Oil and Gas in Place by the Volumetric Method

Stock-tank oil or standard gas initially in place from drainage area, net pay, porosity, water saturation and formation volume factor, and recoverable volume.

Method: Ahmed; Reservoir Engineering Handbook; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Reservoir fluid	Oil	
Drainage area	259.00	ha
Net pay thickness	9.1440	m
Porosity	20.000	%
Initial water saturation	25.000	%
Initial formation volume factor (B_oi, or B_gi in reservoir m³ per standard m³)	1.3000	
Recovery factor	30.000	%

Calculated results

Parameter	Value	Unit
Hydrocarbon pore volume	3,552,428	m³
Volume in place at surface (stock-tank oil or standard gas)	2,732,637	m³
Recoverable volume	819,791	m³

Notes for this case

- Oil: the result is stock-tank m³ (1 m³ = 6.29 bbl).

Formula and method

$$V_p = Ah\phi(1 - S_{wi}), \quad N = \frac{V_p}{B_i}, \quad N_r = N \cdot RF$$

Variables

fluid	Reservoir fluid	-
A	Drainage area	m²
h	Net pay thickness	m
ϕ	Porosity	-
S_{wi}	Initial water saturation	-
B_i	Initial formation volume factor (B_oi, or B_gi in reservoir m³ per standard m³)	-
RF	Recovery factor	-
V_p	Hydrocarbon pore volume	m³
N	Volume in place at surface (stock-tank oil or standard gas)	m³
N_r	Recoverable volume	m³

Method and standards

Volumetric balance.

Assumptions and limits

- Uniform average properties.

References

- Ahmed
- Reservoir Engineering Handbook
- 5th ed. (Gulf Professional Publishing, 2019)
- ch. 4 and ch. 13 (volumetric method)

Report details

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Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/oil-gas/oil-gas-in-place-volumetric

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.