

**Mission:**

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



**Rick Scott**  
Governor

**Celeste Philip, MD, MPH**  
Surgeon General and Secretary

**Vision:** To be the **Healthiest State** in the Nation

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## Toxicology Consult

**Date:** March 5, 2018

**From:** Kendra F. Goff, PhD, DABT, CPM, CEHP, State Toxicologist & Chief  
Bureau of Environmental Health

**Requested by:** Florida Department of Environmental Protection (DEP)

### PURPOSE:

The Department of Health (DOH) received a health concern from DEP regarding irrigation well usage at The Arc Gateway, Inc., 3932 N. 10<sup>th</sup> Avenue, Pensacola, Florida. A site visit was completed on January 4, 2018, by Robert Merritt of DOH-Escambia and Shawn Hamilton from DEP. It was discovered that the nursery at the facility uses radium-contaminated irrigation well water for non-edible plants like those used in landscaping which are then sold to the public. This irrigation water has also been used on some herbs, fruit trees, and possibly some vegetable plants consumed by clients and employees, but most of the irrigated plants are for landscaping and decoration. The hydroponic vegetable garden at the facility, however, is not irrigated with water from the well, but from municipal water supplied by Emerald Coast Utility Authority (ECUA public water).

### METHODS:

Contaminant analysis from water samples from irrigation wells was provided by DEP. The contaminants of concern were radium 226 and radium 228. DOH searched for current drinking water standards to determine the health risk from this exposure. No current standards exist for irrigation water.

### RESULTS and FINDINGS:

For the ingested herbs, vegetables and fruit that use the irrigated water, the health risk is minimal. The radium 226+228 level in the irrigation well (6.16 pCi/L – picocuries per liter) is only slightly above the drinking water standard of 5 pCi/L. A drinking water standard assumes a person's daily water consumption could occur at or below the standard for a lifetime and be unlikely to cause a health effect. Unless a person's entire vegetable diet is watered with irrigation water from this site, the risk from ingesting these edible foods is minimal.

It is important to also point out that exposure to radium and other types of radiation can occur through normal daily activities as well. According to the U.S. Nuclear Regulatory Commission (NRC), most people are exposed to radiation through both food ingestion and medical procedures. In the normal diet, there are several foods which contain radiation such as bananas, carrots, white potatoes, red meat, brazil nuts and lima beans. X-ray procedures, mammograms, and even CT scans of the body also expose people to radiation. Thus, clients

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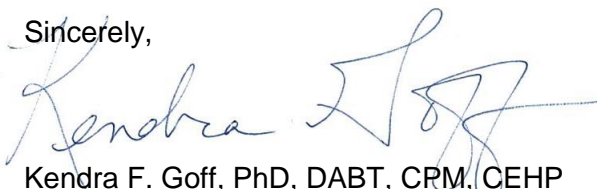
and workers who are associated with The Arc Gateway, Inc. Center will most certainly have other exposures to radium and other types of radiation in addition to any radium exposure from the water at this facility.

Other than ingestion, DOH also considered inhalation and dermal contact exposure routes for both clients and employees in the nursery from the irrigated well water. These pathways were eliminated as exposure routes. For the contaminants of concern (Radium-226 and 228), there is limited dermal exposure because most emitted particles do not pass through the skin. Inhalation contact exposure routes are also very limited since emitted particles do not vaporize and are non-volatile.

It is recommended, though, that in the future edible plants such as the vegetables, fruit trees, and herbs only be watered with municipal water which meets drinking water standards. Using water from the irrigation well for the non-edible plants does not pose a health risk.

If you have any questions or comments concerning this letter, please contact Jesseka D. Forbes, in the Health Risk Assessment Program at 877-798-2772.

Sincerely,

A handwritten signature in blue ink that reads "Kendra F. Goff". The signature is fluid and cursive, with a large, stylized initial "K" and "F".

Kendra F. Goff, PhD, DABT, CRM, CEHP  
State Toxicologist & Chief

KFG/jf