A Canadian refinery was challenged with a significant volume of sour naphtha that required treatment for hydrogen sulfide (H₂S). The material needed to be stored in tanks before being re-processed through the hydrotreater.

Originally, the only available treatment method was diluted caustic. This required a complex dilution system with full winterization for all equipment. Operations personnel were required to handle 50% caustic, adding significant health, safety and environmental (HSE) risks. Additionally, the spent caustic had to be drained from the treated tanks into frac tanks, adding further complexity and cost.

Previous scoping studies found the H₂S scavenger unsuitable due to the high cost, potential deactivation of the hydrotreater catalyst, and limited pipeline shipping options.

Baker Hughes proposed the new SULFIX™ 9290 H₂S scavenger as an alternative to the caustic system. This newly available product is nitrogen-free and specifically designed to be reprocessed through a hydrotreater.

The SULFIX 9290 scavenger provides additional key benefits, including excellent handling (non-corrosive, winterized) and a much lower HSE risk. This resulted in a simpler injection system, reducing setup and operating costs.

The initial treatment lasted 7 days and was an immediate success. The SULFIX 9290 scavenger was able to quickly achieve the H₂S target of <300 ppm.

The simple injection system offered reliable and consistent injection over the course of the treatment. Upon completion, the treated naphtha was quickly reprocessed with no operational impact, eliminating the need to drain tanks or undertake lab testing.

### Challenges
- Sour naphtha with very high H₂S content routed to storage
- High HSE risks
- Fast, effective H₂S removal necessary
- Hydrotreater reprocessing required

### Results
- Less handling improved HSE
- Reliable chemical injection
- Fast and irreversible reaction
- Immediate reprocessing without draining or additional lab testing
- No operational impact during reprocessing
- 40% reduction in operational expenditures (OPEX)

### Treatment summary

<table>
<thead>
<tr>
<th>SULFIX 9290 H₂S scavenger</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Baseline H₂S</td>
<td>10,000 ppm</td>
</tr>
<tr>
<td>Target limit</td>
<td>&lt;300 ppm</td>
</tr>
<tr>
<td>Actual H₂S results</td>
<td>100 ppm</td>
</tr>
<tr>
<td>Total OPEX savings</td>
<td>$320,000 USD</td>
</tr>
</tbody>
</table>

### H₂S levels

| 600 |
| 500 |
| 400 |
| 300 |

### H₂S threshold

- **Baker Hughes testing**
- **Customer testing**

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