



MEMORANDUM

To: Laura Vaugeois – Forest Practices
Karl Wegmann - Geology

From: Bill Lingley – Geology

Date: August 18, 2003

Subject: East/West Dickey Watershed Analysis -- Review

Summary

LaManna and others (1996) present a thorough mass wasting and sedimentation analysis for the East/West Dickey watersheds, notwithstanding the fact that these areas are unusually stable. They identified most landslides, and their report should be sent out for final external review.

Introduction

This memorandum has been prepared as part of the Landslide Hazard Zonation project (Vaugeois and others, 2002) and follows the protocol for Priority #1 Watersheds review developed by you (Wegmann and Vaugeois, 2003). These reviews are spot checks covering watershed analyses that are nearly complete and address only State and fee lands within these watersheds.

The draft East/West Dickey Watershed Analysis (LaManna and others, 1998) has been completed, except for the Prescriptions and Summary sections. LaManna and others combined the mass wasting and surface erosion assessments into a Sedimentation Module. No significant federal ownership is present in the East/West Dickey watersheds, so my review covers the entire area.

Methods

The Sedimentation module was compared with the northern-most part of a landslide compilation by Gerstel (2001) and with geologic mapping by Tabor and Cady (1978), Snavely and others (1993), Lingley (1995), Gerstel and Lingley (2000), and Schasse (2003). A few additional rule-identified unstable slopes including small inner gorges, convergent headwalls, and bedrock hollows were identified using topographic mapping (U.S. Geological Survey, 1984a, b) and a slope/convergence map (SLPSTAB) of the area produced by Laura Vaugeois. Following this work, I reviewed DNR aerial photographic set OL-97 covering about 75% of the watershed. I did not check flatter areas directly south and west of Dickey Lake and similar topography surrounding the junction of the East Fork of the Dickey River and Thunder Creek.

Key Questions

1. *Are the majority of landslides in the basin adequately identified?*

Yes.

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LaManna and others identified only eight debris slides and four debris flows in the entire area using five photo sets acquired between 1953 and 1996. All but three of these landslides are management related. They also identified 57 surface erosion events (i.e., yarding scars, sidecast failures). In addition, I identified seven questionable to probable failures, five of which appear to post-date LaManna and others. However, the watershed as a whole is remarkably stable and LaManna and others have done a good job of depicting the few landslides in the WAU.

2. *Do the Mass Wasting Map Units reflect reasonable assumptions based upon your review of the geology and landslides in the basin?*

Yes.

LaManna and others use the classification scheme of Sasich (1994) to subdivide the basin. For the purposes of this analysis, that scheme is acceptable.

3. *Are the hazard ratings assigned to the Mass Wasting Map Units reinforced by the distribution of landslides as shown in the Landslide Inventory for the WAU?*

Yes.

The entire area is reasonably rated as very low hazard. However, statistically valid correlation of mass wasting events and landforms cannot be achieved owing to the low frequency and number of such events. I agree with the authors' conclusion that, "Mass wasting events triggered by forest practices have been very rare, and the volumes of sediment from these events that have reached the channel network are extremely small compared with the much higher natural background inputs."

4. *Are there landforms that seem to have a large number of landslides, but no associated Mass Wasting Map Unit?*

No

I note, however, that several anomalous areas suggestive of relict earth flows or slumps are present on a 1079-foot knob centered in Section 3, T29N, R14W. One of these, landslide "G" should be included in the Landslide Hazard Inventory. Apparently, unstable strata contribute to several debris flows mapped by LaManna and others (1998) and to my landslides D, E, and F centered near a knob in Sections 1 and 2, T30N, R14W. The same situation is present on the west side of Tyee Hill (Sections 22, 27, 28, 32, and 33, T30N, R13W) where LaManna mapped 10 landslides or erosional events and I mapped landslides A and B.

5. *Does the text describing the Mass Wasting Map Units do an adequate job in presenting the landform / geology information that a forester using this map would need to identify the features on the ground?*

Yes.

6. *Are there additions to the mass wasting assessment products?*

Yes.

A map showing the seven questionable and probable unstable features I identified and a Mass Wasting Inventory Data spreadsheet (Form A-1) are attached.

7. *Should Forest Practices Division send this Mass Wasting Assessment out for final external review?*

Yes

References

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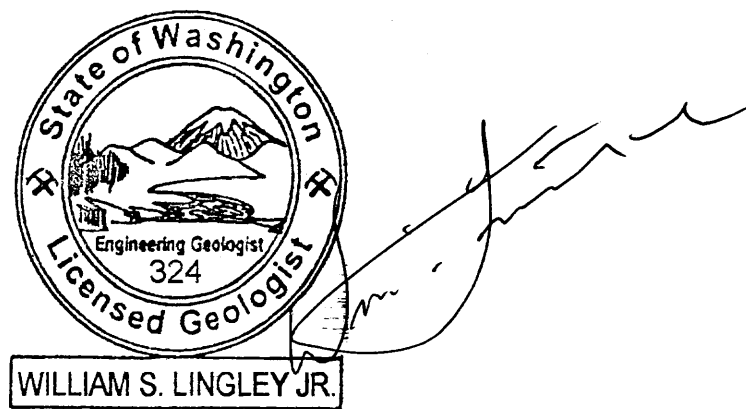
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Respectfully submitted,



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Cc Dave Norman – Geology
 Nancy Sturhan – Forest Practices