

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):

$$Q=0.61*A*\sqrt{2*g*h}$$

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)

Pressure Transmitter Reading (PSI)

