51025

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From: Ross, Scott (Charleston) <Scott.Ross@aecom.com>
Sent: Tuesday, November 21, 2017 9:23 AM
To: Walker, Adelaide
Cc: Dianne Murphy
Subject: Revised Work Plan - Shakespeare Newberry

Hi Addie –

Thanks for touching base regarding the incorrect date for the Work Plan letter. A revised version of the letter with the correct year and correct reference to permanent monitoring wells is attached for your review.

Please let us know if you need any other information. Thanks and have a great Thanksgiving.

Sincerely,

Scott E. Ross, P.G.
Project Manager II, Environment, Midsoutheast Region
T (803)254-4400, ext. 2242
C (803)201-9662
scott.ross@aecom.com

AECOM
101 Research Drive
Columbia, SC 29203
T 803-254-4400
www.aecom.com

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101 Research Drive
Columbia, S.C. 29223

803.254-4400 tel
803.771-6676 fax

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November 15, 2017

Ms. Addie Walker
South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
State Remediation Section
2600 Bull Street
Columbia, South Carolina 29201

Re: Work Plan for Well Installation and Soil Vapor Sampling
Former Shakespeare Composite Structures Site
Newberry County
Voluntary Cleanup Contract 14-6271-RP
Site ID # 51025

Dear Ms. Walker:

Philips Lighting North America (PLNA) and AECOM Technical Services, Inc. (AECOM) have been performing a Remedial Investigation (RI) at the former Shakespeare Composite Structures site (Site). The RI has included multiple phases of subsurface investigative efforts including well installations, groundwater sampling and passive soil vapor sampling. The results of the efforts completed most recently during Phase II of the RI were submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) in the September 2017 Quarterly Progress Report. Upon review of the information provided in the September 2017 report, SCDHEC requested in their October 3, 2017 letter to PLNA, additional investigative efforts be performed at the Site. These efforts are to include installation and sampling of four shallow monitoring wells on private parcels owned by the Dickert and Folk families and collection of soil vapor samples from seven locations within the former Shakespeare plant property. This document serves as a work plan discussing completion of the requested efforts.

1.0 Well Installation

The original scope for the Phase II RI included the installation of one shallow monitoring well on the Folk property, located to the northwest of the Dickert property. After review of the analytical data collected to date during this phase of the RI, SCDHEC has requested installation of two shallow wells (instead of one) on the Folk property and two new shallow wells on the Dickert property. These wells are intended to delineate the extent of CVOC impact to the water table aquifer in this portion of the Site. Each of the new wells is to be installed within the water table/shallow portion of the surficial aquifer beneath the area. The proposed locations for these wells are depicted on the attached **Figure 1**.

Due to the limited access to the proposed locations, AECOM will utilize direct push technology (DPT) via a Geoprobe™ drilling rig to install the new wells. This will minimize clearing and land disturbance efforts that would be required for more traditional drilling methods and equipment. Well installation efforts will entail advancement of 1.5 inch soil core barrel in conjunction with a temporary 2 ¼ inch diameter outer casing. Soil cores, collected as a boring is advanced, will allow determination of lithologic information which will be used to determine depths at which to set well screens. It is anticipated that each well boring will be advanced to depths between 24 and 30 feet below land surface (BLS), depending on location.

Upon reaching the target depth, a ten foot section of one inch diameter schedule 40 polyvinyl chloride (PVC), 0.01 inch slotted screen with riser pipe will be installed through the casing annulus. Appropriately sized filter pack material is then placed in the annulus between the well pipe and outer casing. Once the filter placement process is started, the outer casing is periodically advanced allowing the well materials to settle into the newly created borehole. This process is continued until the bentonite seal is installed and allowed to hydrate for at least one hour. Once the bentonite seal has hydrated, cement grout is placed in the annulus. This continues until the outer casing is removed from the borehole. Each monitoring well will be completed at land surface with a bolt down, 8 inch diameter steel cover, set in a two foot by two foot by four inch thick concrete pad. A diagram depicting the typical construction of these wells is included as **Figure 2.**

Well Development and Sampling

Following installation of the wells, AECOM personnel will development and sampling in accordance with procedures described in the Phase II RI Work Plan submitted to SCDHEC by PLNA and AECOM in April 2017. Development and sampling efforts will be documented on appropriate field forms. Copies of the forms will be included in the RI Report.

2.0 Soil Vapor Survey

During the initial portion of the Phase II RI, passive soil vapor sampling was performed at 51 (SV-1 through SV-51) locations on the former Shakespeare facility. The passive sampling effort detected several volatile organic compounds (VOCs) in soil vapor samples. As a result, SCDHEC requested that additional soil gas data be collected using an active sample collection method at select locations. SCDHEC has requested this information to allow a more thorough correlation of the passive soil gas sample results for the vapor intrusion evaluation portion of the human health risk assessment (HHRA) required at the Site.

The sample collection effort will include use of summa canisters at five (5) locations (SV-31, SV-45, SV-46, SV-49, and SV-54) in the main building and two (2) locations (SV-20 and SV-23) in the pole winder building (**Figure 3**). Samples will be collected from two to three feet below the building floor through disposable stainless steel, slotted drive point attached to Teflon tubing. The drive point will be advanced through a pilot hole drilled in the concrete floor using a slide hammer. Once the point is set at its target depth the borehole will be sealed at the concrete surface using a hydrated temporary bentonite seal. The Teflon tubing attached to the point will be purged of ambient air and then attached to a calibrated flow regulator on a Summa canister. Once activated the calibrated regulator will allow collection of soil vapor for one hour. Each canister will be activated for sample collection within a few minutes of one another.

Once the samples have been collected, the regulators will be shut off and disconnected from the sampling tubing. All sampling devices will be removed from the subsurface each hole will be backfilled with sand to the bottom of the concrete. The core holes in the concrete will then be sealed using high strength concrete patch.

Summa canisters will be shipped to a designated laboratory for analysis the same day of collection. As indicated results from this active gas sampling effort will be used in the vapor intrusion evaluation portion of the HHRA.

3.0 Sample Analysis

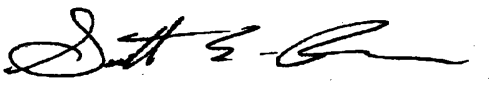
The groundwater samples collected from the new wells will be analyzed for Target Compound List-Volatile Organic Compounds (TCL-VOCs) using SW-846 Method 8260c. Soil vapor samples will also be analyzed for VOCs using EPA Air Toxics Method TO-15.

4.0 Reporting

Data collected during these additional activities will be included in the RI Report currently being generated for this Site. Copies of field logs (soil boring reports, well construction diagrams, well development logs, and groundwater sampling logs) along with analytical data reports for the samples to be collected during this additional round of efforts will also be included in the RI Report.

As previously indicated, this document serves as the work plan for the additional investigative efforts as requested by SCDHEC in the October 3, 2017 letter to PLNA. Should you have any questions regarding the information included in this work plan, please contact me at (803) 254-4400 at your convenience.

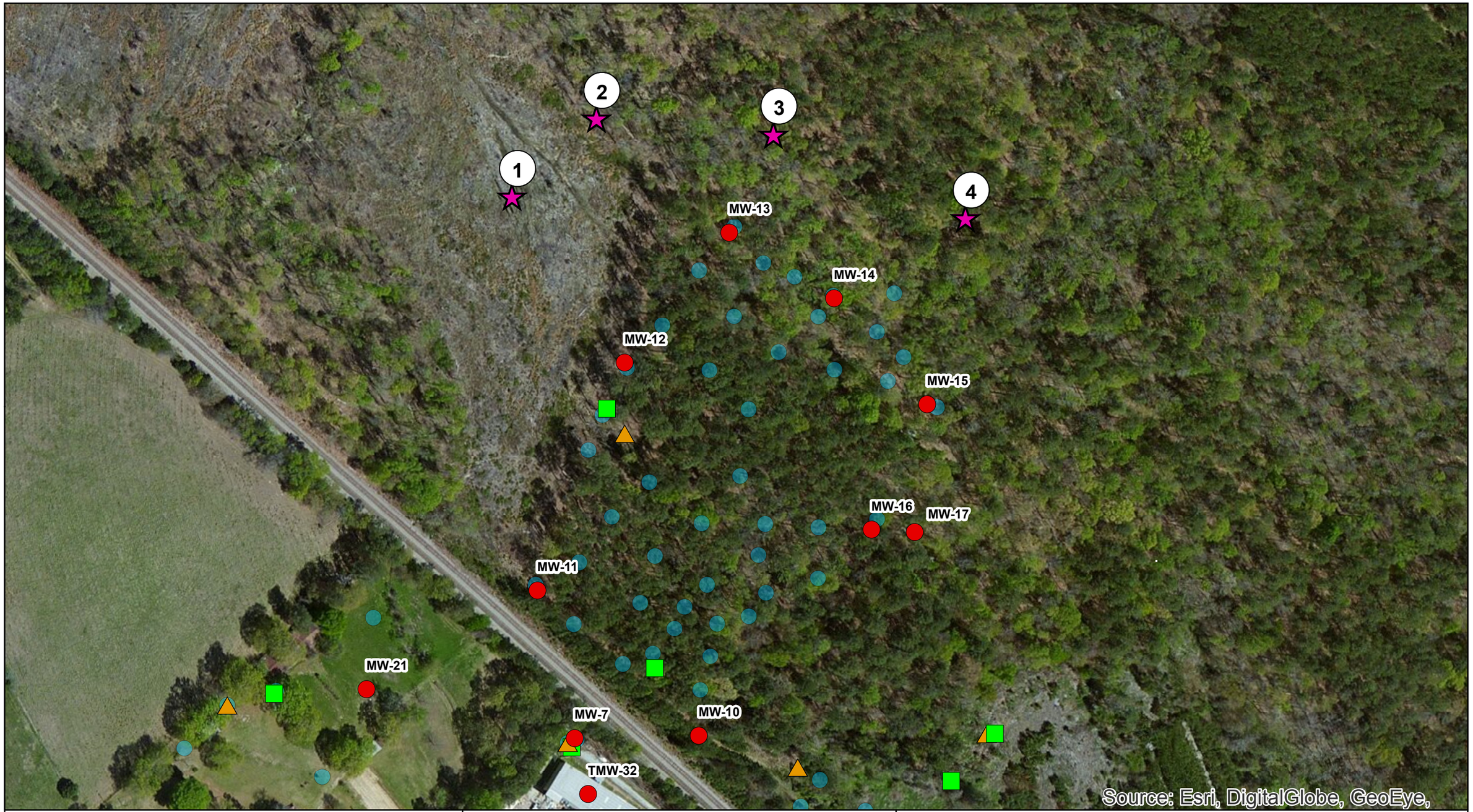
Sincerely,



Scott E. Ross, P.G.
Senior Project Manager

cc: Ms. Dianne Murphy – Philips

FIGURES



Legend

- Proposed Well
- Shallow Well
- Intermediate Well
- Bedrock Well
- Water Supply Well
- Existing Shallow Zone Monitoring Well
- Abandoned Temporary Wells

N
W E
S

0 125 250 500

Feet

G:\Projects\Active\60328308_Shakespeare\map\Folk_wells.mxd

AECOM
101 Research Drive
Columbia, SC 29203-9389
T: (803) 254-4400 F: (803) 771-6676

Figure 1 Proposed Shallow Well Locations
(Dickert and Folk Properties)

Shakespeare Composition Structures
Newberry, South Carolina

Project No.: 60534283; Prepared by: JC; Date: 10/2/2017.

Figure 2 Shallow Well Construction Detail

Shakespeare Composite Structures Site
Newberry, SC

AECOM

PROJECT:	Shakespeare Composite Structures	**WELL NUMBER:**	TBD
LOCATION:	Newberry, SC	**JOB NUMBER:**	
CLIENT:	PLNA	**TYPE OF INSTALLATION:**	**Monitoring Well**
DRILLER:		**LOCATION:**	
FIELD REPRESENTATIVE:		**INSTALLATION DATE:**	TBD

SURVEY DATUM: NAVD 88 (Vertical)
NAD 83 (Horizontal)

NORTHING:

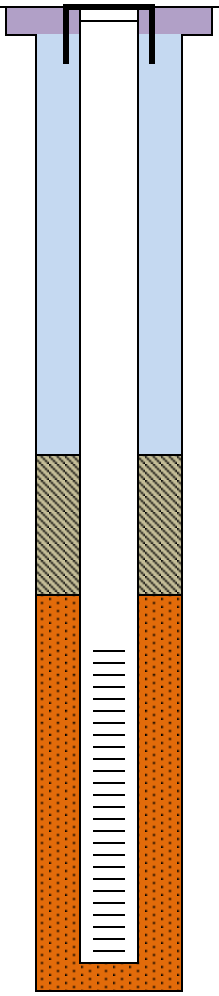
TOP OF CASING ELEVATION:

EASTING:

GROUND SURFACE ELEVATION:

CASING STICKUP:

COMMENTS:



TYPE OF ANNULAR SEAL	Neat Cement	
TYPE OF WELL CASING OR RISER	Sch. 40 PVC	
INSIDE DIAMETER	1.0	inch
NOMINAL BOREHOLE DIAMETER	3.0	inch
TOP OF WELL SEAL		feet
TYPE OF SEAL	Bentonite Chips	
TOP OF SAND FILTER PACK		feet
TOP OF SCREENED INTERVAL		feet
TYPE OF SCREEN	PVC	
SLOT SIZE	0.010	inch
INSIDE DIAMETER	1.0	inch
SCREEN LENGTH	10.0	feet
FILTER PACK AROUND SCREEN		
BOTTOM OF WELL	TBD	feet
BOTTOM OF BOREHOLE	TBD	feet

NOTE: ALL DEPTHS ARE REFERENCED TO GROUND SURFACE
DIAGRAM NOT TO SCALE

Legend

- Historical Soil Sampling Location
- Soil Vapor Sampling Location
- Additional Soil Vapor Sample Location

N
W E
S

200 100 0 200

Feet

G:\Projects\Active\60328308_Shakespeare\map\SoilVaporSamplingLocations.mxd

AECOM
101 Research Drive
Columbia, SC 29203-9389
T: (803) 254-4400 F: (803) 771-6676

Figure 3 Additional Soil Vapor Sampling Locations

Shakespeare Composition Structures
Newberry, South Carolina

Project No.: 60534283; Prepared by: JC; Date: 8/28/2017.