2016 Decommissioning Study – Geo Facility

Purpose – To provide an updated cost estimate and determine annual funding levels for the abandonment of the Geo Facility.

- 2006 Study
  - Est. 2006 cost of abandonment - $24.1 M
  - Escalation Rate – 2.5%
  - Abandonment date – Year 2034
  - Year 2034 abandonment cost - $46 M
  - Currently $14.2 M in reserve
  - FY18 - $1.8 M to be collected from members
Black & Veatch Decommissioning Study
Geo Facility

- Estimated Abandonment Cost - $59.3 M (Yr 2016)
- Changes from 2006 Study - $27.7 M
  - Well Plug and Abandonment costs updated to reflect current actuals (increased Steam Field costs ~$3.3 M)
  - Reflects cost of prevailing wage requirements ~$10.9 M
  - Includes contingency - $7.7m
  - Hazardous waste hauling and disposal - $5.8 M
## Geo Facility Decommissioning Estimates

<table>
<thead>
<tr>
<th></th>
<th>2006 Estimate</th>
<th>B &amp; V 2016 Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plant #1</strong></td>
<td>$7.5 M</td>
<td>$12.9 M</td>
</tr>
<tr>
<td><strong>Plant #2</strong></td>
<td>$7.5 M</td>
<td>$11 M</td>
</tr>
<tr>
<td><strong>Steam Field</strong></td>
<td>$13.44 M</td>
<td>$24.1 M</td>
</tr>
<tr>
<td><strong>Contingencies</strong></td>
<td>$3.2 M</td>
<td>$11.3 M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$31.6 M</td>
<td>$59.3 M</td>
</tr>
</tbody>
</table>
Black & Veatch 2016 Study

- Prevailing wages
- Additional infrastructure
  - SEGEP pipeline, pump stations, solar array, etc
  - Transmission line
- Construction Indirect Costs
  - Project Management & Engineering
  - Permitting & Legal fees
  - Overhead – management salaries, accounting
  - Utilities
- 15% contingency (~ $7.7 M)
# Estimated Impact to Members

<table>
<thead>
<tr>
<th>Abandonment Estimate</th>
<th>Retirement</th>
<th>Escalation Rate %</th>
<th>Future Abandonment Cost</th>
<th>Average Annual Contribution</th>
<th>Incremental Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$24.1 M</td>
<td>Yr 2034</td>
<td>2.5%</td>
<td>$46 M</td>
<td>$1.15 M</td>
<td></td>
</tr>
<tr>
<td>$24.1 M</td>
<td>Yr 2044</td>
<td>2.5%</td>
<td>$61.6 M</td>
<td>$740 K</td>
<td>- $410 K</td>
</tr>
<tr>
<td>$59.3 M</td>
<td>Yr 2044</td>
<td>2.5%</td>
<td>$100 M</td>
<td>$2.1 M</td>
<td>$967 K</td>
</tr>
</tbody>
</table>
## Impact of Interest Rate

Assume $100 M for Abandonment Costs in Yr 2044

<table>
<thead>
<tr>
<th>Interest Rate, %</th>
<th>Future Value of Current Reserve</th>
<th>Average Annual Member Contribution</th>
<th>Incremental Annual Cost to Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2%</td>
<td>$19.6 M</td>
<td>$2.5 M</td>
<td>$1.4 M</td>
</tr>
<tr>
<td>2%</td>
<td>$24.2 M</td>
<td>$2.1 M</td>
<td>$990 K</td>
</tr>
<tr>
<td>3%</td>
<td>$31.5 M</td>
<td>$1.7 M</td>
<td>$528 K</td>
</tr>
<tr>
<td>4%</td>
<td>$41 M</td>
<td>$1.25 M</td>
<td>$101 K</td>
</tr>
<tr>
<td>4.25%</td>
<td>$43.7 M</td>
<td>$1.15 M</td>
<td>$0</td>
</tr>
</tbody>
</table>
Conclusions

• Old Abandonment Estimate - $46 M (2034 dollars)
  • Reserve - $14.2 M
  • FY 18 - $1.8 M
  • Retirement year 2034

• New Estimated Abandonment Costs
  • $59.3 M (2016 dollars)
  • $100 M (2044 dollars, 2.5% escalation)
  • Retirement year 2044
  • Average increase in annual cost to members - $967 K

• NCPA Staff to develop options and analysis
  • Present back to members in Fall 2017
  • Incorporate any changes in 2019 budget