



## CASE STUDY:

# CO<sub>2</sub> Removal From Reformer Gas

### Client's Problem

The client needed to augment supply of CO<sub>2</sub> for injection in an enhanced oil recovery (EOR) project, and was using expensive trucked-in CO<sub>2</sub> as a stopgap supply. A nearby steam methane reformer offered a potential local source. The CO<sub>2</sub> generated in the reformer, however, leaves the process in the reformer tail gas, diluted with hydrogen and unreacted methane. This could not be used directly, because the client needed 90% pure CO<sub>2</sub> for the EOR project.

### MTR's Solution

MTR proposed this scheme to recover 90% pure CO<sub>2</sub> from the reformer.

Because the CO<sub>2</sub>-rich tail gas is at low pressure, gas coming directly from the reformer provides a better source for CO<sub>2</sub> recovery. In the solution developed by MTR, the Polaris™ membrane is used

to permeate CO<sub>2</sub> out of the pressurized reformer gas. Because hydrogen is fairly concentrated in this stream, some hydrogen does co-permeate with the CO<sub>2</sub>. The permeating gas is therefore recompressed and passed through a second membrane stage. This stage permeates 90% pure CO<sub>2</sub> for reinjection. The pressurized, CO<sub>2</sub>-depleted gas leaving this stage is recycled back to the feed.

This simple process increases the CO<sub>2</sub> concentration from 20% in the gas from the reformer to >90% in the recovered CO<sub>2</sub> stream, and recovers nearly 75% of the CO<sub>2</sub> contained in the reformer gas.

