



Humboldt Redwood
COMPANY, LLC

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January 30th, 2011

Ms. Catherine Kuhlman
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd, Suite A
Santa Rosa, CA 95403

Subject: Enrollment of THP 1-10-070 HUM in the Elk River WWDR, "Tier II"

Dear: Ms. Kuhlman

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0039 for THP 1-10-070 HUM. This Tier II portion of the unit proposed for enrollment is comprised of 376.3 acres of group selection (188.9 clear-cut equivalent acres). Total acres currently enrolled or proposed for enrollment under Order No. R1-2006-0039 Tier II is shown in the Attached Pre-Harvest Planning Report. The Erosion Control Plan (ECP), Form 200 and an annual waste discharge enrollment fee have already been submitted for this THP. Revisions have been made to the ECP as per my response to D. Engle's email of 1/14/11. A copy of the email correspondence is attached.

Landslide risks associated with this plan were evaluated in compliance with the Freshwater Creek and Elk River WWDR Permit Acreage Enrollment and Compliance Monitoring Program Quality Assurance Project Plan (Version 2.0, September 1, 2006) approved by the Executive Officer of the North Coast Regional Water Quality Control Board. This approach uses commonly accepted standards for geologic practices in forest management (Sidle et al. 1985, Soeters and Van Western 1996, and Sidle and Ochiai 2006) to assess factors known to contribute to landslides, such as steepness of slope, slope convergence, hydrology, geologic features, and visibly unstable areas. Overlapping and complementary scientific techniques combining state-of-the-art digital elevation model (DEM) slope stability models, field investigation, and terrain analysis were used in this assessment.

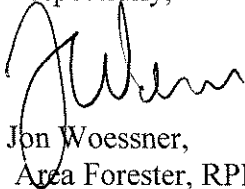
Unit 1 is predominantly underlain by undifferentiated Wildcat Group consolidated silts, sands, and clays. The toe slopes of the unit are underlain by indurated rocks of the Yager terrane. Utilizing past landslide location and causal association, debris slide slopes resulting in CLG limited harvest prescriptions were applied to slopes demonstrating a high potential for debris sliding /flowing (typically in concert with areas of modeled high Shalstab). A strong correlation was also noted by the geologist between road construction and shallow landslide initiation following the initial ground based harvest. This harvest plan has accurately identified potentially unstable areas and conservatively mitigated encompassing areas with reduced harvest rates and slope appropriate yarding methods. As such, it is our opinion that the proposed harvest meets the enrollment criteria for Tier II enrollment.

The THP proposes an uneven-age silviculture retaining 75 sq.ft. of basal area, except for those areas where the Geologist prescribed retaining 100 sq.ft and prohibiting group openings larger than ¼ acre.. Sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags, etc.) will be retained within the harvest area to the extent feasible. Cable and tractor yarding is approved for the entire unit. Post-harvest no site preparation will occur.

Greater detail regarding this landslide hazard assessment is provided in the attached *THP Unit Review for Tier 2 Enrollment*. The licensed geologist involved with the Tier 2 landslide risk evaluation has concluded the proposed harvest operation, if implemented as planned and approved, will result in a negligible increase in potential for post-harvest landsliding; and thereby meets the applicable Zero Delivery of landslide related sediment performance standards of NCRWQCB Orders R1-2006-0039 and R1-2008-0071.

Please do not hesitate to contact me should you have any questions or comments regarding this application for enrollment into WWDR (Order No. R1-2006-0039).

Respectfully,



Jon Woessner,
Area Forester, RPF 2571
Humboldt Redwood Company, LLC

Attachments:

Professional Certification of Design
THP Unit Review for Tier II enrollment
Pre-harvest Planning Report
Maps

Table 1. Proposed 2010 Harvest in North Fork Elk River.

THP Name	THP Number	Unit Number	Silviculture			Hazard					
			CC	ROW	CT	SHR	SEL	CC Equivalent	Low	High*	
Moss Elk	08-072	1				4.1	10	8.1	11.9	28.2	
Moss Elk	08-072	2				0	13.5	6.8	10.5	38.4	
LNFE/Lake tier 1	10-070	tier 1		3.1			79.1	42.7	71.7	135.4	
LNFE/Lake tier 2	10-070	tier 2		1.5			374.8	188.9	236.7	1799.6	
								Total			246.4

*The acres represented here have been converted to High Hazard Acres by multiplying by 12.807.

Table 3. Summary of THPs by Yarding System and Site Preparation for North Fork Elk River.

THP Name	THP Number	Unit Number	Yarding System		Site Preparation	
			Ground Based	Yarder	Mechanical	Broadcast
Moss Elk	08-072	1	74.1	0		
Moss Elk	08-072	2	13.5	0		
LNFE/Lake tier 1	10-070	tier 1				
LNFE/Lake tier 2	10-070	tier 2				

TR
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Humboldt Redwood
COMPANY, LLC

THP Unit Review for Tier 2 Enrollment

THP: LNFE Lake Creek THP 00-000 Unit # 1 January 27, 2011

Tools Used in This Assessment	Figure Number
Elevation Map with 10 ft Contours (HRC LiDAR)	1
SHALSTAB (Montgomery and Dietrich, 1994 and Palco, 2006) / Slope Class / Hillshade Maps	2
CGS Geology and Geomorphic Features (CGS, 2005)	3
Mass Wasting Potential Map (HRC, 1999)	4
Aerial Photo Map (HRC, 2007)	5
HRC Elk River and Salmon Creek WA deep-seated LS inventory (HRC, 2004)	6
Road Condition Map	7

Please see back of enrollment for references

Summary of Changes to THP Prescriptions Based on Tier II Analysis in this Unit:

Geologic Review	Forestry Silviculture/Site Prep Plan	Operational Design Plan
1-1	THP approved silviculture within polygon 1-1 is group selection on ridge tops and stable slopes, single tree selection in RMZs, and CLG limited harvest (100 sq. ft. basal area retention, groups < ¼ acre) on identified potentially unstable areas. No site preparation will occur due to partial harvesting.	The approved THP proposes ground based yarding in five small areas within polygon 1-1. The majority of the polygon is approved for cable yarding. No change to approved yarding methods.

Geological Summary (information presented from existing bodies of work):

The THP included a Note 45 Geology report to address several potentially unstable areas within the THP. The map series supplied in Tier II review was vetted during THP layout and culminated in the final THP prescriptions with respect to both harvest and road proposals. The report confirmed numerous unstable areas within Unit 1 and provided harvest restrictions sufficient for both retention of slope stability and reviewing agency approval. For a more comprehensive review of the geology associated with this harvest unit, please see the report in Section 5 of the THP. This review is brief summary of the geology report found in the THP.

Unit 1 is located on north and south facing slopes flanking a low relief east-west trending ridge. The unit covers a large area resulting in planar, convergent and divergent slope forms that range from gently to steeply inclined. Numerous watercourses extend into the unit and are typically poorly defined near the ridge top transitioning to well defined in the lower slope positions. The harvest unit is adjacent Lake Creek and the North Fork Elk River, Class I and II tributaries of Elk River.

Figure 3 shows the unit to be underlain by the Undifferentiated Wildcat Group sediments. These sediments are composed of silts, sands, clays, and infrequent gravels that are moderately consolidated. Nearly all of the moderate to steeply inclined slopes within the unit are mapped a debris slide slopes / source areas. Rock slides and debris slides ranging from dormant old to historically active are mapped on Figure 3.

Figure 6 shows 3 areas of deep-seated mass wasting within the unit. These areas correspond with low to moderate Mass Wasting Potential shown on Figure 4.

Figure 2 (Hillslope shade) reveals shadows indicative of consistent and even weathering of the slopes within the unit. The transition from flanking slopes to the ridge-top is sharp and distinct. Segments of the truck roads are easily observed.

The area has been previously clearcut and ground-based logged with steam donkeys and bulldozers. Significant ground disturbance is observable throughout the unit in response to past harvest practices. The most recent harvesting occurred under the HCP and consisted of clear cuts and selections using largely cable and helicopter yarding with large stream buffers. The landscape mass wasting response to this harvest entry appears to be significantly reduced by these harvest methods and significant areas of concentrated ground disturbance are not visible.

THP Unit: # 1
Polygon: 1-1

A) General Observations

The entire unit is to be enrolled as Tier II acres.

Class I watercourse Riparian Management Zones include a 50 foot no harvest inner band and an outerband that extends to 150 feet. Harvest is permitted in the outerband provided that 50% canopy closure is retained post harvest.

Typical Riparian Management Zones for the Class II watercourses includes a 30-foot no harvest inner band and a selection buffer that extends the RMZ out to between 75 and 100 feet. The outerband may be harvested but must retain a minimum of 60% canopy closure.

The implemented THP mitigation for the Class III watercourses includes the retention of all trees growing within the active channel and all trees 8 inches and less within 15 feet of the channel. Where channel sideslopes are greater than 50%, a 100' RMZ has been established and maintaining 75 sq. ft (or the CLG limited harvest retention standard if greater) evenly distributed in the buffer. Where side slopes are less than 50% employ a 50' RMZ that maintains 75 sq. ft (or the CLG limited harvest retention standard if greater) evenly distributed in the buffer and no group opening greater than ¼ acre immediately above the terminus of class III with slopes greater than 40% or immediately above a headwall swale. Additionally sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags, etc.) will be retained within the harvest area to the extent feasible.

SHALSTAB modeling (Figure 2) highlights approximately twenty Value 1 areas. The areas are typically located within and adjacent watercourses. The Value 1 areas are often identified by one pixel and do not appear to exceed three closely spaced pixels (suggesting a regionally significant steeply inclined swale). The Value 1 areas we counted are widely distributed and located within CLG limited harvest areas. Value 2 pixels are more prevalent within and adjacent watercourse zones. We observed moderate correlation between SHALSTAB Value 1 and 2 pixels and landslides mapped for the Note 45 Geologic Evaluation provided for this harvest plan.

Figure 4 shows Mass Wasting Potential (MWP) modeling for the unit varies from low to very high. Low MWP is modeled in the majority of the unit. Moderate MWP is much less prevalent and typically correlates with watercourses. One area of high MWP and two areas of very high MWP extend into the operational portion of the unit. The high MWP is located in the northwest portion of the unit and correlates with mapped debris slides slopes. This area is within the CLG limited harvest area. The two areas of very high MWP, also located in the northwestern portion of the unit, are on lower slope positions adjacent the North Fork Elk River. These areas correlate debris slides and debris slide slopes mapped for the Note 45 Geologic Evaluation. The down slope portion of the very high modeled MWP

THP Unit Review for Tier 2 Enrollment

A) General Observations

are within the Class I RMZ for North Fork Elk River and the upslope extents are within the CLG limited harvest.

One hundred seven landslides and landforms were identified in the unit by the project geologist. The vast majority (~90%) are within areas prescribed as CLG limited harvest. Landslides and landforms not within the CLG limited harvest have a low potential for sediment for sediment deliver. Low potential for sediment delivery is based on proximity and slope inclination to the nearest watercourse and activity status of the landslide. Landslides that are dormant young or older have not historically reactivated following highly impactful harvest management and are not anticipated to do so following this harvest.

B) Harvest Related Impacts and Hillslope Sensitivity

Extensive ground disturbance appears to be the most significant component to develop a landslide atop the soils within the unit (see geology report). Those activities are not proposed in this plan. The current planned cable yarding of the more steeply inclined slopes will result in less surface disturbance and significantly reduce the potential for mass wasting. Coupled with a partial harvest, the mass wasting potential is reduced even more.

Significant surface disturbance has occurred within the unit in response to past logging activities. The disturbance is the culmination of road and layout construction. Following that impact, the area appears to have adjusted through minor slumping and settling and have reforested.

The extensive RMZs were designed to provide sediment filtration bands adjacent the watercourses should extensive sediment be generated from the clearcut harvesting. The current level of harvest will retain both canopy closure and slash from the harvested trees potentially increasing the effectiveness of the sediment filtration band to the whole unit.

Overall hillslope sensitivity with respect to the proposed cable yarded selection harvest appears minimal with respect to mass wasting.

Please see the THP geology report for a more comprehensive assessment of the role that timber harvesting has on slope stability.

C) Forestry / Silviculture Plan

We have not changed the silviculture in response to this evaluation.

D) Operational Design Plan

THP approved yarding method is cable where moderate to steeply inclined and ground based atop the ridge. As delineated, the proposed yarding methods appear appropriate.

References:

CGS, 2005, Geologic and Geomorphic Features Related to Landsliding, Elk River Watershed, Humboldt County, California. Department of Conservation, now California Geological Survey (CGS) Watershed Mapping Series, Mapset 4, Plate 1. Available via the web at ftp://ftp.consrv.ca.gov/pub/dmg/thp/maps/elk/elk_color.pdf

Montgomery, D.R. and W.E. Dietrich, 1994. A physically based model for the topographic control on shallow landsliding. Wat. Resour. Res. 30: 1153-1171. For specific details regarding the model used in this evaluation, please see Palco, 2006. Additional information from the model authors is available at the following website: <http://socrates.berkeley.edu/~geomorph/shalstab>

HRC, 2007, Ortho-photo rectified aerial photographs flown by 3Di West, Eugene Oregon,

HRC, 2008, Freshwater Creek and Elk River WDR Permit Acreage Enrollment and Compliant Monitoring Program, NCRWQCB R1-2006—0039 and R1-2006-0041, Quality Assurance Project Plan, Version 3.0. Policy document submitted to NCRWQCB dated June 7, 2006.

HRC, 2004, Elk River / Salmon Creek Watershed Analysis, Scotia, California, prepared for Pacific Lumber Company (PALCO) dated 2004?, and acquired by Humboldt Redwood Company, LLC in 2008.

HRC, 2005, (Policy Acquired from The Pacific Lumber Company (PALCO)) Prescriptions Based on Watershed Analysis for Freshwater Creek, California, August 15, 2002.

HRC, 1999, The Pacific Lumber Company's Habitat Conservation Plan, Vol. 2 Part D, Landscape Assessment of Geomorphic Sensitivity, Public Review Draft.

Brief descriptions of the models used in this evaluation:

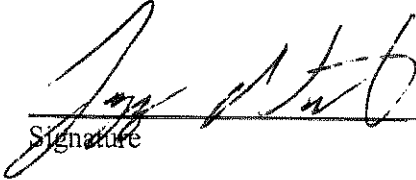
SHALSTAB was first described in Dietrich and Montgomery (1994). SHALSTAB is a simple, physically-based model based on the Mohr-Coulomb failure law that can be used to map shallow landslide potential. The model calculates the potential for failure using gridded digital elevation data. The simplicity of the model lies in the formulation of slope stability parameters that allow the model to be run parameter-free using default values suggested by the authors or determined by local measurement. Because the model uses no field measurements of critical characteristics that determine slope stability, the evaluation of potential instability is only an approximation. In applying SHALSTAB for Tier 2 enrollment, HRC has run the model on a 10-m spatial grid using LiDAR elevation data and applied the parameters as suggested by the model authors. HRC's application of the method and parameters is described in HRC (2008).

Mass Wasting Potential (MWP) modeling is a cursory regional assessment that numerically values soil, slope inclination, geology type, and geomorphology with respect to past mass wasting (HRC, 1999). The sums of the values specific to an area are measured against a set ranking system that extends from very low to extreme. The models intent is to highlight areas of high potential for instability at the planning level. The model's use at the site specific level is limited in that pedogenic soil types are used, not textures, the geologic formations utilized provide one value for all of the incorporated facies, and the model is heavily biased if past mass wasting has occurred or has been mapped as occurring in the area.

Professional Certification of Design

I, Tagg Nordstrom, P.G. 7950, 1/31/11,
Name license # Date




Signature

Place licensed seal here

hereby certify, in accordance with North Coast Regional Water Quality Control Board (NCRWQCB) Order Nos. R1-2006-0039 and R1-2006-0041, that the attached application and the description of THP modifications, and the materials submitted along with:

THP No. 1-10-070 HUM (LNFE Lake Creek) Unit # 1

- a. are in accordance with accepted practices, and recognized professional standards;
- b. comply with the requirements of the Monitoring and Reporting Program No. R1-2008-0071, approved by the Executive Officer of the North Coast Regional Water Quality Control Board; and
- c. provided that the THP is properly implemented, operated, and maintained, are adequate for the THP to meet the applicable Zero Net Delivery performance standards of NCRWQCB Orders R1-2006-0039, R1-2006-0041, and R1-2006-0103, insofar as such performance can reasonably be predicted by accepted engineering geologic practices.

The opinions presented in the subject THP have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineering geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Humboldt Redwood Company LLC

Erosion Control Plan (ECP) for the "LNFE Lake Creek" THP

This plan is being included in the THP to partially meet the requirements of the North Coast Regional Water Quality Control Board Watershed-wide Discharge Requirements. (**WWDRs**)

All operational portions of this ECP that are to be enforced through the Forest Practice Rules have been included in Section II of the THP.

Version **20080819**

Humboldt Redwood Company LLC Erosion Control Plan (ECP)

This document addresses the requirements of the California Regional Water Quality Control Board, North Coast Region Order No. R1-2006-0039 (Elk River) for an Erosion Control Plan (ECP) related to timber harvest activities on Non-Federal lands in the North Coast Region (Sec. III D2 and D3). The responsible party for this ECP is Humboldt Redwood Company LLC, P.O. Box 712 Scotia, CA 95565 (707) 764-2330.

This ECP is submitted for: **LNFE Lake Creek THP**
Contact Person: **Jon Woessner** Phone: **(707) 764-4376**

The landowner is committed to a wide variety of measures to prevent and minimize the discharge or threatened discharge of sediment from controllable sediment discharge sources as part of this project into the waters of the state in violation of applicable water quality requirements. Prevention and Minimization of Controllable Sediment Discharge Sources associated with this project are identified in the *Controllable Sediment Sources* table. The specific conditions of sediment discharge sources and a summary of prevention and minimization measures (Section I) are identified in the table. General prevention and minimization measures for the project (Section II) are incorporated in the ECP by reference.

The RPF and/or the RPF Designee have conducted an inventory of potential "controllable sediment discharge sources" within the project area. As defined in California Regional Water Quality Control Board Order No. R1-2006-0039 (Elk River),

"Controllable sediment discharge source" means sites or locations, both existing and those created by proposed timber harvest activities, within the Project area that meet all the following conditions:

1. is discharging or has the potential to discharge sediment to waters of the state in violation of applicable water quality requirements or other provisions of these WWDRs,
2. was caused or affected by human activity, and
3. may feasibly and reasonably respond to prevention."

Upon guidance of the North Coast Regional Water Quality Control Board (NCRWQCB) staff, discharge from the source must be likely to occur during the life of the Timber Harvesting Plan (THP) and WWDR. (Holly Lundborg, personal communication)

The inventory method consisted of an appurtenant road survey, aerial photos and ground assessments of the harvest units, and a complete ground assessment of all watercourses and associated stream protection zones.

The schedule for implementing the prevention and minimization management measures for the controllable sediment sources will be consistent with the duration of the THP. These measures will be implemented in accordance with the priority level assigned to each site. High priority sites will be addressed first with low priority sites to follow. Work at all sites will be accomplished prior to THP expiration. The general prevention and minimization measures will be implemented concurrent with operations.

I. Inventory and Treatment of Controllable Sediment Sources

All controllable sediment sources are listed in the attached "Erosion Control Plan" table. These sources have been assigned a treatment priority of low, medium or high based on: 1) potential for significant sediment delivery to a Class I, II or III channel; 2) treatment immediacy (a subjective combination of event probability and sediment delivery); and 3) treatment cost-effectiveness.

The Prioritization for implementing prevention and minimization measures for road-related and non road-related controllable sediment sources is based upon guidance provided in Order No. R1-2006-0039 (Elk River). Highest priority is assigned to the largest sediment discharge sources that discharge to waters that support domestic water supplies or fish. The landowner's prioritization method considers this guidance, and combines it with consideration for accessibility and level of imminent risk of significant sediment discharge. Sources that receive a high priority rating will be treated by a date certain as noted in the Controllable Sediment Sources table. Sources that receive a low or medium rating are determined to have a low to moderate risk of imminent discharge and will be treated prior to completion of the THP, or as otherwise indicated.

Non-road related controllable sediment sources can include skid road crossings, yarding furrow, skid road in watercourse, perched skid road fill, skid road rutting, landslide, layouts, railroad grade, incline, etc.

Information specific to Controllable Sediment Discharge Sources is listed in the Controllable Sediment Sources Table, below. An explanation of information provided in that table is provided below.

II. General Prevention and Minimization Measures for Controllable Sediment Discharge

In addition to the site specific measures detailed above, the general measures proposed in this project, either as required by another State or Federal regulating agency, or as a matter of Humboldt Redwood Company policy, will prevent or minimize future sediment delivery. These measures include, but are not limited to measures incorporated in the THP Section Items as follows:

THP Section II:

- Item 14 – Describes silvicultural prescriptions
 - (i) Site Preparation – Disclosure of selected site preparation treatments and mitigation measures
- Item 16 – Harvesting Practices – Describes yarding systems, equipment utilized, equipment limitations, and drainage facility installation timing
 - Inclusive through (m) – equipment use limitations and mitigation
- Item 18 – Soil Stabilization – waterbreak requirements, mitigation to minimize soil disturbance and sediment transport
- Item 20 – Ground Based Equipment Use Location
- Item 21 – Ground Based Equipment Use in Sensitive Areas – locations, descriptions of operations, limitations and mitigation measures
- Item 22 – Alternative Practices to Harvesting and Erosion Control
- Item 23 – Winter Operations – Provides descriptions of limitations and mitigation measures required during winter period operations and Winter Operating Plan
- Item 24 – Roads and Landings – Describes road and landing construction and re-construction operations, limitations, drainage relief structure installation, mitigation measures, road maintenance, inspections and wet weather road use restrictions
- Item 25 – Site Specific Measures to Reduce Adverse Impacts and Special Instructions to the LTO
- Item 26 – Watercourse and Lake Protection (WLPZ)
- Item 27 – "In Lieu" WLPZ Practice(s)
- Item 28 – Downstream Water Users Notification and Domestic Water Supply Protection Description of protection measures
- Item 29 – Sensitive Watershed – Identifies whether the plan is located in a designated sensitive watershed and mitigation measures
- Item 29 – 1 Hillslope Management (HCP 6.3.3.7) – Describes HCP hillslope management measures required as per watershed analysis

THP Section V:

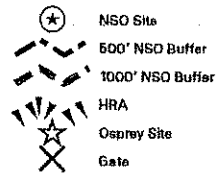
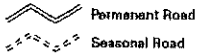
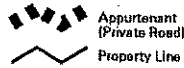
- Sediment Reduction from Roads and THP Sediment Production--Including Table 1 – "Sediment Delivery for Units and Roads for this THP," references, letter regarding Road related sediment assessment for this THP with the calculations of deliverable net cubic yards of sediment, calculations and PWA information related to the THP project area when available

Maps attached:

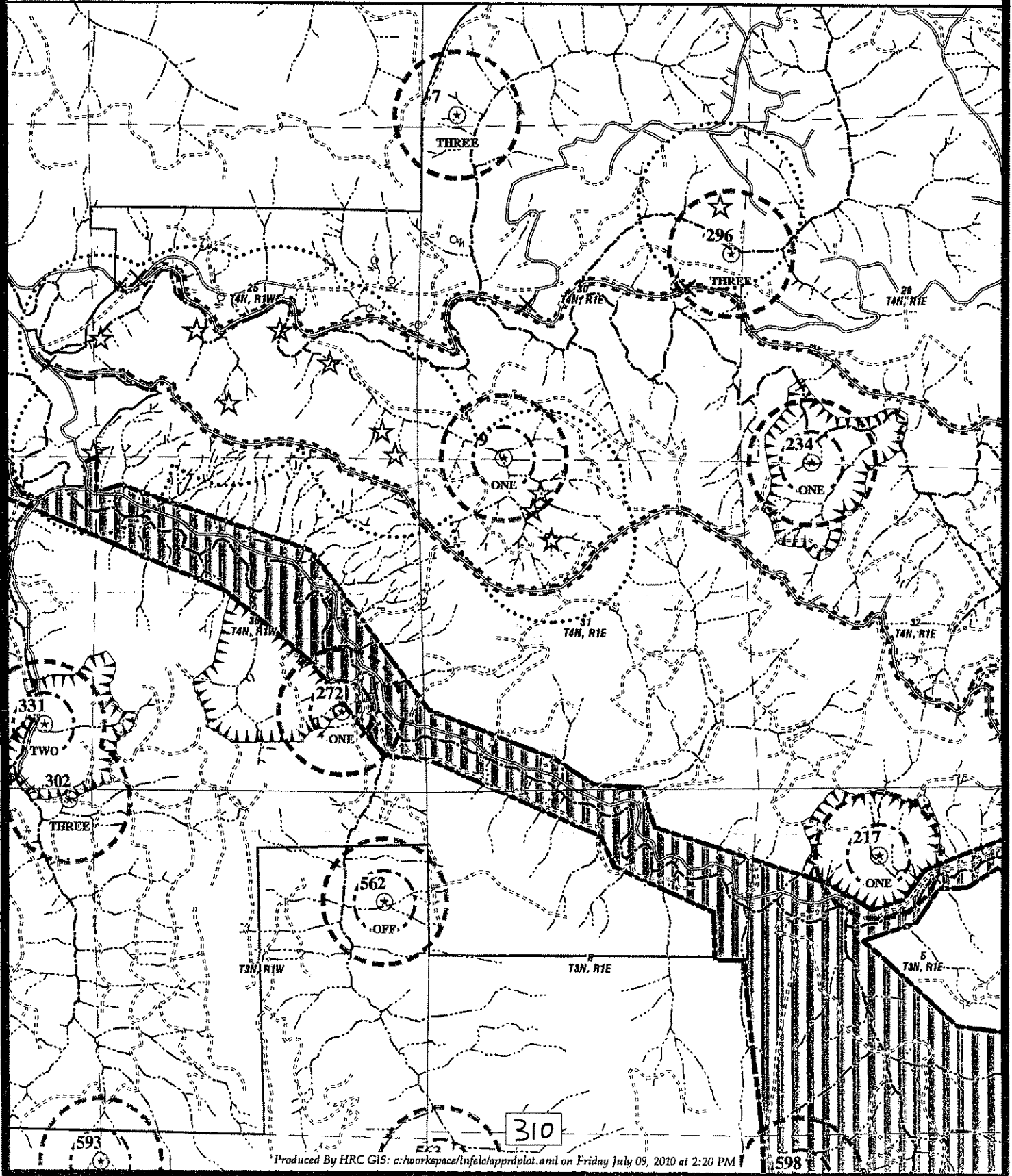
- Appurtenant Road and Wet Weather Road Use map
- Road Construction Locations/ECP Site Locator Map

N LNFE Lake Creek
Appurtenant Road Map

T3N R1E Sec. 3 HB&M
 T4N R1E Sec. 28, 32, 33, 34 HB&M
 USGS Quad (a): MCWHINNEY CREEK

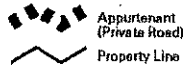


Map Scale: 1 inch = 2000 feet

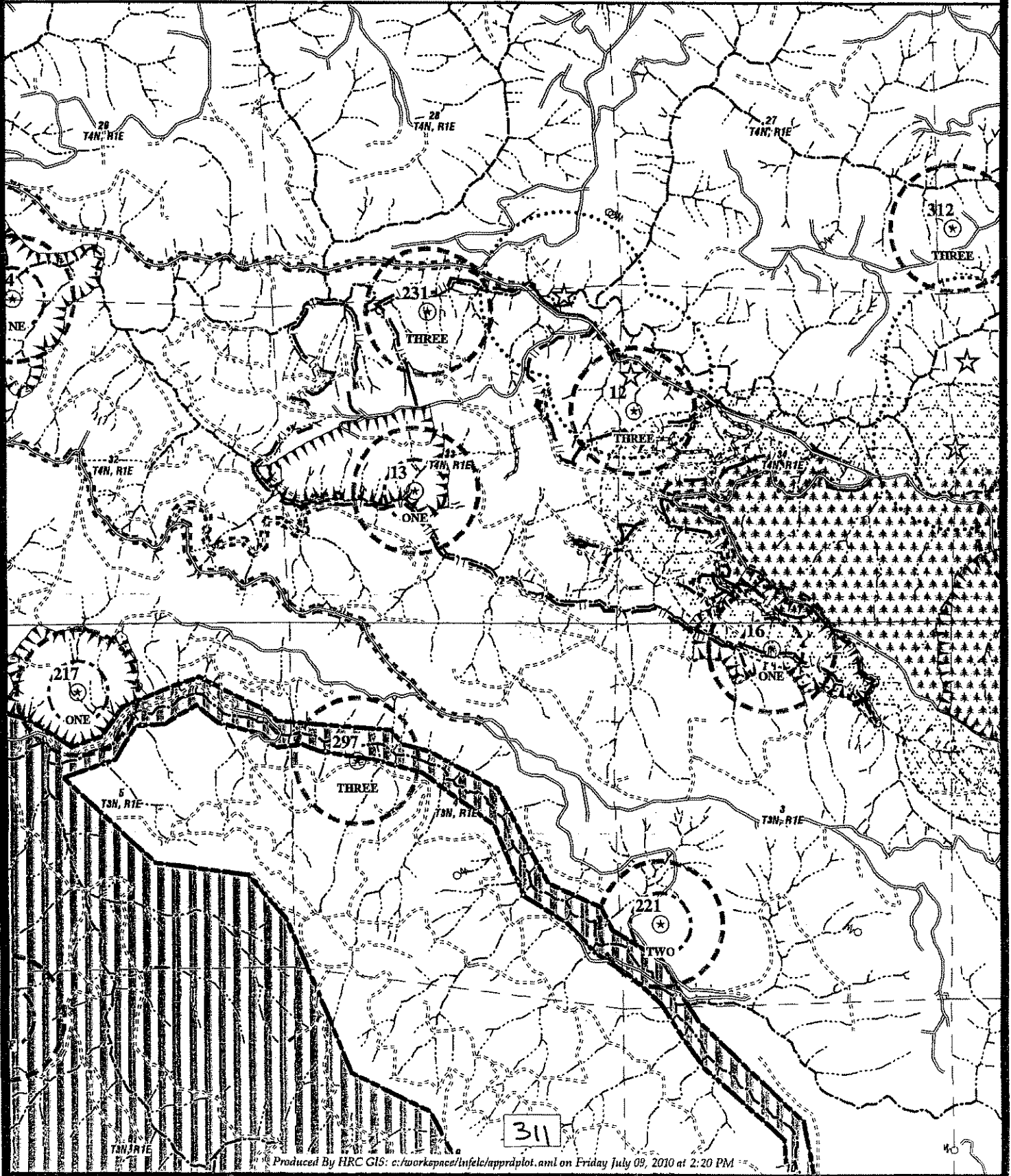


N LNFE Lake Creek
Appurtenant Road Map

T3N R1E Sec. 3 HB&M
T4N R1E Sec. 28, 32, 33, 34 HB&M
USGS Quad (s): MCWHINNEY CREEK



Map Scale: 1 inch = 2000 feet



N LNFE Lake Creek

Road Construction Location

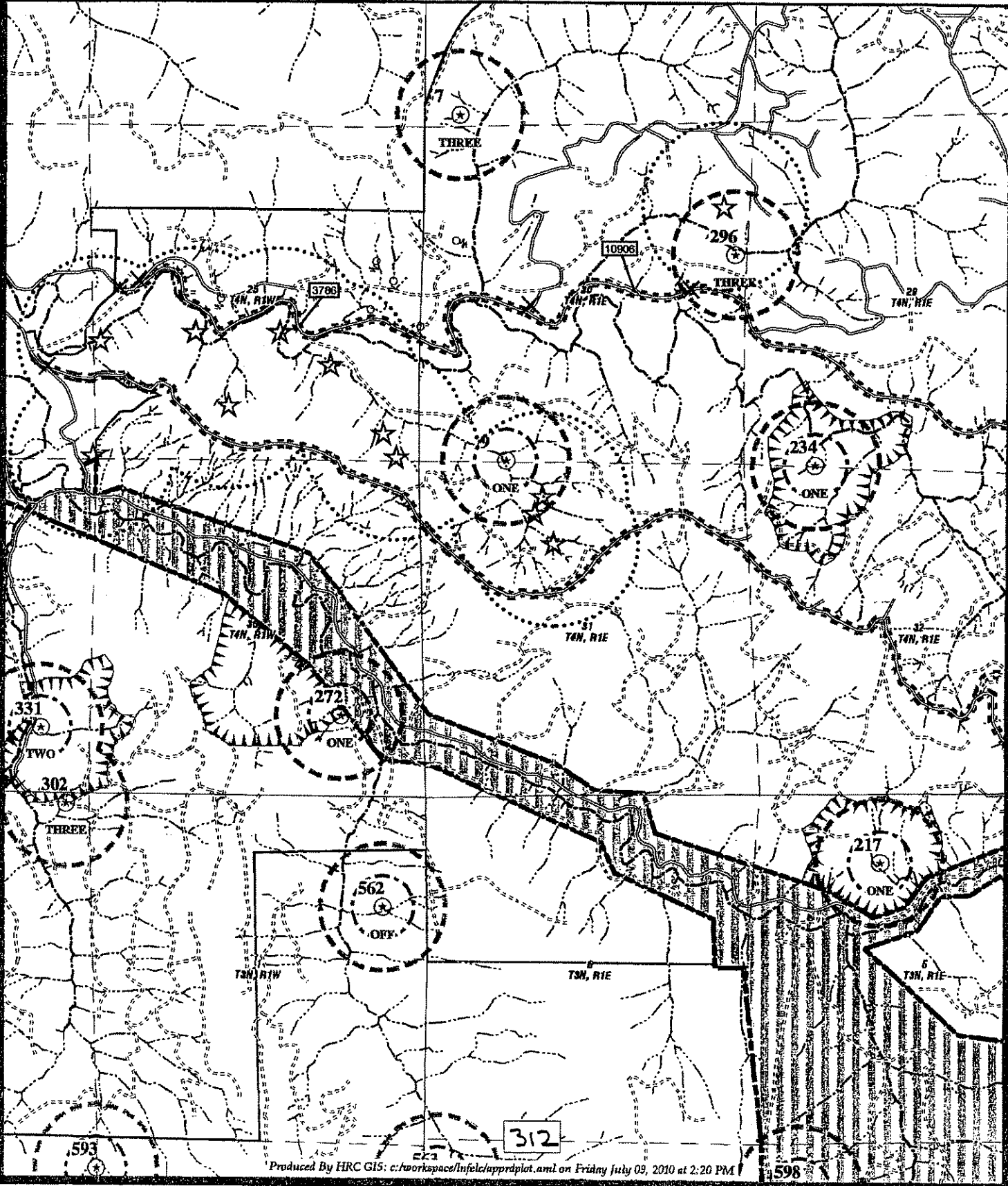
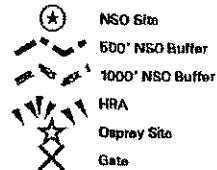
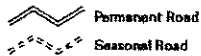
T3N R1E Sec. 2 H&M
T4N R1E Sec. 28, 32, 33, 34 H&M

USGS Quad (s): MCHINNEY CREEK

ECP Site Locator Map

Map Scale: 1 inch = 2000 feet

Map 1 of 2



**PART OF PLAN
RECEIVED**

DEC 2 2010

COAST AREA OFFICE
RESOURCE MANAGEMENT

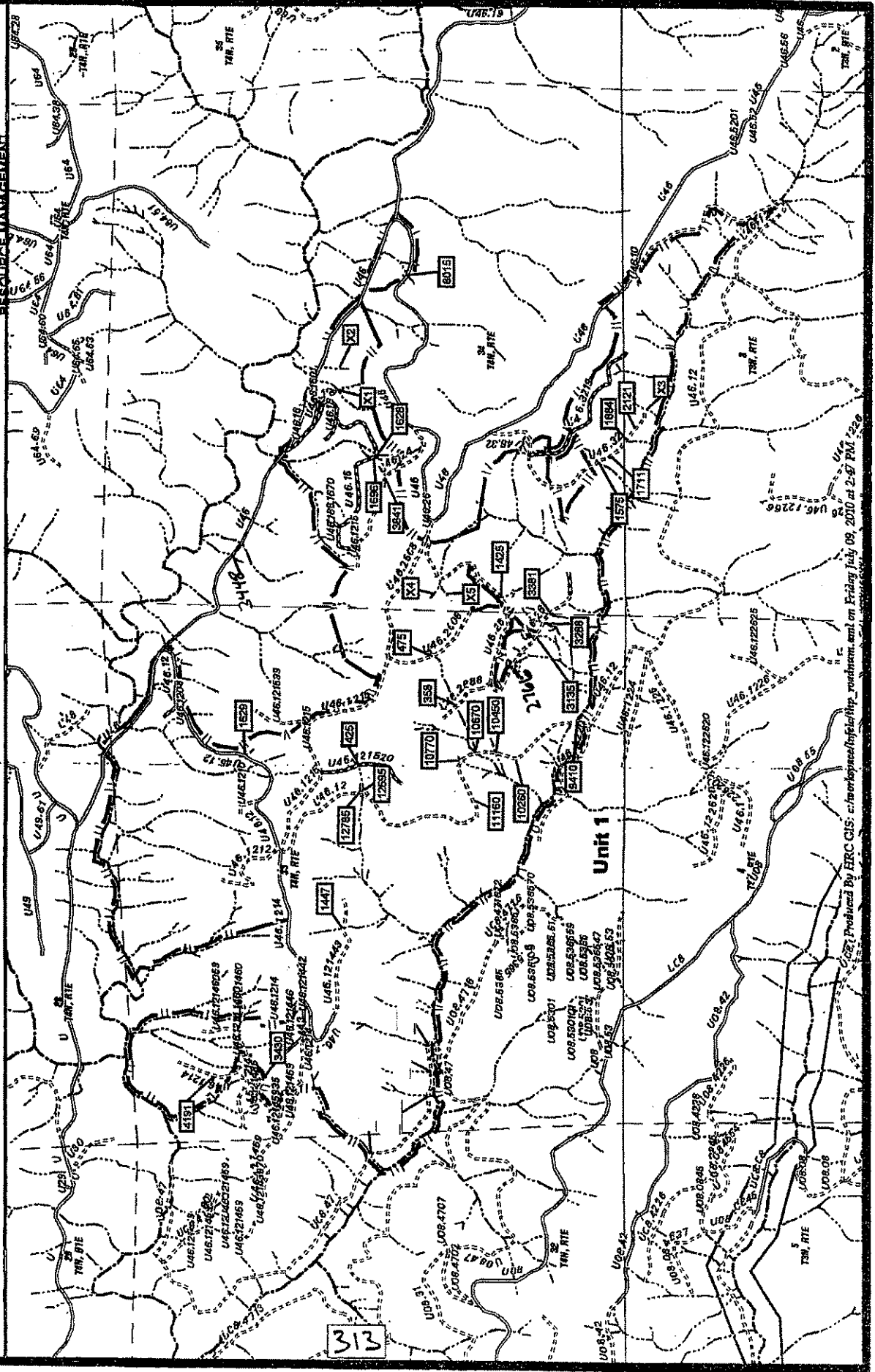
- Property Line
- Class I Wetlands
- Class II Wetlands
- Class III Wetlands
- Harvest Boundary
- Permanent Road
- Seasonal Road
- Proposed Road
- Seasonal Road
- ### Road Point (Refer to Work Order)

**LNFE Lake Creek
N Road Construction Location**
TNX 312 Parc. 3, 28, 32, 33, 34, 36
ECP Site Locator Map

USGS Quad(s): 1608050000

Map 2 of 2

Map Scale: 1 inch = 1320 feet



Map Produced By HRC GIS: c:\workspaces\hrc\hrc\map\map.mxd on Friday July 09, 2010 at 2:07 PM

III. Inspection Plan and Reporting Requirements

A. Inspection Plan

The Inspection Plan is designed to ensure that all required management measures are installed and functioning prior to rainfall events; that the management measures are effective in controlling sediment discharge sources throughout the winter period; and that no new controllable sediment discharge sources developed.

B. Qualified and trained professionals will conduct all specified inspections of the project site to identify areas causing or contributing to a violation of the applicable water quality requirements or other provisions of these WWDRs. The responsible party for inspection and reporting is **Jon Woessner (707) 764-4376**

C. No inspections are required in Project Areas where Timber Harvest Activities have not yet commenced.

D. Project Areas where Timber Harvest Activities have commenced and no winter period Timber Harvest Activities have occurred inspections will be conducted each year and throughout the duration of the Project while Timber Harvest Activities occur.

a. The Project is covered under WWDRs and the following inspection requirements will begin at the startup of timber harvest activities within the Project area:

- i. By November 15 to assure Project Areas are secure for the winter period;
- ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
- iii. After April 1 and before June 15 to assess the effectiveness of management measures designed to address controllable sediment discharges and to determine if any new controllable sediment discharges sources have developed.

b. Project Areas with Winter Period Timber Harvest Activities will conduct inspections of such Project Areas while Timber Harvesting Activities occur and the Project is covered under the WWDRs as follows:

- i. Immediately following cessation of winter period Timber Harvest Activities to assure areas with winter Timber Harvest Activities are secure for the winter;
- ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
- iii. After April 1 and before June 15 to assess the effectiveness of management measures designed to address controllable sediment discharges and to determine if any new controllable sediment discharges sources have developed.

c. Inspection reports will identify where management measures have been ineffective and when repairs and design changes will be implemented to correct management measure failures.

d. After completing the required inspections, and when it has been determined new controllable sediment discharges sources have developed, the ECP, implementation schedule, and inspection plan will be updated, if required, consistent with the WWDRs and submit the updated documents to the Regional Water Board to maintain coverage under the WWDRs. If the approved amendment is found to be out of compliance with the WWDRs, the Project will be amended to be consistent with the provisions of the WWDR within 30 days, or coverage under the WWDRs will be terminated. The Project will then be required to seek Project coverage under an individual WDR.

e. Equipment, materials, and workers will be available for rapid response to failures and emergencies, implement, as feasible, emergency management measures depending upon field conditions and worker safety for access.

D. If during the inspection or during the course of conducting timber harvest activities, a violation of an applicable water quality requirement or conditions of WWDRs is discovered, the following procedures will be followed:

a. When it has been determined that discharges are causing or contributing to a violation or an exceedence of an applicable water quality requirement or a violation of a WWDR prohibition:

- i. Corrective measures will be implemented immediately following the discovery that applicable water quality requirements were exceeded or a prohibition violated, followed by notification to the Regional Board by telephone as soon as possible but no later than 48 hours after the discharge

has been discovered. The notification will be followed by a report within 14 days to the Regional Board, unless otherwise directed by the Executive Officer, that includes:

1. the date the violation was discovered;
2. the name and title of the person(s) discovering the violation;
3. a map showing the location of the violation site;
4. a description of recent weather conditions prior to discovering the violation;
5. the nature and cause of the water quality requirement violation or exceedence or WWDR prohibition violation;
6. photos of the site characterizing the violation;
7. the management measure(s) currently being implemented;
8. any maintenance or repair of management measures;
9. any additional management measures which will be implemented to prevent or reduce discharges that are causing or contributing to the violation or exceedence of applicable water quality requirements or WWDR prohibition violation; and,
10. the signature and title of the person preparing the report.
11. the report will include an implementation schedule for corrective actions and describe the actions taken to reduce the discharges causing or contributing to violation or exceedence of applicable water quality requirements or WWDR prohibition violation.

E. For other inspections conducted where violations are not discovered, a summary report will be submitted to Executive Officer by June 30th for each year of coverage under the WWDRs or upon termination of coverage. The summary report, at a minimum will include the date of inspections, the inspector's name, the location of each inspection, and the title and name of the person submitting the summary report.

If helicopter operations are proposed for this project, please find attached a Columbia Helicopters, Inc. (CHI) Fuel Spill Prevention and Cleanup Plan For Columbia Helicopters Field Operations.

Explanation of Information Included in the Controllable Sediment Sources Table	
Column Heading	Explanation
Site No.	Site identification unique to project area
Site Type	A description of the existing site. Example: Humboldt Crossing; Culvert Crossing; Unstable Fill; Unstable Cut Slope; Diversion Potential.
Estimate of Potential Erosion	A quantitative estimate of the volume, in cubic yards, of the total amount of potential erosion/displacement of soil that will occur should the site entirely fail. The landowner often uses a methodology developed by Pacific Watershed Associates to estimate erosion, which assumes 100% delivery of calculated volume—use of this method for individual sites is noted in Site Description.
Potential Sediment Delivery Percent	An estimate of the relative potential for sediment delivery expressed as a percent of the total amount of Potential Erosion that will be discharged to waters of the State should the site fail.
Sediment Prevention Volume	The volume, in cubic yards, of sediment discharge estimated to be prevented by implementation of the prescribed treatment. Volume represents the Estimate of Potential Erosion multiplied by the Potential Sediment Delivery Percent.
Priority for Treatment	Treatment priority reflects the immediacy of sediment discharge and the relative risk to the receptor, should the site fail. Low priority sites are ones that will not likely deliver significant amounts of sediment during the life of the WWDR permit, and will be treated prior to filing of THP work completion report, which does not exceed 5-years following THP approval date. Medium or high priority sites indicate potentially imminent discharge, and the timing of treatment is indicated in Implementation Schedule column.
Implementation Schedule	Indicates the timing of implementing the prevention and minimization measures listed in the Treatment column.
Site Description	Provides sufficient information that describes the existing condition of the site and factors that inform the chosen treatment methods and implementation schedule. This information will include a description of how the existing condition of the site (ie. stable or unstable) will be affected by different storm events, and whether sediment discharge is imminent. For example, an unstable site could easily discharge significant amounts of sediment in a small storm, thus the treatment priority should be higher. Conversely, a stable site that may take one or more very large storms to trigger discharge could be lower treatment priority. If PWA method is used to calculate erosion/delivery volumes, it will noted here.
Treatment	Sediment discharge prevention and minimization measures that will be implemented at the site, including treatment specifications if necessary.

Attachments:

- ECP Table
- Columbia Fuel Spill Prevention and Cleanup Plan

Erosion Control Plan

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
Project LNFE Lake Creek							
RD: Off Road STATION: 0 SITE: X1 WOID: -861006993 SEDID: 11121 REPAIRED: NO	Humboldt	900	100%	High	Prior to Oct 15; FIRST year of operations.	Tractor crossings. Crossing is at the confluence of a class II and class III watercourses with their associated Humboldt crossing. Crossings to be treated together as one since they over lap remaining soil materials on top of the LWD in the channel should be removed. The LWD below the soil materials shall not be disturbed to the extent possible. A temporary Spittler-type crossing may be used on top of the existing LWD to allow tractors to cross this watercourse and haul logs. In the event that this old tractor crossing is required to be pulled CGS recommends that a licensed geologist first evaluate this site and determine the extent of excavation necessary and how the channel banks might be stabilized. Geologic oversight shall be provided by a licensed geologist prior to and during all excavation activities. The project geologist shall provide recommendations concerning the extent and type of mitigation necessary to stabilize the stream banks and minimize future sediment delivery.	Crossing is at the confluence of a class II and class III watercourses with their associated Humboldt crossing. Crossings to be treated together as one since they over lap remaining soil materials on top of the LWD in the channel should be removed. The LWD below the soil materials shall not be disturbed to the extent possible. A temporary Spittler-type crossing may be used on top of the existing LWD to allow tractors to cross this watercourse and haul logs. In the event that this old tractor crossing is required to be pulled CGS recommends that a licensed geologist first evaluate this site and determine the extent of excavation necessary and how the channel banks might be stabilized. Geologic oversight shall be provided by a licensed geologist prior to and during all excavation activities. The project geologist shall provide recommendations concerning the extent and type of mitigation necessary to stabilize the stream banks and minimize future sediment delivery.
RD: Off Road STATION: 0 SITE: X2 WOID: 1355752580 SEDID: 11120 REPAIRED: NO	Humboldt	100	100%	Low	Prior to THP Final Completion.	humboldt tractor crossing	Use crossing as is. By Oct 15th of year crossing is used Per CGS recommendation, The void in the old skid trail at this location shall be filled with straw bales, logs, or other appropriate material prior to use as a tractor crossing. CGS also recommends that the straw bales and logs are removed prior to the first winter period following use and that the remaining portions of the crossing are not pulled. CGS also suggests that the RPF consider relocating the crossing about 10 feet upstream so that the void at the proposed crossing may be avoided. WQ concurred that removing the debris from the crossing is not required.
RD: Off Road STATION: 0 SITE: X3 WOID: 1274981838 SEDID: 6752 REPAIRED: NO	Humboldt	4500	100%	High	Prior to THP Final Completion.	Humboldt tractor crossing	Site shall be treated once Road U46.32 is opened and before final treatment occurs to Road U46.32 denying access to this site. By Oct 15th of the year Road U46.32 is opened excavate site to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper. Professional geologist on site.
RD: Skid Road STATION: SITE: X4 WOID: 2072780854 SEDID: 6965 REPAIRED: NO	Failing Crossing	22	100%	Med	Prior to THP Final Completion.	Exisiting filled crossing	Existing filled tractor crossing - Prior to 10/15 of year of use, excavate from top (40'-50' above sinkholes to the truck road crossing below. Laid sidelopes back to 2:1 or natural slope - As per WQ PHI report

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority	Treatment	Implementation Schedule	Site Description	Treatment
RD: SkidRoad STATION: 1629 SITE: x5 WOID: -275173591 SEDID: 6970 REPAIRED: NO	Failing Crossing	37	37 100%	Med	Prior to THP Final Completion.	Prior to THP Final Completion.	Existing filled tractor crossing	Existing filled tractor crossing - Prior to 10/15 of year of use, excavate from top (40-50' above sinkholes to the truck road crossing below. Laid sidelopes back to 2:1 or natural slope - As per WQ PHI report
RD: U STATION: 3786 SITE: c2 WOID: 1274377293 SEDID: 11122 REPAIRED: NO	Crossing	30	20 67%	Med	Prior to THP Final Completion.	Prior to THP Final Completion.	Existing rusted out 24 inch cmp	cmp is rusted out replace with culvert 24 . Be aware of buried electrical line.
RD: U STATION: 10906 SITE: c1 WOID: 853712778 SEDID: 11123 REPAIRED: NO	Crossing	300	200 67%	Med	Prior to THP Final Completion.	Prior to THP Final Completion.	18 inch cmp rusting out with holes appearing	18 inch cmp installed as DRC actually drains watercourse but most of flow is from inside ditch to left. Culvert is rusting with holes starting to form. Align new culvert with channel below road which is a little to the left of the current culvert discharge location. Due to flat ground and configuration of the Boy Scout Camp area disconnecting the ditch from this culvert location is not feasible
RD: U46 STATION: 3448 SITE: c4 WOID: -551956991 SEDID: 30544 REPAIRED: NO	Culvert Maintenance	0	0 #Num!	Low	Prior to THP Final Completion.	Prior to THP Final Completion.	Water leaking into culvert.	Approx 7 feet in from culvert inlet on the right subsurface water under pressure is leaking through small holes in side of culvert. Replace culvert to correct this issue. To insure that subsurface water does not cause fill failure after culvert is replaced a subdrain shall be placed in fill along right side of new culvert and drained out through fill to outside edge of road. Subdrain shall consist of perforated drain pipe embedded in drain rock wrapped with non woven filter fabric.
RD: U46 STATION: 6903 SITE: c3 WOID: -1377351297 SEDID: 30551 REPAIRED: NO	Inside Ditch	2	2 100%	Low	Prior to THP Final Completion.	Prior to THP Final Completion.	Existing ditch is headcutting and delivering into inlet of crossing.	Last 5 feet of inside ditch to right is headcutting. Either armor or take other measures to prevent continued headcutting discharge into watercourse.
RD: U46 STATION: 8015 SITE: c2 WOID: -2106587820 SEDID: 11116 REPAIRED: NO	Crossing	250	100 40%	Med	Prior to THP Final Completion.	Prior to THP Final Completion.	18 inch plastic culvert installed as DRC just below channel upslope. Flow appears to go through culvert but recent fill failure on outside of road has occurred below culvert.	18 inch plastic culvert installed as DRC just below channel upslope. Flow appears to go through culvert but recent fill failure on outside of road has occurred below culvert. Appears failure may have been from emergent ground water. Crossing area appears to be a humboldt that culvert was placed on. A diversion potential also exist at this site. Install new culvert in natural channel. Treat crossing by THP Deadline. Install critical dip by Oct 15th
RD: U46,12 STATION: 1629 SITE: c5 WOID: 602998651 SEDID: 11109 REPAIRED: NO	Crossing	1000	1000 100%	Med	Prior to THP Final Completion.	Prior to THP Final Completion.	18 inch cmp not installed to grade on top of Humboldt. Very little evidence of flows through pipe but flows appear within channel well below culvert outlet. Culvert is rusted close to the point of causing holes. Site also has diversion potential down inside ditch.	18 inch cmp not installed to grade on top of Humboldt. Very little evidence of flows through pipe but flows appear within channel well below culvert outlet. Culvert is rusted close to the point of causing holes. Site also has diversion potential down inside ditch.

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
RD: U46.12 STATION: 9410 SITE: NFE953 WOID: 5944 SEDID: 30705 REPAIRED: NO	Bridge Crossing	122	122 100%	Med	Prior to Oct 15; FIRST year of operations.	Dirt covered log stringer bridge	Decommission stream crossing by removing fill from the top flag to the bottom flag. Lay back streamside slopes 2:1 for decommission. Store spoils in a secure location. Seed and mulch bare soil areas. In addition refer to PWA Road Inventory Data Form
RD: U46.12 STATION: 10260 SITE: NFE952 WOID: 5943 SEDID: 30704 REPAIRED: NO	Falling Fill	31	31 100%	Low	Prior to THP Final Completion.	Perched fill	Excavate perched fill material and INSTALL A CROSS ROAD DRAIN TO THE RIGHT OF THE SITE BETWEEN SKID TRAIL AND END FLAG.
RD: U46.12 STATION: 10450 SITE: C1 WOID: -536951263 SEDID: 11111 REPAIRED: NO	Crossing	700	300 43%	Med	Prior to Oct 15; FIRST year of operations.	Dirt fill crossing	If water is flowing across road when site opened install pipe large enough to handle flow. minimum 6 inch pipe. If no water is flowing across road use crossing as is. By October 15th of year site is opened excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle which ever is steeper.
RD: U46.12 STATION: 10670 SITE: NFE951 WOID: 5950 SEDID: 30703 REPAIRED: NO	Crossing	104	104 100%	Med	Prior to Oct 15; FIRST year of operations.	Dirt fill crossing	If water is flowing across road when opened install pipe large enough to handle flow. minimum 6 inch pipe. If no water is present use site as is. By Oct 15th of year site is opened EXCAVATE CROSSING FROM TOP TO BOT RESTORE NATURAL CHANNEL. Excavate channel to natural channel width and PULL SLOPES BACK 2:1 or to natural slope angle whichever is steeper. . Also refer to PWA Road Inventory Data Form
RD: U46.12 STATION: 10770 SITE: e2 WOID: -385189426 SEDID: 11110 REPAIRED: NO	Crossing	75	75 100%	Med	Prior to Oct 15; FIRST year of operations.	18 inch CMP	Use crossing as is. By October 15th of year site is opened excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle which ever is steeper.
RD: U46.12 STATION: 11160 SITE: NFE950 WOID: 5942 SEDID: 30702 REPAIRED: NO	Falling Fill	532	532 100%	Med	Prior to Oct 15; FIRST year of operations.	Slide feature below road	INSTALL CROSS ROAD DRAIN 50' TO THE RIGHT OF THE END FLAG ON THE MAIN ROAD AND A CROSS ROAD DRAIN ON SKID TRAIL IMMEDIATELY BELOW ROAD. CHECK SITE PERIODICALLY FOR MOVEMENT. In addition refer to Geologic report regarding this site. Also refer to PWA Road Inventory Data Form
RD: U46.12 STATION: 12695 SITE: NFE805 WOID: 5919 SEDID: 30058 REPAIRED: NO	Crossing	139	139 100%	Med	Prior to Oct 15; FIRST year of operations.	Existing 18 inch cmp	Use crossing as is. By Oct 15th of year site is opened excavate CROSSING top to bottom BY PULLING PIPE AND EXCAVATING DOWN TO NATURAL STREAM CHANNEL excavate channel to natural channel width. Lay back SIDESLOPES 2:1 or to natural slope angle whichever is steeper THROUGH THE CROSSING. MAY NOT BE FEASIBLE TO EXCAVATE ALL THE WAY TO BOT. MAY BE OK TO EXCAVATE THROUGH SKID BELOW. STOCKPILE LOCALLY. Also refer to PWA Road Inventory Data Form

Site	Site Type	Est. Potential Erosion (Cu. Yards)	Est. Potential Delivery (Cu. Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
RD: U46.12 STATION: 12785 SITE: NFE804 WOID: 5918 SEDID: 30057 REPAIRED: NO	Failing Fill	8000	8000 100%	Med	Prior to Oct 15; FIRST year of operations.	Failing fill	To gain access ramp down and off main road onto skid road downslope of road marked bottom of temp fill utilizing temporary fill material. Do not cut into bank. By Oct. 15 of year road is opened DECOMMISSION MAIN ROAD AND SKID ROAD THROUGH SITE BY PULLING BACK ALL existing and temporary FILL AND ENDHAULING. DECOMMISSION ALONG ~400' X 8 X 25 AND 200 X 9 X 25 ON SKID BELOW TO REMOVE OVER BURDEN OF FILL. Also refer to Geologic report and PWA Road Inventory Data Form
RD: U46.12 STATION: 12785 SITE: c3 WOID: 1304853815 SEDID: 11107 REPAIRED: NO	Humboldt	1000	400 40%	Med	Prior to Oct 15; FIRST year of operations.	Humboldt	Fill voids with native material if no water present. If water is present fill voids with screen rock or woody material, cover with fabric paper or straw and cap with native material. By October 15th of year site is opened excavate crossing top to bottom to grade, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle which ever is steeper. Unstable area below road within crossing excavation. Professional geologist on site during crossing excavation. Also refer to Geologic report.
RD: U46.1214 STATION: 3430 SITE: s1 WOID: 1194969243 SEDID: 11106 REPAIRED: YES	Humboldt	1000	1000 100%	Med	Prior to Oct 15; FIRST year of operations.	Humboldt	Install temporary crossing if water is present at time of operations. Use minimum 6" culvert. Upon completion, install a waterbar up road to the west to prevent surface runoff from entering the crossing area. This site is included in approved South Lake View THP 07-183 and accounts for 1,000 cubic yards of sediment savings.
RD: U46.1214 STATION: 4191 SITE: p1 WOID: -1263183870 SEDID: 11105 REPAIRED: NO	Surface Drainage	2	2 100%	Med	Prior to Oct 15; FIRST year of operations.	Waterbar connected to Class III watercourse.	Waterbar connected to Class III watercourse. Watercourse flagged up outlet of waterbar approx 30 feet to edge of road. When road is opened do not blade material into watercourse portion of waterbar. Disconnect road surface drainage to watercourse by Oct 15th of year road is opened. Place a minimum of 3 waterbars within 130 feet above this site. Backhoe or excavator may be needed to breach berm to allow drainage of waterbars. Currently there is an existing waterbar 130 feet up the road from this site draining to the right. This current waterbar location shall be the first of the minimum 3 waterbars within 130 feet of the watercourse.
RD: U46.121443 STATION: 1447 SITE: 4N1E33D401 WOID: 841607695 SEDID: 30892 REPAIRED: NO	Humboldt	200	100 50%	Low	Prior to THP Final Completion.	Humboldt	USE CROSSING AS IS. BY OCT 15TH OF YEAR OF SITE BEING OPENED EXCAVATE CHANNEL TO GRADE TOP TO BOTTOM, EXCAVATE CHANNEL TO NATURAL CHANNEL WIDTH, LAYBACK SLOPES 2:1 OR TO NATURAL SLOPE ANGLE WHICHEVER IS STEEPER. Also refer to sediment inventory form
RD: U46.121520 STATION: 425 SITE: c1 WOID: 1274997540 SEDID: 11108 REPAIRED: NO	Humboldt	100	100 100%	Low	Prior to Oct 15; FIRST year of operations.	Humboldt on skid trail	Humboldt on existing skid trail. If water is present when utilized fill voids with screened rock or logs, cover with straw or fabric paper and cap with native material. If no water present fill voids with native material. By Oct 15th of year road and crossing are constructed excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.

Treatment

Site Description

Priority for Implementation

Est. Potential Erosion (Cu.Yards)

Site Type

Treatment

Est. Potential Delivery (Cu.Yards & %)

Schedule

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Implementation	Treatment	Site Description	Treatment
RD: U46.16 STATION: 1628 SITE: c1 WOID: 439485617 SEDID: 11117 REPAIRED: NO	Humboldt	600	600 100%	Med	Prior to Oct 15; FIRST year of operations.	Existing skid trail humboldt crossing	Existing skid trail humboldt crossing. If water is present at time of construction screened rock or logs may be placed in voids covered with straw or fabric paper and capped with native material. If water is not present fill voids with native material. By Oct 15th of year road and crossing are constructed excavate humboldt to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.
RD: U46.16 STATION: 1696 SITE: c2 WOID: 37869854 SEDID: 11118 REPAIRED: NO	Humboldt	250	250 100%	Med	Prior to Oct 15; FIRST year of operations.	Existing humboldt skid trail crossing	Existing skid trail humboldt crossing. If water is present at time of construction install spittler type crossing with pipe large enough to handle flow, minimum 6 inch pipe. If water is not present fill crossing with native material. By Oct 15th of year road and crossing are constructed excavate humboldt to grade top to bottom, do not excavate channel above existing cutbank where water is currently appearing, this bank and portion of channel shall be supported by armoring with trip- rap, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.
RD: U46.24 STATION: 3841 SITE: c1 WOID: 63553546 SEDID: 11119 REPAIRED: NO	Crossing	50	50 100%	Low	Prior to Oct 15; FIRST year of operations.	Fill no culvert drained by water bar	By Oct 15th of year road being opened excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.
RD: U46.26 STATION: 1425 SITE: c1 WOID: 1077917457 SEDID: 11112 REPAIRED: NO	Humboldt	500	250 50%	Med	Prior to THP Final Completion.	Humboldt	Install rocked ford.
RD: U46.26 STATION: 2766 SITE: c2 WOID: -1192463362 SEDID: 11330 REPAIRED: NO	Culvert Maintenance	0	0 #Num!	Low	Prior to THP Final Completion.	partially plugged culvert lacking critical dip	Outlet partially plugged with sediment backed up into culvert. Clean out culvert and install critical dip
RD: U46.26 STATION: 3135 SITE: 4NJE33H704 WOID: 1828004080 SEDID: 30891 REPAIRED: NO	Crossing	1000	250 25%	Med	Prior to Oct 15; FIRST year of operations.	Crossing dirt fill, Watercourse crosses landing.	Watercourse crosses landing. Use crossing as is. By Oct 15th of year crossing is utilized. excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper. Geologist inspection for bank armoring post excavation. Also refer to Geologic report and sediment assessment form

Site	Site Type	Est. Potential Erosion (Cu. Yards)	Est. Potential Delivery (Cu. Yards & %)	Priority Treatment	Implementation Schedule	Site Description	Treatment
RD: U46.26 STATION: 3288 SITE: 4N1E33H705 WOID: -290559439 SEDID: 30963 REPAIRED: NO	Humboldt	200	75 38%	Med	Prior to Oct 15; FIRST year of operations.	Humboldt	Use crossing as is. By Oct 15th of year crossing is utilized excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper. Also refer to sediment assessment form.
RD: U46.26 STATION: 3381 SITE: 4N1E33H701 WOID: -1357688565 SEDID: 30890 REPAIRED: NO	Humboldt	250	112 45%	Med	Prior to Oct 15; FIRST year of operations.	Humboldt	Use crossing as is. By Oct 15th of year crossing is utilized excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper. Also refer to sediment assessment form
RD: U46.2608 STATION: 475 SITE: c1 WOID: 1274902560 SEDID: 11126 REPAIRED: NO	Crossing	75	75 100%	Med	Prior to Oct 15; FIRST year of operations.	Existing culvert water flowing under culvert.	Water observed flowing under culvert going subsurface approx. 5 feet above culvert inlet. Sink hole has appeared to left of culvert toward inside edge of road. If water is flowing fill hole with screened rock. If water is not flowing fill hole with native material. By Oct 15th of the year crossing is opened install rocked ford
RD: U46.2688 STATION: 358 SITE: c1 WOID: 2105204129 SEDID: 6954 REPAIRED: NO	Humboldt	100	50 50%	Med	Prior to Oct 15; FIRST year of operations.	Humboldt	If water present when site is opened fill voids with screened rock or woody debris, if dry fill with native material. By Oct 15th of year crossing is utilized excavate crossing to grade top to bottom, excavate channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.
RD: U46.32 STATION: 1575 SITE: c2 WOID: 430580374 SEDID: 11113 REPAIRED: NO	Crossing	150	150 100%	Med	Prior to Oct 15; FIRST year of operations.	Fill no culvert	Use road as is. By Oct 15th of year site is opened, excavate crossing to grade top to bottom, excavated channel to natural channel width and lay back side slopes 2:1 or to natural slope angle whichever is steeper.
RD: U46.32 STATION: 1711 SITE: NFE218 WOID: 5934 SEDID: 30780 REPAIRED: NO	Failing Fill	1220	122 10%	Med	Prior to Oct 15; FIRST year of operations.	Failed and failing road fill.	Failed and failing road fill. Road surfaced narrowed to approx 7 feet in one location. Open road temporarily. Place temporary fill to gain access. Pull any new placed fill and any existing perched fill by Oct 15th of the year road is opened. Disconnect any potential water drainage from road surface to this road segment. PULL UNSTABLE FILL ON MAIN ROAD 110 X 5 X 25 = 510. STOCKPILE SPOILS BEHIND SITE TO LEFT AT LANDING. OUTSLOPE ROAD UP ROAD AND THROUGH SITE TO DISPERSE SPRING FLOW FOR 300' UP ROAD TO THE RIGHT. Also refer to Geologic report.
RD: U46.32 STATION: 1884 SITE: c3 WOID: -1787111329 SEDID: 11114 REPAIRED: NO	Crossing	100	100 100%	Med	Prior to Oct 15; FIRST year of operations.	Head of Class III watercourse, Water emerges from cutbank and flows short distance down road.	Head of Class III watercourse. Water emerges from cutbank and flows short distance down road. By Oct 15th of the year site is opened excavate failing material and align excavated channel with emergent bank water and channel below road approx 70 to the left. Provide water dissipator on downslope excavated channel. Professional geologist on site. Also refer to Geologic report.

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
RD: U46.32 STATION: 2121 SITE: L1 WOID: 194289704 SEDID: 11115 REPAIRED: NO	Failing Fill	500	50 10%	Low	Prior to Oct 15; FIRST year of operations.	Landing fill	Excavate landing material by Oct 15th of the year road is opened.
Total Estimated Yards		24141	19920				

323

323

Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
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Total Estimated Yards 23985 19864

Off road site #	No Treatment Explanation
4N1E33B401	During the 2010 visit of these sites no physical changes were observed following the 2008-2009 and 2009-2010 winter seasons when compared with the site condition recorded during the original assessment. The treatment of these sites during the same time period will result in approximately 40% of the channel length being excavated within the 520 foot segment of channel occupied by these sites. This would essentially result in a complete excavation of the channel. Following a 2010 geologic review with the project geologist it was determined not to treat site due to unstable conditions of the site.
4N1E33B402	
4N1E33B504	
4N1E34B702	During the 2010 visit of this site no physical changes were observed following the 2008-2009 and 2009-2010 winter seasons when compared with the site condition recorded during the original assessment. This site is located at the head of a Class III watercourse. The amount of disturbance to treat the site compared with the potential sediment savings of 16 yards outweighs the potential benefits of treatment.
3N1E03F101	
3N1E03F206	During the 2010 visit of these sites no physical changes were observed following the 2008-2009 and 2009-2010 winter seasons when compared with the site condition recorded during the original assessment. The treatment of these sites during the same time period will result in approximately 60% of the channel length being excavated within the 600 foot segment of channel occupied by these sites. This would essentially result in complete excavation of the channel.
3N1E03G201	
	The bottom of the excavation for site 3N1E03F206 would be at the watercourse confluence with Lake Creek.

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RESOURCE MANAGEMENT



FUEL SPILL PREVENTION AND CLEANUP PLAN FOR COLUMBIA HELICOPTERS FIELD OPERATIONS

Scope

This plan has been prepared by Columbia Helicopters, Inc. (CHI) to meet the requirements set forth by the Federal, State and Local rules that apply to fuel storage.

The procedures and/or plans have been designed to minimize the hazards to human health and the environment from fires, explosions, and hazardous spills. All affected CHI employees and our contractors are charged with the compliance of the provisions of this plan from a maintenance standpoint and whenever there is an emergency. All CHI field mechanics have been instructed and trained in carrying out the plan, and the appropriate techniques of fuel spill prevention and cleanup.

Preparedness and Prevention

CHI maintains and operates its job sites to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste/material or hazardous waste/material constituents to air, soil or surface water which could threaten human health or the environment.

Emergency Command Structure

CHI has a field emergency command structure on all of its job sites. The Primary Emergency Coordinator is the Project Manager, with the Crew Chief or Logging Trainer as alternates. See CHI form CHI-S-31A (enclosed) which is located in the maintenance van for a list of applicable personnel and emergency phone numbers. CHI Field Mechanics are responsible to act as initial responders.

Emergency Coordinators Duties

At all times, there is at least one employee either at the job site or on call with the responsibility for coordinating all emergency response measures. The Emergency Coordinator is thoroughly familiar with all aspects of CHI's Fuel Spill Prevention and Cleanup Plan, all aspects of operations and activities, location and usage of emergency equipment at the job site, and which persons or agencies to notify immediately in the event of an emergency. This person has the authority to commit the resources needed to carry out this Spill Prevention and Cleanup Plan.

Field Mechanics Duties

CHI Field Mechanics are responsible for contacting the Emergency Coordinator immediately and acting as initial responders in the event of a fuel spill. The primary objective of the initial response is to keep the fuel out of waterways, stabilize or contain the fuel to prevent further spillage, and begin the cleanup process.

Emergency Equipment

CHI maintains an adequate supply of absorbent pads, shovels, pumps and hoses, drums, viscoseen, fire extinguishers, first aid equipment, etc. in the maintenance vans in the event of an emergency. The fueling area maintains a smaller supply of absorbent pads, shovels, fire extinguishers, first aid equipment and secondary containment around fuel tanks. Nurse trucks when used for remote fueling will also carry a fire extinguisher, first aid kit, and a small supply of absorbent pads. Absorbent pads may be wrung out and reused. See Spill Containment Plan for diagram of secondary containment system for fuel tanks. CHI is capable of obtaining other emergency equipment from a variety of other sources, such as: local fire and police departments and Riedel Environmental Services, Inc. or another private emergency response contractor.

Emergency Procedures

Whenever there is an imminent or actual emergency situation, the Emergency Coordinator must immediately notify all field maintenance personnel and/or visitors, contractors, CHI management, state and local agencies, and other necessary persons, if needed, then assess the incident, then control or contain the release, if possible, and then if necessary call the National Response Center, 1-800-424-8802. See CHI form CHI-S-31A in maintenance van for phone numbers. The National Response Center, State and Local agencies must be provided with the following information:

- Name and telephone number of the person making the report.
- Name and address or location of the job site.
- Time and type of the incident.
- Name and quantity of the material(s) involved to the extent possible.
- Extent of any injuries known.
- Possible hazards to human health and the environment, outside of job site.

Personnel who cause or observe a spill or release of hazardous materials must immediately call the Emergency Coordinator. If the material(s) come in contact with your skin, wash it off immediately with copious amounts water. If the material(s) come into contact with your clothes, remove the clothes at the best available time and then wash your skin off with copious amounts of water.

Personnel who cause or observe small localized fires or explosions may try to extinguish the fire by using one of the available extinguishers. As soon as the fire is extinguished, contact your supervisor and the Emergency Coordinator.

The Emergency Coordinator will do everything in their power to keep the release from entering surface or ground water. This may include diking or berming, or using absorbents. Once contained or controlled put the material(s) solids/semi solids into open top 17H DOT drums and liquids into closed top 17E metal or poly drums or other approved storage devices that are compatible with the spilled material(s). Immediately label the drums with the words "Hazardous Waste" or words describing the contents of the waste. Also put an

accumulation date on the label. Then contact CHI's Hazardous Materials Manager to arrange for proper waste disposal.

If the spill or release reaches a stream, river, lake or is greater than the Reportable Quantity listed in 40 CFR 302.4 (for non-petroleum products), then the National Response Center must be notified of the release/spill. See CHI form CHI-0-31 in the maintenance van for the telephone number of the National Response Center. If fuel/oil is spilled in quantities greater than 42 gallons, in Oregon only, the Oregon Emergency Response Service must be called at 1-800-452-0311.

If the spill/release is determined to be greater than CHI personnel are able to handle or cleanup, an environmental cleanup contractor will be called to handle that portion of the remediation activities. Foss Environmental Services, Inc. can be reached 24 hours a day at 1-800-337-7455 or 503-283-1150.

Immediately after the spill the Emergency Coordinator will provide for the treatment, storage or disposal of the recovered waste, contaminated soil, surface water or any other material that results from a release, fire or explosion at the job site.

Follow Up

The Emergency Coordinator will ensure that affected area(s) of the job site have no waste which is incompatible with the released material that is treated, stored or disposed of until cleanup procedures are completed, e.g. flammables and oxidizers, and acids and bases. All emergency equipment will be cleaned and fit for its intended use before operations will resume.

Required Reports

CHI will notify the EPA Regional Administrator and the state environmental agency that the job site is in compliance with 40 CFR 265.56 (h) before operations are resumed in the affected area(s) of the job site.

CHI will note in a memorandum the time, date and details of any incident that requires implementation of this plan. Also, CHI will, within 15 days after the incident, submit a written report on the incident to the Regional Administrator. The report will include the following:

- Name, address and telephone number of CHI.
- Date, time and type of incident.
- Name and quantity of the material(s) involved.
- The extent of the injuries, if any.
- An assessment of actual or potential hazards to human health and the environment, where this is applicable.
- Estimated quantity and disposition of the recovered material.

General Purpose Decontamination Solutions/Procedures

<u>Type of Hazard Suspected</u>	<u>Solution</u>	<u>Directions for Preparation</u>
1. Inorganic acids, metal processing wastes.	A	To 10 gallons of water add 4 lbs of sodium carbonate (soda lime) and 4 lbs of trisodium phosphate. Stir until evenly mixed.
2. Heavy metals: chrome, lead, cadmium, etc.	A	Same as item 1
3. Pesticides, fungicides, chlorinated phenols, and dioxins.	B	To 10 gallons of water add 8 lbs of calcium hypochlorite. Stir with wooden or plastic stirrer until evenly mixed.
4. Cyanides, ammonia, and other non-acidic inorganic wastes.	B	Same as Item 3
5. Solvents and organic compound such as trichloroethane and toluene.	C or A	To 10 gallons of water add 4 lbs of trisodium phosphate. Stir until evenly mixed.
6. PCB's and oily, greasy wastes.	C or A	Same as item 5
7. Inorganic bases, alkali and caustic waste.	D	To 10 gallons of water add 1 pint of concentrated hydrochloric acid. Stir with a wooden or plastic stirrer.

CHI equipment that is contaminated will be thoroughly decontaminated with the above solutions for the appropriate contaminate. The rinse waters are to be captured to determine if they are hazardous or not. Personnel decontaminating equipment will wear the proper protective equipment such as goggles, face shield, rubber gloves and boots, a splash suit and air purifying respirator, if necessary.

Notes: The decontamination chemicals listed above can be purchased at most feed and hardware stores.

Revisions

This plan will be amended or reviewed if applicable regulations change, the plan fails in an emergency, the job site changes in its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions or releases of hazardous wastes or hazardous constituents, or changes in the response necessary in an emergency, the list of emergency coordinators changes or the list of emergency equipment changes.

**COLUMBIA HELICOPTERS, INC.
OIL SPILLAGE PROCEDURES**

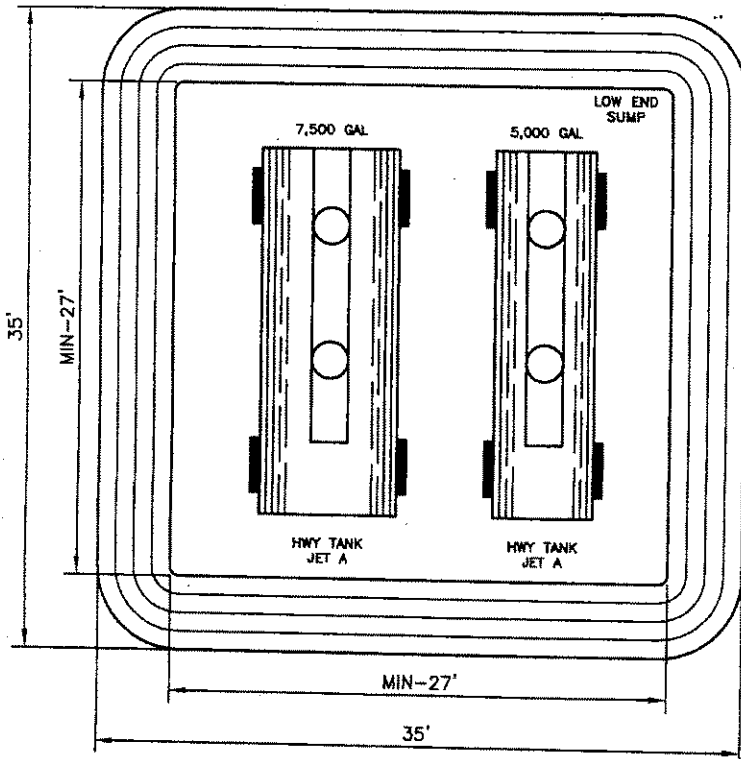
*** POST IN SERVICE VAN ***

In the event of fuel or oil spillage, immediately contact the Aurora office.

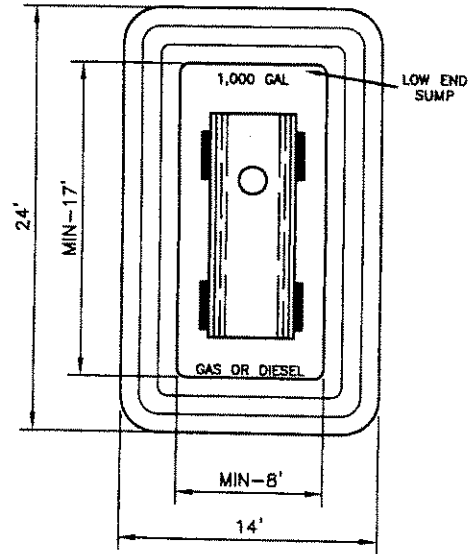
1. Project Manager _____ or
2. Crew Chief _____ or
3. Logging Trainer _____
4. Aurora Office 503-678-1222
5. U.S. Coast Guard 1-800-242-8802
(National Response Center)
6. Oregon DEQ 1-800-452-0311
Washington DEQ 1-800-258-5990
California EPA 916-262-1621 or in-state 1-800-645-7911
Idaho DEQ 208-373-0502 or in-state 1-800-632-8000
Alaska DEQ (Juneau) 907-465-5340 or after hours 1-800-478-9300
7. Local Bulk Commodities Common Carrier:

8. Clean-up Services/Environmental Emergency Services
Foss Environmental Services 1-800-337-7455
9. If appropriate, use oil absorbent pads located at service van.

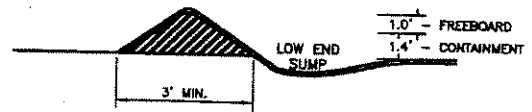
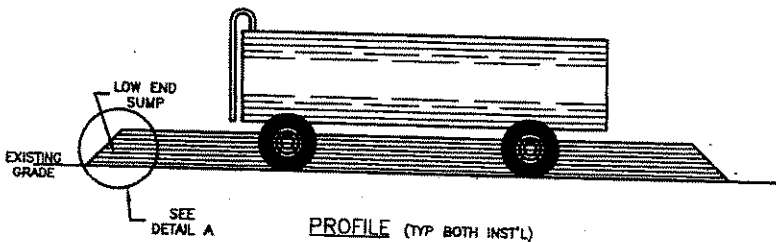
(DRAWING NOT TO SCALE)



MIN. ENCLOSURE = 1,750 FT³ = 13,088 GAL



MIN. ENCLOSURE = 326 FT³ = 2,441 GAL



DETAIL A
TYPICAL CROSS SECTION

NOTES

1. Blade fuel containment area clean of all brush, debris, stones and loose soil. Rake and shovel clean soil base (or sump liner). Provide slight slope to 8" deep sump at corner.
2. Sump liner to be Keptax VCR 2801 25 MIL PVC Fiberglass mesh reinforced fuel pit liner or equivalent. Lay liner over prepared base with edges folded back to allow berm construction. Construct berm to shape shown using soil (or equivalent) free of rock and debris which could puncture or abraid the liner. Roll liner over berm and secure. Volume of finished cell to be adequate to contain volume of largest single tank plus sufficient freeboard to allow for precipitation.
3. Minor holes and tears may be repaired using patches of PVC plastic with adhesives or mastics resistant to Jet A fuel.

Date: 10/22/2004 Filename: H:\PALCO_ONLY\PROJECTS\240033_miscsupport\HELI_CONTAIN.dwg

SECONDARY CONTAINMENT FACILITIES SHOWN IN THIS DRAWING CONFORM TO EPA 40 CFR PART 112.8(c)(2)



THE PACIFIC LUMBER COMPANY HELICOPTER LOGGING OPERATIONS	
FIGURE 1	
SECONDARY CONTAINMENT DESIGN FOR PETROLEUM STORAGE TANKS	
PROJECT: 240033	DATE: 10/22/04
REV:	BY: MH CHECKED: FC
MFG, Inc. consulting scientists and engineers	

PART OF PLAN
RECEIVED

DEC 2 2010

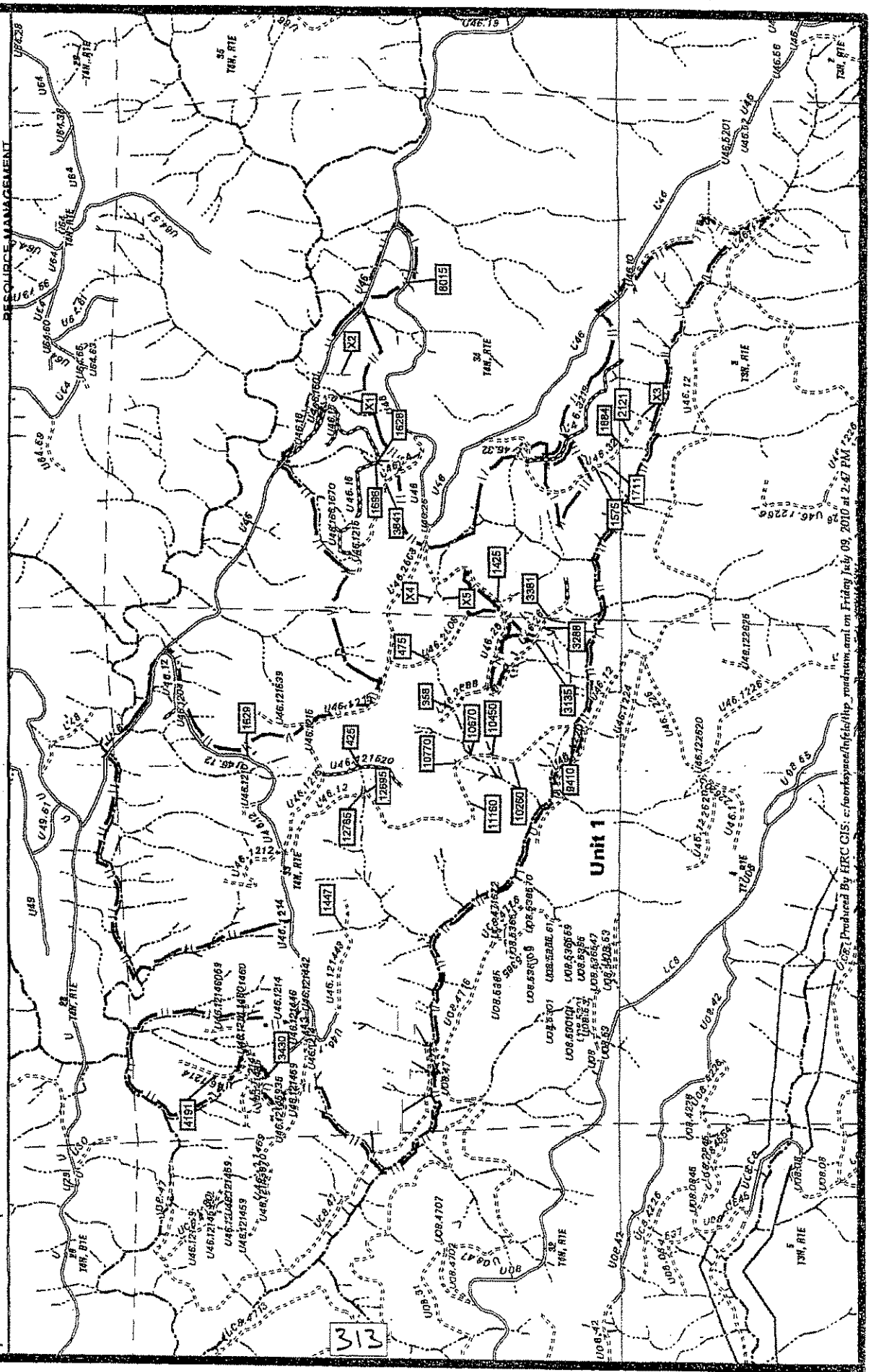
COAST AREA OFFICE
RESOURCE MANAGEMENT

- Property Line
- Harvest Boundary
- Permitment Road
- Seasonal Road
- Proposed Road
- Seasonal Road
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse
- Road Point (Refer to Work Order)
- ###

LNFE Lake Creek
N Road Construction Location
ECP Site Locator Map

USGS QUAD(S): PENNSYLVANIA
Map 2 of 2

Map Scale: 1 inch = 1320 feet



Produced By HRC GIS: c:\workspaces\hrc\hrc\prodnum.amt on Friday, July 09, 2010 at 2:47 PM

Jon Woessner

From: Jon Woessner
Sent: Monday, January 17, 2011 9:05 AM
To: 'David Engel'; Mark Alpert
Subject: RE: ECP sites for 1-10-070 HUM, LNFE Lake

1. We discussed this in the field during the PHI. You had no problem removing them because we were not using the road for logging. Also as we discussed in the field I would prefer to work on these sites under a grant. WE will not be orphaning these sites All of this you were ok with during the PHI. In the same line of thought the water board staff had no problem enrolling unit 3 of 07-183 which had the same road in and sed sites on it, but it was not used for timber operations so it was not included in the ECP.
2. Same answer as above - we will not be using this road for timber operations and it will not be orphaned.
3. It is a leak into the culvert not out of. As I discussed with Mark I was under the impression this did not need to be in the ECP. For ease of process I will put this in
4. As discussed with Mark I was under the impression this site did not need to be in the ECP. For ease of process I will put this in
5. the intention is to fix it the first year we use it. made the change.
6. I am confused. X3 is included in the ECP, refer to page 317 of the THP. It is proposed for treatment.

-----Original Message-----
From: David Engel [mailto:DEngel@waterboards.ca.gov]
Sent: Friday, January 14, 2011 5:34 PM
To: Jon Woessner; David Engel; Mark Alpert
Subject: ECP sites for 1-10-070 HUM, LNFE Lake

Jon,

I have reviewed all of the ECP sites for 1-10-070 HUM, LNFE Lake. These sites are located within the Tier 2 portions of the plan. While you have not yet submitted your Tier 2 application for this plan, I want to give you advance notice of my review. My recommendations are as follows.

- 1.) The ECP sites on U08.47. You deleted this road from the THP after the PHI, however that strands four sites that comprise 95 cubic yards of sediment. In the original THP, these road points were to be fixed as part of the THP. This amounts to at least 10 dump trucks of sediment that potentially discharge into Lake Creek and the North Fork Elk River. Indeed, two of the sites account for only 5 cys. However, I am most concerned about the other two sites, Stations 4872 and

5519. The latter site is listed as 68 cubic yards, but in the field it looked to be a much larger situation. I have discussed these sites with Holly Lundborg who was a major person in writing the orders and is an expert in ECPs. She feels that you need to include these sites in your ECP and develop a plan to fix them in the near future. Stations 4872 and 5519 shall be included in your ECP and a plan developed to fix them prior to enrollment.

- 2) I am concerned about the U08.47 crossing of Lake Creek. The WMDRs state under the erosion control plan section (2.a), Overview "Controllable Sediment Discharge Sources may include, but are not limited to...unstable deposits... or any other location near watercourses, unstable watercourse banks... instream and floodplain sediment deposits... or any other location discharging sediment or earthen materials." A picture showing a shotgunned culvert that extends from the floodplain out to the watercourse indicates there is fill at this location. This indicates to me that this crossing should be included in your ECP and treated.
- 3) Road U46, Station 3448. This site is already in your Road Work Order and is scheduled to be repaired. This site involves a leaking culvert. When culverts leak, they erode the soil material that surrounds the culvert. That is the reason that we replace leaky culverts. This culvert is located on a Class III tributary that leads just a couple hundred feet into the North Fork Elk River. As a result, this road point must be added to the ECP and a plan included to fix the site prior to enrollment.
- 4) Road U46.26, Station 2766. This site involves a partially plugged outlet. You stated that there is less than 1 cubic yard of sediment in the culvert. The WMDRs do not state the minimum amount of sediment that needs to be removed. In this case, if there is less than a cubic yard to be removed, the job will not take too long. However, this culvert is at the head of a Class III watercourse and it will save additional sediment from entering the Lake Creek and the North Fork Elk River. Furthermore, if the culvert is backing up with sediment, then there is something wrong with this crossing that needs to be fixed before there is a major problem with the culvert. In this case, the site is already in the Road Work Order, it should be included as an ECP site. This site shall be added to the ECP prior to enrollment.
- 5) Road U46.12, Station 12785. The ECP in the Treatment section states that the site shall be corrected by October 15 of the year site is opened. However the Implementation Schedule states that it should be fixed "Prior to THP Final Completion. The road segment lists 8000 cubic yards and the road site lists 400 cubic yards of potential sediment delivery. Road site 12785 is located on a Class III tributary to Lake Creek. Both the road segment and the specific site will have the Implementation changed to Prior to end of 2nd year or the 1st year of operations in this portion of the plan" prior to enrollment.
- 6) Road U46.32, Station 2314. This site is also known as X3 and is a CAO site. The site lies just a hundred feet from the end of the road segment that is planned to be opened up. However, it is obvious that the former road in this area extended to this site. There is no major obstacle that would prevent easily reaching this site with equipment. If the road segment leading to this is abandoned as planned, it will strand this CAO site thereby preventing cleaning it up in the future. This site is along a Class III watercourse. The watercourse may have been classified incorrectly as it appears to be a Class II. This watercourse leads within a short distance directly into Lake Creek. This site shall be included in the ECP prior to the plan being enrolled.

Thank you,

David Engel

Engineering Geologist
North Coast Regional Water Quality Control Board



Humboldt Redwood
COMPANY, LLC

FOREST
OPERATIONS
P.O. Box 712
125 Main Street
Scotia, CA 95565
(707) 764-4472
www.hrellc.com

February 27th, 2011

Catherine Kuhlman
North Coast Regional Water Quality Control Board
5550 Skylane Blvd suite A
Santa Rosa, CA. 95403

Re: WWDR Enrollment For THP 1-10-070

Dear Ms. Kuhlman

No new or changes to the current ECP sites as originally proposed in the plan have been noted since the plan approval in December.

If you have any questions please call me.

Sincerely,

Jon Woessner
North Area Manager
Humboldt Redwood Co., LLC
RPF# 2571

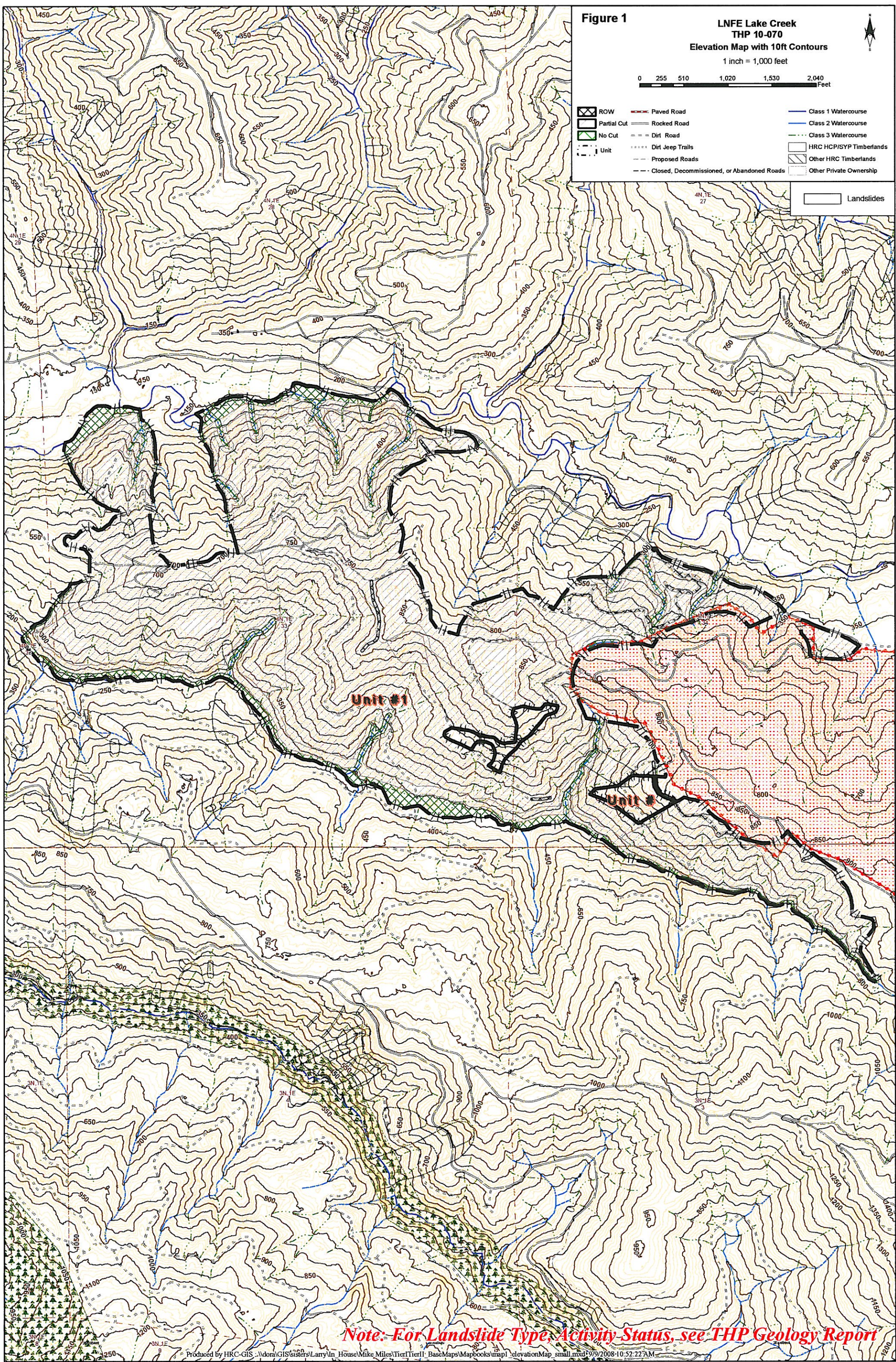
Figure 1

LNFE Lake Creek
THP 10-070
Elevation Map with 10ft Contours
1 inch = 1,000 feet



0 255 510 1,020 1,530 2,040 Feet

- | | | |
|----------------|--|-------------------------|
| ROW | Paved Road | Class 1 Watercourse |
| Partial Cut | Rocked Road | Class 2 Watercourse |
| No Cut | Dirt Road | Class 3 Watercourse |
| Unit | Dirt Jeep Trails | HRC HCP/SYP Timberlands |
| Proposed Roads | Closed, Decommissioned, or Abandoned Roads | Other HRC Timberlands |
| | | Other Private Ownership |
| | | Landslides |



Note: For Landslide Type, Activity Status, see THP Geology Report

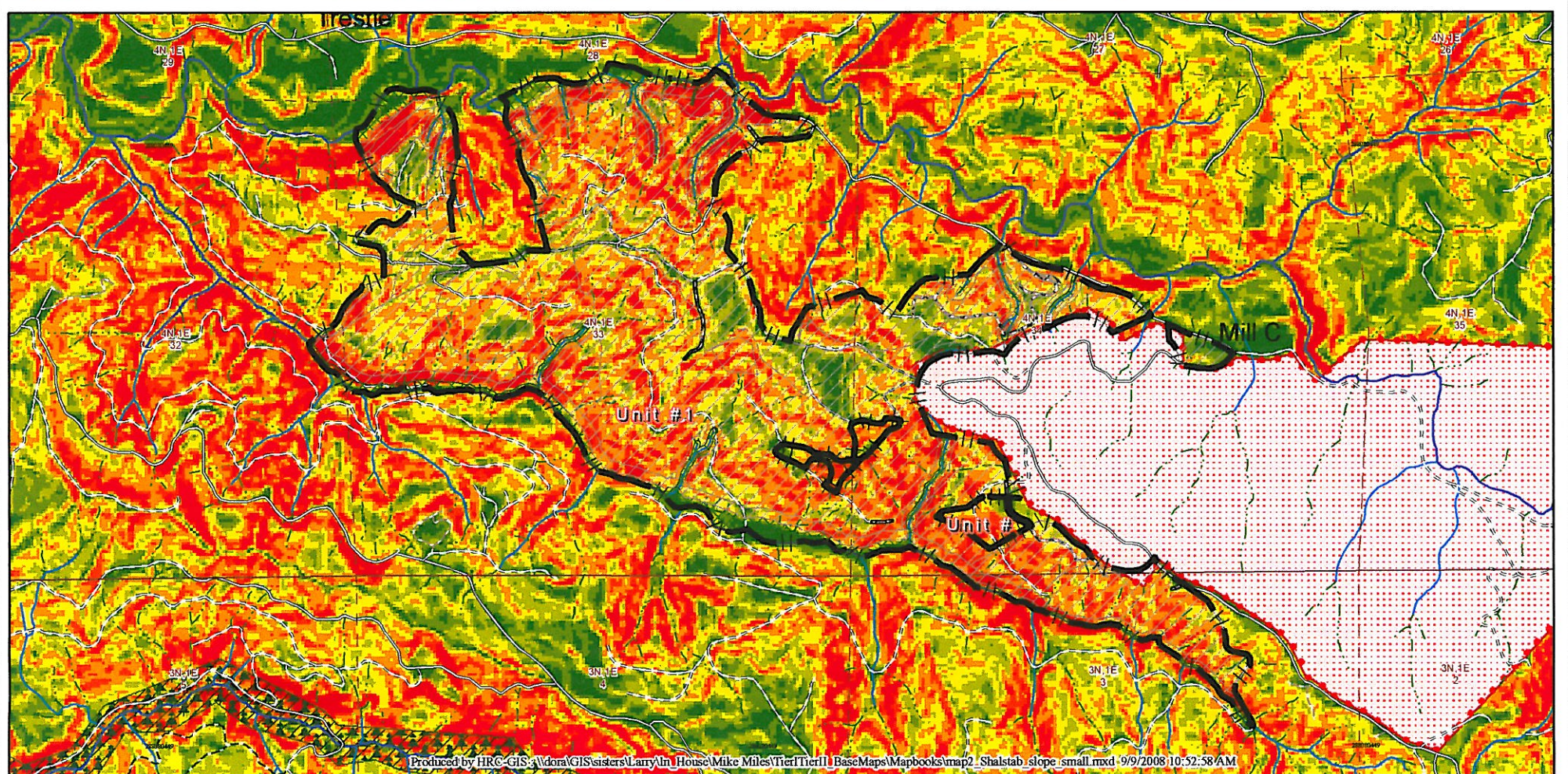
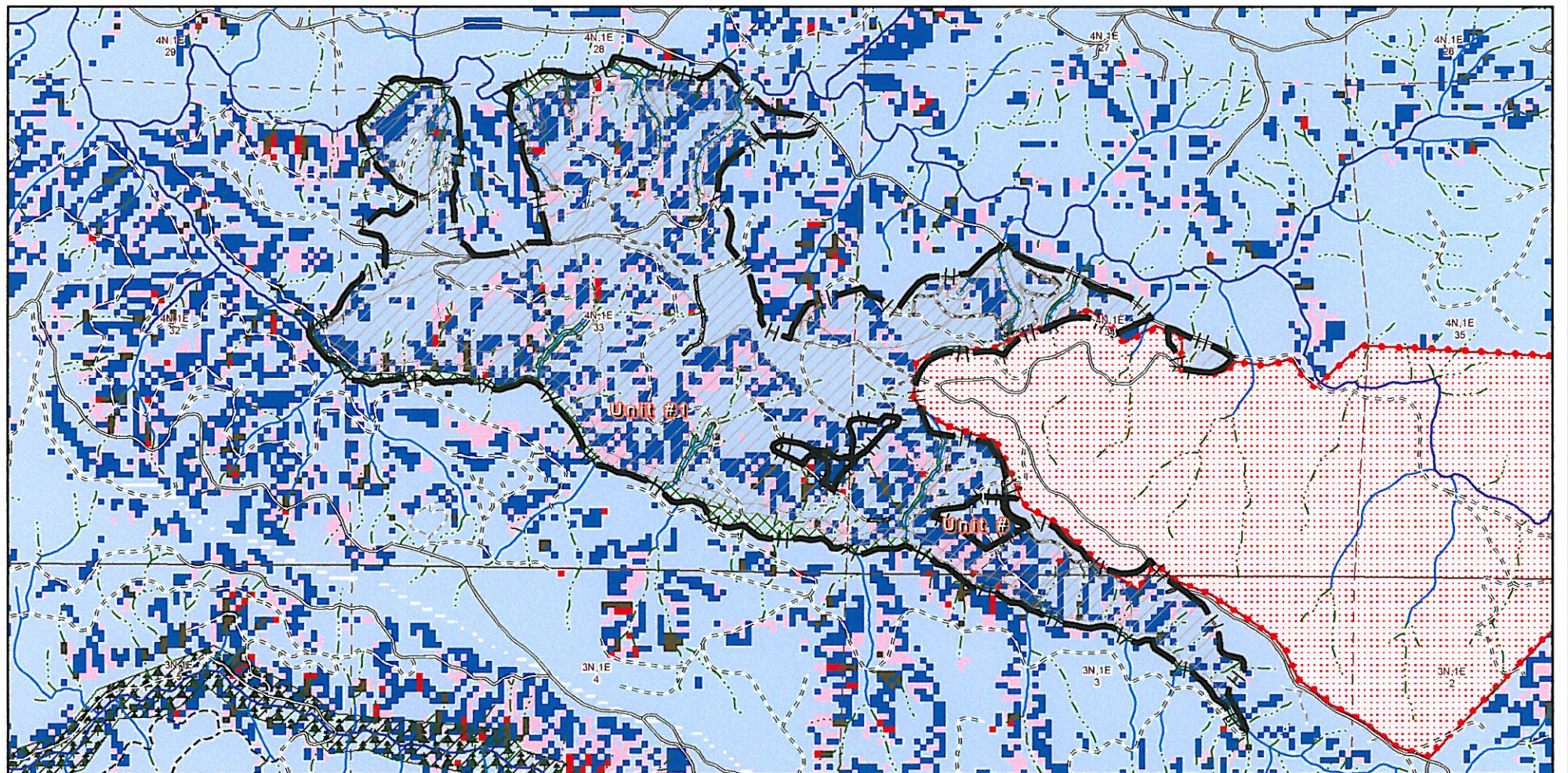
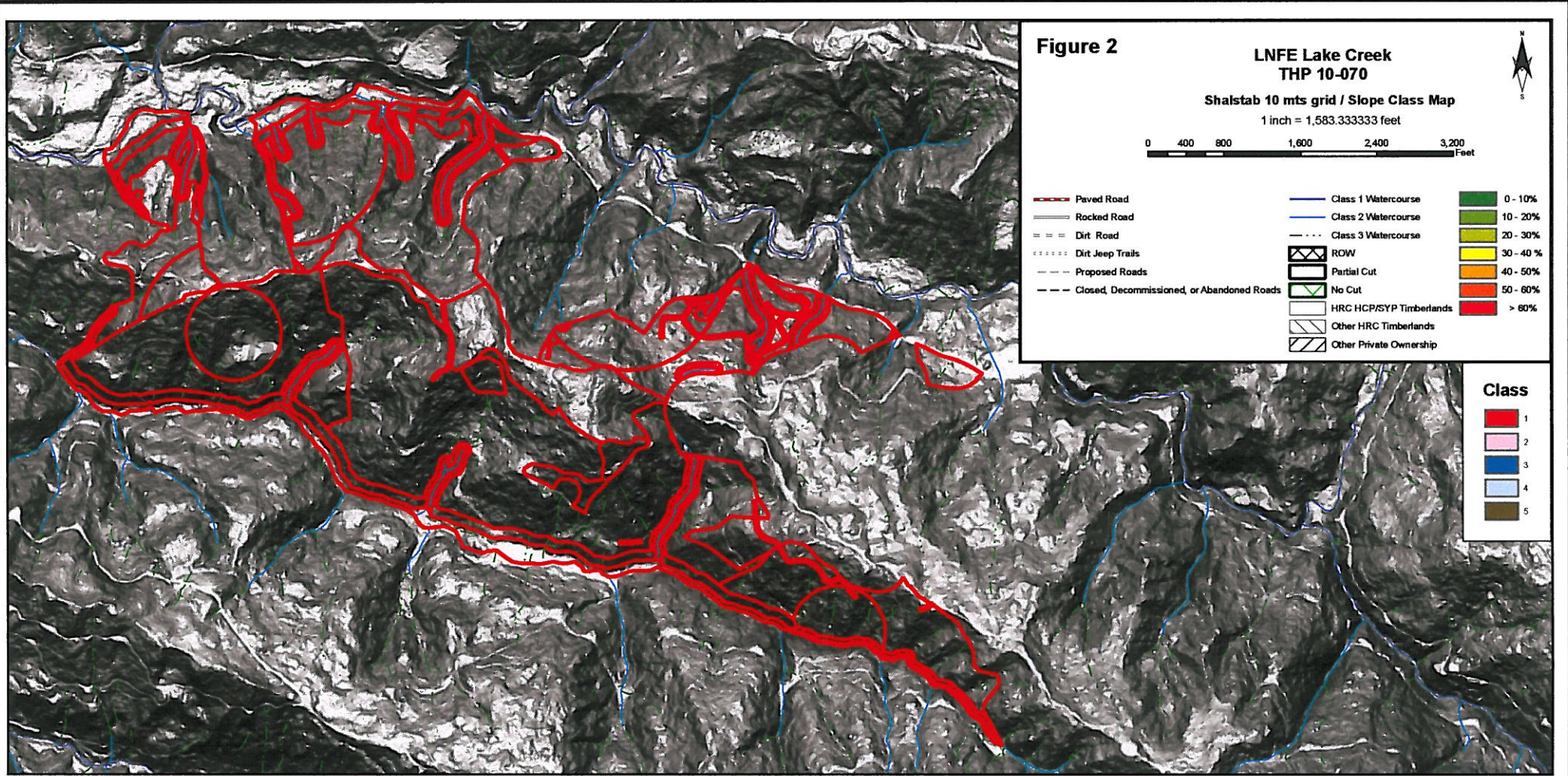


Figure 4

LNFE Lake Creek
THP 10-070
Mass Wasting Potential
1 inch = 1,000 feet



- | | | |
|-------------------------|---------------------------|--|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | Class 3 Watercourse | Dirt Road |
| ROW | DS & Amphitreatre / Slope | Dirt Jeep Trails |
| Partial Cut | Proposed Roads | Closed, Decommissioned, or Abandoned Roads |
| No Cut | | |

- Potential**
- | | |
|--|-----------|
| | Very Low |
| | Low |
| | Moderate |
| | High |
| | Very High |
| | Extreme |

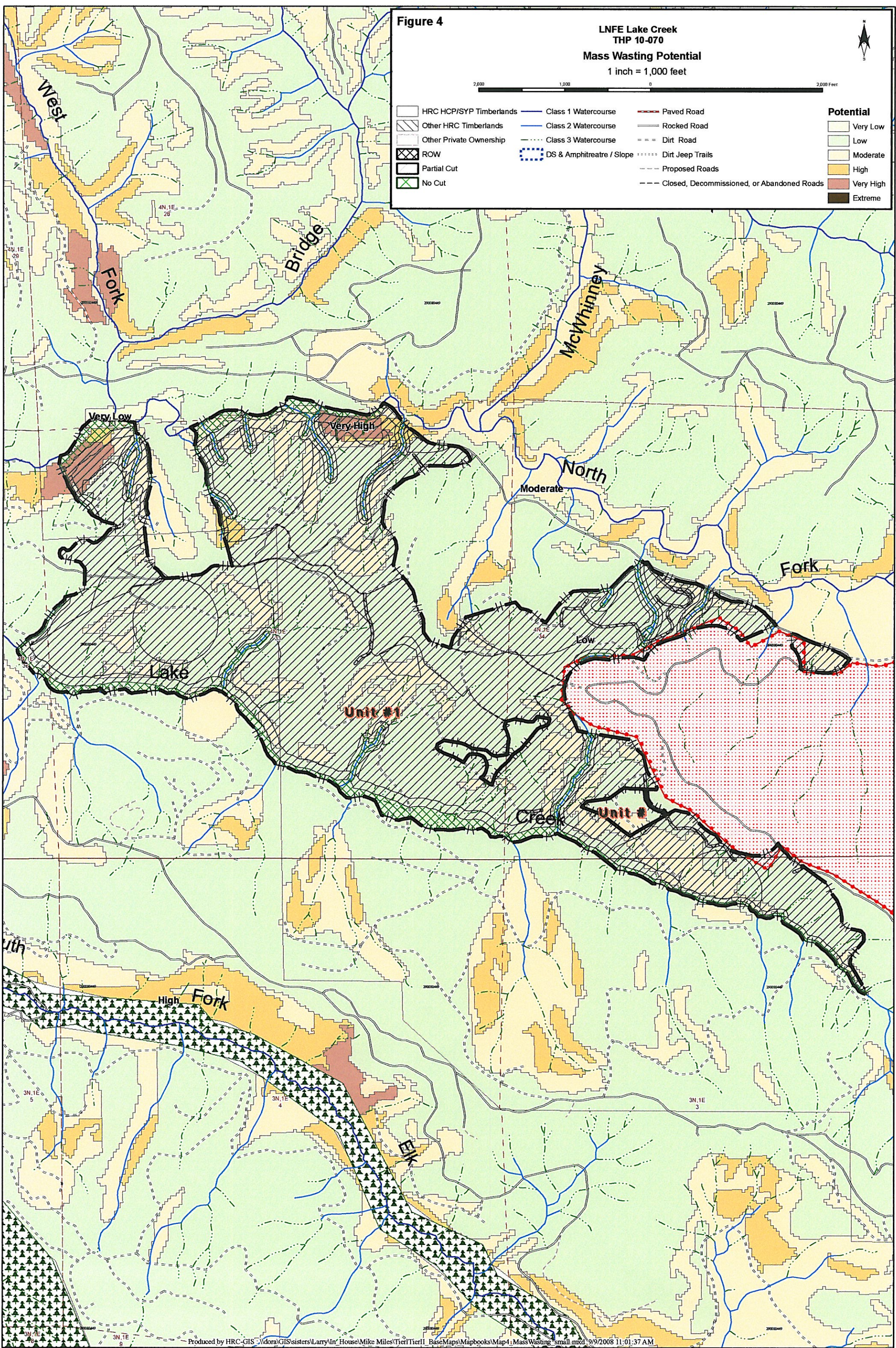
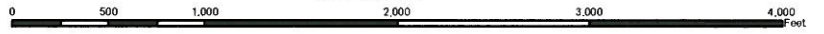


Figure 5

LNFE Lake Creek
THP 10-070
Aerial Photo Map

1 inch = 1,000 feet



- | | | | |
|-------------------------|-------------|---------------------|--|
| HRC HCP/SYP Timberlands | ROW | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Partial Cut | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | No Cut | Class 3 Watercourse | Dirt Road |
| | | Dirt Jeep Trails | Proposed Roads |
| | | | Closed, Decommissioned, or Abandoned Roads |

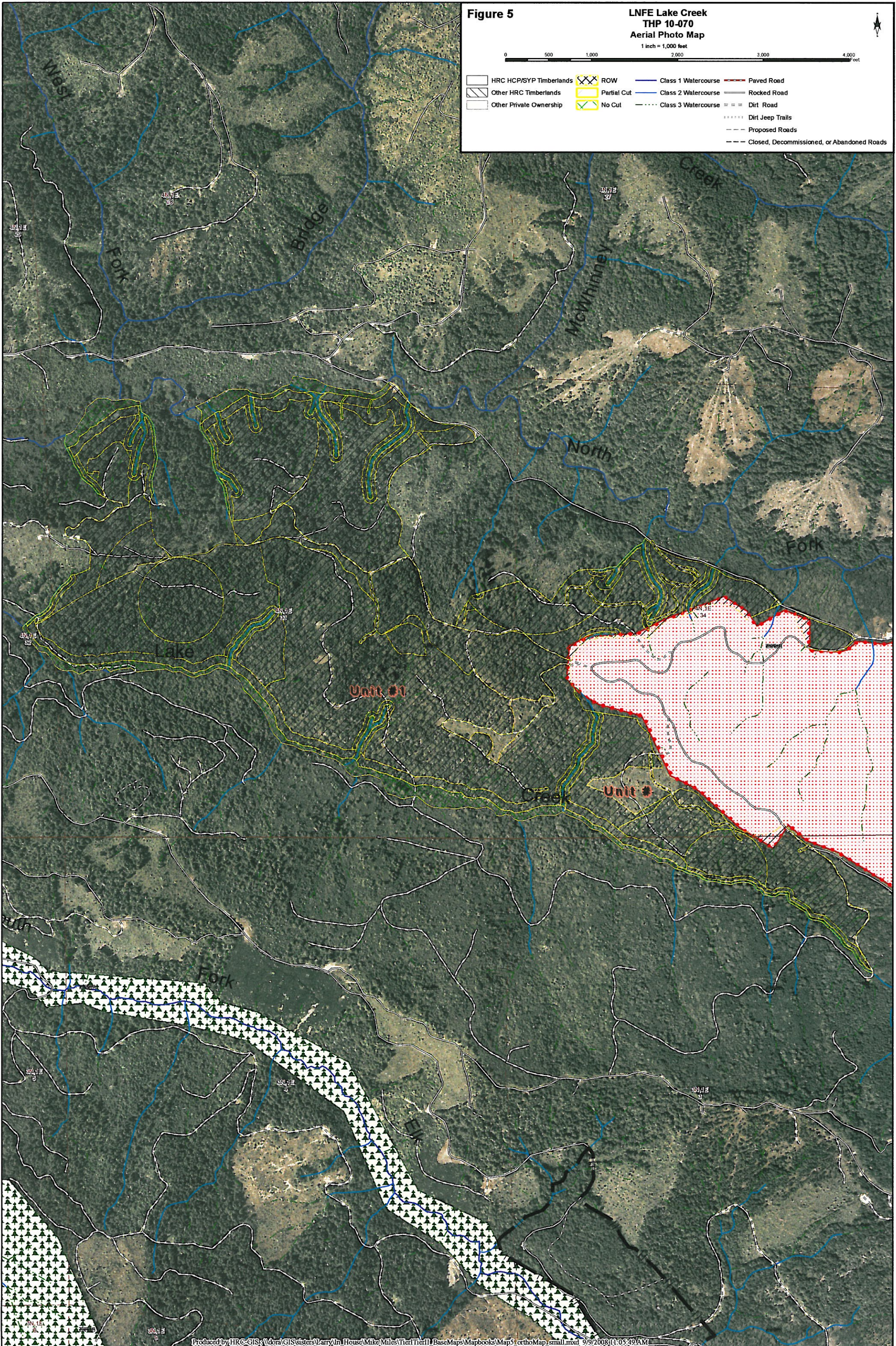
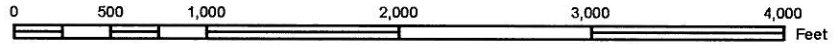


Figure 6

LNFE Lake Creek
THP 10-070

Watershed Analysis Deep-Seated Landslide

1 inch = 1,000 feet



- | | | |
|-------------------------|---------------------|--|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | Class 3 Watercourse | Dirt Road |
| ROW | | Dirt Jeep Trails |
| Partial Cut | | Proposed Roads |
| No Cut | | Closed, Decommissioned, or Abandoned Roads |

- Legend**
- Scarp
 - Earthflow
 - Rotational/ Translational/ Earthflow
 - Rotational/ Translational

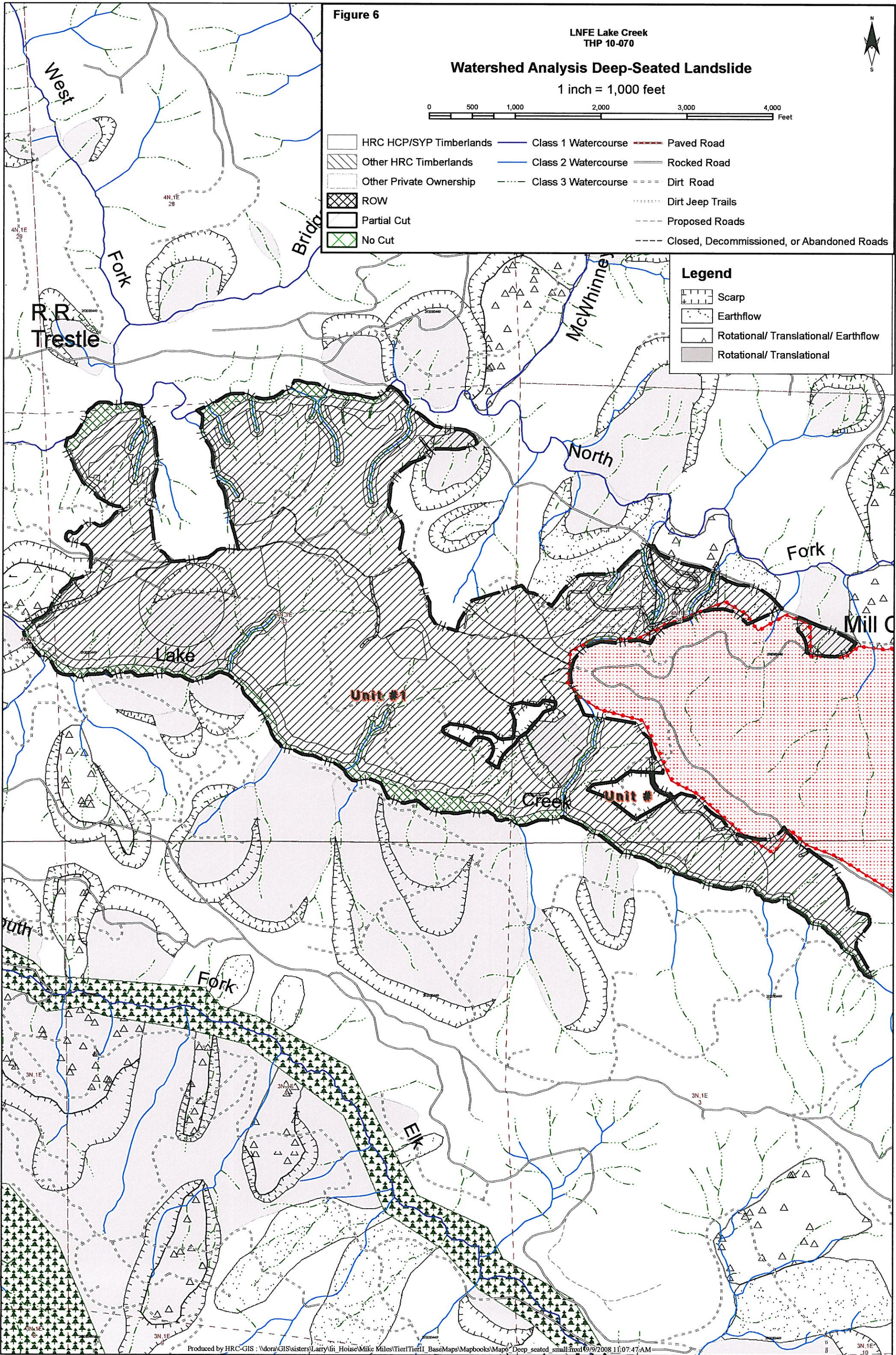


Figure 7

LNFE Lake Creek
THP 10-070

Road Map



- | | | | |
|-------------------------|--|----------------|----------------|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road | Stormproofed |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road | Upgraded |
| Other Private Ownership | Class 3 Watercourse | Dirt Road | Decommissioned |
| ROW | Dirt Jeep Trails | Proposed Roads | |
| Partial Cut | Closed, Decommissioned, or Abandoned Roads | | |
| No Cut | | | |

