

Being Realistic About Risk*

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Abstract

Where has the Risk gone? Our Industry has traditionally approached Risk from a resource/reserves perspective... “Find it and they will come”, but that has never truly been the case. Risk is a business concept, not technical. The continued evolution of our efforts has forced us to bring new technologies and new realities, including concepts such as uncertainty management, operational efficiency, competitive advantage, and materiality into our business planning. Risk is still with us. Its identification and management are not optional.

Profit, especially in the unconventional realm, is harvested via operational efficiency... doing the right thing at the right time in the right way... no less and no more. The fastest way to increase the value of a portfolio is to avoid the “bad stuff”. But Operational Risk is asymmetric. The penalty varies depending the direction of error. Optimal development starts with a sound geotechnical foundation. We must bridge technical to business in our thinking, our planning, and our actions, thereby making business-based decision-support key to success. It will frequently include the tactical elements: Indifference Assessment, Value of Information, and Value of Control.

Risk management at the portfolio level should take Competitive Advantage and Materiality into account. Control becomes a critical success factor. Remember, if you cannot control or establish materiality, being in the way may have value. Geologists should have input to business strategy and planning. Dealing with Risk starts at rock level. Business success, including Risk identification and management starts with sound earth-science that transitions into sound strategy.

Being Realistic About Risk



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What is Risk?

- Our Industry Historically – The **Chance** of Failure
- Everybody Else – The likelihood and extent of Financial penalty

What is a High Risk Project?

New Tech

New Process

New People

Resource



Project Efficiency



So What Are You Going To Do About It?

What if we are wrong? Understand your Pain and Regret.

You spend too much and move too slowly. You can do better.

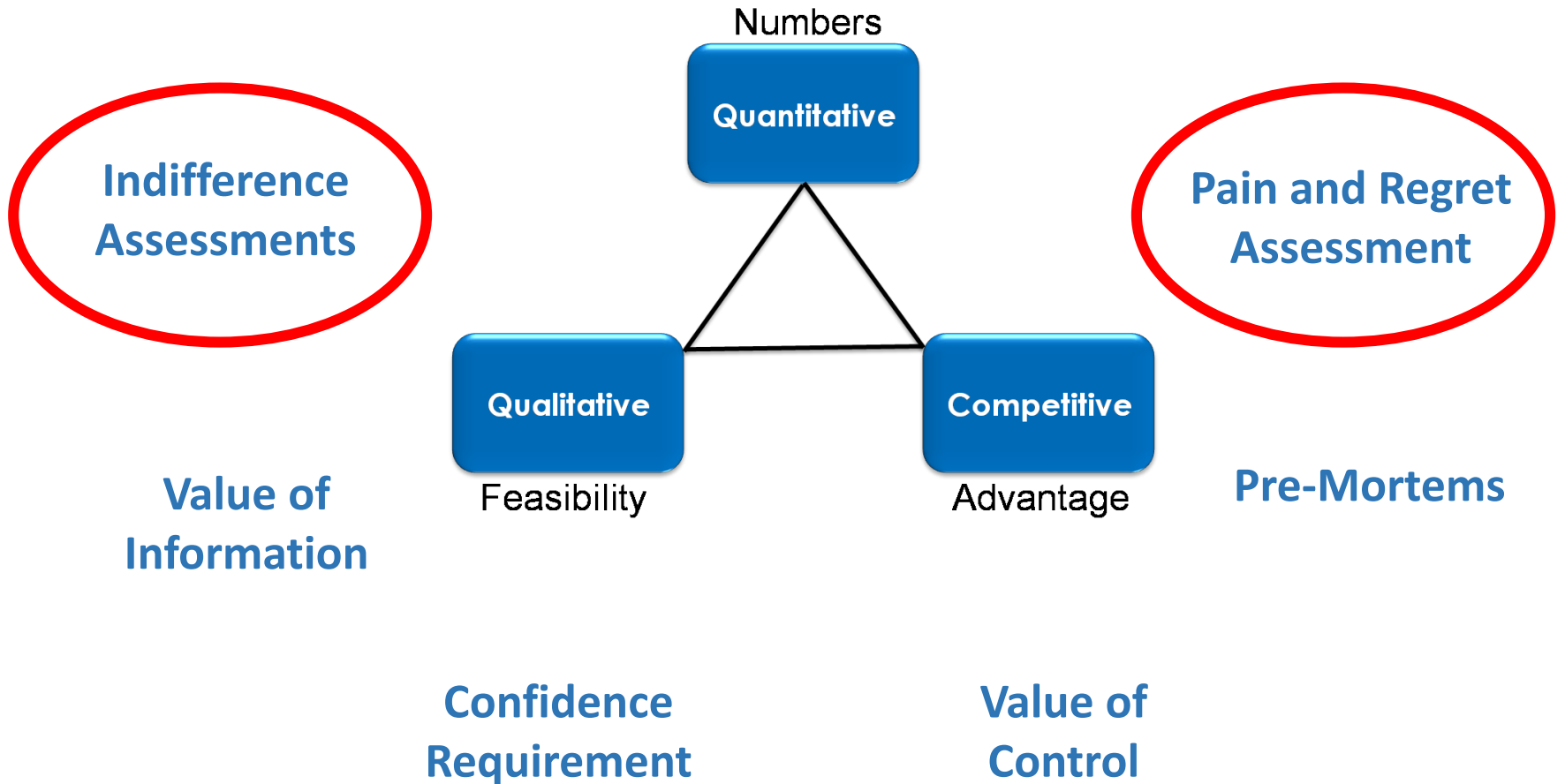
Know where your **Decision** point is. Use threshold decision principles.

Risk is Asymmetrical – Take advantage of that.

Pay attention to Critical Path dangers.
(Project Risk Management)



What If We Are Wrong?



Pain and Regret

Regret: The probability that the thing you don't want to happen happens.

This requires...

- Thresholds
 - The acceptable level of inefficiency
 - Economic Criteria with 0 NPV as the starting point
 - Minimum acceptable outcomes
- Recognition of a full range of outcomes
- An appreciation of Confidence as a metric

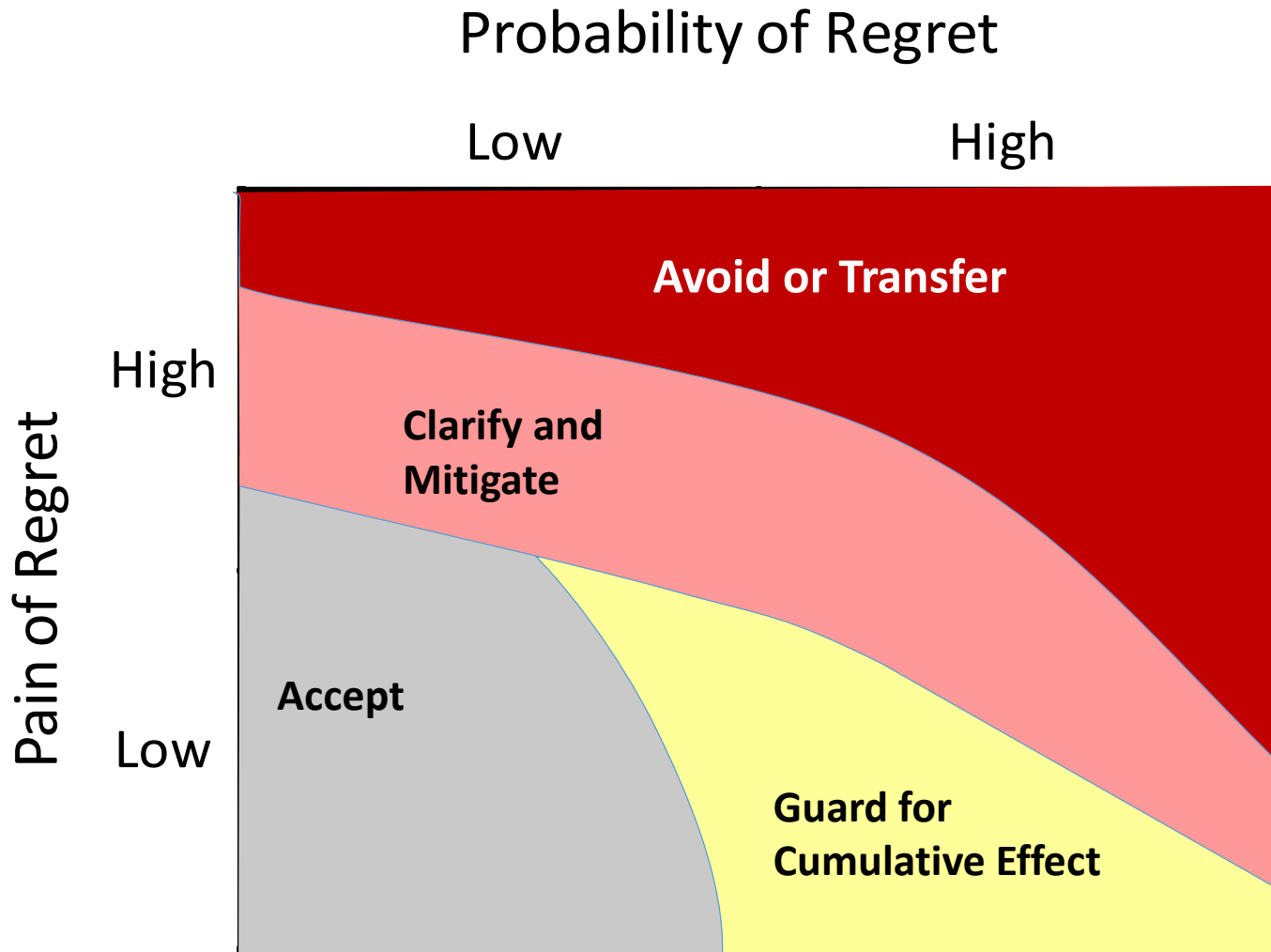
Pain: The penalty felt when that thing you don't want to happen happens.

This affects...

- Cost and Schedule
- Production efficiency



Pain and Regret



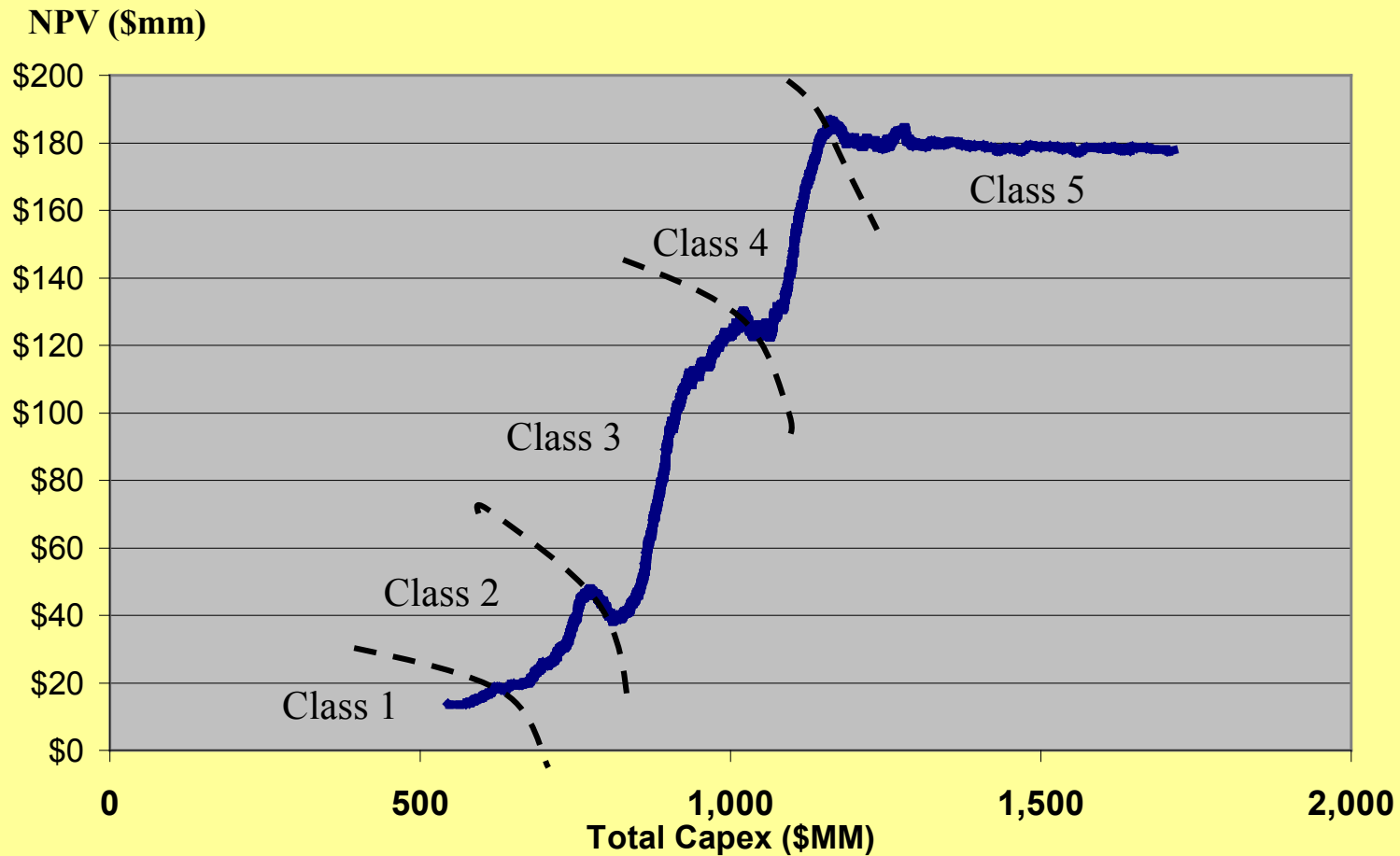
Materiality and Control Make A Difference

Especially in Competitive Situations



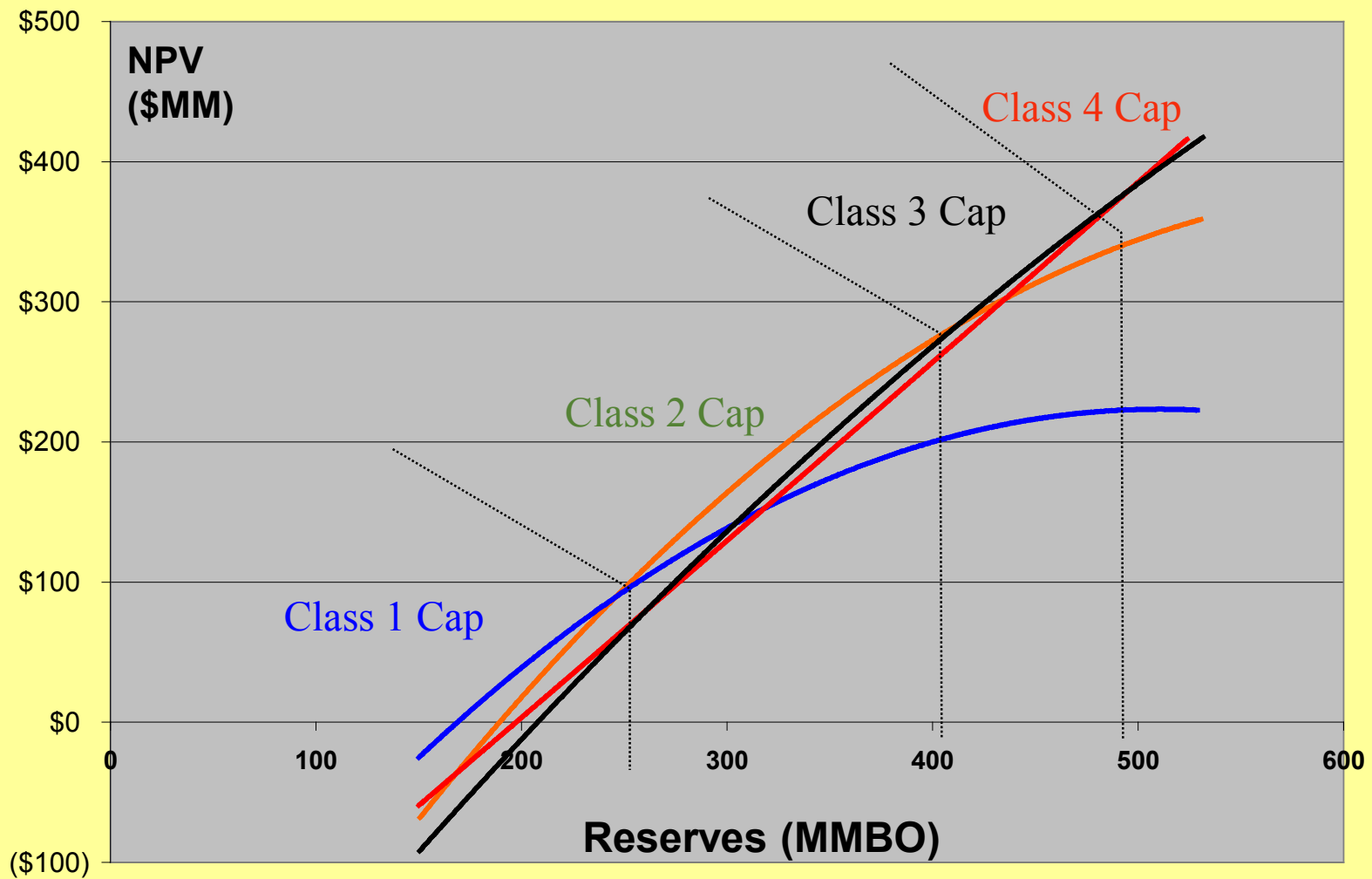
Infrastructure Sizing

Capex vs NPV



Infrastructure Sizing – Value Penalty

Reserves vs NPV

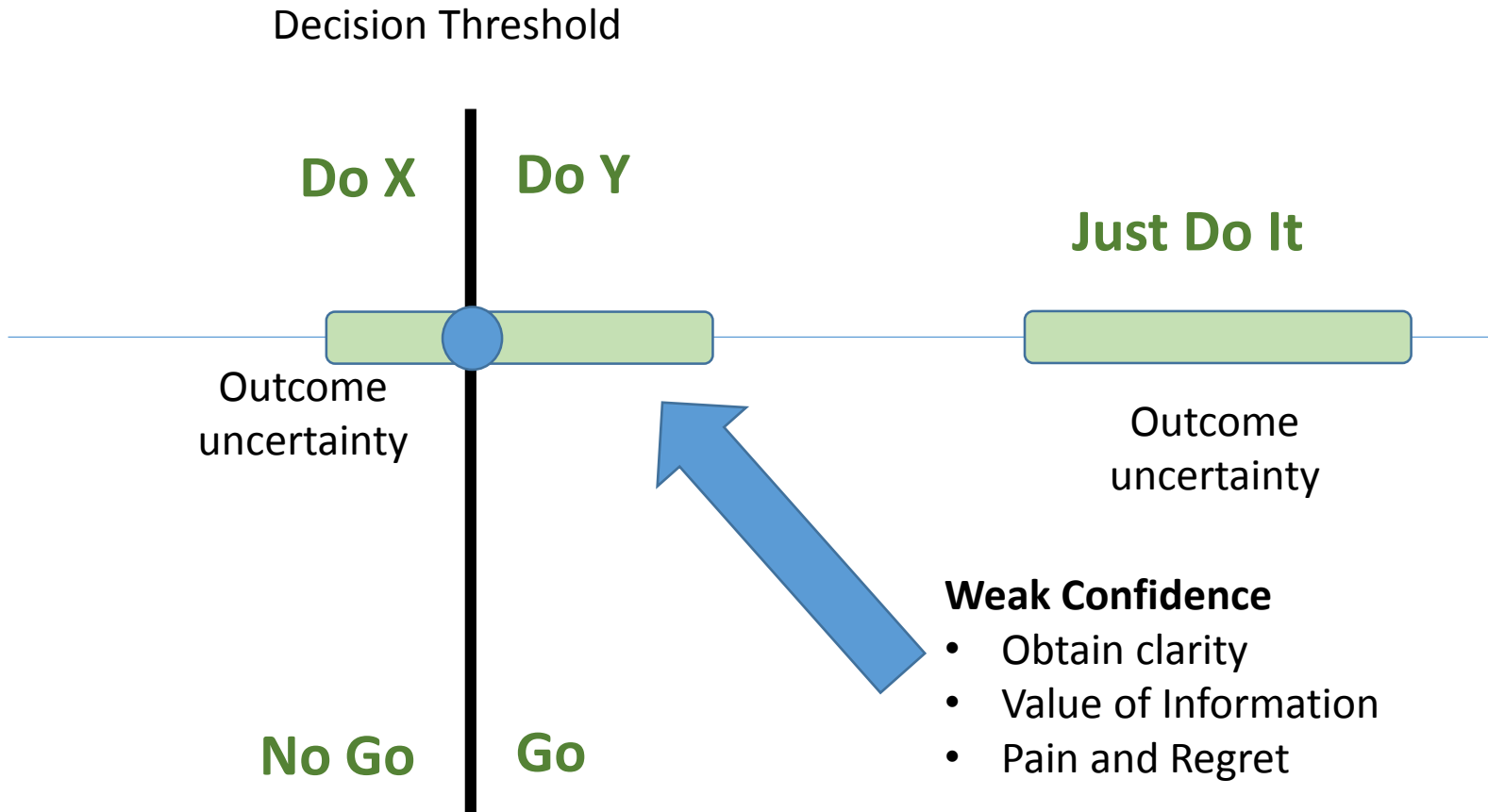


Primary Threshold Decision Principle

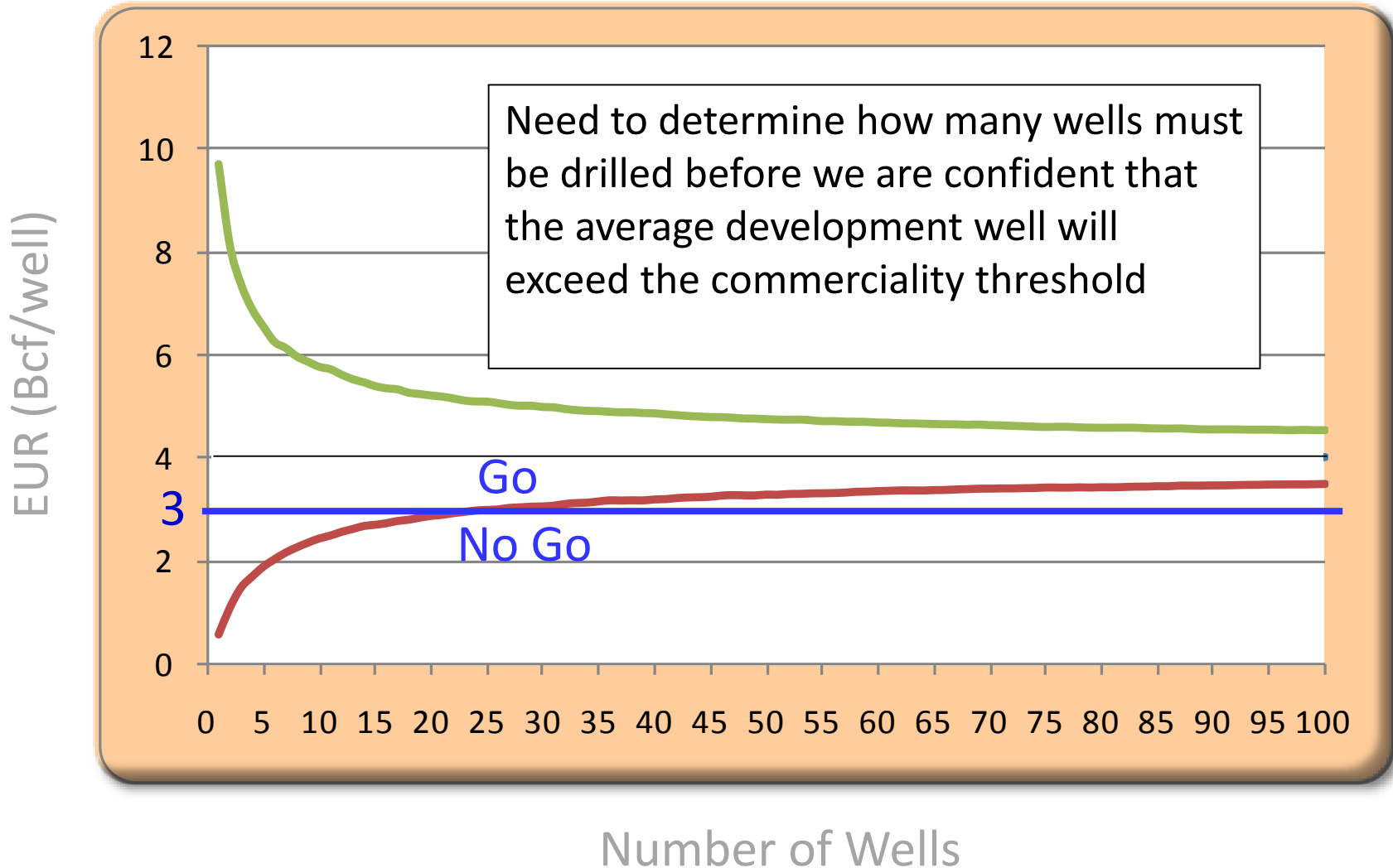
Knowing what you have is less important than having confidence that what you have is greater than what you need.



Decision Thresholds

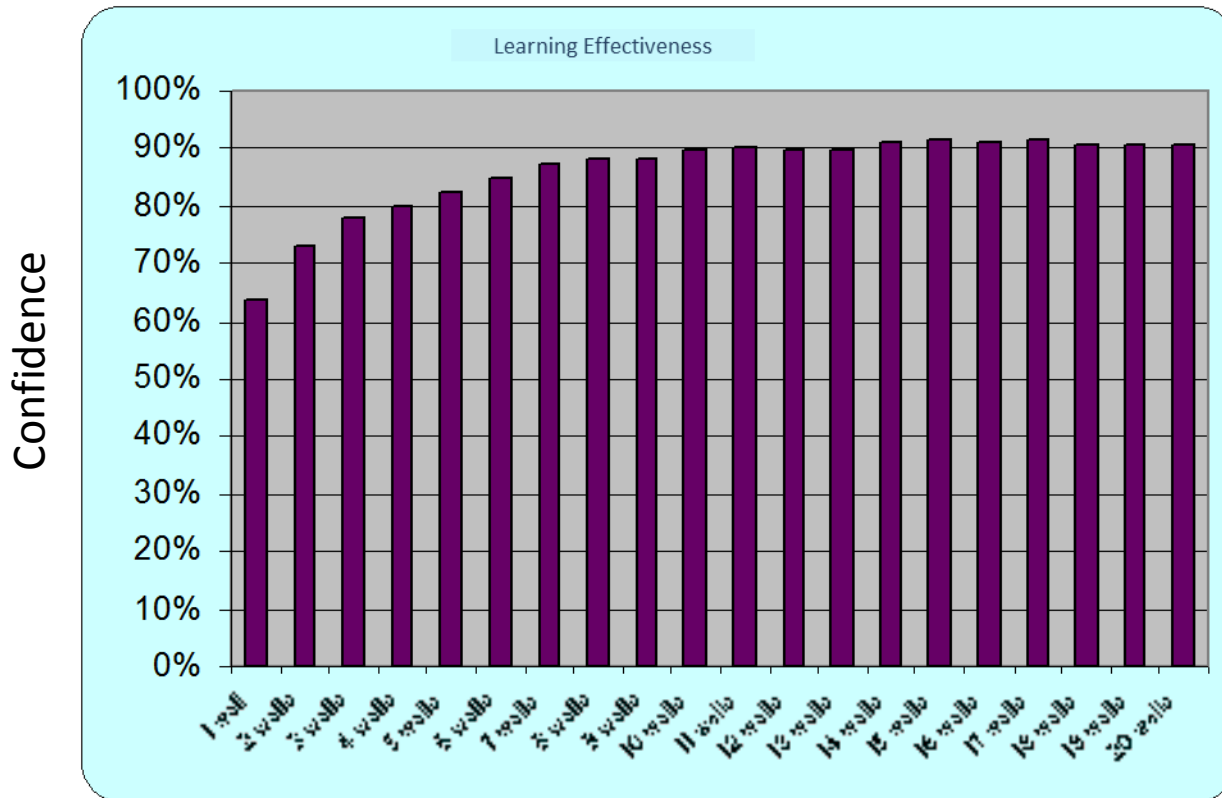


What's the Purpose of a Pilot Project?



Risk Erodes Confidence

Learning Erodes Risk



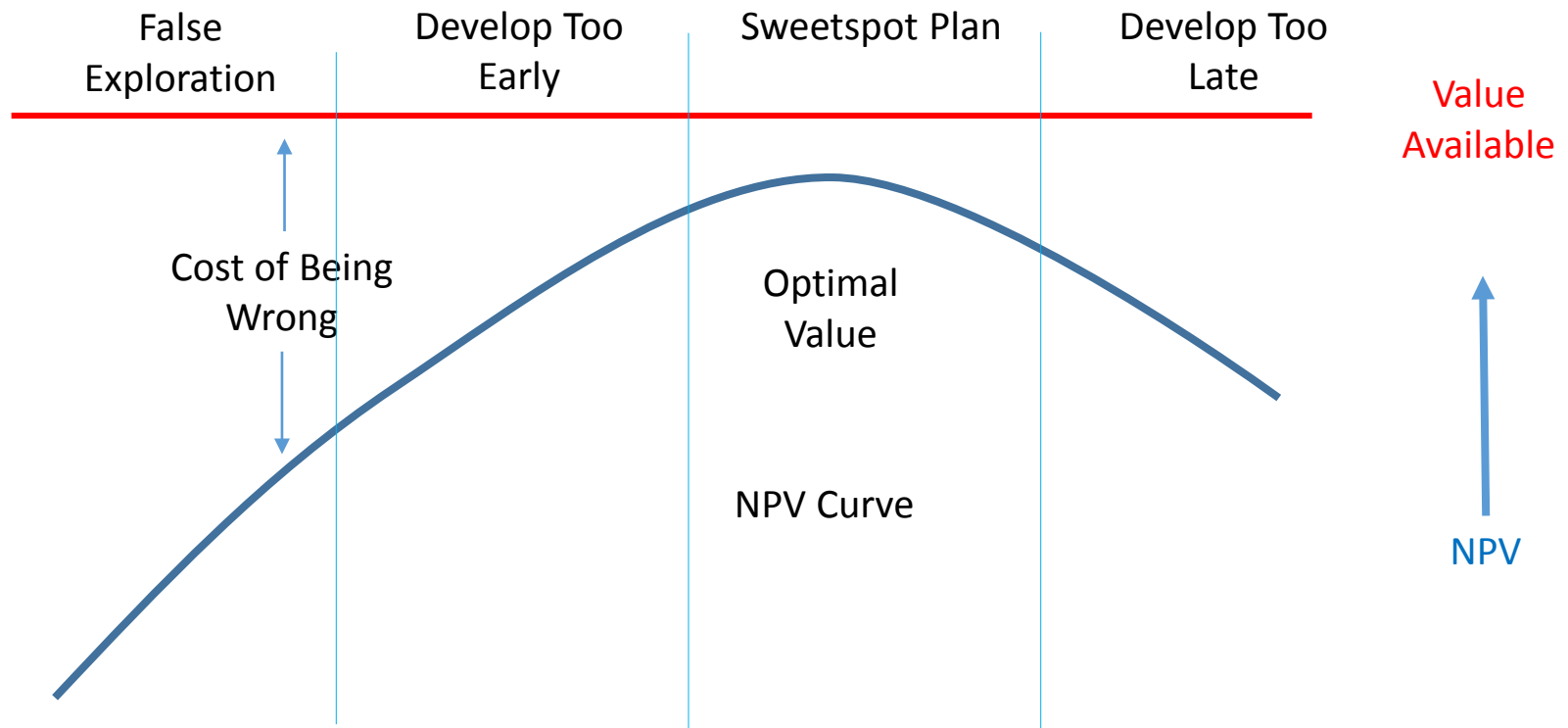
**Efficient Learning
maximizes early
Confidence**

Confidence of making a reliable decision



Asymmetric Penalty

Sweetspot Development Timing



Development Well Placement

- We have a development plan that places wells a certain distance apart
- But it is a decision fraught with uncertainty

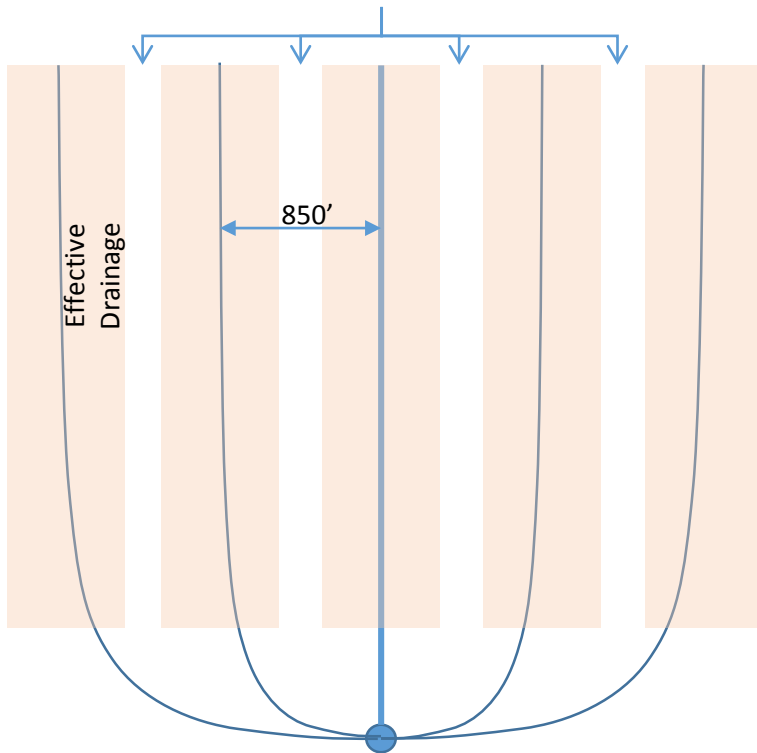
What is the Risk?

The Value of Learning = the program with learning minus the program without learning



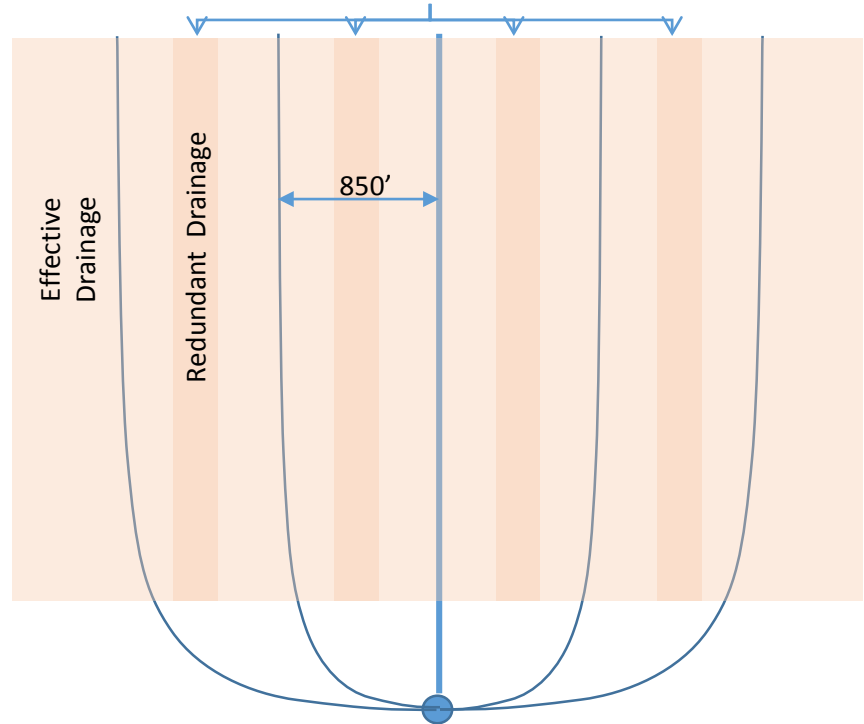
Error Threat – Recognizing Asymmetric Risk

Lost Resource – Lost Production



Drilling at 850' spacing
When optimal is 650'

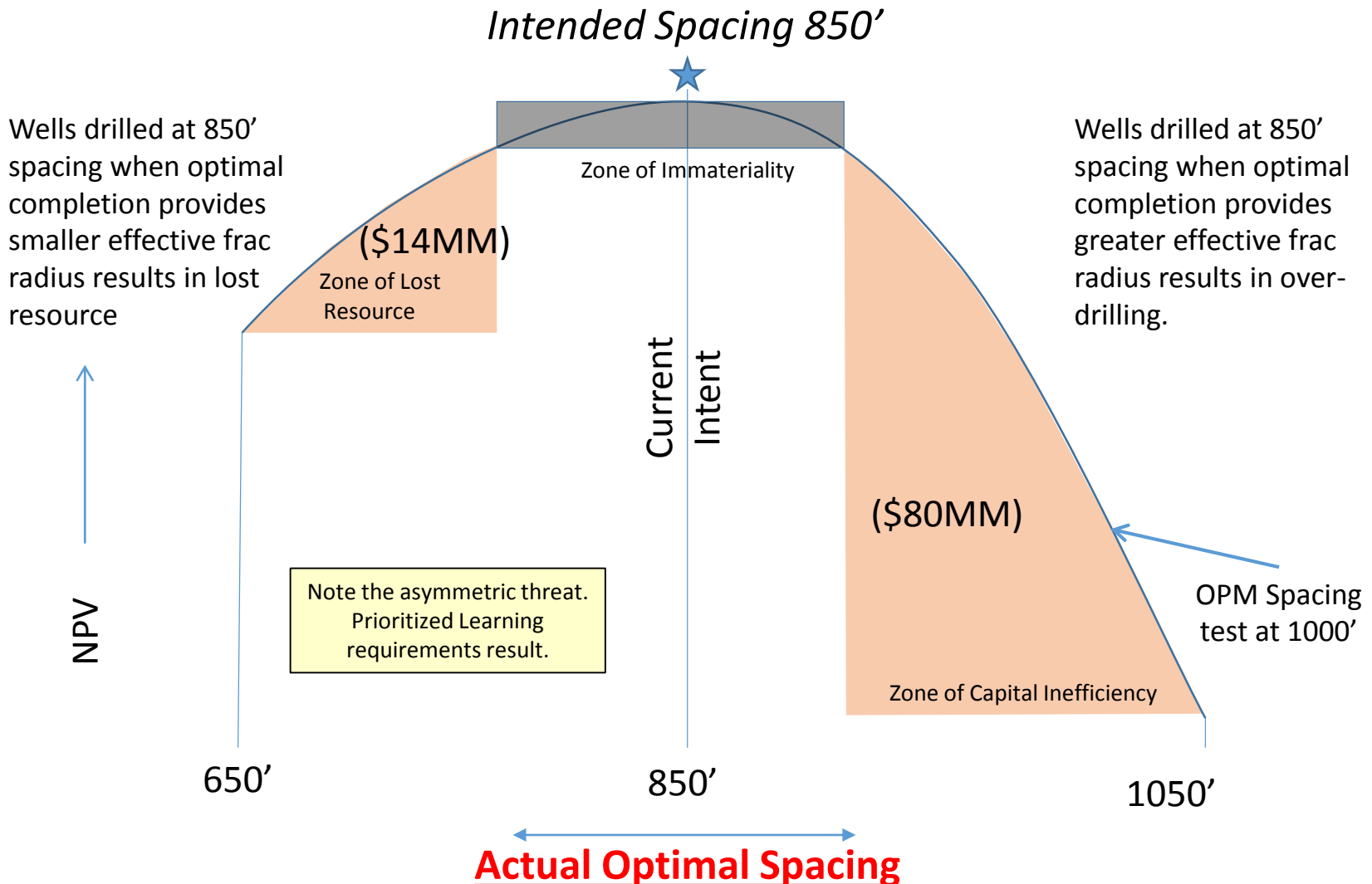
Redundant Drilling/Completion – Impaired Capital/Time



Drilling at 850' spacing
When optimal is 1050'

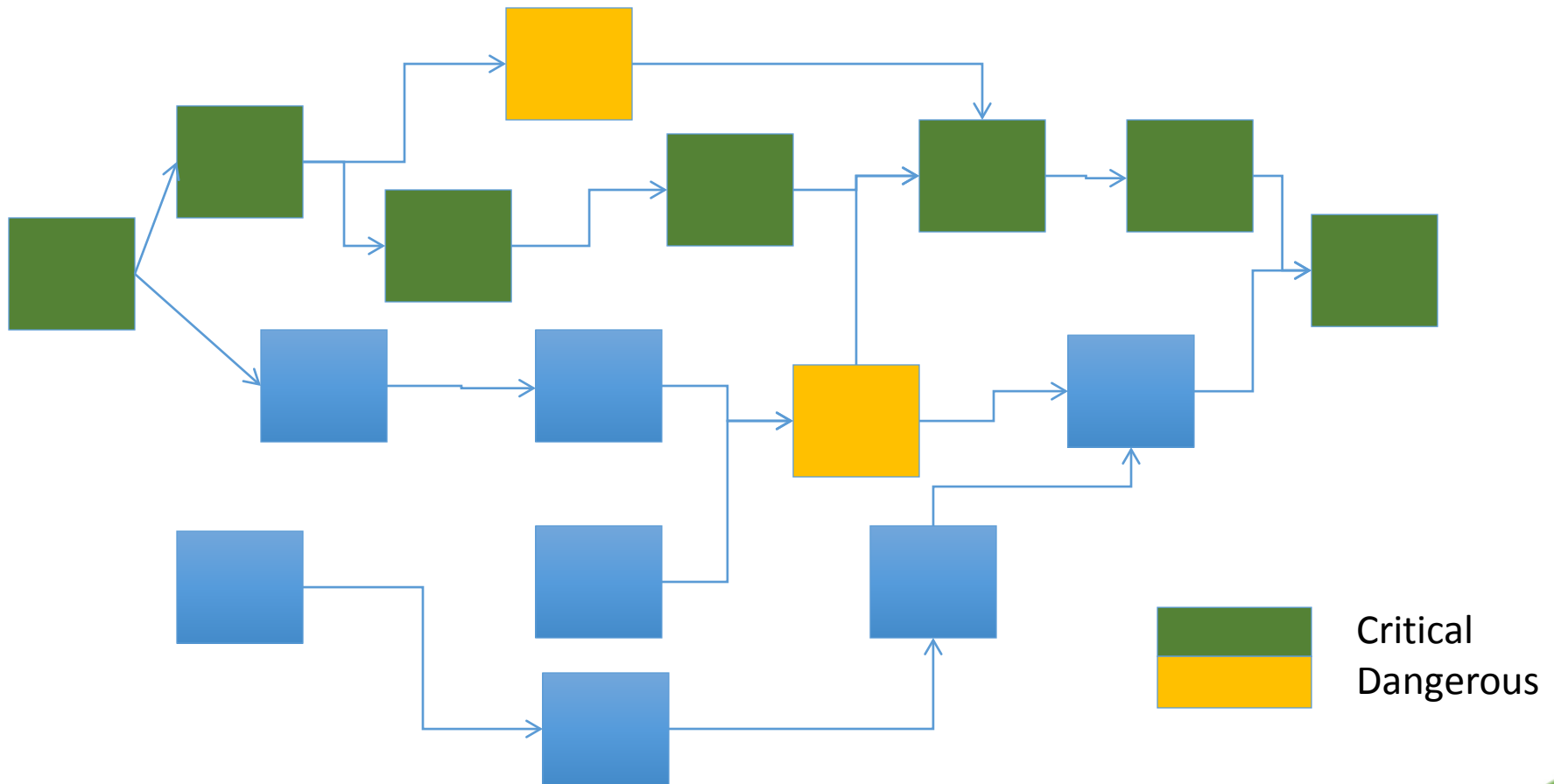


Value Destruction From Inefficient Development



Near critical path assessment

- Critical and “Dangerous” must be spotted and managed



Dealing with Risk...

- Know where your decision would change
- Assess your Confidence
- Risk is Asymmetric, that gives you an “optimal” starting point
- Always ask “What if we are wrong”
- Take a project level approach to Risk and downside threat.





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