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MEMORANDUM FOR: Richard H. Vollmer, Director
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THRU: James P. Knight, Assistant Director for
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Robert E. Jackson, Chief
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FROM: Philip S. Justus, Geologist
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SUBJECT: SUMMARY OF RECENT FINDING OF POSSIBLE CAPABLE
FAULT ON GABLE MOUNTAIN, HANFORD NUCLEAR
RESERVATION, WASHINGTON

History of discovery and notification of NRC. Geologists for Golder Associates working for Puget Sound Power and Light (Skagit applicants) discovered faults in trenches on Gable Mountain that cut sediments which are similar to deposits of about 40,000 years old. Golder notified Puget Sound Power and Light of the discovery on August 15; Puget Sound notified Washington Public Power Supply System, the latter constructing a power plant about 12 miles away. On August 18, project manager for WPPSS-2 notified Geosciences Branch Chief of the discovery. On August 19 a conference-call discussion was held involving Golder, Puget Sound, WPPSS, USGS and NRC (PM and GSB).

The geologic situation. Several faults are known to occur on Gable Mountain. The faults deform lava flows, which underlie the mountain and the entire Hanford Reservation, but they were thought to be millions of years old and therefore not capable. Golder re-studied the trenches on Gable Mountain that had revealed the ancient faults and noted that glacial meltwater deposits, sands and gravels, overlying the faults may have been affected by the faults. Evidence was ambiguous, so new trenches were made. Without a doubt several faults were found that transect both the lava flow and the glacial sediments offsetting the sediments 2" to 3". Similar glacio-fluvial sediments were dated at about 40,000 years old. Because the faults developed more recently than 40,000 years ago, they may be capable faults (less than 35,000 years old). Also, a slickensided clastic dike was observed in a fault zone in a trench wall on Gable Mountain. Clastic dikes elsewhere in the Hanford region have been dated at about 12,000 years, or younger. The possibility of multiple faulting events within the last 500,000 years exists for this discovery and such multiplicity would also render the faults capable by Appendix A definition.

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Implications of the discovery. It is possible that additional young (possibly capable) faults will be found on Gable Mountain and on structurally and tectonically analogous mountains and hills in and near Hanford. Gable Mountain lies on a larger structure which includes Gable Butte and Umtanum Ridge. Large, but as far as we now know, ancient faults exist on Umtanum Ridge. The question now arises as to whether the larger Umtanum Ridge-Gable Butte-Gable Mountain structure is itself a capable structure. If it is, much larger seismic events might be associated with fault movement on the Umtanum-Gable than would be likely to be generated by fault movement on the smaller structure, Gable Mountain. The discovery of young faults necessitates a re-evaluation of the neotectonics and seismicity of the Hanford region.

Plan of Action. An immediate site inspection response was deemed unnecessary when Golder assured NRC that the critical exposures in the discovery trenches would be preserved for inspection and that additional trenching is planned. The purpose of continued trenching is to trace the young faults or fault zones to determine whether the faults found in separate trenches are related and to determine the faults' characteristics and patterns. A joint-NRC-USGS site inspection was projected for early October to allow time for the trenching to proceed and physical properties to be documented.

WPPSS chief geologist will send an illustrated report of the faults. NRC project manager will prepare a memo summarizing the conference-call discussion.

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