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IN THE SUPREME COURT OF THE STATE OF WASHINGTON

SUPREME COURT NO. 90759-5

JEROME C. HURLEY and BESSIE M. HURLEY, *et al*,

Petitioners,

v.

CAMPBELL MENASHA, LLC; *et al.*,

Respondents,

AMICUS BRIEF OF GEOLOGISTS AND GEOMORPHOLOGISTS
DR. DAVID MONTGOMERY, DR. TIM ABBE, DR. SCOTT R.
LINNEMAN, DR. JEFFREY D. PARSONS, DR. SCOTT F. BURNS
DAN MCSHANE, JEREMY T. BUNN, ANDY ROSS, JOHN N.
THOMPSON, AND KIM NINNEMANN

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 ORIGINAL

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I. IDENTITY AND INTEREST OF THE AMICI

The *amici* are Dr. David Montgomery, Dr. Tim Abbe, Dr. Scott R. Linneman, Dr. Jeffrey D. Parsons, Dr. Scott F. Burns, Dan McShane, Jeremy T. Bunn, Andy Ross, John N. Thompson, and Kim Ninnemann, all geologists and/or geomorphologists with advanced degrees who have studied the interaction between forest practices and landslides. *See* Motion to File Amicus Brief. The *amici* have no pecuniary or other direct interest in the outcome of this case. Rather, as scientists, their interest is in assuring that the Court's review of this matter is based on scientifically correct fundamentals, not scientific misimpressions or misunderstandings.

II. LOGGING ON STEEP SLOPES, EVEN WHEN DONE WITH REASONABLE CARE, RESULTS IN A HIGHER RISK AND INCIDENCE OF LANDSLIDES

The Court of Appeals' decision states that the "parties dispute whether logging creates a risk of landslides in general." Decision at 7. There is no evidence in the record to support that statement. The only evidence in the record about logging's effect on landslide risks is that logging significantly increases the risk of landslides. As discussed below, the court's statement is contrary to peer-reviewed, scientific studies (many referenced in the record).

The special problem created by logging on steep slopes is that it is practically impossible, even if reasonable care is used, to identify precisely all areas most vulnerable to sliding if logged. The problem arises because identifying the most dangerous locations requires extensive, sub-surface investigations. It is not practical to do so across hundreds or thousands of forested acres. Sub-surface investigations are routine when much smaller areas are at issue, for instance, to assure the stability of a single building, or even a complex of buildings, to be built in one confined area on a slope. But given the vast expanse of sloped lands logged each year in this state, it is not practical to undertake that level of analysis before logging.

Instead, out of necessity, a more superficial assessment is made. But because of the limitations of that more superficial assessment, it is inevitable that some of the areas that are clearcut will be areas that create additional risks of sliding. We know this both because of textbook-level geological science and because of the numerous studies that have documented this in the field.

Screening tools (some mandated by the State) to identify potentially unstable slopes based on surface information alone have limited capacity to identify high-risk areas due to conditions hidden beneath the surface. Studies confirm that using those surface-oriented

screening tools and complying with state regulations does not eliminate the risk that logging will cause a landslide. To the contrary, these studies, as well as an understanding of basic geologic principles, demonstrate that even when logging is done in compliance with regulations and with reasonable care, logging on steep slopes results in a significantly higher incidence of landslides. *See, e.g.*, CP 75–78; 1162–1163; 1170–71.

III. THE SCIENCE OF LANDSLIDES

The stability of a slope is governed by a wide variety of factors, many hidden below the surface: cohesion, permeability and porosity of the soil at various depths (including the effects of roots); the thickness and friction angle of the soil; presence or absence of subsurface water; and planes of weakness within underlying units. Accurate measurement of these parameters can only be accomplished with subsurface investigations. Absent an intensive amount of subsurface investigation, we must rely on many uncertain assumptions about the subsurface to estimate slope stability.

The harvest of timber across steep slopes brings about changes to subsurface conditions that can and do lead to landslides. Tree removal will lead to loss of apparent soil cohesion as roots binding soil particles together rot, causing the soil to lose strength and, thus, lose resistance to

landslides. Removal of trees also leads to more frequent saturated soil conditions in the subsurface (due to reduced evapo-transpiration) and results in an increase in pore-water pressure. Increased pore-water pressure between soil grains reduces the resistance to landslide forces. Reduced soil cohesion from loss of root strength and increased pore-water pressure have been well studied and documented.

An especially difficult subsurface feature to identify and accurately assess is a bedrock hollow. Bedrock hollows are subsurface depressions within the underlying bedrock that are filled, or partially filled, with looser material (soil) that will be significantly more likely to fail. Sometimes, these bedrock hollows are mirrored on the surface as readily apparent topographic depressions, but sometimes not. The lack of a “surface expression” for a bedrock hollow means that a ground-level review of a logging site will not be able to identify it as a potentially unstable slope.¹

Steep slopes and bedrock hollows are less vulnerable to landsliding when covered by mature trees which maintain soil cohesion and absorb water. But logging may cause such slopes to become unstable due to greater water recharge and/or loss of root cohesion.

¹ The heightened instability of bedrock hollows is due to the presence of the looser material and the likelihood that subsurface waters will collect in these subsurface hollows, saturating and weakening the soils.

Because some bedrock hollows and site-specific variability in other subsurface factors cannot be identified from the surface, fully evaluating the risks created by logging a steep slope would require intensive subsurface, geologic investigation. In the absence of a subsurface investigation, the logging company takes the risk that it is not logging over a particularly vulnerable slope or bedrock hollow and—if they do—that no storm large enough to trigger sliding will hit that slope before the new forest is 10 to 20 years old and regains most of the lost root cohesion.

The impact of clearcut logging on the stability of steep slopes is well established in studies that compare the frequency and magnitude of slope failures in the vicinity of recent clearcuts with landslide activity in untouched areas. These studies (dozens of them) leave no doubt that logging on steep, soil-mantled slopes increases the risk of landsliding. This point has been recognized since Alexandre Surell's famous 1840s studies of the relation between landslides and forest clearing in the French Alps.² More recent studies in the Pacific Northwest have quantified the role of root strength on soil reinforcement and slope stability. The results

² Surell, A., re-published 1870, *A Study of the Torrents in the Department of the Upper Alps*, Translated by A. Gibney, Paris, Dunod.

of those studies support Surell's general conclusion about forest clearing increasing the probability of landslides in steep, forested terrain.

In the Pacific Northwest, landslide frequencies in areas with forest clearing have been estimated to be up to 34 times higher than natural background rates (Rood, 1984). Studies by Montgomery *et al* (2000) found landslide frequencies three to nine times higher than pre-European settlement. Timber harvest is the primary factor responsible for this difference (Sidle *et al*, 1985). These impacts were further reflected in the compilation of studies referenced in the record. CP 73 (§b), 74, 111 (§11). Those studies involved inventories of landslides across large and small landscapes. In each study, landscapes were coded as originating in a recently logged area (or close to a logging road) or in an area that was in its natural condition. One study found that areas with logging had twice as many landslides as the adjacent natural areas. That was the *smallest* increase found among the studies. Other studies found increases of four-fold, ten-fold and even 33-fold. *Id.* On average, the studies indicated an almost ten-fold increase in landslides on lands associated with logging.

Certainly, it is true that landslides occur naturally. As one of the respondents states, "hundreds of debris slide events happened in both logged and unlogged areas in the path of the January 2009 winter storm."

Zepp Resp. Br. at 8. But that statement hides the differences between the frequency of slides in logged and unlogged areas. As described in the in the record, the vast majority of slides occurred in recently logged areas, even though most of the landscape was not recently logged. CP 111-112.

IV. RESTATEMENT OF TORTS, §520

One of the factors to be considered in deciding whether an activity is “ultra-hazardous” is the “inability to eliminate the risk by the exercise of reasonable care.” Restatement of Torts (2d), §520. The geologists and geomorphologists submitting this *amicus* brief believe that there is no doubt from a scientific perspective that this factor is present here. Absent an impractical investment in sub-surface geotechnical investigation across hundreds or thousands of acres of steep forested landscape, each year, the information necessary to identify potentially unstable slopes vulnerable to post-harvest landsliding will be limited to landform features expressed on the land surface. Many potentially unstable slopes will remain unidentified by either logging companies or regulators.

Subsurface investigations routinely done for large buildings and dams are not practical for most logging which can span hundreds of acres. There can be tremendous variation in geologic conditions across a forestry site, both on the surface and underground. It is not practical to develop the

hundreds of boring holes that would be needed for each logging site to try and find all bedrock hollows (and other problematic sub-surface features). Thus, there is no practical way to identify many of the most hazardous areas.

In the absence of subsurface information, forest practice activities on steep slopes will remain inherently risky. The only way to eliminate that risk is to not log on steep slopes, however, that approach would eliminate access to and harvest of vast tracts of valuable timber. The alternative approach that has become the norm is to avoid the most obvious visible slide prone spots and assume or hope that there are no unidentified potentially unstable slopes that will fail due to tree removal or road construction; or hope that no large storm hits that slope before root cohesion is restored; or, if all else fails, hope that if slides do take place due to forest practice activities, no one is in harm's way below.

Thankfully, most logging on steep slopes takes place in areas remote from human settlement. *See, e.g.*, CP 89 (§4.a). Consequently, in most situations, the companies can take the risk without triggering a slide that actually causes harm to anyone. But when forest practices reduce slope stability and a large storm hits before the new forest grows back and a landslide results and damages private property, it seems to us that the

law should allow the persons who suffer property damage or bodily harm to recover for the harm they suffer. The logging companies profit from logging steep, soil-mantled slopes. Those companies should make good when inherently risky activity causes slopes to give way, damaging private property and, possibly, causing bodily harm or death.

The Court of Appeals recognized evidence “that even when exercising the highest degree of due care, logging in rural areas may increase the risk of landslides.” Decision at 10. But the foregoing discussion demonstrates that the undisputed scientific evidence was more conclusive than that. Logging “will” increase the risk, not “may.”

We reiterate, though, that some landslides occur naturally and thus we believe that the damaged party should still be responsible for proving causation. Strict liability would merely eliminate the plaintiff’s burden of proving negligence. This is consistent with the petitioners’ position. *See* PFR at 11, n. 7.

V. REVIEW SHOULD BE GRANTED

The geological evidence discussed above demonstrates that the Court of Appeals’ decision conflicts with other decisions of this Court analyzing the factors in Section 520A. Not only is there no doubt that logging increases landslide risk, but there is no scientific basis for

believing that that risk can, as a practical matter, be mitigated to anything close to background levels. The best we can practically do today results in landslide risks from logging that are vastly greater than leaving the hillsides untouched.

Likewise, the scientific evidence conflicts with the Court of Appeals' reasoning that a multiplicity of causes makes strict liability inappropriate. Decision at 10. In reality, virtually all landslides on logged slopes are caused by logging and a small minority are natural. There is no evidence in the record that any cause other than those two ever is involved. (We note that the Court of Appeals did not identify *any* causes other than natural conditions and those related to logging. *Id.*)

Finally, it should be obvious in the wake of innumerable slides apparently linked to logging activities that deciding this issue is a matter of great public importance.

DATED this 8th day of December, 2014.



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HURLEY, husband and wife, et al.,

Appellants,

v.

CAMPBELL MENASHA, LLC, et al.,

Respondents.

NO. 90759-5

Court of Appeals No. 71430-9-I

DECLARATION OF SERVICE

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I, JEFF BODÉ, under penalty of perjury under the laws of the State
of Washington, declare as follows:

I am the attorney for amici herein. On the date and in the manner
indicated below, I caused the amended Amicus Brief of Geologists and
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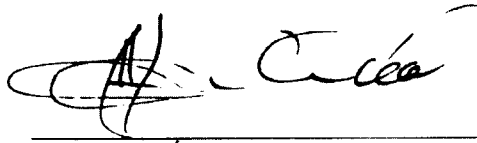
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DATED this 26th day of December, 2014, at Bellingham,
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Dear Clerk,

Re: case name: Jerome Hurley, et al. v. Campbell Menasha, LLC., et al.
case no: 90759-5

Attached for filing are an amended amicus brief and a declaration of service.

The amended brief was allowed by a Dec. 4 letter from the Commissioner to counsel.

Thank you.

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