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Aug. 19, 2022

Mr. Greg Cassidy
South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
Division of Site Assessment, Remediation & Revitalization
State Voluntary Cleanup Section
2600 Bull Street
Columbia, SC 29201

Subject: Feasibility Study Work Plan
Former Bramlette Manufactured Gas Plant
400 East Bramlette Road, Greenville SC
VCC 16-5857-RP

Dear Mr. Cassidy:

Per your letter dated August 10, 2022, please find enclosed two hard copies and one electronic copy on compact disk of the Feasibility Study Work Plan. Duke Energy looks forward to engaging community stakeholders as we evaluate remediation options and implementation schedule. If you have any questions, please contact me at (980) 373-2663 or at Richard.powell2@duke-energy.com.

Sincerely,

Richard E. Powell

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

cc: Kevin Boland, CSXT
Daniel Schmitt, Esq., CSXT
Ty Houck, Greenville County
William W. Brown, Legacy School Properties, LLC

Geosyntec consultants

engineers | scientists | innovators

DUKE ENERGY CAROLINAS

FOCUSED FEASIBILITY STUDY WORK PLAN

FORMER BRAMLETTE MGP SITE

East Bramlett Road, Greenville, South Carolina

VCC 16-5857-RP

Prepared for

Duke Energy Carolinas, LLC
526 South Church St.
Charlotte, North Carolina 28202

Prepared by

Geosyntec Consultants, Inc.
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Project FR7559B

19 August 2022

EXECUTIVE SUMMARY

This Focused Feasibility Study (FFS) Work Plan has been developed on behalf of Duke Energy Carolinas, LLC (Duke Energy) for the Former Bramlette Manufactured Gas Plant (MGP) (the Site). The Site is in Greenville, Greenville County, South Carolina and is comprised of five parcels and a portion of the Legacy Charter School property that total approximately 35 acres in area.

In 2016, Duke Energy entered into a Voluntary Cleanup Contract 16-5857-RP (VCC) with the South Carolina Department of Health and Environmental Control (SCDHEC) to complete a remedial investigation (RI) of the Site. The VCC defines the Site as five parcels, however a portion of the Legacy Charter School property was added due to additional discoveries made during the remedial investigation (RI) as shown on **Figure 1**. The specific parcels are listed in **Table 1** of this report. Prior remediation occurred in 2001 and 2002 when Parcel 1 underwent remedial activities to remove impacted soils from the area of former MGP operations.

The Remedial Investigation Report (RIR) and RIR Addendum (RIR-A), both prepared by SynTerra Corporation, have been submitted to and approved by SCDHEC on September 1, 2020 and January 27, 2022, respectively. The parcels for evaluation in the FFS are grouped together due to similar features, constituents of concern (COCs), and proposed paths forward for closure. Broadly, the parcel-specific findings of the remedial investigation included:

- **Parcels 1 and 2** - Soil impacts above comparative screening criteria remain after remediation activities in 2001-2002 and are limited to former drainage ditches and a small area on Parcel 2 along East Bramlett Road. COCs for soil on Parcels 1 and 2 include visually observed NAPL and polycyclic aromatic hydrocarbons (PAHs) exceeding residential screening criteria and observed NAPL and TLM. Soil results do not exceed current industrial/commercial screening levels, and the parcels are currently zoned for industrial/commercial use. Groundwater within the shallow and transition zones aquifers contain dissolved benzene and naphthalene in excess of comparative screening criteria.

- **Parcel 3** - Soils and sediment, including a portion of the Legacy Charter School Property, contain impacts in the form of sorbed volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), and visually observed free-phase NAPL and TLM. NAPL and TLM are present within the wetland and historical drainage features. Groundwater within the shallow aquifer, transition zone and bedrock zone contain dissolved benzene and naphthalene at concentrations exceeding comparative screening criteria.

- **Parcels 4 and 5** - NAPL and TLM were identified in soils and sediments at thicknesses exceeding 4.5 feet, exclusively constrained to the drainage ditch. VOCs and SVOCs are present sorbed to soils and sediments at concentrations exceeding comparative screening criteria.

The FFS will be conducted in general accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA, 1988). This FFS Work Plan proposes grouping the Site by similar parcels for soil and sediment and flow zones for groundwater and identifying remedial alternatives for each. The alternatives for each are presented below. Additionally, "No Further Action" and monitored natural attenuation (MNA) with land use controls (LUCs) are alternatives that will be considered for each parcel grouping/flow zone:

- Soil and Sediment
    - Parcels 1 and 2
        - Targeted Excavation with LUCs
    - Parcel 3
        - Excavation and LUCs
        - Onsite Encapsulation and LUCs
        - Selective Excavation, Onsite Encapsulation and LUCs
        - In-situ Stabilization and Encapsulation and LUCs
    - Parcels 4 and 5
        - Excavation
        - In-situ Stabilization
- Groundwater
    - Shallow and Transition Zone
        - Hydraulic Control
        - Pump and Treat
        - In-Situ Chemical Oxidation
        - In-Situ Bioremediation

The proposed remedial actions for evaluation in the FFS will seek to achieve the following remedial action objectives (RAOs):

- **RAO 1:** Prevent contact with on-Site soils and sediments containing observable NAPL, TLM, or sorbed COCs exceeding risk-based levels, and restore to unrestricted use where practicable.
- **RAO 2:** Prevent ingestion and/or contact with Site groundwater or surface water containing COCs in excess of applicable maximum contaminant levels (MCLs) or risk-based standards.
- **RAO 3:** Prevent impacted Site sediments, soil, and/or groundwater containing COCs from impacting on-Site surface water and the Reedy River in excess of applicable MCLs or risk-based standards.

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ACRONYMS AND ABBREVIATIONS

ARARs	applicable or relevant and appropriate requirements
bls	below land surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COC	constituent of concern
CSX	CSX Transportation
C&D	construction and demolition

FFS	focused feasibility study
ft	feet
ISB	in situ bioremediation
ISCO	in situ chemical oxidation
ISS	in situ stabilization
LTM	long-term monitoring
LUC	land use control
MCL	maximum contaminant level
MGP	manufactured gas plant
MNA	monitored natural attenuation
NAPL	non-aqueous phase liquid
NCP	National Contingency Plan
NFA	No Further Action
O&M	operation and maintenance
PAHs	polycyclic aromatic hydrocarbons
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RIR	remedial investigation report
RIR-A	remedial investigation report addendum
RSL	regional screening level
RSV	refinement screening value
SCDHEC	South Carolina Department of Health and Environmental Control
SVOC	semi-volatile organic compound
TBC	to be considered
TLM	tar-like material
USEPA	United State Environmental Protection Agency
VOC	volatile organic compound
VCC	voluntary cleanup contract

1. INTRODUCTION

1.1 Scope and Objectives

This Focused Feasibility Study (FFS) Work Plan has been prepared on behalf of Duke Energy (Duke) by Geosyntec Consultants (Geosyntec) to propose remedial alternatives to be evaluated for the Former Bramlette Manufactured Gas Plant (MGP) located in Greenville, South Carolina (the Site). The FFS will focus on remedies that address impacts resulting from historic Site operations associated with the MGP which were identified in the Remedial Investigation Report (RIR) (SynTerra, 2020) and Remedial Investigation Report Addendum (RIR-A) (SynTerra, 2021).

1.2 Report Organization

This FFS Work Plan is organized as follows:

- Section 1 describes the scope and objectives, the report organization, and the regulatory setting.
- Section 2 summarizes the relevant Site background.
- Section 3 describes the FFS approach.
- Section 4 describes the FFS evaluation criteria.
- Section 5 identifies and summarizes the potential Remedial Alternatives that are proposed for further evaluation.
- Section 6 provides a project schedule.
- Section 7 provides references.

1.3 Regulatory Setting

Remediation efforts for the Site are regulated by the South Carolina Department of Health and Environmental Control (SCDHEC) under the Voluntary Cleanup Contract (VCC) between SCDHEC and Duke Energy (VCC 16-5857-RP), executed on July 29, 2016.

The FFS will be required as follow-on work to the RIR (SynTerra, 2020) and RIR-A (SynTerra, 2021) to evaluate remedial alternatives for the Site. This FFS Work Plan has been prepared to introduce the remedial alternatives intended to address soil, sediment, groundwater, and surface water impacts at the Site and the method by which those alternatives will be evaluated.

2. BACKGROUND

2.1 General Site Information

The Site setting and history have been covered extensively in prior Site documents such as the RIR (SynTerra, 2020) and RIR-A (SynTerra, 2021). Details of select Site features and history that are important to the development of this FFS Work Plan are summarized in subsections 2.1.1 and 2.1.2.

2.1.1 Site Description

The Site as defined by the VCC is comprised of five parcels (Parcels 1 through 5) and a portion of the Legacy Charter Elementary School property that total approximately 35 acres in area. The boundary of the Site includes the western edge of the Legacy Charter Elementary School parking lot based on the results of the RI (**Figure 1**) (SynTerra, 2021). A breakdown of Site parcels is provided in **Table 1**. For the purposes of the FFS proposed herein and anticipated remedial options for the Site, Parcel 3 is separated into "Parcel 3 East" and "Parcel 3 West". Parcel 3 East encompasses the portion of the Legacy Charter School property, including the adjacent wetland to the west between the Charter School building and Vaughn Landfill. Parcel 3 West encompasses the majority of Vaughn Landfill and the wetland to the west of Vaughn Landfill and extending westward to the CSX Transportation (CSX) right-of-way to encompass the CSX field office and active railway operations. Parcel 3 is bounded to the North and South by Parcels 2 and 4, respectively. A portion of the southern toe of Vaughn landfill is considered a part of Parcel 4 (**Figure 1**).

Table 1. Site Parcels

Tax Map Serial Number	Parcel ID	Land Use
140000300300	Parcel 1	Vacant lot and location of former MGP operations
140000300200	Parcel 2	Active rail operations, location of a former asphalt manufacturing plant, and debris pile
The wetland portion of 0138000100300	Parcel 3 East (the wetland portion of Legacy Charter School Property)	The jurisdictional wetland adjacent to Vaughn Landfill and a portion of the Legacy Charter School.
138000100100	Parcel 3 West	Vaughn Landfill, the jurisdictional wetland adjacent to Vaughn Landfill to the west, active rail operations and location of CSX field office, and numerous sewer lines and access manways
54000300100	Parcel 4	Jurisdictional wetland; vacant lot
54000600100	Parcel 5	Jurisdictional wetland; vacant lot

2.1.2 Site History

The MGP on Parcel 1 operated from 1917 to 1952. A series of ditches, starting on Parcel 1 likely conveyed wastewater effluent from MGP operations westward to Parcel 2 where it flowed through another ditch heading south beneath East Bramlett Road to Parcel 3, and ultimately to Parcel 4, Parcel 5 and the Reedy River.

Vaughn Landfill, an unpermitted construction and demolition (C&D) debris landfill, received C&D waste from 1988 to 1994 and is approximately 7 acres in size. It is centrally located within Parcel 3 and materials within it "overlie impacted soil, sediment, and groundwater on Parcel 3" (SynTerra, 2021).

From 2001 to 2002, Duke Energy remediated 61,088 tons of contaminated soil and debris, primarily contained to former MGP manufacturing and process areas on Parcel 1. Approximately 33,926 tons of thermally treated material was returned to the Site for use as backfill after treatment. This remedial effort included successful removal of approximately 350 cubic yards of tar mixed with bricks and other debris, as well as approximately 2,500 gallons of free liquid tar. Additionally, that effort reduced human health risk and ecological risk to acceptable levels per land use (industrial and/or commercial) (SynTerra, 2020).

Subsequent to the removal action in 2001-2002, Duke Energy entered into the VCC with SCDHEC in 2016 and has undertaken a RI spanning from 2016 to 2020 which was documented in the June 2020 RIR (SynTerra, 2020). Additional follow-on work for the RI was completed in 2020 to 2021 and memorialized in the RIR-A (SynTerra, 2021).

3. FEASIBILITY STUDY APPROACH

The FFS proposed herein will be conducted in general accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA)* (USEPA, 1988a). United States Environmental Protection Agency (USEPA) guidance provides a transparent, stepwise approach to identify and evaluate remedial options.

The FFS will refine constituents of concern (COCs), remedial action objectives (RAOs), and remediation goals. Proposed COCs, RAOs, and remedial goals are presented in this section as a starting point which may be refined as the FFS is developed. In order to focus future remedial actions, separate COCs are presented for impacted soils and sediments for Parcels 1 and 2, Parcel 3 and Parcels 4 and 5, respectively. Groundwater impacts are not grouped by parcel but will be addressed by aquifer zone with the FFS focusing on the shallow and transition flow zones.

3.1 Groupings by Site Parcels and Media

The sediment and soil Site parcels will be grouped as follows to focus the upcoming FFS:

- **Parcels 1 and 2** – The portion of the Site north of East Bramlett Road;
- **Parcel 3** – Including the portion of the Legacy Charter School property, Vaughn Landfill, and associated CSX property; and
- **Parcels 4 and 5** – The wetlands and historical drainage ditch area south of Parcel 3 which eventually crosses underneath the railroad tracks discharges via an outfall to the Reedy River.

Groundwater comprising the shallow and transition flow zones (approximately 4 feet [ft] below land surface [bls] to 40 ft bls) will be assessed as one unit within the scope of the FFS. Dependent upon seasonal groundwater level fluctuations, the shallow zone water table can intercept the land surface within the wetland areas of the Site. Groundwater contamination within the deeper fractured bedrock (greater than 50 ft bls) will be addressed separately pending additional, ongoing characterization efforts.

COCs for (i) soil/sediment by parcel groups; (ii) surface water; and (iii) groundwater zones are summarized in Section 3.2. The RAOs for the Site are summarized in Section 3.3.

3.2 Constituents of Concern

COCs, grouped by their associated soil and sediment parcels (Parcels 1 and 2, Parcel 3, Parcels 4 and 5) or groundwater zones (shallow zone, and transition and bedrock zones) are provided in Subsections 3.2.1 through 3.2.3.

3.2.1 Soil and Sediment by Parcel Groups

COCs for soil and sediment in Parcels 1 and 2, Parcel 3, and Parcels 4 and 5 are discussed herein. The breakdown of Site-specific COCs by parcel group for soil and sediment are provided in **Table 2** and **Table 3**, respectively. Non-aqueous phase liquid (NAPL) and tar-like material (TLM) are present within historical drainage features, the Legacy Charter School property, and Vaughn Landfill as shown on **Figure 2**.

3.2.1.1 Parcel 1 and Parcel 2

Parcels 1 and 2 have undergone prior remediation in 2001-2002 through the removal of MGP impacted soils and debris. Some soil impacts above residential screening levels remain and are limited to former drainage ditches and a small area on Parcel 2 along East Bramlett Road. COCs for soil on Parcels 1 and 2 include polycyclic aromatic hydrocarbons (PAHs) with concentrations that exceed residential screening criteria and observed NAPL and TLM. The promulgated standards for soil are the USEPA industrial and residential regional screening levels (RSLs [1]).

3.2.1.2 Parcel 3 (East and West)

Parcel 3 sediments, including the portion of the Legacy Charter School Property, contain impacts in the form of sorbed COCs, and free-phase NAPL and TLM. VOCs and SVOCs are present sorbed to sediments with concentrations that exceed the USEPA Region 4 Sediment refinement screening value (USEPA R4 Sediment RSV).

3.2.1.3 Parcels 4 and 5

Parcels 4 and 5 are defined by the drainage ditch that enters Parcel 4 from Parcel 3 and exits Parcel 5 through the outfall to Reedy River which crosses the railroad tracks at the southern end of Parcel 5. Environmental impacts within Parcels 4 and 5 are limited to sediment with COCs exceeding the USEPA R4 Sediment RSV, and observations of NAPL and TLM. NAPL and TLM were identified in sediments within Parcel 4 and 5 at thicknesses exceeding 4.5 feet, exclusively constrained to the drainage ditch.

3.2.2 Shallow and Transition Zone Groundwater

For the purpose of this FFS Work Plan, groundwater COCs will be evaluated for the shallow and transition flow zones collectively. A fractured bedrock flow zone exists beneath the transition zone but characterization of the fractured bedrock is not yet completed and therefore will not be addressed in the forthcoming FFS.

Shallow and transition zone groundwater includes from the water table to the top of the fractured bedrock zone, which includes the fill, alluvium (unconsolidated sand and gravel), saprolite, and partially weathered rock stratigraphic units. COCs for the shallow and transition zones are benzene, naphthalene, and benzo(a)pyrene, and toluene which are detected in groundwater exceeding the SCDHEC MCL - *SCDHEC R. 61-58 State Primary Drinking Water Standards, effective October 2014, Appendix B* maximum contaminant level (MCL). NAPL and TLM are also COCs because they were noted to be present in measurable accumulation within select shallow zone monitoring wells during the RI.

3.2.3 Surface Water

Benzo(a)pyrene was the only constituent detected above screening levels in surface water at the Site at a sampling location on Parcel 3 (SW-5). The promulgated standard for benzo(a)pyrene is the EPA-established MCL. Historically, surface water at the Site has not contained COCs at concentrations above their respective screening levels.

[1] USEPA Generic RSLs (November 2021) provided at: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

3.3 Remedial Action Objectives

The RAOs are levels that, when reached, will result in adequate protection of human health and the environment. The RAOs are selected for the Site as a whole and are expected to be obtained when the COCs identified for each parcel in Section 3.2 meet their remedial goals.

- **RAO 1:** Prevent contact with on-Site soils and sediments containing observable NAPL, TLM, or sorbed COCs exceeding risk-based levels, and restore to the parcels to unrestricted use where practicable.
- **RAO 2:** Prevent ingestion and/or contact with Site groundwater or surface water containing COCs in excess of applicable MCLs or risk-based standards and restore the groundwater to unrestricted use where practicable.
- **RAO 3:** Prevent impacted Site sediments, soil, and/or groundwater containing COCs from impacting on-Site surface water and the Reedy River in excess of applicable MCLs or risk-based standards.

3.4 Remediation Goals

Remediation goals are medium-specific and COC-specific values which are a component of the RAOs that are meant to provide an objective metric for when an RAO has been reached. The proposed remediation goals for Site media are presented in **Tables 2, 3, and 4** for soil, sediment, and groundwater, respectively. The goal is to restore soils and sediments to promulgated residential standards, remove NAPL and TLM, and restore groundwater to the appropriate MCL or concentration promulgated by SCDHEC if no MCL is available (e.g., naphthalene).

The COCs in soils and sediment are limited to VOCs, SVOCs, and NAPL/TLM. The sorbed VOCs and SVOCs are largely individual PAHs, with some exceptions (i.e., phenolics and trimethylbenzenes, which are specific to sediments only). NAPL and TLM are expected to have a visual cleanup goal, not a concentration-based goal. Target compounds in groundwater are limited to SVOCs and VOCs, namely benzene and naphthalene.

3.5 Development of Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA (enacted in 1980, and as amended in 1986) requires that unless there is a waiver, remedial actions must usually comply with requirements or standards set forth under federal and state environmental requirements if they are applicable or relevant and appropriate requirements (ARARs) for the Site and associated remedial activities. The FFS will include a list of ARARs for the Site.

In addition to ARARs, there are also criteria, guidance, and proposed standards developed by federal, state, and local environmental and public health programs that are not legally binding, but that may provide useful information or recommended procedures (USEPA, 1988a). These "to be considered" (TBC) factors are not potential ARARs because they are neither promulgated nor enforceable but are reviewed along with ARARs and considered when setting RAOs.

Potential ARARs may be classified as either "applicable" or "relevant and appropriate." Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state

law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar that their use is well suited to the particular site.

Three (3) types of ARARs will be developed in the FFS to further clarify how to identify and comply with environmental requirements: chemical-specific, action-specific, and location-specific.

- Chemical-specific ARARs are concentration limits in the environment promulgated by government agencies. CERCLA regulations require that development, where possible, of health-based, site-specific levels for chemical or media where such limits do not exist and there is a concern with their potential health or environmental impacts.

- Action-specific ARARs set controls or restriction on the design, performance, and other aspects of implementation of specific remedial activities. Examples include Resource Conservation and Recovery Act (RCRA) regulations for offsite disposal of hazardous materials and the Clean Water Act standards for discharge of treated groundwater.

- Location-specific ARARs must consider federal, state, and local requirements that reflect the physiographical and environmental characteristics of the site or the immediate area. Remedial actions may be restricted or precluded depending on the location or characteristic of the site and the resulting requirements.

4. FEASIBILITY STUDY EVALUATION CRITERIA

USEPA guidance provides nine criteria, divided amongst three broader categories, to consider when screening remedial alternatives: threshold, balancing, and modifying criteria (USEPA, 1988b). The nine criteria and their associated categories are presented below:

4.1 Threshold Criteria

- *Overall Protection of Human Health and the Environment*. The assessment for this criterion describes how each alternative achieves and maintains adequate protection of human health and the environment.
- *Compliance with ARARs*. The assessment for this criterion describes how each alternative complies with potential federal and state ARARs. In addition, the assessment addresses other information from advisories, criteria, and guidance that may be applicable to the Site.

4.2 Balancing Criteria

- *Long-term Effectiveness and Permanence*. The assessment for this criterion evaluates the long-term effectiveness of alternatives in maintaining protection of human health and the environment after response objectives have been met.
- *Reduction of Toxicity, Mobility, and Volume through Treatment*. The assessment for this criterion evaluates the alternative with respect to how well it can permanently and significantly reduce toxicity, mobility, and/or volume of impacted media.
- *Short-term Effectiveness*. The assessment for this criterion evaluates the alternative with respect to its effects on human health and the environment during construction and implementation of the remedial action.
- *Implementability*. The assessment for this criterion evaluates the technical and administrative feasibility of each alternative and the availability of materials and services required during its implementation.
- *Cost*. This assessment evaluates estimated capital and operation and maintenance (O&M) costs of each alternative.

4.3 Modifying Criteria

- *State Acceptance*. This criterion pertains to the potential technical and administrative issues and concerns the state may have regarding each alternative.
- *Community Acceptance*. This criterion pertains to the potential issues and concerns the public may have regarding each of the alternatives.

5. IDENTIFICATION OF SOIL AND SEDIMENT REMEDIAL ALTERNATIVES

The following remedial alternatives for each parcel group are retained for detailed analysis in the FFS. The remedial alternatives proposed for each parcel grouping are specific to the COCs in each area, but all serve the end goal which is to meet the RAOs. All parcel groups will evaluate the "No Action" alternative, and the other remedies proposed for evaluation will likely contain a land use controls (LUCs) component. During the development of the FFS, remedial alternatives may be grouped to create a more optimal remedial scenario.

5.1 No Further Action

The "No Further Action" alternative leaves the Site "as-is" with no provision for future monitoring or land use restrictions. This alternative is evaluated in order to provide a baseline for comparison of other remediation alternatives. Evaluation of the "No Further Action" alternative is required under the National Contingency Plan (NCP) (USEPA, 1992).

5.2 Land Use Controls

LUCs, typically in the form of deed restrictions or environmental covenants, are a necessary component of a remedy when material above health or risk-based levels is left in-place. LUCs are institutional or administrative measures that govern future development (e.g., soil disturbances) at the Site.

5.3 Parcels 1 and 2

In addition to "No Further Action" and "LUC" alternatives discussed in Sections 5.1 and 5.2, targeted excavation with LUCs will be evaluated for Parcels 1 and 2. The goal of the remedy for soils and sediment in Parcels 1 and 2 is to return them to unrestricted (residential) use.

To achieve the unrestricted (residential) end-use scenario, the soil hotspots exceeding residential risk standards will be delineated and targeted for excavation and off-Site disposal. Clean fill will be used for backfilling. Exposure to contaminated soils and sediments left in place above risk-based criteria will be addressed through LUCs.

5.4 Parcel 3

In addition to "No Further Action" and "LUC" alternatives discussed in Sections 5.1 and 5.2, the following remedial alternative(s) will be evaluated for Parcel 3. The remedial action for Parcel 3 may be separated into distinct actions for Parcel 3 East and Parcel 3 West depending on the development or implementation of any interim remedial actions for the Legacy Charter School Property.

5.4.1 Excavation

Under this scenario, the areas with observed NAPL and TLM, and COC-impacted soils, including the entirety of Vaughn Landfill, will be excavated for disposal. Clean fill will be brought in for backfilling. This scenario can result in complete removal of TLM impacted soils and sediments. It is likely that LUCs should only be required for the impacted groundwater. Excavated wetland areas and the entire area of Vaughn Landfill will be replanted and restored.

5.4.2 On-Site Containment and Selective Excavation and LUCs

Under this scenario, a containment barrier will be installed around targeted areas with observed NAPL and TLM. Areas outside the containment barrier with COC-impacted soils and/or NAPL and TLM will be excavated and disposed of off-Site. Clean fill will be brought in to restore the excavated wetlands. The containment area will be covered by a low permeability engineered cap to limit rainfall infiltration. LUCs will be put in place to manage future work in or around the engineered cap and impacted soils and sediments that are left in place.

5.4.3 In-situ Stabilization and LUCs

Under this scenario, targeted areas with observed NAPL and TLM will be stabilized and/or encapsulated using in situ stabilization (ISS). ISS typically involves adding a stabilizer to the soil (e.g., Portland cement) which binds COCs within the soil matrix and reduces hydraulic conductivity to minimize COC leaching to groundwater. The swell from ISS will be excavated and disposed off-Site prior to restoring the wetlands. This remedial technology may be combined with excavation and/or on-Site containment.

5.5 Parcels 4 and 5

In addition to "No Further Action" and "LUC" alternatives discussed in sections 5.1 and 5.2, the alternatives for Parcels 4 and 5 account for excavation of the ditch and concrete lining a portion of the outfall ditch to the Reedy River (which was completed as an interim measure along with a series of check dams in 2021). NAPL and TLM on Parcels 4 and 5 are limited to the sediments within current and historical drainage features.

5.5.1 Excavation

Under this scenario, sediments with observed NAPL and TLM within the ditch will be excavated and disposed of off-Site. This scenario can result in "clean closure" of both Parcels 4 and 5. Sediment management controls (e.g., rip rap or sediment traps) will be installed within drainage ditches to further minimize potential sediment transport toward the Reedy River.

5.5.2 In-situ Stabilization and LUCs

Under this scenario, sediments with observed NAPL and TLM will be stabilized using ISS to minimize leaching to surface water and groundwater. Sediment management controls will be installed within drainage ditches to minimize sediment transport toward the Reedy River.

6. IDENTIFICATION OF SURFACE WATER AND GROUNDWATER REMEDIAL ALTERNATIVES

The following remedial alternatives for COCs present in the shallow and transition groundwater zones and surface water discussed in Sections 3.2.2 and 3.2.3, respectively, are retained for detailed analysis in the FFS. The remedial alternatives proposed for each parcel grouping are specific to the COCs in each area, but all serve the end goal which is to meet the RAOs. All parcel groups will evaluate the "No Further Action" alternative, and the other remedies proposed for evaluation will all contain a monitored natural attenuation (MNA) and LUCs component. **Figure 3** and **Figure 4** illustrate the extents of benzene within the shallow and transitions flow zones, respectively. **Figure 5** and **Figure 6** illustrate the extents of naphthalene within the shallow and transition flow zones, respectively.

6.1 No Further Action

The "No Further Action" alternative leaves the Site "as-is" with no provision for future monitoring or land use restrictions. This alternative is evaluated in order to provide a baseline for comparison of other remediation alternatives. Evaluation of the "No Further Action" alternative is required under the NCP (USEPA, 1992).

6.2 Monitored Natural Attenuation and Land Use Controls

Natural attenuation relies on natural processes to decrease or "attenuate" concentrations of contaminants in groundwater. The presence of COC concentrations in groundwater exceeding health and risk-based standards and the observation of NAPL in select monitoring wells indicates that a combination of groundwater monitoring and land use controls will be a component for all groundwater remedial alternatives, except for "No Further Action". MNA requires the establishment of a long-term monitoring (LTM) network to evaluate the geochemistry, COC concentrations, and other potential indicators of COC degradation (e.g., microbial assays). A groundwater monitoring plan will be developed, which specifies sampling frequency and analytical suites, to understand if COC concentrations remain stable, or increase/decrease following the implementation of the soil/sediment remedy implementation. LUCs, typically in the form of deed restrictions or environmental covenants, are a necessary component of a remedy when groundwater above health or risk-based levels or NAPL is left in-place. LUCs are institutional or administrative measures that govern future development and/or groundwater use at the Site.

6.3 Surface Water

Impacts to surface water are minimal with only one sample to date exhibiting a COC with a concentration in excess of screening criteria. Impacts to surface water are expected to be addressed through MNA following the successful remediation of source material in soil, sediment, and groundwater.

6.4 Shallow and Transition Groundwater Zones

In addition to "No Further Action" and "MNA and LUC" alternatives discussed in Sections 6.1 and 6.2. The following remedial alternative(s) will be evaluated for the shallow and transition groundwater zones.

6.4.1 Hydraulic Control

Under this scenario, hydraulic control measures will be evaluated (pumping and/or TreeWells™) to induce a hydraulic gradient that restricts COC migration. The need for treatment of extracted groundwater and any discharge permits will be evaluated. Hydraulic control of the shallow zone may complement some containment approaches for impacted soils and sediments discussed in Section 5. Hydraulic control will be coupled with MNA within the capture zone to monitor contaminant degradation.

6.4.2 Pump and Treat

Under this scenario, a series of extraction wells will be installed within the shallow and transition zones with the purpose of removing contaminated groundwater and treating it in-situ or ex-situ prior to discharge. Groundwater treatment options will be evaluated for the anticipated flow rate and COC concentrations. Unlike hydraulic control discussed above, the purpose of a pump and treat system is to remove contaminant mass, while also imparting a degree of hydraulic control via pumping.

6.4.3 In-Situ Chemical Oxidation

Under this scenario, a conceptual in situ chemical oxidation (ISCO) approach will be developed for the shallow zone groundwater. The ISCO approach will evaluate the applicability of commercially available regents to oxidize Site COCs along with implementation approaches to reduce concentrations to below promulgated standards. MNA may be required for select areas following implementation to monitor effectiveness towards achieving remedial goals. Under this scenario, LUCs for groundwater are not anticipated.

6.4.4 In-Situ Bioremediation

Under this scenario, a conceptual in situ bioremediation (ISB) approach will be developed for the shallow zone groundwater. The ISB approach will evaluate the applicability of commercially available microbial cultures and amendments along with implementation approaches to reduce COC concentrations to below MCLs. Recent advances in bioremediation research have identified innovative microbial cultures that anaerobically degrade benzene (and potentially other COCs), in addition to known aerobic degradation pathways for benzene and naphthalene. Additional monitoring following implementation may be required for select areas to monitor effectiveness towards remedial goals.

7. SCHEDULE

Duke Energy is prepared to begin implementation of this FFS Work Plan within one week of receiving SCDHEC approval. The FFS will be prepared for SCDHEC review and approval within 120 days. Based on the detailed information and comparative analyses that will be provided in the FFS, SCDHEC will formally make the final remedy selection, following input from the community and/or other stakeholders. It is anticipated that final remedy selection will be made in 2023.

8. REFERENCES

SynTerra Corporation. 2020. “Remedial Investigation Report”. June 2020.

SynTerra Corporation. 2021. “Remedial Investigation Report Addendum”. July 2021.

U.S. Environmental Protection Agency (USEPA), 1988a. CERCLA Compliance with Other Laws Manual: Interim Final, May 1988.

U.S. Environmental Protection Agency. 1988b. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, October 1988.

U.S. Environmental Protection Agency. 1992. National Oil and Hazardous Substances Pollution Contingency Plan (The NCP), January 1992.

TABLES

Table 2: Soil Remediation Targets by Parcel
Former Bramlette MGP Site
Greenville, SC

Analyte	USEPA RSL Industrial Soil (mg/kg)	USEPA RSL Residential Soil (mg/kg)
Parcels 1 & 2		
Benzo(a)anthracene	21	1.1
Benzo(a)pyrene	2.1	0.11
Benzo(b)fluoranthene	21	1.1
Benzo(k)fluoranthene	210	11
Dibenz(a,h)anthracene	2.1	0.11
Indeno(1,2,3-cd)pyrene	21	1.1
Parcel 3 (East & West)		
No Exceedances		
Parcel 4 & 5		
No Exceedances		

Notes:
RSL - regional screening level
USEPA - United States Environmental Protection Agency
mg/kg - milligram per kilogram

Table 3: Sediment Remediation Targets by Parcel
Former Bramlette MGP Site
Greenville, SC

Analyte	USEPA RSL Industrial Sediment (mg/kg)	USEPA RSL Residential Sediment (mg/kg)	USEPA Region 4 Sediment RSV (mg/kg)
Parcels 1&2			
No Exceedances			
Parcel 3 (East & West)			
Naphthalene	17	3.8	3.85
Benzo(a)pyrene	2.1	0.11	9.65
Benzo(a)anthracene	21	1.1	8.41
Benzo(b)fluoranthene	21	1.1	9.79
Chrysene	2100	110	8.44
Dibenz(a,h)anthracene	2.1	0.11	11.2
Fluoranthene	30000	2400	7.07
Indeno(1,2,3-cd)pyrene	21	1.1	11.2
Phenanthrene	NE	NE	5.96
Parcels 4 & 5			
Acenaphthylene	NE	NE	4.52
Naphthalene	17	3.8	3.85
Benzo(a)pyrene	2.1	0.11	9.65
Benzo(a)anthracene	21	1.1	8.41
Benzo(b)fluoranthene	21	1.1	9.79
Chrysene	2100	110	8.44
Fluoranthene	30000	2400	7.07
Indeno(1,2,3-cd)pyrene	21	1.1	11.2
Phenanthrene	NE	NE	5.96
Anthracene	230000	18000	5.94
Benzo(g,h,i)perylene	NE	NE	10.9
Benzo(k)fluoranthene	210	11	9.81
Fluorene	30000	2400	5.38
Dibenz(a,h)anthracene	2.1	0.11	11.2
3 & 4 Methylphenol (m&p Cresol)	820	63	0.26
1,2,4-Trimethylbenzene	1800	300	0.361
1,3,5-Trimethylbenzene	1500	270	0.354

Notes:

NE - No screening level established at this time. A site-specific risk-based screening level may be established as part of the risk assessment process outlined in Section 5.0 of the RIWP-A.

RSL - regional screening level

RSV - refinement screening value

USEPA - United States Environmental Protection Agency

mg/kg - milligram per kilogram

Table 4: Groundwater Remediation Targets
Former Bramlette MGP Site
Greenville, SC

Analyte	Regulatory Standard (µg/L)
Shallow and Transition Zones	
Benzene	5
Naphthalene	25[+]

Notes:
+ - Risk Based Screening Level (RBSL) referenced in Appendix D, Table 1 of the South Carolina Department of Environmental Health and Control (SCDHEC) Quality Assurance Program Plan for the Underground Storage Tank (UST) Management Division.

µg/L - microgram per liter

FIGURES

NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
2. FORMER DRAINAGE DITCHES, EXCAVATION AREA, AND VAUGHN LANDFILL BOUNDARY FROM ERM GROUNDWATER REMEDIAL INVESTIGATION WORK PLAN ADDENDUM, APRIL 13, 2018. THESE LAYERS ARE GEOREFERENCED AND APPROXIMATE.
3. PROPERTY BOUNDARIES SOURCED FROM GREENVILLE COUNTY.
4. WETLANDS (USFWS) BY US FISH AND WILDLIFE NATIONAL WETLAND INVENTORY. WETLANDS (AES) DELINEATED BY APPLIED ENGINEERING AND SCIENCE, INC. IN 1999.
5. SWAMP RABBIT TRAIL CENTERLINE FROM CITY OF GREENVILLE.
6. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83 INTERNATIONAL FEET).
7. 2020 WORLD IMAGERY SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

N

PARCEL 1

PARCEL 2

E BRAMLETT RD

LEGACY CHARTER ELEMENTARY SCHOOL

Legacy Charter Wetland (Parcel 3 East)

GREATER GREENVILLE SANITATION DEPARTMENT

VAUGHN LANDFILL

PARCEL 3

WALNUT DR

REEDY RIVER

Parcel 3 West

PARCEL 4

TEMPLE ST

ELMORE ST

CAGLE ST

PARCEL 5

REACH ST

OWENS ST

WILLARD ST

LEGEND

- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY
- WETLANDS (AES)
- WETLANDS (USFWS)

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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REVISED BY: RJM	DATE: 4/14/2022
CHECKED BY: RJM	
APPROVED BY: APB	
PROJECT MANAGER: APB	

FIGURE 1
SITE PARCELS
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
2. NON-AQUEOUS PHASE LIQUID (NAPL), TAR-LIKE MATERIAL (TLM), FEET IN THICKNESS (FT).
3. NAPL MAY HAVE BEEN VISUALLY OBSERVED IN THE FORM OF STAINING, SEAMS, BUBBLES, OR COATED MATRIX, BUT POTENTIALLY MOBILE TLM WAS NOT OBSERVED.
4. FORMER DRAINAGE DITCHES, EXCAVATION AREA, AND VAUGHN LANDFILL BOUNDARY FROM ERM GROUNDWATER REMEDIAL INVESTIGATION WORK PLAN ADDENDUM, APRIL 13, 2018. THESE LAYERS ARE GEOREFERENCED AND APPROXIMATE.
5. PROPERTY BOUNDARIES SOURCED FROM GREENVILLE COUNTY.
6. SWAMP RABBIT TRAIL CENTERLINE FROM CITY OF GREENVILLE.
7. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83 INTERNATIONAL FEET).
8. 2020 WORLD IMAGERY SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

N

PARCEL 1
PARCEL 2
E BRAMLETT RD
LEGACY CHARTER ELEMENTARY SCHOOL
Legacy Charter Wetland (Parcel 3 East)
GREATER GREENVILLE SANITATION DEPARTMENT
VAUGHN LANDFILL
PARCEL 3
WALNUT DR
REEDY RIVER
Parcel 3 West
PARCEL 4
TEMPLE ST
ELMORE ST
CAGLE ST
PARCEL 5
REACH ST
OWENS ST
WILLARD ST

LEGEND

- 0.5 - 2.5 ft
- 2.5 - 4.5 ft
- 4.5 ft+
- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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CHECKED BY: RJM	
APPROVED BY: APB	
PROJECT MANAGER: APB	

FIGURE 2
OBSERVED THICKNESS OF NAPL AND TLM
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
2. DATA CONTOURED WAS COLLECTED IN MARCH 2021 WITH THE EXCEPTION OF DATA COLLECTED FROM TEMPORARY WELLS IN AUGUST 2020.
3. SOUTH CAROLINA DEPARTMENT OF ENVIRONMENTAL HEALTH AND CONTROL (SCDHEC) R.61-58 HUMAN HEALTH MAXIMUM CONTAMINANT LEVEL (MCL) FOR BENZENE IS 5 µg/L.
4. µg/L - MICROGRAMS PER LITER
5. FORMER DRAINAGE DITCHES, EXCAVATION AREA, AND VAUGHN LANDFILL BOUNDARY FROM ERM GROUNDWATER REMEDIAL INVESTIGATION WORK PLAN ADDENDUM, APRIL 13, 2018. THESE LAYERS ARE GEOREFERENCED AND APPROXIMATE.
6. PROPERTY BOUNDARIES SOURCED FROM GREENVILLE COUNTY.
7. SWAMP RABBIT TRAIL CENTERLINE FROM CITY OF GREENVILLE.
8. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83 INTERNATIONAL FEET).
9. 2020 WORLD IMAGERY SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

N

PARCEL 1
PARCEL 2
E BRAMLETT RD
LEGACY CHARTER ELEMENTARY SCHOOL
Legacy Charter Wetland (Parcel 3 East)
GREATER GREENVILLE SANITATION DEPARTMENT
VAUGHN LANDFILL
PARCEL 3
WALNUT DR
REEDY RIVER
Parcel 3 West
PARCEL 4
TEMPLE ST
ELMORE ST
CAGLE ST
PARCEL 5
REACH ST
OWENS ST
WILLARD ST

LEGEND

- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- INFERRED CONCENTRATION OF BENZENE IN GROUNDWATER GREATER THAN 5µg/L
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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FIGURE 3
BENZENE IN SHALLOW FLOW ZONE
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
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N

PARCEL 1
PARCEL 2
PARCEL 3
PARCEL 4
PARCEL 5
E BRAMLETT RD
LEGACY CHARTER ELEMENTARY SCHOOL
Legacy Charter Wetland (Parcel 3 East)
GREATER GREENVILLE SANITATION DEPARTMENT
VAUGHN LANDFILL
WALNUT DR
REEDY RIVER
Parcel 3 West
TEMPLE ST
ELMORE ST
CAGLE ST
REACH ST
OWENS ST
WILLARD ST

LEGEND

- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- INFERRED CONCENTRATION OF BENZENE IN GROUNDWATER GREATER THAN 5µg/L
- INFERRED CONCENTRATION OF BENZENE IN GROUNDWATER GREATER THAN 50µg/L
- INFERRED CONCENTRATION OF BENZENE IN GROUNDWATER GREATER THAN 500µg/L
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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APPROVED BY: APB	
PROJECT MANAGER: APB	

FIGURE 4
BENZENE IN TRANSITION FLOW ZONE
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
2. DATA CONTOURED WAS COLLECTED IN MARCH 2021 WITH THE EXCEPTION OF DATA COLLECTED FROM TEMPORARY WELLS IN AUGUST 2020.
3. THE RISK BASED SCREENING LEVEL (RBSL) REFERENCED IN APPENDIX D, TABLE 1 OF THE SOUTH CAROLINA DEPARTMENT OF ENVIRONMENTAL HEALTH AND CONTROL (SCDHEC) QUALITY ASSURANCE PROGRAM PLAN FOR THE UNDERGROUND STORAGE TANK (UST) MANAGEMENT DIVISION FOR NAPHTHALENE IS 25 µg/L.
4. µg/L - MICROGRAMS PER LITER
5. FORMER DRAINAGE DITCHES, EXCAVATION AREA, AND VAUGHN LANDFILL BOUNDARY FROM ERM GROUNDWATER REMEDIAL INVESTIGATION WORK PLAN ADDENDUM, APRIL 13, 2018. THESE LAYERS ARE GEOREFERENCED AND APPROXIMATE.
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7. SWAMP RABBIT TRAIL CENTERLINE FROM CITY OF GREENVILLE.
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9. 2020 WORLD IMAGERY SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

N

PARCEL 1
PARCEL 2
E BRAMLETT RD
LEGACY CHARTER ELEMENTARY SCHOOL
Legacy Charter Wetland (Parcel 3 East)
GREATER GREENVILLE SANITATION DEPARTMENT
VAUGHN LANDFILL
PARCEL 3
WALNUT DR
REEDY RIVER
Parcel 3 West
PARCEL 4
TEMPLE ST
ELMORE ST
CAGLE ST
PARCEL 5
REACH ST
OWENS ST
WILLARD ST

LEGEND

- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- INFERRED CONCENTRATION OF NAPHTHALENE IN GROUNDWATER GREATER THAN 25µg/L
- INFERRED CONCENTRATION OF NAPHTHALENE IN GROUNDWATER GREATER THAN 250µg/L
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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CHECKED BY: RJM	
APPROVED BY: APB	
PROJECT MANAGER: APB	

FIGURE 5
NAPHTHALENE IN SHALLOW FLOW ZONE
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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NOTES:

1. SHAPEFILES OF SITE FEATURES AND ISOCONTOURS PROVIDED BY SYNTERRA.
2. DATA CONTOURED WAS COLLECTED IN MARCH 2021 WITH THE EXCEPTION OF DATA COLLECTED FROM TEMPORARY WELLS IN AUGUST 2020.
3. THE RISK BASED SCREENING LEVEL (RBSL) REFERENCED IN APPENDIX D, TABLE 1 OF THE SOUTH CAROLINA DEPARTMENT OF ENVIRONMENTAL HEALTH AND CONTROL (SCDHEC) QUALITY ASSURANCE PROGRAM PLAN FOR THE UNDERGROUND STORAGE TANK (UST) MANAGEMENT DIVISION FOR NAPHTHALENE IS 25 µg/L.
4. µg/L - MICROGRAMS PER LITER
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9. 2020 WORLD IMAGERY SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

N

PARCEL 1
PARCEL 2
PARCEL 3
PARCEL 4
PARCEL 5
E BRAMLETT RD
LEGACY CHARTER ELEMENTARY SCHOOL
Legacy Charter Wetland (Parcel 3 East)
GREATER GREENVILLE SANITATION DEPARTMENT
VAUGHN LANDFILL
WALNUT DR
REEDY RIVER
Parcel 3 West
TEMPLE ST
ELMORE ST
CAGLE ST
REACH ST
OWENS ST
WILLARD ST

LEGEND

- SITE BOUNDARY
- SURFACE WATER FLOW DIRECTION
- FORMER DRAINAGE DITCH (1964)
- INFERRED CONCENTRATION OF NAPHTHALENE IN GROUNDWATER GREATER THAN 25µg/L
- INFERRED CONCENTRATION OF NAPHTHALENE IN GROUNDWATER GREATER THAN 250µg/L
- SWAMP RABBIT TRAIL
- RAILROAD
- VAUGHN LANDFILL
- EXCAVATED AREA (2001-2002)
- PARCEL BOUNDARY
- FORMER MGP OPERATIONAL STRUCTURES
- BUILDING
- HYDROLOGY

DUKE ENERGY

Geosyntec consultants

0 250 Feet

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CHECKED BY: RJM	
APPROVED BY: APB	
PROJECT MANAGER: APB	

FIGURE 6
NAPHTHALENE IN TRANSITION FLOW ZONE
FORMER BRAMLETTE MGP SITE
EAST BRAMLETT ROAD
GREENVILLE, SOUTH CAROLINA

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