



CH2M  
3120 Highwoods Boulevard  
Suite 214  
Raleigh, NC 27604  
C +1 919 875 4311  
F +1 919 875 8491  
www.ch2m.com

April 27, 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:** Request to pump select monitoring wells  
Lewis Drive Release  
Plantation Pipe Line Company  
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 now part of Jacobs) has prepared this letter to present a plan to pump select monitoring wells that may currently be outside the capture zones of the biosparging treatment system.

Biosparging at the site since March 2017 has resulted in marked sitewide decreases in product thicknesses and groundwater hydrocarbon concentrations. However, we have identified five groundwater sampling locations which exhibit stable or increasing trends of dissolved hydrocarbon concentrations despite biosparging (**Table 1**):

- MW-34 and MW-40 in the Brown's Creek Remediation Zone
- MW-17B in the Hayfield Remediation Zone
- MW-23 and MW-46 in the Cupboard Creek Remediation Zone (**Figure 1**).

The locations of these wells are shown on **Figure 1**. Plantation intends to purge these wells and monitor responses to evaluate why concentrations have not markedly changed in the groundwater samples collected from these wells. The water levels during purging and contaminant hydrocarbon concentrations after purging can help determine if the wells are screened in the treatment zones of the biosparging system, and provide data to plan future expansion of the biosparging systems. Following the June 2018 quarterly monitoring events, groundwater will be pumped from the selected wells and samples will be collected during the subsequent monitoring events. The water level responses and analytical results will be evaluated and used to determine future pumping frequency, the pumping well network, and if the pumping will continue.

## Proposed Scope of Work

The following activities will be performed:

- The wells included in **Tables 1 and 2** and shown on **Figure 1** will be purged using a submersible pump. Each well will be purged until a minimum of 3 to 5 well volumes have been removed or until it is pumped dry. Water levels will be monitored during purging with an oil/water interface probe and recorded on a purge log.
- Purge water will be contained in 55-gallon drums and then transferred to one of the onsite poly tanks for later disposal.
- The submersible pump will be decontaminated between each well in accordance with the Revised Quality Assurance Project Plan (QAPP) dated February 9, 2018.

Plantation intends to conduct this work as early as May 2018, between scheduled groundwater monitoring events. If you have any further questions or concerns, please contact me at 919-760-1777 or Mr. Jerry Aycock with Plantation at 770-751-4165.

Regards,  
CH2M HILL Engineers, Inc.



William M. Waldron, P.E.  
Program Manager

#### Attachments

- Table 1 – Analytical Results for Groundwater, Historical
- Table 2 – Well Construction Details
- Figure 1 – Groundwater Analytical Results in Residuam Aquifer, December 2017

#### Cc (via e-mail):

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

Table 1. Analytical Results for Groundwater, Historical  
 Plantation Pipe Line Company  
 Lewis Drive Remediation Site, Belton, South Carolina  
 Site ID #18693 "Kinder Morgan Belton Pipeline Release"

Location	Sample ID	Gauging Date	Depth to Water	Sample Date	Analyte:	Benzene	Ethylbenzene	Toluene	Total Xylenes	1,2-DCA	MTBE	Naphthalene
					Units							
MW-17B	MW-17B-030116			3/1/2016	µg/L	6,480	488	11,900	2,870	5	742	104
	MW-17B-120116			12/1/2016	µg/L	9,370	761	16,900	4,500	100 U <sup>b</sup>	954	112
	MW-17B-031317			3/13/2017	µg/L	7,350	770	14,100	4,510	200 U <sup>b</sup>	944	1,000 U <sup>b</sup>
	MW-17B-032017			3/20/2017	µg/L	10,700	1,360	21,400	7,910	323	1,210	1,000 U <sup>b</sup>
	MW-17B-033117			3/31/2017	µg/L	9,190	900	17,500	5,910	100 U <sup>b</sup>	1,200	500 U <sup>b</sup>
	MW-17B-033117FD			3/31/2017	µg/L	9,190	956	18,200	6,330	100 U <sup>b</sup>	1,210	500 U <sup>b</sup>
	MW-17B-040617			4/6/2017	µg/L	7,780	833	14,900	5,330	200 U <sup>b</sup>	991	1,000 U <sup>b</sup>
	MW-17B-062817			6/28/2017	µg/L	11,200	704	21,600	5,650	200 U <sup>b</sup>	1,150	1,000 U <sup>b</sup>
	MW-17B-090817			9/8/2017	µg/L	11,400	1,240	23,900	8,460	20 U <sup>b</sup>	1,330	201
	MW-17B-120717	12/4/2017	17.05	12/7/2017	µg/L	10,600	1,060	14,900	9,210	10 U <sup>b</sup>	1,140	178
	MW-17B-030718	3/5/2018	14.8	3/7/2018	µg/L	8,830	1,110	20,200	8,220	50 U <sup>b</sup>	960	250 U <sup>b</sup>
	MW-17BD-030718	3/5/2018	14.8	3/7/2018	µg/L	8,700	1,080	19,400	7,770	50 U <sup>b</sup>	983	250 U <sup>b</sup>
	MW-23	MW-23-072715			7/27/2015	µg/L	5 U <sup>b</sup>	5 U	7.5	10 U	5 U <sup>b</sup>	5 U
MW-23D-072715				7/27/2015	µg/L	5 U <sup>b</sup>	5 U	5 U	10 U	5 U <sup>b</sup>	5 U	5 U
MW-23-012016				1/20/2016	µg/L	1 U	1 U	1 U	2 U	1 U	1 U	1 U
MW-23-120216				12/2/2016	µg/L	450	5 U	14.6	336	5 U <sup>b</sup>	46.4	5.9
MW-23-031317				3/13/2017	µg/L	709	5 U	23.1	548	5 U <sup>b</sup>	127	25 U <sup>b</sup>
MW-23-032017				3/20/2017	µg/L	642	10 U	12.7	579	10 U <sup>b</sup>	108	50 U <sup>b</sup>
MW-23-032017-FD				3/20/2017	µg/L	620	10 U	12.0	548	10 U <sup>b</sup>	110	50 U <sup>b</sup>
MW-23-033117				3/31/2017	µg/L	685	10 U	16.5	624	10 U <sup>b</sup>	130	50 U <sup>b</sup>
MW-23-040617				4/6/2017	µg/L	432	1 U	6.6	254	1 U	76.5	5 U
MW-23-062817				6/28/2017	µg/L	131	10 U	10 U	117	10 U <sup>b</sup>	19.1	5 U
MW-23-071717				7/17/2017	µg/L	1.2	1 U	1 U	3 U	1 U	1 U	5 U
MW-23-080117				8/1/2017	µg/L	132	1 U	6.2	252	1 U	48.1	5 U
MW-23-090717				9/7/2017	µg/L	1,110	9.25	43.1	999	5 U <sup>b</sup>	141	25 U <sup>b</sup>
MW-23-100417		10/3/2017	11.52	10/4/2017	µg/L	703	10 U	17.5	515	10 U <sup>b</sup>	90.1	50 U <sup>b</sup>
MW-23-100417-DUP		10/3/2017	11.52	10/4/2017	µg/L	543	2.65	11.5	424	1 U	69.2	5 U
MW-23-110817		11/7/2017	11.1	11/8/2017	µg/L	788	10 U	21.5	580	10 U <sup>b</sup>	118	50 U <sup>b</sup>
MW-23-120617		12/4/2017	11.13	12/6/2017	µg/L	693	10 U	17.0	408	10 U <sup>b</sup>	99.5	50 U <sup>b</sup>
MW-23-010918	1/8/2018	11.02	1/9/2018	µg/L	127	10 U	10 U	137	10 U <sup>b</sup>	69.6	50 U <sup>b</sup>	
MW-23-020618	2/5/2018	9.76	2/6/2018	µg/L	1.1	1 U	1 U	3 U	1 U	33.8	5 U	
MW-23-030618	3/5/2018	8.27	3/6/2018	µg/L	1 U	1 U	1 U	3 U	1 U	17.5	5 U	
MW-26-040618	4/5/2018	7.52	4/6/2018	µg/L	1 U	1 U	1 U	3 U	1 U	32	5 U	
MW-34	MW-34-031517			3/15/2017	--	978	33.0	143	218	10 U <sup>b</sup>	157	50 U <sup>b</sup>
	MW-34-032017			3/20/2017	µg/L	801	10.0 U	113	305	10 U <sup>b</sup>	149	50 U <sup>b</sup>
	MW-34-033117			3/31/2017	µg/L	728	10.0 U	81.4	224	10 U <sup>b</sup>	152	50 U <sup>b</sup>
	MW-34-040617			4/6/2017	µg/L	860	1.7	58.6	181	1 U	123	5 U
	MW-34-050317			5/3/2017	µg/L	287	2.62	27.2	130	1 U	124	5 U
	MW-34-062817			6/28/2017	µg/L	167	4.59	9.3	39.2	1 U	68.3	5 U
	MW-34-071717			7/17/2017	µg/L	137	5.83	19.8	69.5	1 U	73.8	5 U
	MW-34-080117			8/1/2017	µg/L	517	10 U	31.7	110	10 U <sup>b</sup>	98.3	50 U <sup>b</sup>
	MW-34-090817			9/8/2017	µg/L	1,430	6.01	98.0	264	1 U	191	7.33

Table 1. Analytical Results for Groundwater, Historical  
 Plantation Pipe Line Company  
 Lewis Drive Remediation Site, Belton, South Carolina  
 Site ID #18693 "Kinder Morgan Belton Pipeline Release"

Location	Sample ID	Gauging Date	Depth to Water	Sample Date	Analyte: Units	Benzene	Ethylbenzene	Toluene	Total Xylenes	1,2-DCA	MTBE	Naphthalene
	MW-34-100417	10/3/2017	2.76	10/4/2017	µg/L	<b>919</b>	10 U	<b>36.8</b>	<b>157</b>	10 U <sup>b</sup>	<b>151</b>	50 U <sup>b</sup>
	MW-34-100417-DUP	10/3/2017	2.76	10/4/2017	µg/L	<b>846</b>	<b>1.49</b>	<b>40.8</b>	<b>186</b>	1 U	<b>148</b>	5 U
	MW-34-110817	11/7/2017	2.48	11/8/2017	µg/L	<b>338</b>	10 U	<b>15.3</b>	<b>140</b>	10 U <sup>b</sup>	<b>266</b>	50 U <sup>b</sup>
	MW-34-120617	12/4/2017	2.52	12/6/2017	µg/L	<b>169</b>	10 U	<b>29.7</b>	<b>69.9</b>	10 U <sup>b</sup>	<b>218</b>	50 U <sup>b</sup>
	MW-34-010918	1/8/2018	2.48	1/9/2018	µg/L	<b>147</b>	10 U	<b>13.1</b>	<b>79.8</b>	10 U <sup>b</sup>	<b>246</b>	50 U <sup>b</sup>
	MW-34-020618	2/5/2018	2.27	2/6/2018	µg/L	<b>249</b>	10 U	<b>19.2</b>	<b>88.3</b>	10 U <sup>b</sup>	<b>191</b>	50 U <sup>b</sup>
	MW-34-030818	3/5/2018	2.23	3/8/2018	µg/L	<b>696</b>	<b>7.35</b>	<b>51.6</b>	<b>180</b>	1 U	<b>229</b>	<b>5.84</b>
	MW-34-040618	4/5/2018	2.25	4/6/2018	µg/L	<b>619</b>	<b>2.22</b>	<b>31.9</b>	<b>150</b>	1 U	<b>281</b>	<b>7.77</b>
MW-40	MW-40-120716			12/7/2016	µg/L	<b>6,730</b>	<b>588</b>	<b>7,460</b>	<b>3,390</b>	50 U <sup>b</sup>	<b>373</b>	<b>64.8</b>
	MW-40-031417			3/14/2017	µg/L	<b>11,600</b>	<b>1,280</b>	<b>16,100</b>	<b>7,260</b>	50 U <sup>b</sup>	<b>691</b>	250 U <sup>b</sup>
	MW-40-032017			3/20/2017	µg/L	<b>12,300</b>	<b>1,330</b>	<b>19,600</b>	<b>7,500</b>	200 U <sup>b</sup>	<b>654</b>	1,000 U <sup>b</sup>
	MW-40-033117			3/31/2017	µg/L	<b>13,300</b>	<b>1,500</b>	<b>19,500</b>	<b>8,070</b>	100 U <sup>b</sup>	<b>727</b>	500 U <sup>b</sup>
	MW-40-040617			4/6/2017	µg/L	<b>10,400</b>	<b>1,180</b>	<b>16,200</b>	<b>6,570</b>	200 U <sup>b</sup>	<b>650</b>	1,000 U <sup>b</sup>
	MW-40-062817			6/28/2017	µg/L	<b>9,250</b>	<b>1,030</b>	<b>19,200</b>	<b>6,540</b>	500 U <sup>b</sup>	<b>590</b>	2,500 U <sup>b</sup>
	MW-40-071717			7/17/2017	µg/L	<b>11,400</b>	<b>1,210</b>	<b>25,300</b>	<b>7,430</b>	500 U <sup>b</sup>	<b>727</b>	2,500 U <sup>b</sup>
	MW-40-080117			8/1/2017	µg/L	<b>12,000</b>	<b>1,120</b>	<b>23,200</b>	<b>8,070</b>	500 U <sup>b</sup>	<b>631</b>	2,500 U <sup>b</sup>
	MW-40-090817			9/8/2017	µg/L	<b>14,300</b>	<b>1,250</b>	<b>28,700</b>	<b>9,250</b>	20 U <sup>b</sup>	<b>716</b>	<b>219</b>
	MW-40-100417	10/3/2017	1.95	10/4/2017	µg/L	<b>13,800</b>	1,000 U <sup>b</sup>	<b>28,800</b>	<b>9,530</b>	1,000 U <sup>b</sup>	1,000 U <sup>b</sup>	5,000 U <sup>b</sup>
	MW-40-110817	11/7/2017	2.11	11/8/2017	µg/L	<b>13,500</b>	1,000 U <sup>b</sup>	<b>23,000</b>	<b>9,290</b>	1,000 U <sup>b</sup>	1,000 U <sup>b</sup>	5,000 U <sup>b</sup>
	MW-40-120617	12/4/2017	3.43	12/6/2017	µg/L	<b>14,300</b>	1,000 U <sup>b</sup>	<b>22,300</b>	<b>10,100</b>	1,000 U <sup>b</sup>	1,000 U <sup>b</sup>	5,000 U <sup>b</sup>
	MW-40-010918	1/8/2018	2.72	1/9/2018	µg/L	<b>12,400</b>	<b>773</b>	<b>22,300</b>	<b>10,200</b>	200 U <sup>b</sup>	<b>497</b>	1,000 U <sup>b</sup>
	MW-40-020618	2/5/2018	2.75	2/6/2018	µg/L	<b>11,100</b>	<b>777</b>	<b>20,300</b>	<b>9,350</b>	200 U <sup>b</sup>	<b>373</b>	1,000 U <sup>b</sup>
	MW-40-030818	3/5/2018	2.44	3/8/2018	µg/L	<b>8,450</b>	<b>498</b>	<b>14,500</b>	<b>7,580</b>	50 U <sup>b</sup>	<b>337</b>	250 U <sup>b</sup>
	MW-40-040618	4/5/2018	2.32	4/6/2018	µg/L	<b>6,710</b>	<b>212</b>	<b>8,350</b>	<b>5,460</b>	100 U <sup>b</sup>	<b>423</b>	500 U <sup>b</sup>
MW-46	MW-46-120617	12/4/2017	9.48	12/6/2017	µg/L	<b>4.97</b>	1 U	1 U	<b>7.74</b>	1 U	<b>85.5</b>	5 U
	MW-46-030618	3/5/2018	6.33	3/6/2018	µg/L	<b>173</b>	<b>1.76</b>	<b>16.5</b>	<b>29.5</b>	1 U	<b>129</b>	<b>7.21</b>
RBSL <sup>a</sup> :					µg/L	5.0	700	1,000	10,000	5.0	40	25

Notes:

<sup>a</sup> RBSL = Risk-based screening levels identified in South Carolina Underground Storage Tank Management Division Programmatic Quality Assurance Program Plan, Revision 3.1, Table D1 "RBSLs for Groundwater", February 2016

<sup>b</sup> The analyte was analyzed for, but was not detected above the laboratory reporting/quantitation limit. However, the laboratory reporting/quantitation limit is above the screening criteria. The actual absence or presence of this analyte between the screening criteria and the laboratory reporting/quantitation limit can not be determined.

Samples analyzed by EPA Methods SW 8260B and 8011

**Bold** indicates the analyte was detected above the method detection limit.

**Gray shading** indicates the analyte exceeded RBSLs.

µg/L = microgram(s) per liter

1,2-DCA = 1,2-dichloroethane

ID = identification

MTBE = methyl tertiary butyl ether

U = analyte was not detected above the reported sample quantitation limit

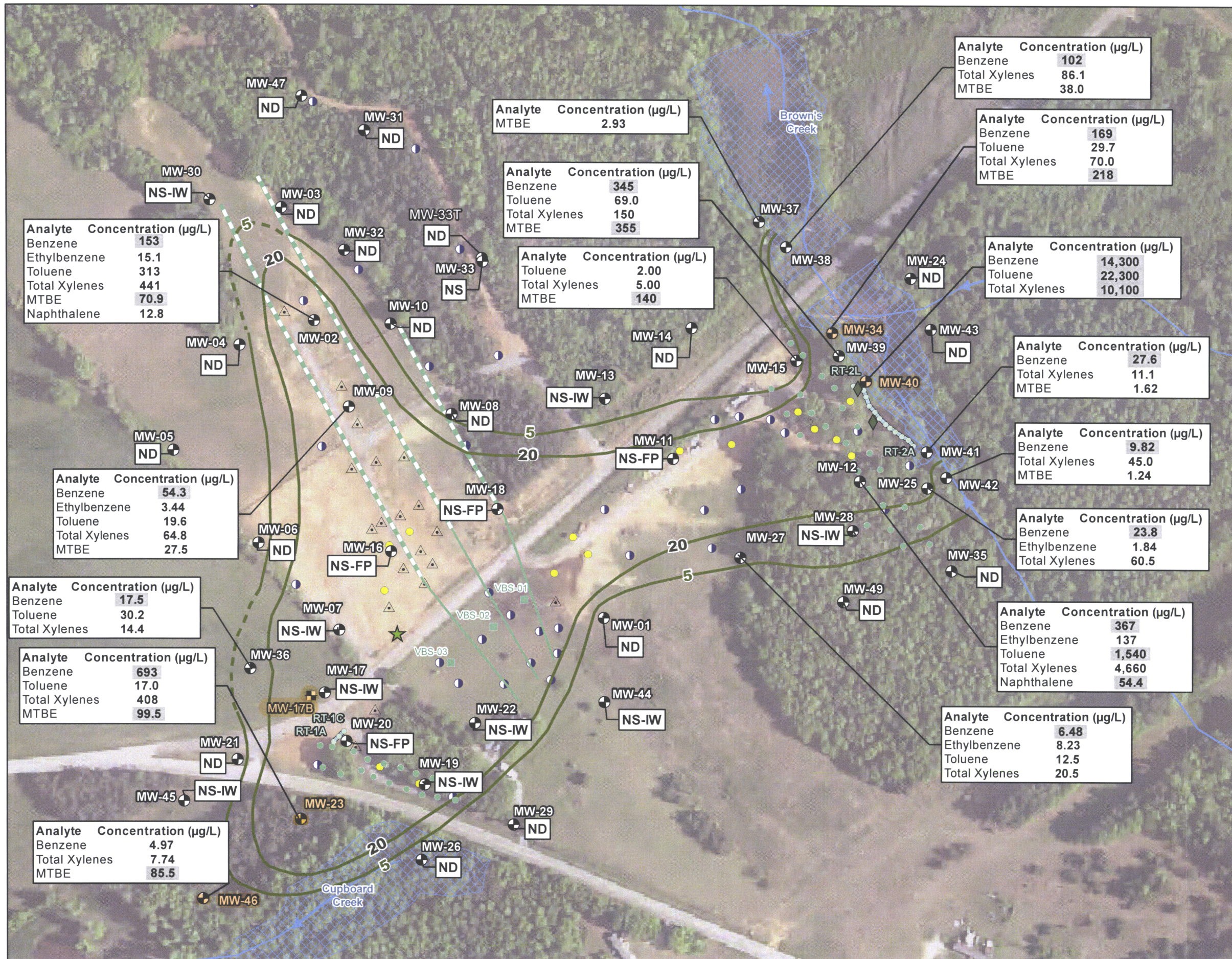
**Table 2. Well Construction Details**

*Plantation Pipe Line Company*

*Lewis Drive Remediation Site, Belton, South Carolina*

*Site ID #18693 "Kinder Morgan Belton Pipeline Release"*

<b>Well ID</b>	<b>Measured Depth to Bottom (ft BTOC)</b>	<b>Top of Screen or Open Borehole Interval (ft BTOC)</b>	<b>Bottom of Screen or Open Borehole Interval (ft BTOC)</b>	<b>Length of Screen or Open Borehole Interval (ft)</b>	<b>Depth to Water (ft BTOC) March 5, 2018</b>	<b>Height of water column (ft)</b>	<b>1 well volume (gal)</b>	<b>3 well volumes (gal)</b>	<b>5 well volumes (gal)</b>
MW-17B	27.5	17.0	27.0	10.0	14.8	12.7	2.07	6.21	10.4
MW-23	23.5	7.91	22.9	15.0	8.27	15.2	2.48	7.45	12.4
MW-34	7.86	5.36	7.86	2.50	2.25	5.61	0.91	2.74	4.57
MW-40	13.2	7.18	12.2	5.00	2.32	10.9	1.77	5.31	8.85
MW-46	17.1	12.1	17.1	5.00	6.36	10.7	1.74	5.23	8.71



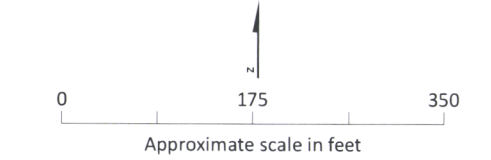
### LEGEND

- ★ Release Point
- ⊕ Residuum Monitoring Well (Shaded wells to be pumped)
- ⊙ Piezometer
- Vertical Bedrock Sparging Well
- Vertical Saprolite Sparging Well
- ◆ Seep Location
- Recovery Well (4" diameter)
- △ Recovery Sump
- Recovery Trench Point
- Recovery Trench
- Surface Water Flow Direction
- Horizontal Sparging Well Riser
- Horizontal Sparging Well Screen
- Dissolved Benzene Plume Extent (µg/L) (Dashed where inferred)
- National Hydrography Dataset Stream
- ▭ Delineated Wetland

- ### NOTES:
1. Total Xylenes is the sum of m&p xylenes and o-xylene.
  2. MTBE = Methyl Tertiary Butyl Ether
  3. µg/L = microgram(s) per liter
  4. Only detected analytes are shown on map.
  5. ND = Groundwater was collected and analyzed, but no analytes were detected above the reported sample quantitation limit.
  6. NS = Not scheduled to be sampled for this event
  7. NS-FP = Sample not collected due to the presence of free product in the well
  8. NS-IW = Sample not collected due to insufficient volume of water in well

Gray shading indicates the analyte exceeded risk-based screening levels (RBSLs) identified in South Carolina Underground Storage Tank Management Division Programmatic Quality Assurance Program Plan Revision 3.1, Table D1 "RBSLs for Groundwater", February 2016.

Base Map Sources:  
 \*Environmental Systems Research Institute (ESRI)  
 ArcMap World Imagery, 2015. Basemap features are approximate.  
 \*United States Geological Survey (USGS) National Hydrography Dataset (NHD)



**FIGURE 1. Groundwater Analytical Results in Residuum Aquifer, December 2017**  
 Lewis Drive Remediation Site  
 Belton, South Carolina  
 Site ID #18693 "Kinder Morgan Belton Pipeline Release"

