
Groundwater Geochemistry Introduction

Last Updated Wednesday, 18 March 2009

Columbia Basin GWMA

Subsurface Geologic Mapping and Hydrogeologic Assessment Project Progress Report

Groundwater Geochemistry Dimitri Vlassopoulos SS Papadopoulos and Associates Portland, Oregon Presented at GWMA Board Meeting, Othello, WA January 22, 2009

- Major ion chemistry
- ––Changes along flow path
- ––Relative age
- ––Recharge sources
- –Mixing
- Stable Isotopes
- –Water sources (precipitation/runoff, surface water)
- –Ancient (glacial) versus modern recharge
- Atmospheric tracers (groundwater age-dating)
- –Radiocarbon, tritium, CFCs, SF6
- –Groundwater “age” (time since recharged)
- –Mixing of old and young water (pumping effects) GWMA Well Sampling 2008 Groundwater Geochemistry, Age and Recharge Royal City•Wells #1, #2
- Shallow-cased water supply wells completed in Wanapum
- Static water levels steady
- Mixture of older and “young” water (recharged since 1950s)
- Recharge from Frenchman Hills sufficient to sustain withdrawals Moses Lake

Well #18

- Supply well completed in Wanapum (Frenchman Springs)
- Static water levels stable
- Mostly “young” water (post-1950’s)
- Direct connection to East Low Canal through Roza/Upper Frenchman Springs flow zones Moses Lake Well #17
- Supply well completed in upper Grande Ronde (Sentinel Bluffs)
- Static water levels declining
- Mixture of old and “young” water (average recharge age ~6,000 years)
- Recharge from “young” water component (<20 %) is too small to offset withdrawals
- Limited connection to surface recharge Odessa Irrigation well 20 miles east of Moses Lake
- Well completed in Lower Grande Ronde (Umtanum and Ortley)
- Static water levels declining
- Old water (recharge age >10,000 years)
- No present-day surface recharge sources Horseshoe Bend Irrigation Wells
- Shallow (132’) well in use since 1948 (Roza/Alluvium)
- Deeper (605’) well in basalt (Wanapum and uppermost Grande Ronde)
- Static water levels stable
- Predominantly young water in shallow well, predominantly older water in deeper well
- Relatively low groundwater use area
- Connection to surface recharge (Sprague Lake) sufficient to recharge shallow well This document is available as a PowerPoint Presentation, to view the presentation [click here!](#) (This file is large and will load slowly for some viewers)