Attachment A
Supporting Calculations for the
Estimated Quantity of Oil
Released
From *Pipeline Rules of Thumb Handbook* (5th Ed.) by E. W. McAllister

Formula to estimate leakage amount through small holes in a pipeline (pg. 333):

\[ Q = 0.61 \times A \sqrt{2 \times g \times h} \]

- **Q** = flowrate in cubic feet per second
- **A** = hole cross-section area in square feet
- **g** = gravitational constant = 32.2 feet/second/second
- **h** = head in feet

**FIND "A"**
- 0.5 hole diameter (in.)
- 0.0013635 hole area (sq. ft.)

**FIND "h"**
- 64 pressure (psi)
- 0.86 specific gravity
- 0.373 psi per foot of head
- 171.735 head (ft)

**FIND "Q"**
- 0.087 flow rate (cfs)
- 56.086 flow rate (bph)

**CALCULATE TOTAL VOLUME**
- 13.66667 leak time (hours)
- 766.51265 total volume (bbls)