**Case #3**

**Well, Pipeline, Separator and Finances…**

Your company is thinking of acquiring a land of 48km^2 (Length = 8km, Width = 6km) and to drill 4 wells on the corners of the rectangle and to buy a separator (put it right in the middle of the land).

But before making that decision you need to analyze this investment. You have the following data:

Well data: Static Well Head Pressure of all wells is equal to 2000psi. Surface Well Productivity Index: Well 1 - 5bopd/psi, Well 2 - 10 bopd/psi, Well 3 - 15 bopd/psi, Well 4 - 20 bopd/psi.

Fluid Properties: Oil density = 900kg/m3, oil viscosity = 50cP, GOR=2000CFD/BBL, Z factor - 0.85, gas density = 3.5lb/ft3.

Separator: Operating Pressure = 1000psi, Operating Temperature = 60F, Droplet size = 140micron, retention time = 3 min.

In the market, only pipelines with 150mm diameter available.

The Static Well Head Pressure decreases by 200psi annually.

For pressure drop calculation along the pipes, consider liquid to be single phase incompressible fluid.

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| **Given Item** | **Corresponding Units or Value** | **Timing** |
| **Oil Price, $/bbl** | 100$/bbl the first year, then falling annualy at 10% | End-of-Year 1 to 5 |
| **Gas Price, $/MCFD** | 30 $/MCFD the first year, then falling annually at 10% | End-of-Year 1 to 5 |
| **Cost of drilling 4 wells and buying a separator** | 4 000 000 $ | Now (year 0) |
| **Straight line depreciation expense** | 800 000 $ | End-of-Year 1 to 5 |
| **Direct labor cost per unit, $/bbl** | 5$ | End-of-Year 1 to 5 |
| **Energy cost per unit, $/bbl** | 5$ | End-of-Year 1 to 5 |
| **Tax expenses on Income** | 20% of pre-tax profit | End-of-Year 1 to 5 |
| **Cost of capital** | 10% | End-of-Year 1 to 5 |

**Task:**

**1) Determine the Separator Size**

**2) Conduct DCF Analysis and Estimate NPV, Pay-Back-Period and IRR**

**Requirements:**

1. **Show your calculations in PPT or Excel format**