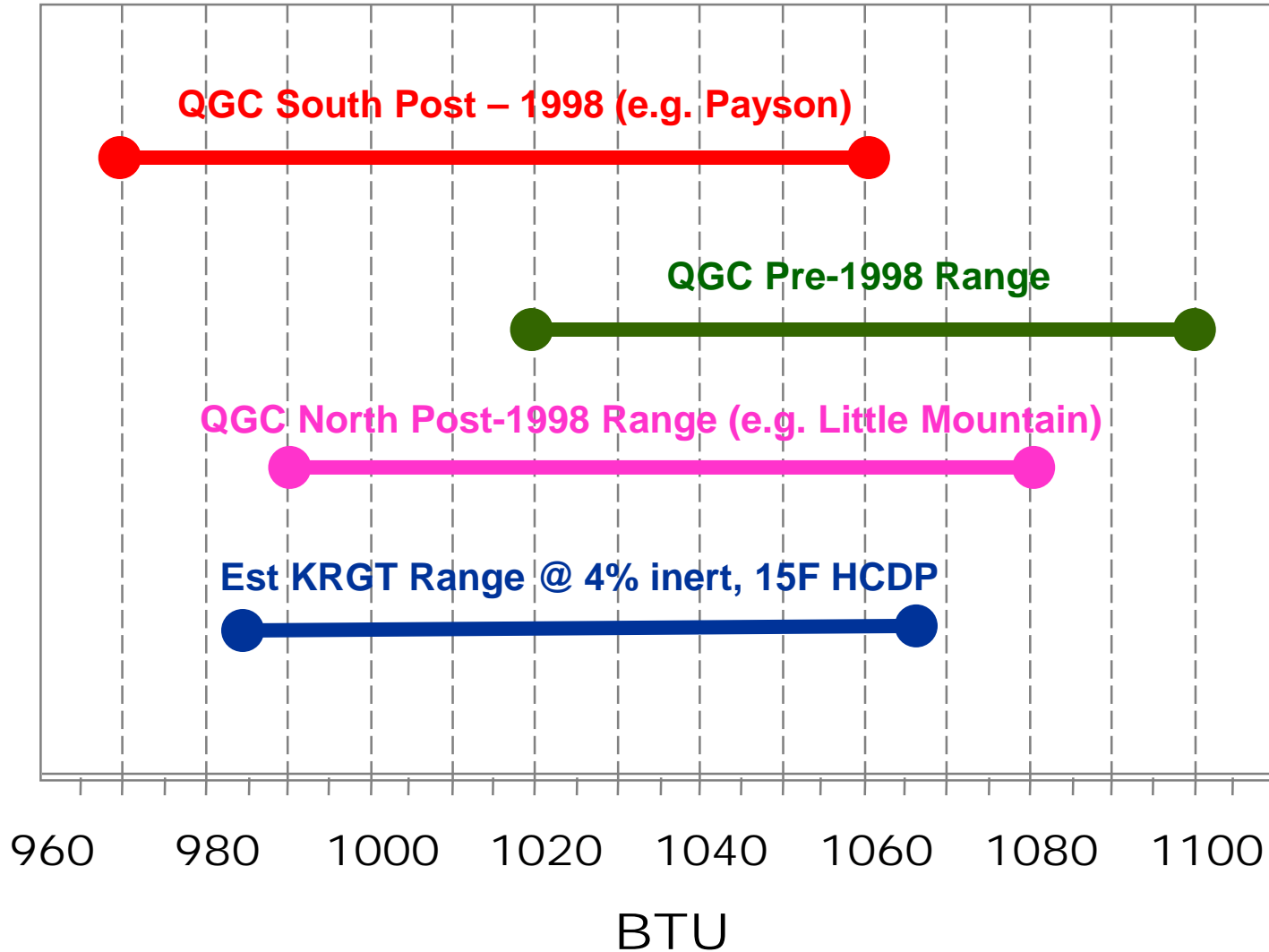
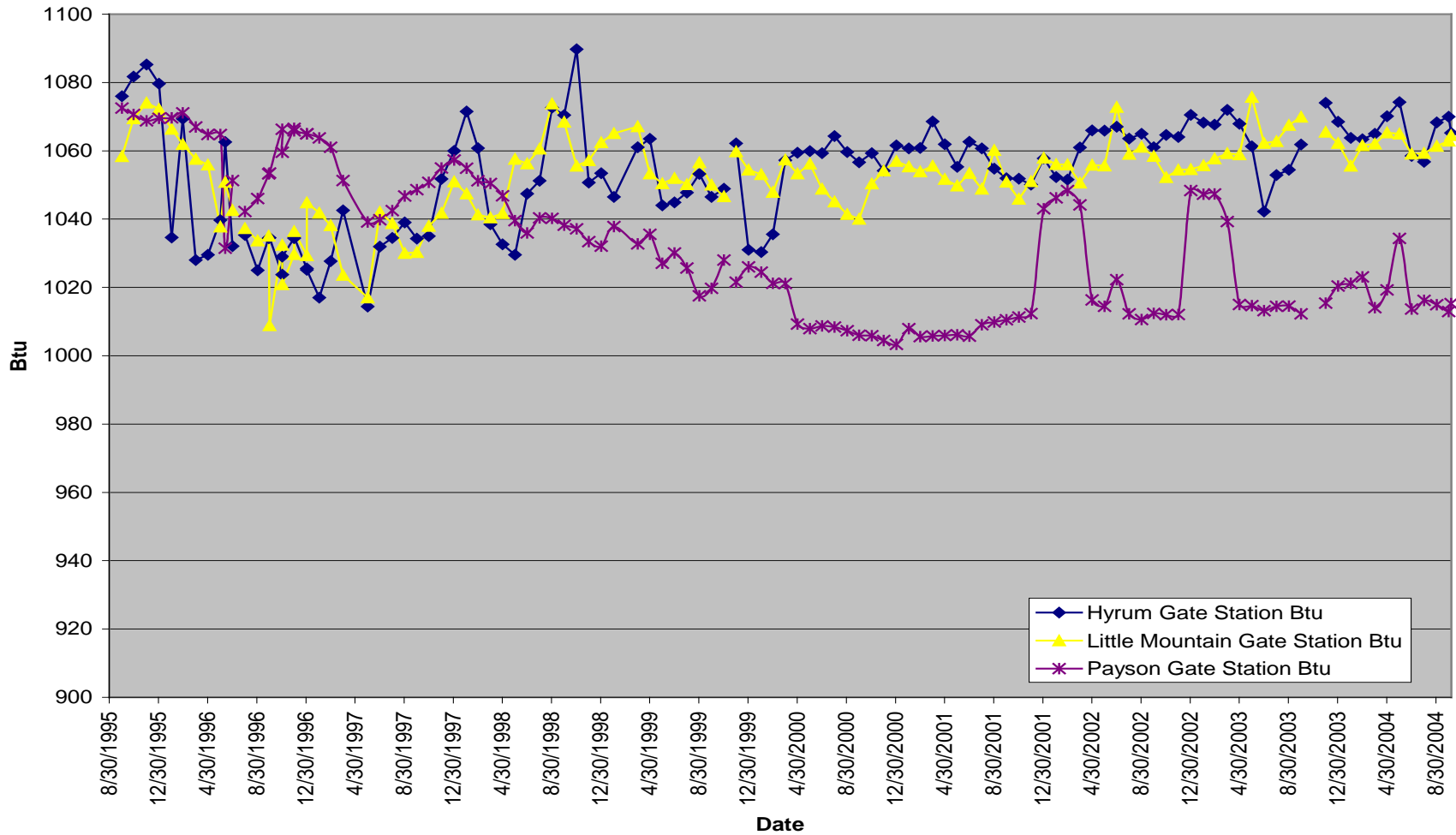


GAS QUALITY SPECIFICATIONS

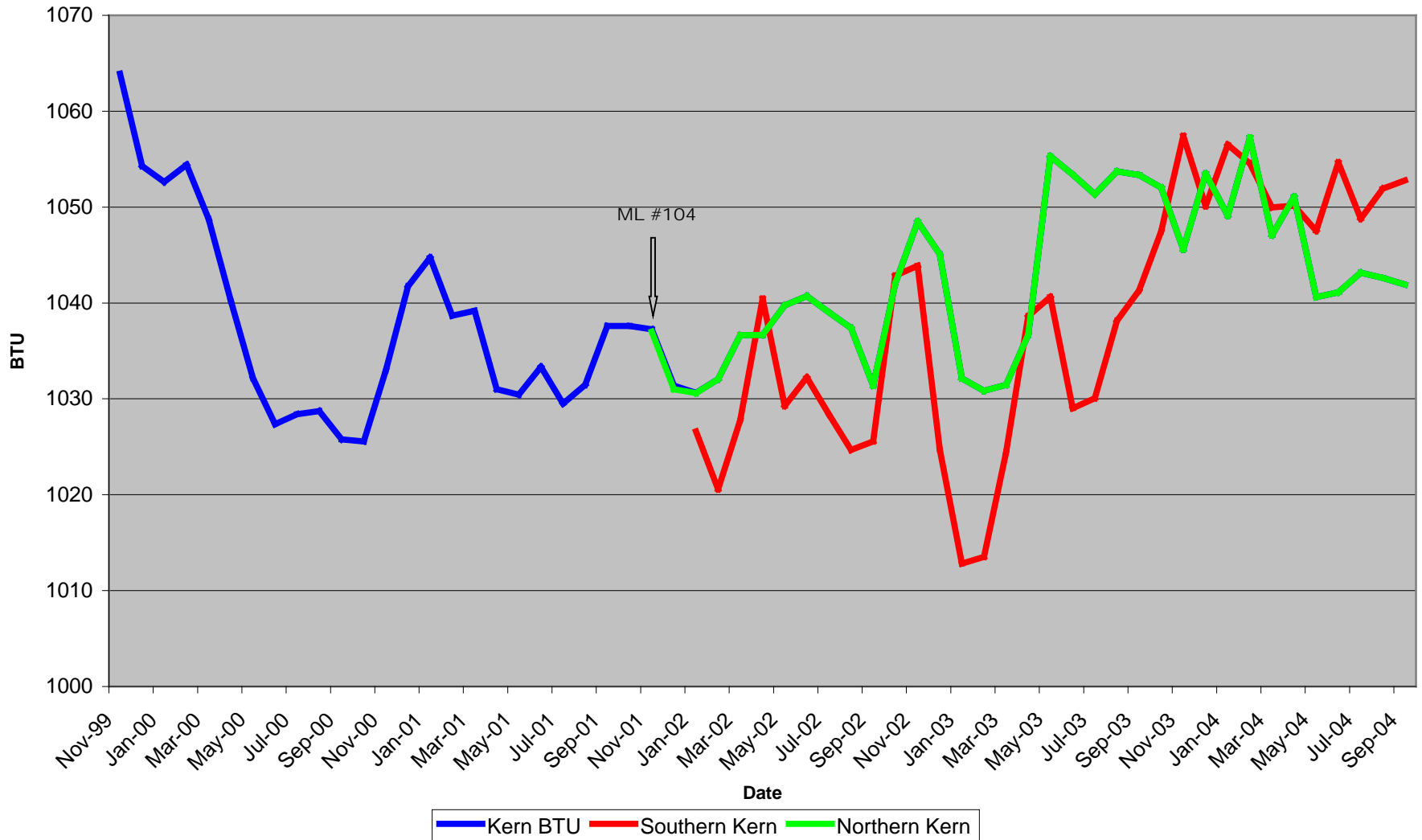
Approximate Interchangeability Ranges



Questar Gas Btu Delivery Ranges (1995 - Present)



Kern Gas Quality to QGC



Gas Quality Specifications

Pipeline Interconnects to QGC

	<u>Questar Pipeline</u>	<u>Kern River Pipeline</u>
Minimum BTU	950	970
Maximum BTU	1150	-
Total Inert	3%	4%
Total Nitrogen	-	3%
Total CO2	-	3%
Hydrocarbon Dew Point	-	15°F up to 800 psig
Hydrocarbon Liquids	Gas shall not contain any hydrocarbon fractions that might condense to free liquids under normal pipeline operation conditions.	Will contain no hydrocarbons in liquid form at the temperature & pressure at which the gas is delivered.

Gas Composition

	<u>Coal Seam Gas</u>	<u>Uinta Basin Gas</u>	<u>Northern Gates Gas</u>
Representative Btu	984	1115	1070
Specific Gravity	0.588	0.632	0.616
Percent Methane(1010 Btu/Scf)	96.4%	90.7%	92.0%
Percent Ethane(1789 Btu/Scf)	0.27%	5.06%	4.35%
Percent Propane(2516 Btu/Scf)	0.0543%	1.95%	1.20%
Percent Butane(3250 Btu/Scf)	0.0139%	0.863%	0.491%
Percent C5+(5500+ Btu/Scf)	0.0018%	0.5923%	0.315%
Percent CO ₂	2.5%	0.629%	0.629%
Hydrocarbon Dewpoint*	-110.5°	70.4°	40.9°
Percent Nitrogen	0.18%	0.24%	0.48%
Wobbe (W = HV/ \sqrt{G})	1283	1402	1363

* Calculated dew point at pipeline delivery pressure.

Hydrocarbon Dewpoint (HDP)

Dewpoint

Temperature below which some components in a gas begin to condense and drop out as liquids

Atmosphere

When the air temperature falls below the air dewpoint it begins to rain

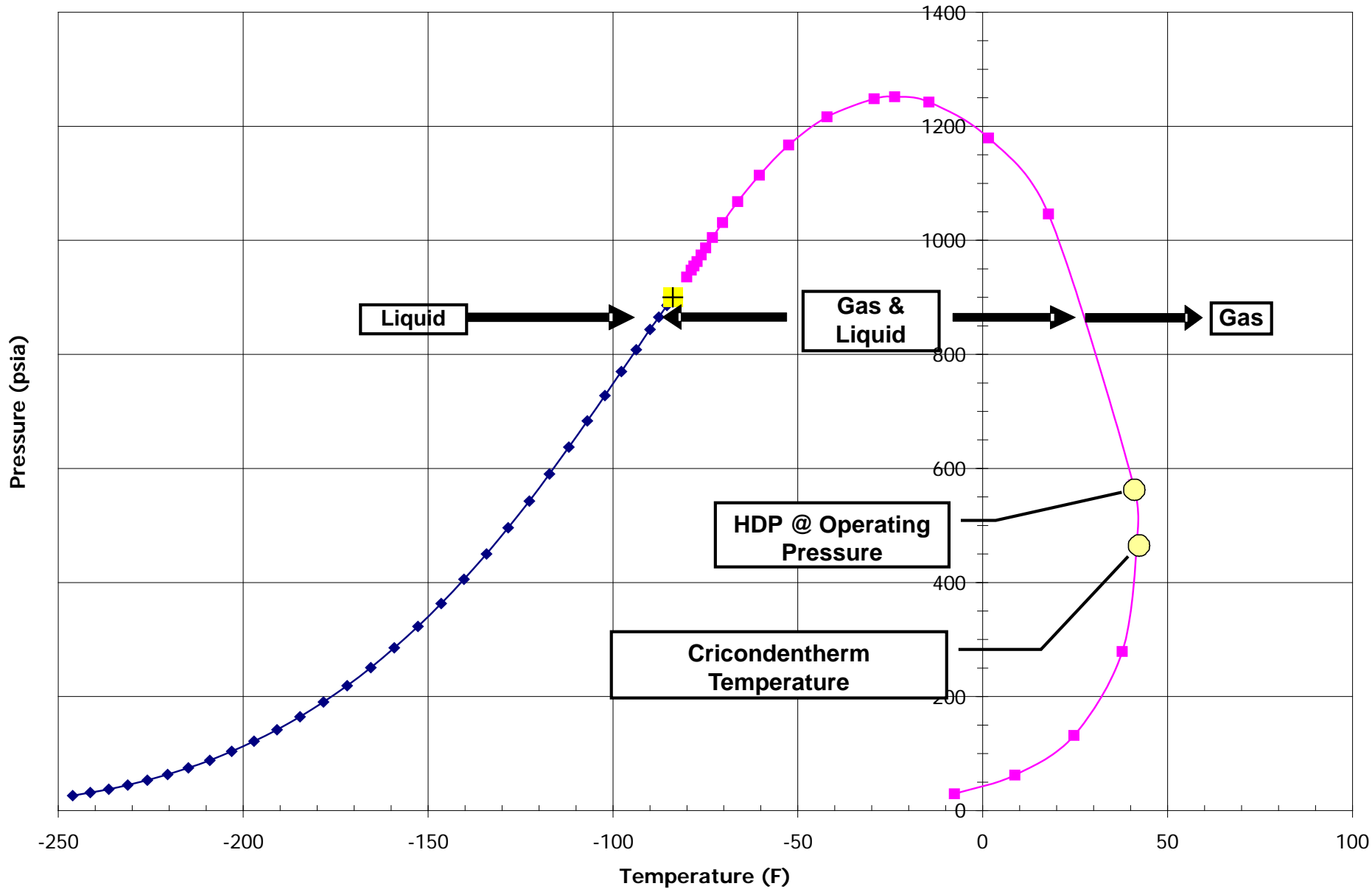


Pipeline

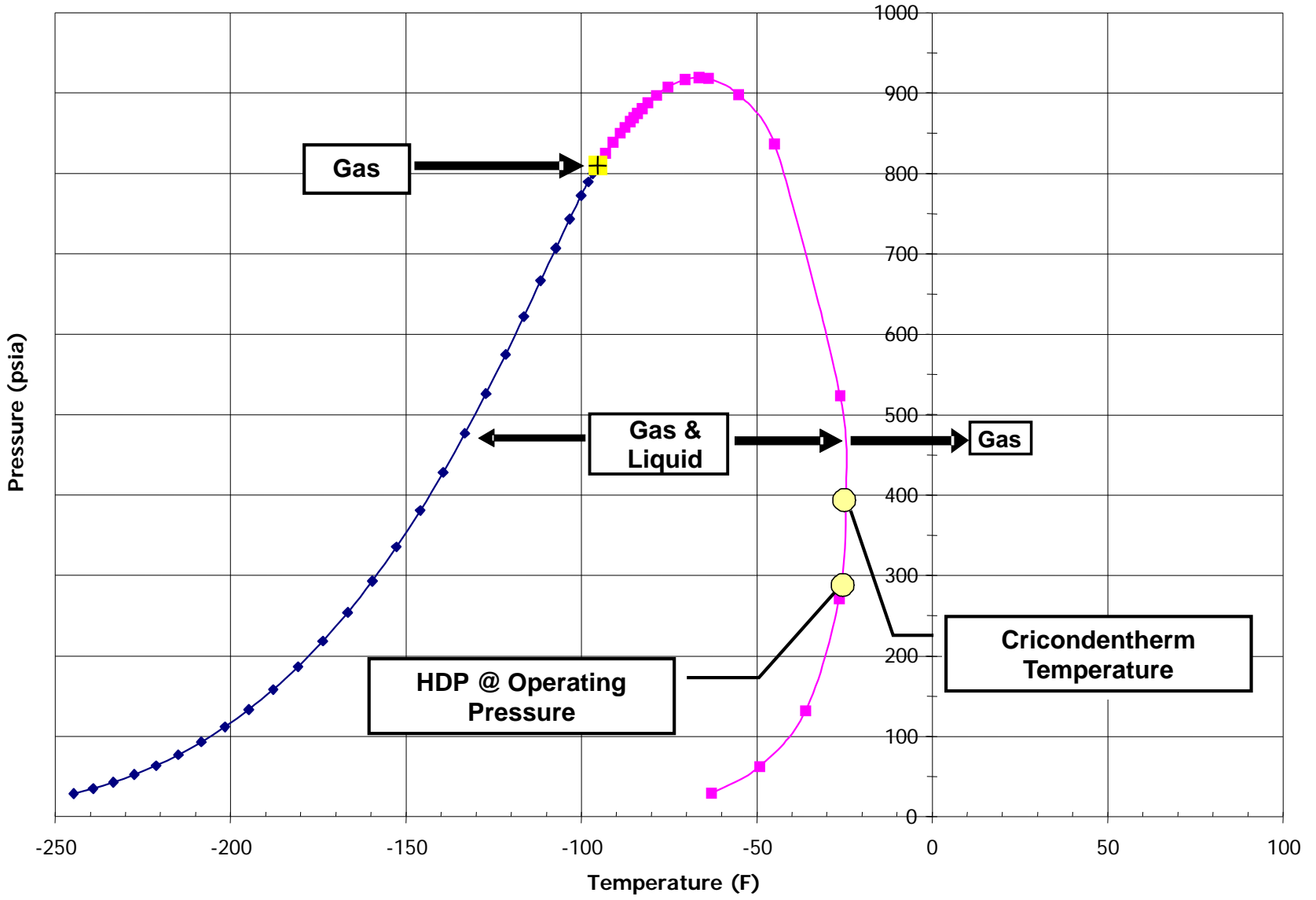
When the gas temperature falls below the hydrocarbon dewpoint it begins to “rain” hydrocarbons in the pipeline. Highly dependant on C6+ concentration



Phase Envelope for Northern Gates Gas



Phase Envelope for Kern River Gas



◆ Bubble Point ■ Dew Point ⊠ Critical Point

POTENTIAL NEW SUPPLIES THAT WILL IMPACT QUESTAR PIPELINE

