Pilot Testing an Alternative Treatment Process to Remove Chromium-6 from Drinking Water and Rescind Authorization to Execute Agreement for Chromium-6 Treatment Project Construction Services

Coachella Valley Water District Board Meeting
October 25, 2016
Stannous Chloride (SnCl₂) Water Treatment

- Salt made of tin and chloride (SnCl₂)
- Drinking water additive used to protect pipes
- Tin like iron reduces Cr₆ to Cr₃ and has low toxicity – food products, water plumbing
- Evaluated for Chromium-6 (Cr₆) water treatment (2004)
  - Removed 40-60% of Total Cr in 3 water types tested
  - Did not meet City of Glendale’s 5 ppb goal for Cr₆
Dr. Seidel’s Recent Findings

- Prop 50 funded research on Cr6 treatment
  - Cal Water System (Willows, California)
- Included SnCl2 treatment testing on spent brine
- Added bench test of SnCl2 treatment for drinking water
- Received results in late September 2016
Observed rapid reduction of Cr6 with low SnCl2 dose (<1 ppm) and over 85% total chromium removal with 0.45 & 6 micron filters
CVWD Evaluation Results

• SnCl2 Desktop evaluation
  – No regulatory challenges or drinking water health effects identified
  – No supply or use challenges expected (drinking water use recertification in progress)
  – No unintended consequences found

• Completed Bench Tests for representative wells
  – Low SnCl2 doses (<1 mg/L) achieved rapid reduction of Cr6 to Cr3 (<5 min)
  – Total Cr levels in treated water are reduced below the 10 ppb MCL with 1 and 0.45 micron filters
Tests with Pre-filter Chlorination
0.75 mg/L SnCl₂ dose, 5 min reduction time

Cr(Total) (µg/L)

<table>
<thead>
<tr>
<th>Well</th>
<th>Test 1 - 1 um</th>
<th>Test 2 - 1 um</th>
<th>Test 3 - 1 um</th>
<th>Test 1 - 0.45 um</th>
<th>Test 2 - 0.45 um</th>
<th>Test 3 - 0.45 um</th>
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<tbody>
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<td>Well 3408-1</td>
<td>6.02</td>
<td>6.2</td>
<td>3.62</td>
<td>3.72</td>
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<td>Well 4720-1</td>
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<td>Well 5657-2</td>
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<td>5.4</td>
<td>4.8</td>
<td>2.8</td>
<td>2.85</td>
<td>2.5</td>
</tr>
</tbody>
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Cr₆ MCL
Well Site SnCl2 Treatment Concept

- Low doses (< 1 ppm) effective in bench tests
- Most SnCl2 removed with Cr during bench test filtration

- Less costly, simpler vessels and plumbing (similar contact time)
- Amenable to lower profile design

- 5 micron bag filters included in current design
- 1 micron cartridge filters removed enough Cr to meet MCL during bench test
- Disposable used bags & cartridges would represent the treatment process waste
Potential Benefits

• Capital Cost Savings
  – $135 M of planned facilities not needed
• Operating & Maintenance Cost Savings
  – Less than half of current plan (over $5 M annual savings)
• Prevents stranded well assets
  – Saves $12-15 M in well replacement costs
• Simpler process to construct and operate
• Allows lower profile equipment at well sites
• Generates substantially less waste
Proposed Pilot Test and Evaluation

• State & Stakeholder Collaboration
  – Proposition 50 funding, State needs & testing by others

• Treatability Testing
  – Test process using flowing conditions at CVWD wells
  – Optimize dosing, contact time & filtration options

• Water System Compatibility Testing
  – Evaluate treated water interaction with water pipes

• Conceptual Implementation Evaluation
  – Develop process treatment plan, costs & schedule

• Complete pilot test and evaluation by mid-2017
Current Project Status

- Project design packages are essentially complete
- PCL is completing work under the Preconstruction services agreement
- Contract and Notice to Proceed for construction has not been issued to PCL pending results of Bench Testing
Potential Impacts due to Pilot Testing Activities

• Compliance Plan milestones will need to be revised
• Risk of not meeting Jan. 1, 2020 compliance date if pilot testing does not work and current project goes out to bid
• Contractor may request compensation for rescinding award of construction agreement
• Potential to save significant costs and time if alternative treatment process works
Staff Recommendation

• Authorize issuance of a Request for Proposals for pilot testing and evaluation of alternative treatment process
  – Staff will request separate Board approval for award of a professional services agreement to top-ranked firm
  – Complete pilot testing by mid-2017

• Rescind July 26, 2016 authority to execute CMAR Services Agreement for Construction and Post-construction phases with PCL
  – If alternative treatment process is deemed not feasible, then request approval to solicit bids
QUESTIONS?