enersight

Petroleum Economics meets Development Planning with Enersight's WellSpring for Shale Gas

WellSpring's Shale gas workflow helps companies model complex development plans quickly and thoroughly so they can spend time on testing ideas and strategies instead of developing and maintaining massive spreadsheets. Analyzing the economics of a shale gas, or other unconventional resource play, requires a number of iterations looking at well capability, number of wells, number and availability of drilling and completion rigs, facility sizing, and timing. Using WellSpring, all of these variables can be easily modified to quickly look at the many permutations to the problem.

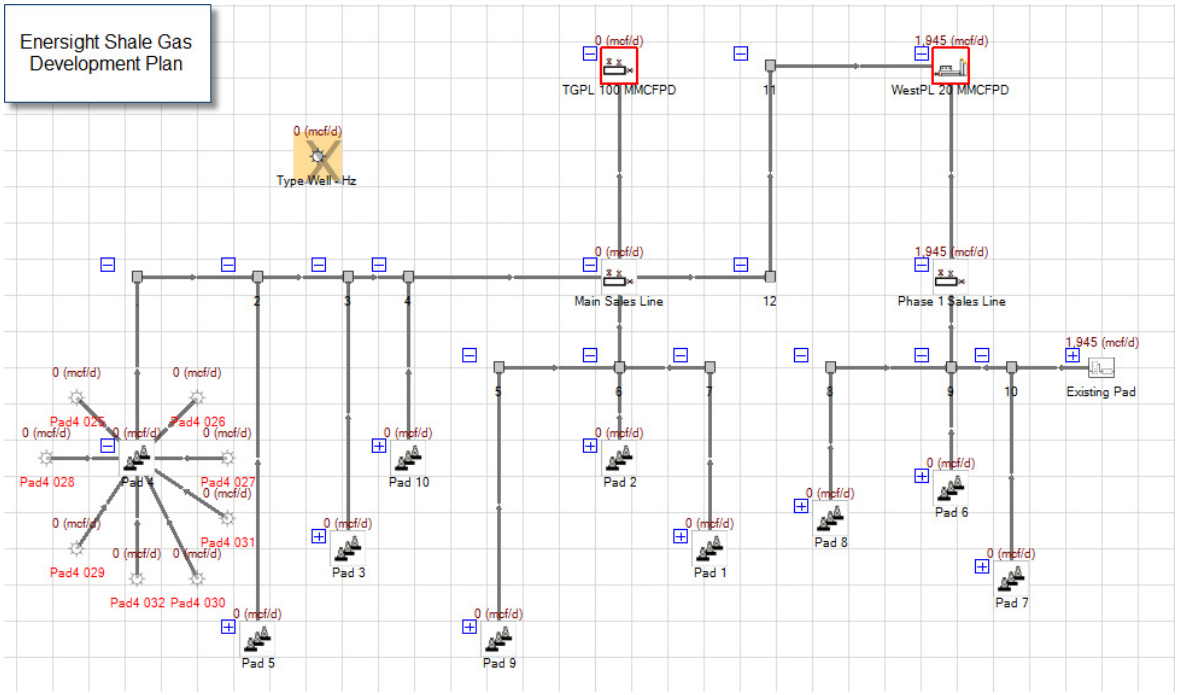


Figure 1 - WellSpring Visual Interface

WellSpring's visual interface helps simplify the analysis of complex problems. By allowing you to view your wells, pads, rigs and facilities, along with your gathering system, WellSpring lets you see your development plan unfold.

For a Shale Gas development, you can build your gathering system infrastructure specifying the limits on any sales lines, water disposal infrastructure, or compressors. You can specify when the capacities of these facilities change over time and schedule drilling to maintain capacity, allowing for quick and accurate comparison of many different development pacing alternatives. You can also put in the existing production from your current wells, together with a forecast for the future production to give you a complete plan.

Finding the Optimum Development Pace

By making it easy to modify rig schedules, well forecasts, facility limits or expansions, WellSpring enables you to quickly evaluate alternative development options. WellSpring allows you to focus on the business decisions for all your projects - CBM, Shale gas, SAGD, CSS, or conventional projects.

WellSpring has the ability to automatically evaluate development scenarios based on the flow network's limitations such as:

- How many rigs do I need drilling to maintain my water injection at capacity?
- When do I need to expand my water handling capacity to keep up with my various drilling options?
- When do I need to recomplete wells to meet delivery contract obligations?

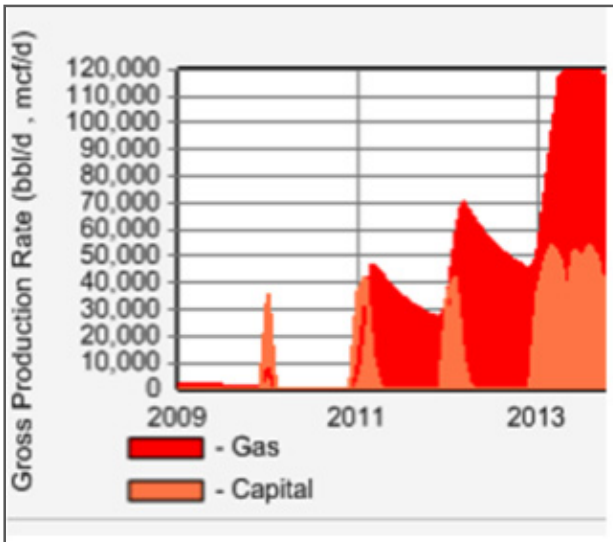


Figure 2 – Plan A Base Plan Development

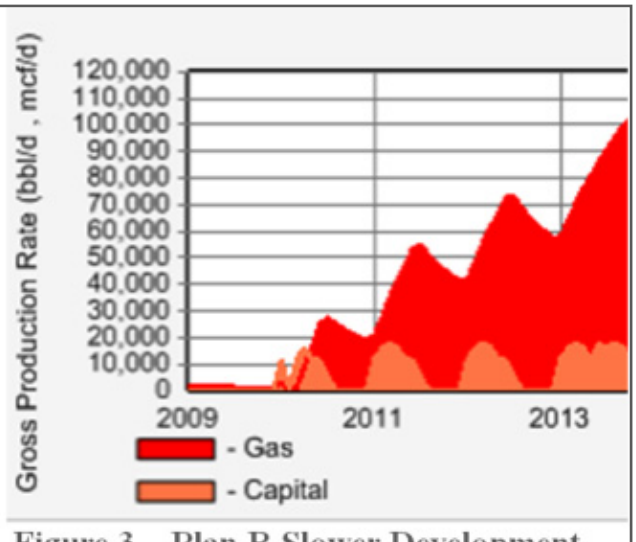
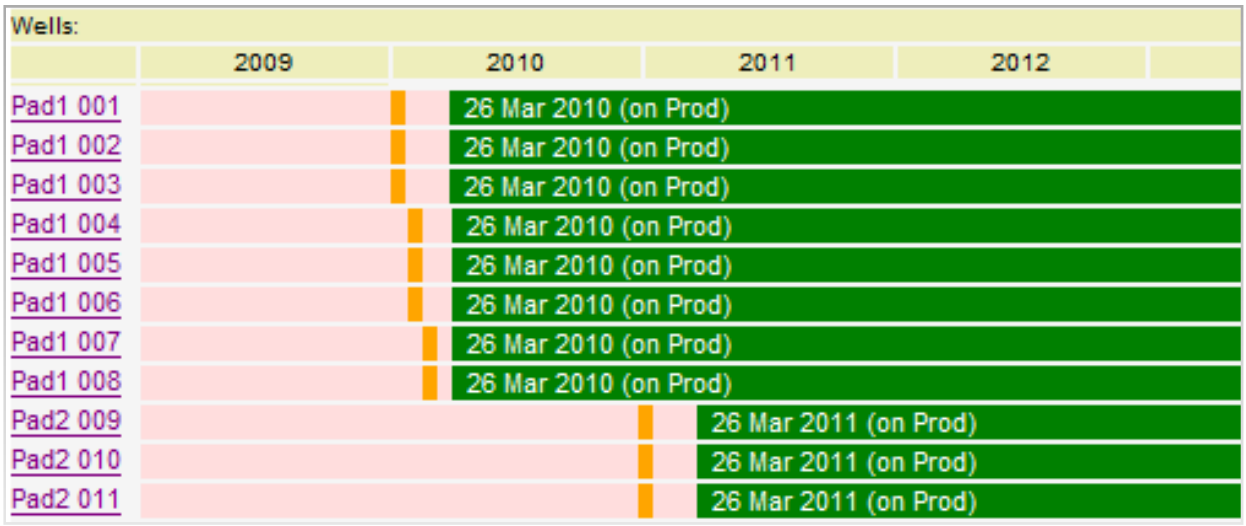


Figure 3 – Plan B Slower Development Plan

WellSpring visually and numerically compares the options with both volume and full economic comparisons of your various scenarios. By allowing the detailed rig scheduling to be combined with the flow network and economics, decision evaluation cycles are drastically reduced. This allows companies to make better decisions with fewer people.

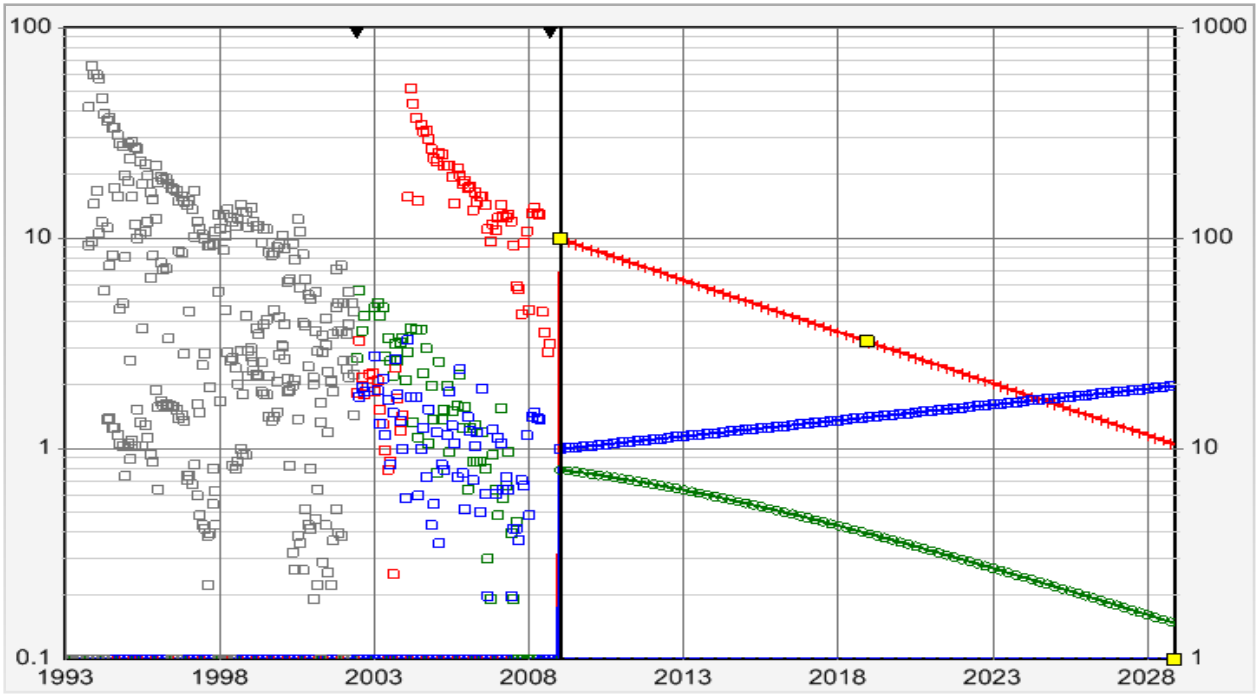
Rig Scheduling

Shale gas plays typically require large drilling programs, and managing 1000's of wells in a drilling program can be tedious. WellSpring is being used by companies to manage +10,000 well drilling programs in a single asset. WellSpring has intuitive interfaces to model pad based drilling and completion timing, limited access issues, timing and per rig costs. WellSpring also has complex performance and efficiency improvement modeling functions.



Existing Production and Economics

Wellspring includes comprehensive decline analysis and production forecasting system with fully integrated US and international economics modeling. The decline allows for quick "best fit" analysis of existing production, including the ability to infill drill using quick rig scheduling and ensure facility limitations will not have an impact in future expansions.



WellSpring's detailed economic modeling, including US, Canadian and International fiscal models, allow you to quickly evaluate the economic impact of development options. The different options can be compared using differential consolidations. And WellSpring's rich reporting and graphing tools help users to fully analyze the impacts of development changes.

US Economic Summary

PROJECT: _Base Production
SCENARIO: Base Production
ASSET: BANKER 552
PROD START DATE: 01 Jan 2009
ASSET START DATE: 01 Jan 2009

DATE: 10/17/2009 10:48:43 AM
RISK: Base
SCENARIO PRICE SET: Oil-$60 Gas-$4 NGL-$60
REPORT INTEREST Gross

WI (%) 50.0000
NRI (%) 42.5000
AVG OIL PRICE ($/BBL) 60.00
AVG GAS PRICE ($/MCF) 4.05

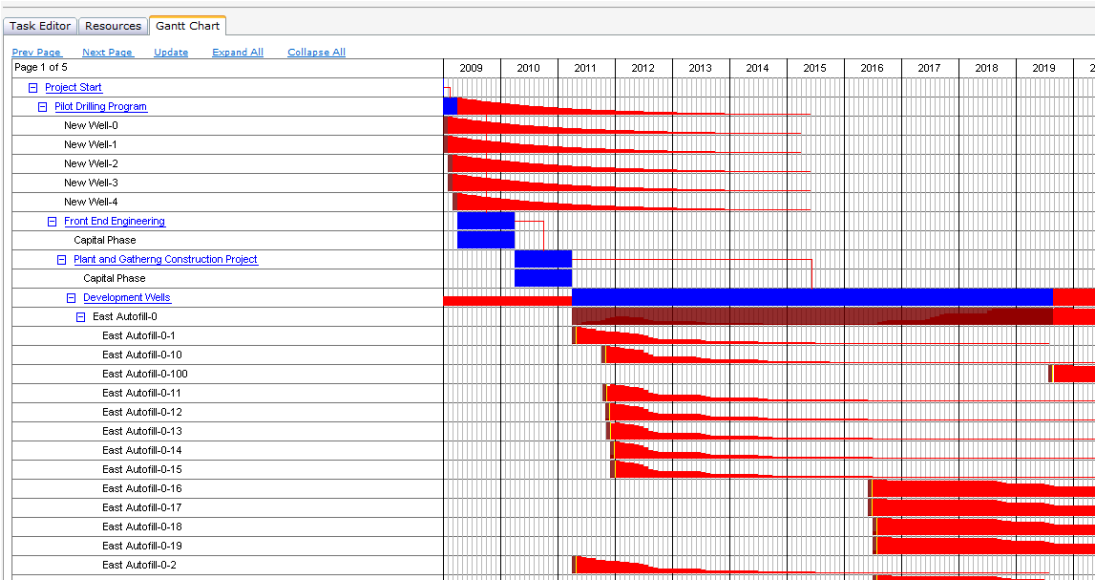
Indicators	Before Tax	After Tax
POS (Asset Level Only)	1 (frac)	
PI Undiscounted (frac)	0.61	0.49
PI @10% (frac)	0.29	0.23
ROR (%)	26.7	26.7
PAYOUT (months)	33.2	33.2
F&D Cost ($/BOE)	8.61	

GROSS RESERVES - OIL	5	mbbl
GAS	317	mmcf
BOE	58	mbbl
NET RESERVES - OIL	2	mbbl
GAS	135	mmcf
BOE	25	mbbl

Gross	UnDisc. m$	10% m$	15% m$
CAPITAL	500	500	500
BEFORE TAX NPV	307	147	92
AFTER TAX NPV	243	116	73

DATE	OIL bbl	GAS mcf	BOE bbl	OIL PRICE $/bbl	GAS PRICE $/mcf	REVENUE m$	OTHER REVENUE m$	STATE TAXES m$	OPCOSTS m$	ROYALTY m$	OP INCOME m$	CAPITAL m$	CASH FLOW BEFORE TAX m$	CASH FLOW AFTER TAX (UNDISC) m$	CASH FLOW AFTER TAX (@10%) m$
2009	945	97,652	17,221	60.00	4.05	452	0.00	38	75	68	272	500	(228)	(180)	(188)
2010	710	53,514	9,629	60.00	4.05	259	0.00	22	52	39	146	0	146	115	101
2011	630	39,142	7,154	60.00	4.05	196	0.00	17	45	29	105	0	105	83	66
2012	584	31,363	5,812	60.00	4.05	162	0.00	14	41	24	82	0	82	65	47
2013	531	25,321	4,751	60.00	4.05	134	0.00	12	38	20	64	0	64	51	33
2014	473	20,505	3,890	60.00	4.05	111	0.00	10	35	17	49	0	49	39	23
2015	414	16,605	3,181	60.00	4.05	92	0.00	8	33	14	37	0	37	29	16
2016	357	13,480	2,604	60.00	4.05	76	0.00	7	31	11	26	0	26	21	10
2017	304	10,883	2,117	60.00	4.05	62	0.00	6	30	9	17	0	17	13	6
2018	256	8,813	1,725	60.00	4.05	51	0.00	5	29	8	10	0	10	8	3
	5,205	317,278	58,084	60.00	4.05	1,596	0.00	140	409	239	807	500	307	243	116

Lifecycle Project Scheduling



WellSpring allows you to define a project schedule as a series of tasks over time that linked together through dependencies and are dependent on resource availability. This allows you to model a complete project from land acquisition through facility construction and detailed drilling schedules with rig availability. When any element changes, your project is instantly updated giving you an accurate picture of the timing and the value of your project.

Collaborative Environment

This complete picture of the project provides a collaborative environment in which all team members can describe their project elements and see how changes in their aspect of the project impacts the other groups, such as facilities, marketing, drilling and reservoir.

The lifecycle modeling capability of WellSpring allows a proper economic analysis of projects ranging from small field development plans to large resource plays with complex infrastructure planning requirements. Forecasting the drilling schedule, capital budget and rate of return on a petroleum project is a rigorous task that WellSpring can make an easier process with better results.

Why use Enersight's WellSpring for Shale Gas Planning?

For Shale gas, or unconventional gas projects in general, WellSpring provides a powerful development planning tool that allows you to visually model your gas gathering system, including any constraints.

Large well plans in excess of 20,000 future well locations can be made and managed with minimal effort, including rig scheduling and pad based drilling and construction issues.

For more information see our Shale Gas White Paper.

WellSpring Features include:

- Detailed Project Scheduling with unlimited activities and associated resource requirements and timing. Full Gantt Chart ability for Project design
- Heavy Oil – SAGD or CSS drilling scheduling with steam capacity management.
- CBM drilling optimization based on water handling capacity.
- Scenario analysis of exploration and development plans
- Seasonal rig scheduling with automated drilling programs
- Nodal analysis production modeling of dry gas pressure system for compression requirement planning
- Easy exports to most 3rd party economics software packages, allowing for simple incorporation into corporate and reserves reporting systems
- Hosted internet application, no installation or IT infrastructure requirements, can be used by anyone anywhere.

Types of questions that you can quickly answer with WellSpring:

- When will the facilities need to be expanded, and by what sizes?
- What is the optimum drilling schedule taking into account winter drilling or other rig availability constraints?