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KITSAP COUNTY DEPT OF
COMMUNITY DEVELOPMENT

16 November 2003

Jim Bolger
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614 Division
Port Orchard, WA 98366

Re: Geologic Hazard Areas

Dear Jim:

My geology major happened long ago and I'll miss the latter part of your 19 November meeting. So I'll comment here about geologic hazard areas.

The King County treatment (their BAS Chapter 5) looks good though it's virtually vacant of numbers and its lit cites are ancient and seem to lack references to some good things done recently by DOE, DNR and others, pertaining specifically to Puget Sound.

King County refers (page 5-13) to a (California) tree that transpired over 100 gallons in a day. That doesn't happen in winter when we want to get rid of stormwater. Trees, shrubs and grass go so quiescent here that evapotranspiration declines as much as 99 percent. Too, (irrigated) grass typically does better than forests, because of the former's higher primary productivity.

I knew Walt Megahan, mentioned on p. 5-13 relative to vegetation and slope stability. His Idaho Batholith work involved highly erosive, logging-ravaged soils immensely susceptible to surface erosion, vastly different from our compressed tills and high water tables. I don't think he ever met a tree perched on a saturated soil above hardpan, all at the edge of a bluff.

In fact I believe that doctrine and dogma of resource conservation around Puget Sound have regularly ignored two key factors: our tight soils and our climatic propensity for vegetation; we can't keep the stuff from growing. Which relates to erosion hazards. We haven't found any on the inland Island, aside from construction sites.

The King County coverage of rill erosion is certainly apt, but our time for that was long ago. Indeed the erosion concern may be beating a dead horse. I suspect there were three periods in Bainbridge history when erosion was prevalent. One was the 1870s and 80s, when logging and burning reached almost everywhere. Another was the era of stump ranching when everybody had livestock and overgrazed pastures were the norm. The third was the time of strawberry farms when much of the island was kept clear for berry culture, with long rows of bare soil exposed to winter rains. With the berry farms invaded by woods, Steve Morse, the Island's staff forester, has estimated that half the island is now wooded. Except for the extensive berry farming, Kitsap's history seems similar. In any case, the most effective

defense against rill (surface) erosion is grass, not trees nor shrubs.

If all this is correct, was erosion really a problem on the Island when the '92-'98 regs were written? If yes, did this reg make a difference? If no, do we need a stronger reg? Or is erosion a trivial matter here relative to slumps and slides and quakes? If trivial, why add another mandate to the load?

Concerning landslides, I have a little trouble with a statement that 'literature indicates buffers should be established...' (p. 5-14). What literature? What kinds of landslide areas? With what estimation of risk? How wide the buffers? King County apparently uses 50 feet--one size evidently fits all situations! Similarly I smile about "Regulatory restraints may help save lives during the next eruption on Mount Rainier" (p. 5-14). Sure, like the 1980 closures of St. Helens. The fact is that many people are prepared to accept risk even given full information about probabilities of death. As do soldiers. And drivers.

This leads into protection philosophy, I guess. Back to landslides, are you wanting to flag every slope that **might** someday move, those that seem **certain** to move within some time frame, or something in between? I would expect to find inconsistency about this in the present code.

Use of the Coastal Zone Atlas, and probably any other predictive mechanism, involves inevitable errors of timing, location, and scope. I'm reminded, for instance, of the Carlyon Beach slump west of Olympia that displaced scores of houses and wasn't anticipated by deduction, designation, data, detection, nor, of course, decree.

Which suggests also a legalistic perspective. Why set the County up for landowners' reactions to error? Why not warn all owners on or close to steep slopes, perhaps with deed attachments? Or, rather, do nothing and pass the baton back to DOE if they want to bear a litigation risk? Or leave it to landowners to look around their properties, seek advice and local knowledge, and draw their own conclusions?

It is certainly obvious why slope-steepness and even surface-soil indicators are poor predictors of slope failures. Assuming bulkhead-type protection at the slope's toe, so that tidewater nibbling isn't a factor, the great cause of slides on Puget Sound is saturation at the top. There are numerous geologists' statements that precipitation is the premier culprit in our episodic spasms of slope failure. I suggest conferring with Hugh Shipman at DOE, who has written, "...the presence of impermeable barriers to downward movement of groundwater can lead to zones which are particularly susceptible to landsliding."

It appears to me that any landslide-warning system (which is what you are about, I judge), that omits the likelihood of accumulated stormwater behind the slope, on one of our tight tills, is destined for deficiency. Whether this 'pooling' can be predicted from surficial geomorphology I don't know.

Bainbridge is considering including in 'landslide hazard areas' any area with a slope of 40 percent or greater. The County's corresponding figure is apparently 30 percent, coupled with an

'unstable' call. Yet cut slopes along roadways are often 100 percent and regularly over 65 percent. I sense overkill here, with no validated relationship to real dangers. Again, where is the data?

The Kitsap CAO calls for 'native' vegetation. I don't think you have any data that finds native veg superior to functionally equivalent non-natives. In fact, yesterday I saw an enthusiastic Island group planting dogwoods along a creek, partly because they are native, even though they are foreign to the site and, more critically, susceptible to a disease that imperils native dogwoods generally. I suggest considering the degree to which 'nativeness' narrows your options, both aesthetically and structurally.

My attitude on earthquakes and tsunamis is to throw up my hands. I've heard the figures mentioned at your last meeting--2 meters of displacement along the Seattle fault followed by a 20-or 30-foot water wave. A few-second 6-foot vertical or tilted displacement will surely end all our concerns before the water arrives, at least if we're indoors or under trees. Assuming we're on the mobile side of the slip plane.

That's enough. Thanks for your hospitality.



Don Flora