



BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

January 6, 2016 (VIA Email)

North Carolina Department of Environmental Quality
Division of Waste Management – Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

Attention: Ms. Elizabeth S. Werner
Hydrogeologist

**Subject: Update on the Status of the ACM
Closed Francis Farm Landfill**
Haywood County, North Carolina
BLE Project Number J14-1957-45
Permit Number 44-03

Dear Ms. Werner:

As you are aware, Haywood County began processes required to address landfill gas and groundwater compliance issues at the subject site in 2009. As part of those processes, BLE conducted a groundwater assessment which was completed in 2014 (DIN 21463). The Solid Waste Section (SWS) approved the groundwater assessment in a letter dated August 5, 2014 (DIN 21525). The letter required that Haywood County initiate and submit a report of Assessment of Corrective Measures (ACM) in accordance with NCAC 15A 13B .1635.

BLE was retained by Haywood County in September 2014 to prepare the ACM report and McGill Associates (McGill) was also retained to perform engineering for ongoing post-closure care, landfill gas compliance, and for ACM consulting services. We anticipated that the ACM report would be submitted to the SWS in late 2015. Our conceptual schedule was discussed in phone calls and emails with the SWS in 2014 and 2015. A formal schedule was not proposed in writing. The conceptual schedule was verbally acknowledged by the SWS.

As you know several post closure care activities related to landfill gas compliance have occurred since 2014 which have changed our potential approach to the ACM. A meeting with representatives from Haywood County, McGill, and BLE was conducted on December 9, 2015 to discuss future plans for the site. The mutual conclusion of the group was that we should evaluate the effects of some recent post closure care activities to determine if they will serve as appropriate remedies in the ACM. We now anticipate that the ACM report will be submitted to the SWS in mid-2016.

We contacted you via telephone on December 10, 2015 to discuss the proposed schedule change. We understand that the SWS is in agreement with our revised conceptual schedule. It was suggested that we prepare this letter for submittal to the SWS to document the post closure care and compliance efforts performed since 2014 and to document the revised conceptual schedule.



The following milestone tasks have been performed by Haywood County, McGill, and BLE as part of post-closure care and preliminary ACM related assessment and evaluation. This is a partial list of activities.

Recall that Haywood County installed landfill gas and leachate extraction wells and installed a landfill gas to energy system, gas flare, and leachate collection system prior to 2014. Sampling of the landfill gas and leachate indicated that contaminants present in the landfill gas and leachate were similar to those present in the groundwater. The landfill gas and leachate were identified as contaminant sources which required an engineered remedy for control.

McGill conducted a topographic survey of the existing landfill soil cap and determined that positive drainage was not present. Leachate production records indicated a direct correlation between rainfall and leachate accumulation due to stormwater infiltration. Landfill gas records indicated that the landfill gas system was operating inefficiently due to subsurface soil moisture (stormwater infiltration) and vacuum loss presumed to be related to the condition of the existing soil cap.

BLE was retained to assess the condition of the existing soil cap and to evaluate soils on an adjacent parcel for potential borrow soil for cap improvements. The results indicated that the existing soils were suited for construction of a low permeability closure meeting the permeability requirement of $k \leq 1 \times 10^{-5}$ cm/s when properly processed, wetted, and compacted. The soils in their current state did not meet the permeability requirement. The thickness of suitable soil on the existing landfill cap was somewhat variable. After removing organic materials (e.g. topsoil) and working around infrastructure for regrading, we concluded that it would be difficult and possibly not cost effective to rework the soils to meet the desired permeability or required thickness. Additionally, earthwork may expose buried waste in some areas due to thin overlying soils. We recommended that a source of additional cover soils be identified to supplement the existing soil cover and achieve desired grades for surface drainage. The volume of suitable soil present in the potential borrow area on the adjacent parcel was unknown because we were not able to access the area for drilling. Based on cost-analysis by the design engineer and the availability of suitable supplemental cover soils, we concluded that a geosynthetic liner system may be more cost-effective than a soil cover.

In 2015 McGill and Haywood County identified soil from a nearby NCDOT roadway project which could be used as a cost-effective source of soil for cap improvements at the subject site. McGill assisted the County in executing a contract for the soil to be transported to and stockpiled at the site by the NCDOT contractor. BLE was retained to conduct periodic testing of the NCDOT project soils to determine compliance with project objectives. Testing indicated that the soils met project objectives and some of the soil was placed over the existing cap by the NCDOT contractor as part of an interim cap maintenance project to improve drainage and to reduce infiltration. BLE conducted periodic testing of the soil placement for compliance with project objectives. A final report of the testing of the interim cap soils will be issued by BLE in early 2016.

In 2015 Haywood County acquired three (3) properties (44.09 acres) surrounding the landfill to expand the facility boundary for landfill gas compliance. BLE submitted a conceptual well abandonment and installation plan to the SWS as part of the project on March 30, 2015. The SWS granted preliminary approval of the conceptual plan on March 31, 2015. BLE was retained to prepare a new Water Quality Monitoring Plan (WQMP) and Landfill Gas Monitoring Plan (LFGMP) to document proposed changes to the facility's monitoring infrastructure. The final versions of the new plans were submitted



to the SWS on November 24, 2015. The WQMP (DIN 25165) and LFGMP (DIN 25164) were approved by the SWS on November 25, 2015 (DIN 25331).

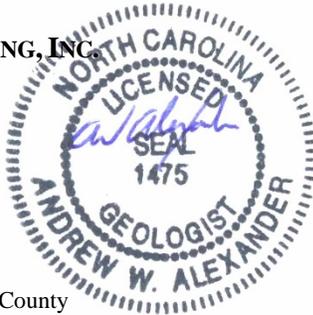
BLE began well abandonments and installations in accordance with the approved WQMP and LFGMP in December 2015. That project is currently in progress. We anticipate that BLE will issue a report in early 2016. The approved WQMP, LFGMP, changes to the monitoring infrastructure, and new facility boundary will be submitted to the SWS by McGill, to secure proper authorization.

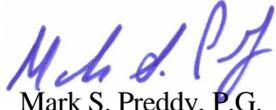
As previously stated, Haywood County, McGill, and BLE plan to evaluate the recent cap improvements, changes to the facility boundary and associated monitoring infrastructure, leachate production, landfill gas production, and groundwater contaminant trends to determine the effectiveness of the interim measures and to determine which remedies should be included as part of the ACM. We anticipate that the ACM report will be submitted in mid-2016.

We appreciate the opportunity to work with Haywood County, McGill, and the SWS on this project. Please contact us at (864) 288-1265 to discuss this project or if you have any questions or comments regarding this letter.

Sincerely,
BUNNELL-LAMMONS ENGINEERING, INC.


Andrew W. Alexander, P.G., RSM
Senior Hydrogeologist




Mark S. Preddy, P.G.
Senior Hydrogeologist



cc: Mr. David Francis – Haywood County
Mr. Mark Cathey, P.E. – McGill Associates

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