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File No. 130623-002

Mr. Jason P. Ericson, P.G.
Director, Environmental
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

Subject: Focused Soil Assessment
Clifton Substation
Clifton, Virginia

Dear Mr. Ericson:

Haley & Aldrich, Inc. (Haley & Aldrich) has completed a focused soil assessment at the Dominion Energy, Inc. (Dominion Energy) Clifton Substation in Clifton, Virginia. As reported in the March 2018 Oil Spill Report prepared by Dominion Energy, a release of mineral oil occurred in January 2018 as a result of an internal electrical failure at transformer #1C. Dominion Energy personnel were onsite when the failure occurred; no oil was observed to have been released from the containment system. This focused soil assessment was conducted to confirm the absence of mineral oil in the shallow soils between the substation and the properties to the east-northeast. The result of this effort as described in detail below provides confirmation of the assessment objective.

FIELD INVESTIGATION ACTIVITIES

Prior to subsurface sampling on 25 June 2018, Accumark, Inc. (a private utility locating company) was contracted to screen the boring locations for the presence of utilities. Hand-auger borings were advanced at four locations (SS-1, SS-2, SS-3 and SS-4) as shown on Figure 1. The depth of the hand-auger borings was to be five feet below ground surface (ft bgs) or the depth at refusal, if the auger could not be further advanced to the target depth. Boring location SS-1 was advanced to 5.0 feet bgs. Stones and other fill material were encountered in the subsurface at the remaining three locations which were located at the bottom of a man-made slope and near a stream bed. The Haley & Aldrich field geologist attempted several hand auger borings at each sampling location and encountered refusal at varying depths in borings SS-2, SS-3, and SS-4. As outlined in Table 1, the final depths for borings SS-2, SS-3 and SS-4 were 1.25 ft bgs, 2.0 ft bgs, and 1.0 ft bgs, respectively.

During the sampling activities, the Haley & Aldrich field geologist observed the soils at one-foot intervals for signs of staining and screened them with a photoionization detector readings (PID). No visible signs of staining or contamination were observed in any of the soil samples recovered. PID readings ranged from 1.0 to 2.0 parts per million (ppm) at all boring locations. Given that there were no visible signs of contamination and PID readings were consistent with background, a soil sample was collected from the

terminal depth of each boring and placed in laboratory-provided bottleware. The soil samples were shipped on ice to REI Consultants, Inc. (a division of Pace Analytical) (VELAP ID 460148) for the analysis of total hydrocarbons (TPH) by a gas chromatography-flame ionization detector (GC-FID) method (e.g., EPA Method 8015). The samples were quantified for two carbon ranges of hydrocarbons: TPH-Diesel Range Organics (DRO) (C10-C28) and TPH-Oil Range Organics (ORO) (C22-C36). At the completion of sampling, each of the hand-auger locations were backfilled with remaining soil.

DATA EVALUATION AND CHROMATOGRAPH COMPARISON

Upon receipt of the laboratory analytical results, the data were validated in accordance with the United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Data Review (USEPA, 2017). The results presented in the laboratory analytical report were found to be compliant with project data quality objectives and to be useable data. The laboratory analytical report and data validation report are provided in Attachment A and the tabulated data are provided in Table 2. In addition, gas chromatographs of the samples and a mineral oil standard were provided as part of the analysis and are included in Attachment A. As indicated in Table 2, no TPH constituents were detected in samples SS-1 or SS-3. Sample SS-2 exhibited a TPH-ORO concentration of 21.4 mg/kg and sample SS-4 exhibited an even lower TPH-ORO concentration of 9 mg/kg.

Comparison of the gas chromatograph fingerprints of the dielectric mineral oil standard and the SS-2 and SS-4 samples indicates that the hydrocarbon content detected in SS-2 and SS-4 is not mineral oil. If mineral oil was present, the gas chromatograph fingerprints would be represented by a Gaussian-shaped hump similar to what is shown in the mineral oil standard. Additionally, the carbon range for mineral oil is generally limited to C12 to C24 (in the TPH-DRO), where results of the four samples are non-detect (ND). The gas chromatograph fingerprints of SS-2 and SS-4 do not show any type of petroleum product. The TPH-ORO hydrocarbons detected in the SS-2 and SS-4 samples are likely natural hydrocarbon residual (e.g., leaf litter). Petroleum product, including mineral oil, is not evident in any of the four soil samples.

ANALYTICAL DATA

The USEPA Regional Screening Level (RSL) table and Virginia Department of Environmental Quality (VDEQ) Voluntary Remediation Program (VRP) screening tables present screening values that are protective of human health for various TPH ranges. Based on the carbon range for the TPH-DRO analysis (C10-C28), the TPH-Medium Aliphatic (defined by the USEPA RSL User's Guide as C9-C18) screening values were used for comparison. Based on the carbon range for the TPH-ORO analysis (C22-C36), the TPH-High Aliphatic (defined by the USEPA RSL User's Guide as C19-C32) screening values were used for comparison.

Table 2 presents the comparison of the TPH-DRO and TPH-ORO analytical results to the applicable direct-contact USEPA Industrial and Residential Soil RSLs and the VDEQ VRP Tier III Industrial Soil Screening Levels. The VDEQ VRP Tier II Residential Soil Screening Levels do not apply as those values are based on values derived from the USEPA Soil Screening Level (SSL) guidance for transfer from soil to air or groundwater. As indicated in Table 2, Sample SS-2 exhibited a TPH-ORO concentration of 21.4 mg/kg

which is more than 1,000 times lower than the USEPA Residential Soil RSL (23,000 mg/kg) and 150,000 times lower than the USEPA and VDEQ VRP industrial screening values (350,000 mg/kg). Sample SS-4 exhibited an even lower TPH-ORO concentration of 9 mg/kg. The detections are also significantly less than 100 mg/kg, which is the level that the VDEQ considers an indication of a release.

CONCLUSIONS

Petroleum product, including mineral oil, is not evident in any of the four soil samples. The analytical results for soil samples SS-1 and SS-3 indicate no hydrocarbon detections in the TPH-DRO or TPH-ORO range. While analytical results for soil samples SS-2 and SS-4 indicated low-level detections of hydrocarbons in the TPH-ORO range, comparison of the sample chromatograms to that of mineral oil typically used in electrical equipment indicated that the hydrocarbon detected in samples SS-2 and SS-4 is unrelated to any type of petroleum product. Even so, the results were well below applicable USEPA/VDEQ screening levels and the VDEQ reporting level that are protective of both industrial and residential receptors.

We appreciate the opportunity to provide environmental consulting services on this project. Please do not hesitate to contact the undersigned at 804-467-8572 or mbennett@haleyaldrich.com should you have any questions or require additional information.

Sincerely yours,
HALEY & ALDRICH, INC.



Montgomery S. Bennett, P.G., RSM
Senior Client Leader

Tables:

- Table 1 – Soil Boring Summary
- Table 2 – Summary of Soil Analytical Results

Figures:

- Figure 1 – Soil Sample Location Map

Attachments:

- Attachment A – Laboratory Analytical Report and Data Validation Report