Information | Analytics | Expertise

OCTOBER 30, 2014

IHS

Identifying Completion Effectiveness using Type Well Analysis

Brian Ho
brian.ho@ihs.com

What is Harmony?

A software environment hosting well performance analysis tools

Currently includes:

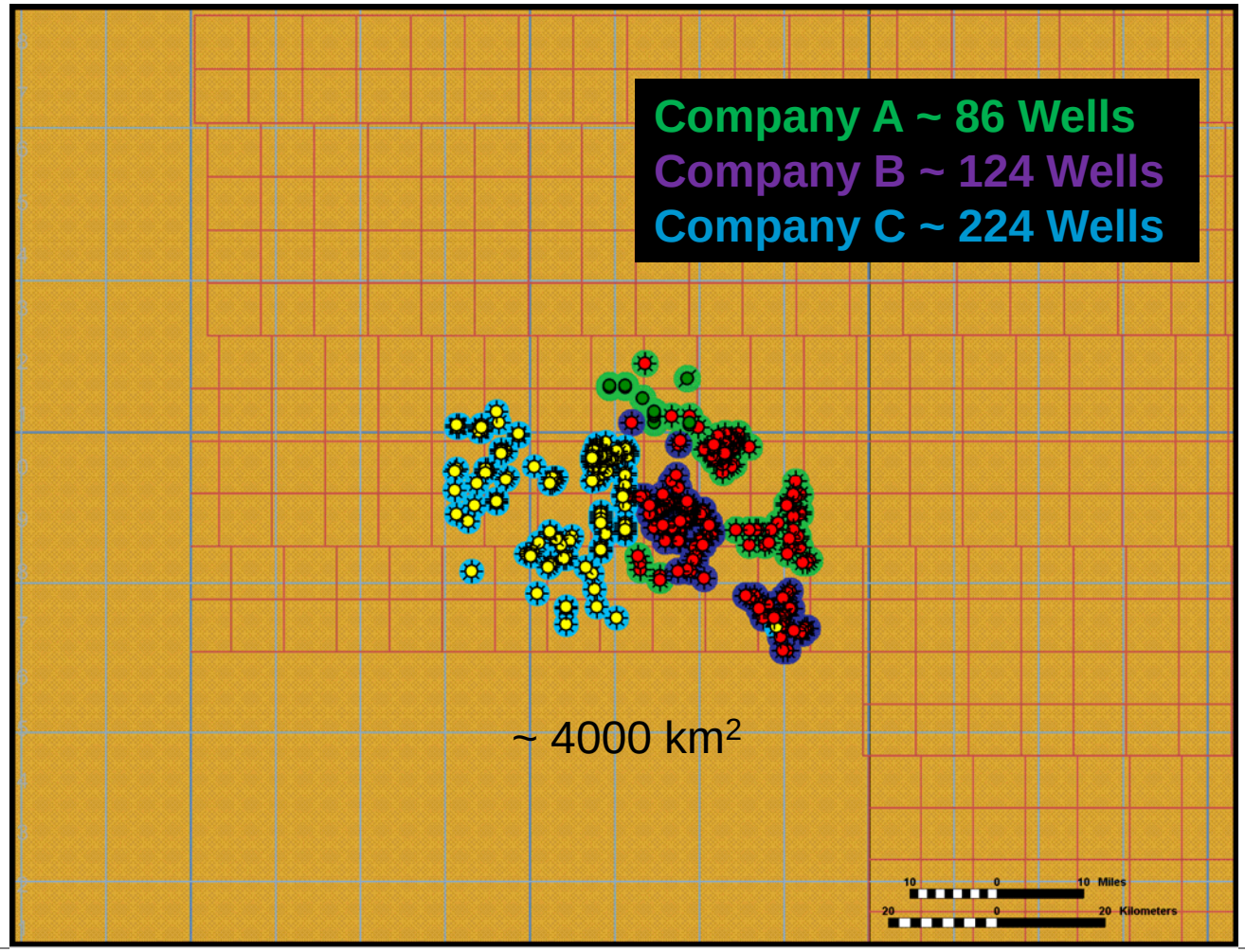
- IHS DeclinePlus
- IHS RTA
- IHS CBM
- IHS VirtuWell

Completion Effectiveness using Type Well Analysis

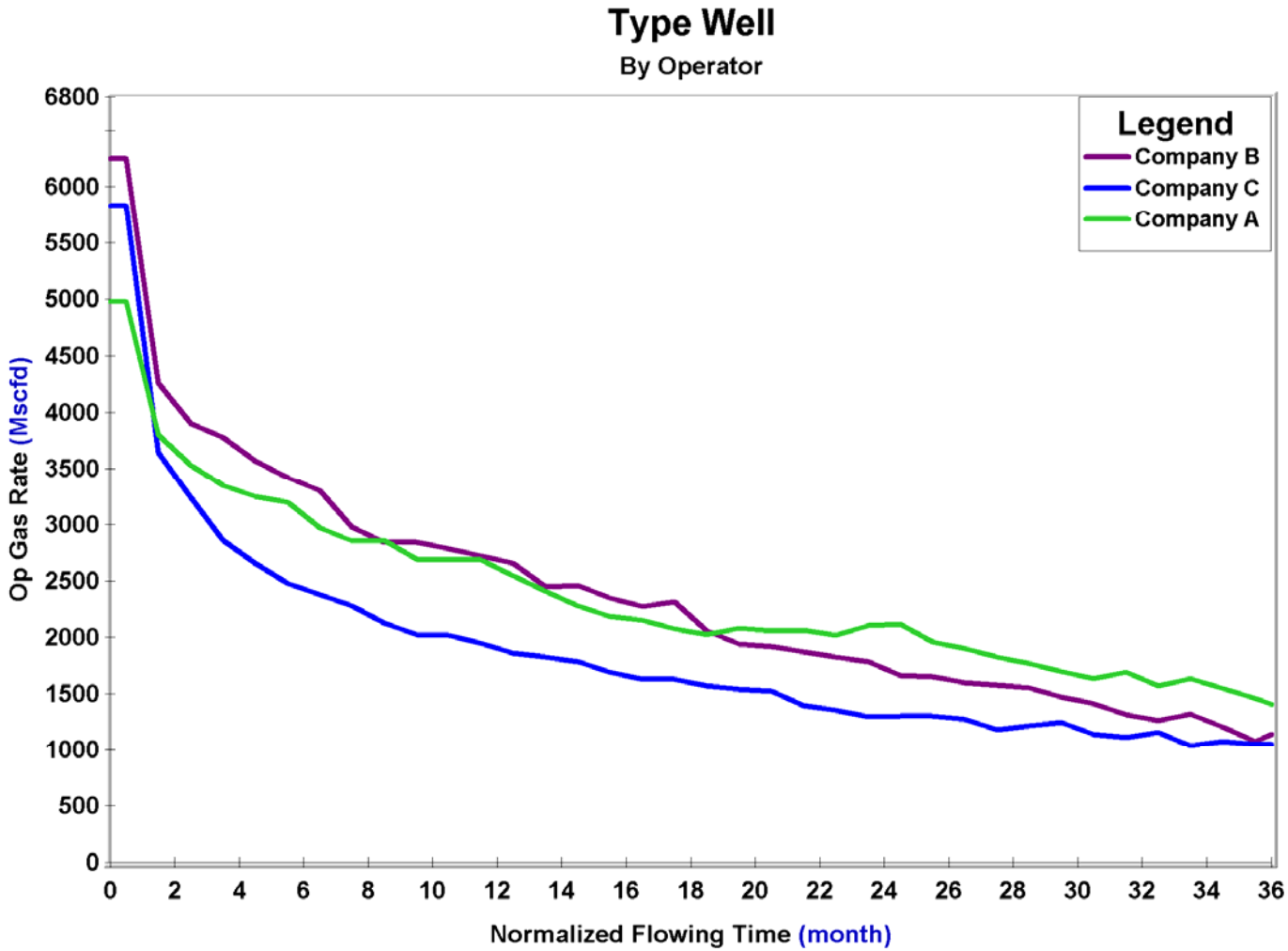
- **Objective**
  - To investigate & compare completion parameters between 3 major operators in the Regional Heritage field using Harmony's DeclinePlus Type Well feature
- **Data**
- Horizontal Gas Wells
- Production data from Accumap
- Frac & completion data from Canadian Discovery's Well Completion & Frac Database

Area of Study

- **Montney – Regional Heritage Field (2008 – 2014)**



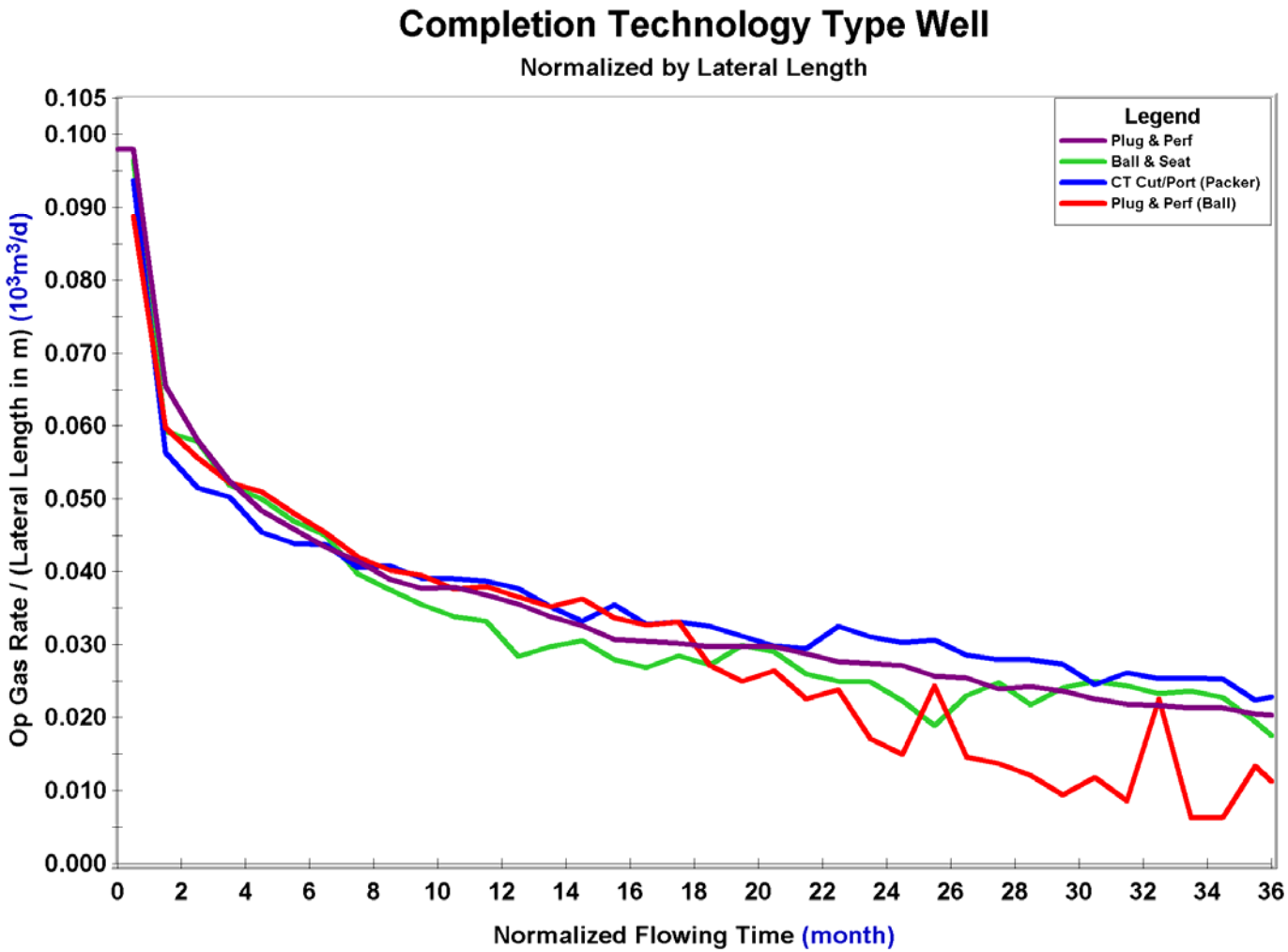
Operator Type Wells



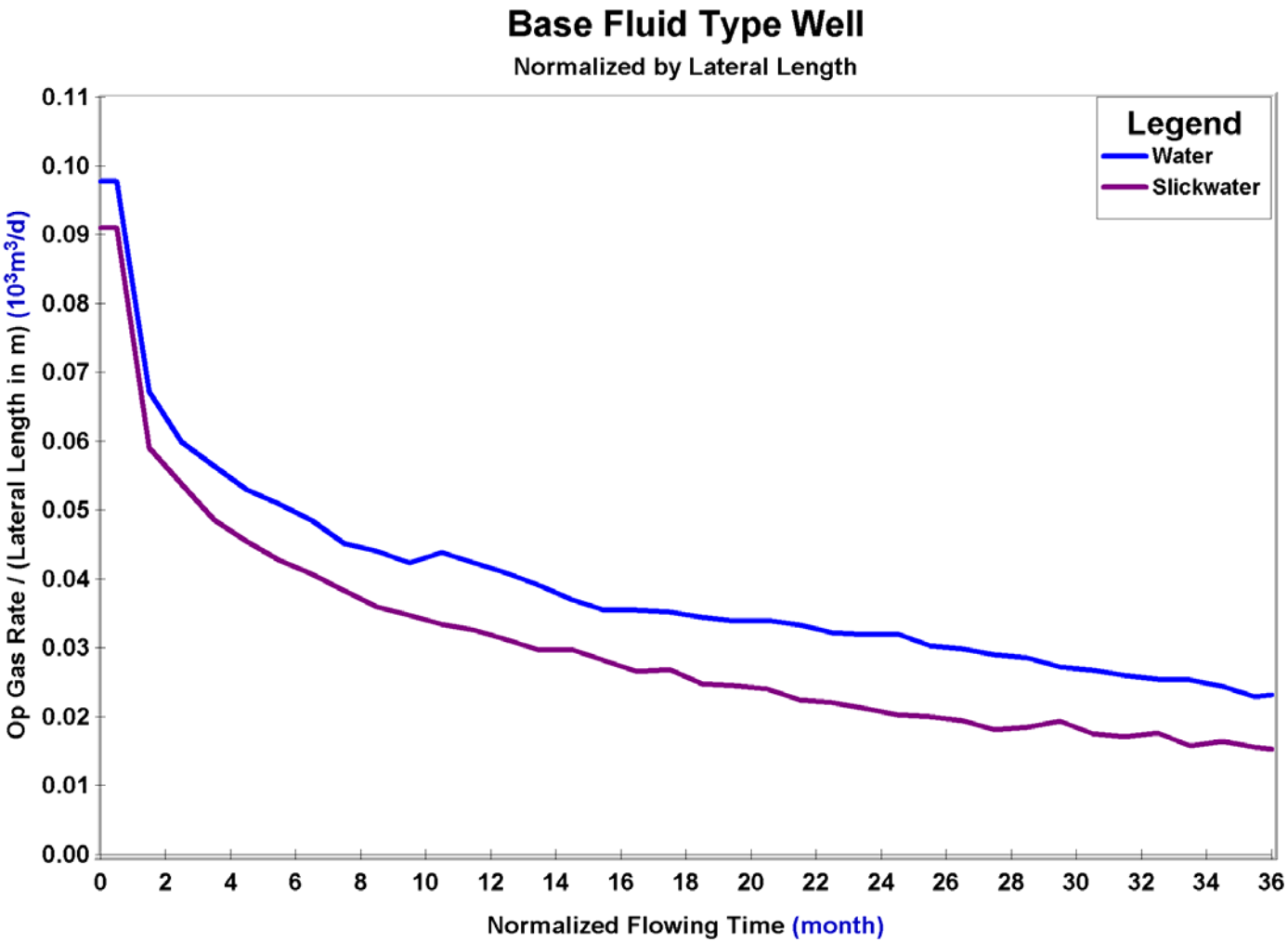
Completion Parameters

	Lateral Length	Stages	Avg. Proppant / Stage	Avg. Fluid / Stage	Avg Spacing	Technology				Base Fluid	
	m		ton / stage	bbl / stage	m	Plug & Perf	Plug & Perf (Ball)	CT Cut/Port (Packer)	Ball & Seat	Water	Slickwater
Company A	1032 - 2284	5 - 25	100 - 125	613 - 1484	153	✓				✓	✓
Company B	1033 - 3044	3 - 25	77 - 180	745 - 8171	164	✓	✓	✓	✓	✓	✓
Company C	1091 - 2547	4 - 30	83 - 244	2694 - 7480	226	✓	✓		✓	✓	✓
						Cased Hole			**Open Hole**		

Completion Technology Type Well



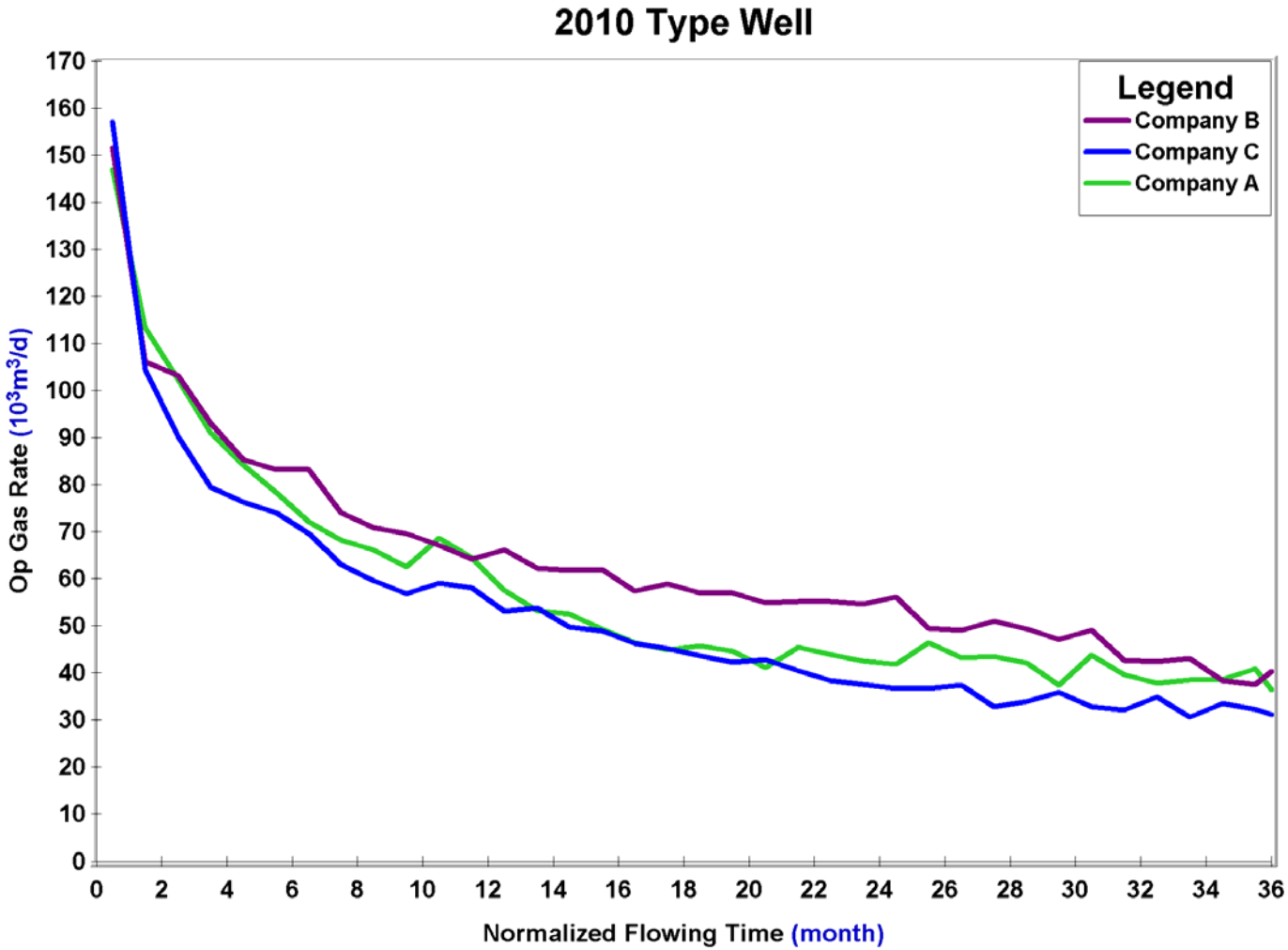
Base Fluid Type Well



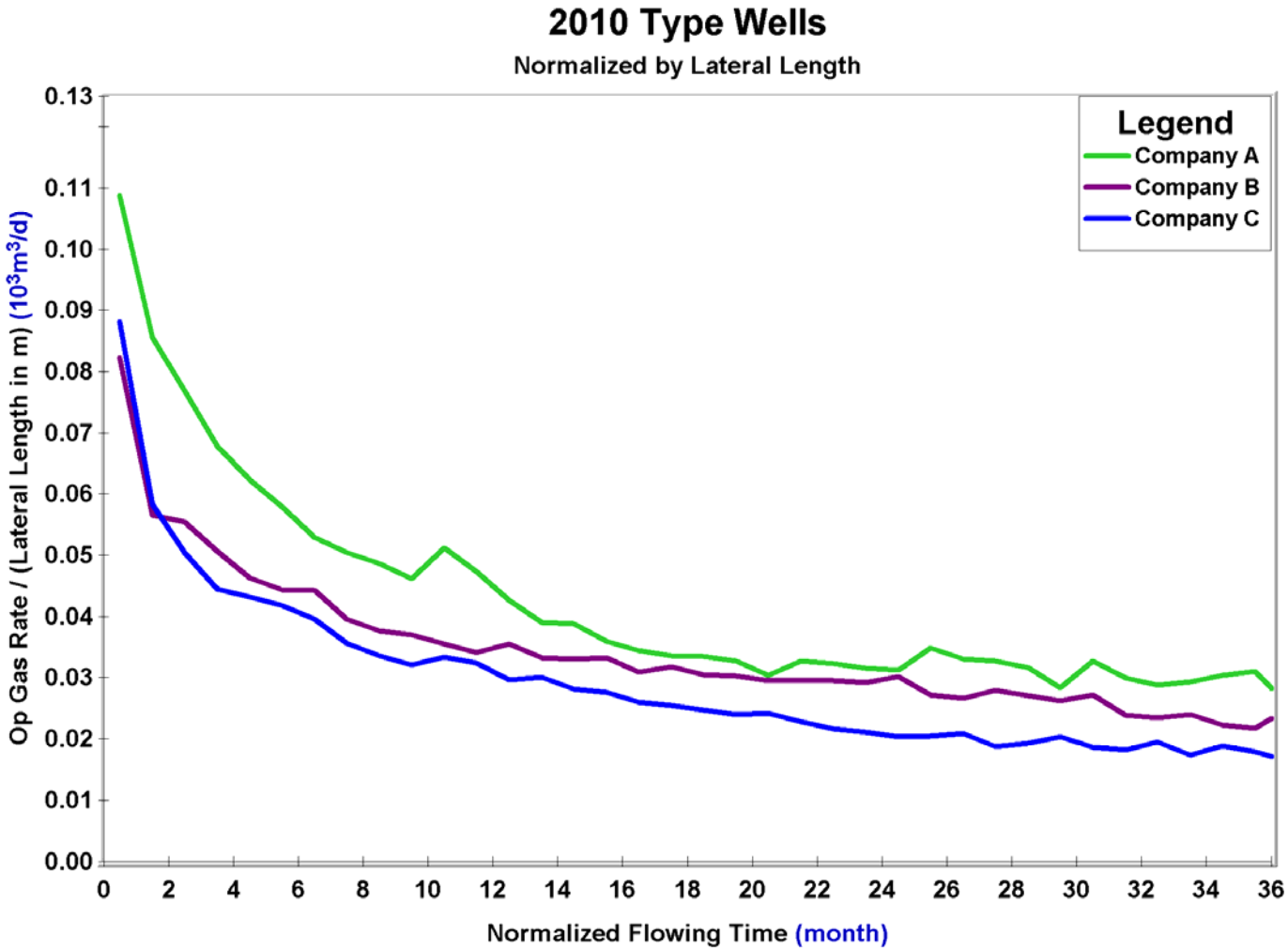
2010 Completion Parameters

	Lateral Length	Stages	Avg. Proppant / Stage	Avg. Fluid / Stage	Avg Spacing	Technology				Base Fluid	
	m		ton / stage	m^3 / stage	m	Plug & Perf	Plug & Perf (Ball)	CT Cut/Port (Packer)	Ball & Seat	Water	Slickwater
Company A	1032 - 2284	5 - 25	100 - 125	97 - 236	123	✓				✓	
Company B	1033 - 3044	3 - 25	77 - 180	119 - 876	164			✓		✓	
Company C	1091 - 2547	4 - 30	83 - 244	358 - 1189	226	✓					✓
						Cased Hole			Open Hole		

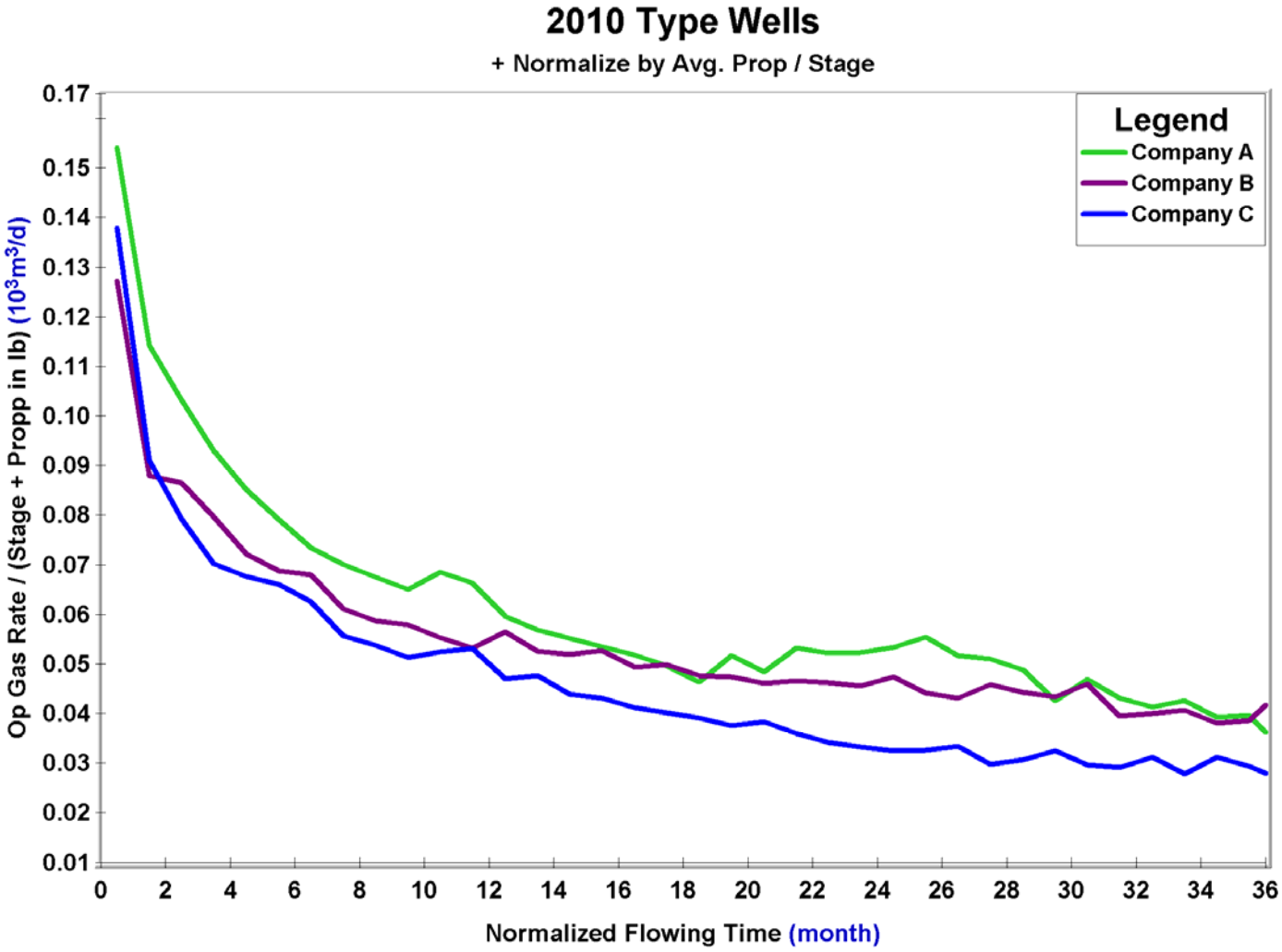
Operator Type Wells (2010)



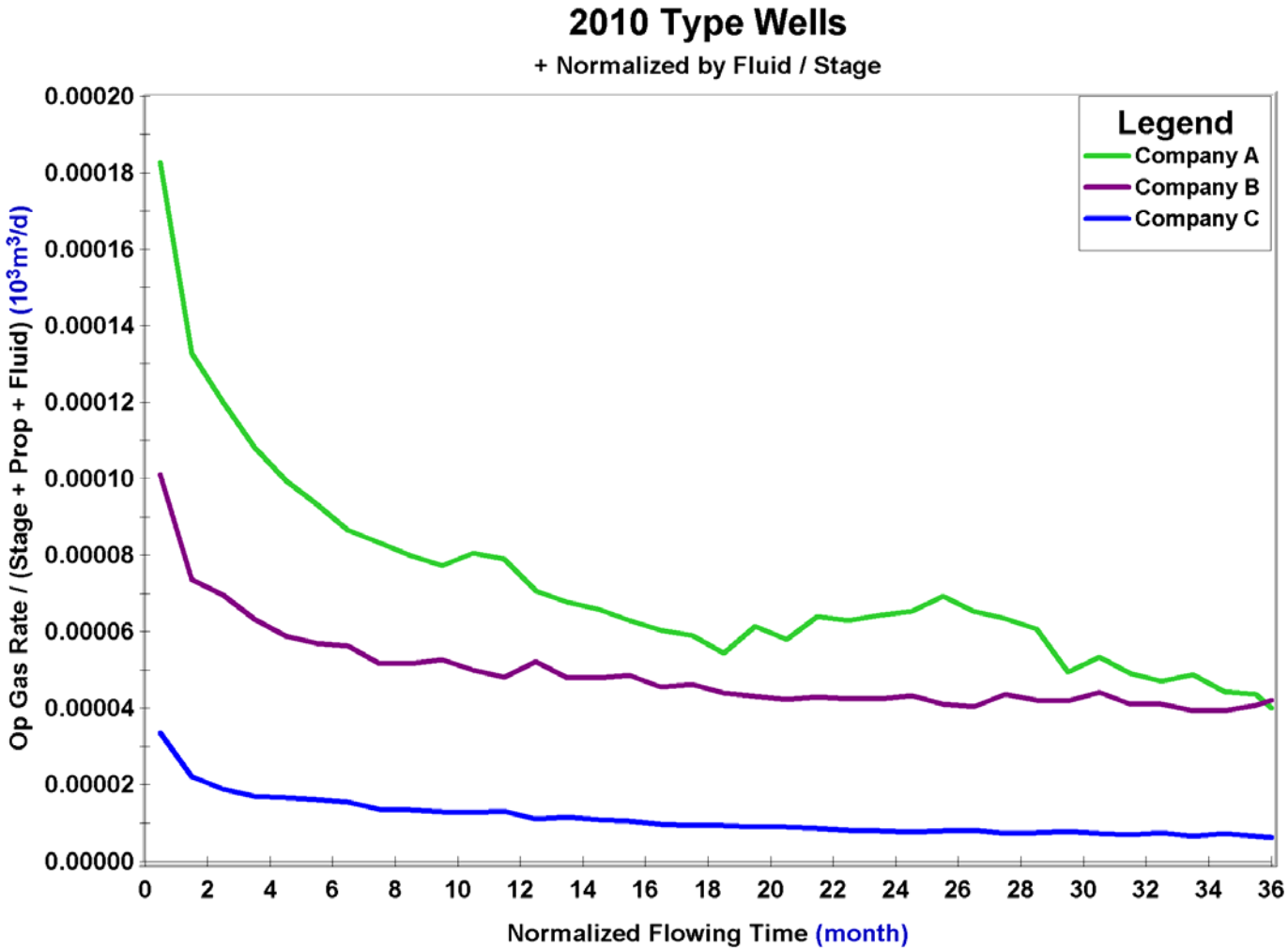
Operator Type Wells (2010) Normalized by Lateral Length



Operator Type Wells (2010)
Normalized by Average Proppant / Stage



Operator Type Wells (2010)
Normalized by Average Fluid / Stage



Summary

Completion Technology:

1) CT Cut/Port (Packer)
2) Plug & Perf
3) Ball & Seat
4) Plug & Perf (Ball)

Base Fluid:

1) Water
2) Slickwater

Tighter Stage Spacing

1) Company A
2) Company B
3) Company C

2010 Type Wells:

1) Company A
2) Company B
3) Company C

Contact

Brian Ho
Reservoir Engineer
brian.ho@ihs.com
403.213.4278 | 1.800.625.2488
www.ihs.com