



October 19, 2015

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2015 First Semiannual Water Quality Monitoring Report  
Tomoka Farms Road Landfill (Permit # 0078767-037-SO-MM)  
Volusia County, Florida

Dear Mr. Rainey:

HDR Engineering, Inc. (HDR) prepared this letter on behalf of Volusia County in response to the FDEP review of the Tomoka Farms Road Landfill (TFRL) 2015 First Semiannual Water Quality Monitoring Report. It is acknowledged that SW-1 will be retained as a background surface water monitoring point and that monitoring in accordance with the current Water Quality Monitoring Plan Implementation Schedule (MPIS) will be continued in future events, as specified in Permit # 0078767-037-SO-MM.

The Department requested a reply on the following issues (*italics*) and, the replies have been included in subsequent plain text:

*1. Ammonia in groundwater: The Chapter 62-777, F.A.C., Groundwater Cleanup Target Level is 2.8 mg/L. That concentration was exceeded in background well B2, compliance wells B64, B85, B1B, MO5-B, and B43-1, detection wells B61R, B62-1R, and B62-2R, and contamination assessment well B85-6. Well B62-1R had the highest concentrations. The technicians took duplicate samples from that well, and there is a 53% difference between the results: 41 mg/L vs. 21.6 mg/L. The report did not discuss the possible sources of the ammonia and the implications with regard to groundwater quality. The report does not give any recommendations or conclusions for the exceedance regarding future actions. Please provide them.*

Response 1: It is acknowledged that the wells listed reported ammonia at levels above the GCTL in samples collected during the 2015 S1 monitoring event. Since all of the wells are located adjacent to, or downgradient from, the unlined portion of the TFRL, the likely source of ammonia is from the bacterial degradation of plant and animal waste possibly supplemented by other discarded material. Each of the wells has historically reported ammonia at levels above the GCTL, but ammonia has been consistently decreasing in most of the wells listed in your response (see the 2014 MPIS Technical Report). Two of the wells listed above (B43-1 and B85) were part of a benzene/ammonia evaluation monitoring project which was conducted downgradient of the other listed wells. The required evaluation monitoring, which resulted in adding four wells to the MPIS (B82-1, B87-6, B85, and B85-6) was accepted as complete by the FDEP in April 2015 (email from Tom Lubozynski to Jennifer Stirk, 4/4/15). Monitoring in accordance with the revised MPIS, is recommended.

Jeff Baylor of Pace Laboratories responded to the question concerning field duplicates reported for 2015 S1: Jeff stated that field duplicates are more associated with the technique used to

collect the samples and field conditions. Field duplicates are collected separately in separate containers, and sampling technique, well stability, weather, etc. can cause a much higher variance than that observed in laboratory duplicates. Laboratory duplicates (where the lab runs the same sample twice) produce much more similar results. Typically, the allowable relative percent difference (RPD) would be up to 20%, where the field duplicate RPD could potentially be much higher (e.g. 53%). Ammonia in B62-1R has ranged from 1.3 to 252 mg/L since 2008, and levels have remained below 100 mg/L since 2012, showing a slow but consistent overall decline.

2. *Unionized ammonia in surface water: The surface water standard is 0.02 mg/L. It was exceeded in SW-5 at 0.1 mg/L. The report did not discuss the possible sources of the ammonia and the implications with regard to surface water quality. Is there evidence of groundwater discharging to surface water? The report does not give any recommendations regarding future actions. Please provide them.*

Response 2: The SW-5 collection point is located in a pond which is part of the TFRL leachate treatment system. The perimeter stormwater/leachate conveyance around the South Cell (closed and unlined Class I) flows north, east, and south before turning west into the pond where SW-5 is collected. The likely source of ammonia reported from SW-5 is from leachate, possibly supplemented by degradation of plant and animal waste within the stormwater/leachate conveyance. Note that the SW-5 sample is collected before the stormwater/leachate enters the four stage leachate treatment system. Additionally, groundwater in the upper surficial aquifer is within approximately one foot of the ground surface, therefore groundwater and surface water interaction is highly likely. It is our professional opinion that comparing a water sample collected in the upper end of a leachate treatment system to surface water standards is inappropriate. HDR recommends continued monitoring as required by the current MPIS.

3. *In section 4.1.1, the report states, "Per FDEP Memorandum dated December 3, 2012, addressing the subject "Monitoring and Evaluation of Ammonia in Groundwater at Solid Waste Management Facilities SMW-13.10," the ammonia GCTL is no longer being relied on or enforced. Consequently, ammonia is no longer used by FDEP for regulatory compliance." Those statements are not a correct characterization of the FDEP Memorandum.*

a. *The ammonia GCTL is not being "enforced" as a water quality standard or "minimum criteria" value. The ammonia GCTL is not being used as a suitable toxicological reference (that is, risk for drinking water use of the aquifer).*

b. *Although not a "compliance" issue, the ammonia GCTL is being relied upon to assist in our review of the water quality data.*

· *As stated in the Memo (Item 4 on page 3), corrective actions solely for ammonia in ground water are no longer pursued unless needed to prevent surface water quality impacts. But, we rely on the ammonia data to evaluate whether other nitrogen compounds may be a concern.*

· *Central District uses the ammonia GCTL to help us decide what is "significant" and when evaluation monitoring should be considered (Rule 62-701.510(6)(a), F.A.C.).*

c. *If ammonia was not monitored, as required by Rule 62-701.510(7), F.A.C., there would be a compliance issue.*

d. *The water quality standard for ammonia in surface water is enforced. That standard is based on ecological impacts rather than human health. So far that has not been an issue at the Tomoka Farms Road Landfill. (The groundwater flow directions at the site (current and past) do not indicate a direct correlation between the unionized ammonia exceedance at SW-5 and the ammonia exceedances seen in the groundwater monitoring wells.)*

Response 3: The above statements are duly noted. In previous discussions with Central District staff, in association with Volusia County projects, Central District representatives stated that evaluation monitoring would not be required solely due to ammonia exceeding the groundwater standard. If other parameters (e.g. benzene) triggered evaluation monitoring, along with ammonia, the ammonia would be included in the evaluation monitoring requirement. However, there has been no suggestion to discontinue sampling or ignore ammonia as an indicator parameter due to the FDEP memo. HDR has, and will continue to recommend sampling as required by the MPIS until substantial evidence supports requesting modifications to the current permit.

In conclusion, HDR acknowledges that ammonia was detected above the GCTL in several groundwater compliance and detection wells and one surface water sampling location during the 2015 First Semiannual sampling event. However, historical data indicate that ammonia levels are trending downward at most groundwater sampling locations (2014 MPIS Technical Report), and the surface water sampling point is located at the upstream end of the leachate treatment system. HDR recommends continued monitoring in accordance the FDEP approved MPIS.

Sincerely,  
HDR Engineering, Inc.

John S. Catches, P.G.  
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Cc: Leonard Marion, Volusia County  
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Mark Roberts, HDR Engineering