



California Regional Water Quality Control Board

Central Coast Region



Linda S. Adams
Secretary for
Environmental Protection

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Arnold Schwarzenegger
Governor

June 20, 2008

Starr Lee
Cal Poly Corporation
Building 15, 1 Grand Avenue
San Luis Obispo, CA 93407

Dear Starr Lee:

ENROLLMENT OF NONINDUSTRIAL TIMBER MANAGEMENT PLAN (NTMP) NO. 1-07NTMP-020 SCR SWANTON PACIFIC RANCH NTMP (NORTH FORK UNIT) UNDER ORDER NO. R3-2005-0066, GENERAL CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS – TIMBER HARVEST ACTIVITIES IN THE CENTRAL COAST REGION

The purpose of this letter is to notify you that I have enrolled 1-07NTMP-020 SCR Swanton Pacific Ranch NTMP (North Fork Unit) under Order No. R3-2005-0066, General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Activities in the Central Coast Region (General Waiver) (Attachment 1).

Please review the attached General Waiver requirements, as you are responsible for complying with all of the prescribed conditions.

MONITORING

California Water Code Section 13269(a)(2) requires monitoring to verify the adequacy and effectiveness of the General Waiver's conditions. Water quality monitoring is required as part of your enrollment under the General Waiver.

The General Waiver requirements include three different monitoring tiers (I, II, and III) based on the proposed timber harvest activities and site conditions. I may modify the monitoring requirements for an individual plan.

Overview of Monitoring Tier requirements:

- Tier I:** CDF Forest Practice Rules compliance monitoring.
Road inventory program.
Forensic monitoring as necessary.

- Tier II:** CDF Forest Practice Rules compliance monitoring.
Road inventory program.
Forensic monitoring as necessary.

California Environmental Protection Agency

Visual and photo monitoring of harvest infrastructure.

Tier III: CDF Forest Practice Rules compliance monitoring.
Road inventory program.
Forensic monitoring as necessary.
Visual and photo monitoring of harvest infrastructure.
Water Column monitoring.

Based on eligibility criteria, your plan has a medium cumulative effects ratio of twelve percent, a high drainage density index of 159, and a medium soil disturbance factor of 1392. Based on the information contained in your timber harvest plan information sheet, you are enrolled under Tier III.

Your Tier III Monitoring and Reporting Program (MRP) is attached (Attachment 2). Please review it carefully. Monitoring must begin at the onset of timber operations. Please inform Water Board staff if you suspect any of the monitoring points might be too difficult to access in inclement weather. You are required to implement the MRP, Road Management Program, Standard Operating Procedure 5.2.3 Photo Documentation Procedure, Standard Operating Procedures for Continuous Temperature Monitoring, and Standard Operating Procedures for Instream Turbidity Monitoring until I revise or rescind it.

REPORTING

The reporting requirements for your monitoring program are contained in the MRP and its exhibits. Please review the reporting requirements in your MRP carefully and include all information requested in your reports. Requirements for reporting include annual reporting as well as events that may be affecting water quality throughout the year. Specific requirements include:

- Providing an annual report by November 15 of each year;
- Status of active timber harvest operations;
- Forest Practice Rules violation reporting;
- Sediment release reporting.

Please provide monitoring reports to us in a timely manner. Failure to provide reports may subject you to civil liability per California Water Code Section 13268.

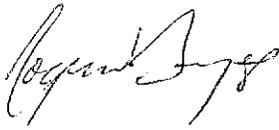
In addition to your reporting requirements, you must maintain a logbook with all monitoring and water quality analysis data; road inventory program reports; and findings from visual monitoring. You must keep logbooks up to date and available for review upon request by Water Board staff.

The goal of the Regional Water Quality Control Board is protection of water quality and its beneficial uses. Please work proactively with us when dealing with water quality

issues. We encourage you to seek our input and assistance when performing road repairs, crossing modifications, and other mitigation work (unstable slopes, etc.) You must, as outlined in the attached monitoring and reporting program, report water quality problems you notice during inspections and maintenance (timber or non-timber related). We may be able to assist the work you do with funding from grants and other programs. Our job is to help you manage your land in a way that minimizes the risk to water quality. Please do not hesitate to contact us if you have any questions or concerns.

If you have any questions, please contact **Julia Dyer** at jdyer@waterboards.ca.gov or **805-594-6144**.

Sincerely,



Roger W. Briggs
Executive Officer

Attachments:

1. General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Activities in the Central Coast Region
2. Monitoring and Reporting Program for 1-07NTMP-020 SCR Swanton Pacific Ranch NTMP (North Fork Unit) with Exhibits 1 - 3.

CC: Nadia Hamey, Registered Professional Forester
3564 Highway 1
Santa Cruz, CA 95017

E-mail: Donna Bradford, County of Santa Cruz
donna.bradford@co.santa-cruz.ca.us

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**MONITORING AND REPORTING PROGRAM NO. R3-2005-0066
FOR THE GENERAL CONDITIONAL WAIVER OF WASTE DISCHARGE
REQUIREMENTS – TIMBER HARVEST ACTIVITIES IN
THE CENTRAL COAST REGION
TIER III MONITORING FOR
1-07NTMP-020 SCR SWANTON PACIFIC RANCH (NORTH FORK UNIT)**

June 20, 2008

Your plan is enrolled in Tier III monitoring. Nonindustrial Timber Management Plans (NTMPs) that are categorized by the eligibility criteria as Tiers II or III cannot be downgraded to a lower category based on other criteria. The Water Board's Executive Officer may not change the monitoring requirements so they are less stringent than the requirements in the designated tier from the eligibility criteria.

The Water Board's Executive Officer determines which monitoring tier applies to a NTMP after considering the NTMP, information from the pre-harvest inspection or other site inspections, the Timber Harvest Information Form and Fact Sheet, and the Eligibility Criteria (attached in Exhibit 1). **Monitoring begins at the onset of timber harvest operations and ends when the Monitoring and Reporting Program is revised or rescinded.**

SITE SPECIFIC MONITORING LOCATIONS FOR TIER III MONITORING

The following takes into account specific site conditions and mitigations to establish monitoring locations (see attached map, Exhibit 2 Monitoring Locations) that will provide functional monitoring information. The Discharger shall perform monitoring at these locations as described below in Section I – Implementation and Effectiveness Monitoring and Monitoring Frequency; Section II – Data Logging and Reporting; and Section III – Standard Provisions.

VISUAL MONITORING POINTS: The Discharger shall conduct visual monitoring at the points listed below:

Visual monitoring points shall include the full length of roads, watercourse crossings, landings, skid trails, water diversions, watercourse confluences, known landslides, and all mitigation sites (as documented the CDF approved NTMP) in the timber harvest plan area.

PHOTO-MONITORING POINTS: The Discharger shall monitor Photo-monitoring points listed below (guidelines in Exhibit 3). Photo-monitoring points:

Photo Point #1 – Road Crossing R7

Photo Point #2 – Road Crossing R15 / Mitigation Point MP29

Photo Point #3 – Road Crossing R18

Photo Point #4 – Skid Trail Crossing S1

Photo Point #5 – Landing 21 / Mitigation Point MP16

WATER COLUMN MONITORING POINTS: The Discharger shall measure instream temperature and turbidity conditions at the locations listed below. Water column monitoring points:

Turbidity monitoring locations:

Commensurate with the turbidity monitoring for the Little Creek Monitoring Project conducted by California Polytechnic State University, San Luis Obispo.

Upstream Turbidity Monitoring Station (T1) – Upper North Fork station (as described by the Little Creek Monitoring Project).

Downstream Turbidity Monitoring Station (T2) – North Fork confluence (as described by the Little Creek Monitoring Project).

Temperature monitoring locations:

Upstream Temperature Monitoring Station (T1) – Upper North Fork station (as described by the Little Creek Monitoring Project).

Downstream Temperature Monitoring Station (T2) – North Fork confluence (as described by the Little Creek Monitoring Project).

CDF FOREST PRACTICE RULES COMPLIANCE MONITORING: The discharger is responsible for and shall ensure timber harvest activities are conducted in accordance with the approved THP and with all applicable sections for the Forest Practice Rules. This includes allowing site access for compliance inspections to California Department for Forestry and Fire Protection and Central Coast Regional Water Quality Control Board pursuant to 40 CFR Article 8, Section 4604.

ROAD INVENTORY PROGRAM: The Discharger shall develop and implement a Roads Management Program (example attached in Exhibit 2, Big Creek Road Inventory Program) within the THP area. The road management program must be approved by the Water Board's Executive Officer prior to implementation.

FORENSIC MONITORING: The Discharger shall conduct forensic monitoring as described in Section I below.

SECTION I – IMPLEMENTATION AND EFFECTIVENESS MONITORING AND MONITORING FREQUENCY

VISUAL MONITORING

VISUAL MONITORING POINTS: Visual monitoring points shall include the full length of roads, watercourse crossings, landings, skid trails, water diversions, watercourse confluences, known landslides, and all mitigation sites (as documented the CDF approved NTMP) in the timber harvest plan area. Visual monitoring points shall be at locations within the timber harvest plan area where timber harvest activities have the greatest risk of potential discharge (sites may be established by the Water Board's Executive Officer during or after the pre-harvest inspection).

VISUAL MONITORING FREQUENCY: The Discharger shall monitor all visual monitoring points established by the Water Board's Executive Officer during or after the pre-harvest inspection for existing or potential sources of erosion. The Discharger shall perform visual monitoring within 12 to 24 hours of storm events of two inches of rain or greater within a 24-hour period.

"Year One" – Monitoring shall occur a minimum of three times over each 12 months during **"Year One"** monitoring. **"Year One"** monitoring begins with the onset of timber harvest operations. **"Year One"** monitoring then continues during the entire length of time active timber harvest operations occur plus one year past the end of active timber harvest operations.

Monitoring Event One:

The Discharger shall perform the first monitoring event within 12 to 24 hours of the first storm event that yields two inches of rain or greater within a 24-hour period.

Monitoring Events Two and Three:

The Discharger shall perform the next two monitoring events within 12 to 24 hours of the next two storm events (one monitoring event each storm) that include two inches of rain or greater within a 24-hour period and soil saturation after the start of the winter period on October 15.

Years 2-5 – In years two through five, following completion of timber harvest operations and a determination by the Water Board's Executive Officer (as documented by information contained in the annual report and post-harvest

inspection conducted by Water Board staff) that implemented management practices are functioning to protect water quality and beneficial uses, visual monitoring shall be implemented according to the Road Management Program developed by the Discharger approved by the Water Board's Executive Officer (example attached in Exhibit 3, Big Creek Road Inventory Program).

It is your responsibility to schedule a post-harvest inspection with Water Board staff. You may call to schedule an inspection no sooner than 10 months after the timber harvest plan is complete.

Important Note: You may not begin Year 2 monitoring until you are directed to do so in writing by the Water Board's Executive Officer.

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Water Board's Executive Officer, the Discharger shall repeat "Year One" monitoring. In addition to supplementary monitoring, the Water Board's Executive Officer will determine additional management measure implementation required.

Summary of Visual Monitoring Frequency:

"Year One": minimum of three events

Year 2 – 5: consistent with the Road Management Program developed by the Discharger and approved by the Water Board's Executive Officer.

PHOTO-MONITORING

PHOTO-MONITORING POINTS: Photo-monitoring points shall be at locations within the timber harvest plan area where timber harvest activities have the greatest risk of potential discharge (sites may be established by the Water Board's Executive Officer during or after the pre-harvest inspection). Photo-monitoring points shall include up and down stream of each newly constructed or reconstructed Class I and Class II watercourse crossings and landings within a Class I or II Watercourse or Lake Protection Zone (WLPZ). Monitoring photos need to be of sufficient quality to record the effectiveness of the implemented management practice.

The Discharger shall:

- i. Utilize the attached document titled "Standard Operation Procedure 5.2.3 - Photo Documentation Procedure" (including any subsequent revisions to SOP 5.2.3) as the protocol for all photo-monitoring (attached in Exhibit 3).

- ii. Utilize flagging, rebar, or another method of establishing the photo-monitoring point site locations.
- iii. Utilize all photo-monitoring point locations until this Monitoring and Reporting Program is revised or rescinded.

PHOTO-MONITORING FREQUENCY: The Discharger shall monitor all photo-monitoring points established by the Water Board's Executive Officer during or after the pre-harvest inspection.

"Year One" - Monitoring shall occur a minimum of two times over each 12 months during "Year One" monitoring. Monitoring may occur as much as four times over a monitoring season if operations are opened and permanently closed in the same 12 month period.

- Prior to the onset of timber harvest operations as baseline monitoring. (One Photo Set)
- Following the first significant storm event (First Storm) (One Photo Set).
- Following completion of timber harvest activities (One Photo Set).
- Following a significant storm event during the month of April (April Storm) (One Photo Set). A significant storm event means any storm with two inches of rain or greater within a 24-hour period and soil saturation (i.e., soil saturation typically occurs after a minimum of four inches of precipitation during after the start of the winter period on October 15).

Additionally, the Discharger shall photograph new or reconstructed Class I and Class II water crossings:

- Before construction begins, after construction is completed, and after the crossing structure is removed (if crossing is temporary).

Photo-monitoring shall occur within seven days of all of the following:

1. The first storm.
2. Completion of timber harvest activities.
3. April storm events. If no significant storm event occurs in the month of April, the Discharger shall complete photo-monitoring by April 30 of the same year.

Years 2 and 5 - In years two and five, following completion of timber harvest operations and a determination by the Water Board's Executive Officer (as documented by information contained in the annual report and a post-harvest inspection conducted by Water Board staff) that implemented management

practices are functioning to protect water quality and beneficial uses, the Discharger shall conduct the April storm photo-monitoring.

It is your responsibility to schedule a post-harvest inspection with Water Board staff. You may call to schedule an inspection no sooner than 10 months after the timber harvest plan is complete.

Important Note: You may not begin Year 2 monitoring until you are directed to do so in writing by the Water Board's Executive Officer.

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Water Board's Executive Officer, the Discharger shall repeat "Year One" monitoring. In addition to supplementary monitoring, the Water Board's Executive Officer will determine additional management measure implementation required.

Summary of Photo-monitoring Frequency:

"Year One": 2 photo sets minimum
Year 2: 1 photo set
Year 5: 1 photo set

TEMPERATURE MONITORING

TEMPERATURE MONITORING POINTS: The Discharger shall monitor temperature continuously as prescribed in the document Central Coast Regional Water Quality Control Board, Timber Harvest Program, Standard Operating Procedures for Continuous Temperature Monitoring (April 2006) (attached in Exhibit 3) during the months of May 1 through October 15. Monitoring sites will be established by the Water Board's Executive Officer during or after the pre-harvest inspection. Continuous water temperature monitoring is required.

If no Class I watercourse exists on the parcel where timber harvest activities occur, and there is water in the Class II during the months of May 1 through October 15, the Discharger shall conduct temperature monitoring in the Class II watercourse.

TEMPERATURE MONITORING FREQUENCY: The Discharger shall monitor all temperature monitoring points.

“Year One” - The Discharger shall program data loggers to record point measurements every hour during the months of May 1 through October 15 at all established temperature monitoring points.

Years 2 and 5 - In years two and five, following completion of timber harvest operations and a determination by the Water Board’s Executive Officer (as documented by information contained in the annual report and a post-harvest inspection conducted by Water Board staff) that implemented management practices are functioning to protect water quality and beneficial uses, the Discharger shall program data loggers to record point measurements every hour during the months of May 1 through October 15 at all established temperature monitoring points.

It is your responsibility to schedule a post-harvest inspection with Water Board staff. You may call to schedule an inspection no sooner than 10 months after the timber harvest plan is complete.

Important Note: You may not begin Year 2 monitoring until you are directed to do so in writing by the Water Board’s Executive Officer.

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Water Board’s Executive Officer, the Discharger shall **repeat “Year One” monitoring**. In addition to supplementary monitoring, the Water Board’s Executive Officer will determine additional management measure implementation required.

Summary of Temperature Data Sets:

“Year One”: 1 data set
Year 2: 1 data set
Year 5: 1 data set

TURBIDITY MONITORING

TURBIDITY MONITORING POINTS: Commensurate with the Little Creek Monitoring Project conducted by California Polytechnic State University, San Luis Obispo.

TURBIDITY MONITORING FREQUENCY: Commensurate with the Little Creek Monitoring Project conducted by California Polytechnic State University, San Luis Obispo.

FORENSIC MONITORING

1. If at any time during implementation or effectiveness monitoring, the Discharger observes failed management measures and/or source of discharge, the Discharger shall conduct forensic monitoring to identify the source. Management measure failure is defined as: 1) whenever an implemented management measure creates a condition of pollution, contamination, or condition of nuisance, as defined by CWC Section 13050, or 2) when lack of implementation of a necessary management measure creates a condition of pollution, contamination, or condition of nuisance, as defined by CWC Section 13050.
2. If management measures fail (this includes failure to implement appropriate management measures as determined by CDF and documented by CDF as a violation of the Forest Practice Rules) the Discharger shall photo¹ document them and shall implement management practices immediately to prevent discharge and impacts to water quality.
3. If timber activities cause a discharge (sediment, soil, other organic material, etc.) into waters of the State, the Discharger shall measure in-stream turbidity (using grab samples) at the point of discharge into waters of the state. If there is a discharge into a Class III watercourse and water is no longer flowing, the Discharger shall measure in-stream turbidity in the closest Class I or Class II watercourse downstream of the discharge.
4. If at any time during implementation or effectiveness monitoring, the Discharger observes a discharge (sediment, soil, other organic material, herbicides, pesticides, fluids from timber equipment (oil, hydraulic fluid, etc), etc.), the Discharger shall notify the Water Board within 24 hours.
5. The Discharger shall submit to the Water Board a written report, including photo documentation, water quality data, and the management measures or corrective actions and a description of their effectiveness within 10 working days. Upon review of the report, the Water Board's Executive Officer will determine completeness of the report and the need for additional actions necessary for the protection of water quality and beneficial uses.

FORENSIC MONITORING AREAS OF CONCERN: The following areas must be addressed during forensic monitoring if water diversion, feral pig activity, or trespass activity are causing or threatening to cause impacts to water quality.

Water Diversion: The Discharger shall monitor the water diversion point(s) for total daily water usage when water is being diverted. The Discharger shall monitor the creek to ensure no more than 10% of the creek flow is diverted.

Feral Pig Activity: During any inspection, the Discharger shall document all evidence of feral pig activity near watercourses that may be contributing discharges to waters of the state.

¹ Monitoring photos need to be of sufficient quality to record the effectiveness of the implemented management practice.

Trespass Activity: During any inspection, the Discharger shall document all evidence of trespass activity near watercourses that may be contributing discharges to waters of the state.

FORENSIC MONITORING FREQUENCY: The frequency of Forensic Monitoring is coincident with implementation and effectiveness monitoring, or at any time a failed management measure and/or discharge is reported or observed.

SECTION II - DATA LOGGING AND REPORTING

LOGBOOKS: The Discharger shall maintain logbooks for recording all visual and water analysis data. Logbooks shall include documentation of maintenance and repair of management practices. These logbooks shall be available for inspection to the Water Board staff.

HEALTH AND SAFETY: The Discharger is responsible for ensuring that all monitoring is done in a safe manner. If any monitoring point is too dangerous to sample, then the Discharger shall report this circumstance to the Water Board within 48 hours.

ROAD MANAGEMENT PROGRAM: The Discharger shall develop and implement a Roads Management Program (example attached in Exhibit 3, Big Creek Road Inventory Program) within the NTMP area. Prior to implementation the road management program must be approved by the Water Board's Executive Officer. After each storm event that triggers an inspection, the Discharger shall perform a field inspection and prepare a field form as described in the protocol for the road management program. The Discharger shall enter the data into a logbook (same as described in item a. above) and database or spreadsheet which tracks observations, work completed, and dates of last review. If the need for repair is immediate, the Discharger shall promptly develop an appropriate treatment so that the Discharger can complete corrective action as soon as practical.

SEDIMENT RELEASE REPORTING: The Discharger shall report to the Water Board within 48 hours whenever at least one cubic yard of soil is released to a waterway due to anthropogenic causes or at least five cubic yards of soil is released to a waterway due to natural causes, or when turbidity is noticeably greater downstream compared to upstream (of a crossing or the Plan area). The Discharger shall submit a written report to the Water Board within 10 days of detection. The Discharger shall investigate source areas of sediment. If sources are found, the Discharger will locate and document the source and size of the release. If sources related to timber harvest activities are found, the Discharger shall immediately correct the source if possible, or schedule corrective action at an appropriate time given the site conditions.

VIOLATION REPORTING: The Discharger shall report any violation of the Forest Practice Rules, to the Water Board within 48 hours. The Discharger shall provide the report in writing to the Water Board within 10 working days of the violation. The written report shall include photo documentation and water quality data (if discharge enters waters of the state) before and after remedial action. Upon review of the report, the Water Board's Executive Officer will determine completeness of the report and the need for additional actions necessary for the protection of water quality and beneficial uses. The Discharger shall complete any additional monitoring the Water Board's Executive Officer determines is necessary.

ANNUAL REPORTING: By November 15 of each year, the Discharger shall submit an Annual Report to the Water Board using the template that can be downloaded from:

<http://www.waterboards.ca.gov/centralcoast/Facilities/TimberHarvest/index.htm>

Under "Monitoring and Reporting" click on "Annual Report Template." In addition to the reporting requirements already set forth in the MRP, the annual report must address each of the following²:

Annual Reports shall include all of the following:

General

- ❖ The name and address of the person submitting the report as well as the day, month, and year in which the report is being submitted at the top of the first page.
- ❖ The subject line of the annual report shall state the NTMP number, three-letter county code, and plan name as it appears in the approved NTMP, and specific units within the NTMP that have been enrolled under the General Waiver.
- ❖ Time period during which the data was collected.
- ❖ List Tier level and summarize the monitoring requirements.
- ❖ A status of active timber harvest operations including:
 - Day, month, and year the harvest opened and closed for the season.
 - Previous year activities (types of activities, locations, percent harvested, area of harvest, and extent the overall plan is complete)
 - Planned activities including estimated month and year harvests activities shall resume.

² Portions of these requirements and sections of the template may not apply to your specific MRP (e.g. If your MRP does not require temperature monitoring, the temperature monitoring requirements should be ignored).

- Estimated month and year harvesting will be completed.
 - Wet weather problems observed
 - Any other critical information
- ❖ A summary of all violations. If there were no violations, please state it as such.
- ❖ Detailed documentation of rainfall measurement procedures and locations or a reference to the page number in the NTMP where this is described. Describe the type of rain gauge(s) used. If applicable include the link to the Web site where data for the rain gauge may be viewed.
- ❖ With the first annual report, a copy of the road management program.
 - A summary of the road management program³ and actions implemented for the protection of water quality and beneficial uses.
- ❖ Recommendations for improving the monitoring and reporting program.

Water Quality Monitoring (if required)

- ❖ A summary of the water quality monitoring performed during the previous year. Any monitoring described in the summary must also include an electronic submittal of the data.
- ❖ A detailed map with the following specifications:
 - In color (if possible).
 - Title stating: "Water Quality Monitoring Locations for NTMP No. XXXX"
 - All monitoring locations and routes clearly marked with unique site identification tags.
 - A Key or Legend identifying all monitoring locations and routes.
 - North Arrow.
 - Scale

Visual Monitoring

- ❖ *A summary of all visual monitoring activities performed during the previous year.*
 - Summary shall include dates and times visual monitoring occurred and any corrective actions taken during inspections.
 - Attach inspection forms or copies of logbook pages detailing inspections.

Photo-monitoring (if required)

- ❖ Submittal of all data and photos in electronic format.

³ Big Creek's Road Inventory Program may be used as a model.

Turbidity Monitoring (if required)

- ❖ All data submitted electronic format compatible with Excel.
- ❖ Make and model of turbidimeter being used.
 - Copy of the manufacture's protocol / recommendation for proper use of the turbidimeter.
- ❖ A summary of all turbidity monitoring activities performed during the previous year.
- ❖ Completed Field Data Sheet with data from all monitoring events. (if more than 4 events no need to complete top section on additional pages)

Continuous Temperature Monitoring (if required)

- ❖ All data submitted electronically in excel format.
- ❖ Make and model of the data loggers being used at each monitoring location.
 - Copy of the manufacture's protocol / recommendation for proper use of the loggers.
- ❖ Calibration check form for each data logger.
- ❖ Description of any modifications or adjustments made based on the calibration checks and field observations.

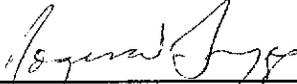
SECTION III - STANDARD PROVISIONS

1. The Water Board shall be allowed:
 - a. Entry upon premises where timber harvest activities occur;
 - b. Access to copy any records that must be kept under the conditions of these requirements;
 - c. To inspect any timber harvest activity, equipment (including monitoring and control equipment), practices, or operations regulated or required under these requirements; and,
 - d. To photograph, sample, and monitor for the purpose of showing timber harvest requirements compliance.
2. The Discharger shall maintain records of all monitoring information and results. Records shall be maintained for a minimum of three years after the MRP is rescinded. This period may be extended during the course of any unresolved litigation or when requested by the Water Board.
3. Any person signing a report shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The Water Board's Executive Officer may modify or rescind this Monitoring and Reporting Program at any time, or may modify or rescind the monitoring and reporting program as to a specific Discharger. Any such modification or rescission must comply with California Water Code section 13269.

Ordered By: _____


Roger W. Briggs, Executive Officer

6-20-08
Date

Attachments:

Exhibit 1

Inspection Report(s)
Copy of the Timber Harvest Plan Information Form and Fact Sheet
Eligibility Criteria

Exhibit 2

Monitoring Locations

Exhibit 3

Big Creek Road Inventory Program
Standard Operating Procedure 5.2.3 Photo Documentation Procedure
Standard Operating Procedures Continuous Temperature Monitoring
Standard Operating Procedures Instream Turbidity Monitoring

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Exhibit 1

Inspection Report(s)
Copy of the Timber Harvest Information Form and Fact Sheet
Eligibility Criteria

Memo

To: File – Nonindustrial Timber Management Plan No. 1-07NTMP-020 SCR
From: Julia Dyer, Environmental Scientist *Julia Dyer*
CC: Matt Thompson, Senior Water Resource Control Engineer
Date: June 18, 2008
Re: Preharvest Inspection (PHI) of Nonindustrial Timber Management Plan 1-07NTMP-020 SCR Swanton Pacific Ranch, Santa Cruz County.

KEY INFORMATION

Inspection Date	January 28, 2008	Persons Present	Affiliation
Plan Size (acres)	701	Bethany Crews	Water Board
Harvest Area (acres)	143	Julia Dyer	Water Board
Yarding Type	Tractor Rubber Tire Skidder Cable Skyline Helicopter	Bob Berlage	Big Creek
Watershed	Scott's Creek	Nadia Hamey*	Big Creek
Sub drainages	Little Creek Big Creek	Brenda Blinn	Fish and Game
303(d) Listed	No	Donna Bradford	SC County
Fisheries	Coho Salmon Steelhead Trout	Chris Coburn	SC County
Landowners	Cal Poly Corporation	Dominic	CDF
		Richard Sampson	CDF
		Scott Bullock	CDF
		Wally Marks	Cal Poly
		Brian Dietterick	Cal Poly
		Steve Auten	Cal Poly
		Tom Spittler	Geology

*Registered Professional Forester that signed the THP.

LOCATION

The Swanton Pacific Ranch property is located in the Scott's Creek watershed, approximately 15 miles north of Santa Cruz, in Santa Cruz County.

HISTORY

Much of the Little Creek watershed was clear-cut by the San Vicente Lumber Company between 1906 and 1923.

INSPECTION

Water Board staff attended the January 28, 2008 inspection as part of the California Department of Forestry and Fire Protection's (CDF) review team preharvest inspection of the Swanton Pacific Ranch property. The review team's inspection included a representative sample of the roads, skid trails, landings, and watercourse crossings. Water Board staff also inspected the proposed monitoring site locations for photo, turbidity, and temperature. Overall, staff found the site to be well maintained, showing little to no signs of erosion or other potential threats to water quality. Water Board staff photographed the site.

The inspection included all subunits of the Nonindustrial Timber Management Plan (NTMP). But, Water Board staff focused their attention on the North Fork Unit as this is the first unit proposed for harvest upon approval of the NTMP. Cal Poly is currently conducting the Little Creek Monitoring Project. The Little Creek Monitoring Project is a long-term study designed to evaluate the water quality and geomorphic conditions of a coastal mountain stream located in the southernmost extent of the redwood/Douglas-fir forest region. As part of the Little Creek project Cal Poly has installed storm-event based in-stream sampling stations above and below the North Fork Unit. The Little Creek project will provide turbidity information for timber harvest activities proposed in the North Fork unit as required in the Monitoring and Reporting Program.

On page 9 of the NTMP, second to last paragraph, the Discharger¹ proposes to control hardwoods with "judicious herbicide application prescribed by a licensed Pest Control Advisor." During the inspection the Discharger explained that they have a specific plan for any application of pesticides on the Swanton Ranch Property. Water Board staff requested a copy of their pesticide application plan for review (Recommendation 1).

CONCLUSION

Based on review of the NTMP, the January 28, 2008 inspection, and special considerations of this site, Water Board staff finds the proposed harvest and its associated management practices and mitigations protective of water quality and therefore appropriate for the site.

RECOMMENDATIONS

1. Provide Water Board staff with a copy of the pesticide application plan.

S:\NPS\Timber Harvest Case Files by Site\1-07NTMP-020 SCR Swanton Pacific Ranch\PHI1-07NTMP-020SCRSwantonPacificRanch6_18_08.doc

¹ Throughout this document "discharger," "you," or "your" means the landowner and anyone working on behalf of the landowner in the conduct of timber harvest activities including monitoring.



California Regional Water Quality Control Board

Central Coast Region

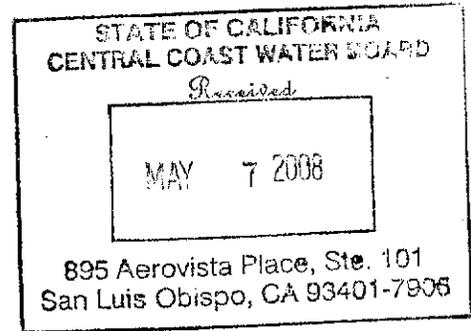


Dr. Alan Lloyd
Secretary for
Environmental
Protection

Internet Address: <http://www.waterboards.ca.gov/centralcoast>
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Phone (805) 549-3147 • FAX (805) 543-0397

Arnold
Schwarzenegger
Governor

Roger Briggs, Executive Director
California Regional Water Quality Control Board
Central Coast Region
865 Aerovista Place, Suite 101
San Luis Obispo, CA 93401



Date: March 21, 2008

RE: Request for Conditional Timber Harvest Waiver Requirements for a THP or NTMP.

Dear Mr. Briggs,

As the landowner of the following NTMP, I would like to request coverage under the conditional timber harvest waiver requirements.

THP/NTMP #:	01-07NTMP-020 SCR (North Fork Unit)
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This NTMP was approved by the California Department of Forestry on: _____

As requested, I have attached the following documents:

- A complete, accurate, and signed Timber Harvest Information Form (ROWD).
- A site map with monitoring points, monitoring route, and mitigation points clearly labeled and identified.
- A site map with slides and EHR areas identified with roads and skid trails.
- Proof of CDF approval of the THP/NTMP, (will be forthcoming).

I certify that the information contained in the fact sheet and on the site map accurately represents site conditions on the property. I also acknowledge that I am ultimately responsible for all activities that occur on my property.

Landowner(s) Signature: Starr Lee Legal Counsel
Date: 4-4-08 Cal Poly Corporation



California Regional Water Quality Control Board

Central Coast Region



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Schwarzenegger
Governor

Notice of Intent Timber Harvest Information Form (6/15/05 revision)

1. Plan or Notice Name:

Plan Number:

Swanton Pacific Ranch NTMP, North Fork Unit	1-07NTMP-020 SCR, NTO #1
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2. Landowner's Contact Information:

Name: Cal Poly Corporation*		
Address: Building 15, 1 Grand Avenue		
City: San Luis Obispo	State: CA	Zip Code: 93407
Phone: (805) 756-1451	E-mail address (optional): N/A	

***Cal Poly Corporation assumes all legal responsibility for erosion control maintenance and compliance with the Conditional Timber Harvest Waiver and relieves owners of Santa Cruz County parcel 057-121-10, (Steve Spafford, Susan Spafford England, and Stuart Spafford) of these responsibilities, as documented in a letter attached to this application and also included on page 308 of the NTMP.**

3. Name and Phone Number of Contact Person(s):

Name: Steve Auten	Phone: (831) 458-5413
Name: Nadia Hamey	Phone: (831) 457-6383

4. Registered Professional Forester :

RPF Name/Signature: Nadia Hamey	RPF Number: 2788
Address: 3564 Highway 1	
City: Davenport	State: CA Zip Code: 95017
Phone: (831) 457-6383	E-mail address (optional): nadiah@big-creek.com

5. Certification:

I, the Landowner named above, hereby certify under penalty of perjury that the CDF-approved plan or CDF-accepted notice and the accompanying fact sheet accurately represent site conditions and I understand that, as the Landowner, I am ultimately responsible for all activities that occur on my property. I also understand that I am ultimately responsible for compliance with all conditions of any Waste Discharge Requirements or Waiver of Waste Discharge Requirements issued for the above-referenced activity.

Signature:	Date: 4-4-08
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Timber Harvest Information Form (6/15/05 revision)

California Environmental Protection Agency

Attachments:

- Fact Sheet
- Site map with all monitoring points, monitoring route, and mitigation points clearly identified and labeled.
- Site map with slides and EHR areas identified with roads and skid trails.



TIMBER HARVEST PLAN FACT SHEET (6/15/05 revision)

The following supplemental information will be used in the approval process of the above-referenced Timber Harvest activity.

1. Timber Harvest Plan

Name: Swanton Pacific Ranch NTMP, North Fork Unit	Number: 1-07NTMP-020 SCR, NTO #1
Location: T10S R3W, Portions of Sections 8,9,17 and Rancho Aqua Puerca y Las Trancas MDB&M	Watershed Name: Little Creek

2. Responsible Parties

Land Owner: Cal Poly Corporation		
Address: Building 15, 1 Grand Avenue		
City: San Luis Obispo	State: CA	Zip Code : 93407
Phone: (805) 756-1451	E-mail address (optional):	
Timber Owner (if different from Land Owner): Same as Land Owner		
Address:		
City:	State:	Zip Code :
Phone:	E-mail address (optional):	
Forester: Nadia Hamey		
Address: 3564 Highway 1		
City: Davenport	State: CA	Zip Code: 95017
Phone: (831) 457-6383	E-mail address (optional): nadiah@big-creek.com	

3. Timber Harvest Plan Summary

a) THP size and watershed size

Acreage of THP/NTMP (parcel size): 701 acres
Acreage to be harvested: 143 acres
Planning Watershed Name and #: Little Creek Planning Watershed Calwater Version 2.2 #3304.110202
Total acres in planning watershed: 4,470 acres
Acres harvested in planning watershed in last fifteen years: Approximately 383 acres
Acres currently proposed for harvest in the watershed in addition to this proposed harvest: None

b) Logging Technique (Yarding) (check all applicable)

Ground based (skidding, long line): X	Cable Yarding: X	Helicopter:
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c) Erosion Hazard (check all applicable)

Moderate:	High: X	Extreme:
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d) Stream Classes

# of each type of stream:	Linear feet of stream:
I: 1 = North Fork Little Creek	I: Approximately 3,800 feet in Unit
II: 4	II: 3,035 feet
III: 17	III: 5,230 feet

e) Percent Canopy Retained in the Watershed & Lake Protection Zone (WLPZ)
(See NTMP pgs 22-24).

Class I: At least 85%, first 75 feet; at least 65%, second 75 feet
Class II: At least 50% canopy retention
Class III: At least 50% understory vegetation retention
No-Cut Zone(s)? (YES/NO) If yes, describe: No

f) Roads

Existing Roads (number/length): 1 existing road with a linear distance of approximately 5100 feet of seasonal and approximately 8190 miles of permanent road.	Watercourse Crossings: 10			
New Roads (number/length): No new proposed road.		Total	Perm	Temp
Reconstructed Roads (number/length): No proposed reconstruction.	Class I:	1	1	
Roads in unstable areas? (YES/NO) If yes, explain: Yes, portions of the road are located on a large-scale, deep-seated landslide with insipient movement.	Class II:	4	4	
	Class III:	5	5	
Roads in WLPZ? (YES/NO) If yes, # of feet and explain: Yes, within the area covered by NTO #1, approximately 690 feet of existing road is located in the WLPZ. Crossing approaches will be re-rocked following operations.				
# of feet of roads in High EHR: 13,290 feet		Extreme EHR: 0 feet		
# of feet of roads decommissioned: 0 feet of road decommissioning is proposed.				
Any decommissioned in high/extreme EHR? (YES/NO) If yes		High EHR: No		
# of feet in:		Extreme EHR: No		

g) Landings

of landings decommissioned: No landings are proposed for decommissioning
Existing landings (number): 6 existing landings
New Landings (number): No new landings are proposed
Reconstructed Landings (number): No landing reconstruction is proposed
Landings in unstable areas? (YES/NO) If yes, explain: Yes, existing landings L20 and L21 are located on a large-scale, deep-seated landslide with insipient movement.
Landings in WLPZ? (YES/NO) If yes, explain: Yes, landing L21 is partially in the WLPZ of a Class II watercourse. The landing is approximately 20' from the Class II watercourse, below crossing R16, with several redwoods and a vegetated filter strip in between. During operations, no soil or debris shall be pushed past the landing edge. If necessary, to prevent material from nearing the watercourse, a barricade or silt fence shall be constructed on the landing edge closest to the watercourse. If refueling is to occur at this landing, it shall take place at least 60 feet from the watercourse transition line. Following operations, the landing shall be shaped to drain by outsloping. Prior to the winter period following operations soil stabilization shall be implemented as described under Item 18 (See NTMP pgs 13-16).

h) Skid Trails (If the plan contains areas with unmapped skidtrails, please indicate the acreage of these areas.)

Existing skid trails (number/length): Approximately 10 existing skid trails with a linear distance of approximately 11,000 feet	Watercourse Crossings: 4	
New trails (number/length): No new skid trails are proposed.		Total
Reconstructed trails (number/length): No skid trail reconstruction is proposed.	Class I:	
Skid Trails in WLPZ (YES/NO)? If yes, explain: Yes, a short section of skid trail is within the WLPZ of a Class II seep (MP 17). In addition, a short section of trail is within the ELZ (not WLPZ, therefore not In-lieu) of a spring that forms a Class III watercourse downstream (MP19). At MP17, the trail stays away from the wet area, by avoiding the switchback closest to the seep. The trail is currently drained with a functioning rolling dip and is in good condition. The flagged trail shall be used as is and prior to the winter period following operations the main trail shall be dipped out to drain away from the switchback following use, the main trails shall be seeded and/or straw mulched as necessary to mitigate erosion, and the switchback by-pass shall be covered with tractor crushed or hand placed slash to discourage use. At MP19, the existing skid trail is located within 10 feet of a seep that forms a Class III watercourse below. Above the seep there is approximately 30 feet of channel that does not show signs of recent sediment movement. The following mitigations shall be implemented for operations: Brow logs shall be placed on the skid trail edge if necessary to prevent sediment movement into the channel. Prior to the winter period following operations the skid trail shall be treated as specified in Soil Stabilization under Item 18.	Class II:	4
	Class III:	
	Trails in unstable areas (YES/NO)? If yes, explain: Yes, existing skid trails in the vicinity of the Tranquility Flats sub-unit are located on a large-scale, deep-seated landslide with insipient movement. The extent of the slide margins and their relative ages are shown on the Geologic and Landslide Maps at the end of Section II and in the Focused Engineering Geologic report in Section V of the NTMP. The engineering geologic review for the NTMP states that it is unlikely that the proposed harvest will have any measurable impact on deep-seated stability and associated sediment delivery to the stream network for several reasons. First, the harvest will employ single tree selection retaining a substantial component of the total stand. Harvesting on unstable areas shall maintain a minimum of 50% of the existing stand greater than 12-inches dbh except those incidentally damaged during harvest operations. Any changes in hydrologic balance due to reduced evapotranspiration is expected to be minor. Second, the proposed selection harvest is not expected to have a measurable impact on root strength, particularly in redwood and hardwood which dominate the site and which resprout vigorously after cutting. Moreover, any reduction in root strength will have negligible impact on a deep-seated landslide where the depth of failure extends well below the zone of root penetration. Third, there is no empirical evidence in the professional literature or from geologic reconnaissance of harvest plans in the Santa Cruz area to indicate that a partial harvest under selection silviculture (or equivalent) has significantly increased the risk of deep-seated slide movement. Per mitigation point MP2, skidding equipment shall only operate on designated skid trails in this area. The LTO shall conduct operations with as little blade work as possible so as to minimize vegetation and soil disturbance. No ground based equipment operations shall take place on unstable areas in the winter period. Prior to the winter period or following operations, soil stabilization shall be carried out according to the erosion control specifications under Item 18.	
# of feet of skids in High EHR: 11,000 feet	Extreme EHR: None	
# of feet of skids decommissioned: None		
Any tractor operations in areas with high/extreme EHR with no flagged or marked skid? (YES/NO) If yes, # of acres in:	High EHR: No Extreme EHR: No	

i) Mitigation points (summarize or import from timber harvest plan) – Reference site map

The following locations can be found on the Monitoring Map, attached to this application packet and also on the Operations Maps (pgs 45-47.4) and Water Resources Maps (pg 51) in the NTMP.

Watercourse Crossings:

Road Watercourse Crossings

Crossing R7: This is an 18 inch by 30 foot long plastic pipe located at a narrow and steep gradient Class II watercourse that is prone to debris flows. The NTMP proposes to reconstruct the crossing for the proposed harvest. At this location the road contours across 75+% sideslopes following an old railroad grade. The outer edge of the crossing has repeatedly failed causing sections of hand-stacked rock wall to fall away, and narrowing the road to about 10 feet. The 18 inch diameter culvert was installed in 1998, as an emergency repair following crossing failure associated with a 1998 El Nino event. This pipe is undersized and was installed with the outlet misaligned to the native channel and shot gunned out the side of the crossing fill. The misalignment was done to avoid having to disturb and reconstruct the stacked rock wall, which supports the outer edge where the road is narrowest. Because the road is too narrow for logging operations and because the culvert is undersized and misaligned, the crossing will need to be reconstructed. The best alternative to widen the road is to cut into the bank slightly on a full bench. The best alternative to reconstruct the crossing is to remove the culvert and install a relatively short bridge. Additional description of these alternatives is provided in the Addendum to the Focused Engineering Geologic Report, which is located in Section V. The CEG recommendations are listed below and the CEG diagrams can be found at the end of Section II. Additional explanation and diagrams for installation of cross vane structures are also included at the end of Section II. Prior to operations the following mitigations shall be implemented:

1. Widen the road into the bank about 4 to 6 feet on a full bench. Soils may be endhauled or feathered out along the inboard edge. Following this treatment, the crossing shall be used as is for log hauling.

Prior to the winter period following operations:

1. Remove crossing and associated fill. The excavated crossing shall have a minimum 6 foot wide channel bottom with uniform channel grade. Banks shall be laid back to 1.5:1 (65%) slope or gentler, unless otherwise directed onsite by the project engineering geologist or designee. Steeper channel banks up to a 1:1 slope may occur if competent native earth materials are encountered. Depending on conditions encountered, approximately 100 to 150 cy of material will need to be excavated and endhauled to a stable location on slopes less than 30%. If the CEG determines that banks may be steeper than 1.5:1, a letter with observations to support that the steeper slope is reasonable shall be provided to DFG and CDF.
2. Install cross-vane structures in the channel to help stabilize the channel banks and direct flow to the center of the channel, as warranted by channel bottom conditions. Cross-vane structures have been designed by Dr. Brian Dietterick, Professional hydrologist who will also oversee their installation
3. Install a bridge that is long enough to span between its abutments. Bridge shall utilize suitable footings. For this crossing, a long-lasting footing such as reinforced concrete blocks or piers is preferred. Footings shall be offset a minimum of 5 feet from the edge of the channel bottom. Final location and depth of footings to be determined in the field by the project geotechnical consultant at the time of operations.
4. Conform to the DFG 1600 agreement.
5. Mulch exposed soils per Section II, Item 18 of the NTMP.
6. The project Certified Engineering Geologist or designee shall supervise work.

Crossing R8: This location has two existing Class II watercourse crossings, each with a 24" CMP culvert positioned out of alignment with the natural channel, as was common practice for basins prone to debris flows. The crossings are just above a road intersection and the outlet for the upper culvert drains into a wooden box between the two roads before entering the lower culvert. This crossing was overtopped in a debris flow during a 1998 storm; however a majority of the debris was caught by the

upper road and no sustained damage resulted. Critical dips were installed in conjunction with the 2004 LLC THP and the roads were rocked. Prior to log hauling on this road section, the critical dip on the upper road shall be removed and the headwall above the upper culvert shall be built up approximately 1 foot.

Prior to the winter period following operations:

1. Critical dips shall installed and armored to mitigate diversion potential.

Multiple options for culvert replacement have been explored by the RPF, landowner, CEG, and review team agencies at this location. The current crossing condition does not necessitate immediate replacement and more analysis of the various options is desired prior to crossing replacement. This crossing may be upgraded in the future under the NTMP and prior to upgrade, the review team agencies shall be consulted and a Lake or Streambed Alteration Agreement shall be obtained.

Crossing R9: The section of road was constructed in 1989 across a steep (75% to 80%) swale at a 17 to 20 foot width supported by a 5 to 6 foot high, 45 foot long, log crib wall. The wall consisted of two 24± inch diameter stacked redwoods logs retained on either end behind two small groups of redwoods. The site is located within an area that has perennially high groundwater and the sound of subsurface water can be heard year round flowing within the swale axis at shallow depth below the ground. A 2 to 3 foot deep inside ditch draining to a 12 inch culvert is installed along the back edge of the road to intercept shallow groundwater. The bulk of flow is below the depth of the inside ditch, which primarily captures cutbank seeps. Runoff from the inside ditch is conveyed to a ditch relief culvert and discharged to the south of the swale. A spring servicing a domestic water intake is located approximately 100 feet below the road within the swale. The road grade is between 12% and 17% with a strong outslope pitch past the swale. Over the past 18 years the two logs have slowly decayed contributing to the failure of the upper portion of the log crib wall during the 2007-08 winter. Less than 5 cy of material failed with debris retained a short distance downslope. Presently the outside edge of the road is potentially unstable and the road is too narrow for long term use. Following the PHI, a detailed engineering geologic review of the site was conducted. Several alternatives were considered to upgrade the road at this site for both short and long term use. The alternative to maintain the existing narrow roadway for short term use provides the most economical short term solution for road access, while minimizing offsite impacts. Over time, however, a more lasting solution may need to be employed. For longer term stability, installing a bridge across the failure is a viable options for replacement of the log crib wall. Building the road out on a rock buttress is also feasible but uncertainties in subsurface soil strength and groundwater conditions may complicate construction and result in possible impacts to the downstream water intake. The following mitigations under Alternative 1, to maintain the narrow road, outline the minimum work needed to upgrade the road. Additional work may be required over time, in which case either the option to bridge the site or reconstruct the road on a rock buttress will be implemented. The alternatives are discussed in more in the Addendum to the Focused Engineering Geologic Report, included in Section V. The specific CEG recommendations for the short term and long term alternatives are listed below and the CEG diagrams can be found at the end of Section II.

Short Term

Alternative 1: Maintain narrow road

1. Remove crib log and pull back residual fill material to a 1:1 slope
2. Temporarily backfill the inside ditch with drain rock
3. Level out the strongly outslowed road on temporary fill
4. About 50 feet north of the swale the road can be widened a maximum of 3 feet into the comparatively stable bank if extra road width is required for trucks to make the turn through the swale.
5. Maintain existing rolling dip located about 75 feet to the north

Optional:

1. Install a 2+ foot deep subdrain (French drain) below the inboard ditch
2. See R2 for typical drain specifications
3. Drain shall be sloped to discharge in a reasonable and controlled manner to an area within the swale and above the water intake, unless otherwise specified by the project CEG or designee at the



time of construction. If discharged upslope of the water intake, materials used in drain construction shall conform to drinking water standards.

4. To allow for periodic cleaning, a cleanout shall be installed at the head of the subdrain.
5. Drain installation to be supervised by geotechnical consultant or designee

Long Term

Alternative 2: Bridge the site

1. Remove crib log and pull back residual fill material to a 1.5:1 slope
2. Install permanent 62 foot long railcar bridge
3. Bridge abutments to be keyed into firm native soils behind the two redwood clumps located at either side of the swale
4. Bridge abutments may consist of reinforced concrete blocks or piers. The RPF and/or landowner shall provide final bridge footing design criteria to the project geotechnical consultant prior to bridge installation.
5. The existing 12" diameter ditch relief culvert may need to be relocated to accommodate the bridge footing. Culvert shall discharge outside of the swale leading to the domestic water intake.
6. Inside edge of the bridge to be founded on native earth or on a gravel mat
7. Temporarily backfill the inside ditch with drain rock as judged necessary. Reestablish ditch at the conclusion of operations and prior to the winter season.
8. About 50 feet north of the swale the road can be widened a maximum of 3 feet into the comparatively stable bank if extra road width is required for trucks to make the turn through the swale.
9. Maintain existing rolling dip located about 75 feet to the north
10. Geotechnical consultant or designee to supervise excavation of bridge abutments

Optional:

1. Install a 2+ foot deep subdrain (French drain) below the inboard ditch as described in Alt. 1.

Alternative 3: Reconstruct road on rock buttress

The following are conceptual recommendations:

1. Rock buttress to be keyed a minimum of 3 feet into firm native soils
2. The keyway shall be a minimum of 8 feet wide and inclined into the hillside 5%
3. The back cut shall be inclined no steeper than a 0.75:1 slope. The final inclination of the temporary cut is the responsibility of the contractor based on safety considerations.
4. About 120± cy of material will need to be excavated. Some of this material may be incorporated into the inside edge of the road above and below the site, the remainder will need to be endhauled to a stable location on slopes less than 30%
5. Note: Excavation of the keyway may encounter the zone of high groundwater flow complicating excavation and buttress construction.
6. A backdrain shall be installed at the back and base of the keyway
7. The backdrain shall consist of a 4-inch diameter, perforated SDR35 pipe (or equivalent) surrounded on all sides by at least 4-inches of ½ to ¾ inch drain rock wrapped in filter fabric (Mirafi 180NC or equivalent).
8. Approved Class 2 permeable material may be used in lieu of drain rock wrapped in fabric
9. The backdrain shall be sloped to drain to a controlled discharge point a minimum of 30 feet downslope. Water shall be discharged in a manner so as to minimize the impact to the water intake.
10. To allow for periodic cleaning, a cleanout shall be installed at the head of the backdrain, at every bend greater than 45 degrees, and at 150 foot intervals
11. Materials used in the drain shall be compatible with drinking water standards.
12. Note: Discharging groundwater flow outside of the swale or downslope the water intake could impact the quantity of water available at the intake.
13. The rock buttress shall consist of 24 inch to 36 inch diameter sound angular rock and brought up to grade at a 1:1 slope and capped with a minimum of 18" of compacted soil. Separate soil from rock with woven geotextile fabric (Mirafi 500X or equivalent).
14. Temporarily backfill the inside ditch with drain rock as judged necessary. Reestablish ditch at the conclusion of operations and prior to the winter season.



15. About 50 feet north of the swale the road can be widened a maximum of 3 feet into the comparatively stable bank if extra road width is required for trucks to make the turn through the swale.
16. Maintain existing rolling dip located about 75 feet to the north
17. Geotechnical consultant or designee to supervise excavation of the rock buttress

Crossing R10: This location is a Class III watercourse crossing utilizing a 12" culvert. The flow often goes subsurface upstream of the culvert inlet and resurfaces downstream below the outlet. The crossing is functioning and shall be used as is. Following operations, a critical dip shall be installed.

Crossing R11: This location is a Class III watercourse crossing utilizing an 18" culvert. This crossing does not appear to flow much water as soil is building up in the culvert inlet, yet it remains clear. The crossing will be used as is. Following operations, a critical dip shall be installed.

Crossing R12: This location is a rail car bridge over a Class II watercourse. The bridge was put in place in 1989 and rests on redwood cant abutments. The integrity of the cants shall be evaluated prior to operations on this road section and if necessary replacement options shall be established at that time. Prior to the winter period or following operations the following mitigations shall be implemented:

1. The sediment catchment basins on either side of the bridge shall be dug out.
2. The approaches to the bridge for 50 feet on either side of R12 and the span between R12 and R14 shall be rocked with drain rock to approximately 2 inch depth.

Crossing R13: This location is a 14" culvert that captures drainage from landing L20 above. The culvert is clear and functioning with a downspout below the road. Following operations or prior to the winter period, the road shall be out-sloped to the extent feasible and waterbars or rolling dips shall be placed on this road section to minimize flow toward the cross-drain culvert.

Crossing R14: This location is a rail car bridge over the North Fork of Little Creek. The bridge was put in place in 1989 and rests on redwood cant abutments. The integrity of the cants shall be evaluated prior to operations on this road section and if necessary replacement options shall be established at that time. Prior to the winter period or following operations the following mitigations shall be implemented:

1. The sediment catchment basins on either side of the bridge shall be dug out.
2. The approaches to the bridge for 50 feet on either side of R14 and the span between R12 and R14 shall be rocked with drain rock to approximately 2 inch depth.

Crossing R15: This is an existing crossing of a Class II seep-fed watercourse. A 14" metal culvert was installed when the road was constructed in 1989. Subsequently, when the culvert inlet plugged, a snorkel drain and an additional 12" plastic culvert were installed above the original culvert. Both culverts extend past the downslope road edge several feet and their outflow has likely contributed to instability of the road fill. This location is discussed in detail under Item 24 Mitigation Point MP29 and in the Focused Engineering Geologic Report in Section V. The following recommendations are from the CEG report. Also refer to the diagram of MP29 at the end of Section II.

Prior to operations the following shall be implemented:

1. Remove the redwood stump such that the crossing inlet basin can be restored.
2. Remove both culverts at R15.
3. Reconstruct approximately 15-20 feet of channel to create an inlet basin.
4. Line inlet basin with 12-18" rock.
5. Install a 30" diameter, 20' long culvert.

Following operations prior to the winter period the following shall be implemented:

1. Install a 30+ foot downspout.
2. Place energy dissipaters at the culvert downspout outlet to minimize erosion.
3. Inslope road.
4. Install a critical dip below the crossing.
5. Install waterbreaks at regular intervals.



Crossing R16: This location is an existing 14" metal culvert on a Class III watercourse. The watercourse is fed by several springs and seeps upslope. The crossing is functional and shall be used as is. Following operations, a critical dip shall be installed.

Crossing R17 and R18: This location is an existing 8" metal culvert conveying water under the haul road from a 70' long inside ditch. The ditch collects water, which seeps from the cutbank along its length and trickles over the cutbank in multiple locations, originating from a spring, upslope.

Following operations prior to the winter period the following shall be implemented:

1. A new 18" culvert shall be installed that is aligned with the approximate watercourse centerline.
2. The inside ditch to R17 shall be maintained so that it may continue to handle any bank seep.
3. If any water exists within the proposed work site area at the time of crossing implementation, water shall be channeled around the work area by confining the flow with sand bags and placing 4" to 6" flexible ADS pipe to move water around the project area until work is completed.

Skid Trail Watercourse Crossings

* For crossings S1-S4, if any water exists within the proposed work site area at the time of crossing implementation, water shall be channeled around the work area by confining the flow with sand bags and placing 4" to 6" flexible ADS pipe to move water around the project area until work is completed.

Crossing S1: This location is an existing skid trail crossing on a Class II watercourse that remains wet throughout the year. A temporary Spittler Modified Humboldt crossing shall be installed prior to use*. See the sketch and specifications describing temporary skid trail crossing construction at the end of Section II. Following use or prior to the winter period, the Spittler Modified Humboldt shall be removed and the crossing be dipped out with the approaches slash packed. Post-operations the trail shall be recontoured such that it gently slopes away on either approach. This location shall be monitored per the botanist's recommendation to track the species composition and percent cover over time, see mitigation point MP31 under Item 32.

Crossing S2: This location is an existing skid trail crossing on a Class II watercourse. A temporary Spittler Modified Humboldt crossing shall be installed prior to use*. See the sketch and specifications describing temporary skid trail crossing construction at the end of Section II. Following use or prior to the winter period, the Spittler Modified Humboldt shall be removed and the crossing be dipped out with the approaches slash packed.

Crossing S3: This location is an existing skid trail crossing on a Class II watercourse. A temporary Spittler Modified Humboldt crossing shall be installed prior to use*. See the sketch and specifications describing temporary skid trail crossing construction at the end of Section II. Following use or prior to the winter period, the Spittler Modified Humboldt shall be removed and the crossing be dipped out with the approaches slash packed. The crossing approach from the west side of this crossing shall be slash packed such that slash has full ground contact.

Crossing S4: This location is a proposed skid trail crossing on a Class II watercourse, close to the spring origin. A temporary Spittler Modified Humboldt crossing shall be installed prior to use*. See the sketch and specifications describing temporary skid trail crossing construction at the end of Section II. Following use or prior to the winter period, the Spittler Modified Humboldt shall be removed and the crossing be dipped out with the approaches slash packed. Previous harvest entries crossed this watercourse on a different alignment downstream, where the trail was not quite perpendicular to the watercourse at the crossing point. The proposed crossing has a perpendicular approach to the watercourse, yet requires minor trail construction on the edge of the WLPZ. East of the crossing, the proposed trail traverses side-hill across a small ridge nose. Minor bench construction will be necessary to open this trail and removed material will be pulled back from the slope and not sidecast in the process. At the time of trail close-out, the ridge nose will be recontoured, leaving no perched fill and will be treated with packed slash.



Roads:

Discussion of Little Creek Haul Road Upgrade and Maintenance (Mitigation Point MP20):

Currently, the primary haul road that travels parallel to the mainstem and North Fork of Little Creek possesses a solid base composed of well-compacted Santa Cruz mudstone. Portions of this road are in the Class I WLPZ. The road is located on a stable historic railroad grade except for several sections that were realigned in 1989 to bypass switchbacks. Following the Lower Little Creek harvest in 2004, the road, below the confluence of the North and South Forks was reshaped and rocked in sections as directed by the RPF. Following operations, additional sections of this road shall be rocked to an approximate 2 inch depth to facilitate wintertime travel for management purposes and access.

Mitigation Point MP29: This location is a control point for access to the infrastructure on the ridge between the North and South Forks of Little Creek. The road was built in a geologic sensitive area on an active portion of a deep-seated landslide. The outer edge of road was apparently constructed on 3 to 4 feet of sidecast fill on steep slopes. About 50+ feet of linear distance of the road fill has failed with relatively little residual fill material left. Cutbank instability is another factor that has contributed to narrowing of the road, which is now 10 feet in width. A large redwood root wad, which was perched on the edge of the cut at the time of road construction, has since slid downslope toward the culvert at crossing R15 and partially obstructs the seep-fed watercourse, causing water to pipe below the root wad and seep out of the cutbank and onto the road, just below R15. This causes the road to be seasonally wet. Below crossing R15, the road is insloped and drained to a ditch relief culvert. This area has been reviewed by the project Certified Engineering Geologist and his discussion is included in the Focused Engineering Geologic Report found in Section V. Recommendations are specified below and a diagram is included at the end of Section II.

The recommendation identifies that it is not possible to stabilize the large landslide complex within the economic constraints of the NTMP and therefore any road reconstruction/repair at this site will need to be designed and constructed to accommodate future landslide movement. The goal is to upgrade the road for use in the NTMP in a manner that, although it may be partially or wholly damaged by future slide movement, it will not increase the instability of the slide nor result in a significant increase in sediment to a watercourse. The proposed mitigation to take place in conjunction with harvesting of the North Fork Unit in 2008 is to restore the function of crossing R15, widen the road to the minimum width necessary for safe passage of equipment, inslope the road to allow proper drainage and minimize erosion, and equip the culverts with downspout to reduce saturation of the outboard edge of the road.

Grading

Prior to operations the following shall be implemented:

1. Widen the road by cutting into the bank a maximum of 2 feet and endhaul spoils.
 - For minimal cuts that are less than 2 feet into the bank, the cut will not need to be laid back thus maintaining the small established Douglas fir trees at the top of the cut.
2. Spoils will be endhauled to a stable location on slopes less than 30%, as directed by the RPF, see specifications under Item 18 GENERAL RULES FOR SOIL STABILIZATION.
3. Backfill in the inboard ditch and inlet to the southern ditch relief culvert.

Prior to the winter period following operations the following shall be implemented:

1. Project engineering geologist shall inspect the cut.
2. Replace the toe of the slope with compacted earth if directed by the geologist or designee.
3. Regrade the road to have an inslope pitch.
4. Clean culvert inlets.

Prior to the winter period following operations the following shall be implemented:

R15 Stream Crossing

1. Replace the existing culvert at R15 with a new 30 inch diameter pipe.
 - Install the pipe at grade.
 - Install 30 foot long downspout and energy dissipater.
2. Remove redwood stump such that the crossing inlet basin can be restored.



3. Construct a 15 to 20 foot long catch basin at culvert inlet.
4. Line inlet basin and banks with rock rip rap.
 - Rock shall extend 5 feet up the channel bank in the area where the seep is located as directed.
 - Rock shall be inclined no steeper than 1.25:1 (H:V).
 - Use 12 to 18 inch diameter rock placed 1½ layers deep.
5. Conform to DFG 1600 agreement.

Road Drainage

1. Replace southern ditch relief culvert if necessary.
 - Add downspout and energy dissipater.
2. Maintain inslope pitch to road.
3. Upgrade 200 feet of road drainage to the south by installing rolling dips at 75 foot spacings or ditch relief culverts at 100 foot spacings.

Other

1. Mulch exposed soils with straw or slash per Item 18.
2. Project geotechnical consultant or representative should oversee the work and advise the contractor.

Optional treatments that could occur in conjunction with the above mitigations, depending on conditions:

Extra Road Width

1. Widen the road up to 5 feet by cutting to the bank on a full bench and endhaul material to a stable location.
2. Lay the slope back to 1.25:1 (80%).
3. For cuts greater than 20 feet tall, incorporate a 6-foot wide intermediate bench.

Drainage

1. Install a 3-4 foot deep curtain drain on the inside road edge.
 - See the typical design specifications at the end of the Focused Engineering Geologic Report.

Cross-vane structures

1. Install cross-vane structures in the channel to help stabilize the channel banks and direct flow to the center of the channel.
2. Cross-vane structure designs shall be designed by Dr. Brian Dietterick, Professional hydrologist who will also oversee their installation.

Skid Trails:

Tranquility Flats: Existing skid trails are located on unstable slopes of a deep seated landslide in this area. The extent of the slide margins and their relative ages are shown on the Geologic and Landslide Map at the end of Section II. Along the slide margins, tipped trees have been noted and significant cracks in the earth are present in several places, including landing L21. Skidding equipment shall only operate on designated skid trails in this area. The LTO shall conduct operations with as little blade work as possible so as to minimize vegetation and soil disturbance. No ground based equipment operations shall take place on unstable areas in the winter period. Prior to the winter period or following operations, soil stabilization shall be carried out according to the erosion control specifications under Item 18.

Mitigation Point MP17: At this location a wet area above and east of the skid trail seeps onto the inside edge of the skid trail where Carex and Woodwardia (wet area species) are growing. This trail is an access route to the General Smith tree that is too steep with tight switchbacks for truck traffic. The flagged skid trail bypasses the tightest switchbacks by going straight upslope. At MP17, the trail stays away from the wet area, by avoiding the switchback closest to the seep. The trail is currently drained with a functioning rolling dip and is in good condition. The flagged trail shall be used as is and prior to the winter period following operations the following mitigations shall be implemented:

1. The main trail shall be dipped out to drain away from the switchback following use.
2. The main trails shall be seeded and/or straw mulched as necessary to mitigate erosion.
3. The switchback by-pass shall be covered with tractor crushed or hand placed slash to discourage use.



Mitigation Point MP18: At this location an existing skid trail is located on slopes over 50% for approximately 50 feet. Slopes do not exceed 60%. Prior to the winter period or following operations, refer to Soil Stabilization under Item 18 for the close-out of this trail.

Mitigation Point MP19: At this location an existing skid trail is located within 10 feet of a seep that forms a Class III watercourse below. Above the seep there is approximately 30 feet of channel that does not show signs of recent sediment movement. The following mitigations shall be implemented for operations:

1. Brow logs shall be placed on the skid trail edge if necessary to prevent sediment movement into the channel.
2. Prior to the winter period following operations the skid trail shall be treated as specified in Soil Stabilization under Item 18.

Mitigation Point MP25: The trail to the General Smith Tree has several switchbacks with turns too sharp to skid around. Short sections of existing bypass skid trails have short pitches with slopes over 50%. Prior to the winter period or following operations, refer to Soil Stabilization under Item 18 for the close-out of these trails.

Landings:

Landing L21/Mitigation Point MP16: Landing L21 is an existing landing partially in the WLPZ of a Class II watercourse. The landing is approximately 20' from the Class II watercourse, below crossing R16, with several redwoods and a vegetated filter strip in between. The south side of the landing has settled approximately 2 feet due to large-scale geologic movement in the area. This location has been reviewed by the project CEG and is discussed in the Focused Engineering Geologic Report which is located in Section V. A sketch of this location can be found at the end of Section II. The following mitigations shall be implemented while opening the landing, during, and following use:

1. The LTO shall grade over the scarps.
2. No soil or debris shall be pushed past the landing edge.
3. If necessary, to prevent material from nearing the watercourse, a barricade or silt fence shall be constructed on the landing edge closest to the watercourse.
4. Refueling may occur at this landing, at least 60 feet from the watercourse transition line.
5. The landing will be shaped to drain by outsloping.
6. Prior to the winter period following operations soil stabilization shall be implemented as described under Item 18.

j) In Lieu Practices (YES/NO)?

If yes please explain reason(s) in lieu practices are utilized: Yes. The NTMP includes several in-lieu practices which are described in detail in Sections II and III. Specific operational mitigations are listed above, including: Ground-based equipment on unstable areas 14 CCR § 914, Ground based equipment on slopes over 50%, Use of existing skid trails in the WLPZ, Use of an existing landing in the WLPZ, and Beneficial directional falling of trees in the WLPZ.

k) Water Drafting (YES/NO)? No

Drafting location(s):
Drafting flow rate (gallons/minute):
Other drafting in watershed (number/total flow rate estimate):

l) Winter operations (YES/NO)? Yes

If yes, summarize (include dates of operation (when is drop dead date?) and map showing potential areas of operation):

Winter operations with a multitude of restrictions may occur within the North Fork Unit. For all intents and purposes, operations in the winter period will be extended dry season operations. All road, skid trail, and landing construction shall occur prior to the start of the wet season (*see below for the definition of the wet season). All ground based yarding and skidding activities shall occur prior to the onset of the wet season. All temporary crossings shall be removed prior to the onset of the wet season. As the wet season approaches, the number of open landings will be limited to the minimum necessary and areas where harvesting is complete will be closed out with erosion controls in progress. (*For purposes of protection of red-legged frogs, the wet season begins when precipitation events are sufficient to cause saturated soil conditions, according to a wildlife biologist familiar with California red-legged frog life history, or the RPF who has had RLF training and can demonstrate familiarity with RLF life history and identification. Saturated soil conditions, described in 14 CCR 895.1 could occur after one downpour at the start of the winter period, or following a succession of light rains. However, if light rains are dispersed with dry periods in-between and the soil does not become saturated, the wet season restrictions will be deferred. Barring rain events that cause saturated soil conditions at the start of the winter period, wet season restrictions will apply on December 1, or when cumulative rainfall exceeds 4 inches as measured at the Cal Poly rain gauge, whichever comes first.)

A table summarizing the Winter Period Operating Plan follows. Operations on roads and landings involving truck traffic is limited to permanent roads during the wet season. For the complete Winter Period Operating Plan, see NTMP pgs 18-19.

Winter Period Operating Table:

FOP – Fall Operating Period, October 15 to December 1
 WOP - Winter Operating Period, December 1 to April 15
 SOP – Spring Operating Period, April 15 to May 1

Activity	FOP	WOP	SOP
Tractor Yarding	X		X
Road Construction / Reconstruction			
Landing Construction / Reconstruction			
Cable Yarder Operations	X	X	X
Log Hauling	X	X	X
Log Loading	X	X	X
Temporary Water Crossings			
Timber Falling in WLPZ	X	X	X
Cross Falling of Class III Watercourses	X	X	X
Cross Falling of Class II Watercourses			
Lopping	X	X	X
Planting	X	X	X
Erosion Control	X	X	X

m) Cumulative Impact Analysis

Percent of Watershed to be harvested: 3%
Threatened and Impaired for Steelhead/Coho? (YES/NO) Yes
303(d) Listed Watershed (YES/NO)? If yes, what is the impairment (sediment, temperature, etc.)?: No
Sources of Cumulative Impacts (briefly describe): The Little Creek watershed has a rich history of human activity. Notable projects that have had an

impact on the beneficial uses of water include past timber harvesting, livestock grazing, agriculture, road building and residential development. Net cumulative impacts from these landuses linger; however, proposed selective timber harvests will not exacerbate these effects and will in fact address some legacy issues. A selective harvesting operation utilizing tractor and cable yarding, including several crossing upgrades (proposed as photopoints), is scheduled to take place on the North Fork of Little Creek in 2008, covering approximately 143 acres, 3% of the watershed. Selective timber harvests will likely continue to be proposed on a sustainable cycle on forestlands within the watershed.

Outside of the forested extent of the watershed, a small portion of the lowlands of the watershed are currently used for agriculture and are tilled and planted in row crops. Rangeland with seasonal cattle grazing covers approximately 1,600 acres of the watershed. Ownership in the watershed is primarily made up of large landowners including Big Creek Lumber, CEMEX, MPK Farms, and Cal Poly Corporation (Swanton Pacific Ranch). The predominant land use in the watershed is timber production with simultaneous management for wildlife and watershed values. There is minimal residential development and rural development is primarily in the valley bottom with a few structures in the surrounding hills.

Much of the watershed was logged by the San Vicente Lumber Company between 1908 and 1922. A Shay engine railroad followed the Little Creek drainage to the headwaters of the North Fork, where it branched and continued, north to Big Creek, and south to the headwaters of San Vicente Creek. Several miles of railroad grade, including a trestle across Little Creek are part of the Little Creek watershed area. Several logging camps along the rail line were constructed and used over the course of the logging operation. The logging technique at that time was clearcut and burn, leaving the ground relatively unvegetated. It is estimated that approximately 2000 acres were harvested during this time period between the Little Creek and Big Creek watersheds. The wood was in high demand to rebuild San Francisco following the 1906 earthquake. In 1922 the railroad was dismantled and many of the ties were removed and sold as scrap.

For the complete Cumulative Impacts Analysis, see Section IV of the NTMP (pgs 226-287).

n) Monitoring Points

Describe all monitoring points shown on site map:

Swanton Pacific Ranch is currently under two Waivers for various land management activities, including irrigated agriculture, the Waiver for timber harvesting under NTMP 1-07NTMP-020 SCR will be the third. A still-active Waiver for harvesting under THP #1-04-053 SCR (Resolution No. R3-2004-0074) requires as a condition that the Ranch submit data collected as part of the Little Creek Study, currently underway on Little Creek and its tributaries. This study is contributing to the understanding of the local hydrology as well as the effects of modern forest management practices on water quality, namely suspended sediment transport. In 1997, three monitoring stations equipped with rated section flumes were installed on Little Creek –on the North and South Forks, just above the confluence, and one on the lower Mainstem. The North Fork Flume above the confluence is monitoring station T2 on the Monitoring Map. In 2000, a fourth monitoring site without a flume was established as a control at the upper property boundary of the North Fork (T1), above the proposed harvest area. The calibration phase will be complete following the 2007-08 rain year when stations will have gone through over 7 years of data collection. Water quality data collected over this period include flow, turbidity, and suspended sediment.

This research has several objectives using a both paired and nested watershed study designs. The paired and nested analyses rely heavily on the statistical significance of the data established between stations during the 7 year calibration phase. According to results of the preharvest calibration for the Little Creek watershed analysis, “changes in storm event suspended sediment loads approximately 30% above background levels may be needed to detect change for the nested watershed design, while changes of approximately 90% may be needed to detect change in the paired watershed design.” This is according to the thesis by Michael Gaedeke entitled Pre-harvest Calibration of the Little Creek Watershed - a Paired and Nested Watershed Analysis, available on the CDF Monitoring Study Group website: http://www.bof.fire.ca.gov/PDFS/Gaedeke_Thesis.pdf.

More information on the study design is on Cal Poly's watershed research website:

http://www.spranch.org/research_water.html

More information on this study as well as other research occurring on the Ranch is available in Section III of the NTMP.

Visual Monitoring Route: The proposed visual monitoring route encompasses all critical inspection points that have the potential to negatively impact water quality resulting from harvest operations in the North Fork Unit. The inspection route covers the entire primary existing seasonal road and all existing landings within the Unit boundary. In addition, the inspection route travels on key skid trails to visit each temporary watercourse crossing. The route spans the entire harvest area while putting emphasis on those locations where visual monitoring has particular merit during and immediately after major storm events.

Photo Point Monitoring: Photopoints to be monitored include road crossings R7, R15/MP29, R18, skid trail crossing S1, and Landing L21/Mitigation Point MP16. This list includes all locations of crossing construction and reconstruction, a typical temporary skid trail crossing installation, major road mitigation point MP29, and the In-lieu landing in the WLPZ.

Turbidity Monitoring: Swanton Pacific Ranch is a property dedicated to land stewardship, research, and teaching for Cal Poly State University, San Luis Obispo. A research project involving intensive study of water quality conditions in the North and South Forks of Little Creek has been on-going on the Ranch for the past 7 years. This study, unlike the unsystematic grab-sample monitoring required under many timber Waivers, is using a scientifically valid sampling design to elucidate impacts (if any) from timber harvesting.

The three original Little Creek stations (North Fork confluence [T2], South Fork confluence, lower Mainstem) contain a stilling well to measure the depth of the water mechanically and electronically to obtain the stage of streamflow throughout the storm event. The rectangular shape of the natural-bottom flumes provides a stable channel cross-section and allows for the electronic measurements of stage and stilling well, which are then converted to flow discharge using a rating curve developed for each site. The more recent Upper North Fork station [T1] is a natural channel station, but includes much of the same hydrologic and water quality sampling instrumentation.

An automated pump sampler records instream turbidity and water temperature readings every minute as well as pumping the one-hour storm samples into bottles for lab analysis. During the summer months, 90° sharp-crested V-notch weirs are installed for more accurate low-flow measurements and a HOBO datalogger is installed instream to measure summer temperatures.

Data that is collected from these stations is analyzed and stored at the Water Quality Lab by hydrology graduate students and project assistants. The lab contains a turbidimeter to measure turbidity, and gravimetric analysis is used to determine suspended sediment concentration (SSC) from water samples collected at one-hour intervals from the monitoring stations during storm events. This data is then entered into a computer database for each of the monitoring stations so that a statistical analysis can be performed to determine correlations between the different stations. Ultimately, this will allow for post-harvesting comparisons to evaluate the effectiveness of management practices in protecting water quality.

This data is part of proprietary graduate-level research that requires robust analysis to appreciate the context. It cannot be submitted in its entirety to the Central Coast Regional Water Board for these reasons; however, summary data of the turbidity measurements taken at flumes above and below the North Fork Unit [T1 & T2] will be submitted with the annual report each year.

Temperature Monitoring: Temperature data is collected at the flumes as part of the on-going Little Creek Study. These locations shall continue to be monitored in conjunction with the Little Creek Study and the temperature readings from T1 and T2 shall be submitted in electronic format for this Waiver.



o) Names and addresses of any property owner within 300 feet of the timber harvest area or harvest area entrance road (from public right of way).

Smith Roberta Katherine Trustee
PO Box 174
Davenport, CA 95017

Big Creek Timber Company
3564 Highway 1
Davenport, CA 95017

McCrary Homer T & Emma W
310 Swanton Road
Davenport, CA 95017

La Mar Frances S Trustee
881 Palo Verde Ave
Long Beach, CA 90815

Lone Star Cement Corp
5180 Golden Foothill Pkwy, Suite 200
El Dorado Hills, CA 95762-9347

S:\NPS\Timber Harvest\Forms\Timber Harvest Information Form with Fact Sheet.doc

California Environmental Protection Agency



Recycled Paper

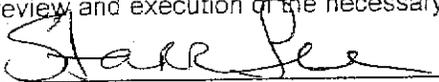
Swanton Pacific Ranch Nonindustrial Timber Management Plan 2007

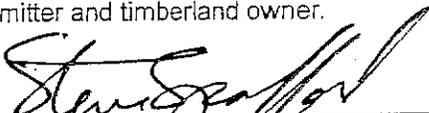
Cal Poly Corporation ("Corporation"), a nonprofit corporation that benefits California Polytechnic State University, owns Swanton Pacific Ranch, which is located in portions of Sections 8, 9, 16, 17 and portions of Rancho Agua Puerca y las Trancas, Township 10 South, Range 3 West. The Ranch is roughly 3202 acres, and was bequeathed to Cal Poly Corporation by Al Smith. Cal Poly Corporation is submitting a Nonindustrial Timber Management Plan ("NTMP") for portions of the ranch to the California Department of Forestry and Fire Protection. The NTMP will include the harvest of timber in parcel 057-121-10, an 80 acre in-holding owned by other heirs of Al Smith (Steve Spafford, Susan Spafford England, and Stuart Spafford (together known as "Landowners")). This parcel is located next to Swanton Pacific Ranch and is located near the confluence of the North and South Forks of Little Creek; Cal Poly Corporation holds timber rights to parcel 057-121-10.

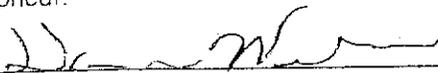
The Department of Forestry is requiring that the Landowners execute the NTMP and other documents as plan submitter and timberland owner in order for Cal Poly Corporation to realize its timber rights on parcel 057-121-10. Therefore, the Cal Poly Corporation assumes all responsibilities, including costs for filing and permits, as plan submitter and as the timberland owner for all timberlands included in the NTMP as required by the state of California per Title 14 California Code of Regulations Chapter 4, 4.5, and 10 ("California Forest Practice Rules"), and assumes legal responsibility as plan submitter and timberland owner for parcel 057-121-10. Cal Poly Corporation will comply with all applicable state laws and regulations regarding the NTMP, including but not limited to, the Forest Practices Act, the Forest Practice Rules, and the Porter-Cologne Water Quality Control Act.

Cal Poly Corporation shall defend, indemnify, hold harmless and protect Steve Spafford, Susan Spafford England and Stuart Spafford (together known as the "Landowners") from and against any and all costs, damages, expenses, liabilities, losses (including without limitation to costs and fees of litigation of every nature) arising out of or in connection with Cal Poly Corporation's compliance with the NTMP as approved by the state, or failure to comply with any of its obligations contained in this agreement, except such loss or damage which was caused by the negligence or willful misconduct of any of the Landowners.

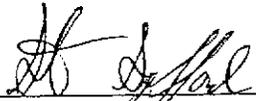
In consideration of this agreement, the Landowners each agree to support Cal Poly Corporation's submission of the NTMP and the application for waiver for waste discharge requirements, and any other documents required for the successful and timely application and completion of the NTMP process, by providing reasonable and expeditious review and execution of the necessary documents as plan submitter and timberland owner.


Starr Lee
Legal Counsel
Cal Poly Corporation
12-10-07
Date


Steve Spafford, Landowner
12/11/07
Date

Concur:

David Wehner
Dean
College of Agriculture, Food, and Environmental
Sciences
California Polytechnic State University
Date 12/17/07


Susan Spafford England, Landowner
12/11/07
Date


Stuart Spafford, Landowner
12/11/07
Date

Concur:

Brian Dieterick
Swanton Pacific Ranch Manager
12/11/07
Date

Swanton Pacific Ranch NTMP - North Fork Unit Monitoring Map

T10S R3W, Portions of Sections 8,9,16,17 and Rancho Agua Puerca y Las Trancas, MDB&M, Davenport USGS 7.5' Quadrangle

Legend

- Swanton Pacific Ranch Boundary
- North Fork Unit Harvest Area 2008
- Visual Monitoring Route
- Temperature Monitoring Point
- Turbidity Monitoring Point
- Photo Monitoring Point

Watercourses

- Class I
- Class II
- Class III
- Class IV
- Wet Area
- Spring
- Pond

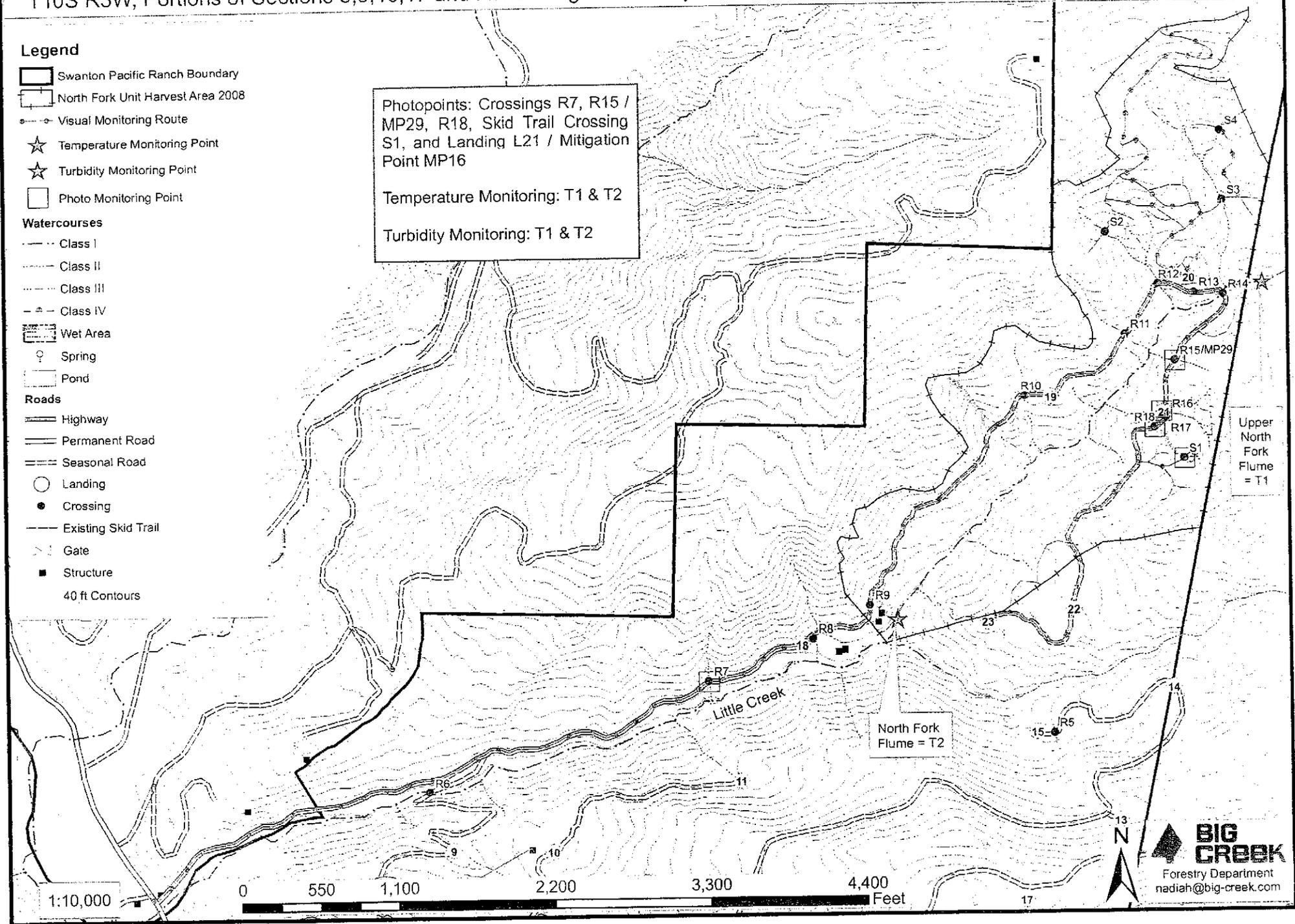
Roads

- Highway
- Permanent Road
- Seasonal Road
- Landing
- Crossing
- Existing Skid Trail
- Gate
- Structure
- 40 ft Contours

Photopoints: Crossings R7, R15 / MP29, R18, Skid Trail Crossing S1, and Landing L21 / Mitigation Point MP16

Temperature Monitoring: T1 & T2

Turbidity Monitoring: T1 & T2



Upper North Fork Flume = T1

North Fork Flume = T2

1:10,000

0 550 1,100 2,200 3,300 4,400 Feet

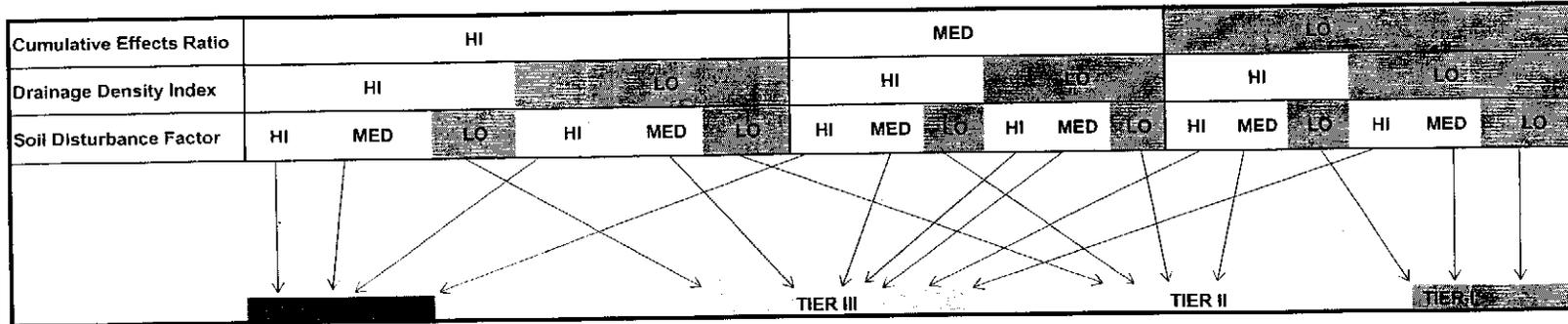


BIG CREEK
Forestry Department
nadiah@big-creek.com

Eligibility Criteria

Plan No.:	1-07NTMP-020 SCR
Plan Name:	Swanton Pacific Ranch NTMP, North Fork Unit

Regulatory and Monitoring Requirement Decision Tool



Regulatory Option

Individual WDR or Waiver

Monitoring Requirements

Individual Monitoring

General Conditional Waiver for Timber Operations

Tier III Monitoring Requirements include water column monitoring for temperature and turbidity, visual and photo monitoring of timber harvest area infrastructure, CDF Forest Practice Rules compliance monitoring, road inventory program, and forensic monitoring as necessary. Tier III monitoring is automatically required if ground based equipment is used off of an all-weather road during the period October 15 - May 1.

Tier II Monitoring Requirements include visual and photo monitoring of timber harvest area infrastructure, CDF Forest Practice Rules compliance monitoring, road inventory program, and forensic monitoring as necessary.

Tier I Monitoring Requirements include CDF Forest Practice Rules compliance monitoring, road inventory program, and forensic monitoring as necessary.

	High	Med	Low
Cumulative Effects Ratio	>15%	15% to 10%	<10%
Drainage Density Index	>100		<100
Soil Disturbance Factor	>2500	2500 to 1000	<1000

	12%	Final			
		Medium			
	159	High			
	1392	Medium			

Winter Ops Proposed - Automatic Tier III

Plan No.:	I-07NTMP-020 SCR
Plan Name:	Swanton Pacific Ranch NTMP, North Fork Unit

Soil Disturbance Factor

Enter values in cells shaded yellow.

		<u>Group(ac)</u>	<u>Selection(ac)</u>			<u>Corrected Sum</u>	
Silviculture	Harvest Area (ac)		143			143	
	Area in THP (ac)	143					
Roads			<u>Seasonal/Temporary</u>		<u>All weather/Permanent</u>		
			<u>Existing</u> x 4	<u>Proposed</u> x 6	<u>Existing</u> x 2	<u>Proposed</u> x 4	
	Linear feet - Existing and proposed	5,100			8,190	257	
			<u>Class I</u> x 30	<u>Class II</u> x 20	<u>Class III</u> x 10		
	Crossings - Number and Class of watercourse crossed	1		4	5	160	
			x 10				
	Number of feet In-lieu/Alt rule in WLPZ	690				69	
			<u>High</u> x2	<u>Extreme</u> x5			
	EHR - Number of feet in high or extreme	13,290				266	
							Roads Subtotal 732
Skid Trails		<u>Existing</u> x 1.5	<u>Proposed</u> x 2.5				
	Linear feet - Existing and proposed	11,000			For unmapped acreage, add 100 feet per acre	115	
			<u>Class I</u> x 10	<u>Class II</u> x7	<u>Class III</u> x 3		
	Crossings - Number and Class of watercourse crossed			4		28	
			x 5				
	Number of In-lieu/Alt rule in WLPZ					0	
		<u>High</u> x1.0	<u>Extreme</u> x2				
EHR - Number of feet in high or extreme	11,000				110		
						Skid Trails Subtotal 233	
Landings		<u>Existing</u> x 1.5	<u>Proposed</u> x 2.5				
	Ground-based	6				9	
	Helicopter	x 1	x 2				
	No. of In-lieu/Alt rule in	0	0			0	
		x 3	x 5				
	1		0			3	
						Landings Subtotal 12	
FINAL SUM							
						Sub Total 1160	
Winter Operations Proposed? Yes or No	Yes					Total 1392	
If yes, automatic Tier III monitoring.							

Plan No.:	1-07NTMP-020 SCR
Plan Name:	Swanton Pacific Ranch NTMP, North Fork Unit

Cumulative Effects Ratio					
Is the proposed harvest in a 303(d) listed watershed? **	Acres Proposed for Harvest or Harvested in Planning Watershed (CalWater) in last fifteen years*		Acres to be harvested as part of proposed THP/NTMP		CER
	Sum	Total Acres in Planning Watershed	Sum	Total Acres in Planning Watershed	
	383	4,470	143	526	12%

* Include all acreage in proposed and approved THPs/NTMPs

**Watershed 303d listed as impaired from sediment or temperature?
If yes type "yes" or leave blank.

Plan No.:	1-07NTMP-020 SCR
Plan Name:	Swanton Pacific Ranch NTMP, North Fork Unit

Drainage Density Index					
ft. of Class I	ft. of Class II	ft. of Class III	Corrected Sum	Plan Area (ac)	DDI
3,800	3,035	5,230	22700	143	159

Exhibit 2

Monitoring Locations

Swanton Pacific Ranch NTMP - North Fork Unit Monitoring Map

T10S R3W, Portions of Sections 8,9,16,17 and Rancho Agua Puerca y Las Trancas, MDB&M, Davenport USGS 7.5' Quadrangle

Legend

- Swanton Pacific Ranch Boundary
- North Fork Unit Harvest Area 2008
- Visual Monitoring Route
- Temperature Monitoring Point
- Turbidity Monitoring Point
- Photo Monitoring Point

Watercourses

- Class I
- Class II
- Class III
- Class IV
- Wet Area
- Spring
- Pond

Roads

- Highway
- Permanent Road
- Seasonal Road
- Landing
- Crossing
- Existing Skid Trail
- Gate
- Structure
- 40 ft Contours

Photopoints: Crossings R7, R15 / MP29, R18, Skid Trail Crossing S1, and Landing L21 / Mitigation Point MP16

Temperature Monitoring: T1 & T2

Turbidity Monitoring: T1 & T2

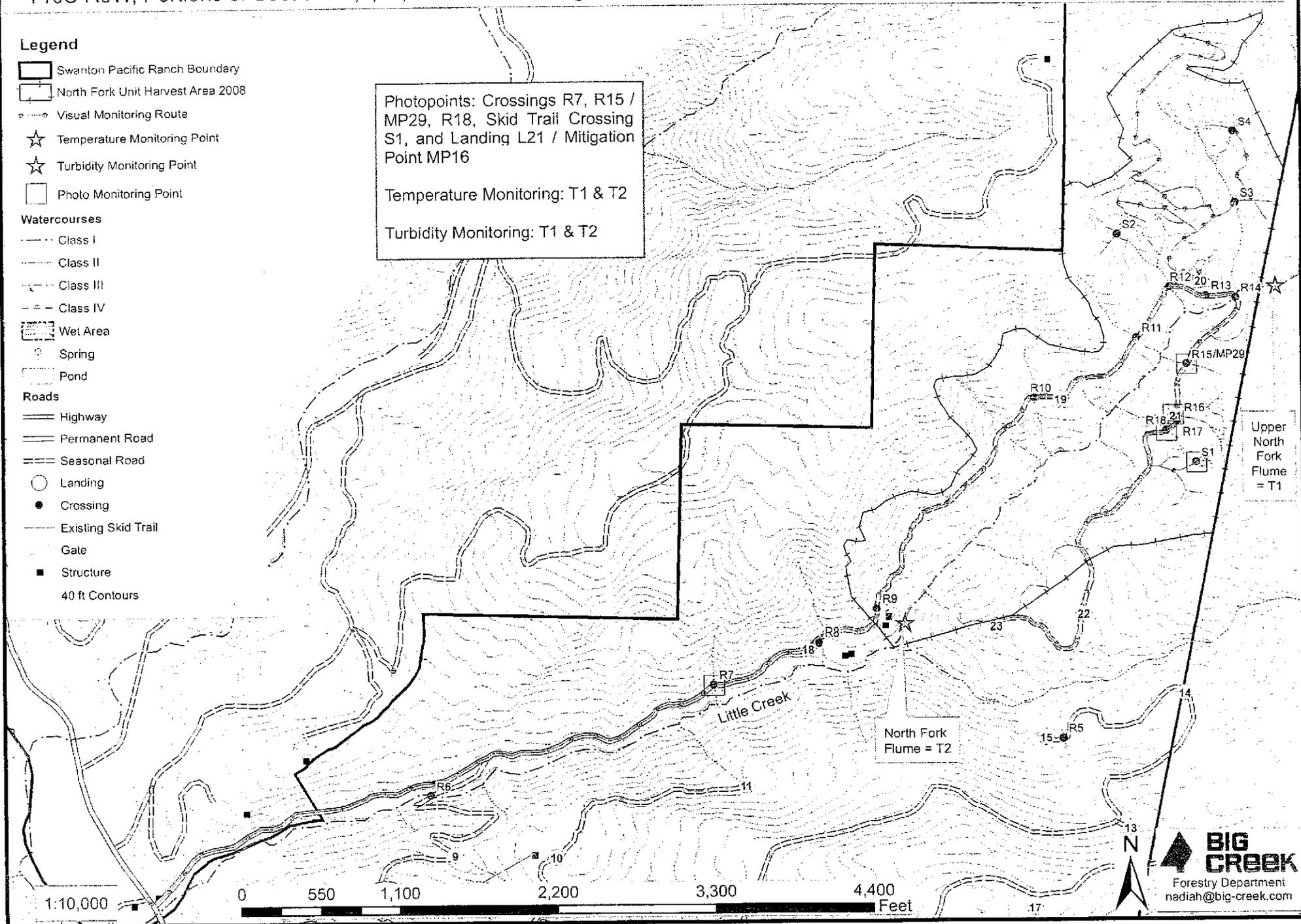


Exhibit 3

Big Creek Road Inventory Program

Standard Operating Procedure 5.2.3
Photo Documentation Procedure

Standard Operating Procedures
Continuous Temperature Monitoring

Standard Operating Procedures
Instream Turbidity Monitoring

BIG CREEK ROAD INVENTORY PROGRAM (BCRIP)
PROTOCOL FOR CONDUCTING COMPANY ROAD
INVENTORIES & MAINTENANCE

Purpose

Big Creek Lumber Company owns and controls over 11,000 acres of forestlands on which there are over 60 miles of permanent, temporary, surfaced, and un-surfaced roads. Maintenance of these roads requires frequent monitoring and treatment.

This document has been drafted to provide the standard operating procedures for conducting and recording road inventories and for the use of the inventory to direct appropriate treatments. This protocol has been drafted so as to guide road inventories consistent with Big Creek goals & objectives and with the certification of Big Creek's lands with the Forest Stewardship Council (FSC).

Process of Road Inventory

Big Creek conducts road inventories on varying intervals, depending upon (1) the designated use of the road, (2) the intensity and duration of precipitation received, (3) the hydrologic activity of the stream system in the area, (4) the susceptibility of the road and appurtenant crossings to failure or damage, and (5) the interval of time since that portion of road was used.

On properties where there has been recent activity or road use, especially if road drainage was altered or improved, review of the roads is conducted more frequently. For each portion of road, Big Creek has designated a standard interval of 2 inches of rain per storm event as the cue to send out maintenance crews. The 2" standard interval is subject to change based on the relationship between the five factors listed above.

When indicated by the interval period, or when deemed necessary otherwise, an individual or group of persons will review the portion of road. Road inventory may be conducted on foot, by pickup, or (especially in wet periods) by ATV or other light-tracking vehicle. While conducting the inventory, the person or persons will do handwork, where necessary, to clear and improve drainage structures and culverts.

Each instance a portion of road is inventoried, a form is filled out recording the observations of the person (see Appendix B, Road Inventory Form). This form allows the person to record the location, date, problem, and proposed solution. This form is then submitted to the Chief Forester of Operations (CFO).

After the road inventory form is completed, it is entered into the roads inventory database (a spreadsheet which tracks observations, work completed, and dates of last review for a portion of road).

If the need for repair or maintenance is immediate, the road reviewer will immediately notify the Chief Forester of Operations so that an appropriate treatment may be planned and initiated. All road inventory forms submitted to the CFO are reviewed, and potentially urgent problems are further analyzed to determine if immediate treatment is necessary. When immediate treatment is prescribed, the project is listed with indication of urgency on a dry erase board posted in the Big Creek Forestry Office. As soon as resources are available to conduct the treatment operations, the necessary equipment, materials, and personnel are dispatched to the site.

After the site is treated, the CFO or the CFO's designee will review the site to determine the success of the treatment. This site, at an interval dependent upon the treatment, will be reviewed over time to evaluate success of treatment and to determine if follow-up treatment is necessary.

For sites that do not require immediate treatment, the records for that site will not be further reviewed until the biennial summary of roads is prepared (May 1 and November 1 of every year). At these times corresponding to the approximate end and beginning, respectively, of the winter period, the latest records for each property are reviewed and responsibility for appropriate treatments are delegated. Subsequent evaluation of the treatment's success is conducted, and follow-up treatment prescribed, if necessary.

ELEMENTS OF THE FIVE FACTORS THAT DETERMINE INSPECTION TRIGGERS FOR THE BCRIP:

Watershed:

- Threatened and Impaired
- 303 (D) Listed Stream Segments
- Sub-division/home proximity to project area
- Orographic effect:
 - South county vs. North county
- Project elevation, low vs. high in the watershed
- Road conditions outside of project area that contribute or receive flow
- Watercourse classifications for project area

Porosity:

- Fast vs. slow
- Soil type - sandstone/shale/granite
- High vs. low rock content
- Ground saturation point/springs begin to flow at higher rates

Topography:

- Steep/flat/undulating
- Indication of instabilities/ tipped trees/earth fractures/slides
- Proximity to San Andreas Fault

Vegetative Cover Type:

- Brush/oak woodland/conifer
- General vegetative cover

General Elements Associated with Infrastructure:

Age of road:

- Older vs. newer road/existing leaf cover/general vegetation cover

History:

- Legacy problems/old humboldt crossings
- Who designed and implemented the existing road/crossings
- Past performance and condition of general infrastructure

Location of road:

- Ridge top/steep ground/proximity to watercourse/roads on unstable areas

Road surfacing:

- Rocked/ based/seeded/straw mulched/slash packed/un-surfaced

Road Standard:

- Insloped/outloped/crowned/re-contoured:
 - Spittler outslope of new roads
 - Full bench road cut/balanced cut and fill/fill
 - Through cuts/long run of through cut
 - Berms on outside edge of road
 - Seasonal/all winter road

Type of drainage and crossings:

- Waterbars/rolling dips/bridges/culverts/rocked fords
- Current condition of erosion control structures/How much do you think they can handle

Trespass

- 4WD/motorcycles/mountain bikes/horses/foot traffic

Watercourse crossing location and frequency

Gopher holes

Pig wallows/rooting

PG&E access road

EHR rating in THP

Weather:

Interval of time since the last rain event
Type of rain year/El nino/are storms holding more rain
Jet stream status

High pressure or low pressure

Wind direction:

• South East - Strong high pressure
• South - Storm medium pressure
• Southwest - Storm low pressure
• East/Southeast - Strong extreme low pressure
• West - Clearing

Check the barometer

Soaking, low intensity, rain vs. hard, high intensity, rain

General weather patterns

Trigger Assessment Tools:

Weather radio

Barometer

Local contacts:

Forest landowners

Local news forecasts

Tell tail locations:

Creek mouths open to the ocean

General overland flow

• Bridge crossings of major rivers/streams/creeks throughout the county

Etc...

State wide contacts

Other foresters and forestry companies

California Newts:

Moving uphill vs. downhill

Weather web sites (rainfall, stream flow, satellite imagery, forecasts, flood warnings, etc...):

<http://www.wrh.noaa.gov/mtr/>

<http://www.goes.noaa.gov/>

http://water.usgs.gov/cgi-bin/waterwatch?map_type=real&state=ca

<http://cdec.water.ca.gov/misc/realStations.html>

http://www.weather.com/maps/maptype/satelliteworld/pacificoceansatellite_large_animated.html?

<http://www.wrh.noaa.gov/mtr/gettext.php?pid=RR5&sid=RSA>

<http://www.surflife.com/home/index.cfm>

<http://weather.cnn.com/weather/forecast.jsp?locCode=SRU>

OWNERSHIP:

NAME(S):

DATE:

LOCATION:

PROBLEM:

CODES

SOLUTION:

CODES

LOCATION:

PROBLEM:

CODES

SOLUTION:

CODES

PROBLEM

Cut-Bank Failure	1
Fill-Slope Failure	2
Water Bar Failure	3
Fill Failure	4
Drainage Problem	5
Cracks/Settling	6
Plugged Culvert	7
Wash-Out	8
Slide Debris/Flow	9
Trees Blocking Road	10

SOLUTION

Replace	A
Reconstruct	B
Drain	C
Resurface	D
Remove	E
Cover	F
Mechanical	M
Hand Work	H
Temporary	T
Permanent	P

Standard Operating Procedure 5.2.3

Photo Documentation Procedure

Introduction:

Photographs provide a qualitative, and potentially semi-quantitative, record of conditions in a watershed or on a water body. Photographs can be used to document general conditions on a reach of a stream during a stream walk, pollution events or other impacts, assess resource conditions over time, or can be used to document temporal progress for restoration efforts or other projects designed to benefit water quality. Photographic technology is available to anyone and it does not require a large degree of training or expensive equipment. Photos can be used in reports, presentations, or uploaded onto a computer website or GIS program. This approach is useful in providing a visual portrait of water resources to those who may never have the opportunity to actually visit a monitoring site.

Equipment:

Use the same camera to the extent possible for each photo throughout the duration of the project. Either 35 mm color or digital color cameras are recommended, accompanied by a telephoto lens. If you must change cameras during the program, replace the original camera with a similar one comparable in terms of media (digital vs. 35 mm) and other characteristics. A complete equipment list is suggested as follows:

Required:

- Camera and backup camera
- Folder with copies of previous photos (do not carry original photos in the field)
- Topographic and/or road map
- Aerial photos if available
- Compass
- Timepiece
- Extra film or digital disk capacity (whichever is applicable)
- Extra batteries for camera (if applicable)
- Photo-log data sheets or, alternatively, a bound notebook dedicated to the project.
- Yellow photo sign form and black marker, or, alternatively, a small black board and chalk

Optional:

- GPS unit
- Stadia rod (for scale on landscape shots)
- Ruler (for scale on close up views of streams and vegetation)

Some safety concerns that may be encountered during the survey include, but are not limited to:

- Inclement weather
- Flood conditions, fast flowing water, or very cold water
- Poisonous plants (e.g.: poison oak)
- Dangerous insects and animals (e.g.: bees, rattlesnakes, range animals such as cattle, etc.)
- Harmful or hazardous trash (e.g.: broken glass, hypodermic needles, human feces)

We recommend that the volunteer coordinator or leader discuss the potential hazards with all volunteers prior to any fieldwork.

General Instructions:

From the inception of any photo documentation project until it is completed, always take each photo from the same position (photo point), and at the same bearing and vertical angle at that photo point. Photo point positions should be thoroughly documented, including photographs taken of the photo point. Refer to copies of previous photos when arriving at the photo point. Try to maintain a level (horizontal) camera view unless the terrain is sloped. (If the photo can not be horizontal due to the slope, then record the angle for that photo.) When photo points are first being selected, consider the type of project (meadow or stream restoration, vegetation management for fire control, ambient or event monitoring as part of a stream walk, etc.) and refer to the guidance listed on *Suggestions for Photo Points by Type of Project*.

When taking photographs, try to include landscape features that are unlikely to change over several years (buildings, other structures, and landscape features such as peaks, rock outcrops, large trees, etc.) so that repeat photos will be easy to position. Lighting is, of course, a key ingredient so give consideration to the angle of light, cloud cover, background, shadows, and contrasts. Close view photographs taken from the north (i.e., facing south) will minimize shadows. Medium and long view photos are best shot with the sun at the photographer's back. Some artistic expression is encouraged as some photos may be used on websites and in slide shows (early morning and late evening shots may be useful for this purpose). Seasonal changes can be used to advantage as foliage, stream flow, cloud cover, and site access fluctuate. It is often important to include a ruler, stadia rod, person, farm animal, or automobile in photos to convey the scale of the image. Of particular concern is the angle from which the photo is taken. Oftentimes an overhead or elevated shot from a bridge, cliff, peak, tree, etc. will be instrumental in conveying the full dimensions of the project. Of most importance overall, however, is being aware of the goal(s) of the project and capturing images that clearly demonstrate progress towards achieving those goal(s). Again, reference to *Suggestions for Photo Points by Type of Project* may be helpful.

If possible, try to include a black board or yellow photo sign in the view, marked at a minimum with the location, subject, time and date of the photograph. A blank photo sign form is included in this document.

marker post) then have an alternate method (map, aerial photo, copy of an original photograph of the photo-point, etc).

2. Select an existing structure or landmark (mailbox, telephone pole, benchmark, large rock, etc.), identify its latitude and longitude, and choose (and record for future use) the permanent position of the photographer relative to that landmark. Alternatively, choose the procedure described in *Monitoring California's Annual Rangeland Vegetation* (UC/DANR Leaflet 21486, Dec. 1990). This procedure involves placing a permanently marked steel fence post to establish the position of the photographer.
3. For restoration, fuel reduction, and BMP projects, photograph the photo-points and carry copies of those photographs on subsequent field visits.

Determining the Compass Bearing:

1. Select and record the permanent magnetic bearing of the photo center view. You can also record the true compass bearing (corrected for declination) but do not substitute this for the magnetic bearing. Include a prominent landmark in a set position within the view. If possible, have an assistant stand at a fixed distance from both the photographer and the center of the view, holding a stadia rod if available, within the view of the camera; preferably position the stadia rod on one established, consistent side of the view for each photo (right or left side).
2. Alternatively, use the procedure described in *Monitoring California's Annual Rangeland Vegetation* (UC/DANR Leaflet 21486, Dec. 1990). This procedure involves placing a permanently marked steel fence post to establish the position of the focal point (photo center).
3. When performing ambient or event photo monitoring, and when a compass is not available, then refer to a map and record the approximate bearing as north, south, east or west.

Suggestions for Photo Points by Type of Project:

Ambient or Event Monitoring, Including Photography Associated with Narrative Visual Assessments:

1. When first beginning an ambient monitoring program take representative long and/or medium view photos of stream reaches and segments of shoreline being monitored. Show the positions of these photos on a map, preferably on the stream/shore walk form. Subjects to be photographed include a representative view of the stream or shore condition at the beginning and ending positions of the segment being monitored, storm drain outfalls, confluence of tributaries, structures (e.g., bridges, dams, pipelines, etc.).
2. If possible, take a close view photograph of the substrate (streambed), algae, or submerged aquatic vegetation.

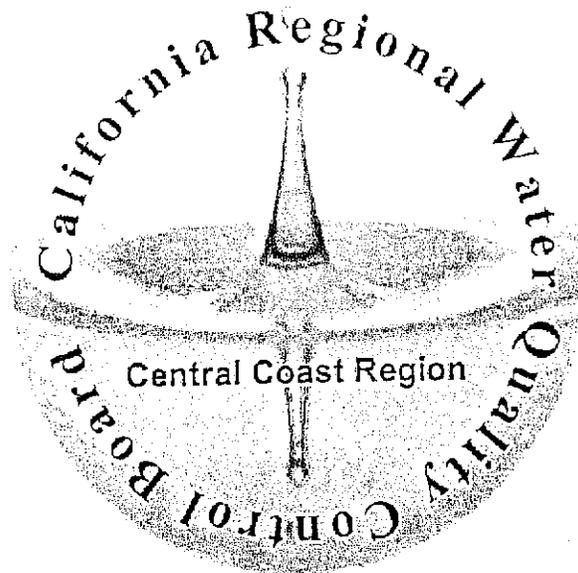
4. Long view and medium view of streambed changes (thalweg, gravel, meanders, etc.)
5. Medium and close views of structures, plantings, etc. intended to induce these changes.
6. Optional: Use a tape set perpendicular across the stream channel at fixed points and include this tape in your photos described in 3 and 4 above. For specific procedures refer to Harrelson, Cheryl C., C.L. Rawlins, and John P. Potyondy, *Stream Channel Reference Sites: An Illustrated Guide to Field Techniques*, United States Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-245.

Vegetation Management for Fire Prevention ("fuel reduction"):

1. Aerial view (satellite or airplane photography) if available.
2. In the absence of an aerial view, a landscape, long view showing all or representative sections of the project (bluff, bridge, etc.)
3. Long view (wide angle if possible) showing the project area or areas. Preferably these long views should be from an elevated vantage point.
4. Medium view photos showing examples of vegetation changes, and plantings if included in the project. It is recommended that a person (preferably holding a stadia rod) be included in the view for scale
5. To the extent possible include medium and long view photos that include adjacent stream channels.

Stream-Sediment Load or Erosion Monitoring:

1. Long views from bridge or other elevated position.
2. Medium views of bars and banks, with a person (preferably holding a stadia rod) in view for scale.
3. Close views of streambed with ruler or other common object in the view for scale.
4. Time series: Photograph during the dry season (low flow) once per year or after a significant flood event when streambed is visible. The flood events may be episodic in the south and seasonal in the north.



Timber Harvest Program
Standard Operating Procedures
Continuous Temperature Monitoring

April 2006

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Purpose

This document provides standard operating procedures for continuous temperature monitoring on forest streams pursuant to the General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Activities in the Central Coast Region (General Waiver). These procedures, when followed correctly, will support the collection of continuous temperature data. The data will be used for trend analysis and to determine compliance with Monitoring and Reporting Program R3-2005-0066.

Monitoring Season

Monitoring shall begin at the onset of timber harvest operations (i.e. tree falling, yarding, and / or roadwork, etc.) and shall be consistent with the Monitoring and Reporting Program (MRP), any conditions set forth within the waiver or waste discharge requirements, and the procedures outlined in this document. Monitoring shall continue as specified in the MRP until it is revised or rescinded.

Continuous Temperature Monitoring occurs for the five and a half month period starting May 1 and ending October 15, at all temperature monitoring locations established in the MRP. If a site becomes dry at any point during the monitoring season, the logger shall be relocated further downstream where monitoring can continue. Relocation of the logger must be documented.

If timber harvest operations commence during the period of October 16 through April 30, temperature monitoring shall begin the subsequent May 1. If timber harvest operations commence during the period of May 1 through October 15, temperature monitoring shall begin and continue the day operations begin until October 15 of that same year. Temperature monitoring shall then continue in the subsequent years as prescribed in the MRP.

Calibration Checks

Calibration checks shall be conducted on the data loggers at three separate times during the monitoring season: 1) prior to logger deployment 2) at mid-season data collection 3) at the end of the monitoring season. Calibration check One shall be conducted as described for the two bath tests (below). Calibration checks Two and Three will be conducted against a stream temperature thermometer¹ reading in the field, as described in the mid-season data collection and logger calibration section. Calibration checks are used to document logger performance and accuracy. This provides assurance of the quality of data being collected and reported. Calibration events Two and Three shall occur shortly after sampling results have been downloaded and backed up. Always download data according to the manufacture's instructions. Results of the calibrations must be documented on the calibration check form,² the form must be kept with your logbook.

The following bath tests shall be conducted at least once per year, prior to deployment of your logger for the monitoring season, to determine its accuracy. Each logger shall be assigned a unique temperature logger ID number. The calibration check form shall include fields to record the calibration check results for each data logger. The loggers, utilized for continuous temperature monitoring must be specified for full submersion, outdoor freshwater stream temperature monitoring. The logger must also be designed to withstand the environmental conditions it will be subjected to over the full duration of the monitoring season.

¹ All references to a thermometer in this document call for the use of a Certified Reference Thermometer or one certified by the National Institute of Standards and Technology that is designed for total immersion.

² Available at the Water Board's website or upon request to Water Board staff.

Data Logger Ice Bath

This test will allow you to determine the accuracy of your data logger at its lower range.

Place crushed ice in an insulated container that is large enough to hold the loggers that you are testing. It is important to crush the ice to maintain as consistent and uniform a temperature as possible. Fill the container with water to just below the level of the ice and stir the mixture around. Submerge the loggers that you are testing. Place the entire container in a refrigerator to minimize temperature gradients. Allow enough time for the logger to acclimate; at least ten minutes. The ice will melt slowly, so the actual temperature should settle around 0°C if the ice bath was prepared correctly. Place a thermometer in the bath to confirm the temperature against your logger's reading. Allow the logger to collect at least five readings before removing it from the bath. Check the reading of your logger to confirm that the five readings are within the acceptable accuracy range reported by the manufacturer at 0°C. Record the calibration check on your calibration check form.

Room Temperature Bath

This test will allow you to determine the accuracy of your data logger at its higher range.

Fill an insulated container that is large enough to hold the loggers that you are testing with water. Place the open container in a room overnight that has constant air temperature at the higher end of the loggers temperature range. Submerge the loggers that you are testing. Allow enough time for the logger to acclimate; at least ten minutes. Place a thermometer in the bath to confirm the temperature against your logger's reading. Allow the logger to collect at least five readings before removing it from the bath. Check the reading of your logger to confirm that the five readings are within the acceptable accuracy range reported by the manufacturer at the upper end of the loggers temperature range. Record the calibration check on your calibration check form.

Note: Water used to make the ice and fill the containers for the bath tests may be tap water or bottled water. Salt water may not be used.

Deployment Procedure

All loggers must be deployed at the temperature monitoring locations identified in your MRP. Only those loggers that pass the calibration check requirements may be programmed for deployment. Prior to deployment, follow the manufacture's instructions for programming the logger for a delayed start and set the logger to record point measurements every hour. All loggers and other monitoring equipment should be kept clean, stored in protective cases during transportation, and protected from extreme temperatures. Prior to programming the temperature logger, both the computer clock and the watch used to record deployment times shall be synchronized. You must also confirm that the date and time modes of the logger are functioning properly.

During the deployment process, all field data including station number, station name, temperature logger ID numbers, and calibration results must be recorded. All monitoring stations must have a unique site identification number and / or name. A sketch and description of the logger locations that notes a landmark reference point, such as a unique rock, log, root, or tree should also be recorded. In addition, a picture of the water temperate logger location including a landmark should be taken to help relocate the logger in the future.

The most important aspect of logger deployment is to find a location in the stream that is safe to get to and where representative stream temperature data may be obtained during lower flows. The logger should be placed to avoid direct sunlight. In small streams, loggers should be installed as close to the thalweg³ as possible and six inches off the stream bottom. In large streams, areas of potential temperature stratification (resulting from eddies, groundwater, and tributaries) need to be avoided. In addition, placing the logger in a 2 -2 ½ foot deep location downstream or alongside a landmark rock or streambed feature improves the chance of it staying submerged during its deployment period and being located for retrieval.

When placing the logger at the sampling point, you must find a method to secure the logger in place for the duration of the monitoring season. Secure a waterproof business card to the logger in a manner that will not inhibit the collection of data. This provides an opportunity for the logger (and the data) to be returned in the event the logger is lost. If the logger will be placed in an area subject to vandalism, you must make accommodations to prevent vandalism. Most manufactures sell products that can camouflage the logger without disrupting its data collection.

Mid-season Data Collection and Logger Calibration

For the safety of the data, data logger manufactures recommend that a logger never be deployed for longer than a three-month period. Mid-season data collection and logger calibration will decrease the chances of losing a full season of temperature data for any one monitoring point. Mid-season data collection and logger calibration shall occur within the last two weeks in July or first two weeks in August. This mid-season check can either be conducted in the field or the loggers may be taken back to the lab for data collection and analysis. Loggers removed from the field to perform the mid-season calibration check must be returned to their monitoring station within four days.

Upon inspection of the site, look for signs of physical disruption of channel conditions; inspect the logger for fouling, corrosion, or damage; perform a battery or power check; clean or service the sensor as needed; and calibrate the logger as described below.⁴

To conduct the mid-season data collection and logger calibration you must begin by checking the stream temperature with a thermometer. Place the thermometer next to the

³ The line defining the lowest points along the length of a riverbed or valley.

⁴ This inspection regime must be repeated when the logger is removed from the field at the end of the monitoring season.

data loggers long enough for it to acclimate and then take the temperature reading. Record the thermometer's temperature reading on the calibration check form. After recording the temperature readings from the thermometer in the stream, remove the data loggers from the stream and download the data either onto a laptop in the field or on your computer in the lab. Check the reading of your logger to confirm that the reading is within the acceptable accuracy range presented by the manufacturer. Any loggers not reading within an acceptable range, found to be damaged, missing, or destroyed, must be replaced immediately with a logger that meets the specifications per these procedures. Spare loggers should be kept on hand for this purpose. Document all findings from the mid-season data collection and logger calibration on the calibration check form.

Reporting Requirements

By November 15 of each year, you must submit an Annual Report to the Central Coast Water Board per the requirements in your MRP. When reporting the temperature data you must include:

- ❖ A summary of the water quality monitoring performed during the previous year.
- ❖ A detailed map with all monitoring locations clearly marked with unique site identification tags.⁵
- ❖ All data submitted electronically in excel format.
- ❖ Make and model of the data loggers being used at each monitoring location.
 - Copy of the manufacture's protocol / recommendation for proper use of the loggers.
- ❖ Calibration check form for each data logger.
- ❖ Description of any modifications or adjustments made based on the calibration checks and field observations.

⁵ The map needs to be submitted once unless monitoring station locations are modified. In the future a map with unique monitoring site tags shall be submitted with the Timber Harvest Information Form and Fact Sheet.

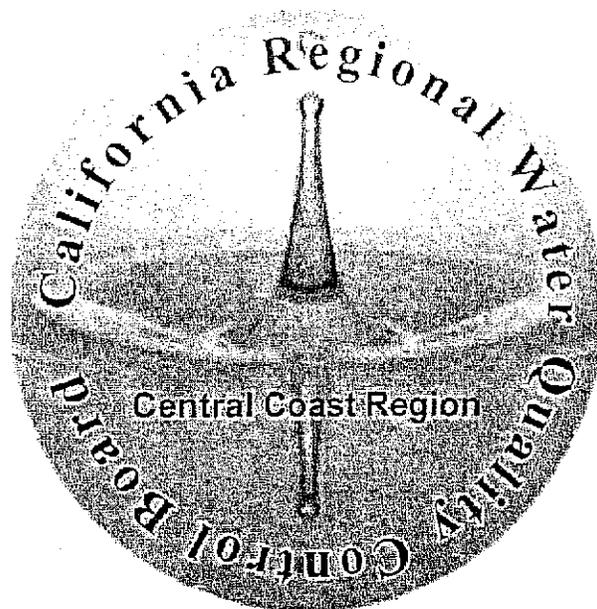
Literature Consulted

Quick Accuracy Check Copyright © 1996-2004 Onset Computer Corporation
<http://www.onsetcomp.com/Support/HS_Support/5317_acc_test.html>

Schuett-Hames D., A.E. Pleus, E. Rashin, and J. Matthews. 1999. *TFW Monitoring Program method manual for the Stream Temperature Survey*. Prepared for the Washington State Department of Natural Resources under the Timber Fish and Wildlife Agreement, Olympia, WA. TFW-AM9-999005. DNR # 107. June

Wagner Richard J., Harold C. Matraw, George F. Ritz, and Brett A. Smith. 2000. *Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Site Selection, Field Operation, Calibration, Record Computation, and Reporting*. U.S. Geological Survey, Water-Resources Investigations Report 00-4252. Reston, Virginia.

Ward, William J. *Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends Section*. 2003. Washington State Department of Ecology. Olympia, WA. Publication No. 03-03-052. December.



Timber Harvest Program

Standard Operating Procedures for Instream Turbidity Monitoring

October 2006

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Purpose

This document provides standard operating procedures for instream turbidity monitoring on forest streams pursuant to the General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Activities in the Central Coast Region (General Waiver). These procedures, when followed correctly, will support the collection of turbidity grab samples or insitu probe measurement data. The data will be used for trend analysis and to determine compliance with Monitoring and Reporting Program R3-2005-0066.

Throughout this document "the discharger" means the landowner and anyone working on behalf of the landowner in the conduct of timber harvest activities including monitoring.

Timing: Monitoring Season

Monitoring shall begin at the onset of timber harvest operations (i.e. tree falling, yarding, and / or roadwork, etc.) and shall be consistent with the Monitoring and Reporting Program (MRP), any conditions set forth within the General Waiver or Waste Discharge Requirements, and the procedures outlined in this document. The turbidity monitoring season begins on or after October 15 as specified in the MRP. You are required to conduct forensic monitoring throughout the entire year as necessary. Monitoring shall continue as specified in the MRP until it is revised or rescinded.

Monitoring Triggers: Rainfall Information

Monitoring events¹ are triggered by rainfall events as prescribed in the MRP and as necessary according to forensic monitoring requirements.

The discharger shall document when and where rainfall data was obtained for each monitoring event on the Timber Harvest Turbidity Monitoring Field Data Sheet (Data Sheet). The Data Sheet may be downloaded from the website at: http://www.waterboards.ca.gov/centralcoast/Facilities/Timber_Harvest/index.htm and then click on "turbidity." Hard copies of the data sheet are available upon request.

Rain gauges used shall represent precipitation at the harvest site as closely as possible. Compare rain gauge readings at the site to published gauges whenever possible.

Locations: Monitoring Sites

Turbidity sampling shall occur at monitoring locations specified in the MRP or identified during forensic monitoring. Identify the monitoring locations for each harvest at the top of the Data Sheet and include the latitude and longitude of the location in North American Datum of 1983 (NAD83) (i.e. decimal degree format dd.ddddd). Latitude and longitude are available at the www.topozone.com website.

Equipment: Turbidimeter / Turbidity Probe

The MRP specifies that a handheld turbidimeter is acceptable for the purposes of measuring instream turbidity. A handheld turbidimeter is either field equipment, equipped with a probe that takes direct turbidity readings from the watercourse, or bench top laboratory equipment that takes a turbidity reading from a sample

¹ A monitoring event is defined as all the turbidity samples or readings taken during the same storm event.

already collected from the monitoring location. Some models of the bench top style turbidimeter are designed to be taken into the field.

Whether a bench top turbidimeter or probe is used, the equipment must report turbidity levels in Nephelometric Turbidity Units (NTUs) and be able to read within a scale of at least 0 – 1,000. Each piece of equipment must be assigned a unique equipment identification number.

Calibration and Accuracy Checks

Turbidity equipment (probe or bench top turbidimeter) must be calibrated within twenty-four hours prior to each sampling event using standard reference materials and following the manufactures instructions. Calibration must include at least two calibration points that are intended to bracket the expected conditions in the field. Calibration data must be recorded on the data sheet and include the equipment identification number, date and time, result prior to calibration, value of calibration standard, and result following calibration.

An accuracy check must be preformed on the turbidity equipment within 24 hours following each sampling event. Accuracy check must include the same calibration points and certified reference materials as were used in the pre sampling calibration. If the readings are not within 5% of the standard value for any of the ranges, the probe or bench top turbidimeter must be recalibrated. Accuracy check data must be recorded on the data sheet and include equipment identification number, date and time, accuracy check result, and value of calibration standard.

Field Collection Procedures

Take turbidity reading with the probe or collect the grab sample away from the stream bank in the main current in a location that best represents the water column. An optimal location would be in a relatively straight reach that is well mixed, with uniform hydraulics, and away from turbulence. Never sample stagnant water.

When wading² to the site try not to disturb bottom sediment. Be careful not to take a turbidity reading or collect water that has sediment from bottom disturbance. Mark the site with flagging, photo-documentation, or other method to ensure that subsequent sampling occurs at the same location.

Probe

The discharger must take a turbidity reading using a probe that has been cleaned according to the manufacture's specifications or collect the sample using a clean sample container.

² A small clean container, such as a bucket, attached to a long handle may be used to collect a sample from a stream if direct access to the bank is difficult or dangerous.

If using a probe, identify a sampling location and place the probe in the stream at least 2.0 cm below the water surface but not more than 4.0 cm below the surface. Allow the probe measurement to stabilize (see manufacturer's instructions) and record the result on the field data sheet.

Grab samples

The sample container must be a plastic, wide mouthed, bottle with a screw top lid. Analyze the samples immediately. If samples will be placed in storage prior to analysis, they must be stored in amber laboratory bottles at 4° C for a time period not to exceed twenty four hours.

All bottles must be cleaned prior to each use according to the following specifications, 1) Wash each sample container with a brush and phosphate-free detergent, 2) Rinse three times with cold tap water.

Prior to sample collection label the bottle with the name of the sampler, location, and the date/time the sample was taken. Identify the sampling location and stand facing upstream. Rinse sample container three times with ambient water before filling with sample. To collect the sample, lower the lip of the bottle **below the surface of the water** and towards the current. Collect the sample with a "scooping" motion to sample the full water column instead of just one spot. (see Attachment 1, Collecting a Turbidity Grab Sample) Promptly³, pour out excess water to leave at least a 1-inch air space so the sample can be re-suspended (by inverting the sample container several times) prior to analysis.

Stage Measurements

At each monitoring location establish a staging location where the substrate is relatively stable. During each sampling event measure stream stage with a yard stick, staff gauge, or staff plate for comparison to future measurements.

Sample Analysis

Perform the sample analysis per the manufacturer's recommendation for the turbidimeter. If performing analysis with a bench top turbidimeter, conduct analysis on three separate sub-samples⁴ from the same bottle and record the median⁵ on the Data Sheet. Always re-suspend the sample by gently inverting the sample bottle several times (do not shake as air bubbles can interfere with your readings) before transferring to sub sample vials to prevent a misrepresentative reading due to settling.

³ This must be done immediately after collecting the sample. Waiting to pour out excess water can create an unrepresentative sample as some material may have already settled.

⁴ If using bench top turbidimeter, all vials for subsamples must be cleaned to manufacturer's recommendations.

⁵ Constituting the middle value in the distribution.

Data Sheet

All sections of the field data sheet must be completed for each monitoring event.

Identify the Timber Harvest Plan (THP) or Nonindustrial Timber Management Plan (NTMP) number, Plan Name, and monitoring year. For NTMPs identify the unit or notice of timber operations (NTO) number.

Identify the monitoring sites with a unique site identification (ID). This ID needs to correlate to the monitoring maps in the MRP. Provide the latitude and longitude of each site in decimal degree format (e.g. 35.345600N 122.678900W).

Identify the type of turbidimeter or probe.

Provide data from pre sampling calibration prior to each monitoring event, including the equipment identification number, date and time, result prior to calibration, value of calibration standard, and result following calibration. Record the name of the person who conducted the calibration.

Provide data from accuracy checks following each monitoring event, including the equipment identification number, date and time, accuracy check result, and value of the standard. Record the name of the person who conducted the accuracy check.

Provide the date and time each sample was taken and the date and time the sample was analyzed. Record the stage height and note any additional information such as problems at the site or any other observations.

Note the rain gauge location reading and time; amount and duration of rainfall; and current weather.

Estimate whether the stream is on the rising or falling limb of the hydrograph.

Reporting Requirements

By November 15 of each year, the discharger must submit an Annual Report to the Central Coast Water Board per the requirements in the MRP and the following:

- ❖ A summary of the water quality monitoring performed during the previous year. Any monitoring described in the summary must also include the data submitted in an electronic format compatible with Excel.
- ❖ A detailed map⁶ meeting the following specifications:
 - In color (if possible).
 - Title stating: "Water Quality Monitoring Locations for THP No. XXXX"
 - All monitoring locations and routes clearly marked with unique site identification tags.
 - A Key or Legend identifying all monitoring locations and routes.
 - North Arrow.
 - Scale
- ❖ Completed Field Data Sheets with data from all monitoring events.

⁶ The map needs to be submitted only once unless monitoring station locations are modified. In the future a map with unique monitoring site tags shall be submitted with the Timber Harvest Information Form and Fact Sheet.

Literature Consulted

Anderson, Chauncey W. "Chapter A6 Field Measurements Version 2.1 – 6.7 Turbidity" National Field Manual for the Collection of Water-Quality Data United States Geological Survey. September 2005.

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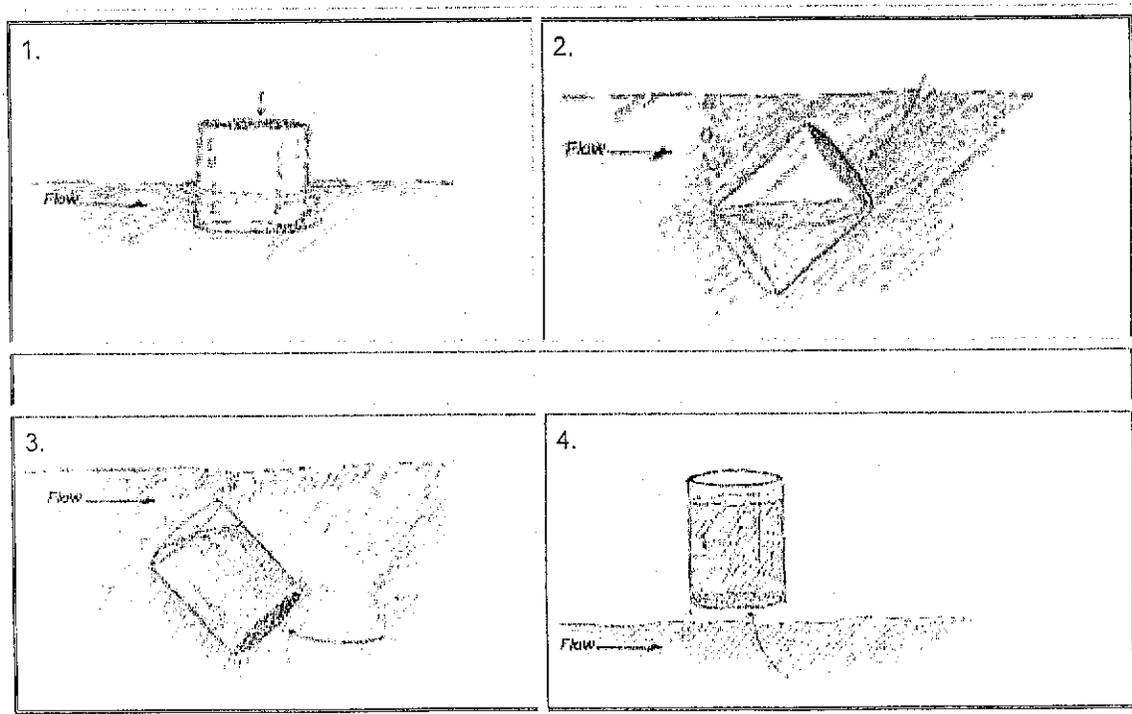
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Document1



Getting into position to take a turbidity grab sample.



Taking a water sample.

Turn the bottle into the current and scoop in an upstream direction.

Sketches taken from USEPA "Quality Assurance, Quality Control, and Quality Assessment Measures. Figures 5.2 and 5.3" Volunteer Stream Monitoring: A Methods Manual <http://www.epa.gov/volunteer/stream/vms50.html>.