

State of New Mexico  
Energy, Minerals and Natural Resources Department

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02 June 2017

Joseph Wiley, P.G.  
Project Manager Pipeline Remediation  
Kinder Morgan, Inc  
1001 Louisiana Street, Room 956I  
Houston, TX 77002

Re: 2016 Annual Ground Water Monitoring Report (AGWMR)

Dear Mr. Wiley:

I've reviewed the results and recommendations in your 2016 AGWMR for the 12 remediation projects discussed below. OCD comments follow.

- 1) Duration of Projects. These projects have been going on for a long time. They began in the last century.

| <u>Project</u> | <u>Name</u>            | <u>Date of First Ground Water Sample</u> |
|----------------|------------------------|------------------------------------------|
| 3RP-201        | Johnston Federal #4    | 08/08/1995                               |
| 3RP-207        | Knight #1              | 10/16/1995                               |
| 3RP-235        | Sandoval GC A#1A       | 05/30/1995                               |
| 3RP-196        | Jams F Bell #1E        | 10/17/1998                               |
| 3RP-204        | K-27 Line Drip         | 11/04/1996                               |
| 3RP-179        | GCU A#142E             | 10/17/1997                               |
| 3RP-407        | GCU #124E              | 06/25/1998                               |
| 3RP-239        | State Gas Com N#1      | 10/17/1995                               |
| 3RP-202        | Johnston Federal #6A   | 08/10/1995                               |
| 3RP-155        | Canada Mesa #2         | 11/04/1996                               |
| 3RP-213        | Lateral O-21 Line Drip | 11/06/1995                               |
| 3RP-068        | Fogelson #4-1          | 11/06/1995                               |

- 2) Delineation of Ground Water Contamination. Best practices call for the extent of contamination to be determined soon after its discovery. Even though these projects have been underway for some time, some of the limits of free product (NAPL) and benzene (C<sub>6</sub>H<sub>6</sub>) contamination have yet to be found, as follows. Recall the cleanup limit for C<sub>6</sub>H<sub>6</sub> is 10 ppb and for NAPL is non-detect. Results shown are for 2016.

| <u>Project</u> | <u>Name</u>         | <u>Not Delineated for</u>                                                                                                                                   |
|----------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3RP-201        | Johnston Federal #4 | Looks good                                                                                                                                                  |
| 3RP-207        | Knight #1           | West of Monitoring Well #11 (MW11) (1,100 ppb C <sub>6</sub> H <sub>6</sub> )                                                                               |
| 3RP-235        | Sandoval GC A#1A    | N, W, and S of MW2 (0.43 ft NAPL)<br>W, E, and S of MW5 (4,700 ppb C <sub>6</sub> H <sub>6</sub> )<br>N, S, and E of MW4 (may be switched with MW2?)        |
| 3RP-196        | James F Bell #1E    | N and W of MW11 (3,200 ppb C <sub>6</sub> H <sub>6</sub> )<br>N and E of MW10 (0.24 ft NAPL)<br>E of MW6 and MW7 (1,200 ppb C <sub>6</sub> H <sub>6</sub> ) |
| 3RP-204        | K-27 Line Drip      | N of MW2R (0.35ft NAPL)                                                                                                                                     |
| 3RP-179        | GCU A#142E          | N, E, and W of MW2 (0.30 ft NAPL)<br>S and W of MW7                                                                                                         |
| 3RP-407        | GCU #124E           | Looks good (after 12 years, NAPL appears in MW1)                                                                                                            |
| 3RP-239        | State Gas Com N#1   | Looks good (23,000 ppb C <sub>6</sub> H <sub>6</sub> )                                                                                                      |
| 3RP-202        | Johnston Fed #6A    | Looks good (0.09 ft NAPL)                                                                                                                                   |
| 3RP-155        | Canada Mesa #2      | N, S, and W of MW1 (0.03ft NAPL)                                                                                                                            |
| 3RP-213        | Lateral O-21 Drip   | Poor all directions, only 3 MWs, 2 are dry, 2 w/ historic NAPL                                                                                              |
| 3RP-068        | Fogelson #4-1       | Poor all directions, only 3 MWs                                                                                                                             |

- 3) Recovery of NAPL. Unless NAPL is aggressively recovered, these ground water projects will go on for years. Use of absorbent socks placed or of hand baling in monitoring wells is passive and is suited for use only after aggressive mechanical systems have removed the bulk of contamination. The online documents show bailing of NAPL up to 2011. The records seem incomplete after that. Recovery of contamination is summarized below.

| <u>Project</u> | <u>Name</u>         | <u>Wells NAPL 2016</u> | <u>Recovery 2016</u>                                                                                                                                                            |
|----------------|---------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3RP-201        | Johnston Federal #4 | 4 max 0.76 ft          | 7.1 gal bailed<br>22 gal+85 lb vapor MDPE in 16 hours<br>[bailing twice yearly 1996-2011 in 2 MW recovered 22.7 gal]                                                            |
| 3RP-196        | James F Bell #1E    | 3 max 0.24 ft          | 1.81 gal bailed<br>20 gal+137 lb vapor MDPE in 16 hours<br>[ NAPL discovered in new MWs 8 & 10]<br>[bailing between 1996-2011 in 2 MW recovered 891 gal; 1.7 gal/bailing event] |
| 3RP-202        | Johnston Fed #6A    | 1 max 0.09 ft          | 5 gal MDPE in 7 hours (mostly vapor)<br>[bailing between 2009-2011 in 3 MW recovered 18.8 gal]                                                                                  |
| 3RP-239        | State Gas Com N#1   | 3 max 0.99 ft          | 1.68 gal bailed<br>[bailing between 1996-2011 in 7 MW recovered 274 gal]                                                                                                        |

|         |                  |   |             |      |                                                                 |
|---------|------------------|---|-------------|------|-----------------------------------------------------------------|
| 3RP-204 | K-27 Line Drip   | 1 | max 0.35 ft | None | [bailing between 2001-2011 in 3 MW recovered 12.3 gal]          |
| 3RP-207 | Knight #1        | 1 | max 0.62 ft | None | [bailing between 2000-2011 in 3 MW recovered 9.9 gal]           |
| 3RP-235 | Sandoval GC A#1A | 1 | max 0.43 ft | None | [ground water sampling since 1995, NAPL first appeared in 2016] |
| 3RP-179 | GCU A#142E       | 1 | max 0.30 ft | None | [bailing between 2010-2011 in 3 MW recovered 1.0 gal]           |

With less than a day of aggressive mechanical recovery (MDPE), you can recover more NAPL than by decades of hand bailing. The three MDPE projects demonstrated the success of NAPL and C<sub>6</sub>H<sub>6</sub> recovery, even when NAPL thickness was marginal. Likewise, the results of hand bailing demonstrate its inefficiency and futility. It's clear that what's been done so far isn't working and we're chasing the contamination plumes downgradient with progressions of monitoring wells. We're pleased you've shown insights into using advanced recovery methods.

By 31 July 2017, please submit remediation plans to a) fully delineate both the NAPL and benzene plumes and b) to recover NAPL effectively by use of more active remediation techniques. Passive remediation techniques shown to be ineffective, such as bailing and sorbent socks, will not be approved.



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Cc: Jim Griswold, Charlie Perrin, Brandon Powell, Cory Smith, Vanessa Fields