

Technical Memorandum

TO: Mayre Flowers, Citizens for a Better Flathead
DATE: November 27, 2007

FROM: Chris Cerquone, R.S. No. 422, Cam Stringer, PG
PROJ. NO.: 13968.000
Geomatrix Consultants, Inc.

CC: **PROJ. NAME:** North Shore Ranch

SUBJECT: **Review of Preliminary Plat Application, Proposed North Shore Ranch, August 2007**

Geomatrix Consultants, Inc. (Geomatrix) completed a preliminary review of the August 2007 Preliminary Plat Application (PPA) submitted by Kleinhans Farms Estates, LLC (applicant) for the proposed North Shore Ranch subdivision in Flathead County, Montana. The objective of our review was to evaluate whether the application provides sufficient information to understand the potential impacts of the proposed subdivision.

Mr. Chris Cerquone, senior scientist and Montana Registered Sanitarian and Mr. Cam Stringer, senior hydrogeologist in Geomatrix's Missoula office reviewed the application. Mr. Cerquone has more than 18 years of diverse environmental consulting and regulatory oversight experience. As an Environmental Health and Water Quality Specialist for the Missoula City-County Health Department, he routinely evaluated projects involving groundwater and surface water quantity and quality issues, from basin-wide water resource studies to review of proposed subdivision projects. Mr. Stringer has more than 18 years of groundwater and surface water hydrologic experience. He has managed numerous groundwater characterizations, including projects involving complex groundwater modeling and interactions between groundwater and surface water.

EXECUTIVE SUMMARY

A review of information submitted by the applicant and available to Geomatrix was insufficient to determine potential impacts of the subdivision. In some cases, claims made by the applicant appear to be in error based on a review of published water resource studies. Denial of the proposed North Shore Ranch Subdivision should be considered until potential impacts are fully understood. Information required at this time, includes the following:



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1. A seismic evaluation. A seismic evaluation is commonly included in an environmental assessment for a subdivision. Groundwater at the project site is very shallow increasing the potential for soil liquefaction during seismic events.
2. A determination of the base flood elevation on the property. Without a determination of a base flood elevation (water-surface elevation), floodplain impacts associated with this subdivision (including filling) cannot not be determined. Reliance on the FEMA floodplain is inappropriate because the FEMA floodplain and the base flood elevation can often be different.
3. The wetland in the western portion of the site should be delineated. The wetland delineation report provided in the application does not delineate this wetland.
4. The completion of a wetland delineation during high groundwater (April/May) should be considered. The delineation included in the applicant's submittal was completed in August.
5. Additional information on storm water management should be provided. It is unclear how the proposed bio-swales will effectively treat storm water when in some instances storm water would discharge directly to the shallow groundwater. Based on the subdivision's proximity to sensitive environments, proven and effective treatment of storm water prior to discharge to groundwater and the floodplain should be required. The applicant's plan currently proposes conveyance of storm water to the wetland adjacent to Flathead Lake with little to no treatment.
6. More information on the grinder pump systems proposed for the homes should be provided. It has been our experience that individual pumping systems can fail resulting in an overflow of sewage onto the ground. Consideration should be given to installation of alarm systems for any grinder pump system that alerts the homeowner of grinder pump system failure.
7. The rationale for installing special sewer pipe in some areas of the subdivision and not in others should be explained, as groundwater is shallow throughout, sewage would be conveyed under pressure, and the subdivision is proposed in proximity to sensitive environments. Special sewer pipe for the entire subdivision should be considered.