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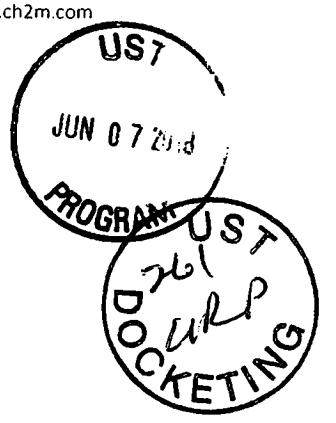


June 6, 2018

Delivered via FedEx Overnight Delivery

Ms. Bobbi Coleman
South Carolina Department of Health and Environmental Control
Assessment Section, UST Management Division
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Subject: **Response to Comments in SCDHEC Letter titled "Reviews of Misc. Reports, Response to Comments Document, Free Product Recovery Plan, Product Recovery Skimmer Results and Request for Well Permit" dated May 8, 2018**
Plantation Pipe Line Company
Lewis Drive Remediation Site
Belton, South Carolina
Site ID #18693, "Kinder Morgan Belton Pipeline Release"

Dear Ms. Coleman,

On behalf of Plantation Pipe Line Company (Plantation), CH2M HILL Engineers, Inc. (CH2M is now Jacobs) has prepared this response to comments received from the South Carolina Department of Health and Environmental Control (SCDHEC) in your letter date-stamped May 8, 2018.

Each SCDHEC comment is presented below and followed by Plantation's response.

Monthly and Quarterly Reports

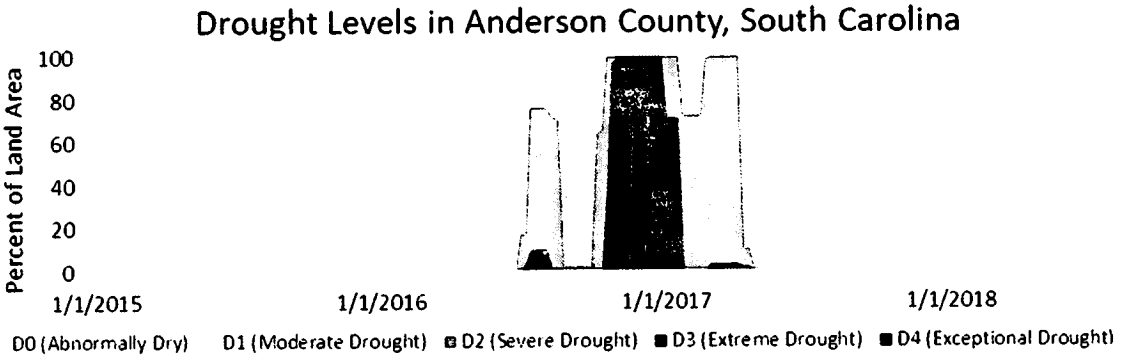
Comment 1: *The January 2018 Monthly Status Update notes insufficient water in the following groundwater monitoring wells:*

MW-7: 8 out of a total of 10 sampling events
MW-13: 4 out of a total of 6 sampling events
MW-17: 9 out of a total of 10 sampling events
MW-19: 7 out of a total of 10 sampling events
MW-22: 11 out of a total of 13 sampling events
MW-28: 8 out of a total of 15 sampling events
MW-30: 7 out of a total of 12 sampling events
MW-44: 3 out of a total of 4 sampling events
MW-45: 12 out of a total of 21 sampling events

As discussed in the March 7, 2018 meeting, these wells were selected to monitor the effectiveness of the corrective action, as described within the corrective action plan addendum (CAPA). In that these wells are not providing consistent data, an alternative approach to monitor the effectiveness of the CAPA must be

provided or replacement wells installed. A plan to address this issue should be provided within 30 days of this correspondence.

Response: Between October 2016 to April 2017, Anderson County was under a "severe" drought, according to the South Carolina State Climate Office (http://dnr.sc.gov/climate/sco/Drought/drought_current_info.php#). Prior to that, as early as April 2016, Anderson was experiencing a "moderate" drought. Even after a drought officially ends, however, there is usually a time delay before groundwater returns to its normal elevation. The chart below indicates the durations of the moderate, severe, extreme, and exceptional drought periods in Anderson County since 2015:



Note: developed using data from http://droughtmonitor.unl.edu/Data.aspx

Most of the instances in which the above-listed wells experienced an insufficient water column to sample occurred during or shortly after this drought period. Since then, however, the water column has rebounded. The following wells have had sufficient water to sample during the 3 most recent monitoring events (March, April, and May 2018) since the February monthly report upon which SCDHEC's evaluation was based:

- MW-7
- MW-13
- MW-22
- MW-28
- MW-30
- MW-44
- MW-45

The remaining wells in question, MW-17 and MW-19, continue to experience an insufficient water column for sampling. We recommend abandoning these wells without replacement. In the vicinity of MW-17, there are downgradient and cross-gradient wells to the northwest (MW-06), west (MW-36), and south (MW-20) which have had sufficient water to sample. In the vicinity of MW-19, there are wells downgradient and cross-gradient to the east (MW-29), south (MW-26), and west (MW-23) which have had sufficient water to sample.

***Comment 2:** In the future, the Department requests copies of field data sheets be provided with laboratory data.*

Response: Field data sheets will be provided with quarterly reports.

Quality Assurance Project Plan (QAPP)

***Comment 3:** Section A8.3.1 (Groundwater Sampling SOP). The Department understands that sampling collection details are recorded in logbooks and field sampling sheets, as stated in the response to comments. However, the QAPP should state that the time of purging and sampling will be documented*

on the field log regardless of the length of time between purging and sampling rather than only "if excess time (greater than 10 hours) is required for slow recharging wells to recharge, it will be documented in the field log". Additionally, it would be beneficial to provide an example field data sheet within the QAPP.

Response: The standard operating procedure (SOP) has been revised as suggested and an example field data sheet has been included. A copy of the revised SOP A8 is attached.

Free Product Recovery Plan: Revision 4 / Product Recovery Skimmer Results

Comment 4: *The above-referenced Free Product Recovery Plan: Revision 4 proposes using passive skimmers and absorbent socks in monitoring wells, recovery wells and recovery sumps. Further, this document proposes abandonment of all one-inch piezometers. During the March 7, 2018 meeting, PPL stated that changes to the free product recovery plan included within the approved CAPA had already taken place (in the form of a study), as outlined in the Free Product Recovery Plan: Revision 4. PPL shared that skimmers and absorbent socks were installed in numerous monitoring wells, recovery wells, recovery sumps, and recovery trench points. The results of this study were provided in the above-referenced March 23, 2018 Product Recovery Skimmer Results document which states that PPL plans to continue product recovery events using the new methods that allow the volume of product to be measured by well rather than total recovery, as previously identified. Further, frequency of product recovery events would be expanded from weekly to monthly.*

To clarify, during the January 22, 2018 meeting, the Department discussed the possibility of peristaltic skimmers, not passive skimmers and absorbent socks. Recovery of product from monitoring wells was not discussed. The Department agrees to PPL's proposal to use skimmers within recovery wells, recovery sumps, and recovery trenches with monthly collection. The Department does not concur with removal of product from monitoring wells, as the purpose of monitoring wells is to monitor the effectiveness of the corrective action system. All skimmers or absorbent socks must be removed from monitoring wells. Further, if the skimmers or absorbent socks are routinely full or saturated during monthly measurement and product recovery, the frequency of recovery may need to be adjusted or a different recovery method evaluated. In the future, no changes to the CAPA or studies should be conducted prior to approval from the Department.

Response: PPL will remove the product skimmers out of monitoring wells MW-08, MW-15, and MW-20 and the petroleum absorbent sock from monitoring well MW-11.

Comment 4b: *As further discussed during the March 7, 2018 meeting, the Department understands that PPL would like to continue with the plan to abandon all the one-inch piezometers at the site. As these piezometers have value as a resource to monitor the free phase petroleum levels in key areas and are beneficial as a measure of comparison due to their existence near the initiation of site assessment, the Department does not concur with the removal of all piezometers. The Department requires that TW-55, TW-59, TW-60, TW- 64, TW-66, TW-67, TW-73, TW-96 remain intact as they are incorporated within the approved CAPA for monitoring. The Department also requests that TW-28, TW-41, TW-42, TW-45, TW-46, TW-59, and TW-94 remain intact for routine free product gauging and groundwater elevation measurement due to their location and/or importance regarding free product measurement data.*

Response: Plantation disagrees with keeping any piezometers. The piezometers were necessary during the initial response phase to delineate the lateral extent of free product at the site. Although the piezometers were useful to indicate presence or absence of free product, capillary action in these narrow 1-inch piezometers greatly exaggerates the actual free product thickness in the formation and yields inaccurate groundwater elevation measurements. Using gauging data from these features results in inaccurate and misleading potentiometric surface and free product maps. A sufficient network of 2-inch monitoring wells now covers the site to effectively monitor free-phase product, groundwater elevations, and dissolved groundwater

concentrations. Therefore, since the 1-inch piezometers cannot be sampled, cannot be used to recover free product, and yield inaccurate and misleading gauging data, they are no longer necessary and should be abandoned.

Receptor Survey & Request to Routinely Sample Lewis/ Chandler AG Well

Comment 5: *Due to settlement agreement terms between PPL and Scott Lewis, the site property owner, PPL does not consider the Chandler-AG well to be a potential receptor and does not intend to update the receptor survey, as requested by the Department. In regard to the Department's request to sample the Chandler-AG well routinely on a quarterly basis, PPL provided documentation asserting the source of the contamination in the Chandler-AG is not gasoline, and differs from the contamination found in groundwater collected from groundwater monitoring well MW-40. Therefore, PPL has stated it will not add the Chandler-AG well to routine sampling. The Department will recognize the Chandler-AG well as a potential receptor and may find it necessary to sample this well in the future.*

Response: Noted. SCDHEC is welcome to sample this well at their convenience.

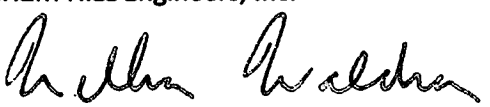
Shallow Bedrock Zone Biosparging Pilot Study Plan

Comment 6: *During the January 22, 2018 meeting, PPL stated that they planned on delaying the Shallow Bedrock Zone Biosparging Pilot Study Plan approved in the December 14, 2017 correspondence (Coleman to Aycock) until April 2018. The Future Activities Section within the February 2018 Monthly Status Update lists the implementation of the bedrock sparging pilot study. The Department requests that PPL propose dates for initiation of the study and submittal of the comprehensive pilot study report.*

Response: According to our meeting records, Plantation discussed deferring the Shallow Bedrock Zone Pilot Study Plan during our March 7, 2018, meeting with SCDHEC (not January). This text was inadvertently included in the February 2018 Monthly Status Update and will be omitted from future status updates. Due to new data obtained since the Bedrock Zone Biosparging Pilot Study was proposed in May 2017, PPL is deferring the implementation of the Bedrock Zone Biosparging Pilot Study at this time in favor of an alternative biosparging expansion as proposed in our letter dated May 4, 2018.

If you have any further questions or concerns, please call me at (919) 760-1777, or Mr. Jerry Aycock/Plantation at (770) 751-4165.

Regards,
CH2M HILL Engineers, Inc.



William M. Waldron, P.E.
Program Manager

Attachments:
Revised QAPP SOP A8 – Groundwater Sampling from Monitoring Wells

c: Jerry Aycock, Plantation (Digital, Jerry_Aycock@kindermorgan.com)
Mary Clair Lyons, Esq., Plantation (Digital, Mary_Lyons@kindermorgan.com)
Richard Morton, Esq., Womble Bond Dickinson, LLP (Digital, ric.morton@wbd-us.com)
File

Attachment

Revised QAPP Standard Operating Procedure A8 – Groundwater Sampling from Monitoring Wells

STANDARD OPERATING PROCEDURE A8

Groundwater Sampling from Monitoring Wells

A8.1 Purpose and Applicability

This procedure conforms to the EPA Quality Assurance Requirements and describes methods for purging and sampling a groundwater monitoring well to ensure that the sample collected is representative of the formation groundwater. The procedure follows EPA guidance detailed in *Region 4 Science and Ecosystem Support Division (SESD) Operating Procedure (OP) for Groundwater Sampling, SESDPROC-301-R4.* (EPA, 2017).

A8.2 Definitions

Bailer: A hollow tube constructed of stainless steel or Teflon® that is used to collect groundwater samples. A dedicated bailer remains in the well casing.

A8.3 Procedures

A8.3.1 Purging

The following equipment is required for well purging:

- Bailer or pump. The device used depends upon aquifer properties, individual well construction, well yield, and data quality objectives (DQOs).
- Water level measuring device.
- Tape measuring device.
- pH, specific conductance, turbidity, and temperature measuring device.

Well purging is performed as follows:

- For the well to be purged/sampled, the following information is obtained and recorded in the groundwater purging/sampling data sheet (attached) or the field logbook: date, field conditions, well location, well ID, well diameter, groundwater elevation, total well depth, screened interval, water quality field measurements (pH, specific conductance, turbidity, and temperature), and the method for disposal of purged water.
- Field instruments are calibrated prior to use and according to manufacturers' instructions.
- Prior to opening the well, plastic sheeting is placed on the ground surrounding the well head to prevent contamination by sample spillage;
- The well is unlocked and opened and an FID/PID reading is immediately taken.
- The water level and the total depth of the well are measured.
- The volume in gallons of water in the well casing or sections of telescoping well casing is calculated as follows:

  $(\Pi\ r^2h)\ 7.48$ = gallons

where: $\Pi = 3.142$
r = Radius of the well pipe in feet
h = Linear feet of water in well
7.48 = Gallons per cubic foot of water

The volume of water in typical well casings may be calculated as follows:

gallons/feet x __ (linear feet of water) = total gallons

where:
2-inch well = 0.163 gallons/foot
3-inch well = 0.367 gallons/foot
4-inch well = 0.653 gallons/foot
5-inch well = 1.02 gallons/foot
6-inch well = 1.469 gallons/foot
7-inch well = 1.999 gallons/foot
8-inch well = 2.611 gallons/foot
10-inch well = 4.28 gallons/foot
12-inch well = 5.87 gallons/foot

- Purging the well will begin by lowering the decontaminated purging apparatus (pump or bailer) to the standing water column so that the water will be pulled through the casing and the entire static volume will be removed. A bailer is used when the well does not yield sufficient water for pumping; otherwise, a pump is preferred. For low- flow sampling techniques, see section A8.3.4.
- The initial pH, specific conductance, turbidity, and temperature of water are measured and recorded in the field logbook along with the odor, color, clarity, silt concentrations and general water condition. During purging, field parameters are measured at least once during each well volume (more often is preferable). Record changes in the physical condition of the monitoring wells that could affect the well integrity.
- For purging to be complete, a total of at least 3-5 volumes of groundwater should be removed from the well, and the field parameters must stabilize. The amount of purged fluid will be measured by filling a graduated bucket or by using a stopwatch and noting the flow rate of the pump versus elapsed time. Field parameter stabilization is as follows: pH measurements ± 0.1 units, temperature measurements ±1°C, specific conductance measurements ± 10%, and ± 10% for turbidity).
- Wells with little or no recharge will be purged to near dryness, and the well is allowed to recover before sampling.
- When using a pump, prior to the completion of purging activities, the pump will be brought to the water surface to ensure complete removal of stagnant water.
- Purge water will be placed in a storage tank and disposed of as IDW

Wells will be sampled immediately after purging, if possible, but generally no later than 6 hours after purging. Purging and sampling times will be documented in the field log. Wells that recharge slowly will be purged dry and allowed to recharge before sampling. If excessive time (greater than 10 hours) is required for the slow recharging wells to recharge, it will be documented in the field log.

A8.3.2 Sample Collection

Following are the general procedures for groundwater sampling along with methods for utilizing specific sampling devices and techniques.

A8.3.2.1 General

- With the exception of low-flow sampling (Section A8.3.4) and open borehole sampling, before samples are taken, the well is purged as described in Section A8.3.1.
- Sampling equipment will be cleaned and decontaminated prior to the commencement of sampling activities. A new pair of disposable gloves will be worn at each location by sampling personnel.
- Prelabeled, precleaned, sample bottles with preservative added, are used to contain the groundwater samples. VOA samples will be collected first followed by other organic analyses. Inorganic analyses are collected last accept in the case where the influences of turbidity on metals concentrations is a concern. In this case metals samples will be collected immediately following the volatile organics.
- As the sample is taken, the sample container is tilted slightly allowing the water to run down the inside of the sample bottle with a minimum of splashing
- Adequate space is left in the bottle to allow for expansion, except for volatile organic analysis (VOA) vials, which are filled to overflowing and capped. VOAs vials are checked for air bubbles and if detected, more sample is carefully added to the vial (care must be taken to minimize the loss of preservative).
- Samples are placed in appropriate containers, and packed with ice in coolers immediately after the sample is collected.

Measure pH, conductivity, temperature, and turbidity after sample bottles have been filled and record the measurements in logbook.

A8.3.2.2 Bailer

A decontaminated Teflon® bailer can be used to remove groundwater samples from a well as follows:

- A decontaminated and properly secured, bailer is lowered to the sampling interval from which the sample is to be collected.
- The bailer is allowed to fill with a minimum of surface disturbance to prevent sample water aeration. When the bailer is raised, the bailer cord must not be allowed to touch the ground.
- The sample is slowly poured from the bailer and the bottle is tilted slightly allowing the water to runs down the inside of the sample bottle with a minimum of splashing
- If the bailer is dedicated, it is returned to the well and the well is capped and locked. Non-dedicated samplers are cleaned and decontaminated after use.

A8.3.3 Purging/Sampling Using a Small Diameter, Electric Submersible Pump

Small Diameter Electric Submersible Pumps includes a range of small diameter, variable speed pumps capable of pumping rates ranging from 0.5 ml./min. to in excess of 9 gallons per minute. The power source for these pumps can be provided directly from an automobile battery or from a generator. While small diameter pumps are generally light-weight and easily handled by one person when lowering into a well, two people are generally needed when removing the pump, one to pull and another to reel the hose and power lead. Groundwater monitoring wells can be purged utilizing a decontaminated pump and clean flexible tubing as follows:

- Slowly lower the pump to the middle of the screened interval. This minimizes excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize re-suspension of solids, which will have collected at the bottom of the well (EPA, 1996).
- Follow the manufacturer's procedures, and begin pump-purging the monitoring well.

- If the recovery rate of the well is faster than the pump rate, the pump may be left hanging at the initial level. If the pump rate exceeds the recovery rate, the pump must be lowered to accommodate the drawdown, or the pump rate can be decreased.
- Once 3-5 well volumes have been removed from the well, and the field parameters have stabilized, remove the pump from the well, and sample utilizing a Teflon® bailer.

A8.3.4 Purging/Sampling Using Modified Low-Flow Techniques

Low-flow techniques are utilized to obtain a more representative sample from the aquifer formation. In general, the advantages of low-flow purging include (EPA, 1996):

- Samples which are representative of the mobile load of contaminants present (dissolved and colloid-associated);
- Minimal disturbance of the sampling point thereby minimizing sampling artifacts (i.e. less turbidity);
- Less operator variability, greater operator control;
- Reduced stress on the formation (minimal drawdown);
- Less mixing of stagnant casing water with formation water;
- Reduce the need for filtration and, therefore, less time required for sampling;
- Smaller purging volume which decreases IDW disposal costs;
- Better sample consistency; reduced artificial sample variability.

The pumps selected for perform low-flow sampling, should be capable of producing purge rates sufficient to allow for the modified low-flow sampling technique. Pumps, which meet these requirements include but are not limited to, bladder-type pumps (provided that reagent grade nitrogen is used for bladder inflation) and the Grundfos Redi-Flow2 pump.

Following are the procedures for modified low-flow groundwater sampling. These procedures include adaptations from EPA's paper entitled "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures" (EPA, 1996):

- Slowly lower the decontaminated pump to the middle of the screened interval. This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize re-suspension of solids, which will have collected at the bottom of the well.
- Once the pump is positioned in the well, an airtight flow-through cell (equipped with a YSI or Horiba-type water quality meter) is plumbed to the water discharge line.
- Lower a decontaminated water level gauge into the well to monitor the water table.
- Once purging is initiated, water level measurements should be continuously monitored, and pumping rates adjusted as necessary (e.g., 100 - 200 ml/min) to maintain minimal drawdown.
- While purging, the groundwater field parameters (including water level) should be continuously monitored every 3-5 minutes until all parameters have stabilized for 3 consecutive readings.
- Stabilization for each parameter is defined as follows: ±0.1 for pH, ±5% for specific conductance, ±20 mv for redox potential, ±10% for turbidity, ±10% for dissolved oxygen (DO), and unchanging water level (goal is < 4 inches drawdown).

Once field parameters have stabilized for 3 consecutive readings, samples may be taken. The same device used for purging should be used for sampling (remove flow-through cell).

A8.4 Attachments

Groundwater sampling purge log sheet (Low_flow_sampling_log.xls)

ch2m

PROJECT NUMBER	WELL NUMBER
699858.LD.MR.GW	SHEET OF

LOW FLOW SAMPLING LOG

Well Number:		Site: Lewis Drive Site, Belton, SC			
Field Crew:		Date:			
Well Depth (ft):	Purge	Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
DTW (ft):	Methodology:	2"	0.163	5"	1.02
Water Column (ft):		3"	0.367	6"	1.469
Well Diameter (in):		4"	0.653	8"	2.611
Gal. Per ft:		Water level indicator, serial number:			
Well volume (gal):		Pump type (please circle):		Peristaltic	Bladder
Depth of Screen (ft):		Pump serial number:			

PID reading: opening well | after venting, if initially high | middle of sampling | closing well

Field Parameters

Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Color/Odor
Stabilization	<0.33' or 4"	100-500	NA	±0.1 SU	±1°C	±5%	±20 mV	within 0.2 mg/L	±10% or < 10	NA

Remarks:

SAMPLING INFORMATION:

Depth to Water Before Sampling:	Depth sample was acquired:
Sample Methodology:	
Sample Date/Time:	
Signed Sampler:	
Filtered Metals Collected: Y / N	Filter Size:
Sample Observations:	
Parameters (please circle): VOCs	SVOCs Dissolved Metals Other: