked the Regional Board to direct staff to bring a new General Conditional Waiver of Waste Discharge Requirements and associated monitoring and reporting program for timber harvest activities for Regional Board consideration.

Prior to directing staff to return with a proposal for a new general conditional waiver, the Regional Board requested staff to evaluate monitoring and reporting requirements (MRPs) for the proposed general conditional waiver and return to the February 11, 2005 Regional Board meeting for discussion.

The current staff report proposes for Regional Board consideration:

- Regulatory and Monitoring Requirement Eligibility Criteria Decision Tool (Eligibility Criteria) – this decision tool helps determine the appropriate regulatory option and level of monitoring (Figure 1

The proposed monitoring program for the General Conditional Waiver for Timber Harvest Operations includes:

and Attachment 1) These criteria will eventually become the eligibility criteria for the different tiers of the general waiver(s) and WDRs, and the basis for tailoring individual MRPs as needed.

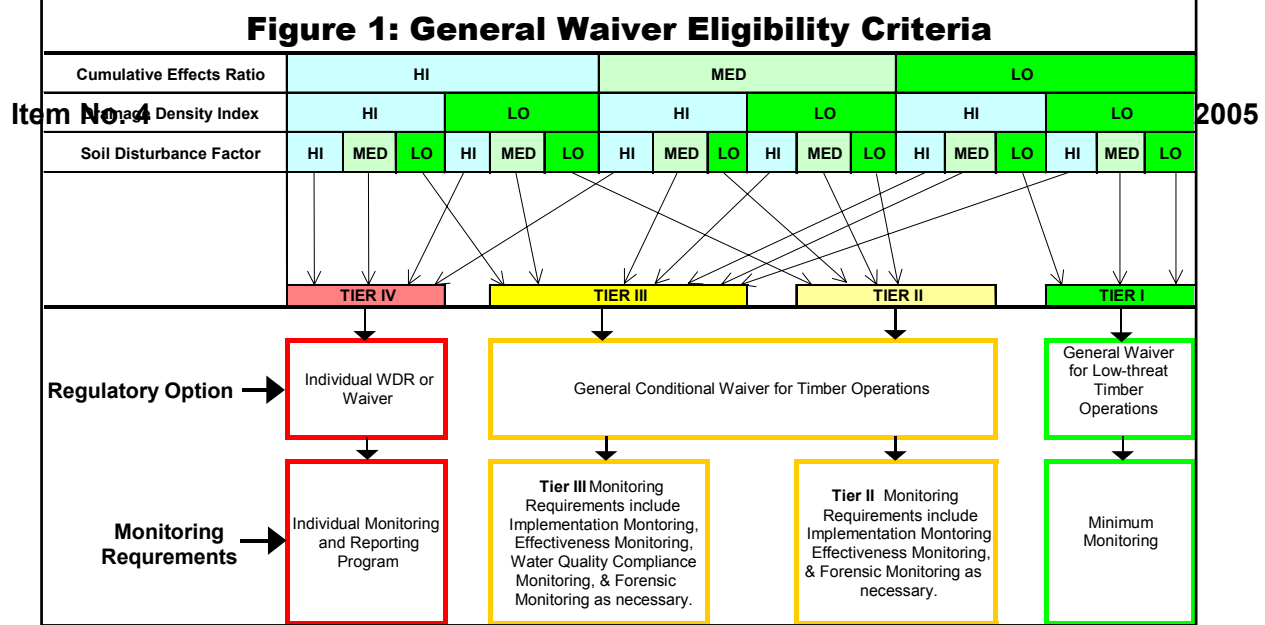
A proposed conditional waiver monitoring and reporting program (MRP) to be included with a new general conditional waiver for timber harvest activities (Attachment 2).

The proposed Eligibility Criteria allow for two regulatory options for timber harvest activities:

- a) General Conditional Waiver for Timber Harvest Operations
- b) Individual Waste Discharge Requirements for Timber Harvest Operations

The proposed conditional waiver MRP contains several levels of monitoring based on the potential threat to water quality. The proposed monitoring actions are also directed at answering specific questions.

- **Minimum Monitoring** - Under this option, compliance with the California Department of



Forestry and Fire Protection (CDF) Forest Practice Rules is required and CDF conducts Forest Practice Rules compliance monitoring.

- **Implementation/Effectiveness Monitoring** – visual monitoring to determine if management measures are installed and working as designed.
- **Forensic Monitoring** – visual response monitoring when failed management measures and/or discharges are discovered during Implementation and Effectiveness Monitoring
- **Water Quality Compliance Monitoring** - water column monitoring (e.g., turbidity analyses)

The proposed reporting program for the General Conditional Waiver for Timber Harvest Operations includes:

- a. **Logbooks**
- b. **Sediment Release Reporting**
- c. **Road Inventory Program**
- d. **Violation Reporting**
- e. **Winter Grading of Roads**
- f. **Annual Report**

Protection of water quality and associated beneficial uses is achieved through multi-faceted implementation efforts. Assessment of those efforts needs to recognize the dynamic nature of watershed monitoring, evaluate the complexity associated with the collection of appropriate data, and formulate questions to be answered with focused monitoring efforts. In the case of timber harvest activities, the overarching goal is for monitoring to demonstrate that the proposed activities comply with waiver conditions and that impacts to water quality and beneficial uses are prevented.

Staff proposes to bring a new general conditional waiver with a focused MRP for timber harvest activities to the Regional Board for consideration on May 13, 2005. The proposed general conditional waiver will be structured similarly to other general waivers and comply with Porter-Cologne sections 13269(a)(2) and 13267(b)(1). The proposed MRP will require data collection to be used to answer specific questions for the protection of water quality and beneficial uses. Staff proposes that applicants submit a notice of intent (NOI) to comply with the general conditional waiver for timber harvest activities. The NOI must include sufficient information to allow staff to determine which tier of the waiver should apply. Applicants will be required to comply with the terms of the waiver and implement management practices for the protection of water quality and beneficial uses. The general conditional waiver will include monitoring and reporting requirements to confirm compliance with waiver conditions. A general conditional waiver for timber harvest activities will reduce staff time for the processing of waivers and allow more field time for pre/post harvest inspections.

## DISCUSSION

### A. DETERMINING REGULATORY OPTIONS AND MONITORING NEEDS

At the December 3, 2004 Regional Board meeting, staff presented a status report titled “Summary of Timber Activities and Proposed Actions.” The report described the status of timber harvest activities managed through individual conditional waivers and monitoring and reporting associated with individual conditional waivers. At the

conclusion of the presentation Regional Board staff asked the Regional Board to direct staff to bring a new General Conditional Waiver of Waste Discharge Requirements and associated monitoring and reporting program for timber harvest activities for Regional Board consideration.

Prior to directing staff to return with a proposal for a new general conditional waiver, the Regional Board requested staff evaluate monitoring and reporting requirements for the proposed general conditional waiver and return to the February 10-11, 2005 Regional Board meeting for discussion.

### Using the Eligibility Criteria

During evaluation of the monitoring and reporting requirements for the proposed general conditional waiver, staff concluded there was a need to establish a protocol for determining the appropriate regulatory action for a particular timber harvest activity. Staff developed and proposes incorporating the Eligibility Criteria into the general conditional waiver or WDRs, as appropriate, to establish the appropriate regulatory option (Figure 1 and Attachment 1).

The Eligibility Criteria are a method for interpreting and ranking proposed timber harvest activities. The Eligibility Criteria guide staff selection of the appropriate regulatory option and the appropriate level of monitoring for a proposed timber harvest.

Using data available in any Timber Harvest Plan, three categories, 1) Cumulative Effects Ratio, 2) Drainage Density Index, and 3) Soil Disturbance Factor are numerically evaluated. The numeric values used for evaluation are empirically derived and rely on pre-selected thresholds that determine the outcome. As the Regional Board gathers more data from timber harvest monitoring, it may be necessary to amend the Eligibility Criteria to incorporate the growing body of knowledge of water quality impacts. Staff has evaluated 12 existing waivers using the Eligibility Criteria (Attachment 3). This evaluation has been used to help “tune” the Eligibility Criteria.

The numeric values assigned to the three categories only rank a proposed timber harvest activity and are not used to determine the absolute threat to water quality and beneficial uses such an

activity might cause. The numeric ranking is simple and allows for more consistency and objective certainty. The numeric ranking also creates a transparent process that is clear to both the regulated party and interested public. A clear and defined process is a necessary feature for regulatory action. Figure 1 provides a graphic illustration of the process and Attachment 3 shows values generated using the Eligibility Criteria for existing waivers.

### Components of the Eligibility Criteria

Described below are the three risk-based categories, 1) Cumulative Effects Ratio, 2) Drainage Density Index, and 3) Soil Disturbance Ratio used for establishing the regulatory option for a proposed Timber Harvest Plan (THP).

**Cumulative Effects Ratio (CER)** - The CER uses the Acres Harvested in the Planning Watershed (CalWater) in the last ten years (AH) plus Acres to be harvested (PA) as part of the proposed THP or Non-Industrial Timber Management Plan (NTMP), and divides this sum by the Total Acres in the Planning Watershed (TA). This produces a value, expressed as percent of watershed that has been designated for timber harvest activities. The equation is as follows:

$$((AH+PA)/TA)*100=CER$$

The CER, as a percent of watershed that has been designated for timber harvest activities, is ranked high, medium, or low. Currently, the CER is considered high when a value is greater than 15 percent (adapted from Klein, 2003). CER is considered medium when a value is between 15 percent and 10 percent. CER is considered low when a value is less than 10 percent (Attachment 1).

The Cumulative Effects Ratio accounts for the longer-term (ten-year) intensity of harvest within a watershed. Contemporary research, including that of Randy Klein, who presented his work at the June 2004 Timber Workshop, suggests there are thresholds of harvested acres beyond which additional harvesting within a watershed will generate discernable water quality effects, such as higher turbidity for longer duration.

**Drainage Density Index (DDI)** - The DDI is derived from the single most important factor

governing water quality vulnerability; the accessibility or adjacency of waterbodies to the proposed activity. The DDI is the sum of three criteria (feet of Class I watercourse times a factor of three (CI\*3), plus feet of Class II watercourse times a factor of two (CII\*2), plus feet of Class III watercourse (CIII)) divided by Acres to be harvested (PA) as part of proposed THP or NTMP. The equation is as follows:

$$((CI*3)+(CII*2)+(CIII))/PA=DDI$$

The DDI is currently considered high when the value is greater than 100. The DDI is currently considered low when the value is 100 or less (Attachment 1).

The Drainage Density Index provides a gross characterization of a Timber Harvest Plan area's vulnerability to water quality impacts. More an intuitive check on site-specific risks than a quantification of those risks, the DDI implicitly includes rainfall, slope, and geologic conditions that explain the observed density of drainages throughout the site.

Drainage density indicates how well-drained the area to be harvested is. Channel-forming processes are controlled by several factors, including: slope, which affects the velocity of rainfall runoff and, in turn, its erosive power; the erodibility of soil and rock over which water flows; elevation, which is directly correlated with rainfall quantity and intensity in the Santa Cruz Mountains; and watershed disturbance, including fire, mass wasting, and hydrologic modification by humans.

**Soil Disturbance Factor (SDF)** - The SDF is based on the scale of operations and the extent of ground-based equipment use. Several factors are used including acres harvested, timber yarding method, roads, skid trails, and landings. Within each factor there are several types of activities that are considered. For example, for roads, three activities are considered including linear feet of road (existing, proposed, permanent, etc.), number of crossings (Class I, Class II, or Class III), and In-Lieu practices in Watercourse and Lake Protection Zone (WLPZ) (Attachment 1). Lower values for this factor imply less soil disturbance during the proposed timber harvest activities.

The numeric value for the SDF is ranked high, medium, or low. Currently, the SDF is considered

high when a value is greater than 2500. SDF is considered medium when a value is between 2500 and 1000. SDF is considered low when a value is less than 1000 (Attachment 1).

The Soil Disturbance Factor is an expression of the overall intensity of timber operations conducted within a Timber Harvest Plan. For example, ground-based yarding practices are weighted more heavily than helicopter yarding, and Plans without waterbody crossings are weighted lower than those with crossings. Thus the most likely potential causes of water quality impacts are broadly characterized and the Plan's intensity can be described as one of three levels: high, medium, or low.

Once the rankings are determined for the tool categories (CER, DDI, and SDF) the regulatory action and monitoring requirements are established as shown in Attachment 1. There are two regulatory options to be considered:

**Tier I, II, and III** - General Conditional Waiver for Timber Harvest Operations

**Tier IV** - Individual Conditional Waiver or Waste Discharge Requirements for Timber Harvest Operations

For Tier I, II, and III, timber harvest activities where the threat to water quality can be controlled through the implementation of typical management measures, enrollment under the proposed General Conditional Waiver would be appropriate. As shown in Attachment 1, in addition to determining the regulatory option, the level of monitoring for proposed timber harvest activities is indicated. The monitoring levels for the proposed General Conditional Waiver are described in section B, below, titled Monitoring and Reporting Program for Proposed Conditional Waiver below.

For all other timber harvest activities that cannot be regulated under the proposed General Conditional Waiver for timber harvest operations, Tier IV, an individual conditional waiver or waste discharge requirements would be appropriate. For individual conditional waiver or waste discharge requirements, individual monitoring and reporting programs would be developed based on site-specific conditions.

Staff has determined (Attachment 4) that if proposed timber harvest plans were randomly

distributed the proposed THP's would fall into Tier's as follows:

**Tier I** - 17% would fall into Tier I and result in minimum monitoring (Proposed MRP Section IA). Under this Tier, the Regional Board requires no monitoring. However, compliance with the California Department of Forestry and Fire Protection (CDF) Forest Practice Rules is required under this regulatory option. Compliance with CDF Forest Practice Rules is required under all regulatory options.

**Tier II** - 22% would fall into Tier II result in implementation and effectiveness monitoring (Proposed MRP Sections IB and II). Forensic monitoring for these plans, proposed MRP Sections IC, would be conducted as necessary.

**Tier III** - 39% would fall into Tier III and result in implementation, effectiveness, and water quality compliance monitoring (Proposed MRP Sections IB, ID, and II). Forensic monitoring for these plans, proposed MRP Sections IC, would be conducted as necessary.

**Tier IV** - 22% would fall into Tier IV result in the development of Plan-specific MRPs through individual waivers or waste discharge requirements.

Staff knows from experience that timber harvest plans are not randomly distributed and typically fall into the central portion of this spread. Staff knows that the Eligibility Criteria, CER, or DDI cannot be modified through implementation of management measures. However, project proponents have the option to proactively manage the SDF. By reducing the level of soil disturbance (fewer watercourse crossings, fewer roads, etc.) project proponents can lower the SDF and maintain coverage under the general conditional waiver. Thus staff expects a greater percentage of actual outcomes in Tiers II and III and fewer in Tiers I and IV.

Currently Attachment 1 shows Tier II does not require water quality compliance monitoring. However, at this stage of Eligibility Criteria development, the proposed monitoring program requires water quality compliance monitoring of turbidity in all new and reworked Class I and II watercourse crossings, and temperature in Class I watercourses where timber harvest occurs in the

WLPZ, until staff has reviewed a number of individual plans and data for Tier II THP's. Staff proposes to conduct this review after 24 months of data are collected.

## **B. MONITORING AND REPORTING PROGRAM FOR PROPOSED CONDITIONAL WAIVER**

The development of waiver monitoring and reporting requirements for a general conditional waiver has been focused on the necessity and usefulness of the data collected. In March 2003, the Regional Board established guidance for waiver monitoring requirements to be considered in setting the "Bar" for Regional Board staff to use as a template when developing all future waiver-monitoring programs. The "Bar" monitoring requirements are summarized in Attachment 5. Regional Board staff considered the "Bar" in developing the current proposed monitoring and reporting program.

The monitoring issues for the General Conditional Waiver are best addressed by focused monitoring efforts. By defining what is to be documented through data collected, appropriate monitoring efforts can be directed towards answering specific questions. Defined questions also assist Regional Board staff with the selection of appropriate monitoring to evaluate impacts associated with timber harvest activities.

For timber harvest activities, the following monitoring types<sup>1</sup> may be considered relative to the questions being asked (Attachment 6 contains additional information regarding these monitoring types):

### **1. Implementation/Effectiveness Monitoring –** The questions we are trying to answer through visual implementation monitoring are:

- Are timber harvest activities being carried out as planned?
- Are management practices being implemented as designed?

The questions we are trying to answer through visual effectiveness monitoring are:

---

<sup>1</sup> Monitoring types were defined by the State Monitoring MOU Workgroup.

- Are the implemented management measures effective at achieving desired results?
2. **Forensic Monitoring** – The questions we are trying to answer through visual forensic monitoring are:
- Are significant pollutant discharges (e.g., turbidity and sediment) visually detectable?
  - Are there significant pollutant discharges resulting from timber harvest activities (e.g., failed management measures) that require timely remedial action to prevent impacts to water quality and beneficial uses?
  - Is turbidity and/or sediment being transported from the timber harvest area into waters of the state?
3. **Water Quality Compliance Monitoring** – The questions we are trying to answer through water quality compliance monitoring through in stream or grab sample collection are:
- Are timber harvest activities impacting water temperatures?
- Impact is defined as a temperature increase of more than 5°F above natural receiving water temperature. (Basin Plan, 1994).
- Although not a Basin Plan water quality objective, another temperature criteria that will be considered when evaluating data is when water temperature approaches the upper limit of 68°F creating unsuitable habitat for salmonids (Cafferata, 1990).
- Are timber harvest activities impacting water clarity?
- Impact is defined as when the down stream sample is at least 50 NTUs (Nephelometric Turbidity Units) and 20% greater than the up stream sample.
- This is an interpretation and non-scientific conversion of the Basin Plan (1994) general water quality objectives for turbidity in Jackson Turbidity Units (JTU).

The proposed monitoring and reporting program for timber harvest activities subject to conditional

waivers will include implementation, forensic, effectiveness, and water quality compliance monitoring.

The proposed monitoring and reporting program for timber harvest activities subject to conditional waivers will not include assessment or trend monitoring. The Regional Board will use the Central Coast Ambient Monitoring Program, the proposed San Lorenzo Sediment TMDL monitoring program, and the California Polytechnic Little Creek Sediment Assessment to evaluate water quality and beneficial use conditions for long-term trends.

### **I. Determining Monitoring Requirements**

The proposed MRP for the general conditional waiver (Attachment 2) contains multiple levels of monitoring (Levels A-D). The monitoring actions for each harvest will vary based on the potential threat to water quality.

**Monitoring Level A** - Monitoring level A would apply if proposed timber harvest operations would not pose significant threat to water quality.

**Monitoring Level B (Implementation and Effectiveness Monitoring)** – Monitoring level B would apply if proposed timber harvest operations typical conditions include a low level of soil disturbance and a low drainage density index.

**Monitoring Level C (Forensic monitoring)** – Would apply if at any time during Monitoring Level B (implementation and effectiveness monitoring), a failed management measure or discharge is observed, forensic monitoring shall be conducted to identify the failed management measure and/or discharge and additional management measures to address the failed management measure and/or discharge shall be implemented.

**Monitoring Level D (Water Quality Compliance Monitoring)** – Monitoring level D would apply if proposed timber harvest operations typical conditions include a medium/high level of soil disturbance and a high drainage density index.

**Monitoring level D.1** - Monitoring level D.1 would apply if proposed timber harvest operations would not pose significant threat to water quality, but there are Class I watercourses within the timber harvest

boundary and timber harvest occurs in Class I or II WLPZ.

**Monitoring level D.2** - Monitoring level D.2 would apply if proposed timber harvest operations would not pose significant threat to water quality, there are Class I or II watercourses that are within or adjacent to the timber harvest boundary, and there are newly constructed or reconstructed Class I or II watercourse crossings. If no crossings exist within a proposed timber harvest plan and the plan has activity within a Class I or II WLPZ, turbidity monitoring may be required as determined by the Regional Board Executive Officer.

If turbidity or temperature data collected under this monitoring program indicate water quality impacts, as determined by the Regional Board Executive Officer, then the source of the water quality impacts shall be investigated and managed.

## II. Reporting Requirements

For the proposed General Conditional Waiver for Timber Harvest Operations, the proposed reporting requirements include:

- a. **Logbooks** - recording visual and water column data.
- b. **Sediment Release Reporting** – Whenever at least one cubic yard of soil is released to a waterway due to anthropogenic causes or at least five cubic yards of soil is released to a waterway due to natural causes, or when turbidity is noticeably greater downstream compared to upstream (of a crossing or the Plan area), then this event shall be reported to the Board within 48 hours.
- c. **Road Inventory Program** - implement a Roads Management Program
- d. **Violation Reporting** If at any time during implementation or effectiveness monitoring, the Discharger observes a discharge, the Discharger shall notify the Regional Board within 24 hours.
- e. **Annual Report** - By November 15 of each year, an Annual Report shall be submitted to the Regional Board that addresses timber harvest activities that occurred the previous year, planned activities, violations, wet weather problems, implemented management practices, recommendations for the next year,

submittal of water quality data and photo documentation.

## III. Summary of General Conditional Waiver Monitoring for Timber Harvest Operations

Within the proposed MRP, the monitoring requirements for the proposed General Conditional Waiver for timber harvest operations include:

- **Minimum Monitoring** – Under this option, compliance with the California Department of Forestry and Fire Protection (CDF) Forest Practice Rules is required and CDF conducts Forest Practice Rules compliance monitoring.
- **Implementation/Effectiveness Monitoring** – visual monitoring to determine if management measures are installed and working as designed.
- **Forensic Monitoring** – visual response monitoring when failed management measures and/or discharges are discovered during Implementation and Effectiveness Monitoring
- **Water Quality Compliance Monitoring** - water column monitoring

Monitoring requirements for the proposed General Conditional Waiver for timber harvest operations will generate information that will enable staff to answer specific questions about the protection of water quality and beneficial uses. The proposed MRP will help provide a consistent data set between timber harvest plans and provide data that may be useful across watersheds. The proposed water quality compliance monitoring will provide Regional Board staff data to “ground truth” field observations.

## C. ADDITIONAL MONITORING INFORMATION AND ISSUES

At the December 3, 2004 Regional Board meeting there were other issues not covered in this staff report, regarding timber harvest activities and related monitoring.

1. The Regional Board asked about the development of an issue paper to discuss the need for monitoring. Issues addressed in this paper may include various types of monitoring, costs, how monitoring can be adapted to various conditions, pros and

cons of particular monitoring efforts, and a recommendation on how to proceed. Staff has not yet developed this paper.

2. Regional Board staff should evaluate the tools (statistics, models, etc) available for data interpretation. The data evaluation tools should be reviewed by experts (for example, Dr. Harris, Dr. Reid, etc.). Staff has not yet evaluated available information.
3. Staff has included the abstract (Attachment 7) Characterizing the Regulatory Environment Affecting the Forest Products Industry in California, Timber Harvest Plan Costs as reference information for Regional Board review. The study focuses on the effects of changing forest practice regulations on timber harvest planning and preparation costs.

#### D. CONCLUSION

Our authorities and responsibilities are effectively implemented through regulating specific timber harvest activities. We need to focus our limited resources (currently 0.6 personnel years per year) on implementation of management actions to control discharge. Use of a general conditional waiver and the Eligibility Criteria to establish the appropriate regulatory action and direct monitoring for a proposed timber harvest activity will improve protection of water quality and beneficial uses by making staff available for field review. As stated above, the MRP proposed for the General Conditional Waiver will help provide a more consistent data set between timber harvest plans and provide data that may be useful across watersheds. A General Conditional Waiver, in conjunction with the proposed MRP, should allow Regional Board staff time to conduct additional inspections and spend more time in the field evaluating conditions of timber operations.

Additionally, through participation and tracking of existing monitoring efforts such as the Little Creek Study, the San Lorenzo River TMDL for Sediment, the Regional Sediment Assessment Framework, and statewide monitoring initiatives, staff will be able to make progress toward the longer term goal of watershed monitoring.

#### E. RECOMMENDATION

Provide feedback to staff on the monitoring approach described in this report. Direct staff to bring a new conditional general waiver with a revised monitoring and reporting program (described herein) for timber harvest activities to the May 13, 2005 Regional Board meeting for Regional Board consideration.

#### ATTACHMENTS

1. Regulatory and Monitoring Requirement Decision Tool (Eligibility Criteria) and Spreadsheets for CER, DDI, and SDF
2. Timber Harvest Activities - monitoring and reporting program
3. Summary of Results Using Eligibility Criteria
4. Spread of Potential Outcomes Generated by the Eligibility Criteria
5. Monitoring "Bar" program
6. Monitoring types defined by the State Monitoring MOU Workgroup
7. Characterizing the Regulatory Environment Affecting the Forest Products Industry in California, Timber Harvest Plan Costs

#### REFERENCES:

1. Cafferata, Peter H., (1990) Watercourse Temperature Evaluation Guide, Department of Forestry and Fire Protection
2. Klein, Randy, (2003) Duration of Turbidity and Suspended Sediment Transport in Salmonid-Bearing Streams, North Coastal California, A Report to the US Environmental Protection Agency, Region IX. March.
3. Regional Water Quality Control Board, Central Coast (1994), Water Quality Control Plan Central Coast Region (Basin Plan) – Region