

Shale Gas Development Pacing Drill to Fill

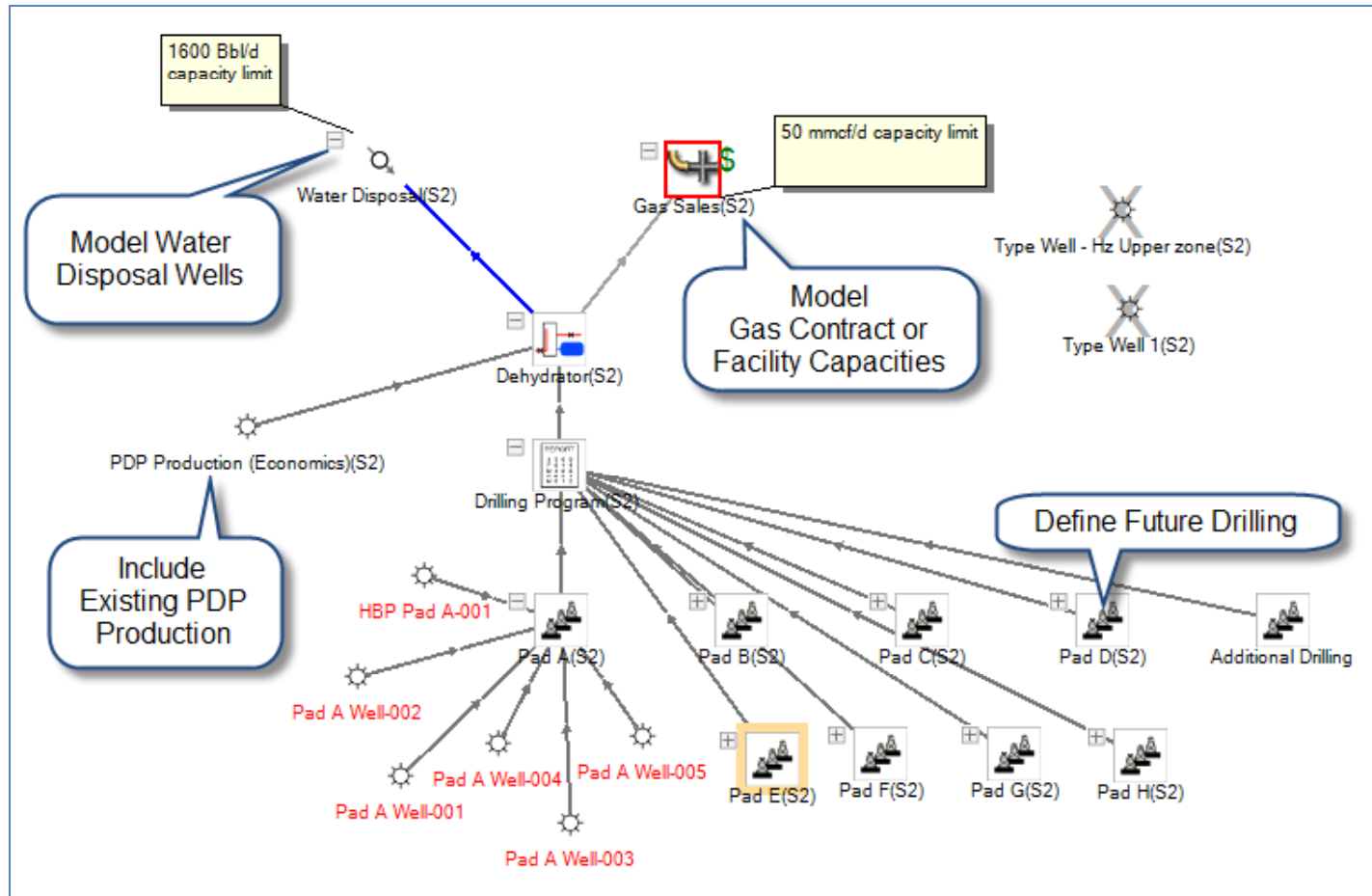
Problem

- Defining number of resources (rigs) required to maintain production levels. Based on facility of export contract requirements

Challenges

- Define drilling requirement over project life to meet production targets or limits
- Improved forecasting of facility or pipeline capacity requirements.

Flow Diagram – Shale Gas Development Pacing



Change Drilling Program to be “Drill to Fill”

- Drill to fill monitors volumes through a network node a controls drilling program well start dates.

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	2010	2011	2012	2013	Start	Duration	Finish	Rig Name	Gas Reserves
<input checked="" type="checkbox"/> HBP Drilling Program	[Gantt bars]				01/01/2010	147 Days	05/27/2010		
<input checked="" type="checkbox"/> Drill to Fill - Gas Sales	[Red bar]				05/28/2010	3172 Days	02/01/2019		166,578.4 mmcf
<input checked="" type="checkbox"/> Pad A Well-001 (Drilling)					05/28/2010	25 Days	06/21/2010	Precision Rig A	2,333.6 mmcf
<input checked="" type="checkbox"/> Pad A Well-002 (Drilling)					06/22/2010	25 Days	07/16/2010	Precision Rig A	2,331.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-003 (Drilling)					07/17/2010	25 Days	08/10/2010	Precision Rig A	2,329.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-004 (Drilling)					08/11/2010	25 Days	09/04/2010	Precision Rig A	2,327.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-005 (Drilling)					09/05/2010	25 Days	09/29/2010	Precision Rig A	2,325.6 mmcf
<input checked="" type="checkbox"/> Pad B Well-001 (Drilling)					09/30/2010	25 Days	10/24/2010	Precision Rig A	2,323.4 mmcf
<input checked="" type="checkbox"/> Pad B Well-002 (Drilling)							11/18/2010	Precision Rig A	2,321.2 mmcf
<input checked="" type="checkbox"/> Pad B Well-003 (Drilling)							12/13/2010	Precision Rig A	2,319.0 mmcf
<input checked="" type="checkbox"/> Pad B Well-004 (Drilling)							01/07/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-001 (Drilling)							01/24/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad B Well-005 (Drilling)					01/25/2011	25 Days	02/01/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-002 (Drilling)					01/25/2011	24 Days	02/17/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad C Well-003 (Drilling)					04/01/2011	24 Days	04/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-004 (Drilling)					04/01/2011	24 Days	04/24/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad C Well-005 (Drilling)					07/01/2011	24 Days	07/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-001 (Drilling)					07/25/2011	24 Days	08/17/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-002 (Drilling)					08/18/2011	24 Days	09/10/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-003 (Drilling)					11/01/2011	24 Days	11/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-004 (Drilling)					11/25/2011	24 Days	12/18/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-005 (Drilling)					12/19/2011	24 Days	01/11/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad E Well-001 (Drilling)					04/01/2012	25 Days	04/25/2012	Precision Rig B	
<input checked="" type="checkbox"/> Pad G Well-001 (Drilling)					04/01/2012	24 Days	04/24/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-002 (Drilling)					04/25/2012	24 Days	05/18/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-003 (Drilling)					08/01/2012	24 Days	08/24/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-004 (Drilling)					08/25/2012	24 Days	09/17/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-005 (Drilling)					12/01/2012	24 Days	12/24/2012	Precision Rig A	

Drilling Program Slowed as Facility Reaches Capacity

Fill Facility Task: Drill to Fill - Gas Sales [delete](#)

Name :

Is Active : Start Trigger Function: *fn*

Start Date (mm/dd/yyyy):

Timeline Color :

Use Production Potential Use Actual Production

Facility :

Facility Capacity Trigger (%) : *fn*

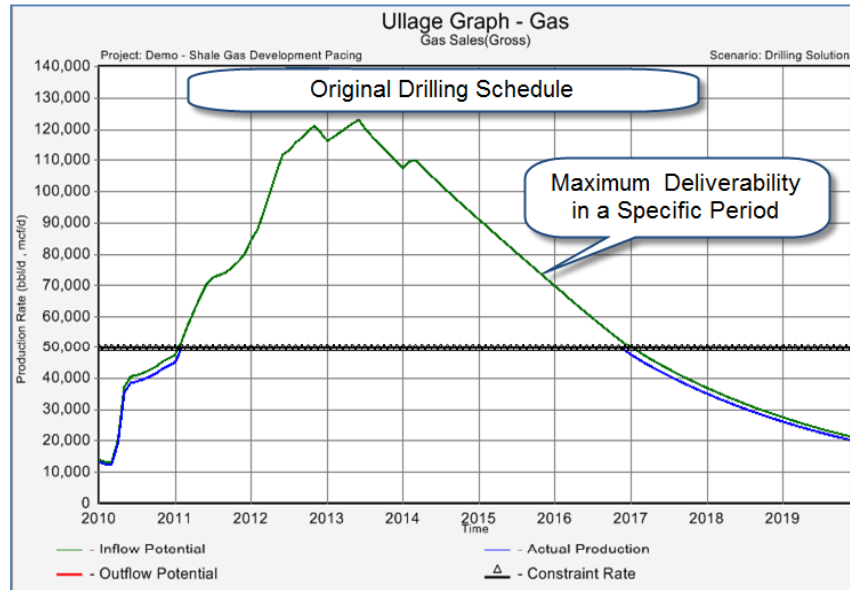
Maximum Refill Target (%) : *fn*

Facility Triggers Based On all Products

Select Asset Node

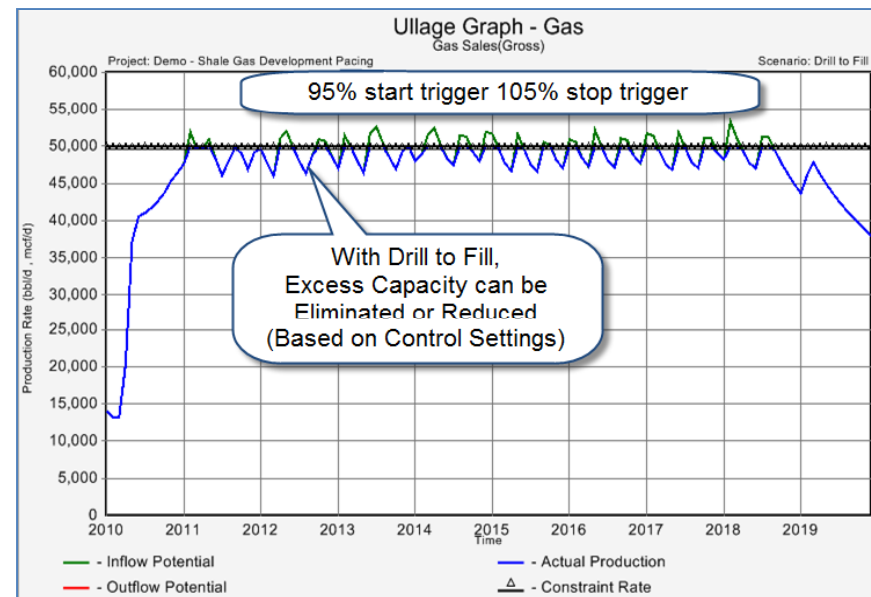
Set trigger points

Results – New program avoids over capacity

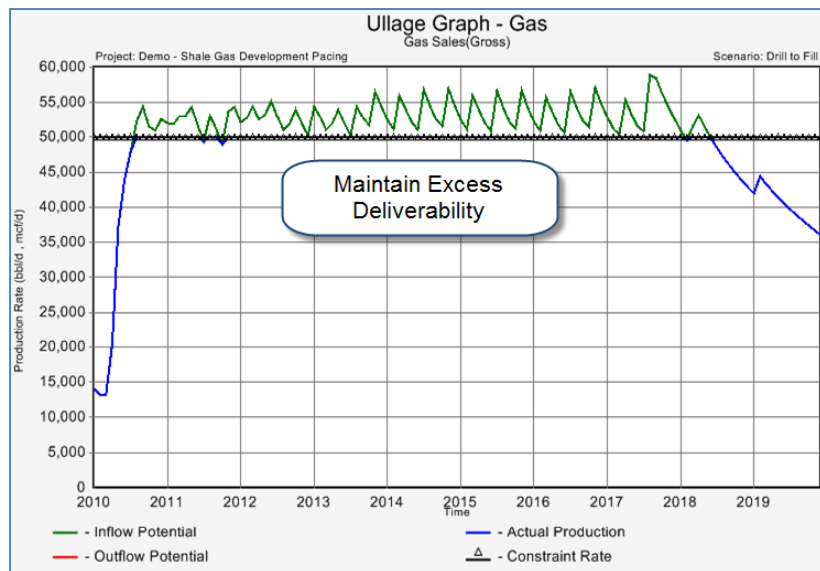


Drill to Fill Controls the Drilling Schedule while honoring all resource rules, including:

- Access Restrictions
- Rig Availability Timing
- Frac Timing
- Gathering system construction



Results – Drill to Fill program can be Tuned



- Drill to Fill can be tuned to eliminate All Over capacity, or under capacity as needed

