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April 15, 2019

Mr. Greg Cassidy, Brownfields Project Manager
South Carolina Department of Health and Environmental Control
Division of Site Assessment, Remediation, and Revitalization
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201

RECEIVED

APR 16 2019

SITE ASSESSMENT, REMEDIATION & REVITALIZATION

Subject: Quarterly Progress Report – First Quarter 2019
Former Bramlette Manufactured Gas Plant
400 East Bramlette Road
Greenville, South Carolina
VCC 16-5857-RP

Dear Mr. Cassidy:

This Quarterly Progress Report has been prepared for the referenced site in accordance with the requirements of the Responsible Party Voluntary Cleanup Contract (VCC 16-5857-RP) between Duke Energy Carolinas (Duke Energy) and the South Carolina Department of Health and Environmental Control (SCDHEC), dated July 29, 2016.

The following sections provide a summary of work performed during the reporting period: test and sampling results generated during the reporting period, environmental problems experienced during the reporting period and their resolution, and work to be performed during the next reporting period. Monitoring wells were installed in accordance with SCDHEC Monitoring Well Approval MW-11615, dated July 19, 2018, pursuant to the provisions of South Carolina Well Standards R.61-71. The work was conducted in accordance with the April 13, 2018 Remedial Investigation Work Plan Addendum (RIWP-A) submitted by Duke Energy and approved by the SCDHEC on April 24, 2018.

Work Performed During the Reporting Period

Activities performed during the first quarter (January 1 through March 31, 2019) included the following:

February 15, 2019

- Completed a ground penetrating radar (GPR) and electromagnetic (EM) survey on the north side of East Bramlette Road to identify potential subsurface utilities at the proposed location of monitoring wells MW-29S and MW-29TZ.

February 21 and 22, 2019

- Installed and developed monitoring wells MW-29S and MW-29TZ on the north side of East Bramlette Road at the locations shown on **Figure 1** (Attachment A).

February 21 through 26, 2019

- Installed security gate to control site access.
- Placed crusher run stone on the former MGP site (Parcel 1) to improve access from East Bramlette Road and West Washington Street entrances.
- Placed surge stone at the entrance from East Bramlette Road to the Vaughn Landfill.
- Conducted vegetation clearing to support monitoring well installation and abandonment, non-aqueous phase liquid (NAPL) assessment, and groundwater, surface water, sediment, and sheen sampling on the former MGP site (Parcel 1), north of East Bramlette Road (Parcel 2), and Vaughn Landfill (Parcel 3).

March 1, 2019

- Completed a GPR and EM survey to identify potential subsurface utilities along proposed transects T1 through T15 along the proposed transect locations for the NAPL investigation on the north side of East Bramlette Road (Parcel 2) and Vaughn Landfill (Parcel 3).

March 11 through April 1, 2019

- Completed monitoring well installation and abandonment, NAPL assessment, and groundwater, surface water, and sediment sampling in accordance with RIWP-A. A sample and analysis summary table for all media is provided in **Table 1** (Attachment B).
- A total of 48 soil borings were drilled along transects T1 through T15 and discretionary transect T17 as shown on **Figure 1** (Attachment A) using the rotary sonic method. Three additional discretionary soil borings, RI-SB-1 through RI-SB-3, also were drilled (**Figure 1**, Attachment A) to further characterize the nature and extent of NAPL. During the NAPL assessment, a total of 45 soil samples were collected for analysis of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260 and semi-volatile organic compounds (SVOCs) by EPA Method 8270. Soil samples also were collected for geotechnical and NAPL characterization and mobility analysis.
- Collected surface water samples SW-01 through SW-06 along the perimeter of the Vaughn Landfill at the locations shown on **Figure 1** (Attachment A) for analysis of VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. Surface Water Sampling Logs are provided in Attachment C.
- During drilling on the former landfill area two samples were collected for chemical analysis by Alpha Analytical (Mansfield, Massachusetts). One sample, consisting of NAPL-impacted sands, was collected from a depth of approximately 11-13 feet below ground surface (bgs) at monitoring well MW-3BR. A second sample was collected of tar-like material (TLM) within the bottom of the monitoring well MW-06A during its abandonment; the depth of tar is estimated at 11.5 to 15 feet bgs. The two samples were shipped to Alpha Analytical for the following laboratory analyses:

  - Alkylated polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D-SIM (modified list)

  - Paraffins, isoparaffins, aromatics, naphthenes and olefins (PIANO) VOCs by EPA Method 8260B/5035 High-Resolution

  - Saturated hydrocarbons by EPA Method 8015D (modified list)

- During abandonment of monitoring well MW-06A, TLM with relatively high viscosity was encountered within the well. This tar was recovered for analysis of several basic physical parameters. This tar was sent to PTS Labs (Houston, Texas) for the following analysis:

  - Density/Gravity by ASTM Method D1481 (determination of the density or relative density of petroleum/hydrocarbons and their derivative products)

  - Viscosity by ASTM Method D445 (Standard Test Method for Kinematic Viscosity; three separate temperatures)

- Collected sediment samples SW-01-SED through SW-06-SED from the locations of surface water samples SW-01 through SW-06 (**Figure 1**, Attachment A) for analysis of VOCs by EPA Method 8260 and SVOCs by EPA Method 8270.

- Measured depth to ground water to the nearest 0.01 foot, and determined presence/absence and thickness of NAPL, in all accessible monitoring wells.

- Collected groundwater samples from all accessible monitoring wells for analysis of VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. Groundwater Sampling Logs are provided in Attachment D.

- Installed staff gages RI-SG-1 through RI-SG-3 within the surface water adjacent to the Vaughn Landfill at the locations shown on **Figure 1** (Attachment A).

- Abandoned monitoring wells MW-3D, MW-06A, and MW-19 (**Figure 1**, Attachment A) in accordance with South Carolina Well Standards R. 61-71.

- Completed a GPR and EM survey to identify potential subsurface utilities along discretionary transect T17 and at the locations of discretionary soil borings RI-SB-1 through RI-SB-3 within and on the perimeter of the Vaughn Landfill (Parcel 3).

- Installed and developed monitoring well MW-03BR in the Vaughn Landfill (Parcel 3) adjacent to monitoring wells MW-03 and MW-20.

- Downloaded water level data from December 21, 2018 through April 1, 2019 from transducers/data loggers in monitoring wells MW-13R (shallow), MW-26 (bedrock), MW-27 (saprolite), MW-31S, and MW-31TZ (**Figure 1**, Attachment A).

- Investigation derived waste (IDW) including drill cuttings, decontamination fluids, development water, and purge water were removed from the site by VLS Recovery Services (VLS) for proper off-site disposal. A summary of IDW pickup details, along with the associated manifests, are provided in Attachment E.

Summary of Test and Sampling Results Generated During Reporting Period

A summary of the test and sampling results for work performed during the first quarter (January 1 through March 31, 2019) is provided below:

- Construction details for monitoring wells MW-29S, MW-29TZ, and MW-03BR are listed in **Table 2** (Attachment B). The well permit, boring logs, and Water Well Records (Form 1903) are provided in Attachment D. Water Well Records (Form 1903) for abandonment of monitoring wells MW-3D, MW-06A, and MW-19 are provided in Attachment F.

- Water Well Records (Form 1903) for the 51 soil borings drilled during the NAPL investigation are provided in Attachment G. Soil boring locations are shown on **Figure 1** (Attachment A) along with the observed occurrence of NAPL and/or tar like material (TLM) in the subsurface.

- Water level data are listed in **Table 3** (Attachment B). Groundwater elevations, contours, and inferred flow direction in the shallow aquifer zone are shown on **Figure 2** (Attachment A).

- Analytical data have been reviewed for quality and completeness and approved for release by Pace Analytical. Full data validation in accordance with Section 6 of the September 2018 Quality Assurance Project Plan (QAPP) will be conducted prior to submittal of the Groundwater Remedial Investigation (RI) Report. Quarter 1 2019 analytical results submitted in this progress report include:

    - VOC and SVOC analyses results for groundwater samples - **Table 4** (Attachment B); analytical laboratory reports for groundwater samples are provided in Attachment H.

    - VOC and SVOC analyses results for surface water samples - **Table 5** (Attachment B); analytical laboratory reports for surface water samples are provided in Attachment I.

    - VOC and SVOC analyses results for sediment samples - **Table 6** (Attachment B); analytical laboratory reports for sediment samples are provided in Attachment J.

    - VOC and SVOC analyses for soil samples - **Table 7** (Attachment B); analytical laboratory reports for soil samples are provided in Attachment K.

- Time series hydrographs from December 21, 2018 through March 31, 2019 for water levels in monitoring wells MW-13R (shallow), MW-26 (bedrock), MW-27 (saprolite), which are located on the former MGP site on Parcel 1 (**Figure 1**, Attachment A), and a USGS stream gaging station located downstream of the site are provided in Attachment

L. Time series hydrographs from December 21, 2018 through March 31, 2019 for the water levels in monitoring wells MW-31S, and MW-31TZ, which are located along the Swamp Rabbit Trail near the east bank of the Reedy River (**Figure 1**, Attachment A), and a USGS stream gaging station located downstream of the site also are provided in Attachment J. The river stage fluctuated approximately 5.3 feet during the period of record. Water levels in the monitoring wells located on the former MGP site fluctuated approximately 2.2 feet during the same time period and appear to respond to fluctuations in river stage within one day(s). Water levels in the monitoring wells located along the Swamp Rabbit Trail near the east bank of the Reedy River fluctuated approximately 5.8 feet during the period of record and appear to respond to fluctuations in river stage in less than one day.

Environmental Problems Identified During Reporting Period and Their Resolution

Environmental conditions encountered during implementation of the NAPL Assessment that resulted in variation from the RIWP-A included:

- Soft ground conditions and wet areas eliminated access to Transect T16 which could not be drilled
- NAPL observed in Monitoring Wells MW-03, MW-03D, and MW-20, therefore groundwater samples were not collected for analysis
- Depth of water blocked access to MW-23 and MW-24. Wells MW-23 and MW-24 will be abandoned during a period of sustained dry weather.
- On March 28, 2019, the beaver dam in Parcel 3 at the property boundary was breached resulting in changing site conditions. Once the surface water adjacent to the Vaughn Landfill has stabilized, sheen inspection and sampling will be conducted.

Work to be Performed During the Next Reporting Period (Second Quarter 2019)

The following activities are scheduled to be conducted in accordance with Section 4 of the RIWP-A during the second quarter (April 1 through June 30, 2019). The proposed schedule is subject to change based on weather conditions, site access, availability of subcontractors, and other unforeseen delays. Field work notifications will be provided in accordance with the VCC and access agreements prior to initiating each phase of the work.

- Collect groundwater samples from monitoring well MW-03BR – April 2019
- Slug testing of newly installed monitoring wells MW-29S, MW-29TZ, and MW-03BR – April 2019
- IDW disposal – Upon completion of sampling and slug testing
- Sheen inspection and sampling in surface water on the perimeter of the Vaughn Landfill (Parcel 3) - April 2019

- Survey location and elevation of monitoring wells, staff gages, and soil borings and establish benchmarks for site-specific measurement of the Reedy River stage– April 2019

- Complete geologist logs for the 51 soil borings drilled during the NAPL investigation for inclusion in the next Quarterly Progress Report (Second Quarter 2019) – April 2019

- Tabulate the remaining laboratory data for samples collected during the first quarter of 2019 (including soil samples for chemical and geotechnical analysis and NAPL characterization and mobility samples) for inclusion in the next Quarterly Progress Report (Second Quarter 2019) – May 2019

- Abandon monitoring wells MW-23 and MW-24 in accordance with South Carolina Well Standards R. 61-71(**Figure 1**, Attachment A) – when weather, ground conditions, and surface water extent in the flood plain permit

- Download and monitor water level transducers/data loggers in monitoring wells and Reedy River stage from a United States Geological Survey (USGS) stream gaging station located downstream of the site – Monthly

- Conduct data validation in accordance with Section 6 of the September 2018 QAPP – June 2019

- Initiate preparation of RI Report or additional RIWP-A, as appropriate, based on data collected during implementation of the April 2018 RIWP-A – June 2019

If you have any questions regarding this submittal, please contact me at 980.373.2663 or by email at Richard.Powell2@duke-energy.com.

Sincerely,

Richard E. Powell

Richard E. Powell, P.G.
Senior Environmental Specialist

cc: Kevin Boland, CSXT
Daniel Schmitt, Esq., CSXT
Ty Houck, Greenville County
Todd Plating, SynTerra

Enclosures:

Attachment A – Figures
- Figure 1 – Site Layout Map
- Figure 2 – Shallow Water Level Map

Attachment B – Tables
- Table 1 – Quarter 1 2019 Sample and Analysis Summary
- Table 2 – Construction Details for Newly Installed Monitoring Wells
- Table 3 – Quarter 1 2019 Water Level Data
- Table 4 – Groundwater Analytical Results Summary
- Table 5 – Surface Water Analytical Results Summary
- Table 6 – Sediment Analytical Results Summary
- Table 7 – Soil Analytical Results Summary

Attachment C – Surface Water Sampling Logs

Attachment D – Groundwater Sampling Logs

Attachment E – IDW Pickup Details and Manifests

Attachment F – Monitoring Well Records

Attachment G – DHEC 1903 Forms for Soil Borings

Attachment H – Groundwater Analytical Laboratory Reports

Attachment I – Surface Water Analytical Laboratory Reports

Attachment J – Sediment Analytical Laboratory Reports

Attachment K – Soil Analytical Laboratory Reports

Attachment L – Hydrographs

ATTACHMENT A

FIGURES