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Thorndyke Resources
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Attn: Mr. Alex Hill & Dan Baskins

Hydrogeologic Consultation
Potential Impacts – Thorndyke Ck
MRL - Upland Action Area
Jefferson County, Washington
Job No.ThorndykeRes.Hydro.L5

This hydrogeologic letter is provided at your request and provides our opinion regarding the potential impacts related to mining the previously identified aggregate resources in the MRL Upland Action Area (Thorndyke Mineral Resource Area). Previous studies and groundwater monitoring in the area indicates that there are several aquifers in the region including the Vashon aquifer and the deeper pre-Vashon (Bridgehaven) aquifer. The Vashon upper aquifer surface ranges from approximately Elevation 290 in the north (Twin Lakes) to Elevation 210 in the south (Thorndyke Lake). The Vashon aquifer generally flows to the south-southwest throughout the Thorndyke Mineral Resource Area. Farther to the east (Shine and Bridgehaven areas), the Vashon groundwater flow appears to be more in the east-southeast direction.

As currently proposed, mining activity in the Wahl and Meridian Extraction areas will be conducted in accordance with Washington State and Jefferson County regulations, and WDNR Best Management Practices. Based on the resource documentation and plans prepared for the proposed site activities, mining will be limited to the aggregate resources encountered above the regional groundwater table with the mining depth limited to 10 feet above the Vashon aquifer. Therefore, no measurable change is expected to water quality or quantity of the Vashon aquifer, and thus no adverse impact will occur to Thorndyke Creek – located 500 feet or more to the west. In fact, we expect that during mining activities, groundwater recharge will increase locally and to a minor extent. This typically occurs as a result of the vegetation removal during mining until reclamation or reforestation. Once mining reclamation is achieved and vegetation is re-established, groundwater recharge will return to pre-mining levels.

Mining in the extraction areas will be incremental with segmental reclamation and revegetation. Any changes in surface water infiltration are expected to be similar to changes that have historically occurred with timber harvesting activities throughout the region. The observation wells completed in the area will be utilized to monitor groundwater levels prior to and during mining operations. This will assure the required separation of 10 feet. Based on the above, it remains our opinion that there will be no measureable adverse

impact, cumulative or otherwise, related to the proposed mining activities. The proposed mining activity is a temporary use with the long term reclaimed use being forestry.

If you have any questions regarding this report or need additional information please call.

Yours Very Truly,
GeoResources, LLC

Bradley P. Biggerstaff, LEG, LHG
Hydrogeologist

Citations

GeoResources previous reports and documents.

Economic and Engineering Services, Inc., and Pacific Groundwater Group, 1994, Eastern Jefferson County Groundwater Characterization Study, Prepared for PUD No. 1 of Jefferson County.

Grimstad, Peder, and Carson, Robert J., 1981 Geology and Groundwater Resources of Eastern Jefferson County, Washington: Water Supply Bulletin No. 54.

Jefferson County Critical Aquifer Recharge Area Ordinance, Jefferson County, Washington, 2003.

Robinson & Noble, Inc., 1999, CARA Report for Ace Paving, Shine Pit - proposed asphalt batch plant near Port Ludlow, Jefferson County, Washington. (Attached)

Robinson & Noble, Inc., 1992, South Aquifer Study: Port Ludlow-Shine Area, Jefferson County, Washington, prepared for Pope Resources.

Shannon & Wilson, Inc., Thorndyke Conveyor – Jefferson County, Washington, 2001.

U.S. Soil Conservation Service, 1975, Soil Survey of Jefferson County Area, Washington.