Methodology to Rehabilitate Methane Recovery Wells that Outweigh the Cost of Well Replacement

Stefan Stamoulis, P.G., PDTC
William Meyer, Waste Management, Inc.
Problems Associated with Methane Recovery Wells:

1. Cost of Well Installation
2. Capital Cost of O & M
3. No Alternative to Well Replacement
Solution to Methane Recovery Well Replacement: Post-Perforation!
Post-Perforation: Generates New Apertures in Methane Recovery Wells After the Well has been Installed.

- Produces a New Screen Interval for LFG Capture
- Relieves Flooded Wells to Allow for LFG Capture
- Creates New Migration Pathways for LFG in Vertically Extended Wells
How Post-Perforation Works:

- Navigates Past Bends and Deviations in Well Casings
- Hydraulically Generates Apertures in Well Casings from the Inside Out
- Intrinsically Safe / Works Safely in Explosive Environments
- Safe for, and Maintains Integrity, of Both PVC and HDPE Wells
Case Study – Metro Houston Area (Site 1)

• Five Methane Gas Extraction Wells were Post-Perforated on the Same Day

• Average Length of Post-Perforations per Well = 16.4 feet (from 20 to 36.5 ft bgs)

• **Average Measured Flow** for 3 Consecutive Months before Post-Perforation Compared to Averaged Measured Flow for 3 Consecutive Months after Post-Perforation
<table>
<thead>
<tr>
<th>Well ID</th>
<th>Average Measured Flow Pre-Perforation (SCFM)</th>
<th>Average Measured Flow Post-Perforation (SCFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well 1</td>
<td>1.67</td>
<td>19.67</td>
</tr>
<tr>
<td>Well 2</td>
<td>0.33</td>
<td>1.00</td>
</tr>
<tr>
<td>Well 3</td>
<td>2.33</td>
<td>25</td>
</tr>
<tr>
<td>Well 4</td>
<td>4.67</td>
<td>10.67</td>
</tr>
<tr>
<td>Well 5</td>
<td>3.33</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Average Flow Pre- vs. Post-Perforation

- **Well 1**: Average Flow Pre-Perforation: 19 SCFM, Average Post-Perforation: 19 SCFM
- **Well 2**: Average Flow Pre-Perforation: 1 SCFM, Average Post-Perforation: 1 SCFM
- **Well 3**: Average Flow Pre-Perforation: 25 SCFM, Average Post-Perforation: 25 SCFM
- **Well 4**: Average Flow Pre-Perforation: 4 SCFM, Average Post-Perforation: 4 SCFM
- **Well 5**: Average Flow Pre-Perforation: 3 SCFM, Average Post-Perforation: 3 SCFM
Cost Savings by Utilizing Post-Perforation

The Cost Difference Between Post-Perforation and Drilling a New Well:

- Typical Cost to Install a New Methane Extraction Well 40 feet in Length (minimum industry standard) = ~ $ 3,000
- Cost to Post-Perforate 40 feet in Length in an Existing Well = ~ $ 1,500
Cost Savings of Post-Perforation vs. Drilling New Well

- 50% Savings
- 63% Savings
Post-Perforation Extends the Life of Methane Extraction Wells

- Increase Methane Flow
- Decrease Oxygen Levels
- Maximize Gas Collection

Patent Awarded under the EPA Green Technology Initiative, 2010
For More Information about Post-Perforation

Please Contact:

Stefan Stamoulis, P.G.
Prospector Drilling and Tool Co.

409-927-8000
info@prospectordrilling.com
Stefan.stamoulis@prospectordrilling.com