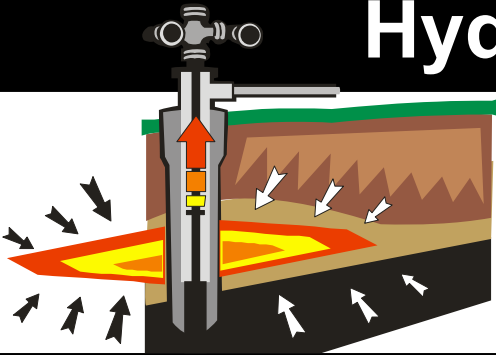


EXODUS - Modeling Fluid Flow in Hydraulic Fracture



Accurate, flexible calculations to help you make informed decisions, optimize budgets and maximize your profits.

Why YOU should use EXODUS:

- ✓ 3D, 3-phase, multi-component reservoir simulator
- ✓ Existing installed base - proven over last 12+ years to be numerically stable and accurate.
- ✓ History matching of measured data a routine procedure.
- ✓ Built-in NPV economic comparison capability.
- ✓ Customized to meet needs of the Fracturing community.
- ✓ User friendly. Import MFRAC™ frac geometry.
- ✓ All modules included in package – no added costs.
- ✓ Multiple Proppants – up to 5 per frac – either different proppant concentrations and/or proppant types.
- ✓ Flexible segmented/tapered fracture geometry (width can vary along length AND height).
- ✓ Embedment effects.
- ✓ Non-Darcy flow (Beta factors).
- ✓ Crushing/ Fines migration/ Fluid breakout (Damage factor).
- ✓ Easy to get started.

3D Frac. Template

- ✓ Modified input forms to consolidate data entry.
- ✓ Covers most needs for vertical wells/vertical fracs.

Manual Construction

- ✓ Ultimate flexibility.
- ✓ Advanced users can build very complicated models ... your imagination is the limit.

**We let
YOU
get it right.**

T.T.& Associates Inc. c/o PetroStudies Consultants Inc.

204, 4603 Varsity Drive N.W. • Calgary, Alberta, CANADA T3A 2V7

Website: www.petrostudies.com • Phone: 403.265.9722 • Fax: 403.265.8842



Reasons to use EXODUS:

Stress dependant:

- Beta factor
- Permeability
- Porosity
- Damage factor
- Embedment

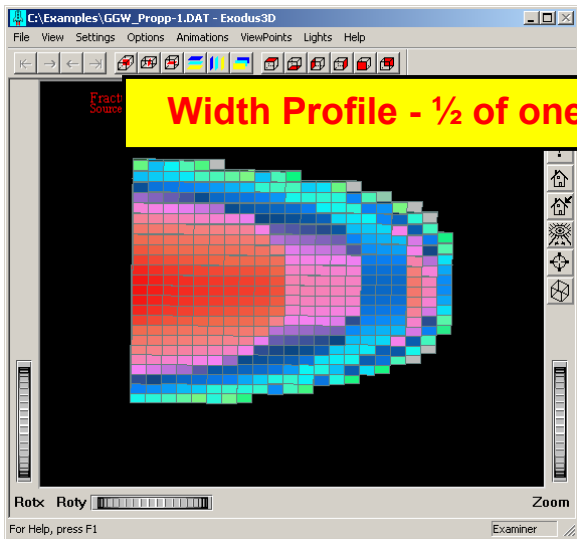
User defined proppant database.

Data entry consolidated on one form with 6 tabs.

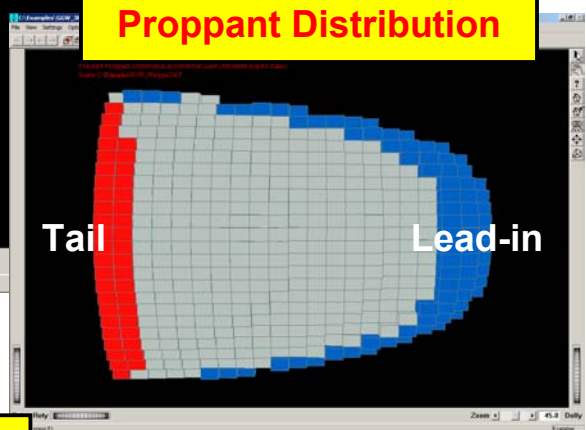
Choose Stress Dependent Properties of Proppant. Enter data or use database.

General Information	PVT	Formation	Fracture
Tubing (optional)	Economics (optional)	Rel. Permeability (optional)	Proppant (optional)
Proppant Database: ...ExampleProppant_DB.pdb Active Proppant 1 Name Propp_1 Conc. 2 S.G. 2.65 Cooke_a 1.22 Calc. Sphericity 0.7 Diameter in 0.012 Cooke_b 0.15 Roundness 0.8 Comment Stress on proppant = $(v/1-v)(\sigma_{verburden}-b \cdot P_{res}) + b \cdot P_{res} - P_{res}$ where v =Poisson's Ratio, b =Biot's const, P_{res} = Reservoir Pressure			
	Stress on Proppant psia	Beta Factor 1/feet	Perm. Darcy
		Porosity frac.	Damage Factor
			Embedme % of Diamete
1	0.00	21027.0000	70.00
2	1000.00	23102.0000	65.00
3	2000.00	25574.0000	60.00
4	3000.00	28562.0000	55.00
5	4000.00	32237.0000	50.00
6	5000.00	36853.0000	45.00
7	6000.00	42799.0000	40.00
8	7000.00	61675.0000	30.00
9	8000.00	103215.0000	20.00
1.00	197465.0000	12.00	0.290
0.00	284552.0000	9.00	0.278

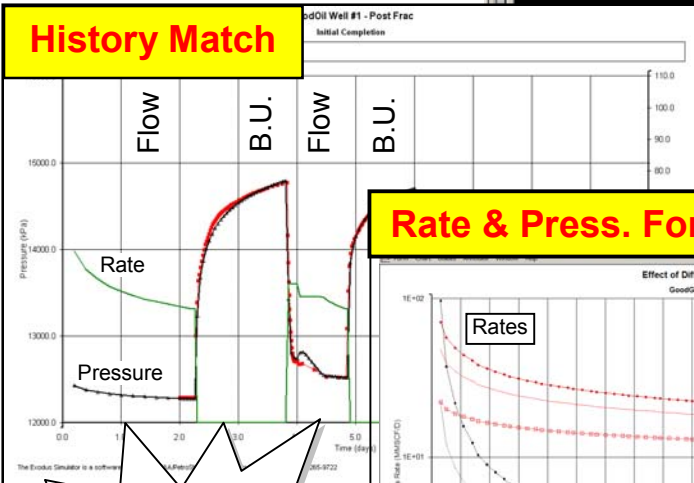
Width Profile - 1/2 of one wing



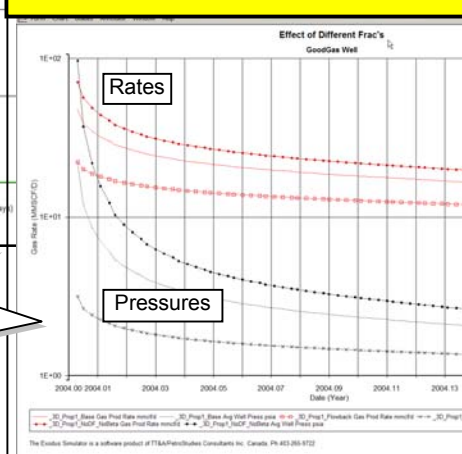
Proppant Distribution



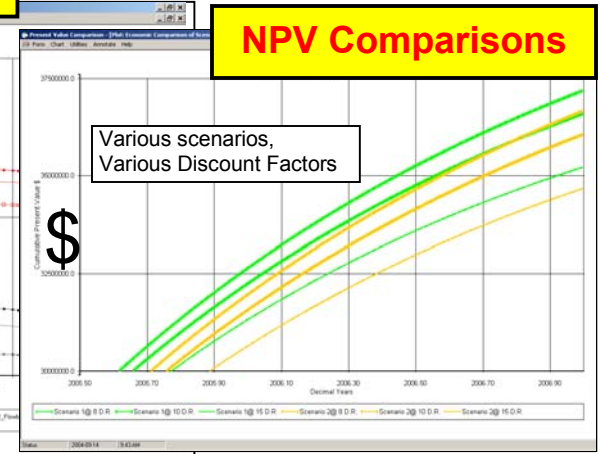
History Match



Rate & Press. Forecasts



NPV Comparisons



... and much more!

In addition to elements of symmetry, Exodus also models total well, patterns, entire reservoirs and multi-pool full field studies.