

Interoffice Memorandum

January 11, 2011

To: Kerry Kavanagh, G-17399 file
From: Josh Hackett
Subject: G-17399 (Food for Lane County): Well construction request submitted by Springfield Utility Board (SUB).

Findings:

Although SUB's Sports Way Well (LANE 16446) produces from deep in the alluvial aquifer system, it is not isolated from shallower wells. The local depositional environment is such that laterally extensive clay beds, which would provide a degree of separation from the upper and lower parts of the aquifer system, do not exist. Requiring the proposed well to terminate above a confining layer will not benefit LANE 16446. **The findings of the groundwater review for application G-17399 are not affected.**

Background:

In a letter dated 08/04/2010, Bart McKee, Senior Civil Engineer with SUB, offered comments regarding well construction concerns for a proposed well on water right application G-17399 submitted by Food for Lane County. Mr. McKee states in the letter that he is concerned about potential future water quality issues in SUB's wells. Specifically, he raised concerns about water quality issues in SUB's Sports Way Well (LANE 16446). On behalf of SUB, Mr. McKee has the following requests regarding construction of Food for Lane County's well:

- 1) The well be constructed to terminate above any confining layer encountered during construction of the well, and
- 2) That if it is found necessary to penetrate a confining layer, the proposed well be sealed into the confining layer.

In a memo to the Groundwater Section dated 10/29/2010, Kerry Kavanagh (OWRD Water Rights Section) seeks an answer to the following question: "Does Bart McKee's letter change the groundwater review in any way?"

Well Construction:

Food for Lane County has proposed a well on G-17399 that will be <100 feet deep and will likely be sealed to ~20 feet below land surface (bls). SUB's Sports Way Well

(LANE 16446) is 424 feet deep and is sealed to a depth of 98 feet bls. Most of the production in LANE 16446 occurs between 169.5 and 399.5 feet bls.

Geologic and Hydrologic Setting:

Both Food for Lane County's proposed well and SUB's Sports Way Well (LANE 16446) develop water from the Willamette aquifer (Gannett and Caldwell, 1998). In the vicinity of the wells, the aquifer consists of up to 450 feet of permeable sands and gravels that form the apex of the Springfield fan, an alluvial fan complex that occurs at the eastern margin of the Willamette valley where the McKenzie and Willamette Rivers enter the valley lowlands (Gannett and Caldwell, 1998). The upper part of the aquifer consists of up to 50 feet of younger, highly-permeable, unconsolidated sands and gravels. These highly permeable sediments consist of broad, thin sheets of late Pleistocene gravels that mantle the upper surface of the alluvial fan or as Holocene floodplain gravels that occupy the entrenched floodplains of the modern Willamette and McKenzie Rivers. The main underlying portion of the aquifer is composed of older, moderately permeable sands and gravels that locally contain lenses of finer-grained sediments. The older sediments are generally more compacted and cemented at depth. Although the Holocene alluvium is the product of a meandering stream system, the older Pleistocene sands and gravels were deposited in a braided alluvial stream environment (O'Connor and others, 2001).

Discussion:

Mr. McKee's comments infer that he believes a confining layer will protect and isolate SUB's Sports Way Well from contamination from nearby wells. This is only true if the confining layer is laterally continuous. Multiple lines of evidence indicate a continuous confining layer is not present locally. Results from several aquifer tests conducted in 2002 for Eugene Water and Electric Board (EWEB) show rapid response in shallow wells from pumping in deep wells, suggesting efficient vertical connections between the shallow and deep portions of the aquifer. A review of well logs in the vicinity of the wells also suggests significant clay layers are not present locally. Although silty and cemented zones are noted on most well logs, no discrete, aerially-extensive, low-permeability confining zones occur in the area. In general terms, the aquifer can be described as a thick pile of gravel and sand with some discontinuous beds of silty sand and gravel and zones of local cementation.