

## **Shotwell Landfill Groundwater Quality Evaluation**

Following the public hearing on September 6, 2016 regarding Shotwell Landfill's request for amendment of their landfill franchise, Wake County Environmental Services (WCES) was asked to evaluate the potential water quality impacts of the requested franchise amendment. For this evaluation, WCES reviewed current and historical groundwater monitoring data for the Shotwell Landfill. WCES staff also spoke with staff of the NC Division of Waste Management (DWM) about Shotwell Landfill's permit and its groundwater compliance history.

### **Groundwater Monitoring**

WCES examined selected groundwater monitoring reports from 2001, 2007, 2009, 2015, and 2016. The monitoring data in these reports did not suggest any releases from the landfill to groundwater or any increasing concentrations of contaminants associated with the landfill activities. Some monitoring wells on the site have iron, manganese, cobalt, or vanadium at levels above state groundwater standards, but there were no discernable trends in metals concentrations in these reports. Moreover, iron and vanadium were present in the background well at the site at levels above the state groundwater standard, consistent with a hypothesis that these elements are naturally-occurring in groundwater at the site.

In the monitoring reports reviewed for this evaluation, only one volatile organic compound, tetrahydrofuran (THF), was detected. This compound was reported in the December 2015 monitoring report and was previously detected in the same well in December 2014. The origin of these detections is unclear. These detections appear to be isolated and do not indicate a trend. THF is a component of cement used to assemble PVC pipe. As such, isolated detections of THF in well water are commonly attributed to materials used in well construction and water supply piping.

In April 2016, WCES staff collected a water sample from the on-site water supply well that serves the scale house at Shotwell Landfill. The sample was tested for inorganic contaminants and VOCs. On the inorganic panel, iron was present at 370 parts per billion (ppb), slightly higher than the state groundwater standard of 300 ppb, and the pH was 6.22, slightly lower than the range of 6.5-8.5 in the state groundwater standards. Other inorganic parameters were within standards used by Wake County to evaluate water quality from private drinking water wells. Elevated iron and low pH are very common conditions in Wake County groundwater due to natural hydrogeologic conditions. No VOCs were detected in the April 2016 water supply well sample.

### **DWM Permit Requirements**

According to staff at DWM, Shotwell is currently in detection monitoring status, the standard monitoring status for landfills with no groundwater quality issues. DWM could request that the facility move to assessment monitoring based on elevated levels of iron, manganese, cobalt, and vanadium in some wells, but has not found compelling evidence to do so at this time. DWM staff further reported that while many construction and demolition (C&D) landfills in North Carolina have issues with VOCs that are

clearly related to C&D disposal (such as detections of vinyl chloride), Shotwell Landfill's groundwater monitoring does not indicate any releases of VOCs to groundwater.

DWM staff reported that Shotwell Landfill's current permit is consistent with all other current C&D landfill permits. The permit specifies an allowable waste disposal area and total landfill capacity. The permit also includes restrictions on waste acceptance rates and the service area from which Shotwell can accept waste. These restrictions are based on the franchise approved by the county. In order to increase the waste acceptance rate, Shotwell will have to request an amendment of its landfill permit from DWM. DWM cannot increase the waste acceptance rate or expand the service area without the county first amending the franchise to increase these limits.

Shotwell Landfill's permit also requires the permittee "to employ a screening program that includes random inspections of incoming loads or comparable procedures, records of any inspections, training of personnel to recognize hazardous, liquid, or other excluded waste types, [and] development of a contingency plan to properly manage any identified hazardous, liquid, [municipal solid waste], or other excluded or unauthorized wastes." DWM reported that it conducts periodic reviews and site inspections to ensure that the screening program is adequate.

## **Conclusion**

While any construction and demolition debris landfill represents a potential threat to groundwater quality, review of available groundwater monitoring data for the Shotwell Landfill does not suggest any groundwater contamination attributable to landfill activities. Permitting and monitoring requirements for the Shotwell Landfill are intended to minimize the risk of releases to groundwater and are consistent with permits for other C&D landfills operating in North Carolina.