



Humboldt Redwood
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February 13, 2009

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 1-05-085 HUM (Unit 3) in the Freshwater Creek WWDR, "Tier II"

Dear Ms. Kuhlman:

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0041 for unit 3 of THP 1-05-085 HUM. This unit is comprised of 25.3 acres of Selection (12.7 clear-cut equivalent acres). Total acres currently enrolled or proposed for enrollment under Order No. R1-2006-0041 Tier II is shown in the Attached Pre-Harvest Planning Report provided by Forester, Mr. Wayne Rice. The Erosion Control Plan (ECP), Form 200 and an annual waste discharge enrollment fee have already been submitted for this THP.

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.

In summary the unit is underlain by moderate to steeply inclined slopes within Wildcat Group sediments. The unit includes numerous watercourses including the South Fork of Freshwater Creek. The unit was clearcut and steam donkey yarded near the turn of the century. Mass wasting identified in response to this harvesting was assessed as minimal. Four small areas of mass wasting were identified during THP development and were removed from harvest. The Unit includes significant RMZ protection and has been amended to selection silviculture. The silviculture change in addition to the broad RMZs provides for a minimal impact harvest that meets the intent of the Tier II process. As such, we have made no additional changes, to the unit.

The THP proposes an uneven-age silviculture retaining 90 sqft of basal area. 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 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 R1-2006-0041 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. R1-2006-0041).

Respectfully,

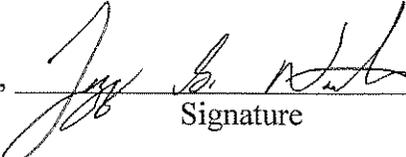


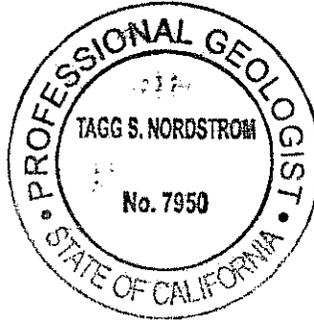
Wayne D. Rice,
RPF
Humboldt Redwood Company, LLC

Attachments:

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

Professional Certification of Design

I, , P.G. 7950, 2/16/09,
Signature license # Date



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. 1-05-085 HUM (Little Main) Unit # 3

- a. are in accordance with accepted practices, and recognized professional standards;
- b. comply with the requirements of the Monitoring and Reporting Program No. R1-2006-0103, 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.

THP: Little Main THP 05-085 Unit # 3 February 13, 2009

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, 1999)	3
Mass Wasting Potential Map (HRC, 1999)	4
Aerial Photo Map (HRC, 2007)	5
HRC Elk River WA deep-seated LS inventory (Palco, 2001)	6
Road Condition Map	7

Please see back of enrollment for references

Geological Summary:

The harvest unit occupies predominantly convex and concave slope forms adjacent Class I reaches of South Fork Freshwater Creek. The underlying geology is the lower facies of undifferentiated Wildcat Group sediments (Figure 3) composed of interbedded mudstone, silts, fine sands, and infrequent pebbles and conglomerates in contact with Yager terrane sandstone which is overlain by alluvial terrace deposits adjacent the Class I watercourse (South Fork Freshwater Creek). The bedrock is compact and predominantly held together by consolidation. Yager terrane bedrock is located in the lower elevations of the unit adjacent the Class I watercourse. Figure 3 maps debris slide slopes that correlate regionally and locally with watercourses (Figure 3). No other mass wasting features are identified in Figure 3.

No areas associated with deep-seated landsliding are mapped in the unit from Watershed Analysis (Figure 6).

Review of Figure 2 (Hillslope Shade) shows a well entrenched watercourse network draining the predominantly smooth slopes. The shade map also shows an abandoned railroad grade across the toe slopes of the unit. The Hillslope Shade maps show moderately steep convergent slopes (swales) that are most prominent where Class II and Class III watercourses have been mapped. Freshwater Creek appears with a low gradient and a prominent terrace.

A review of existing geologic information and disclosure of known unstable areas was conducted for the THP. The forester observed indicators of landslides within the proposed units and removed these areas from harvest to avoid inclusion of a Note 45 Report within the THP. Three small shallow debris slides were observed prior to submittal of the THP. These areas were removed from harvest. Two additional unstable areas were identified by CGS during PHI. These areas were flagged no harvest and removed from the harvest. One of the landslides was previously identified by watershed analysis (PALCO, 2001) and one landslide identified by Golder (2001). These landslides are in close proximity to Class III watercourses and have been removed from harvest. The THP was reviewed by various agencies during PHI. Unit 3 was found to be compliant with the Forest Practice Rules with respect to the disclosure of all known unstable areas after conclusion of the THP review process.

The harvest unit was evaluated at the THP level with respect to clearcut silviculture. As mandated by new management, the silviculture has changed to selection. This change is not in response to perceived high slope stability hazard, however, the retention of timber on the slopes further reduces the potential for harvest related mass wasting.

For this evaluation, the harvest unit has been reviewed as one polygon. We validate this decision based on the uniform slope morphology, consistent slope inclination with respect elevation, and limited previous, harvest related mass wasting.

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	For reasons other than slope stability hazard, silviculture is now selection with a target	-No change to approved yarding methods.

	retention of 90 sq. ft. No site preparation will occur	
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THP Unit: # 3
Polygon: 3-1

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>The unit is bound by a ridge top rocked road to the south, a gently inclined ridge top to the west, and incised drainage swales to the north and east.</p> <p>The polygon occupies convergent slopes in the northeast and divergent slopes in the southwest. Slope inclinations vary from gently inclined to over 60%. The slopes exceeding 50% typically define the flanking slopes of watercourses.</p> <p>The unit drains through numerous Class III watercourses and one Class II to South Fork Freshwater Creek (Class I). Three of the unit Class III watercourses drain to the Class II. These channels drain a broadly convergent, moderated to steeply inclined swale that encompasses the southwestern portion of the unit. The channels are moderately well developed. The remaining Class III watercourses drain directly to Freshwater Creek and vary from short segments to 900 to 1000 feet in length. Again, the channels are moderately well developed. The Class I watercourse is flanked by predominantly > 60% inclined hill slopes. The slopes appear smooth with limited incision of the direct draining Class III tributaries. The Class II watercourse is well developed.</p> <p>Areas of elevated SHALSTAB (Value 2) are concentrated within and adjacent the Class III watercourse. Only one of the linear SHALSTAB</p>	<p>The slopes within the unit have experienced clearcut, burning and donkey yarding (a legacy method that dragged the large diameter, felled timber to railroads).</p> <p>Regionally, the catchment area for the corresponding watercourse appears to remain low.</p> <p>The location of MWP modeled moderate and high rating is consistent with CGS mapped debris slide slopes. This suggests a bias in the modeling.</p> <p>The potential for the development of shallow debris slides increases significantly where roads are constructed across steeply inclined slopes and incorporate fills. These activities are not proposed in this plan.</p> <p>Partially harvesting the slopes within the unit is likely to further reduce the potential for mass wasting.</p>

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>delineations was interpreted as a potential unstable area and mitigated (see CGS PHI report for this THP). The remainder of the SHALSTAB value 2 locations were not interpreted as representing unstable areas.</p> <p>One pixel of elevated SHALSTAB value 1 is located in the southwestern most Class III watercourse.</p> <p>The downslope Class I watercourse is buffered with a harvest exclusion zone that ranges from 100 to 150 feet. This area essentially includes the areas of SHALSTAB value 2 adjacent the Class I watercourse.</p> <p>Our review of the SHALSTAB areas revealed steeply inclined swales, evenly distributed, in situ old growth stumps and abundant 2nd growth timber.</p> <p>Debris slide slopes mapped (Figure 3) within the unit correlates well with the steep flanking slopes of the watercourses. It appears that these areas were mapped as potential source areas since few actual debris slides were identified during THP layout and approval.</p> <p>Mass Wasting Potential (MWP) modeled for the unit (Figure 4) is regionally low to moderate. Within the unit high MWP has been modeled adjacent the Class II watercourse. The areas matching high MWP are in response to the inclusion within the model the values for the Figure 3 mapped debris slide slopes.</p> <p>The stand is predominantly redwood and fir. The original harvest was a ground based clearcut yarded either to the downslope watercourse or the ridge top. A second entry occurred sometime in the 1990s. This was a cable yarded thinning of the stand.</p>	

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
As a product of THP field evaluation and PHI, four small unstable areas were identified and flagged with no harvest. These areas have been removed from harvest.	

C) Forestry / Silviculture Plan	D) Operational Design Plan
<p>THP approved silviculture was originally clearcut, but has been amended to selection silviculture with a targeted retention of 90 ft² BA/A due to a management change.</p> <p>The Class I and Class II watercourses in this unit are protected with an expanded harvest exclusion zone. No harvesting will occur within 75 feet of the Class II watercourse, and in areas the harvest exclusion extends to over 100 feet. No harvesting will occur within 100 feet of the Class I watercourse, and in areas the harvest exclusion extends to 150 feet. The Class III watercourses will retain all channel trees, plus on side slopes greater than 50% employ a 50' RMZ that maintains 75 sq. ft evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft evenly distributed in the buffer, Headwall Swales need to maintain at least 50% canopy. 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.</p>	<p>THP approved yarding method for this polygon is cable yarding. No change is proposed for the yarding method.</p> <p>The moderate to steep slopes associated with the polygon combined with the option to rig tail-hold trees or tie-off on the other side of watercourses for additional lift provides sufficient deflection to limit logging-related ground disturbance. In addition, a byproduct of the mid 1990s partial harvest is a densely vegetated understory. This vegetation will aid in retarding significant site disturbance where full suspension does not occur. Based on the deflection, the understory vegetation, and the significant buffers provided to the down slope watercourses, we do not anticipate any significant increase in potential for mass wasting-related discharge as a result of yarding operations.</p> <p>Site preparation has been changed to none.</p>

References:

- CGS, 1999, Geology and Geomorphic Features Related to Landsliding, Freshwater Creek, Humboldt County, California, OFR 99-10, dated 1999..
- 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>
- Golder, 2001, Engineering Geologic Report, Engineering Geologic Evaluation, Freshwater South 23 THP, Humboldt County, CA, unpublished report to the Pacific Lumber Company, dated August 18, 2000.
- 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, 2007, Ortho-photo rectified aerial photographs flown by 3Di West, Eugene Oregon,
- Palco (The Pacific Lumber Company), 2002, The Pacific Lumber Company (PALCO) Prescriptions Based on Watershed Analysis for Freshwater Creek, California, August 15, 2002.
- Palco, 2001, Watershed Analysis,
- PALCO, 1999, 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 PALCO (2006).

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. The sums of the values specific to an area are measured against a set ranking system that extends from very low to extreme. The model's 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.

Table 1. Proposed 2009 Harvest in Freshwater Creek

THP Name	THP Number	Unit Number	Silviculture				CC Equivalent	Hazard	
			CC	ROW	CT	SEL		Low	High*
Little 34	08-048	1				22.4	11.2	22.4	0.0
Little 34	08-048	3				30.3	15.2	27.4	10.8
McCready Ridge	07-132	1	0	0	0	15.6	7.8	15.6	0.0
McCready Ridge	07-132	2	0	0	0	15	7.5	13.1	7.3
Around gills	05-077	4		3.1		36.2	21.2	38.6	2.7
Mid Incline	05-123	1		0.4		26.2	13.5	4.8	83.7
Mid Incline	05-123	2				31.5	15.8	31.5	0.0
Mid Incline	05-123	3				28.7	14.4	24.4	16.4
Fresh 1	04-242	2				36.1	18.1	34.3	6.9
Fresh 1	04-242	3				27.4	13.7	27.1	1.2
Little Fresh	05-176	1				36.3	18.2	30.1	23.8
Little Fresh	05-176	2				20	10.0	12.4	29.2
Little Fresh	05-176	3				5.7	2.9	5.7	0
Little Fresh	05-176	5				39.6	19.8	39.6	0.0
Little Main	05-085	2				29.7	14.9	14.3	59.1
Little Main	05-085	3				25.3	12.7	16	35.7
Little Main	05-085	7				33.3	16.7	19.5	53.0
Whiskey	08-041	1				20.9	10.5	20.6	1.2
Whiskey	08-041	2				23.5	11.8	23.2	1.2
Whiskey	08-041	3				35.4	17.7	29.6	22.4
Whiskey	08-041	4				32	16.0	32	0.0
Whiskey	08-041	5				11.3	5.7	9.5	6.9
						Total	294.7		

*The acres represented here have been converted to High Hazard Acres by multiplying by 3.8404.

Highlight indicates a THP and Specific Unit to be enrolled prior to establishing an enforceable Zero Discharge Monitoring Plan (Tier I). Weighted Acreage Totals are listed below to demonstrate compliance with the Staff Landslide Model limit of 144 Harvest Acres in Freshwater Creek. Other THP Units will be enrolled after approval of the aforementioned Monitoring Plan

No Highlight Indicates a THP and Specific Unit to be enrolled after establishment of an enforceable Zero Discharge Monitoring Plan (Tier II).



Indicates tier 1 for ROW and tier 2 for remainder of the unit

Total Clear Cut Equivalent Acres enrolled or submitted for enrollment	145.1
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Table 2. Summary of THPs to enrolled prior to establishment of Zero Discharge Monitoring Plan for Freshwater Creek

THP Number	Unit Number	Harvest Acres	Hazard	
			Low	High*
08-048	1	22.4	22.4	0.0
05-077	4	3.1	3.1	0.0
05-176	5	39.6	39.6	0.0
08-041	1	20.9	20.6	1.2
08-041	2	23.5	23.2	1.2
08-041	4	32.0	32	0.0
Totals		141.5	143.3	

Table 3. Summary of THPs by Yarding System and Site Preparation for Freshwater Creek

THP Name	THP Number	Unit Number	Yarding System			Site Preparation	
			Ground Based	Yarder	Helicopter	Mechanical	Broadcast
Little 34	08-048	1	3.9	18.5			
Little 34	08-048	3	6.9	23.4			
McCready Ridge	07-132	1	0	15.6			
McCready Ridge	07-132	2	10.1	4.9			
Around gills	05-077	4	17.7	20.5			
Mid Incline	05-123	1	0	26.2			
Mid Incline	05-123	2	11.5	23			
Mid Incline	05-123	3	0	28.7			
Fresh 1	04-242	2	10.9	25.2			
Fresh 1	04-242	3	0	27.4			
Little Fresh	05-176	1	0	36.3			
Little Fresh	05-176	2	7.3	12.7			
Little Fresh	05-176	3	0	5.7			
Little Fresh	05-176	5	0	39.6			
Little Main	05-085	2	0	29.7			
Little Main	05-085	3	0	25.3			
Little Main	05-085	7	0	33.3			
Whiskey	08-041	1	20.9	0			
Whiskey	08-041	2	11.7	11.8			
Whiskey	08-041	3	9.3	26.1			
Whiskey	08-041	4	19	13			
Whiskey	08-041	5	0	11.3			

Humboldt Redwood Co. LLC

Erosion Control Plan (ECP) for
the “Little Main” THP

1-05-085HUM

Updated ECP – for purpose of identifying **Tier 2** erosion control sites specific to units 2, 3 and 7 (2009 enrollment requests); Unit 2 has site 900 (Road X94.79), and units 3 & 7 have no erosion control sites located on the spur road system leading specifically to These unit.

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 **20080226**

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. R1-2006-0041 (Freshwater Creek) 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 Co. LLC P.O. Box 712 Scotia, CA 95565 (707) 764-2330.

This ECP is submitted for: THP Name: **Little Main**
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. R1-2006-0041 (Freshwater Creek).

"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. R1-2006-0041 (Freshwater Creek)

Highest priority is assigned to the largest sediment discharge sources that discharge to waters that support domestic water supplies or fish. HRC'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 HRC 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 reconstruction 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 Locations/ECP Site Locator Map

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.

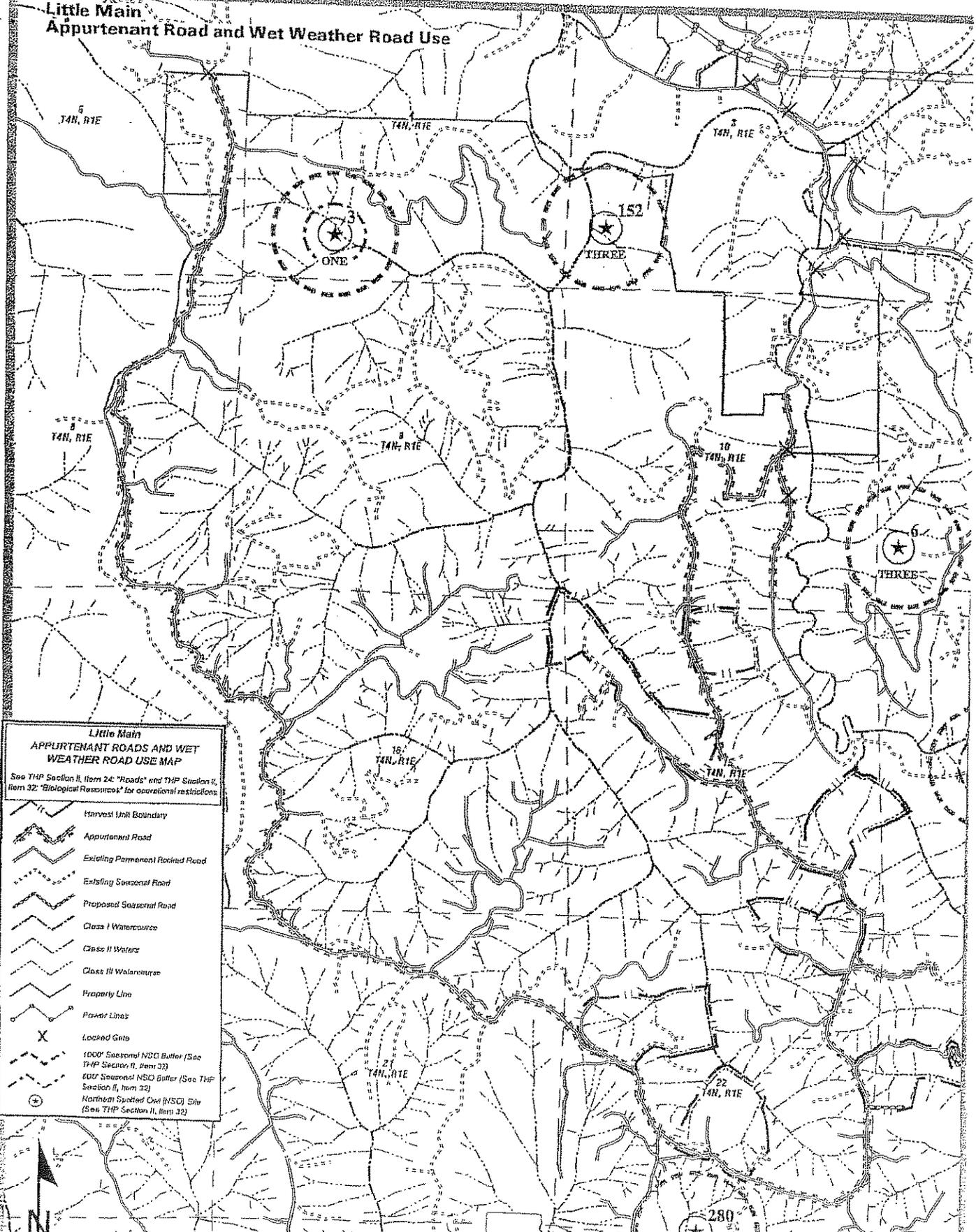
If helicopter operations are proposed for this project, please find attached a Columbia Helicopters, Inc. (CHI) Fuel Spill Prevention and Cleanup Plan For Columbia Helicopters Field Operations.

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. PALCO 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

Little Main Appurtenant Road and Wet Weather Road Use



**Little Main
APPURTENANT ROADS AND WET
WEATHER ROAD USE MAP**

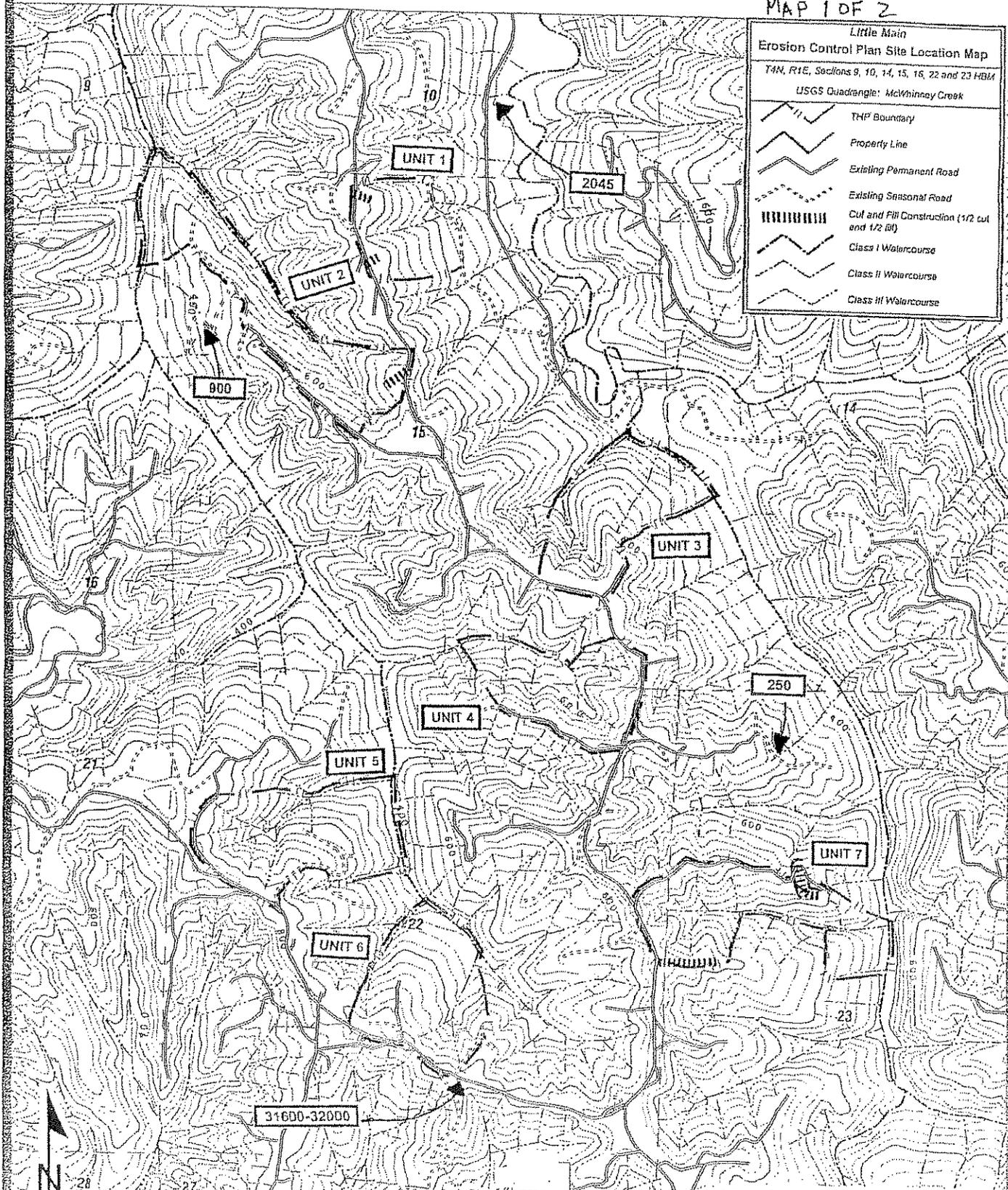
See THP Section II, Item 24: "Roads" and THP Section II, Item 32: "Biological Resources" for operational restrictions.

- Harvest Unit Boundary
- Appurtenant Road
- Existing Permanent Roaded Road
- Existing Seasonal Road
- Proposed Seasonal Road
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse
- Property Line
- Power Lines
- Locked Gate
- 100' Seasonal NSO Buffer (See THP Section II, Item 32)
- 400' Seasonal NSO Buffer (See THP Section II, Item 32)
- Northern Suckled Owl (NSO) Site (See THP Section II, Item 32)



MAP 1 OF 2

Little Main	
Erosion Control Plan Site Location Map	
T4N, R1E, Sections 9, 10, 14, 15, 16, 22 and 23 HBM	
USGS Quadrangle: McWhinney Creek	
	THP Boundary
	Property Line
	Existing Permanent Road
	Existing Seasonal Road
	Cut and Fill Construction (1/2 cut and 1/2 fill)
	Class I Watercourse
	Class II Watercourse
	Class III Watercourse

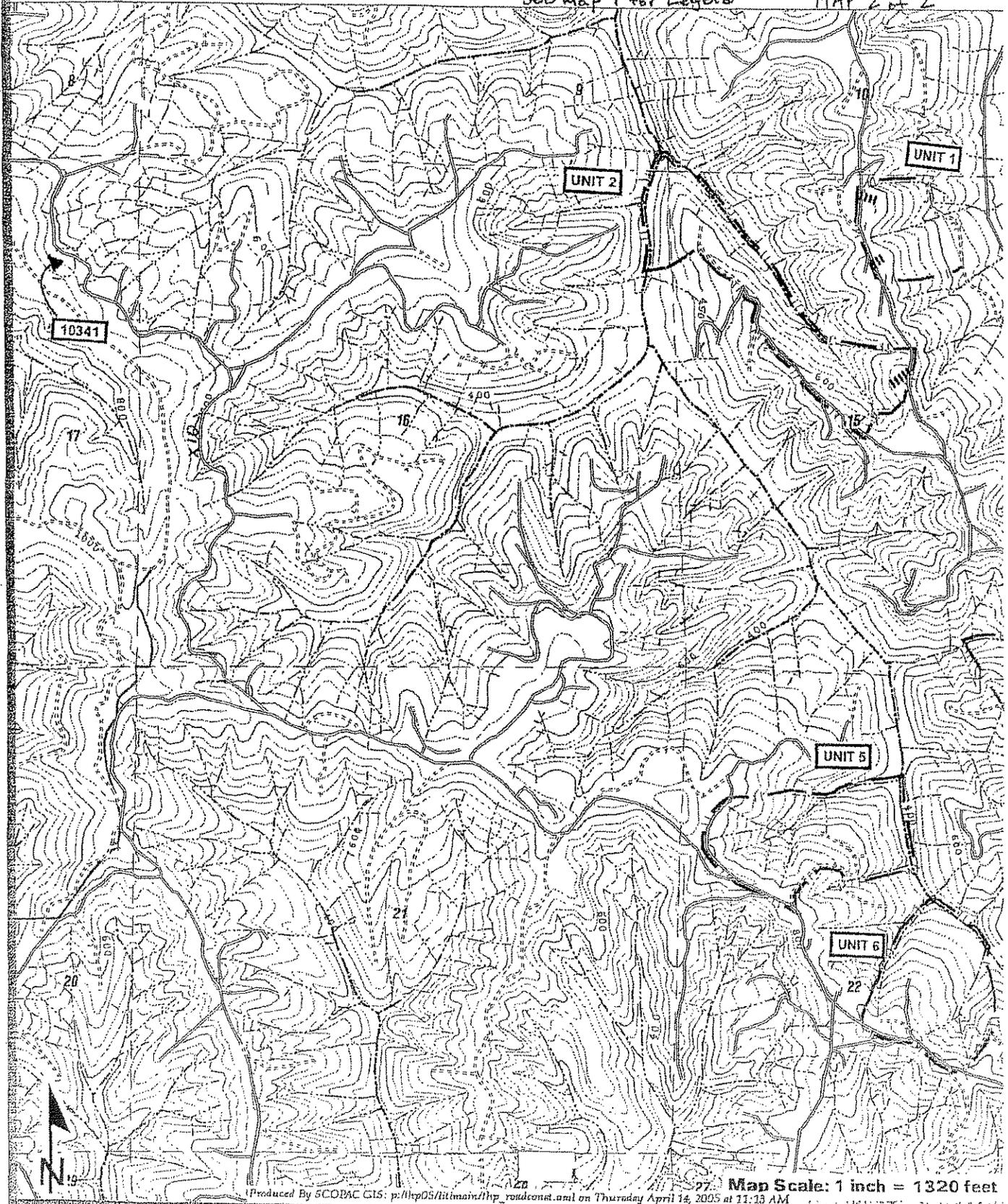


Little Main

EROSION CONTROL PLAN SITE LOCATION MAP

See map 1 for Legend

MAP 2 of 2



Erosion Control Plan For General Waste Discharge Requirements R1-2004-0030

Site NO.	Site Type	Estimate of Potential Erosion Volume (in cubic yards)	Potential Sediment Delivery Volume (in cubic yards)	Priority for Treatment (based on risk of failure and beneficial uses)	Implementation Schedule (season/year)	Site Description	Treatment
Road X10 Site 10341	Permanent crossing	384	25	Low <i>Completed</i>	Prior to or consistent with the duration of the THP	Water is flowing subsurface below 18" CMP.	Install 24" pipe to natural gradient.
Road X83 Site 2045	Permanent crossing	35	10	Low <i>Completed</i>	Prior to or consistent with the duration of the THP	Current pipe is undersized and crushed at outlet. A deep hole at the outlet has been created by current water flow.	Replace current 18" CMP with 24" pipe with an energy dissipater as necessary. Store spoils 350' to right of site at OBR. Install critical dip on right hinge.
Road 94.79 Site 900	Failing watercourse crossing	32	20	High <i>Completed</i>	Prior to October 15 th of the first year of operations	Flowing water creating incised channel across road. Outboard edge of road is beginning to fail.	Remove crossing, lay slopes back 2:1. Store spoils on road on both sides of crossing.
Road X95.91 Site 250	Critical dip / Culvert maintenance	67	5	Low <i>Completed</i>	Prior to or consistent with the duration of the THP	Current water flow is creating a hole on the outlet side.	Install critical dip and 20' downspout to maintain culvert.
Road U Site 31600 - 32000	Surface Drainage	10	5	Low <i>Completed</i>	Prior to or consistent with the duration of the THP	Water is currently directed toward road U59 creating saturated soil conditions.	Regrade and outslope road to the south away from road U59 to prevent surface runoff onto the dirt seasonal road.

* All estimates of potential sediment are based on general field observations and not generated by calculations.



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, visqueen, 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.
- Extant 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-O-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 hour 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 265.55 (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 trichloroethene 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.

Note: 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

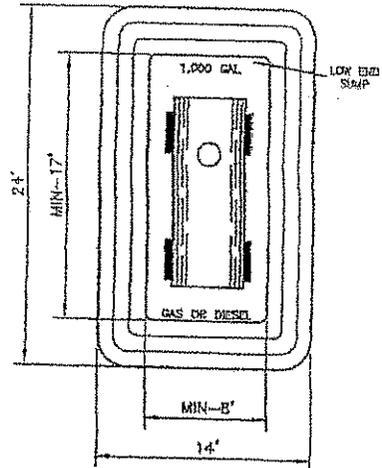
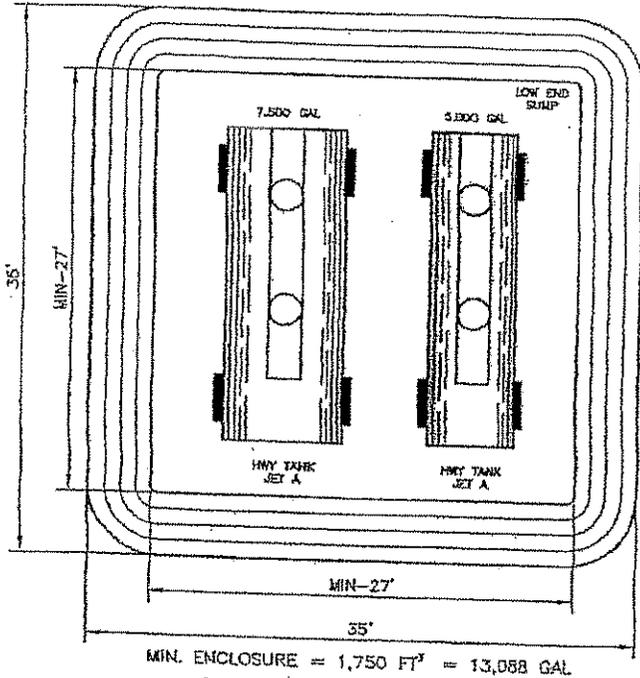
*** POST IN SERVICE VAN ***

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

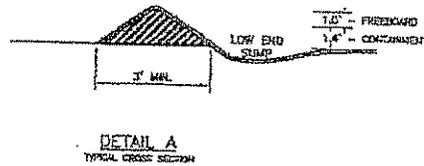
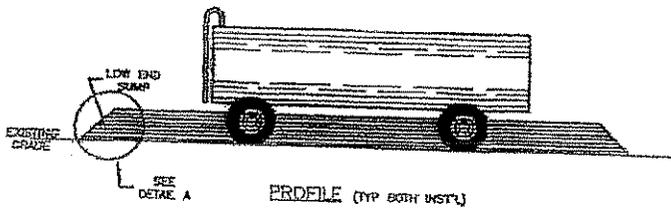
1. Project Manager _____ or
2. Crew Chief _____ or
3. Logging Trainer _____
4. Aurora Office 503-678-1222
5. U.S. Coast Guard 1-800-242-8802
(National Response Center)
6. Oregon DEQ 1-800-452-0311
Washington DEQ 1-800-258-5990
California EPA 916-262-1821 or in-state 1-800-645-7911
Idaho DEQ 208-373-0502 or in-state 1-800-632-8000
Alaska DEQ (Juneau) 907-485-5340 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 = 326 FT³ = 2,441 GAL



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 VOR 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: 10/22/04
Filename: H:\VIA\CP\SHRT_PROD\015\240033_mixed\app\1\NFU_G001481.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	

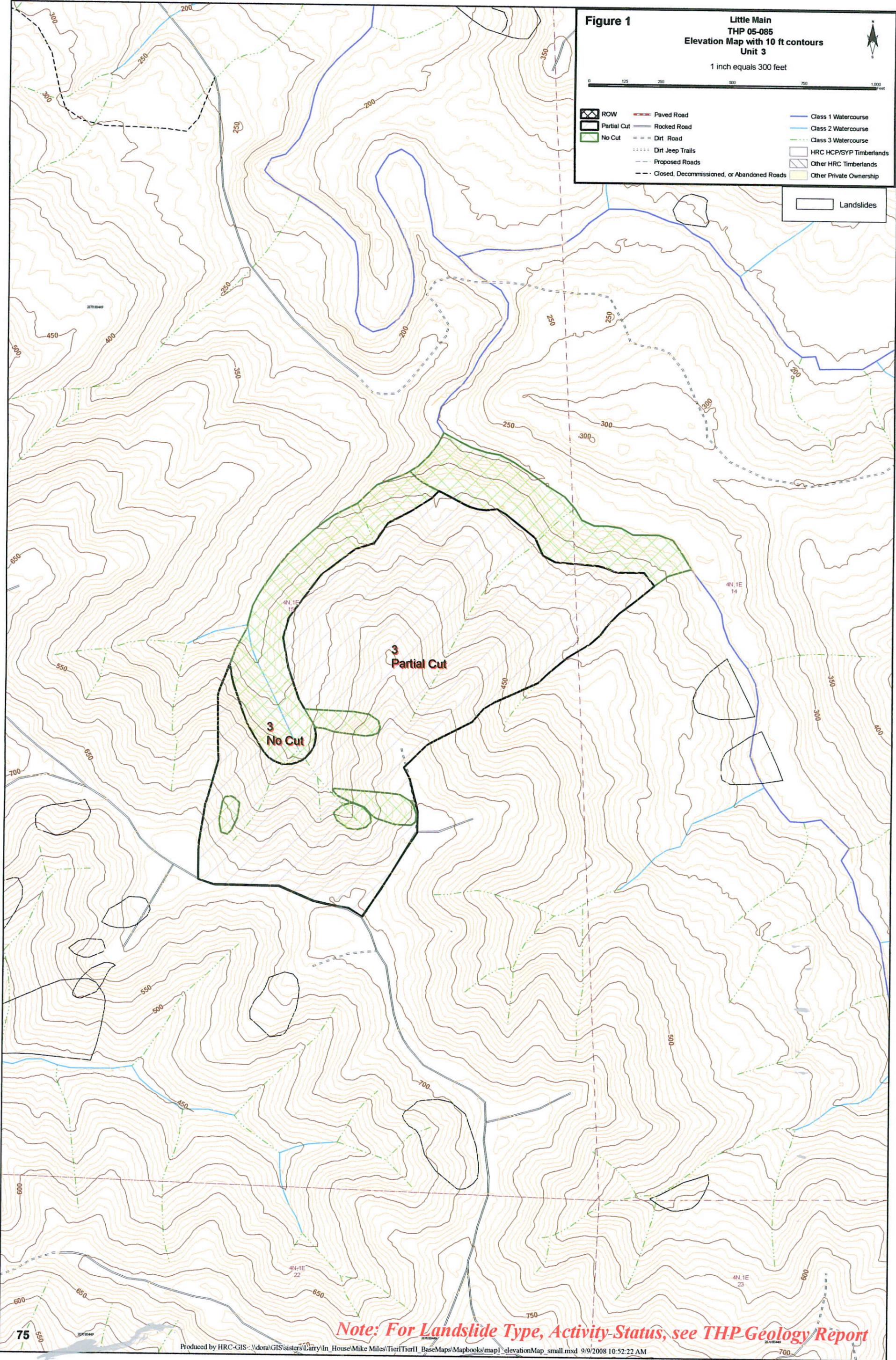
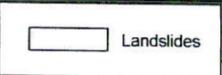
Figure 1

Little Main
THP 05-085
Elevation Map with 10 ft contours
Unit 3

1 inch equals 300 feet



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



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

Figure 2

Little Main
THP 05-085
Shalstab 10 mrs grid / Slope Class Map
Unit 3

1 inch equals 500 feet

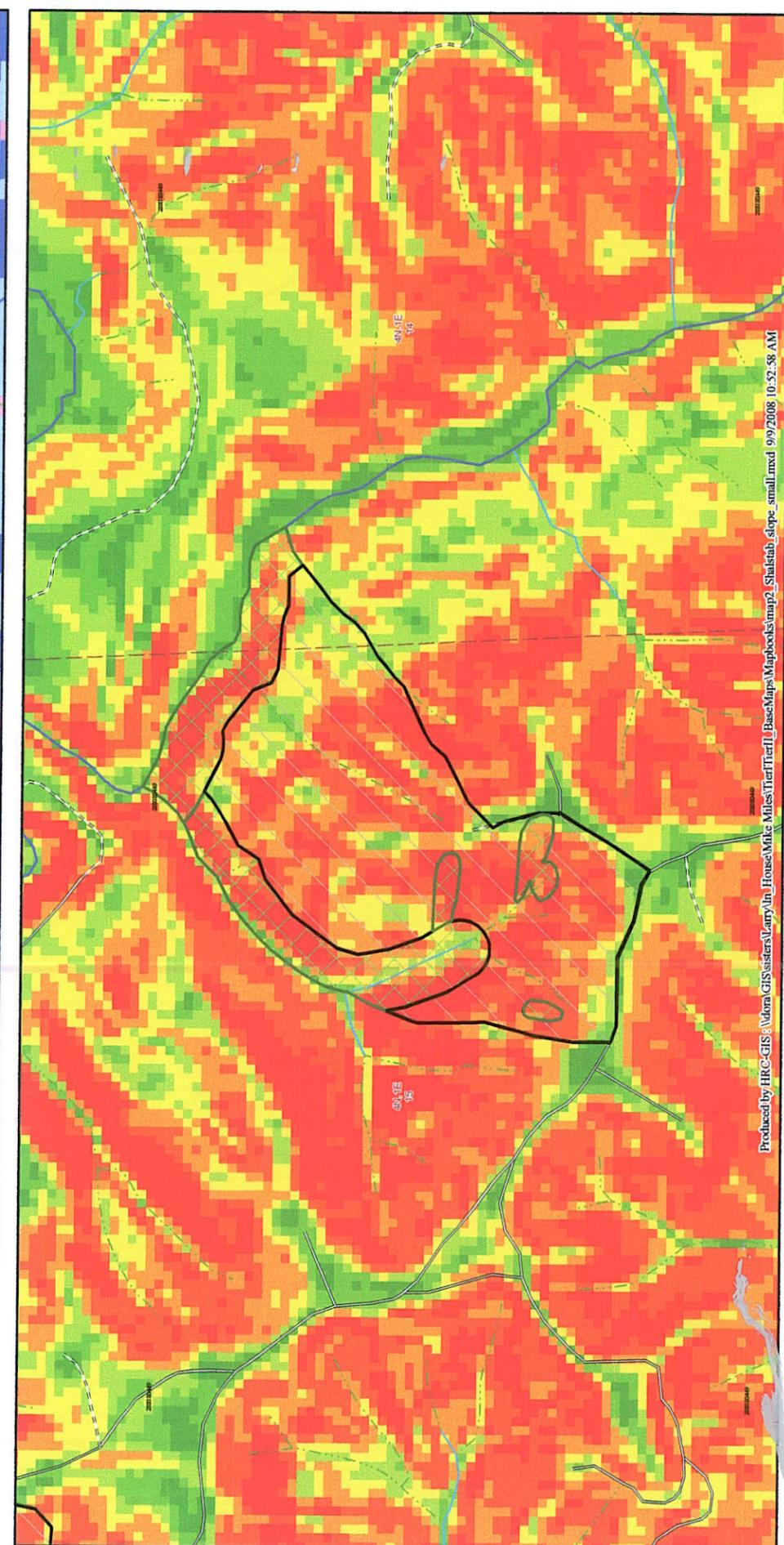
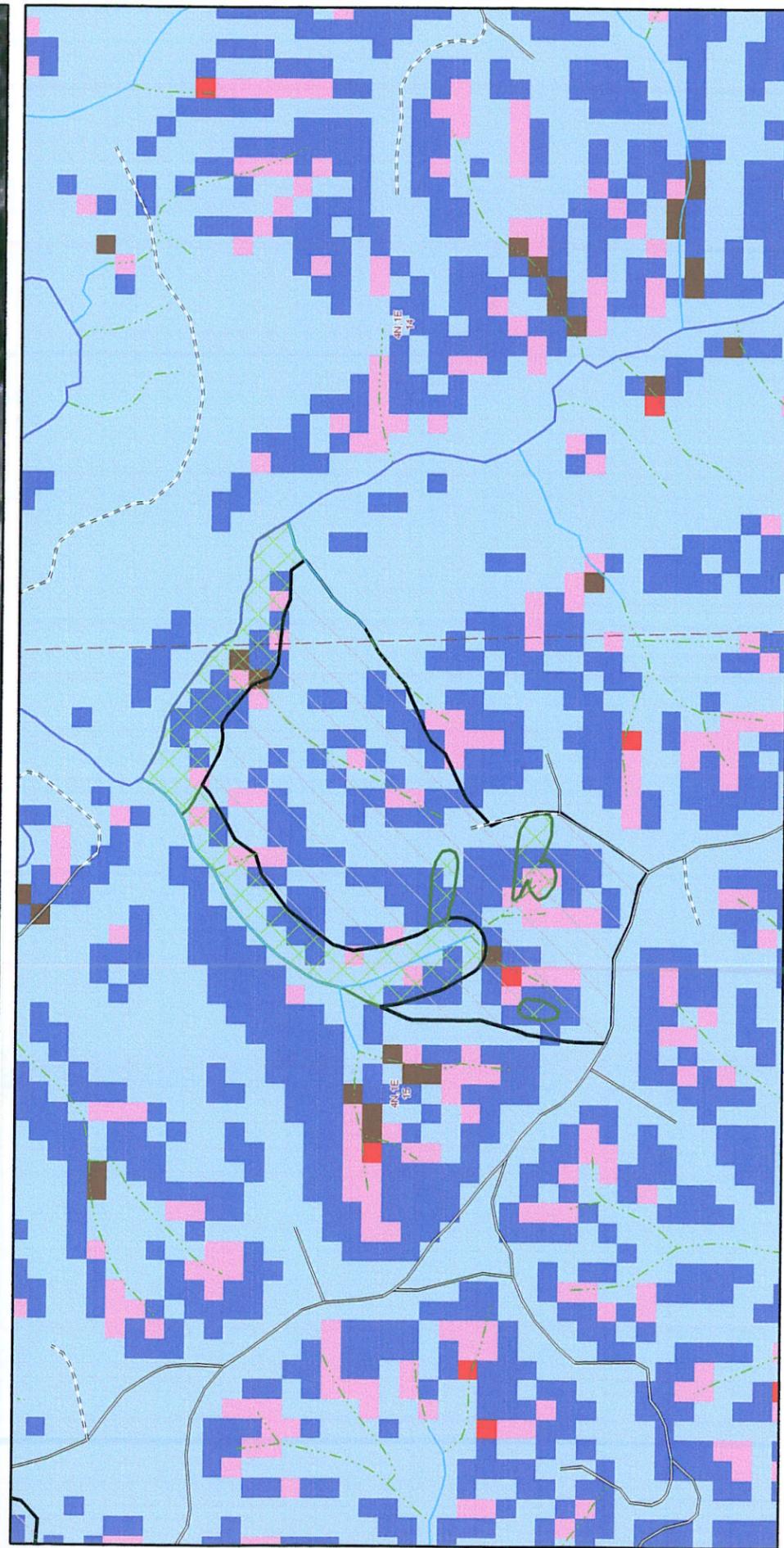
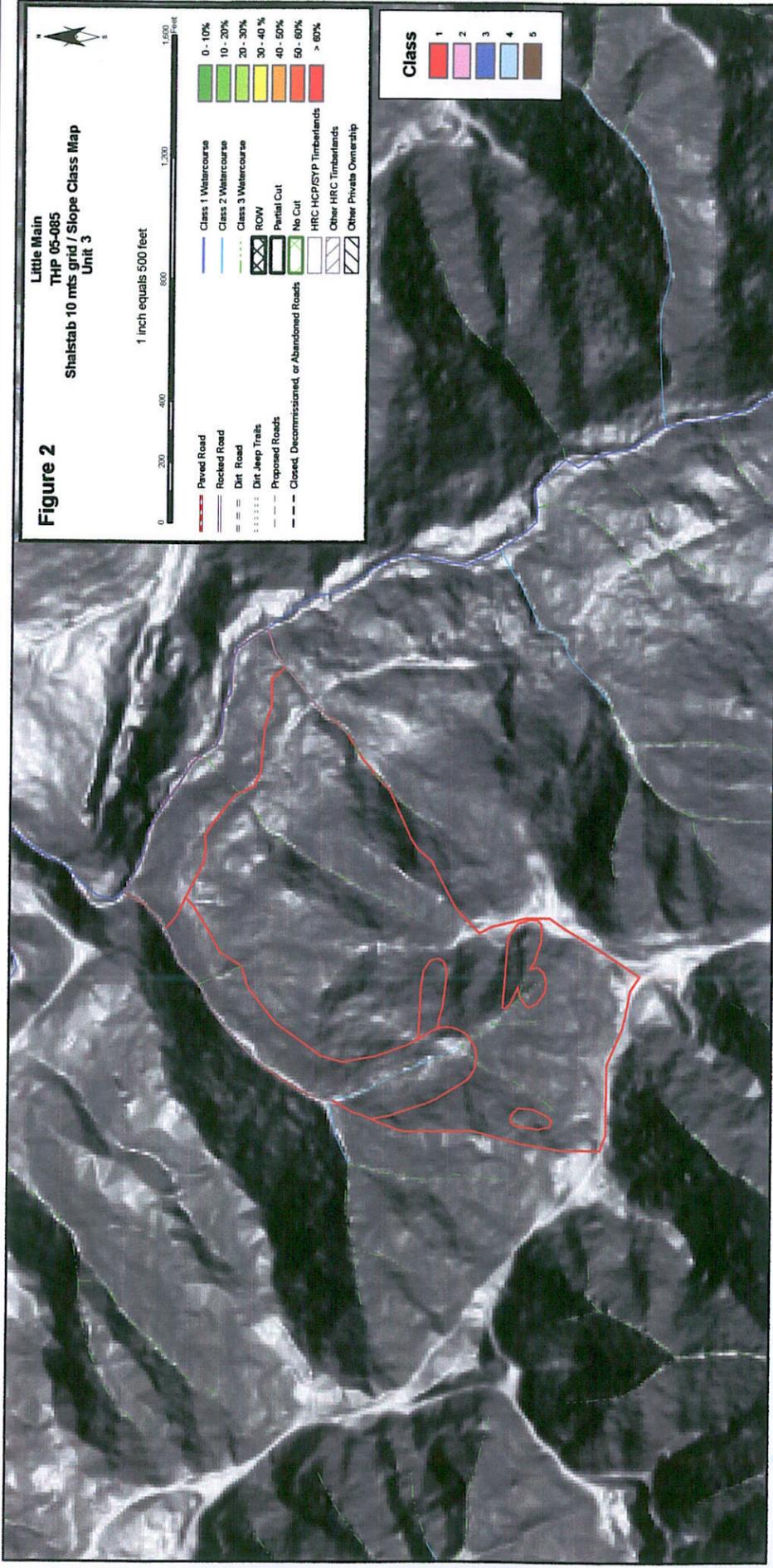
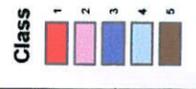
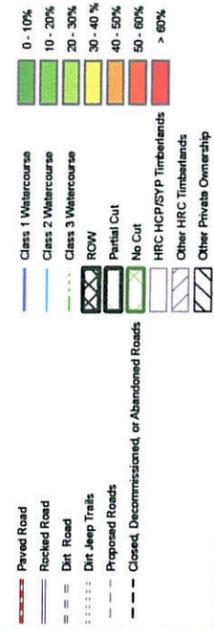


Figure 3

Little Main
THP 05-085
CGS Map Unit 3

1 inch equals 300 feet



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

- Legend**
- CGS Freshwater structure**
- FEATURE**
- anticline, approx. loc.
 - fault, approx. loc.
 - fault, concealed
 - thrust fault, approx. loc.
 - thrust fault, concealed
 - thrust fault, queried
 - lineament
- CGS Freshwater lines**
- TYPE**
- +HHH ig
 - arrow
- CGS Freshwater LS**
- INIT_TYPE, ACTIVITY**
- df, h
 - ds, d
 - ds, h
 - ef, d
 - ef, h
 - rs, d
 - rs, h
 - dss
- CGS Freshwater symbols**
- <all other values>
- ACTIVITY**
- ah
 - d
- CGS Freshwater geology**
- UNIT**
- KJfm
 - KJfs
 - Q
 - Qfa?
 - Qrt
 - Twl
 - Twf?
 - Twu
 - Ty
 - Ty?
 - u
- CGS Freshwater contacts**
- CONTACT**
- approximately located
 - certain location
 - queried location

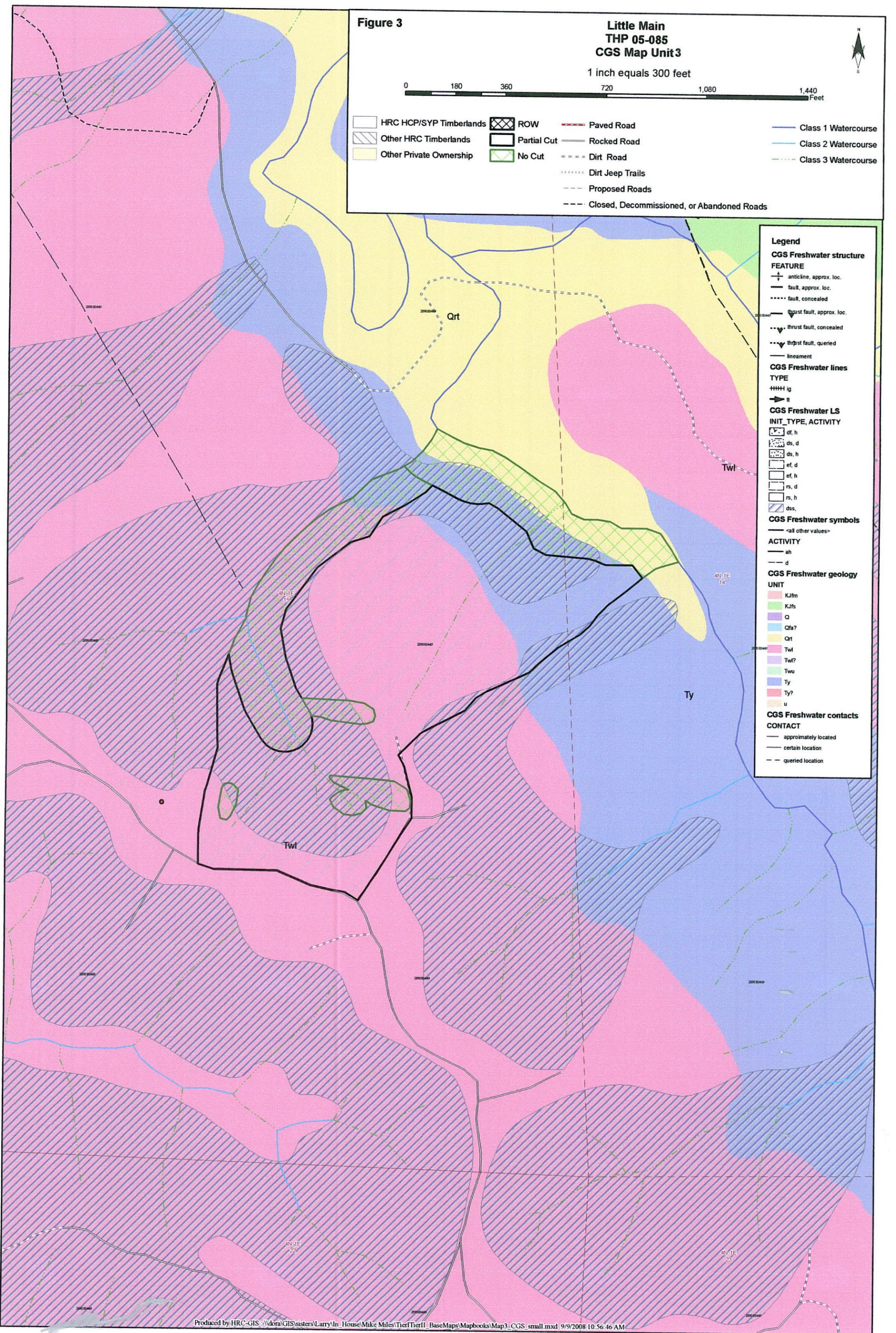


Figure 4

Little Main
THP 05-085
Mass Wasting Potential
Unit 3

1 inch equals 300 feet



- | | | | |
|-------------------------|---------------------------|--|---|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road | Potential
Very Low
Low
Moderate
High
Very High
Extreme |
| 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 | | | |

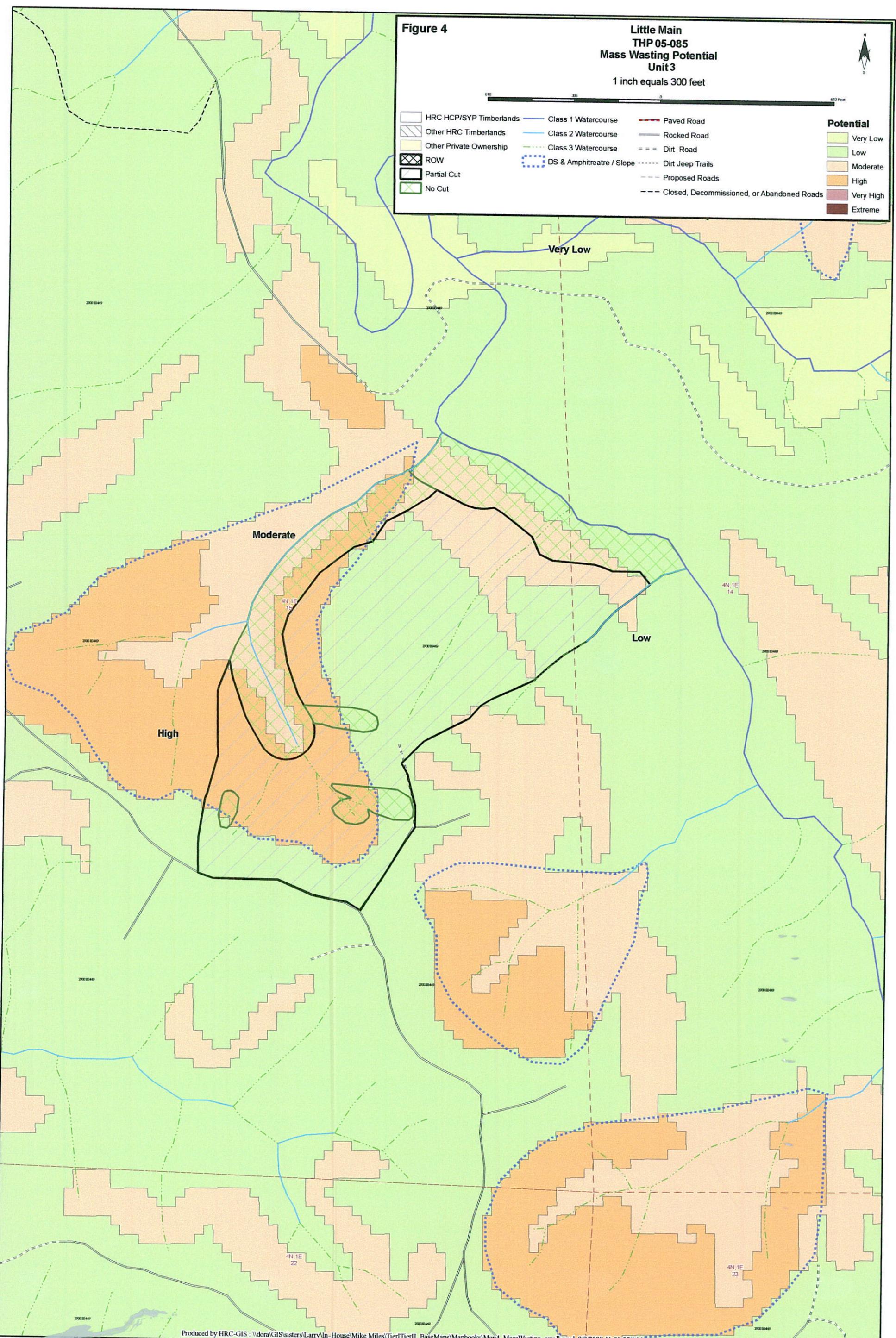


Figure 5

Little Main
THP 05-085
Aerial Photo Map - Unit 3

1 inch equals 300 feet

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

Creek

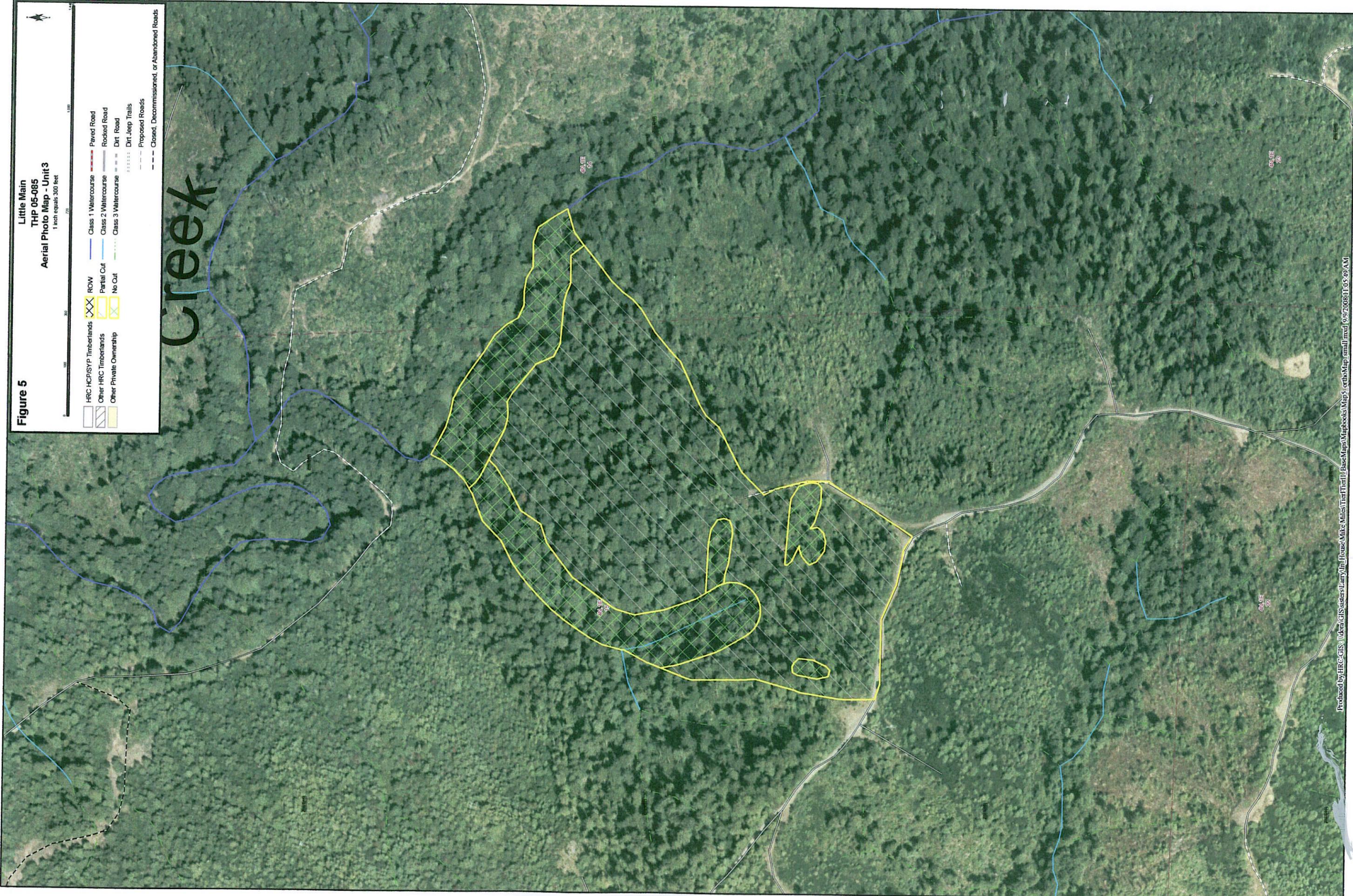
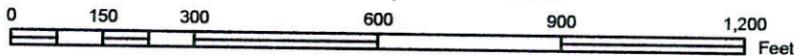


Figure 6

THP 05-085 Watershed Analysis Deep-Seated Landslide Inventory Unit 3



1 inch equals 300 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 | | Proposed Roads |
| | Partial Cut | | Closed, Decommissioned, or Abandoned Roads | | |
| | No Cut | | | | |

- Crown of Deep-Seated Landslides
- Hazard for Reactivation or Acceleration of Movement**
REACT_HAZARD
- | | |
|--|-------------------------------------|
| | N/A (landslides in grassland areas) |
| | Very Low |
| | Low |
| | Low to Moderate |
| | Moderate |
| | High |

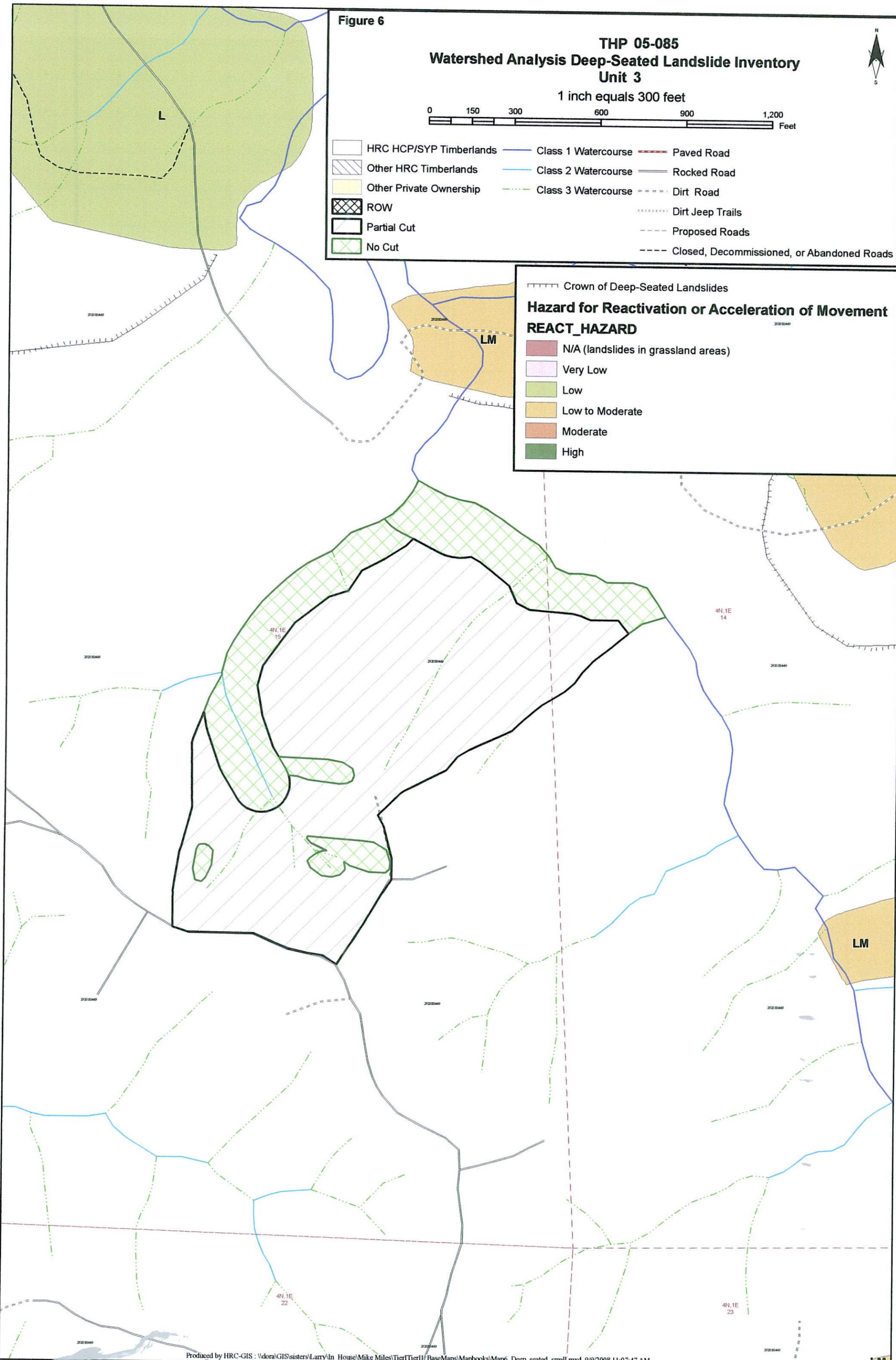


Figure 7

Little Main THP 05-085 Road Map

1 inch equals 1,000 feet



- | | | | |
|-------------------------|--|----------------|----------------|
| 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 | | | |

