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City of Beaverton  
Planning Services

June 18, 2015

RE: Aquifer and Radon Questions with Staff Response

Dear Eric:

You recently posed several questions to the Commissioners regarding radon and the District's aquifer storage and recovery (ASR) facilities. The following memo provides a brief background and response to your questions. I would be happy to meet with you to follow up on these or other related questions you may have on radon, or the District's aquifer storage and recovery (ASR) facilities in general.

**1) Was radon noted in the aquifer?**

Yes, radon has been detected in water tested at our Grabhorn ASR site on Cooper Mountain but only at relatively low levels since TVWD began collecting data back in 2010. This is common for the geology of the Pacific Northwest, in general, and specifically the Cooper Mountain area since this is a volcanic-rock aquifer dominated by basalt formations. Results from testing of recovered ASR water have ranged from approximately 200 to 600 picocuries per liter (pCi/L) with an average result of 411 pCi/L. To provide some context to these values, recently published data from the United States Geological Survey (USGS, 2011) indicate that this is a common occurrence across the United States within similar aquifers, with the highest results exceeding 1300 pCi/L. In addition, data from Portland's Columbia South Shore Well Field in 2012 indicated an average radon detection of 370 pCi/L.

**2) Does the gas absorb in the water?**

Radon may be present in either a dissolved or gaseous phase in water pumped from the aquifer during ASR operations. This depends on a variety of factors, such as the levels historically noted in the aquifer before ASR activities began, how long water is stored in the aquifer before being pumped out and how long pumping operations last, to highlight a few examples. In short, radon will transition between either phase in water within the aquifer and conversely, can be decreased relatively quickly through aeration once the water is no longer confined (i.e., when it becomes exposed to the atmosphere).

**3) Might the gas be displaced by the aquifer into nearby homes?**

The short answer to this question is that the District has no information to suggest that ASR recharge contributes to radon release into nearby homes. As I'm sure you are aware, radon can be a considerable risk within a home but this is a result of the natural breakdown of radioactive material, specifically uranium, in the ground beneath a home rather than gases originating from the aquifer itself.

It's important to note that ASR activities on Cooper Mountain occur several hundred feet below the surface, within a confined aquifer bounded by geologic materials that restrict groundwater movement. In turn, this restricts the possibility of displacing radon into the surrounding

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atmosphere. To that point, the Copper Mountain area is considered low to moderate risk based on data collected from indoor air quality. More information on this topic along with some useful interactive maps can be found on the Oregon Health Authority's site at the following link:

<https://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/RadonGas/Pages/zipcode.aspx>

The District plans on continuing the monitoring efforts for radon to further the understanding of its occurrence within the aquifer and the subsequent impact to ASR operations. In fact, TVWD staff has already budgeted for additional assessment and consultation services specifically for this topic in the 2015-2017 Budget. While the data collected over the past several years indicates that radon levels are relatively low in comparison with other similar aquifers, the District continues to be committed to delivering the highest quality water to our customers.

I appreciate your inquiry regarding this important and complex topic. Please let me know if you have any additional questions or would like to discuss this topic in even greater detail. I can be reached at 503-848-3019 or [joel.cary@tvwd.org](mailto:joel.cary@tvwd.org). I would be happy to sit down with you and explain our radon monitoring efforts and the results that we've seen to date.

Sincerely,

Joel A. Cary  
Water Quality Technician

Cc: John Tyner  
Mark Knudson  
Peter Boone  
Frank Reed