ORDER R1-2012-0087

WASTE DISCHARGE REQUIREMENTS

FOR

DISCHARGES RELATED TO GREEN DIAMOND RESOURCE COMPANY'S FOREST MANAGEMENT ACTIVITIES CONDUCTED WITHIN THE AREA COVERED BY ITS AQUATIC HABITAT CONSERVATION PLAN

IN THE

NORTH COAST REGION

HUMBOLDT AND DEL NORTE COUNTIES

TABLE OF CONTENTS

LIST OF ATTACHMENTS

I. FINDINGS

The California Regional Water Quality Control Board, North Coast Region (hereinafter Regional Water Board), *finds*:

1. On February 16, 2012, pursuant to Water Code section 13260(a), Green Diamond Resource Company (Green Diamond) submitted a draft report of waste discharge (ROWD) to the North Coast Regional Water Quality Control Board (Regional Water Board) for discharges related to its forest management activities that occur within the area covered by its Aquatic Habitat Conservation Plan (AHCP) and Master Agreement for Timber Operations (MATO). The AHCP and MATO contain management measures that minimize impacts and protect and improve water quality that the Regional Water Board intends to rely on, in part, and in conjunction with existing regulations in order

to implement Basin Plan water quality standards and restore the beneficial uses of water across Green Diamond's ownership. This approach will result in greater consistency across multiple state and federal agencies, streamline paperwork submittals, and promote landscape-based stewardship of water quality.

2. The project area covered by this Order includes all commercial timberland acreage on the west slopes of the Klamath Mountains and the Coast Range of California in Del Norte and Humboldt counties where Green Diamond owns land or harvesting rights that are covered by the AHCP. This area is currently 384,400 acres, and is subject to adjustment as Green Diamond buys and sells property. This area is located in portions of the following watersheds: Smith River, Lower Klamath River, Redwood Creek, Maple Creek, Little River, Mad River, Jacoby Creek, Freshwater Creek, Elk River, Salmon Creek, Van Duzen River and the Eel River.

3. The ROWD was deemed complete on July 26, 2012. The ROWD includes a description of the forest management activities currently conducted pursuant to the AHCP, which are subject to various state and federal regulations.

4. This Order is intended to complement Order R1-2010-0044 *Waste Discharge Requirements for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR), which together provide complete, programmatic, ownership-wide waste discharge coverage to Green Diamond for the project area.

5. Management activities to be covered by this Order are as follows:
   - **Timber Product Harvest**
     Felling and bucking timber
     Yarding timber (ground-based, cable, aerial)
     Loading and other landing operations
     Landing construction and maintenance
     Salvaging timber products
     Transporting timber and rock products
     Road construction and reconstruction[1]
     General road use[1]
     Rock pit construction and use
     Water drafting
     Equipment maintenance
   - **Silvicultural Regimes and Methods**
     Regeneration harvest (clearcut)
     Commercial thinning
     Other silvicultural methods include single tree selection, group selection, seed tree, and shelterwood

[1] This management activity may be migrated into Order R1-2010-0044, the Roads WDR, at a later date.

- **Timber Stand Regeneration and Improvement**
  Site preparation, prescribed burning, and slash treatment
  Planting
  Vegetation management (mechanical cutting and chipping, (herbicides not covered))
  Pre-commercial thinning (cutting trees, sawing or chipping rows or groups, pruning – material left on site)
- **Minor Forest Product Harvest**
  Burls, stumps, boughs, and greenery
- **In-stream and Riparian Restoration**
  Improving in-channel habitat (altering the local channel morphology by placing objects such as logs, root wads, and boulders in or adjacent to the stream channel that provide or create additional habitat complexity, structure, or cover)
  Improving riparian habitat (providing bank stability and future recruitment of wood and shade canopy to the stream)
- **Mitigation Measures**
  Management measures designed to control potential discharges and minimize impacts associated with the activities listed above

Waste Discharge Requirements

6. Water Code section 13260(a) requires that any person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the state, other than into a community sewer system, must file with the appropriate Regional Water Board a ROWD containing such information and data as may be required.

7. Under Water Code section 13263, the Regional Water Board shall prescribe requirements as to the nature of any proposed or existing discharge with relation to the receiving water conditions. Requirements shall implement any relevant Water Quality Control Plan requirements and take into consideration beneficial uses and objectives reasonably required to protect such uses, and other relevant factors.

8. This Order sets out waste discharge requirements (WDRs) for non-point source management activities described in finding 5, that have the potential to discharge wastes that affect waters of the state from only those portions of Green Diamond's ownership covered by its Aquatic Habitat Conservation Plan (AHCP). The potential water quality impacts are primarily associated with erosion, sediment delivery, and/or changes to riparian systems that may reduce shade and affect water temperatures. The Order includes conditions that prevent or minimize sediment discharges and that limit harvesting adjacent to streams.

Basin Plan

9. The beneficial uses and water quality objectives for the watersheds in the coverage area are contained in the Water Quality Control Plan for the North Coast Region (Basin Plan).

The primary beneficial uses of concern for this Order are the cold freshwater habitat (COLD), spawning, reproduction, and/or early development (SPWN), migration of aquatic organisms (MIGR), and rare, threatened, or endangered species (RARE). Green Diamond's AHCP was designed to conserve habitat for and mitigate impacts to the aquatic species that are most sensitive to elevated sediment and temperature conditions. Evidence of salmon population declines is contained in the listing of all the major species under the Endangered Species Act by the National Marine Fisheries Service and the California Endangered Species Act by the Department of Fish and Game. Salmon populations are listed by distinct population segments, or evolutionarily significant units. The listings that apply to the watersheds in the project area are as follows:

Species Common Name, *Scientific Name*	Federal Listing Status	State Listing Status
Chinook salmon, *Oncorhynchus tshawytscha*		
California Coastal evolutionarily significant unit (ESU)	Threatened	None
Southern Oregon and Northern California Coastal ESU	None	None
Upper Klamath/Trinity Rivers ESU	None	None
Coho salmon, *Oncorhynchus kisutch*		
Southern Oregon/Northern California Coast ESU	Threatened	Threatened
Steelhead, *Oncorhynchus mykiss*		
Northern California distinct population segment	Threatened	None
Klamath Mountains Province ESU	None	None
Resident rainbow trout, *Oncorhynchus mykiss*	None	None
Coastal cutthroat trout, *Oncorhynchus clarki clarki*	None	Concern
Tailed frog, *Ascaphus truei*	None	Concern
Southern torrent salamander, *Rhyacotriton variegatus*	None	Concern

10. Pursuant to the Basin Plan, the existing and potential beneficial uses of waters that could be affected by the proposed activities include:

a. Municipal and Domestic Supply (MUN)
b. Agricultural Supply (AGR)
c. Industrial Service Supply (IND)
d. Industrial Process Supply (PROC)
e. Groundwater Recharge (GWR)
f. Freshwater Replenishment (FRSH)
g. Navigation (NAV)
h. Hydropower Generation (POW)
i. Water Contact Recreation (REC-1)
j. Non-contact Water Recreation (REC-2)
k. Commercial and Sport Fishing (COMM)
l. Aquaculture (AQUA)
m. Warm Freshwater Habitat (WARM)
n. Cold Freshwater Habitat (COLD)
o. Estuarine Habitat (EST)
p. Marine Habitat (MAR)
q. Wildlife habitat (WILD)
r. Preservation of Areas of Special Biological Significance (BIOL)
s. Rare, Threatened, or Endangered Species (RARE)
t. Migration of Aquatic Organisms (MIGR)
u. Spawning, Reproduction, and/or Early Development (SPWN)
v. Shellfish Harvesting (SHELL)
w. Native American Culture (CUL)

x. Flood Peak Attenuation/Flood Water Storage (FLD)
y. Wetland Habitat (WET)
z. Water Quality Enhancement (WQE)
aa. Subsistence Fishing (FISH

The Basin Plan contains water quality objectives developed to protect the above-listed beneficial uses of water. Economic considerations were evaluated as required by law during the development of these objectives. Conditions, prohibitions, and provisions contained in this Order implement these previously developed water quality objectives. Compliance with water quality standards will protect these beneficial uses.

Total Maximum Daily Loads

11. A number of the watersheds in Green Diamond's AHCP ownership are listed as impaired on the Clean Water Act section 303(d) list:
Lower Klamath River—sediment/siltation, temperature, nutrients, dissolved oxygen
Redwood Creek—sediment/siltation, temperature
Mad River—sediment/siltation, turbidity, temperature
Jacoby Creek—sediment
Freshwater Creek—sediment/siltation
Elk River—sediment/siltation
Lower Eel River—sediment/siltation
Van Duzen River—sediment/siltation

12. Placement on the 303(d) list generally triggers development of a pollution control plan called a Total Maximum Daily Load (TMDL) for each waterbody and associated pollutant/stressor on the list. TMDLs have been established for the following hydrographic areas and pollutants on Green Diamond's ownership:
Lower Klamath River—sediment/siltation, temperature, nutrients, dissolved oxygen
Redwood Creek—sediment/siltation, temperature
Mad River—sediment/siltation, turbidity
Van Duzen River—sediment/siltation
Lower Eel River—sediment/siltation, temperature

13. The 2004 Sediment TMDL Implementation Policy (Resolution R1-2004-0087) and Temperature Policy (Resolution R1-2012-0013) provide for the control of sediment and temperature pollution by using existing permitting and enforcement tools where possible and support the combination of TMDL requirements with region-wide nonpoint source programs for efficiency and to avoid duplicative regulation. The Regional Water Board Staff Work Plan to Control Excess Sediment in Sediment-Impaired Watersheds directs staff to develop ownership-wide WDRs regionally, and specifically to develop ownership-wide WDRs for Green Diamond in those watersheds in which Green Diamond operates, as a key task to comprehensively control excess sediment. The Staff Report for the Klamath River TMDLs recognizes the Green Diamond AHCP as establishing a solid framework for Klamath River TMDL compliance because of its stringent water quality protections (Chapter 6-Implementation, 6.5.5.4).

14. Implementation measures for achieving recovery of watersheds impaired for sediment and temperature are similar for watersheds throughout the North Coast Region and include management practices, riparian buffers and inventory and cleanup of legacy sediment sites. As described in more detail below under Applicable Regulatory Programs, the AHCP, MATO and Roads WDR include these elements, as well as monitoring provisions necessary for TMDL compliance.

15. The conditions of this Order, CEQA mitigations, and the required management measures are expected to achieve TMDL load allocations and recover impaired watersheds. The Regional Water Board considers this Order to constitute TMDL implementation for the 303(d) listed and TMDL watersheds in which Green Diamond conducts covered management activities.

Elk River

16. Green Diamond owns and/or conducts timber harvesting activities on approximately 1,900 acres (15%) of the 12,442-acre South Fork Elk River watershed. Green Diamond's ownership in the South Fork Elk River watershed is located in the tributaries McCloud Creek, Tom Gulch, and Railroad Gulch. The South Fork is one of the two major tributaries of Elk River, the other being the North Fork Elk River. The Elk River is located southeast of Eureka and flows into Humboldt Bay.

17. The Elk River watershed is listed as an impaired water body under section 303(d) of the Clean Water Act due to sedimentation/siltation. Increased rate and depth of flooding due to sediment has caused impacts to spawning habitat, water supplies and other property damage in this unique and sensitive watershed.

18. Since 2006, Green Diamond has operated in the South Fork Elk River Watershed under Waste Discharge Requirements through Resolution R1-2006-0042, Order R1-2006-0043, and Monitoring and Reporting Program R1-2008-0092 (collectively, "Watershed-Wide Waste Discharge Requirements for Timber Harvesting Plan Activities Conducted by, or on Land Owned by, the Green Diamond Resource Company in the South Fork Elk River Watershed, or "*SF Elk WWDR"*).

19. Conditions specific to the Elk River in this Order rely, in large part, upon the South Fork Elk River Management Plan. Green Diamond submitted the original version of the South Fork Elk River Management Plan in May 2006. On July 26, 2012, Green Diamond submitted an updated version of its South Fork Elk River Management Plan. The South Fork Elk River Management Plan contains watershed-specific elements tailored to the uniquely sensitive geology in the South Fork Elk River.

20. Since 2006, Green Diamond has harvested a total of 340 acres in the South Fork Elk River Watershed. 152 road-related sediment discharge sites have been treated and an additional 29 road sites will be treated by 2015, completing all of the sites identified in a watershed-wide road assessment inventory. Approximately 26,602 cubic yards of sediment have been prevented from discharging due to treatment of these road sites.

21. This Order supersedes the SF Elk WWDR and incorporates its substantive conditions.

22. A TMDL for the Elk River, pursuant to Section 303(d) of the Clean Water Act, is currently under development by the Regional Water Board. The TMDL may contain timeframes or tasks that differ from those contained in the Elk River component of this Order. At such time as the TMDL is adopted, the provisions of the Elk River component of this Order and/or the South Fork Elk River Management Plan will be reviewed and adjusted, as appropriate, to ensure compliance with the TMDL.

23. The sections of this Order and the attached Monitoring and Reporting Program specific to activities in the Elk River were designed to anticipate requirements of the TMDL currently in development, provide site specific requirements for this uniquely sensitive watershed, and establish a feedback loop to ensure adequate implementation of and maximize effectiveness of management measures.

24. The South Fork Elk River Management Plan may be updated, with approval by the Regional Water Board, due to necessary changes from TMDL adoption, changes to the Basin Plan, or adaptive management.

Applicable State and Federal Regulatory Programs

25. On June 10, 2010, the Regional Water Board adopted Order R1-2010-0044, *Waste Discharge Requirements for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR). The Roads WDR provides waste discharge coverage for activities performed under Green Diamond's Road Management Plan from the AHCP. The Road Management Plan is a comprehensive program to systematically prioritize, upgrade and decommission portions of the road system, maintain a prioritized road-related sediment source inventory, implement routine maintenance and monitoring of the mainline and secondary road system, accelerate treatment of high and moderate priority sediment sources, design detailed annual work plans, and perform post-treatment compliance and effectiveness monitoring.

26. Concurrently with development of the Roads WDR, the California Department of Fish and Game (DFG) developed a Master Agreement for Timber Operations (MATO, 1600-2010-0114-R1). DFG has jurisdiction over the conservation, protection, restoration, enhancement, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species under state law including Fish and Game Code section 1600 et seq.

27. The MATO section 11.0 A contains conditions (starting on page 21) for authorized activities including watercourse crossing installation, repair, replacement, maintenance, and upgrading and activities associated with in-stream and riparian restoration projects. Conditions necessary for protection of water quality and biological resources in streams include:

    - General—conditions for construction activities at stream sites
    - New road construction—conditions for design and construction of roads
    - Upgrading—conditions for process and materials used in upgrading existing roads
    - Decommissioning—conditions for treatments of sites that will be removed
    - Erosion control—conditions to minimize erosion and prevent sediment delivery from road work activities
    - Water drafting—conditions for water extraction
    - In-stream restoration projects—procedures, oversight, and restrictions

28. The California Department of Forestry and Fire Protection (CAL FIRE) is the state agency responsible for overseeing timber harvesting activities through implementation of the Forest Practice Rules (Cal. Code Regs., tit. 14, §§895-1115.3). Non-federal landowners proposing to harvest timber are required to have an approved timber harvest plan (THP), prepared by a registered professional forester (RPF), prior to starting timber harvesting activities. Pursuant to the Forest Practice Rules (FPRs), the Regional Water Board, DFG, California Geological Survey, and other agencies are also responsible agencies that review THPs and provide recommendations to CAL FIRE as part of a "Review Team". The Regional Water Board will continue to participate as a Review Team member for individual THPs proposed by Green Diamond to ensure compliance with this Order.

29. In July 2007, Green Diamond began implementing the Aquatic Habitat Conservation Plan (AHCP) and Candidate Conservation Agreement with Assurances approved in June 2007 by the National Marine Fisheries Service and the U.S. Fish & Wildlife Service for the conservation of the following aquatic species: Chinook salmon, coho salmon, steelhead, cutthroat trout, rainbow trout, southern torrent salamander, and tailed frog. The biological goals of the AHCP are to maintain cool water temperature, minimize and mitigate human-caused sediment inputs, provide for the recruitment of large wood into all stream classifications, and allow for the maintenance or increase of populations of the covered species through minimization of timber harvest-related impacts.

30. The Operating Conservation Program is contained in section 6.2 of the AHCP and details all of the enforceable measures to be implemented as part of timber harvest operations. The elements listed below are tailored to the needs of specific hydrographic planning areas as defined and described in AHCP section 4.2.1.5. The Operating Conservation Program includes:

    - Riparian Management Measures (AHCP section 6.2.1)— buffer zone widths, canopy retention requirements, tree selection guidelines

- Slope Stability Measures (AHCP section 6.2.2)— identification of geologic features, buffer zone widths, harvest limitations, site-specific evaluations by a professional geologist
- Road Management Measures (AHCP section 6.2.3)— decommissioning and upgrading standards, landing and road construction requirements, accelerated treatment of legacy sediment sources, hydrologic disconnection standards, inspection protocol, timing protocols
- Harvest-Related Ground Disturbance Measures (AHCP section 6.2.4)— yarding restrictions, site preparation restrictions, seasonally appropriate access restrictions

31. Watercourse buffer zones under Green Diamond's Operating Conservation Program require significantly higher canopy retention than buffer zones required by the current FPRs (AHCP section 6.2.1). Additionally, where there are defined steep slopes, additional harvesting restrictions are implemented to provide another level of protection to sensitive areas (AHCP section 6.2.2).

32. The majority of legacy sources of anthropogenic sediment are associated with roads. Discharge sources located on Green Diamond's mainline and secondary road system will be covered under Order R1-2010-0044 *Waste Discharge* Requirements *for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR). The Roads WDR requires systematic treatment of road-related sediment sources across Green Diamond's ownership independent of timber harvest plans. Other legacy sediment sources, such as those located up-slope on skid trails, are less conducive to a property wide inventory due to the challenges of evaluating them across a vast acreage.

33. Non-road legacy sediment sources will be evaluated, inventoried, and addressed concurrently with timber harvest plans, under coverage of this Order. The inventories will be included in each pertinent THP and sites will be treated prior to completion of the THP.

34. The Regional Water Board relies, in part, on the MATO, applicable provisions of the FPRs, and Green Diamond's AHCP requirements that are related to protection of water quality, which are included specifically or by reference, as enforceable provisions of this Order. Collectively, these regulatory mechanisms require implementation of specific prescriptions or management practices that provide a significant level of water quality protection. This Order is intended to work in conjunction with, and to supplement, the existing regulations in order to implement Basin Plan water quality standards and restore the beneficial uses of water across Green Diamond's ownership. As such, those applicable MATO conditions, FPRs, and AHCP prescriptions that provide water quality protection are included as enforceable conditions of this Order.

35. A monitoring and reporting program (Attachment B, MRP R1-2012-0088) is necessary to assess the implementation and effectiveness of mitigation measures required under this Order and provide feedback for adaptive management. The Effectiveness

Monitoring Program (AHCP section 6.2.5) and Implementation Monitoring Measures (AHCP section 6.2.7)will give the Regional Water Board relevant feedback regarding the effectiveness of the Order in protecting and enhancing water quality across the project area. Effectiveness of the management measures contained in the Operating Conservation Plan will be evaluated in relation to the AHCP biological goals and objectives (AHCP section 6.1),which include benchmarks that correlate to the primary beneficial uses of concern and comprise water temperature, sediment, and habitat concerns. The biennial report that Green Diamond is required to submit to the Regional Water Board, National Marine Fisheries Service, and United States Fish and Wildlife Service includes information summarizing the application of and compliance with management measures and monitoring programs.

Water Quality Certification

36. In-stream restoration projects that involve construction and other work in waters of the United States may require a federal permit pursuant to section 404 of the Clean Water Act. Section 401 of the Clean Water Act (33 U.S.C. §1341) requires every applicant for a federal license or permit to provide water quality certification from the state. The Regional Water Board Executive Officer may issue a decision on a water quality certification application. (CCR, tit. 23, § 3838, subd. (b).) State water quality certification conditions shall become conditions of any federal license or permit for the project. This Order includes a general water quality certification for activities and associated discharges for in-stream restoration projects that require federal permits.

37. The Regional Water Board may issue a general water quality certification for a class or classes of activities that are the same or similar, or involve the same or similar types of discharges and possible adverse impacts to water quality if it determines that these activities are more appropriately regulated under a general certification rather than individual certifications (Cal. Code Regs., tit. 23, §3861). General certifications apply for a fixed term not to exceed five years, must be conditioned to require subsequent notice to the Regional Water Board at least 30 days prior to commencement of the activity, and include appropriate monitoring and reporting requirements. A fee is also required pursuant to California Code of Regulations, title 23, section 3833, sub.(b)(3).

38. In-stream restoration projects will be submitted with the Annual Work Plan associated with Order R1-2010-0044 and will include all of the information required for, and be in compliance with, all of the conditions referenced in the MATO, Section 11.0 A.8 (DFG Notification 1600-2010-0114-R1). Unless the Regional Water Board determines that the project or activity does not meet the specified criteria for coverage under the general water quality certification, this Order will provide Clean Water Act section 401 certification for the federal permit required for that project.

Fees and Administration

39. Pursuant to Water Code section 13260 (d)(1), Green Diamond shall submit an annual fee for this Order according to a fee schedule established by the State Water Resources Control Board (State Board).

40. For in-stream restoration projects that require water quality certification, Green Diamond shall submit the appropriate fee at least 30 days prior to commencement of the activity. Annual fee schedules are detailed in the California Code of Regulation, title 23, section 2200(a)(3).

41. Green Diamond THPs in the AHCP area submitted to the Review Team after adoption of this Order will not require enrollment under Order R1-2004-0030, General Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-federal Lands in the North Coast Region (GWDR) or Order R1-2009-0038, Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-federal Lands in the North Coast Region (Waiver). Green Diamond THPs will be reviewed by Regional Water Board staff during CAL FIRE's Review Team process for compliance with this Order. In this regard, any Green Diamond THP in the project area where water quality issues identified by Regional Water Board staff have not been resolved to the satisfaction of the Regional Water Board Executive Officer will be considered for denial of coverage under Section V of this Order.

42. Designated Regional Water Board staff will be notified of the commencement of THP activities each calendar year within a 15 day period prior to the start of timber operations.

43. Upon completion of a THP, the RPF will submit the AHCP post-harvest forms for the THP, the CAL FIRE final completion report, and a final certification notice to certify completion and compliance of the THP with this Order. The Regional Water Board will review the certification and may schedule a field inspection to verify conformance of the THP with this Order. The RPF will be notified in writing regarding approval or disapproval of the certification.

44. In considering this Order under the California Environmental Quality Act (CEQA), the Regional Water Board used the Environmental Impact Statement (EIS) issued by the U.S. Fish & Wildlife Service and National Marine Fisheries Service for the AHCP. When a project requires compliance with both CEQA and the National Environmental Policy Act (NEPA), and the federal EIS is prepared first and meets the requirements of CEQA, CEQA provides that the state agency should use the EIS rather than preparing a separate EIR or negative declaration, pursuant to California Code of Regulations, title 14, section 15221. On August 1, 2012, the Regional Water Board circulated a Notice of Intent and letter that added any points of analysis not covered in the EIS but required under CEQA. In that Notice and letter, the Regional Water Board provided public notice of the availability of the EIS and its intent to rely on the federal document. The EIS and supplemental letter were completed in compliance with CEQA, and reflect the Regional

Water Board's independent judgment and analysis. The Regional Water Board has reviewed this information and has considered this along with all the other information in the record prior to making its decision to issue this Order. In addition, potential environmental effects associated with the project were also analyzed under CEQA in the Initial Study/Mitigated Negative Declaration (IS/MND) prepared by the California Department of Fish and Game for the MATO and Roads WDR. The Regional Water Board has reviewed and considered the IS/MND as responsible agency prior to taking action on the Order. (Cal. Code Regs., tit. 14, § 15162.) The Regional Water Board adopts the CEQA findings required under Public Resources Code section 21081 as detailed in Appendix E. Mitigation measures necessary to reduce or eliminate significant water quality impacts are included as conditions of approval in the Order section below.

THEREFORE, pursuant to Water Code section 13263, the Regional Water Board approves and adopts Order R1-2012-0087, and directs the Executive Officer to file all appropriate notices. Green Diamond shall comply with the following:

II. SPECIFIC CONDITIONS

A. Timber Harvesting Plan Review
Individual timber harvesting plans will be reviewed as part of CAL FIRE's Review Team (FPR 1037.5) to confirm compliance with this Order. Participation, as deemed necessary, in First Review, pre-harvest inspections, and Second Review will provide the opportunity for representatives of the Regional Water Board to make any necessary site-specific water quality recommendations to ensure compliance with this Order, and for any subsequent changes to the THP to be made prior to CAL FIRE approval. If the THP is approved by CAL FIRE with no non-concurrences and all water quality issues identified by Regional Water Board staff have been resolved to the satisfaction of the Regional Water Board Executive Officer, then the THP shall be considered in conformance with the conditions of this WDR.

B. Notification of Commencement of Timber Harvesting Plan Activities
Each calendar year, within a 15 day period before beginning timber operations, and not later than the day of the start of timber operations, the Regional Water Board shall be notified of the actual commencement date for the start of operations for each THP. The notification shall be directed to the designated personnel at the Regional Water Board by telephone or by electronic mail.

C. Timber Harvest Plan Completion and Certification of Compliance
Upon completion of a THP, the RPF shall submit the AHCP post-harvest forms for the THP, the CAL FIRE final completion report, and a final certification notice to certify completion and compliance of the THP with this WDR. The Regional Water Board shall review the certification and may schedule a field inspection to verify conformance of the THP with this WDR. The RPF shall be notified in writing (including email) regarding approval or disapproval of the certification.

D. Green Diamond Aquatic Habitat Conservation Plan
Except for discharges described in Condition E below, this WDR provides waste discharge coverage for discharges from Green Diamond's forest management activities described in finding 5 carried out under the AHCP. All applicable mitigation measures identified in the Operating Conservation Program (AHCP Section 6.2) are requirements under this Order, including those identified in finding 30.

E. Treatment of Road Related Sediment Sources
Discharge sources located on Green Diamond's mainline and secondary road system are covered under Order R1-2010-0044 *Waste Discharge* Requirements *for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR).

F. Treatment of Other (Non-road Related) Sediment Sources
Other controllable sediment discharge sources, e.g. failing skid trail crossings and watercourse diversions within timber harvest units, will be evaluated, inventoried, and addressed concurrently with THPs. The inventory shall be included in the THP and shall include the following information:

1. A description of the proposed activity, including the type and scope of work.
2. Whether the proposed activity will occur on a Class I, II, III, or IV watercourse or restorable fish-bearing stream.
3. An estimate of the potential sediment volume that could discharge if left untreated.
4. An estimate of the relative potential for sediment delivery.
5. A description of the current site condition.
6. Where warranted, construction drawings, diagrams or sketches, cross sections with dimensions, or other information.

G. In-stream and Riparian Restoration
All applicable mitigation measures identified in the MATO are requirements under this Order, including those identified in finding 27. In-stream restoration projects shall be identified and reviewed via the Annual Work Plan associated with the Roads WDR (Order R1-2010-0044) and shall comply with all of the conditions referenced in the MATO, Section 11.0 A.8 (DFG Notification 1600-2010-0114-R1).

H. Discharge Notifications
Should it be determined by Green Diamond or the Regional Water Board that a discharge is causing or contributing to an exceedence of a water quality standard or violation of an applicable water quality requirement, Green Diamond shall:

Implement corrective measures immediately following discovery and notify the Regional Water Board by telephone or email as soon as possible, but no later

than 48 hours after the discharge was discovered. This notification shall be followed by a report within 14 days that includes:

- The date the exceedence or violation was discovered
- The name and title of the person discovering the exceedence or violation
- A map showing the location of the exceedence or violation site
- A description of recent weather conditions prior to discovering the exceedence or violation
- The nature and cause of the exceedence or violation
- Photos of the site characterizing the exceedence or violation
- The management measures currently being implemented
- Any maintenance or repair of management measures
- Any additional management measures that will be implemented to prevent or minimize discharges that are causing the exceedence or violation
- An implementation schedule for corrective actions
- The signature of the person preparing the report

Compliance with the required technical reports and the implementation of required corrective measures shall not prevent the Regional Water Board from taking enforcement action under any other requirements of this Order.

I. Green Diamond shall comply with the Monitoring and Reporting Program R1-2012-0088 attached to this Order.

III. SPECIFIC CONDITIONS FOR THE SOUTH FORK ELK RIVER WATERSHED

The following conditions apply to lands where Green Diamond owns and/or conducts timber harvesting activities in the South Fork Elk River watershed.

A. South Fork Elk River Management Plan
All THPs in the South Fork Elk River must adhere to Green Diamond's South Fork Elk River Management Plan, included as Attachment C to this Order.

B. South Fork Elk River Sediment Reduction Plan

1. Green Diamond shall maintain a master inventory of all sediment discharge sites deemed feasible to treat, including road-related sites both associated with THPs and not associated with THPs, non-road related sites associated with THPs (i.e. skid trail crossings), and non-road related sites not associated with THPs. The inventory shall include a site identification number, the location shown on a scaled map, the volume of sediment to be treated, treatment priority, and the proposed treatment. Upon completion of all the sites from the master inventory, maintenance of the master inventory will not be required.

2. All road related sites from the master inventory and all non-road related sites associated with THPs shall be treated by 2015.

3. All controllable non-road related sites not associated with THPs shall be inventoried by 2015 and treated by 2018.

4. Annual proposed treatments of sites from the master inventory shall be submitted via the Annual Work Plan for the Roads WDR (Order R1-2010-0044).

5. Upon completion of all sites from the master inventory, inventory and treatment of any new road related sediment sources in the South Fork Elk River Watershed shall be conducted pursuant to Green Diamond's Routine Road Maintenance Program and the Roads WDR (Order R1-2010-0044).

IV. GENERAL CONDITIONS

A. Discharge Prohibitions

1. The discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

2. The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities which could be deleterious to fish, wildlife, or other beneficial uses is prohibited.

3. Discharges of waste, which are not otherwise authorized by waste discharge requirements, or other orders issued by the Regional Water Board or the State Water Resources Control Board, to waters of the state in violation of Basin Plan standards, are prohibited.

4. Discharges must not cause or threaten to cause pollution, contamination, or nuisance.

5. Discharges must not adversely impact human health or the environment or the beneficial uses of water set out by the Basin Plan.

6. Discharges of waste in the Klamath River Basin that violate any narrative or numeric water quality objective, that are not authorized by waste discharge requirements or other order or action by the Regional Water Board or State Water Resources Control Board, are prohibited.

B. If any dispute arises regarding implementation of this Order, Green Diamond and Regional Water Board staff will attempt to resolve it through field examination and discussion.

C. Green Diamond must comply with all applicable mitigation measures identified in Attachment E of this Order (CEQA findings). Notwithstanding general condition B above, above, compliance with these mitigation measures and all other conditions are requirements under this Order, and violation of any such requirements subjects Green Diamond to enforcement action, including civil liability, under the Water Code.

D. Green Diamond shall comply with any additional mitigation measures identified and required pursuant to the CAL FIRE CEQA-equivalent process.

E. Green Diamond must allow Regional Water Board staff entry onto the affected property, with reasonable notice, for the purpose of observing, inspecting, photographing, videotaping, measuring, and/or collecting samples or other monitoring information to document compliance or non-compliance with this Order.

F. Green Diamond must allow Regional Water Board staff access to copy, at reasonable times, any records that must be kept under the conditions of this Order.

G. All activities covered by this Order must comply with local, state, and federal law.

H. No discharge of waste into the waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue to discharge. All discharges of waste into waters of the state are privileges, not rights (Water Code, section 13262, subd. (g)).

I. Prior to implementing any change to the project or activity that may have a significant or material effect on the findings, conclusions, or conditions of this Order, Green Diamond must obtain the written approval of the Regional Water Board Executive Officer.

J. In the event of unforeseen circumstances such as fire, wind, earthquake, flood, pest or pathogen infestation, or landslides of a scale not reasonably foreseeable, Green Diamond shall initiate a meeting with the Executive Officer to discuss potential changes to the conditions of this WDR.

K. The Regional Water Board may add to or modify the conditions of this Order, with notice and as appropriate, to implement any new or revised water quality standards and implementation plans adopted and approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.

L. This Order may be modified, revoked and reissued, or terminated for cause. Significant changes to the AHCP or MATO which influence this Order, affect compliance with the conditions of this Order, or contribute to a violation or exceedence of applicable water quality requirements should receive written approval from the Regional Water Board Executive Officer to avoid the possible need to reopen this Order.

V. RESCISSION AND DENIAL OF COVERAGE

The Executive Officer shall rescind or deny the applicability of this Order to any individual project or activity if the Executive Officer makes any of the following determinations:

1. The project or activity does not comply with any condition or provision of this Order.
2. The project or activity is reasonably likely to result or has resulted in a violation or exceedence of any applicable water quality requirement.
3. The project or activity has varied in whole or in any part from the approved project in any way that could adversely affect water quality.
4. When requested by Green Diamond, another state agency (upon a demonstration that the project or activity would cause an exceedence of water quality standards or otherwise violate this Order), a subdivision of the state (county), or a federal agency, and with concurrence by the Executive Officer.
5. The project or activity is the subject of an unresolved non-concurrence filed by Regional Board staff with CAL FIRE.
6. The project or activity meets the WDR terms, but may still result in discharge that could affect the quality of waters of the state.

Upon receipt of a written notice of rescission or denial of coverage for a project or activity under this Order, the applicability of this Order to the covered project or activity is immediately terminated. Upon termination, Green Diamond must immediately cease all activities that may result in un-permitted discharges of waste to waters of the state, other than activities necessary to control further discharges.

VI. 401 CERTIFICATION FOR IN-STREAM RESTORATION PROJECTS

IT IS HEREBY ORDERED, THE REGIONAL WATER BOARD CERTIFIES THAT in-stream restoration projects in compliance with the conditions of this order will comply with sections 301, 302, 303, 306, and 307 of the Clean Water Act, and with applicable provisions of state law, subject to the following additional terms and conditions:

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and title 23, California Code of Regulations, section 3867.

2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to title 23, California Code of Regulations, section 3855, subdivision (b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. Certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, section 3833, subdivision (b)(3). Annual Fee Schedules are detailed in the California Code of Regulation, title 23, section 2200.

4. This general certification applies only to in-stream restoration projects subject to this Order.

5. Green Diamond shall notify the Regional Water Board, at least 30 days prior to commencement of the activity, and submit information regarding the construction schedule, other relevant information, and the appropriate fee. The Regional Water Board will notify Green Diamond within 30 days if the project or activity does not meet the specified criteria for coverage.

6. The authorization of this certification for any dredge and fill activities expires five (5) years from the date the activity commences.

7. Any relevant conditions of this Order are enforceable conditions of this general water quality certification.

8. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under state law. For purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

9. The general water quality certification portion of this Order may be modified as needed by the Executive Officer of the Regional Water Board.

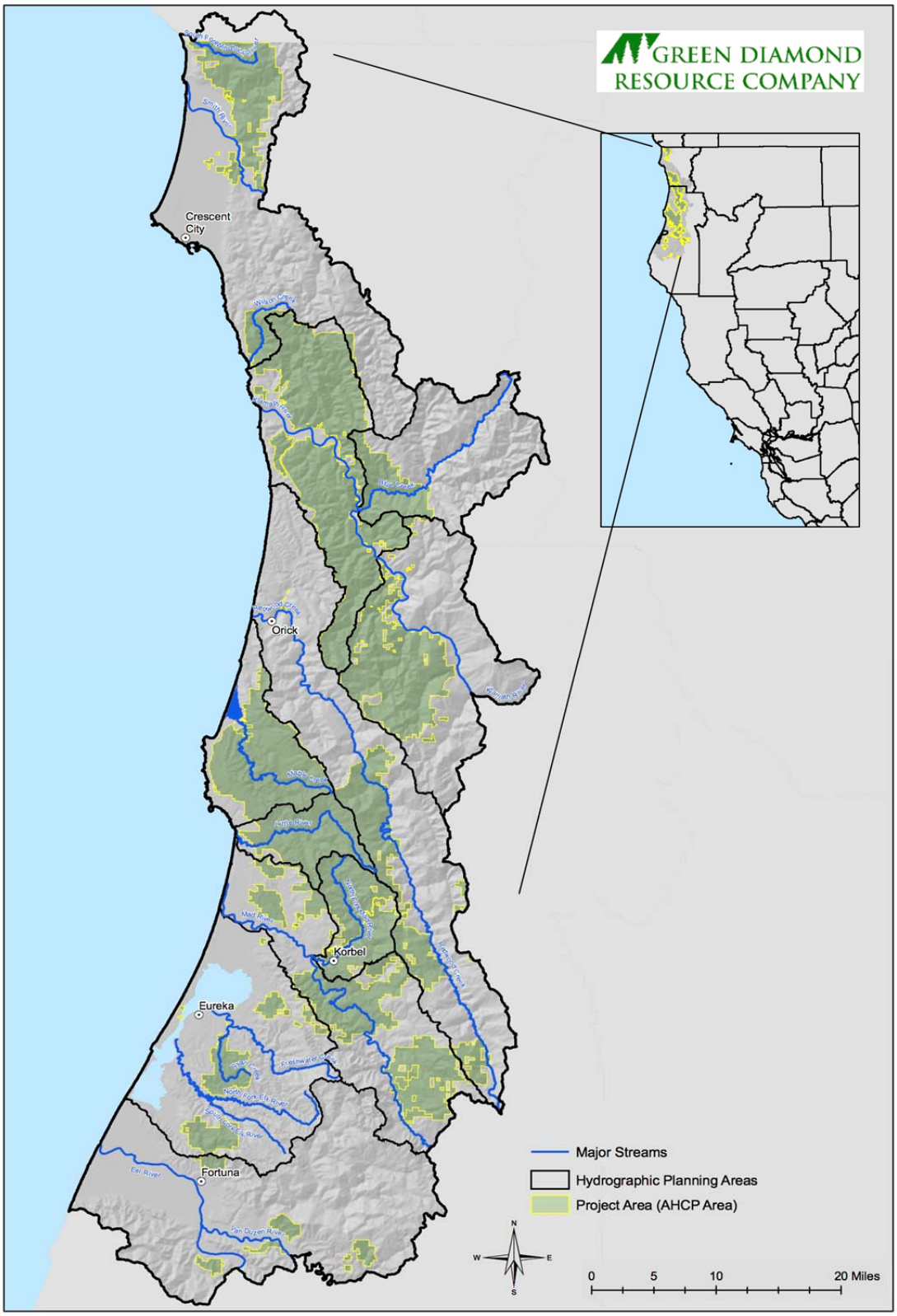
Certification:

I, Matthias St. John, Executive Officer do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on October 4, 2012.

_____

Matthias St. John
Executive Officer

ATTACHMENT A



Attachment B

MONITORING AND REPORTING PROGRAM R1-2012-0088

FOR

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES RELATED TO GREEN DIAMOND RESOURCE COMPANY'S FOREST MANAGEMENT ACTIVITIES CONDUCTED WITHIN THE AREA COVERED BY ITS AQUATIC HABITAT CONSERVATION PLAN
IN THE
NORTH COAST REGION

HUMBOLDT AND DEL NORTE COUNTIES

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code section 13267(b) and requires Green Diamond Resource Company (Green Diamond) to implement the MRP described below. The purpose of the MRP is to ensure that Green Diamond complies with waste discharge requirements established by Order R1-2012-0087 (the Order), to track activities covered under the Order, and to evaluate the effectiveness of the Order in protecting and restoring the beneficial uses of water.

The Regional Water Board has delegated its authority to the Executive Officer to revise, modify, and reissue the MRP. Green Diamond must develop and implement additional monitoring and reporting requirements when the necessity of such measures is supported by evidence and the measures are described in writing by the Executive Officer.

I. MONITORING

A. Roads
Monitoring of Green Diamond's road system will occur pursuant to Order R1-2010-0044, *Waste Discharge Requirements for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR)

B. Non-road Sediment Sources
Non-road controllable sediment discharge sources, e.g. failing skid trail crossings and watercourse diversions within timber harvest units, shall be inspected twice after treatment to evaluate the implementation and effectiveness of the completed treatment. One inspection shall occur prior to the winter period, and once following a full winter. If the site has stabilized and there is no reasonable potential for waste discharge in violation of the Basin Plan, no further monitoring of the site will be required.

If any minor maintenance issue, such as debris plugging or damage to waterbreaks, is identified following treatment, maintenance shall be conducted as soon as feasible prior to the next winter period.

If a major maintenance issue, such as fill failure resulting in significant sediment delivery or watercourse diversion, major maintenance shall be conducted as soon as feasible prior to the next winter period and the site shall be monitored for an additional year, once prior to the winter period, and once following a full winter.

C. Effectiveness Monitoring

The Effectiveness Monitoring component of Green Diamond's Aquatic Habitat Conservation Plan (AHCP) evaluates the success of the conservation program in achieving the biological goals and objectives of the AHCP. Over time, better ways to manage watersheds that may further benefit aquatic species and their habitats may emerge. The Effectiveness Monitoring and Adaptive Management programs were developed to incorporate new information into practice as it becomes available. The Effectiveness Monitoring measures are also expected to give the Regional Water Board relevant feedback regarding the effectiveness of the Order in protecting water quality. Current Effectiveness Monitoring measures include:

1. Rapid Response Monitoring

   Provides early warning signals to ensure that the biological goals and objectives of the AHCP will be met.
   - Annual property-wide water temperature monitoring in Class I and Class II watercourses
   - Paired water temperature monitoring on Class II watercourses
   - Tailed frog monitoring
   - Southern torrent salamander monitoring
   - Implementation and effectiveness monitoring of road management measures
   - Road maintenance assessments

2. Response Monitoring

   Monitors the effectiveness of the conservation measures in achieving the biological goals and objectives of the AHCP.
   - Class I channel monitoring
   - Class III sediment monitoring

3. Long-term Trend Monitoring/Research

   Have the potential to provide feedback for adaptive management, but in some circumstances, decades may be required before that can occur.
   - Steep streamside slope delineation study
   - Steep streamside slope assessment
   - Mass wasting assessment
   - Long-term habitat assessments
   - Large woody debris monitoring
   - Summer juvenile population estimates

- Out-migrant trapping
- Turbidity threshold sampling

4. Experimental Watersheds Program
   Four watersheds, judged to be representative of the different geologic and physiographic provinces across the AHCP area were designated for additional monitoring and research on the interactions between forestry management and riparian and aquatic ecosystems.
   - Little River (Little River Hydrographic Planning Area (HPA))
   - South Fork Winchuck River (Smith River HPA)
   - Ryan Creek (Humboldt Bay HPA)
   - Ah Pah Creek (Coastal Klamath HPA)

D. Monitoring Specific to the Elk River
   Monitoring efforts specific to the Elk River watershed are intended to evaluate the effectiveness of the Order in protecting water quality and in moving the watershed toward recovery from cumulative impacts.

   1. Master Inventory
      All sediment sources under the master inventory shall be inspected after treatment, once prior to the winter period (October 16) and once following the winter period (after May 14) to ensure that all prescribed management measures have been implemented, are functioning as designed, and that no new sediment sources have developed.

   2. Road Related Sites after Completion of Master Inventory Treatments
      Upon completion of all sites from the master inventory, inventory and treatment of any new road related sediment sources in the South Fork Elk River watershed shall be conducted pursuant to Green Diamond's Routine Road Maintenance Program (AHCP 6.2.3.9) and the Roads WDR (Order R1-2010-0044).

   3. South Fork Elk River Sediment Reduction Effectiveness Monitoring
      The purpose of the South Fork Elk River Sediment Reduction Effectiveness Monitoring plan is to quantify sediment delivery and effectiveness at treated sites and provide feedback to refine sediment control measures in the Elk River.

      a. Parameters to be measured, before and after the first winter period after treatment
         - Visual Observations
         - Photographic control points
         - Void volumes
         - Longitudinal profiles

      b. Locations
         Monitoring shall be conducted at a representative sample of treated sites, from both simple and complicated categories of treatment. Once treatment of

sites from the master inventory has been completed, this monitoring effort shall continue for a subset of sites treated in the Elk River through the Routine Road Maintenance program.

4. Landslide Monitoring
   The purpose of landslide monitoring is to determine if there are changes to the landslide pattern and delivery rate in the Elk River in response to land management activities and to identify new landslides that occur in the years between analyses.

   a. The landslide inventory shall include the following:
      - Unique identifier code
      - Primary watershed name
      - Sub-basin name
      - Aerial photo year number and scale
      - Feature type
      - Reactivation status
      - Landslide dimensions and volume
      - Delivery percentage, volume, and certainty
      - Watercourse class affected
      - Aspect of hillslope
      - Geomorphic association (i.e. inner gorge, headwall swale, planar slope, break in slope, vertical and horizontal/convex and concave slope, other unstable areas, etc.)
      - Hillslope angle
      - Proximity to watercourse
      - Land use history at point of initiation, upslope, and downslope (including harvesting and roading)
      - Field visit status
      - Stand age class at time of failure (under or over 15 years)
      - Geologic unit
      - Field observation notes

   b. Location
      All Green Diamond lands in the South Fork Elk River watershed shall be inventoried.

   c. Method
      Aerial photo review shall be coupled with a subsample of field inventories to locate and map landslide features. At a minimum, the landslide inventory shall occur every 3-5 years, subject to the availability of aerial photos.

5. Water Quality Trend Monitoring

   a. Parameters to be measured
      - Stage (m or feet)

- Velocity (m/sec or ft/sec)
- Streamflow (m^3/sec or ft^3/sec)
- Turbidity (NTU)
- Suspended sediment concentration (mg/L)

b. Location
The water quality monitoring station is located in McCloud Creek, tributary to South Fork Elk River. The station is situated on Humboldt Redwood Company property approximately 400 feet upstream of the confluence with South Fork Elk River and 2,200 feet downstream of Green Diamond's property.

c. Frequency
Turbidity and stage will be measured simultaneously at 10-minute increments. Streamflow shall be measured at an interval to ensure that a wide range of all flows is measured and incorporated into the stage-streamflow relationships at the monitoring locations.

Sampling shall begin no later than October 1 annually. The monitoring shall continue each year until there has been a period of 30 continuous days of no rain, at least until May 15. If these conditions are not met, then turbidity monitoring may cease on June 30 for the remainder of the dry season.

d. Analysis
Informational items related to streamflow, turbidity, and suspended sediment concentration shall be developed by Green Diamond according to hydrologic year, including rating curves for stage-streamflow, field turbidity-lab turbidity, streamflow-turbidity, and turbidity-suspended sediment relationships. These relationships shall be used to develop "finalized data" which represent stage, lab turbidity, and streamflow.

II. REPORTING

A. Annual THP Summary
By June 30 of every year, an annual summary for each THP currently being covered by this Order shall be submitted by the RPF. The annual summary shall, at a minimum, contain the following information:
- THP number
- Current status of harvesting, including which units were harvested
- Current status of any sediment source treatments, including THP-related road sites and non-road sites such as skid trail crossings.
- Current status of site preparation activities
- Whether any new sediment sources have been discovered

B. AHCP Post-harvest Report Forms
By January 31 of every year, for each THP where all the felling, logging, loading, hauling, and hazard abatement operations have been completed, the RPF shall submit the AHCP Post-harvest Report Form. An example of the form is included at the end of this MRP.

C. AHCP Biennial Report
Per the Implementation Agreement between the National Marine Fisheries Service, United States Fish and Wildlife Service, and Green Diamond, Green Diamond creates a biennial report describing its activities pursuant to the Operating Conservation Plan (Section 6.2 of the AHCP). The biennial report provides information relevant to the AHCP regarding implementation, minor modifications, compliance of individual THPs, land transactions, road management measures, training programs, monitoring efforts, and more.

Green Diamond shall submit to the Regional Water Board a copy of the Biennial Report on March 15 every two years, concurrently with submission to the National Marine Fisheries Service and United States Fish and Wildlife Service.

D. Data Submission
Upon request, Green Diamond must provide any records that must be kept under the conditions of the Order or this MRP.

E. Reporting Specific to the Elk River

1. Master Inventory
An updated copy of the master inventory maintained per the Order shall be submitted annually, by March 31, to the Regional Water Board and shall include the status of the treatment for each site (i.e. completed, to be scheduled, year scheduled for treatment). Upon completion of all the sites from the master inventory, maintenance and submission of the master inventory will not be required, and inventory and treatment of any new road related sediment sources in the South Fork Elk River Watershed shall be conducted pursuant to Green Diamond's Routine Road Maintenance Program and the Roads WDR (Order R1-2010-0044).

2. South Fork Elk Sediment Reduction Effectiveness Monitoring
Green Diamond must submit, by December 1 each year, a report describing the sites currently being monitored, with the following information:
   - The monitoring location selection criteria
   - The unique site identification
   - Site attributes
   - A description of the pre-winter monitoring activities
   - Comparative pre- and post-winter photos
   - Comparative pre- and post-winter longitudinal profiles
   - Comparative pre- and post-winter void monitoring

3. Annual Harvest Reports
   By January 31 of each year, Green Diamond shall submit an Annual Harvest Report with a scaled map containing the following information for completed and planned timber harvesting:

   a. Acres felled/to be felled, by silvicultural prescription

   b. Acres yarded/to be yarded, by yarding technique

   c. Acres subject to/to be subject to mechanical site preparation

   d. Acres reported to the nearest acre, with the THP number, harvest unit number, and hazard class.

   e. A brief description of the methods and/or data sources used to calculate the number of acres.

4. Landslide Monitoring
   Green Diamond shall provide reports of landslide inventories by December 31 of the most recent photo flight year. If there is some technical reason limiting the ability to conduct the inventory and report by the due date, Green Diamond shall request an extension, in writing within 10 days prior to the due date, with the specific reasons described for the delay.

5. Water Quality Trend Monitoring
   Green Diamond shall submit a report by November 1 each year containing all of the raw and processed data from the previous hydrologic year (October 1-September 30). The report shall include:
   - A description of each monitoring site
   - A list of equipment used in the collection of data
   - All raw and processed data in tabular form
   - Graphics and supporting data representing the relationships used in any data transformation
   - Complete disclosure of all possible sources of error
   - An activity log of monitoring activities at each sites and observations made by field staff.
   - Optionally, the report may also include an analysis of the data and discussion of findings with recommendations for improvements or changes to this requirement

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

THP Name: GDRCO No:

RPF: CDF No:

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres

Hazard Abatement

Unit	Treatment Type	Treatment Date	Treatment Acres	AHCP Criteria Met

Reason if AHCP Criteria Are Not Met:

Unit	Issue	Acres Affected	Percent Non Compliance	Reason Not Met

Riparian

Feature	Requirements Met?
I	
II-1	
II-2	
Modified Tier A III	

Reason Requirements Not Met:

Geology

Unit	Feature	Watercourse	Basal Area Retent.(ft²)	Slide ID	Length (ft)	Acres of Retent.	Clear Cut Acres	Alt RX?	Alt RX Silviculture	Alt RX Met?	Retent. Req. Met?

Reason Retention or Alternate Prescription Not Met:

South Fork Elk River Management Plan

Green Diamond Resource Company

5/11/2006
Revised 7/26/2012

Green Diamond Resource Company (Green Diamond) has developed the South Fork Elk River Management Plan (SFERMP) as a sediment reduction strategy for its timberland ownership within the South Fork of Elk River Watershed. The key goal of this strategy is to implement operational procedures and measures specifically aimed at reducing sediment production, transport, and deposition into watercourses. This plan specifically describes the measures the company will apply to ensure that its operations will achieve this goal, protect water quality and beneficial uses and mitigate or avoid significant impacts to aquatic habitat. These measures were conceived, developed and revised in the context of watershed-specific physical characteristics, past management activities, and future Green Diamond management objectives of South Fork Elk River, as well as to meet the pending Elk River TMDL requirements.

The South Fork Elk River Watershed is significantly influenced by a geologic formation known as the Wildcat Group. This formation incorporates undifferentiated rocks composed of soft yellowish brown to bluish gray siltstones, clay stones and fine sandstones, which, because of their lack of strength and durability, are prone to erosion. This fine grained material becomes easily mobilized and has a high potential to reach fish bearing stream habitat.

Recognizing the underlying geology and the erodible nature of the soils within significant areas of the South Fork Elk River Watershed and acknowledging that Green Diamond planned to re-enter the South Fork Elk River watershed (within its ownership) to harvest timber and maintain road systems; it was deemed necessary and appropriate that watershed specific measures be instituted to ensure the continued protection and enhancement of water quality and aquatic habitat. The SFERMP addresses watershed specific operating procedures in the following five key categories: A) Riparian Prescriptions, B) Geological Prescriptions, C) Harvesting, Yarding and Hauling Prescriptions, D) Road Management and E) Seasonal Restrictions.

These categories include practices directed toward managing riparian zones to protect aquatic habitat, minimizing soil disturbance, minimizing movement of sediment into watercourses, and identifying potential off-site measures which could aid in reducing overall sediment contribution to the system. Green Diamond will follow these measures during administrative activities and incorporate these measures into THPs, within Green Diamond's South Fork Elk River property.

A. Riparian Prescriptions

1) Class I Riparian Management Zone (RMZ):
   a) 150 feet on each side of the watercourse.
   b) At least 85% overstory will be retained, where it currently exists, within the first 75 feet of the watercourse and at least 70% within the remainder of the Class I RMZ. 70% of the overstory canopy and understory vegetation within all Class I RMZ's will be retained.
   c) Class I watercourses will be provided with an additional 25 foot SOZ on slopes between 0-30% or 50 foot SOZ on slopes >30%, where understory vegetation, hardwoods and mid-canopy conifers will be retained on site.
   d) No trees will be harvested that contribute to maintaining bank stability. Redwoods will be preferentially harvested over other conifers
   e) The following criteria will be used to identify trees within the RMZ as potential candidates for marking to harvest due to their low likelihood of recruitment to the watercourse. (The determination of trees to be marked within the RMZ will be predicated on ensuring that overstory canopy retention standards and slope stability measures are met (See Aquatic Habitat Conservation Plan (AHCP) Sections 6.2.1 and 6.2.2), as well as ensuring that trees that are likely to recruit to the watercourse are not marked for harvest.)
      Criteria for trees that have a low likelihood of recruiting are:
      - Tree has an impeded "fall-path" to the stream (e.g., upslope family members of a clonal group blocked by downslope stems); or
      - Tree or the majority of the crown weight of the tree is leaning away from stream and the tree is not on the stream bank or does not have roots in the stream bank or stream; or
      - The distance of the tree to the stream is greater than the height of the tree; or
      - Tree is on a low gradient slope such that gravity would not carry the fallen tree into the stream or objects such as trees and large rocks impede its recruitment path; or
      - Tree is not on an unstable area or immediately downslope of an unstable area; or
      - Harvesting of the tree will not compromise the stream bank or slope stability of the site or directly downslope of the site.
   f) Trees may be felled within Class I RMZs to create cable yarding corridors as needed to ensure worker safety, subject to the canopy closure requirements set forth above. Such trees will be part of the harvest unit.
   g) There will be only one harvest entry into Class I RMZs during the life of the AHCP, which will coincide with the even-aged harvest of the adjacent stand.
   h) The Class I RMZ is an equipment exclusion zone (EEZ), except for a) existing roads and landings; b) construction of new spur roads to extend operations outside the RMZ; c) road watercourse crossings; d) skid trail watercourse crossings; and e) designated skid trail intrusions.

The exception for skid trail watercourse crossings is only applicable when the following conditions are met:

- Construction and use of skid trail watercourse crossings within the RMZ may occur only when construction and use of alternative routes to otherwise inaccessible areas outside of the RMZ would result in substantially greater impacts to aquatic resources. Preference shall be given to utilizing existing skid trail watercourse crossing sites in the RMZ over establishing new skid trail watercourse crossing sites in the RMZ.
- Skid trail watercourse crossings shall not be constructed or used in the RMZ to provide access to RMZs for the purpose of their harvest.
- Within the Class I RMZ, trees may be felled to facilitate skid trail watercourse crossing construction and use. All such felled trees will be retained as downed wood in the RMZ.
- Green Diamond will submit to the Services an explanation, justification, and map of any proposed skid trail watercourse crossings as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

The exception for skid trail intrusions is only applicable when the following conditions are met:

- RMZ hillslopes are less than 25%.
- Construction and use of skid trails within the RMZ may occur only when construction and use of alternative routes to otherwise inaccessible areas outside of the RMZ would result in substantially greater impacts to aquatic resources. Preference shall be given to utilizing existing skid trails in the RMZ over construction of new skid trails in the RMZ.
- Skid trails will not be constructed or used in the RMZ to provide access to RMZs for the purpose of their harvest.
- Within the RMZ, only trees less than 10 inches in dbh may be felled to facilitate skid trail use. All such felled trees will be retained as downed wood in the RMZ.
- Green Diamond has submitted to the Services an explanation, justification, and map of the proposed skid trail and use in the RMZ as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

i) Any ground disturbance caused by management activities that is larger than 100 square feet within an RMZ will be mulched and seeded or otherwise treated to reduce the potential for sediment delivery from sheet and gully erosion. Minimum standards for seeding and mulching operations are 30 pounds per acre of seed and a minimum mulching depth of two inches, covering at least 90% of the surface area.

j) No salvaging within the inner zone of the Class I RMZ. If any part of the salvageable piece is in the inner zone, the entire piece will be left.
k) Salvaging of downed trees within the outer zone of the Class I RMZ is permitted if the following criteria are met:
   - The wood is not currently, and is unlikely in the future to be, incorporated into the bankfull channel (including wood located below unstable areas);
   - The wood is not contributing to bank or slope stability; or
   - The wood is not positioned on a slope such that it can act to intercept sediment moving toward the stream.

2) Class II RMZ:
   a) 75 feet or 100 feet on each bank of all Class II watercourse.
   b) A 75-foot minimum buffer will be used on the first 1,000 feet of 1st order Class II watercourses (Class II-1 watercourses). Downstream of this first 1000-foot section, the RMZ will be expanded to at least 100 feet.
   c) A 100-foot minimum buffer will be used on all 2nd order or larger Class II watercourses (Class II-2 watercourses).
   d) Where a 1st order Class II watercourse flows directly into a Class I watercourse, the Class II RMZ will be at least 100 feet on each bank for the first 200 feet of Class II channel upstream of the Class I RMZ boundary.
   e) First order Class II watercourses with sideslopes >50% with ground based operations, will have an RMZ of 100 feet.
   f) A 30 foot inner zone within the RMZ will be established, measured from the watercourse transition line.
   g) An outer zone of the RMZ will be established and extend the remaining 45 feet or 70 feet (depending on whether it is a Class II-1 watercourse or a Class II-2 watercourse, respectively).

      At least 85% overstory canopy will be retained in the inner zone. The RMZ inner zone is not flagged. Canopy closure retention standards in the inner and outer RMZs will be determined by varying the mark of harvest trees.
   h) At least 70% overstory canopy will be retained in the outer zone.
   i) No trees will be harvested that contribute to maintaining bank stability. Redwoods will be preferentially harvested over other conifers.
   j) Trees may be felled within RMZs to create cable yarding corridors as needed to ensure worker safety, subject to the canopy closure requirements set forth above. Such trees will be part of the harvest unit.
   k) There will be only one harvest entry into Class II RMZs during the life of the AHCP, which will coincide with the even-aged harvest of the adjacent stand.
   l) The Class II RMZ is an EEZ, except for a) existing roads and landings; b) construction of new spur roads to extend operations outside the (RMZ); c) road watercourse crossings; d) skid trail watercourse crossings; and e) designated skid trail intrusions.

The exception for skid trail watercourse crossings is only applicable when the following conditions are met:

- Construction and use of skid trail watercourse crossings within the RMZ may occur only when construction and use of alternative routes to otherwise inaccessible areas outside of the RMZ would result in substantially greater impacts to aquatic resources. Preference shall be given to utilizing existing skid trail watercourse crossing sites in the RMZ over establishing new skid trail watercourse crossing sites in the RMZ.
- Skid trail watercourse crossings shall not be constructed or used in the RMZ to provide access to RMZs for the purpose of their harvest.
- Within Class II-1 RMZs, trees may be felled and harvested to facilitate skid trail watercourse construction and use. All harvested trees will be counted towards estimated reductions in "full tree equivalents" (FTE) values and reductions in potential recruitment of LWD (See AHCP Section 6.2.7.3).
- Within Class II-2 RMZs, trees may be felled to facilitate skid trail watercourse crossing construction and use. All such felled trees shall be retained as downed wood in the RMZ and shall be counted towards estimated reductions in FTE values and reductions in potential recruitment of LWD.
- Green Diamond will submit to the Services an explanation, justification, and map of any proposed skid trail watercourse crossings as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

The exception for skid trail intrusions is only applicable when the following conditions are met:

- RMZ hillslopes are less than 25%.
- Construction and use of skid trails within the RMZ may occur only when construction and use of alternative routes to otherwise inaccessible areas outside of the RMZ would result in substantially greater impacts to aquatic resources. Preference shall be given to utilizing existing skid trails in the RMZ over construction of new skid trails in the RMZ.
- Skid trails will not be constructed or used in the RMZ to provide access to RMZs for the purpose of their harvest.
- Within the RMZ, only trees less than 10 inches in dbh may be felled to facilitate skid trail use. All such felled trees shall be retained as downed wood in the RMZ and shall be counted towards estimated reductions in FTE values and reductions in potential recruitment of LWD.
- Green Diamond has submitted to the Services an explanation, justification, and map of the proposed skid trail and use in the

RMZ as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

m) Any ground disturbance caused by management activities that is larger than 100 square feet within an RMZ will be mulched and seeded or otherwise treated to reduce the potential for sediment delivery from sheet and gully erosion. Minimum standards for seeding and mulching operations are 30 pounds per acre of seed and a minimum mulching depth of two inches, covering at least 90% of the surface area.

n) No salvaging within the inner zone of the Class I RMZ. If any part of the salvageable piece is in the inner zone, the entire piece will be left.

o) Salvaging of downed trees within the outer zone of the Class I RMZ is permitted if the following criteria are met:
   - The wood is not currently, and is unlikely in the future to be, incorporated into the bankfull channel (including wood located below unstable areas);
   - The wood is not contributing to bank or slope stability; or
   - The wood is not positioned on a slope such that it can act to intercept sediment moving toward the stream.

3) <u>Class III protection measures:</u>
Green Diamond will apply one of two levels of protection measures within Class III watercourses on their ownership within South Fork Elk River. Class III watercourses having average side slopes under 60% will be provided Modified Tier A protection measures and Class III watercourses having average side slopes over 60% will be provided Tier B protection measures.

a) Modified Tier A Class III Protection Measures:
   - 30 foot EEZ except for a) existing roads, b) road watercourse crossings, c) skid trails*, and d) skid trail watercourse crossings**.
   - Where side slopes average between 30% and 60%, the EEZ shall be expanded to 50 feet.
   - Retain all Channel Zone Trees*** – all species.
   - Retain all LWD on the ground (not including felled trees) within the EEZ.
   - Retain all sub-merchantable conifers and safe snags.
   - Retain a minimum of 15 square feet of basal area of hardwoods per acre where it exists before harvest, including the largest hardwoods available for this purpose. Retain all hardwoods when less than 15 square feet basal area is present before harvest.
   - Retain at least 50% of the understory vegetation following completion of yarding operations.
   - Broadcast burning will not occur within Green Diamond's properties in South Fork Elk River.

b) Tier B Class III Protection Measures:

- 50 foot EEZ except for a) existing roads, b) road watercourse crossings, c) skid trails*, and d) skid trail watercourse crossings**.
- Retain all Channel Zone Trees*** – all species.
- Retain a minimum average of one conifer 15 inches dbh or greater per 50 feet of stream length within the EEZ.
- Retain all hardwoods and non-merchantable conifers located within the EEZ except where necessary to create cable corridors or for the safe falling of merchantable trees.
- Retain all LWD on the ground (not including felled trees) within the EEZ.
- Broadcast burning will not occur within Green Diamond's properties in the South Fork of Elk River.

* The exception for skid trail intrusions is only applicable when the following conditions are met:

1. EEZ hillslopes are less than 25%.
2. The location and use of skid trails within the EEZ may occur only when the use of alternative routes to otherwise inaccessible areas outside of the EEZ would result in substantially greater impacts to aquatic resources. Intrusion into the EEZ is preferred if the alternative routes would result in greater road length and additional watercourse crossings. Preference will be given to utilizing shovel logging equipment and using existing skid trails in the EEZ over locating new skid trails in the EEZ.
3. Skid trails will not be used in the EEZ to provide access to EEZs for the purpose of their harvest.
4. All bare mineral soil greater than 100 square feet created by management activities within the EEZ, will be mulched or treated with slash to adequately cover the exposed soil area prior to any onset of rain or upon completion of operations, whichever occurs first.
5. Green Diamond has submitted to the Services an explanation, justification, and map of the proposed entry into the EEZ as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

** The exception for skid trail watercourse crossings is only applicable when the following conditions are met:

1. Construction and use of skid trail watercourse crossings within the Class III EEZ may occur only when construction and use of alternative routes to otherwise inaccessible areas outside of the RMZ would result in substantially greater impacts to aquatic resources. Preference shall be given to utilizing existing skid trail watercourse crossing sites in the Class III over establishing new skid trail watercourse crossing sites in the Class III.
2. Within Class III EEZs, trees may be felled and harvested to facilitate skid trail watercourse crossing construction and use.

3. Green Diamond will submit to the Services an explanation, justification, and map of any proposed skid trail watercourse crossings as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

*** A "Channel Zone Tree" is defined as follows: A tree with its trunk or surface roots located within the channel or extending into the channel. Typically these trees serve the function as "control points" (retaining sediment and/or preventing channel head cutting) within the channel. When growing on the bank with surface roots extending into the channel, trees can also contribute to overall bank stability.

B. Geologic Prescriptions

A California licensed Registered Professional Forester (RPF) is responsible for conducting field reconnaissance of all proposed timber harvest units specifically for the purpose of identifying unstable areas, as described by the California Forest Practice Rules and using California
Licensed Forestry Association 1999 Check List. The RPF is also responsible for determining the need for additional site assessment by a California licensed Professional Geologist (PG) based on the presence or absence of indicators of unstable areas.

During THP development, an RPF will 1) impose the default prescriptions applicable below if it is determined that any portion of the THP meets the definitions for a steep streamside slope (SSS), headwall swale, deep-seated landslide or shallow rapid landslide; 2) exercise professional discretion to avoid operations in unstable areas; or 3) retain a California PG to develop site-specific alternative prescriptions to the default prescriptions. The default prescriptions below as well as complete avoidance of operations in unstable areas are considered conservative prescriptions. For that reason, where unstable areas are avoided or default prescriptions applied, RPFs will not necessarily retain the services of a PG for further site evaluation and prescription development and a geological report will not typically be included with a proposed THP as a matter of necessity.

Where RPFs determine that unstable areas or indicators of unstable areas exist within a harvest unit and they require a professional geological assessment, RPFs will consult with Green Diamond's staff geologist to develop appropriate site-specific forestry-related prescriptions. Professional geological assessments also may be performed by qualified licensed professional geological consultants, depending on workload or scheduling constraints of Green Diamond's staff geologist. Professional Geologists who conduct geological assessments for RPFs must comply with the California Department of Consumer Affairs Geological Licensing Act and will be expected to utilize professional discretion to follow the guidelines of the California Department of Conservation Division of Mines and Geology Note 45 (Guidelines for Engineering Geological Reports for Timber Harvesting Plans) to whatever extent may be necessary depending on site-specific conditions and the scope of a given project.

1) <u>Steep Streamside Slopes:</u>

a) Identify all steep streamside slopes (SSS) greater than or equal to 60% leading to Class I or II watercourses.
b) The initial default maximum width of the SSS zone, measured from the watercourse transition line, is 200 feet for Class I and Class II-2 watercourses and 75 feet for Class II-1 watercourses.
c) The SSS zone will be comprised of an inner zone (Riparian Slope Stability Management Zone [RSMZ]) and an outer zone (Slope Stability Management Zone [SMZ]).
d) The width of the RSMZ will be the same as the applicable watercourse RMZ, except where a qualifying slope break exists within that distance the RSMZ may only extend to the slope break. A "qualifying slope break" is an interruption of slope gradient of sufficient degree and scale to reasonably impede sediment delivery to watercourses from shallow landslides originating above the slope break.
e) The width of the SMZ will be either the remainder of the distance to the default maximum SSS distance for that Hydrographic Planning Area (HPA) or to a qualifying slope break, whichever is shorter.
f) The RSMZs will be comprised of an inner zone and an outer zone.
g) The inner zone of RSMZs on all Class I watercourses will be 70 feet, except where a qualifying slope break exists within that distance the RSMZ inner zone may only extend to the slope break, and the outer zone, if any, will be the remainder of the applicable RMZ distance except where a qualifying slope break exists within that distance.
h) The inner zone of RSMZs on all Class II watercourses will be 30 feet, except where a qualifying slope break exists within that distance then the RSMZ inner zone may only extend to the slope break, and the outer zone, if any, will be the remainder of the applicable RMZ distance except where a qualifying slope break exists within that distance.
i) On Class I and Class II-2 watercourses, Green Diamond will not conduct harvesting on the inner zone of the RSMZ and there will be 85% overstory canopy retention in the outer zone of the RSMZ.
j) On Class II-1 watercourses, Green Diamond will retain 85% overstory canopy in the inner zone of the RSMZ and 75% overstory canopy in the outer zone of the RSMZ.
k) The silviculture prescription employed within SMZs will be single tree selection.
l) Even spacing of unharvested trees will be provided where the trees are available to allow it, and all hardwoods will be retained. All species and size classes represented in pretreatment stands will be represented post-harvest where feasible.
m) If cable corridors through SMZs are necessary to conduct intermediate treatments (e.g., commercial thinning) in adjacent stands prior to even-aged harvest, Green Diamond will apply the restrictions in this section except harvesting of trees in the SMZs will be limited to cable corridors only. Any cable roads established in the SMZ as part of the intermediate treatment will,

to the extent feasible, be reused during the even-aged entry in the adjacent stands.

n) Where no SMZ is identified, the standard default prescriptions for RMZs will apply.
o) Green Diamond may fall trees within RSMZs and SMZs for worker safety and to create cable yarding corridors of up to 25 feet in width.
p) Green Diamond's road construction will avoid RSMZs and SMZs where feasible. Where such zones cannot be avoided or where major road reconstruction is required, the road alignment within a RSMZ or SMZ will be evaluated by a PG and a RPF with experience in road construction in steep forested terrain. In addition, Green Diamond will submit to the Services an explanation, justification, and a map of the proposed exception as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

2) <u>Headwall Swales</u>:
   a) The silviculture prescription employed on a field verified headwall swale will be single tree selection.
   b) Even spacing of unharvested trees will be provided where the trees are available to allow it, and all hardwoods will be retained.
   c) All species and size classes represented in pretreatment stands will be represented post-harvest where feasible
   d) There will be only one harvesting entry in headwall swales during the term of the AHCP.
   e) Green Diamond may fall trees on a field verified headwall swale for worker safety and to create cable yarding corridors of up to 25 feet in width
   f) Green Diamond's new road construction will avoid field-verified headwall swales where feasible. Where such areas cannot be avoided or where road reconstruction is required, the terrain will be evaluated by a PG and RPF with experience in road construction in steep forested terrain. In addition, Green Diamond will submit to the Services an explanation, justification, and a map of the proposed exception as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2)

3) <u>Deep-Seated Landslides</u>:
   a) No cut within the boundaries of the deep-seated landslide and 25-foot no cut buffer upslope of the main scarp of the slide.
   b) Green Diamond will not construct new roads across active deep-seated landslide toes or scarps, or on steep (greater than 50% gradient) areas of dormant slides, without approval by a PG and a RPF with experience in road construction in steep forested terrain.

4) Shallow Rapid Landslides:
   a) The following measures will apply to field-verified shallow rapid landslides that are at least 200 square feet in plan-view and that observably deliver

sediment to a watercourse or exhibit indicators of instability with the potential to deliver sediment directly to a watercourse:

- No cut within the boundaries of the landslide.
- 50-foot buffer above the slide with at least 70% overstory retention.
- 25-foot buffer along the sides of the slide with at least 70% overstory retention.
- Avoid new road construction on shallow rapid landslide where feasible. Where such areas cannot be avoided or where major road reconstruction is required, the terrain will be evaluated by a PG and RPF with experience in road construction in steep forested terrain. In addition, Green Diamond will submit to the Services an explanation, justification, and a map of the proposed exception as part of the informational copy of the THP notice of filing (see AHCP Section 6.2.7.2).

C. Harvesting, Yarding and Hauling Prescriptions

The following prescriptions have been developed to ensure that Green Diamond's logging operations are designed and implemented to minimize overall ground disturbance that could generate and cause sediment delivery into watercourses.

1) Green Diamond will adhere to a 4-year harvest adjacency versus the 3- year adjacency requirement in the California FPRs. This extension of the harvest adjacency in this watershed will serve to further reduce potential impacts from harvest activities and will distribute them over greater time and space. This will avoid concentrating harvest units over a short period into individual sub-basins within Green Diamond's South Fork Elk River ownership.

2) Green Diamond will limit the rate of harvest in South Fork Elk River to approximately 75 acres per year, calculated on a 3-year rolling average. The 3-year rolling average provides operational flexibility while maintaining a low annual harvest rate.

3) Skyline cable yarding systems will be the preferred harvest method on slopes averaging greater than 35%.

4) In areas where road construction would require building across steep slopes with large amounts of endhaul construction, long cable skyline yarding (average yarding distance >1000 feet) will be prescribed in areas with long continuous steeper slopes, therefore eliminating the need for additional roads. Emphasizing both short and long skyline cable yarding systems will reduce the overall road mileage and site impacts that are associated with road building as well as reduce impacts associated with ground based yarding systems.

5) Green Diamond intends to use shovel logging in ground based harvest areas. Ground based yarding will be limited to slopes less than 35%. Shovel logging has been shown to minimize ground disturbance due to low ground pressure, no need to construct skid trails, operating on top of slash rather than bare soil, and the opportunity to utilize residual vegetation to slash pack temporary constructed haul roads to minimize raindrop impact and surface erosion. Exceptions to shovel logging will be confined to isolated areas where topographic conditions or other circumstances would require excessive road construction to utilize cable yarding. In these circumstances other ground based equipment may be required and its use will be explained and justified during the THP approval process.

6) Newly constructed temporary roads located in shovel logging areas will be decommissioned by removing temporary crossings, draining the road (waterbars and rolling dips) and slash packing the road surface prior to closure.

7) Helicopter yarding will be considered and prescribed in areas that would require the construction of roads across steep slopes with high hazard topography (i.e. unstable slopes). Although this harvesting method is expected to have limited use within the watershed, its application if required, will be explained and justified in the THP.

8) See seasonal restrictions below for harvesting, yarding and hauling activities.

9) No broadcast burning will be conducted in South Fork Elk River. Burning of piles accumulated during harvesting operations, may occur.

D. Road Management Prescriptions

A full road assessment within Green Diamond's South Fork Elk River ownership was completed in 2006. Green Diamond developed and has been following a South Fork Elk River Road Management Plan that prioritized all assessment sites located within the drainage and proposed recommendations for treatment by the end of 2015. As of the end of 2011, Green Diamond has completed 84% of the sites representing approximately 77% of the sediment volume that could potentially deliver to a watercourse. Green Diamond will treat the remaining 16% of the controllable sediment discharge sites by the end of 2015.

Taking into consideration the location of these roads and associated sites, relative condition, potential future risk of failure (due to location), and the location for long term future use, specific roads and road segments have been identified to be either upgraded or decommissioned. Some roads will be decommissioned permanently, and others will be temporarily decommissioned (ear marked for eventual reconstruction and upgrading in the future (20-30 years) when the surrounding young plantations are ready for harvest and road access is again needed. In either case, the goal of the decommissioning process is to

remove the need for continued maintenance as well as removing the risk of road related sediment input from crossing failures, diversions, and side cast failures. Roads chosen for decommissioning will be essentially hydrologically disconnected from the stream network so that the potential for future road related sediment delivery into watercourses would be minimal. Roads not designated for decommissioning will be upgraded to the "Road Upgrading" procedures outlined in Green Diamond's Road Management Waste Discharge Requirements (WDR) and Master Agreement for Timber Operations (MATO). These roads as well as newly constructed roads in the future will be part of our permanent transportation system and consist of roads that are properly located, hydrologically disconnected and well maintained. Operational procedures have been developed for all road types so that, after treatment, sediment delivery into watercourses will be mitigated.

I. ROAD DECOMMISSIONING

Over the past 10 years of decommissioning experience, Green Diamond has learned that there is value in insuring that the project is implemented correctly and efficiently the first time. By insuring that all reasonable and feasible operational procedures are site specifically identified and carried out during the decommission process, efficiency is maximized and the risk of unacceptable future failures or significant streambed adjustments is minimized. Green Diamond will adhere to the following site-specific Operational Procedures for road decommissioning in addition to those outlined in the Road Management WDRs, MATO and AHCP:

a) To further guard against road surface rilling and sheet erosion associated with erodible Wildcat soil types, Green Diamond will treat all decommissioned road surfaces with grass seed and straw mulch at 2" depth and 90% coverage.

b) All designated waste disposal sites will be compacted with a tractor or excavator packed in lifts and treated with straw mulch and grass seeded.

c) An emphasis and priority will be made to initiate and finish all pull back sites and stream crossing removals on a specific road during the same summer season if feasible. If the road to be decommissioned can not be completed in one season due to weather or operational constraints, the following procedure will be initiated to minimize any additional sediment contribution from erosion control points (ECPs) until final site completion occurs:

   Sites not treated by the pull back, disconnect, and mulch/seed protocol, will be left in a "no further disturbance" condition. This means partially failing stream crossings will have the holes and depressions of the fills temporarily filled and packed with hay bails and/or clean wood chunks and covered with a layer of soil for short term minimal equipment access to lower sites. These temporary sites will be constructed to be easily pulled back out without the need for refilling a fill with soil. The intent of this practice is to ensure that operations do not introduce any additional sediment into watercourses and

that these sites that can not feasibly be treated via permanent pull back of all soil and organics in one season will be prepared for "over wintering" with clean materials that can be retrieved the next operating season. At that time, the temporary fill structure can be utilized to access equipment to achieve necessary decommissioning past the site and/or pulled out correctly that final season

d) Some roads have been abandoned and are in a condition where no treatment would be required because they are completely revegetated, no longer pose a threat to aquatic systems, and are in a condition that would render the disturbance inherent in decommissioning counter-productive. The road assessment process will determine whether treating certain roads or road segments would be counter-productive.

e) Green Diamond field personnel will work cooperatively with water quality staff to ensure that the final decommissioning product meets the expectations and mutual goals.

II. ROAD UPGRADING

It is Green Diamond's goal to ensure that all roads designated for upgrading will be improved in such a way as to minimize future risk for failure and resulting sediment delivery to watercourses. Green Diamond will adhere to the following site-specific Operational Procedures for road upgrading in addition to those outlined in the Road Management WDRs, MATO and the AHCP:

a) Ditch relief culverts will be installed to meet the following specifications**:

Road Grade	**Maximum Spacing (Feet) for Ditch Relief Culverts**
2%	600
4%	530
6%	355
8%	265
10%	210
12%	180
14%	155
16%	135
18%	115

** Additional ditch relief culverts will be installed if site specific erosion indicators continue to exist.

b) Procedures designed to ensure sediment is not mobilized during winter quad use and delivered to watercourses is provided in the Road Sediment Reduction Plan (See Section D. IV.).

III. NEW ROAD AND LANDING CONSTRUCTION

As part of THP preparation, RPFs perform a detailed field reconnaissance to identify and locate the best access between topographic control points that are critical to a harvesting operation. When designing, locating, and constructing roads and landings, Green Diamond will adhere to the following site-specific Operational Procedures in addition to those outlined in the MATO and AHCP:

a) In areas located on steep slopes or adjacent to watercourses where management of sidecast is not feasible, the practice of endhauling will be employed. A dump truck will transport the excavated material to a stable disposal area where sediment cannot deliver to any watercourses. Waste material will be seeded and mulched prior to October 15th of the same year.
b) Where feasible, and within the limits of safety considerations, all new seasonal secondary and spur roads will be constructed with an outsloped surface rather than a crowned road with an inside ditch. Outsloped roads can reduce potential maintenance problems caused by bank sloughing, ditch plugging, and drainage diversion.
Ditch relief culverts will be installed according to the specifications outlined in the Road Upgrading section (See Section D. II. a). Additional ditch relief culverts and rolling dips will be installed where appropriate to adequately disconnect the roads from the watercourses and to minimize ditch water accumulation on slide prone landforms such as inner gorges.

i. Erosion Control for New Roads

a) Procedures designed to ensure sediment is not mobilized and delivered to watercourses during winter quad use is provided in the Road Sediment Reduction Plan (See Section D. IV.)
b) All watercourse crossings and cross drains will be installed and functional prior to the winter period as defined below. In addition, by the beginning of the winter period, all waterbars, rolling dips, and road and landing construction associated with straw mulching and grass seeding will be completed in order to minimize suspended or mobilized sediment delivery to a watercourse.
c) All running surfaces of seasonal unsurfaced roads will be straw mulched and seeded prior to the first winter season following initial construction. This practice will protect against significant rain drop, sheet, and rill erosion on newly constructed, non-compacted, and unseasoned road surfaces.

IV. Road Sediment Reduction Plan

In recognition of the sensitive geology and the erodible nature of the soils within large areas of the South Fork Elk River Watershed, Green Diamond has developed a watershed plan incorporating measures designed to reduce sediment production from existing roads. This plan addresses the erodible nature of the soils within existing roadbeds and provides a mechanism to ensure that reasonable and feasible measures are undertaken to disconnect roadways from watercourses so that significant sediment delivery to aquatic habitat does not occur. The majority of operational activities occur during the summer season because of the lack of suitable rock nearby for road surfacing. Winter access on these erodible native surface roads with heavy equipment and pickups is not feasible. "Quad only" limited winter operations will be allowed for in THPs in this watershed. Winter quad use will ensure that Green Diamond continues to have the needed access to property within the watershed so that THP layout, tree planting, and cutting activities, as well as other administrative functions can occur year round. The persistent use of quads on unsurfaced dirt roads during the winter months (in areas with erodible Wildcat soils) can mobilize sediments from the exposed road surface unless specific measures and procedures are undertaken to minimize these potential sediment sources, and they are disconnected from watercourses.

The following measures will be implemented to ensure sediment is not mobilized from existing roadways and deposited into aquatic habitat resources. Priority will be placed upon higher use roads and more vulnerable stream crossings. Practices proposed in this plan will also be utilized on new roads as they are developed in the future.

a) Ensure that all existing watercourse crossings have a properly designed "critical dip" installed at or immediately adjacent to the crossing to reduce diversion potential.

b) A disconnect rolling dip or water bar will be installed up grade from the crossing and designed to deposit on the forest floor. RPF's or their designees will be responsible for identifying in the field the location for permanent rolling dips used to disconnect the road from the watercourse crossings.

c) Identify the main-line administrative roads that will be utilized via quads on a more consistent basis during the winter months (e.g. S-1000, S-2000, S-2500 up to road point MC21road). All watercourse crossings will have a permanent rolling dip disconnect installed up grade from the crossing and designed to deposit on the forest floor. The disconnect rolling dip as well as a minimum of 75' of road way leading into and including the crossing will be rocked. Filter fabric in conjunction with an average depth of 6" of clean rock will be used. If the roadway parallels a RMZ, the distance to be rocked will be the length of the RMZ road or 75 feet whichever is longer.

d) Main-line administrative roads will also be assessed to identify chronic erosion problems associated with isolated steeper road gradients. These sections of road will also be treated with an average depth of 6" of clean rock with filter fabric.

e) Where secondary roads are identified that are occasionally used during winter months for quad access, all watercourse crossings will be straw mulched and grass seeded for a minimum of 75 feet including the disconnect rolling dip. If the roadway parallels a RMZ, the distance to be mulched will be the length of the RMZ road or 75 feet whichever is longer. This measure has proven to be an effective erosion prevention method utilized extensively in the past on new roads within drainages with similar soil types. This option will allow Green Diamond to effectively treat roads and crossings commensurate with their anticipated use (and risk of sediment mobilization).

f) Where extended segments of roadway are located in a through-cut or outside bermed condition, a permanent tractor or excavator constructed ditch-out will be built to further minimize the distance between rolling dips and water bars.

g) The interval of strategically placed rolling dips and waterbars will be installed according to the standards provided below to ensure that ditch line and surface road water from storm events is efficiently dispersed onto the forest floor. Additional rolling dips and waterbars will be installed if site specific erosion indicators continue to exist.

Road Grade	**Maximum Spacing (feet) for Rolling Dips and Waterbars**
2%	500
4%	400
6%	300
8%	250
10%	200
12%	175
14%	150
16%	125
18%	100

h) Other erosion prevention methods such as silt fences or sediment settling basins will be utilized in site specific places where measures described above may not be adequate to prevent sediment input into watercourses.

i) All roads maintained for consistent or occasional winter quad use (See Road Sediment Reduction Plan) will be signed "Consistent Winter ATV Use OK" or "Occasional Winter ATV Use OK", respectively. All other roads within the watershed will have no quad use during the winter period.

The measures provided above will not only aid in significantly reducing sediments mobilized from winter quad use, but also dramatically reduce the potential for sediment introduction into streams from normal sheet erosion and rilling that can occur on unsurfaced roads located in the Wildcat geology type that experience no winter ATV traffic.

V. ROAD MAINTENANCE

As previously described, Green Diamond will treat the remaining road sites identified in the 2006 road inventory by the end of 2015. Roads upgraded prior to 2011 will be maintained as described below. The remaining road sites to be treated in South Fork Elk River, will also be maintained as described below following their treatment.

a) Green Diamond will inspect all mainline roads annually for needed maintenance.

b) Roads appurtenant to THPs will be inspected annually through the maintenance period of the THP. This inspection will assess the effectiveness and condition of all erosion control and drainage structures.

c) Secondary roads will be inspected and treated according to Green Diamond's Routine Road Maintenance Program and Road Management WDRs.

d) After the maintenance period of the THP expires, secondary roads will inspected and treated according to Green Diamond's Routine Road Maintenance Program and Road Management WDRs.

e) Road maintenance activities include brushing, waterbarring, constructing rolling dips, culvert replacement, grading (including berm removal or maintenance where appropriate), installation of critical dips at watercourse crossings to reduce diversion potential, outsloping roads, patch rocking, dust abatement, resurface rocking, cleaning ditches, and cleaning inlets and outlets of culverts.

f) Road maintenance activities, other than by hand labor, will only be conducted during the non-winter period due to equipment access limitations.

g) Grading will not be used to blade off wet soil to provide conditions for extended periods of operation on a deteriorated road surface.

h) Road maintenance inspections will assess the following:
- Adequate waterbar and/or rolling dip spacing, depth, interception of the ditch line, and complete diversion of water flow onto undisturbed soil.
- Adequate road surface drainage and all outside berms are breached.
- Ditches are open and properly functioning, free of debris that could plug the ditch or a culvert and cause a diversion of water onto the road surface.
- Culverts are functioning properly (e.g., the culvert is not rusted out or separated at a joint; water is flowing through the pipe and not underneath; sediment and debris is not reducing the pipe capacity).

i) The road maintenance assessment will be completed with enough time to initiate and complete all necessary repairs prior to winter period.

j) Landing debris associated with harvesting operations will be evaluated to determine the need for either burning or pull-back to reduce any potential for landing failure and debris avalanches associated with overloading the landing with slash.

k) Upon completion of timber operations, landings will be drained to prevent water accumulation. Concentrated flows will not be channeled over fills and will only be discharged onto stable areas. Discharge points will be located on stable landforms and where stable discharge points are absent, adequate erosion protection and energy dissipation will be employed.

E. Seasonal Restrictions

As previously described in this Management Plan, the South Fork Elk River has a uniquely erodible soil type that is not only easily mobilized with vehicular traffic but tire traction is completely lost with the slightest amount of road surface moisture. This situation coupled with lack of rock for road surfacing and the remoteness of the watershed results in a shorted operating window. The following measures reflect these conditions and the need to appropriately address them to minimize impacts to aquatic resources.

1. The winter period for this management plan is from Oct.15th, to May 15th. An exception to this will be limited to the brief time frame from Oct. 15th to Nov.1st, and from May 1st to May 15th when the potential for extended seasonal dry periods exist. This exception will be implemented only when the "Early Spring Drying" or "Dry Fall" conditions exist, as described in the AHCP. This stipulation acknowledges the sensitivity of the watershed and associated soils, while providing flexibility to achieve harvest and road repairs/upgrading goals in a "short season, limited access" area when conditions warrant.

2. Yarding (except helicopter yarding with no heavy equipment), hauling, or road construction activities will not occur during the winter period (as defined above). Timber falling, site preparation (pile burning), and administrative access (THP preparation, planting, monitoring) can be conducted year round.

3. Log hauling will be suspended, regardless of the time of year, if a storm event causes saturated soil conditions on haul roads. Hauling will not be resumed until the RPF or his designee determines that the road can withstand truck traffic without causing deterioration of the road surface and subsequent loss of surface material. Operation of trucks and heavy equipment on roads and landings will be limited to those with a stable operating surface.

4. Access during the winter period for activities such as timber falling, site preparation burning, maintenance inspections, reforestation, or timber harvesting plan layout will be restricted to the use of low ground pressure ATVs operating on designated signed roads only (See Road Sediment Reduction Plan, Section D. IV.).

Attachment D

Final Certification Notice

to Certify Completion and Compliance with
Waste Discharge Requirements
For
Discharges Related to Green Diamond Resource Company's Forest Management Activities Conducted within the Area Covered by its Aquatic Habitat Conservation Plan
In the
North Coast Region
Order No. R1-2012-0087

Project Information

CAL FIRE THP Number	Project Size (acres)
Watershed Name	
Section, Township, Range Number(s)	

Contact Information

Timberland Owner/Representative	Registered Professional Forester
Address	Telephone number

Certification

I understand and certify that the above listed project was in conformance with the approved project and all applicable provisions of the Waste Discharge Requirements, and that discharges from the project were in compliance or are expected to comply with all applicable water quality requirements.

Signature Discharger/Duly Authorized Representative	Date

Attachment E

CEQA Findings

ATTACHMENT E

CALIFORNIA ENVIRONMENTAL QUALITY ACT
FINDINGS OF FACT FOR ORDER R1-2012-0087
WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES RELATED TO GREEN DIAMOND RESOURCE COMPANY'S FOREST MANAGEMENT ACTIVITIES CONDUCTED WITHIN
THE AREA COVERED BY ITS AQUATIC HABITAT CONSERVATION PLAN
IN THE
NORTH COAST REGION

I. PROJECT OVERVIEW

Discharges from forest management activities covered by proposed Order R1-2012-0087 (Project), including timber product harvest, silvicultural regimes and methods, timberstand regeneration and improvement, minor forest product harvest, instream and riparian restoration, and mitigation measures, have the potential to affect water quality. Under the California Porter-Cologne Water Quality Act, discharges of waste to waters of the state require the issuance of waste discharge requirements (WDR) unless otherwise waived. WDRs prescribe requirements, such as limitations on temperature, toxicity, or pollutant levels, as to the nature of any discharge. (Water Code, § 13260, subd. (a).) The Project also includes activities that may require a Clean Water Act section 404 permit from the Army Corps of Engineers (Corps). Under section 401 of the federal Clean Water Act (33 U.S.C. §§ 1251-1387), every applicant for a federal license or permit which may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the Clean Water Act, including water quality standards and implementation plans promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Clean Water Act section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the Clean Water Act and with any other appropriate requirement of state law. Section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the project.

In July 2007, Green Diamond began implementing the Aquatic Habitat Conservation Plan (AHCP) approved in June 2007 by the National Marine Fisheries Service and the U.S. Fish & Wildlife Service. On June 10, 2010, the Regional Water Board adopted Order R1-2010-

0044, *Waste Discharge Requirements for Discharges Related to Road Management and Maintenance Activities Conducted Pursuant to the Green Diamond Resource Company Aquatic Habitat Conservation Plan in the North Coast Region* (Roads WDR). The Roads WDR provides waste discharge coverage for activities performed under Green Diamond's Road Management Plan from the AHCP. Concurrently with development of the Roads WDR, the California Department of Fish and Game (DFG) developed a Master Agreement for Timber Operations (MATO, 1600-2010-0114-R1). The California Department of Forestry and Fire Protection (CAL FIRE) is the state agency responsible for overseeing timber harvesting activities through implementation of the Forest Practice Rules (Cal. Code Regs., tit. 14, §§895-1115.3). The Regional Water Board is not a party to or otherwise bound by any agreements and assurances Green Diamond may have with other state and federal agencies; however, the AHCP and MATO contain management measures that minimize impacts and protect and improve water quality that the Regional Water Board intends to rely on, in part, and in conjunction with existing regulations in order to implement Basin Plan water quality standards and restore the beneficial uses of water across Green Diamond's ownership. This approach will result in greater consistency across multiple state and federal agencies, streamline paperwork submittals, and promote landscape-based stewardship of water quality. The Regional Water Board will continue to participate as a Review Team member for individual THPs proposed by Green Diamond to ensure compliance with this Order.

The project area includes all commercial timberland acreage on the west slopes of the Klamath Mountains and the Coast Range of California in Del Norte and Humboldt counties where Green Diamond owns land or harvesting rights that are covered by the AHCP. This area is currently 384,400 acres, and is subject to adjustment as Green Diamond buys and sells property. This area is located in portions of the following watersheds: Smith River, Lower Klamath River, Redwood Creek, Maple Creek, Little River, Mad River, Jacoby Creek, Freshwater Creek, Elk River, Salmon Creek, Van Duzen River and the Eel River.

II. CEQA FINDINGS OF FACT

As indicated in the Regional Board's August 1, 2012 Notice of Intent, in October 2006, the U.S. Fish & Wildlife Service and National Marine Fisheries Service issued an Environmental Impact Statement (EIS) covering the AHCP. Where, as here, a project requires compliance with both CEQA and the National Environmental Policy Act (NEPA), and the federal EIS is prepared first and meets the requirements of CEQA, CEQA provides that the state agency should use the EIS rather than preparing a separate EIR or negative declaration, pursuant to California Code of Regulations, title 14, section 15221. The NOI added any points of analysis not covered in the EIS but required under CEQA. For those aspects of the project for which the Regional Board is relying on the EIS, the Regional Board is the lead agency under CEQA , in connection with the proceeding to consider issuing WDRs and water quality certification for the Project. (Pub. Resources Code, §§ 21000-21177.) The Regional Water Board is a responsible agency under the California Environmental Quality Act (CEQA) with regard to its consideration of the IS/MND issued by the Department of Fish and Game

in support of its issuance of a MATO. The IS/MND analyzed activities carried out in riparian areas, stream crossings and roadways, including obstruction and sediment removal, vegetation removal, bank stabilization, maintenance of watercourse crossings, water drafting and diversion, deposition and disposal of material, decommissioning and instream restoration. While there is considerable overlap in the EIS and IS/MND, the Regional Water Board relies on both for the most complete and comprehensive impacts analyses.

CEQA requires that the lead agency make one or more of a set of three findings whenever an EIR identifies a significant effect on the environment. These findings are set forth in section 21081, subdivision (a) of the Public Resources Code:

(1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.

(2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.

(3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report. (See also Cal. Code Regs., tit. 14, §15091.)

When significant effects are subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment (Pub. Resources Code, § 21081, subd.(b)).

A public agency shall provide that measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures. Conditions of project approval may be set forth in referenced documents which address required mitigation measures or, in the case of the adoption of a plan, policy, regulation, or other public project, by incorporating the mitigation measures into the plan, policy, regulation, or project design. (Pub. Resources Code, § 21081.6, subd.(b).)

All of the potentially significant impacts identified in the EIS and IS/MND will be fully avoided or rendered less than significant by implementation of the AHCP measures, including identified mitigation measures, referenced in the EIS and IS/MND. These findings are made under Public Resources Code, section 21081, subdivision (a)(1). All measures are incorporated as conditions of Order R1-2012-0087 issued by the Regional Water Board to Green Diamond and, as applicable in the previous approved Road Management WDRs and the MATO. Further, as proposed by Green Diamond, all these measures are incorporated into the Project to avoid the significant environmental effects identified in the EIS and IS/MND. Green Diamond is responsible for carrying out these mitigation measures as well as monitoring and reporting under the WDRs.

Public Resources Code section 21081.6, subdivision (a) requires that if a public agency makes changes or alterations in a project to mitigate or avoid the significant adverse environmental effects of the project, it must adopt a monitoring or reporting program to ensure compliance with the changes or alterations. The Regional Board has imposed a number of conditions in the Order to protect and improve water quality, including incorporation of all the impact mitigation and avoidance measures included in the EIS and IS/MND. The Regional Water Board has adopted a monitoring and reporting program (MRPR1-2012-0088) for the Project pursuant to Water Code section 13267(b) and approval of the WDRs. This MRP will assess the implementation and effectiveness of the measures required under the Order and provide feedback for adaptive management. The MRP also implements the monitoring and reporting requirements under Public Resources Code section 21081.6, subdivision (a).

Geology, Geomorphology, and Mineral Resources

Impact 1: Implementation of the project could adversely impact surface erosion, hillslope mass wasting, bank stability, and road-related sediment production.

Potential adverse impacts to geology and geomorphology include acute or chronic changes in geomorphic and hydrologic processes that affect soil productivity and delivery of surface materials to streams and rivers. Potential impacts could be localized or dispersed over a wide area. The primary processes with the potential to result in impacts to geology and geomorphology and deliver sediment to watercourses are:

- Surface erosion
- Hillslope mass wasting
- Reduced bank stability
- Road related sediment production

Geomorphology and geologic impacts include movement of surface materials, including soils, weathered rock, and sediment (i.e., hillslope mass wasting). When delivered to streams, these materials can affect water quality (see Section 4.3, Hydrology and Water Quality) and fish habitat (see Section 4.4, Aquatic Resources). In the past, sediment inputs to stream networks resulted from existing roads, implementation of THPs, natural conditions, and legacy conditions. Excessive sediment, both coarse and fine has resulted in significant adverse effects to watercourses. Future management-related sediment delivery to impaired streams above existing levels could prolong the time required for recovery of habitat. Mineral-resource depletion, fire-prevention and fire-suppression activities, and earthquakes or volcanic eruptions would have no or negligible direct or indirect impacts.

A number of ownership-specific AHCP measures (described in Mitigation Measures 1-4 below) are required to minimize and mitigate the individual and cumulative impacts of forest management activities on geology and geomorphology and to reduce sediment inputs**.**

Implementation of Mitigation Measures 1-4 will reduce geologic and geomorphologic impacts to a less-than-significant level.

Mitigation Measure 1: Implement the AHCP Measures Directed at Surface Erosion

To address potential impacts on surface erosion, Green Diamond must implement riparian conservation measures, harvest-related ground disturbance measures, and the Road Management Plan.

Riparian Management Zone (RMZ) management prescriptions in the AHCP are designed to impede sediment delivery in areas where sediment has relatively short transport distances to watercourses. These measures include minimum overstory canopy-retention standards within the inner and outer zones of the RMZ, limitations on equipment use, and retention of trees judged to be critical to maintaining bank stability. Vegetation is well documented as an effective means of erosion prevention and control because it absorbs the impact of rain drops, reduces runoff velocity, increases water percolating into the soils, and binds soils with roots (Goldman et al., 1986; Gray and Sotir, 1996). Vegetative buffers are also effective in preventing or impeding eroded sediment from reaching watercourses. Vegetative buffers on toe slopes have also been observed to intercept sediment from upslope landslides. Modified Tier A Class Ill protection measures will reduce ground disturbance, retain bank stabilizing vegetation, and retain vegetative over-story and ground cover. These measures are similar in type and scope to the RMZ and surface erosion measures in the AHCP (i.e., the measures consist of varying RMZ widths, restrictions on ground disturbance, and vegetation retention requirements). Application of these measures further reduce the level of surface erosion, bank destabilization, and, ultimately, delivery of fine sediment to stream channels and aquatic habitat, in areas with highly erodible soil types.

Harvest-related ground disturbance conservation measures are designed to minimize management-related surface erosion. In particular, there are operational restrictions on silvicultural and logging activities during those time periods when timber operations have a greater potential for sediment delivery to watercourses. The time period restrictions allow only those harvest activities with relatively low ground disturbance (and associated low potential for surface erosion), such as shovel logging and skyline and helicopter yarding, to be conducted during the winter period. Those harvest activities that have the potential to create more ground disturbance (e.g., skid trail construction and mechanized site preparation) are limited to the summer period, with some activities (e.g., ground-based yarding with tractors, skidders, or forwarders) extending into the early spring or late fall if certain favorable climatic conditions occur. More closely spaced waterbreaks are required on highly erodible soil types upslope of RMZs or Equipment Exclusion Zones (EEZs) where skyline yarding roads require treatment. In addition, some harvest-related ground disturbance measures focus on minimizing ground disturbance and the associated exposure of bare mineral soil within harvest units.

Road-related conservation measures are designed to reduce road-related sediment production and delivery to streams. In particular, the road measures increase the estimated proportion of hydrologically disconnected roads to 93 percent. The measures also place strict wet weather restrictions on road use, construction, upgrading and decommissioning. The MATO and Roads WDR also contain specific erosion control measures designed to minimize and prevent sediment from entering watercourses during and following road treatment activities.

These measures are specified in AHCP Sections 6.2.1, 6.2.3, 6.2.4, MATO Section 11.A.6 and incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 2: Implement the AHCP Measures Directed at Hillslope Mass Wasting

To address potential impacts on hillslope mass wasting, Green Diamond must implement riparian conservation measures and slope stability measures. The slope stability measures are intended to reduce landslide occurrences and sediment production from landslides associated with steep streamside slopes, headwall swales, and active deep-seated landslides.

The riparian conservation measures and the steep stream slope prescriptions address stream-side landslides. Timber harvesting is prohibited within the inner zone of all Class I RMZs and 2nd order or larger Class II RMZs that are located below designated steep streamside slope management zones (SMZs), except for purposes of creating cable-yarding corridors when other options are impractical. RMZ areas located below an SMZ are referred to as Riparian Slope Stability Management Zones (RSMZs) in the AHCP. Retention of a minimum 85 percent overstory canopy closure is required in Class I and 2nd order or larger Class II outer zones where RSMZs have been established. Limited timber harvesting is permitted within the first 1,000 feet of a 1st order Class II RSMZ inner zone subject to 85 percent overstory canopy closure retention post-harvest. A minimum 75 percent canopy retention within the first 1,000 feet of a 1st order Class II RSMZ outer zone is also required. Single-tree selection is the initial default silvicultural prescription within designated SMZs. One commercial harvesting entry is permitted within SMZs for the term of the AHCP, except where cable corridors are necessary to conduct intermediate treatments. If cable corridors through SMZs are necessary to conduct intermediate treatments (e.g. commercial thinning) in adjacent stands prior to even-aged harvest, the restrictions in AHCP/CCAA Section 6.2.2.1.7 apply except harvesting of trees in the SMZs are limited to cable corridors only. Any cable roads established in the SMZ as part of the intermediate treatment are, to the extent feasible, reused during the even-aged entry in the adjacent stand. All hardwoods within SMZs are retained with unharvested conifers evenly distributed, wherever possible, such that all species and size classes represented in pretreatment stands are generally represented post-harvest. Applied in areas with highly erodible soil types, the modified Tier A Class Ill protection measures require an EEZ width of 30 feet with 15 square feet of basal area of hardwoods and all channel zone trees retained. Tier B Class III watercourse

have an EEZ with of 50 feet with 100% hardwood retention and one conifer retained every 50 feet of stream length.

In high-risk headwall swales, single-tree selection is the initial default silvicultural prescription. All hardwoods within headwall swales are retained with unharvested conifers evenly distributed, wherever possible, such that all species and size classes represented in pretreatment stands are generally represented post-harvest. Only one commercial harvesting entry is permitted within headwall swales for the term of the AHCP.

Active deep-seated landslides are provided with not-cut zones on the toe and 25 feet upslope from the top of the toe, except for purposes of creating cable-yarding corridors when other options are impractical. No-cut zones are also established upslope of the scarp of deep-seated landslides. The body of active deep-seated landslides are evaluated by a California Professional Geologist.

Harvesting is prohibited within the boundaries of shallow rapid landslides and a minimum 70 percent overstory canopy buffer is retained within 50 feet above and 25 feet on the sides of the slide.

During THP development RPFs survey the THP area to determine whether portions of plan meet the CFPR definition of unstable areas. Additionally RPFs determine if portions of the THP area contain headwall swales, steep streamside slopes, deep-seated landslides or shallow rapid landslides.

RPFs do one of the following when he or she determined that any portion of the THP met the definition of a steep streamside slope; headwall swale; deep-seated landslide or shallow rapid landslide:

- Impose the default prescription applicable to that feature as set forth above, or
- Retain a California Professional Geologist to:
  - Evaluate the likelihood that timber harvesting operations will cause, or significantly elevate the risk of causing or reactivating, landslides within these areas that will likely result in sediment delivery to watercourses; and
  - Work with the RPF to prepare a more cost-effective, site-specific alternative to the default prescription designed to minimize that likelihood and minimize and mitigate potentially significant impacts on aquatic species from sediment delivery resulting from landslides caused or exacerbated by timber harvest operations. Alternative prescriptions can be applied to any of these areas except RSMZs. A qualified biologist is involved in evaluating the potential biological consequences whenever a more cost effective alternative to the default prescription is proposed.

The alternate approach could be applied to portions of any SMZ outside of RMZs, field verified headwall scarps, deep-seated landslides or shallow rapid landslides. THPs for which a geologic report has been prepared (and whose conclusions allow for measures other than those specified in the AHCP) are identified as such when submitted for review by CDF and other agencies, including the Regional Water Board. A THP map and letter of

notice that describes the alternative prescriptions are sent to the Services when a THP with alternative prescriptions is proposed.

The goal of the slope stability conservation measures in the AHCP is to reduce management-related landslide occurrences and associated sediment loads, which will minimize the possible effects of management-related sediment input on aquatic species from mass-soil movement. Tree retention in SMZs and associated RSMZs, headwall swales, deep-seated landslides, and shallow rapid landslides is expected to maintain a network of live roots that will preserve soil cohesion and contribute to slope stability in these areas. Tree retention also is expected to help maintain forest canopy, which will preserve some measure of rainfall interception and evapotranspiration. Maintenance of rainfall interception and evapotranspiration is expected to contribute to slope stability conditions in some locations by minimizing the likelihood of management-induced high ground water ratios. Limited road construction and road reconstruction on unstable slopes and in RMZs will likely result in avoiding or reducing the undercutting and overburdening of sensitive hill slopes and help avoid unnatural concentration of storm runoff on these slopes. The application of more conservative SMZ prescriptions in HPAs more susceptible to hillslope mass wasting, plus the avoidance or limitation of timber harvesting in certain landslide-prone areas, will result in a reduced potential for sediment delivery to streams in the area covered by the AHCP. On this basis, the measures in the AHCP are anticipated to result in improvements in water quality.

These measures are specified in AHCP Sections 6.2.1 and 6.2.2 and incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 3: Implement the AHCP Measures Directed at Bank Stability

To address potential impacts on bank stability, Green Diamond must implement the riparian conservation measures.

The riparian conservation measures for Class I and II watercourses require retention of 85 percent overstory canopy closure in the RMZ inner zone and prohibit harvesting of trees that are likely to recruit to stream channels. Tier B Class-III measures require retention 100% hardwood retention and trees that are judged to be critical to maintaining bank stability and Modified Tier A Class Ill protection measures require the retention of 15 square feet of basal area of hardwoods and all channel zone trees. Collectively these riparian conservation measures will likely lead to increased bank stability. In addition, implementation of the general riparian conservation measures in the AHCP is expected to contribute to streambank stabilization.

These measures are specified in AHCP Sections 6.2.1 and incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 4: Implement the AHCP Measures Directed at Road-related sediment production

To address potential impacts on road-related sediment production, Green Diamond must implement the measures described in the AHCP Road Management Plan and Roads WDR.

Road-related surface erosion and road-related mass wasting are recognized as major contributors to the sediment budget in most managed watersheds. The AHCP includes road management conservation measures for both new and existing roads to address potential road-related sediment production. The AHCP provides a methodology to classify roads on the basis of use and to prioritize road work and site-specific repairs. The road conservation measures improve the standards for general road repairs and upgrades and improve the design standards for stream crossings. The standards for temporary and permanent road decommissioning are also improved under the AHCP. A training program is required for equipment operators and supervisors on the Road Management Plan and other AHCP/CCAA standards and practices to ensure familiarity with the measures. Green Diamond is required to provide $2.5 million (inflation adjusted) per year for 15 years to accelerate the repair of high-and moderate-risk sediment delivery sites across the area covered by the AHCP. All high and moderate-risk sediment delivery sites must be treated by the end of AHCP term. The road-related conservation measures also increased restrictions on wet weather road use, construction, upgrading, and decommissioning.

These road-related measures are specified in AHCP Sections 6.2.3 and MATO Section 11 and incorporated in the Roads WDR, Order R1-2012-0087 Condition II.D.

Cumulative effects. The cumulative impact of implementing all these measures on erosion and sediment control under the AHCP would be an improvement of aquatic resources and riparian habitat conditions in each of the 11 Hydrographic Planning Areas over time. The Road Management Plan and the accelerated road sediment site repair provide the greatest sediment control benefits among the AHCP sediment conservation measures. Implementing the AHCP (as well as the requirements of the MATO, Roads WDR and IS/MND) will incrementally reduce adverse conditions associated with on-going and past land management activities.

Hydrology and Water Quality

Impact 2: Implementation of the project could adversely impact hydrology, water temperature and sediment control.

The EIS evaluated the potential impacts of expected changes in watershed characteristics on hydrology and water quality as a result of implementing forest management activities under the AHCP. The primary water quality parameters of concern for the evaluation were suspended sediment, turbidity, and water temperature. The EIS identified the following potentially significant impacts:

Increases in summertime stream temperatures can adversely affect the salmonid and aquatic species by reducing growth efficiency, increasing disease susceptibility, changing the age of smoltification, causing loss of rearing habitat, and shifting the competitive advantage of salmonids over non-salmonid species. Decreases in water temperatures are beneficial to aquatic resources. Stream temperatures can be affected by direct shading, reduced surface and groundwater flows and sediment disposition and can affect the survival and/or reproduction of both salmonids and amphibians.

Hydrology in forested areas can be affected by peak flows during storm events that can cause scour, alter channel morphology, and cause flooding. Alteration of snow pack, enhancement of runoff throughout timber harvest units or along roads, interception of groundwater flows by roads, and alteration of evapotranspiration through changes in forest structure all have the potential to affect hydrology. In particular, snow buildup in logged areas above 2,000 feet elevation and subsequent melting during rainstorms (known as rain-on-snow events) results in enhanced flows and increased potential for erosion. Summer base flows could increase in logged versus unlogged areas in the short term and return to pre-harvest conditions within a few years. Excessive sediment input can fill pools, eliminate spawning gravels, decrease channel stability, increase nutrient and contaminant loads, and modify overall channel morphology. Sediment input is important in directly affecting fish and fish spawning success but is also useful as a surrogate for changes in concentrations of sediment-associated contaminants (primarily metals and many pesticides) and nutrient input.

The AHCP includes a number of ownership-specific measures (described in Mitigation Measures 5-7 below) to minimize and mitigate the individual and cumulative impacts of forest management activities on hydrology and water quality. Implementation of Mitigation Measures 5-7 will reduce hydrologic and water quality impacts to a less-than-significant level.

Mitigation Measure 5: Implement the AHCP Measures Directed at Hydrology

To address potential impacts on hydrology, Green Diamond must implement riparian conservation measures, slope stability conservation measures, road management measures and harvest-related ground disturbance measures.

Through the road upgrading and decommissioning program, it is anticipated that 93 percent of the road network will be hydrologically disconnected from area watercourses. Mitigation measures such as hydrologic disconnects, cross-drains, rolling dips, and outsloping, reduce the amount of concentrated surface runoff at any point along the road surface. As these measures are implemented, water from inboard ditches is dispersed onto the forest floor where it infiltrates and reduces the potential effects on peak flows and sediment delivery associated with road network runoff.

In general, harvest-related ground disturbance can cause soil compaction and result in reduced infiltration capacity of soils and altered subsurface water movement, leading to increased surface runoff. The riparian conservation measures require Equipment Exclusion Zones (EEZs) that result in a reduction of locations potentially exposed to soil compaction from use of heavy equipment. In addition, for those areas in which heavy equipment is used, site preparation measures (including seasonal operating limitations for tractors, skidders, and forwarders, and minimized use of tractor and-brushrake piling) will reduce potential for ground compaction related to covered activities compared to pre-AHCP conditions. These harvest-related ground disturbance prevention/conservation measures are expected to reduce: (1) adverse impacts of operations-related alterations in hydrology (by minimizing soil compaction that can increase the magnitude of peak flows) and (2) the volume of sediment available for runoff during peak flow events.

The slope stability conservation measures will result in a greater reduction in sediment delivery from steep streamside slopes and unstable areas than forest operations without these measures by avoiding new road construction on these features or by substantial upgrades of existing roads already located on these features. In addition, tree retention in these and other potentially unstable areas will preserve rainfall interception and evapotranspiration.

The riparian conservation measures maintain in-channel large woody debris (LWD) and provide increased potential for LWD recruitment. The presence of LWD in stream channels aids in pool formation, and sediment storage and sorting. Increased LWD recruitment and the volume of LWD are expected to improve aquatic habitat and stream substrate conditions.

Conservation measures under the AHCP are anticipated to minimize the potential impacts that could otherwise result from altered hydrology. They will reduce the impacts of forest management on surface runoff and peak flows, reduce soil compaction and disturbance, and maintain or enhance in-channel LWD. Adverse impacts to hydrology and water quality that would occur will be minimized by the improved riparian conditions resulting from riparian management and decreased sediment production and delivery.

These measures are specified AHCP Sections 6.2.1, 6.2.2, 6.2.3 and 6.2.4 and MATO Section 11. All these measures are incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 6: Implement the AHCP Measures Directed at Water Temperature

To address potential impacts on water temperature, Green Diamond must implement riparian conservation measures, road management measures and the slope stability measures.

The riparian conservation measures have overstory canopy closure requirements and tree retention standards that are more protective overall than those implemented prior the AHCP approval. The minimum width of RMZs on Class I (fish bearing) watercourses is 150 feet with 85% overstory canopy retention in the inner zone (50-70 feet depending on slope class) and 70% overstory retention in the remaining outer zone. Class II watercourses have a minimum buffer width of 75-100 feet with 85% overstory canopy retention in the inner zone (30 feet) and 70% on the remaining outer zone.

Implementation of riparian measures will help to maintain stream shading in the critical "inner zone" where microclimate effects are anticipated to have the greatest potential to affect water temperatures. Overall, overstory canopy closure, while expected to slightly decrease in the short term following harvesting is likely to increase in all stands as they regenerate following timber harvesting. The overall increase in overstory canopy closure is anticipated to result in slight decreases in water temperatures in streams. Any increase in water temperature that might occur in any individual location is expected to be slight and less than significant.

Reduced sediment delivery as a result of implementing the road management measures, the slope stability measures and the MATO, also could indirectly contribute to minor decreases in water temperature. Sediment input, particularly increases in fine sediment, can affect stream temperatures through changes in channel morphology such as reduced pool volume and increased channel width. With the slope stability and road management measures designed to minimize management-related sediment inputs, sediment production and delivery will be reduced. relative to existing conditions and conditions prior to AHCP implementation.

These measures are specified in AHCP Sections 6.2.1, 6.2.2 and 6.2.3 and MATO Section 11 and are incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 7: Implement the AHCP Measures Directed at Sediment Control

To address potential impacts on sediment control, Green Diamond must implement riparian conservation measures, slope stability measures, road management measures, and harvest-related ground disturbance measures.

The riparian conservation measures are designed to impede sediment delivery in areas where sediment has relatively short transport distances to watercourses. These measures include increased overstory canopy retention standards within RMZs, limitations on equipment use, retention of trees likely to recruit as LWD, and retention of trees that contribute to maintaining bank stability. Implementing the retention standards is expected to result in almost no loss in total forest canopy in the inner zone of RMZs along Class I and Class II watercourses, and is anticipated to increase overstory canopy along Class II watercourses. This overstory canopy impedes sediment mobilization in these critical areas, where sediment has relatively short transport distances to watercourses. On this basis, the

measures associated with the AHCP are anticipated to result in reductions in sediment delivery.

Harvest-related ground disturbance conservation measures focus on minimizing ground disturbance and exposure of bare mineral soil within harvest units. These measures include: (1) site-specific site preparation methods, (2) limited operating periods for the construction of skid trails and use of ground-based yarding equipment, (3) limiting use of ground-based yarding equipment that requires constructed skid roads to slopes less than or equal to 45 percent (with some exceptions), (4) preferential use of cable yarding systems, and (5) water-barring of cable corridors, where necessary. All of these ground disturbance conservation measures will minimize the potential for soil compaction and management related surface erosion within harvest units.

Sediment production from hillslope mass wasting is greatest in steep streamside slopes, headwall swales, and deep-seated landslides. These areas are subject to default slope stability conservation measures intended to reduce landslide occurrences and associated sediment production. The implementation of the AHCP results in these sensitive areas receiving additional protection by establishing slope management zones (SMZs) upslope of the RMZ along Class I and Class II watercourses. The width of the SMZ vary among the 11 HPAs, with wider more conservative SMZs identified for those HPAs with the potential deliver sediment from the longer locations from watercourses. Single tree selection harvest is the most intensive silvicultural prescription allowed within the SMZ and no harvesting is allowed in the inner portion of the RMZ downslope of the SMZ (i.e., the RSMZ) along Class I and larger Class II watercourses. In addition, no harvest is allowed within the toe and 25 feet upslope from the top of the toe or scarp of historically active deep-seated landslides. Alternative prescriptions to the default slope stability measures may be developed through site-specific review by a California registered geologist.

Tree retention in the SMZs and associated RSMZs is expected to maintain a network of live roots that will provide soil cohesion and contribute to slope stability in these areas. Tree retention also is expected to help maintain forest canopy, which preserves some measure of rainfall interception and evapotranspiration. Maintenance of rainfall interception and evapotranspiration is expected to contribute to slope stability conditions in some locations by minimizing the likelihood of high ground water ratios that are management related. Limited road construction and road reconstruction on unstable slopes and in RMZs will result in avoiding or reducing the undercutting and overburdening of sensitive hill slopes, helping to avoid unnatural concentration of storm runoff on these slopes. The implementation of SMZs (and the application of more conservative SMZ prescriptions in HPAs more susceptible to hillslope mass wasting) will reduce impacts because of reduced potential for sediment delivery to streams.

Road-related erosion and hillslope mass wasting are known to be substantial contributors to the sediment budget in most managed watersheds. The Road Management Plan and associated conservation measures in the MATO will reduce road-related sediment production and delivery to watercourses relative to pre-AHCP measures and existing

conditions. The Road Management Plan provides for accelerated repair of high- and moderate-risk sediment delivery sites on roads. The road-related conservation measures will reduce road-related sediment production and, therefore, result in benefits to the aquatic resources because of reduced potential for sediment delivery. AHCP measures emphasize strategic identification and classification of roads targeted for improvement. High- and moderate-risk sediment delivery sites will be addressed using an accelerated program.

Green Diamond has performed a general assessment of its ownership that identifies road-related sediment sources requiring treatment (e.g., stabilization of dirt or other remediation to prevent road-related, sediment-producing failures or hillslope mass wasting events). The Road Management Plan is designed to provide treatment of all high- and moderate-risk sediment delivery sites, and to minimize potential delivery of sediment to riparian and aquatic areas. In addition, the AHCP requires that Green Diamond provide an average of $2.5 million per year for the first 15 years of the AHCP (for a total of $37.5 million) to accelerate implementation of the treatments for the high- and moderate-risk sites. (The acceleration period is to be adjusted following revision of the estimate of sediment yield from high- and moderate-risk sediment delivery sites at the end of the first five years following issuance of the Permits. The acceleration period and monetary commitment could be adjusted (upward or downward) by up to 1.5 years and $3.75 million depending on the revised estimate of sediment yield.)

These measures are specified in AHCP Sections 6.2.1, 6.2.2, 6.2.3 and 6.2.4 and MATO Section 11 and incorporated in Order R1-2012-0087 Condition II.D.

Cumulative effects. Past timber management within the 11 HPAs had affected peak flows, water temperatures and sedimentation of streams. Changes in peak flows (timing and intensities) has resulted in additional water runoff throughout timber harvest units or along roads, the interception of groundwater flows by roads, and alteration of evapotranspiration through changes in forest structure. The normal hydrologic cycles for some of the HPAs have also been modified by dams, water diversions, development, and agriculture. These activities have resulted in adverse environmental conditions in some locations including insufficient stream flows, and have resulted in instances of increases in stream temperatures, stranded juvenile entrainment, and alterations to aquatic habitat.

Existing adverse conditions related to the hydrologic cycle are expected to improve. Implementation of the measures in the AHCP will result in an incrementally greater improvement in conditions. The most important measures will address road upgrading and decommissioning programs that would hydrologically disconnect the road network from area watercourses on a THP-by-THP basis (see AHCP Section 6.2.3), although incremental short-term and localized increases in the peak flows will likely occur in association with timber harvesting. AHCP measures will reduce the incremental impacts of forest management activities and result in improvements over what would occur under the No Action alternative.

Aquatic Resources

Impact 3: Forest management activities could adversely impact hydrology, riparian conditions, sediment production and delivery and aquatic habitat.

The EIS evaluated potential impacts of forest management activities on habitat and biota, including:

- Changes in peak flows that have the potential to affect channel morphology through bed scour and bank erosion
- Reduction (over time) in the amount of Large Woody Debris (LWD) that could be recruited into the watercourses, contributing to reduced sediment storage sites, and reduced pool numbers and volumes
- Removal of riparian vegetation, resulting in altered thermal regimes, changes in nutrient cycling, and destabilization of streambanks
- Increases in sediment supplies from surface erosion, hillslope mass wasting, and bank erosion, leading to channel aggradation, loss of pool volume, and degradation of spawning gravels

Such changes to the stream channel and associated riparian areas could adversely or beneficially affect the quantity and quality of aquatic habitat for aquatic species through changes in temperature, sedimentation, habitat complexity, and connectivity. These impacts are potentially significant.

The AHCP requires a number of ownership-specific measures (described in Mitigation Measures 8-12 below) to minimize and mitigate the individual and cumulative impacts of forest management activities on aquatic resources. **Implementation of Mitigation Measures 8-12 will reduce potential impacts on aquatic resources to a less-than-significant level.**

Mitigation Measure 8: Implement the AHCP Measures Directed at Hydrologic Effects

To address potential impacts on aquatic resources, Green Diamond must implement riparian conservation measures, road management measures and harvest-related ground disturbance measures.

Under the harvest-related ground disturbance measures, there are greater seasonal operating limitations that minimize soil compaction. This could decrease the magnitude of peak flows and the volume of sediment available for runoff during such events. The road treatment accelerated period associated with the road management plan will increase the rate at which roads will be hydrologically disconnected from the watercourses. The riparian management measures will also increase LWD recruitment. Over time these measures will increase the amount of LWD in streams, ultimately increasing the

overwintering habitat for juvenile salmonids. This could avoid species displacement that can be caused by altered hydrology by providing increased habitat options for salmonids.

Harvest-related ground disturbance can reduce the infiltration capacity of soils and alter the process of subsurface water movement through soil compaction, leading to increased surface runoff. Site preparation measures include seasonal operating limitations for tractors, skidders, and forwarders, and minimized use of tractor-and-brushrake piling. These harvest-related ground disturbance conservation measures substantially reduce the impacts of any operations-related alterations in hydrology by minimizing soil compaction, which can increase the magnitude of peak flows and reduce the volume of sediment available for runoff during peak flow events.

Riparian conservation measures reduce potential impacts of altered hydrology on aquatic habitat. Specifically, the riparian conservation measures maintain in-channel LWD and provide increased LWD recruitment potential through enhanced riparian conservation measures. The presence of LWD in stream channels aids in pool formation, sediment storage and sorting, provides refugia from peak flows, and maintains overwintering habitat for anadromous and resident salmonids and other fishes.

Conservation measures reduce the impacts of forest management on surface runoff and peak flows, reduce soil compaction and disturbance, and maintain or enhance in-channel LWD. Any impacts to aquatic habitat that could occur are mitigated by improved riparian conditions resulting from riparian management and decreased sediment production and delivery.

These measures are specified in AHCP Sections 6.2.1, 6.2.3, and 6.2.4 and are incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 9: Implement the AHCP Measures Directed at Improving Riparian Conditions

To mitigate or avoid potential impacts on riparian conditions, Green Diamond must implement the AHCP's riparian conservation measures and slope stability measures.

The AHCP limits commercial entry into the RMZs to one harvest entry during the term of the AHCP, except where cable corridors are necessary to conduct intermediate treatments. The RMZs are at least 150 feet wide along Class I watercourses, with a variable-width inner zone ranging from 50 to 70 feet. The AHCP limits harvesting to only those trees that have a low likelihood of recruitment within Class I RMZs. The AHCP also establishes SMZs upslope of Class I watercourses in areas identified as steep streamside slopes.

Minimum 100-foot-wide RMZs are established along 2nd order or larger Class II watercourses; minimum RMZ width along 1st order Class II watercourses are 75 feet. The RMZ contains a 30-foot wide inner zone for Class II watercourses within which 85 percent

of the overstory canopy is retained post-harvest; at least 70 percent overstory canopy is retained within the outer zone of Class II RMZs. The AHCP limits harvesting to only those trees that have a low likelihood of recruitment within the first 200 feet of Class II RMZs adjacent to a Class I RMZ. The AHCP also establishes SMZs upslope of Class II watercourses in areas identified as steep streamside slopes.

Overall, the AHCP provides riparian protection along Class III watercourses by establishing minimum 30- to 50-foot-wide EEZs. Within the EEZ of Tier A (less than 60 percent to 70 percent slopes) Class III watercourses, all existing LWD on the ground is retained and there is no fire ignition during site preparation. Within the EEZ of Tier B (greater than 60 percent to 70 percent slopes) Class III watercourses, all hardwoods and nonmerchantable trees are retained, as are all conifers that contribute to bank stability or act as a control point (retaining sediment or preventing headcutting) in the channel; at least one conifer per 50 feet of stream length is retained. Within the EEZ of modified Tier A (applied in areas with highly erodible soil types) Class III watercourses, 15 square feet of basal area of hardwoods and all channel zone trees are retained.

Overall, the riparian conservation measures under the AHCP provide greater protection of riparian functions such as LWD recruitment, stream shading, sediment filtration, bank stability, and nutrient input. These measures contribute to maintenance and development of a more suitable microclimate for amphibians and other species that use habitats along streams, and benefit habitat used by the various life stages of fish species present in streams. The protection measures and the effects of these additional protections provided under the AHCP on individual riparian functions and related aquatic functions are described below.

LWD Recruitment:
The overstory canopy closure requirements and tree retention standards will help to increase the potential for LWD recruitment so that in-channel LWD loading and size is likely to increase in the future. Whether such an increase will occur within a given stream reach depends on the current condition and trend of existing LWD levels, and the length of time necessary to recruit additional wood to streams from adjacent riparian areas. For example, if little or no recruitment of wood has occurred recently, and existing pieces of wood are decaying or being washed out of a stream reach, in-stream levels of wood could continue to decline for some time, despite the fact that riparian management provides an increase in sources of future LWD and thereby increased potential for wood recruitment in the future.

The AHCP is expected to provide additional LWD recruitment by retaining at least 15 conifer stems greater than 16 inches dbh per acre. All trees within the inner zone of RMZs along Class I streams and portions of Class II streams that are determined to be likely to recruit LWD to the stream channel are retained. Numerous criteria are used to identify trees with a low likelihood of recruitment to the watercourse as potential candidates for harvesting within the RMZ. These criteria include, but are not restricted to, distance from the stream, direction of the tree lean, intercepting trees, side slope gradient, slope stability,

and streambank stability. The riparian conservation measures ensure that all trees with the greatest potential for LWD function (e.g., that can influence fluvial processes or provide cover for fish) are retained. The limitation to a single commercial harvest entry into the RMZ (except where cable corridors are necessary for intermediate treatments) ensure that this additional LWD recruitment potential will be maintained.

Riparian conservation measures will minimize and mitigate impacts of past practices and improve LWD recruitment in streams. These measures will help to maintain and improve channel complexity and provide habitat necessary for all life stages of salmonids and amphibians. Implementation of these riparian conservation measures will result in increased tree retention and LWD recruitment that will help mitigate effects of altered hydrology that could occur as a result of upslope management.

Stream Shading:
Overstory canopy closure requirements and tree retention standards help to maintain stream shading in the critical "inner zone" where microclimate effects have the greatest potential to impact amphibians directly or impact anadromous and resident salmonids indirectly through changes in water temperatures. Although the inner zone width along Class I watercourses is slightly less under the AHCP than pre-AHCP measures, the effects on microclimate and stream temperatures are not expected to be substantially different. Overstory canopy closure will likely increase over current conditions in all stands as they regenerate after timber removal and could temporarily decline slightly following harvesting in the future. In some stands there could be an immediate net reduction of overstory canopy closure of up to approximately 15 percent to 20 percent following timber harvest in the outer zone that will be replaced within 5 to 10 years by recovery of the remaining tree crowns. On average, the average-sized harvest unit (currently about 25 acres) can influence approximately 1,000 feet of watercourse if the unit surrounds or is adjacent to a watercourse.

On the basis of the minimal changes in temperature under the most extreme annual conditions, and the anticipated substantial increase in riparian protection under the AHCP, a measurable increase in water temperature in Class I or larger Class II streams caused by minor reductions in canopy closure following timber harvesting is not anticipated. Limiting entry (i.e., a single commercial entry during the term of the Permits except where cable corridors are necessary for intermediate treatments) into the RMZ will further reduce any potential minor impact from any slight temperature increases. Any increase in water temperature will be slight and less than significant. Stream temperatures will be maintained or improved.

Sediment Filtration:
Although sediment can be delivered to streams from outside of the riparian zone, maintenance of riparian buffers aids in filtering overland sediment flow and helps to minimize direct sediment inputs from or through the riparian zone. Exclusion of heavy equipment and mechanical site preparation within Class I and Class II RMZs, plus exclusion of heavy equipment in Class III EEZs, minimize the level of ground disturbance that occurs

adjacent to watercourses. Maintaining at least 50 percent surface cover and treating bare soil in excess of 100 square feet minimizes the potential for management-related sediment delivery from within the RMZs along Class I and Class II watercourses. The RMZs are at least 150 feet wide along Class I watercourses, with a variable-width inner zone ranging from 50 to 70 feet within which 85 percent of the overstory canopy is retained post-harvest; at least 70 percent overstory canopy is retained within the outer zone of Class I RMZs. Minimum 100-foot-wide RMZs are established along 2nd order or larger Class II watercourses; minimum RMZ width along 1st order Class II watercourses are 75 feet. The RMZ has a 30-foot wide inner zone for Class II watercourses within which 85 percent of the overstory canopy is retained post-harvest; at least 70 percent overstory canopy is retained within the outer zone of Class II RMZs. LWD recruitment helps minimize the effects of sediment production and delivery by providing in-channel LWD, which functions to sort and increase the storage of sediment within stream channels. All of these improved functions will benefit aquatic and riparian habitat used by aquatic species.

Streambank Stability:
Management-induced erosion and hillslope mass wasting from watercourse banks can be amplified by increased peak flow intensity and duration, as well as by reductions in root reinforcement of soil cohesion when vegetation is removed. Riparian conservation measures for Class I and II watercourses require 85 percent overstory canopy retention in the RMZ inner zone and prohibit harvesting of trees that are likely to recruit to stream channels. In addition, Tier B Class-III measures require retention of trees that are judged to be critical to maintaining bank stability. The current FPRs also require that removal of trees may not result in any measurable decrease in the stability of a watercourse bank.

Nutrient Input:
Riparian conservation measures favor conifer retention over hardwoods in the RMZs. The level of harvest in both the inner and outer zones of all RMZs will maintain the overstory canopy, so that the longer-lived conifers will eventually replace the short-lived hardwoods. In the long term, this is anticipated to reduce the level of nutrient inputs, although such a process will be slow and gradual, and will not result in complete elimination of hardwoods or complete elimination of insufficient levels of nutrient input from riparian areas where it already exists.

Aggradation of channels and scour from debris flows favor recolonization by the more rapidly growing hardwoods such as red alder. Therefore, both the slope stability and road management measures will tend to cause a decline in riparian hardwoods over time and a corresponding decrease in nutrient inputs. However, as noted above, this will be a long and gradual process that will not result in the total elimination of hardwoods.

It is anticipated that any effects on aquatic species and their habitats will be minimal (i.e., less than significant) and mitigated by the benefits of increased LWD recruitment through the retention of conifers. This is particularly relevant where structural elements of aquatic habitat are more limiting than nutrient availability.

These measures are specified in AHCP Sections 6.2.1 and 6.2.2 and incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 10: Implement the AHCP Measures Directed at Sediment Production and Delivery.

To address potential impacts on sediment production and delivery, Green Diamond must implement riparian conservation measures, slope stability measures, road management measures, and harvest-related ground disturbance measures.

Sediment production and delivery to streams will be reduced. Potential benefits associated with reduced sediment loading, include, among others, increased quantity and quality of suitable salmonid spawning gravels, greater survival of salmonid eggs and alevins in the gravels, and increased production of aquatic invertebrates that serve as foods for fish and other species.

Reduced sediment delivery to streams also could contribute to small decreases in water temperature. Sediment input, particularly increases in fine sediment, can affect stream temperatures through changes in channel morphology such as reduced pool volume and increased channel width. With the slope stability and road management measures designed to minimize management-related sediment inputs, sediment production and delivery will be reduced.

Sediment production from surface erosion is of most concern on slopes that are adjacent to watercourses, although erosion does occur higher on the hillslopes and within harvest units. The RMZ management prescriptions include conservation measures designed to impede sediment delivery in areas where sediment has relatively short transport distances to watercourses. These measures include minimum overstory canopy retention standards within RMZ inner and outer zones, limitations on equipment use, and retention of trees judged to be critical to maintaining bank stability. The retention standards ensure that there will be almost no net loss in total forest canopy in the inner zone of RMZs along Class I and Class II watercourses, and will greatly increase overstory canopy along Class II watercourses relative to existing conditions. This overstory canopy will impede sediment detachment in these critical areas, where detached sediment will have relatively short transport distances to watercourses.

Also, harvest-related ground disturbance measures focus on minimizing ground disturbance and the exposure of bare mineral soil within harvest units. The AHCP contains conservation measures, including site preparation methods, limited operating periods for the construction of skid trails and use of ground-based yarding equipment, limiting use of ground-based yarding equipment that requires constructed skid roads to slopes less than or equal to 45 percent (with some exceptions), preferential use of cable yarding systems, and water-barring of cable corridors where necessary. The AHCP also includes conservation measures for treatment of bare mineral soil within RMZs and on stream

crossings. All of these ground disturbance conservation measures are expected to contribute directly to minimizing management related surface erosion within harvest units.

Sediment production from hillslope mass wasting is greatest in RMZs, steep streamside slopes, headwall swales, and deep-seated landslides. These areas are subject to specific slope stability conservation measures intended to achieve a reduction in management-related sediment delivery from landslides. Steep streamside slopes receive additional protection through establishment of SMZs upslope of the RSMZ along Class I and Class II watercourses. The width of the SMZ varies among the 11 HPAs, with wider SMZs identified for those HPAs with potential to deliver sediment to watercourses from the longest distances. Selection harvest is the most intensive silvicultural prescription allowed within the SMZ without geologic review, and no harvest is allowed in the inner portion of the RMZ downslope of the SMZ along Class I and larger Class II watercourses. In addition, no harvest is allowed within the toe and 25 feet upslope from the top of the toe or scarp of active deep-seated landslides without geologic review.

Tree retention in the SMZs and associated RSMZs is expected to maintain a network of live roots that will preserve soil cohesion and contribute to slope stability in these areas. Tree retention also helps maintain forest canopy, which preserves some measure of rainfall interception and evapotranspiration. Maintenance of rainfall interception and evapotranspiration is expected to contribute to slope stability conditions in some locations by partially mitigating high ground water ratios that may be management related. Limited road construction and road reconstruction in SMZs and RSMZs are expected to reduce the undercutting and overburdening of sensitive hillslopes and help avoid unnatural concentration of storm runoff on these slopes.

The riparian conservation measures for Class I and II watercourses that require 85 percent overstory canopy retention in the RMZ inner zone, and that prohibit harvesting of trees that are likely to recruit to stream channels, will likely lead to increased bank stability. The Tier B Class-III measures that require retention of trees determined to be critical to maintaining bank stability will also contribute to increased bank stability.

Road-related erosion and hillslope mass wasting are known to be important contributors to the sediment budget in most managed watersheds. Eroded sediment can be delivered to watercourses through gullies or rills or through sheet transport processes from roads or through hillslope mass wasting. The Road Management Plan and associated conservation measures in the MATO will reduce road related sediment production and delivery to watercourses relative to pre-AHCP measures.

The Road Management Plan includes:

- A methodology to classify roads on the basis of use and prioritize road work and site-specific repairs
- Standards for road repairs and upgrades
- Standards for stream crossing, culvert repairs and upgrades

- Standards for temporary and permanent decommissioning of roads
- A training program for equipment operators and supervisors on the Road Management Plan and other AHCP standards and practices
- An accelerated repair of high-and moderate- risk sediment delivery sites
- A commitment to address all of the high- and moderate-risk sites by the end of the term of the AHCP
- Increased restrictions on wet weather road use, construction, upgrading, and decommissioning

Green Diamond has performed a general assessment of its ownership within the AHCP covered area that identifies road-related sediment sources requiring treatment (e.g., stabilization of dirt or other remediation to prevent road-related, sediment-producing failures or hillslope mass wasting events). The Road Management Plan is designed to provide treatment of all high- and moderate-risk sediment delivery sites over the term of the Permits, to minimize potential delivery of sediment to riparian and aquatic areas. In addition, the AHCP requires that Green Diamond provide an average of $2.5 million per year for the first 15 years of the AHCP (for a total of $37.5 million) to accelerate implementation of the treatments for the high- and moderate-risk sites. Implementation of the Road Management Plan will result in improved sediment control by accelerating the reduction of sediment loading. This will result in direct beneficial effects to aquatic and riparian species.

These measures are specified in AHCP Sections 6.2.1, 6.2.2, 6.2.3 and 6.2.4 and MATO Section 11 and incorporated in Roads WDR Order R1-2012-0087 Condition II.D.

Mitigation Measure 11: Implement the AHCP Measures Directed at Protecting and Improving Aquatic Habitat.

To address potential impacts on aquatic habitat, Green Diamond must implement riparian conservation measures, slope stability measures, road management measures, harvest-related ground disturbance measures and a special project.

Water quality and substrate in streams are expected to improve because of reduced sediment delivery. There will be little or no change in other clean water parameters such as nutrient loading, contaminant loading (e.g., herbicides), and dissolved oxygen levels. Because improvements in overstory canopy closure, shading, sedimentation, and turbidity are expected, future thermal conditions for aquatic species will be similar to or better than existing conditions. Habitat complexity will likely increase through increased LWD loading, similar or increased bank stability, and reduced sediment delivery.

Potential fish passage problems at existing road crossings are documented during the road inventory process, and culverts that are impeding fish passage are prioritized for replacement with a bridge or other “fish friendly” structure. As culvert replacement is

implemented over time, fish passage problems at road crossings will be eliminated. These actions will result in improved stream connectivity and have the potential for providing access to potentially suitable, but presently unavailable, habitat in some stream reaches.

There are stream reaches that occur above natural barriers to anadromy that appear to have habitat for anadromous salmonids, particularly coho salmon. Green Diamond will undertake a special project that is expected to expedite the conservation of this species by increasing the available habitat for spawning and rearing. Green Diamond will undertake a project involving trapping and transporting coho that are native to the stream system around a barrier during the spawning season for a ten-year period and allow them to spawn. Prior to undertaking the project, Green Diamond will evaluate the selected stream to assess whether salmonids residing in the basin above the barrier will be adversely affected by the translocation. The project will include monitoring of subsequent spawning, utilization of summer rearing habitat by the juvenile fish, and outmigrant trapping to document the number of smolts leaving the system. The upper North Fork of the Mad River has been identified as being one of the top candidate sites for the initial project. Impacts associated with relocating anadromous salmonids upstream of natural barriers will be thoroughly evaluated prior to implementation.

These measures are specified in AHCP Sections 6.2.1, 6.2.2, 6.2.3, 6.2.4, and 6.2.8 and MATO Section 11 and incorporated in Order R1-2012-0087 Condition II.D.

Mitigation Measure 12: Implement the AHCP Measures Directed at Research, Monitoring and Adaptive Management Program

To further address potential impacts on aquatic resources, Green Diamond must implement research and monitoring measures, including effectiveness monitoring, wildlife surveys, environmental assessments and watershed studies.

In addition to the required and voluntary research and monitoring activities presently being conducted by Green Diamond, additional monitoring is being conducted under the AHCP to document the level of effectiveness of the AHCP measures.

Effectiveness monitoring is designed to evaluate the implementation and overall effectiveness of the Operating Conservation Program in achieving the AHCP's biological goals and objectives. This monitoring tracks trends in the quality and quantity of habitat for the covered species (as well as the distribution and relative abundance of the covered species) and provides information to better understand the relationships among specific aquatic habitat elements and the long-term persistence of the covered species. The effectiveness monitoring projects include temperature monitoring, channel and erosion monitoring, salmonid and amphibian population monitoring, and LWD assessments. These and other monitoring efforts are described in detail in Appendix D of the AHCP and incorporated into the Regional Water Board's MRP.

Monitoring data are collected year-round, as with some in-stream temperature recorders, or seasonally, as with the Class I channel dimensions monitoring. The data collected through some monitoring projects are analyzed on an annual basis and other monitoring projects on a longer time interval. The intent is to provide a timely review of monitoring data that have monitoring thresholds associated with them to allow for corrective actions, if necessary, to occur. Based on the results of the effectiveness monitoring, changes to management and conservation measures could be implemented through adaptive management.

Adaptive management is an important tool for natural resource management when there is substantial scientific uncertainty regarding appropriate management and conservation strategies. Adaptive management has two key features: (1) a direct feedback loop between science and management, and (2) the use of management strategies as a scientific experiment. Green Diamond's monitoring and adaptive management program incorporates both these features with the goals of: (1) increasing the understanding of watershed processes and the effects of management activities on the habitats and populations of the covered species over the term of the Permits; and (2) modifying some of the AHCP's conservation measures as necessary in response to this new information. Order Conditions I and L provide for Regional Water Board Executive Officer approval of any significant changes to the Order, including any alterations of AHCP water quality prescriptions, and only if modified prescriptions are found to be equally or more protective of water quality.

The overall benefit of the monitoring and adaptive management program is to: (1) monitor through time the habitat and populations of the covered species where they currently exist; (2) document the expected trend in recovery in areas that have been affected by past management activities or natural disturbances; (3) modify or augment existing conservation measures where necessary; and (4) re-allocate resources to make the AHCP more efficient, where warranted. In addition, the monitoring and experimental studies that are conducted as part of the AHCP will further the knowledge on conservation of aquatic species on managed landscapes, potentially benefiting these species throughout their range.

These measures are specified in AHCP Section 6.2.5 and incorporated in Order R1-2012-0087 Condition II.D.

Cumulative effects. The anticipated improvement in riparian conditions and the reduction in sediment production and delivery to streams would speed the improvements expected over time under existing conditions, and would likely result in improved physical habitat for the covered species. Improvements in aquatic and riparian habitat benefiting the covered species would, in general, benefit other species associated with these habitats.

Vegetation/Plant Species of Concern

Impact 4: Forest management activities could adversely impact vegetation resources, riparian areas, listed plant species and other plant species of concern.

Forest management activities in the Project Area could adversely affect [ ] These impacts are potentially significant.

The AHCP requires a number of ownership-specific measures (described in Mitigation Measure 13 below) to minimize and mitigate the individual and cumulative impacts of forest management activities on vegetation and plant species of concern**. Implementation of Mitigation Measure 13 will reduce these impacts to a less-than-significant level.**

Mitigation Measure 13: Implement the AHCP Measures Directed at riparian area management, Research, Monitoring and Adaptive Management Program

To address potential impacts on vegetation and species of concern, Green Diamond must implement the AHCP's research and monitoring measures, including effectiveness monitoring, wildlife surveys, environmental assessments and watershed studies.

The AHCP requirements include:

- Class II RMZ widths of 75 to 100 feet
- EEZs of 30 to 50 feet for Class III watercourses
- Inner- and outer-zone tree and overstory canopy retention standards for RMZs
- No mechanical site preparation by wheeled or tracked equipment in Class I or Class II RMZs

In addition, the AHCP:

- Prohibits timber harvesting within the "inner zone" of all Class I RSMZs and 2nd order or larger Class II RSMZs that are located below designated "steep streamside slope management zones" (SMZs), except for purposes of creating cable-yarding corridors when other options are impractical. Retention of a minimum 85 percent overstory canopy closure is be required in Class I and 2nd order or larger Class II RSMZ "outer zones."
- Limits timber harvesting within the first 1,000 feet of a 1st order Class II RSMZ inner zone subject to 85 percent overstory canopy closure retention post-harvest. A minimum 75 percent overstory canopy retention within the first 1,000 feet of a 1st order Class II RSMZ outer zone is also required.
- Prohibits timber harvesting within the entire RSMZ for the Coastal Klamath and Blue Creek Hydrographic Areas.
- Uses single-tree selection as the initial silvicultural prescription within SMZs headwall swales. In addition, only one commercial entry is allowed within SMZs and headwall swales for the term of the Permit (except for cable corridors necessary to conduct intermediate treatments). All hardwoods within SMZs and headwall swales are retained

and, wherever possible, Green Diamond provides for even spacing of unharvested conifers such that all species and size classes represented in pretreatment stands are generally represented post-harvest. The AHCP provides flexibility for this default prescription to be modified pursuant to site-specific geologic review.

- Establishes no-cut zones within the toe, and 25 feet upslope from the top of the toe of active deep-seated landslides, except for purposes of creating cable-yarding corridors when other options are impractical. Similarly the AHCP establishes no-cut zones upslope of the deep-seated landslide scarp so as to taper to the lateral margins of the scarp. The AHCP provides flexibility for this default prescription to be modified pursuant to site-specific geologic review.
- Prohibits timber harvesting within the boundaries of shallow rapid landslides, and retains a minimum 70 percent overstory canopy within 50 feet above and 25 feet on the sides of shallow rapid landslides. The AHCP provides flexibility for this default prescription to be modified pursuant to site-specific geologic review.

Activities conducted under the MATO and Roads WDR are subject to conditions detailed in a property-wide survey and consultation process for sensitive plants developed by Green Diamond and DFG, which is described in the *Green Diamond Resource Company Sensitive Plant Conservation Plan* (see MATO Attachment 2). Implementation of these measures will avoid or minimize potential adverse impacts to sensitive plant species. Green Diamond will continue to minimize adverse effects to listed plants and plant species of concern, including continuing to adhere to measures contained in the FPRs (special protections afforded to meadows and wetlands), Green Diamond's own Plant Protection Program, and other measures identified during the THP preparation and review process.

Survey and monitoring results from 2001-2008 suggest the most efficient and effective approach to the long-term conservation of sensitive plants on Green Diamond lands is through adaptive management that is informed by appropriate inventory, monitoring and research. A combination of compatible land management practices, plant protection measures (PPMs), property-wide consultations, and area-specific botanical management plans (BMPs) provide the foundation of the SPCP. Various conservation strategies will continue to be developed, implemented, reviewed and revised over time with the ultimate goal of dividing the ownership into botanical management areas (BMAs). The BMAs are managed under BMPs that rely on known existing conditions within the BMA rather than project-by-project surveys.

These measures are specified AHCP Sections 6.2.1 and 6.2.2 and MATO Attachment 2 and incorporated in Order R1-2012-0087 and MRP E1-2012-0088.

Terrestrial Habitat/Wildlife Species of Concern

Potential benefits to listed species under the Proposed Action would generally be greater than under the No Action Alternative, primarily because of increased overstory-canopy requirements within Class II RMZs, retention of all LWD within Class III Tier A EEZs, and retention of evenly distributed conifer trees within SMZs. Also, slightly more land would

likely be left undisturbed in riparian areas relative to the No Action Alternative. These differences would amplify benefits described under the No Action Alternative for listed species and other wildlife species of concern that breed or forage in older trees and late-seral-forest stands. The EIS found that individual and cumulative impacts upon terrestrial habitat/wildlife species of concern would be less than significant.

Air Quality

Under existing conditions, PM10 would be generated by slash-burning activities associated with site preparation under even-aged management. Although various alternative management practices would result in some change in PM10 generation, these changes are not expected to be significant.

Visual Resources

Implementation of the AHCP may reduce, to some degree, the visual effects of commercial forest management relative to the historical level. Individual and cumulative impacts upon visual resources would be less than significant.

Recreational Resources

Recreational opportunities would continue to occur, subject to written entry permits. The potential for harvest-related impacts would likely be similar to current conditions. Some potential for additional benefits to recreational experiences provided by improved riparian and fishery conditions. Individual and cumulative impacts upon recreation would be less than significant.

Cultural Resources

Current FPRs contain measures for protection of cultural resources that would minimize the effects of timber harvesting on cultural resources. No significant individual or cumulative effects would result from implementation of the Project.

Land Use

Current land use would continue in a manner consistent with local land use plans and compatible with surrounding land uses. Individual and cumulative impacts on land use resources from implementation of the project would be less than significant.