The Wildcatters, the Regulators and the Prize: Chronicles of the Cat Canyon Oil Field, Santa Barbara County, CA*

Joe Nahama[1]

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Abstract

Wildcatters spend a lifetime developing the skills to find the next Prize; a large oil or gas reservoir. Regulators have a mandate to protect both the environment and public from real or potential threats. Thus, a field of play is set where a wildcatter drives towards developing a Prize, while regulators plays defense, wanting all potential future threats to be mitigated. In California, the ‘wildcatter’ of old must become the new Playmaker, and navigate the team to the prize. PetroRock set its sights on the prize of the Sisquoc Oil Sands in the Cat Canyon Field, Santa Barbara County, CA. These Pliocene heavy oil sands were steamed cyclically from 1965 to 1997 by Texaco and produced 4 million barrels of 8 API oil. Oil prices and the regulatory environment in the late 1990’s prompted Texaco to abandon these leases. After a cursory look at the old Texaco production, PetroRock decided to ‘do what it takes’ to reactivate the field. That is when we learned about the Santa Barbara County Production Plan process. Impacts to air, tiger salamanders, ground water, ambient noise, visual impacts, traffic counts, and septic tanks, among other things, had to be addressed in a County application. How would PetroRock do this? To execute our plan we implemented a three-step process. First, by understanding the geology and reservoir characteristics of the Sisquoc sands and compared this with questions posed to us by the Regulators. Second, we took our knowledge, met face to face with regulators, and heard their concerns. This lost art of being in the ‘Room Where It Happens’ was crucial for our project. Finally, we changed our ‘team’ mindset and went from ‘Wildcatters versus Regulator’ to ‘we're all in this together’. As PetroRock has found, each day does not guarantee the ball will be moved down the field. However, the modern wildcatter's knowledge can develop the playbook and keep the team on a successful quest for the prize.

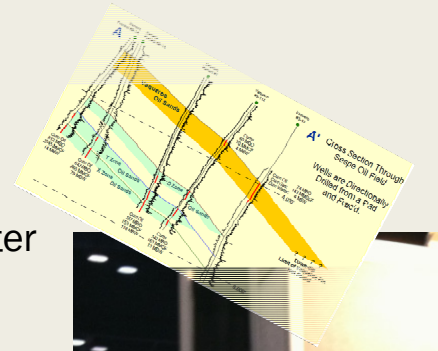
THE WILDCATTERS, THE REGULATORS AND THE PRIZE: CHRONICLES OF THE CAT CANYON OIL FIELD, SANTA BARBARA COUNTY, CA.

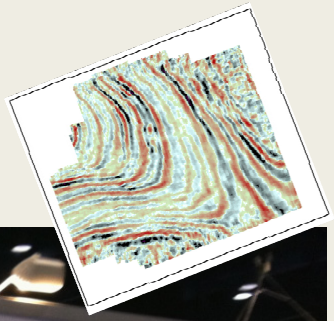
Joe Nahama, President, PetroRock LLC

Wildcatter - a prospector who sinks exploratory oil wells, a risky investor.

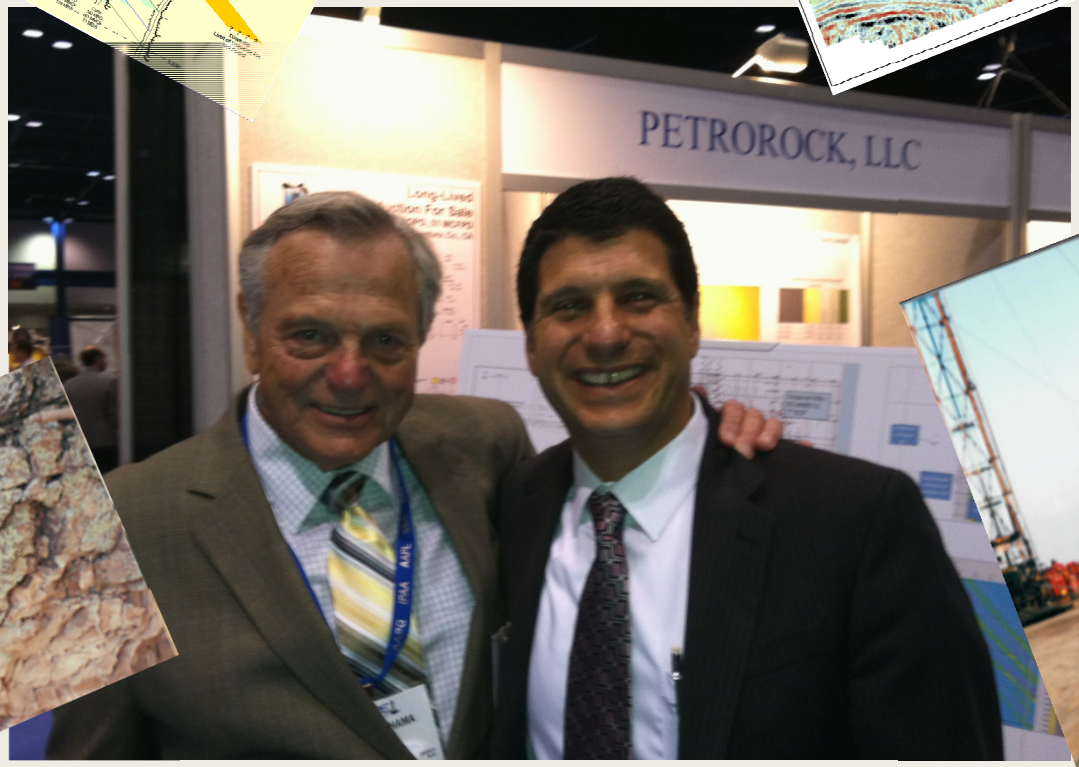
Yep, that's my Mom holding me, a 4-year old kid, next to a flare.

Rod Nahama
…true Wildcatter

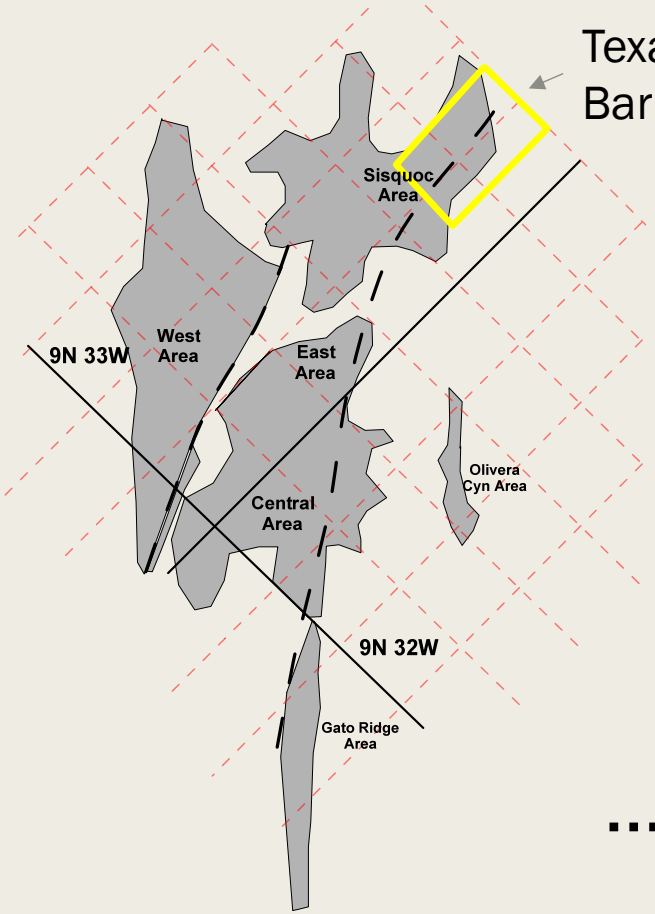




Joe Nahama
…just happy to be in the picture with Rod Nahama



I want to be a Wildcatter.



Texaco produced 4 Million Barrels 640 acres.

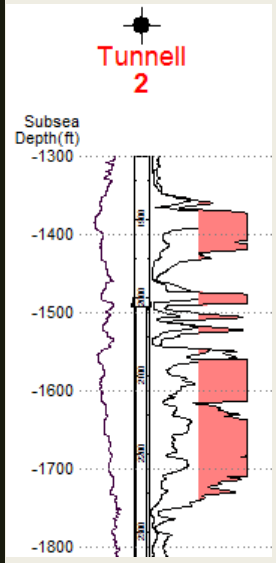
Cat Canyon Oil Field

Cumulative Oil: 300 Million Barrels

...one day a landowner walks into a bar and asks,

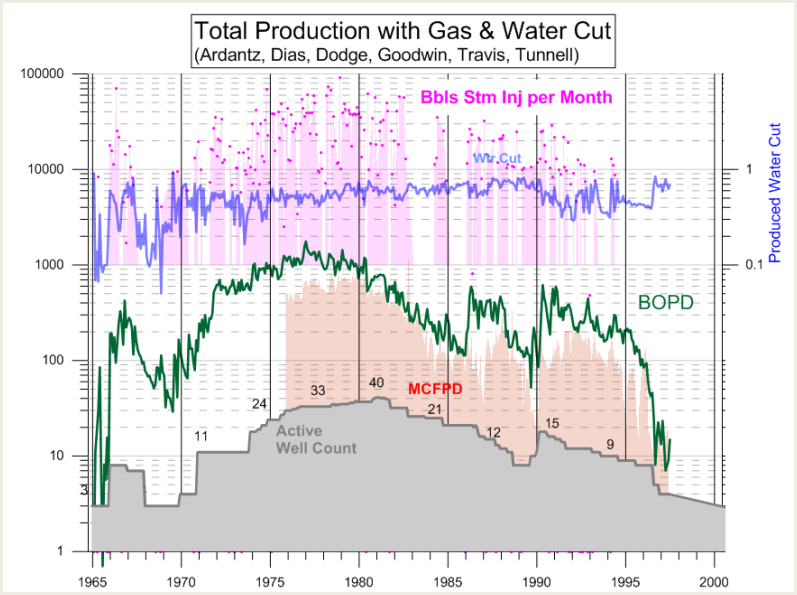
"Do you want to lease my land?"

30 wells making 1,000 BOPD during the early ‘80’s.



	Perm	Por	So
S1	2,000	35%	
b		60%	
S2	1,700	34%	
		53%	
S8	1,800	30%	
		54%	
S9	1,900	34%	
		60%	

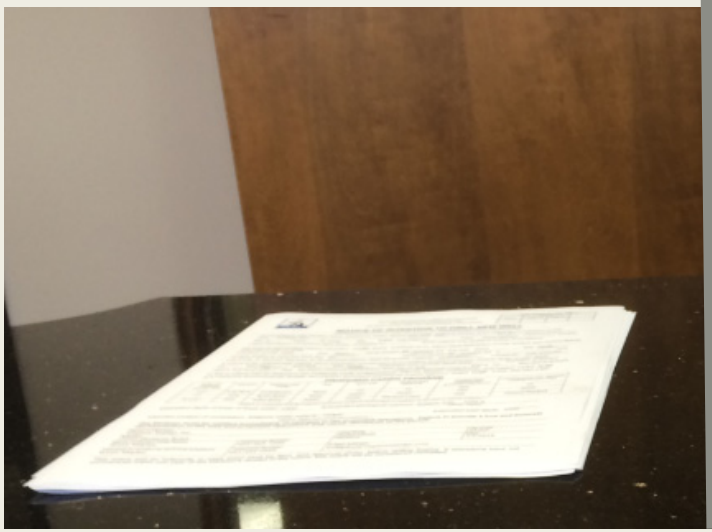
…there’s P&P and good oil saturation.



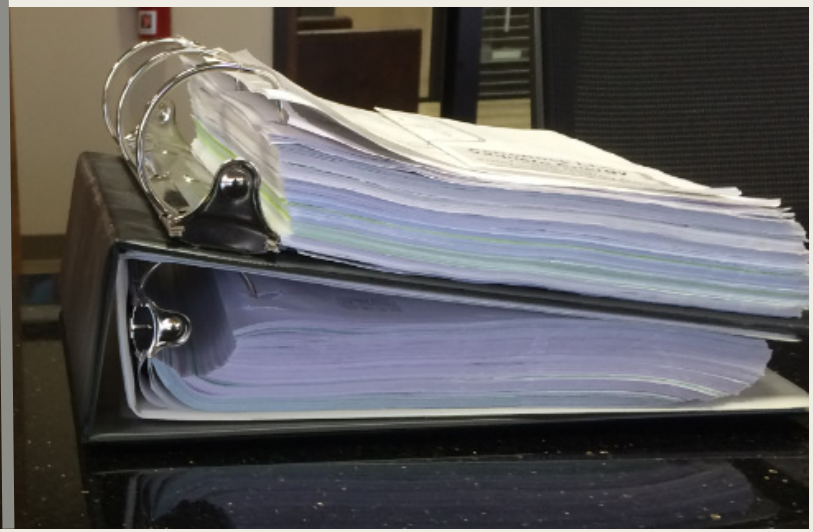
At Tunnell, injecting one barrel of steam yielded one barrel of oil.

The more we looked, the more we liked it. Time to go to DOGGR, submit an NOI, wait 10 days and drill…just like Kern County.

Stack of Paper needed to obtain a permit to drill in Kern County



Stack of Paper needed to obtain a hearing /vote from Santa Barbara County Planning Commission



To regulate: control or supervise (something, especially a company or business activity) by means of rules and regulations.

SB County (CEQA)

- Air Quality
- Endangered Species
- Landscaping
- Noise
- Mobile Emissions
- Fresh Water Use
- Traffic
- Paint Color on Tanks
- Archeology
- Greenhouse Gas
- Septic Tanks

What are the thresholds for each item?

State

- UIC Injection
- Drilling Permits

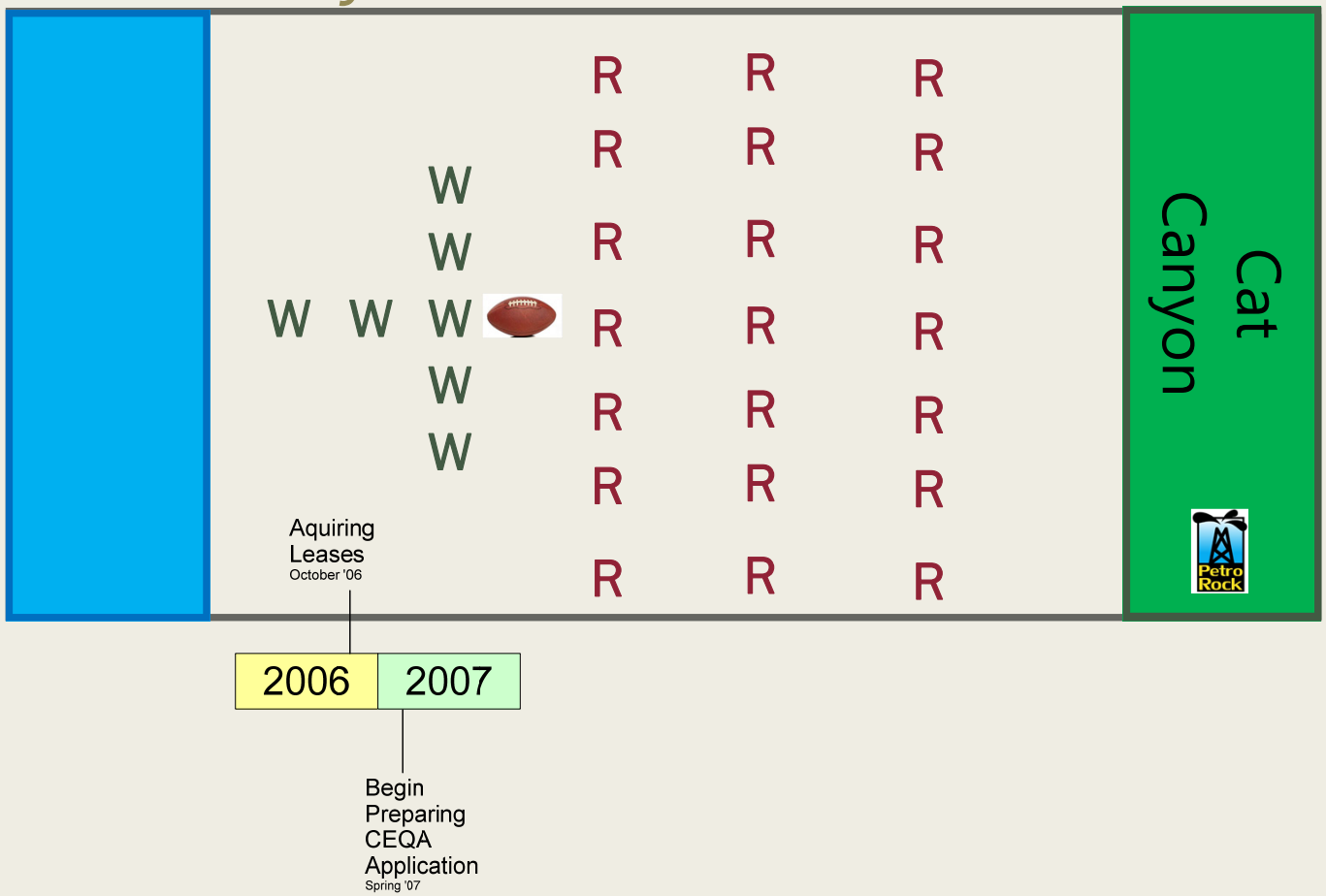
Federal

- US Fish & Wildlife

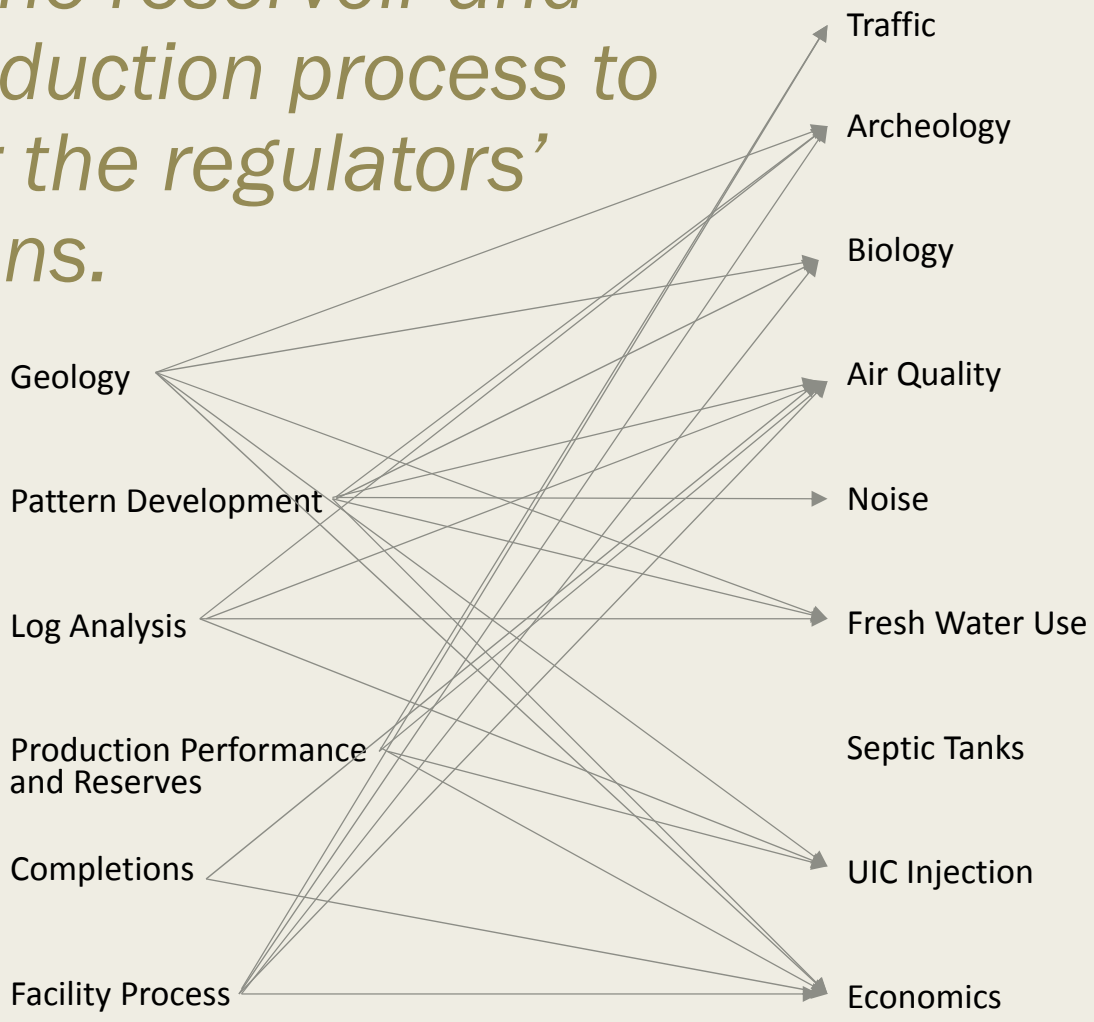
Corporate

- Board of Managers
- The Bank

The Field of Play is set

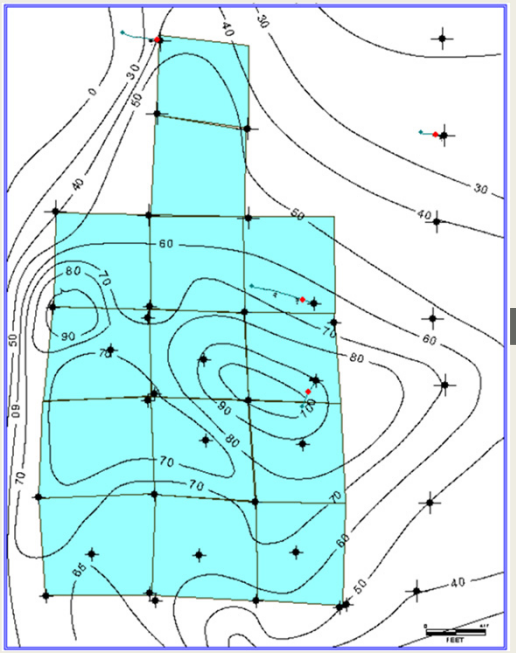


Lesson #1: Learn the reservoir and the production process to answer the regulators' questions.

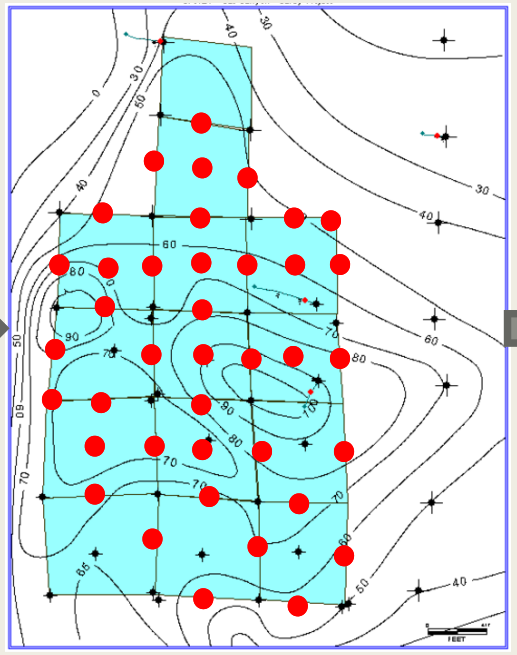


How does the geology fit with Texaco's development plan?

Where do we drill?

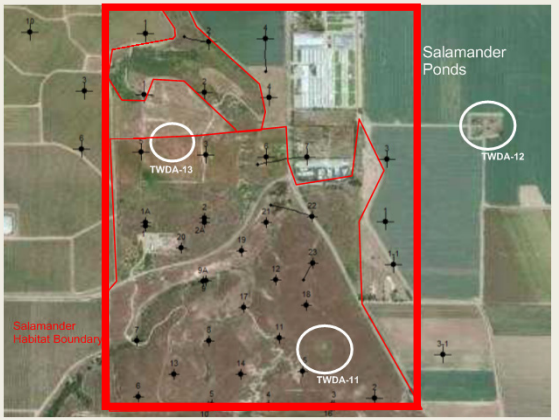


Sisquoc S8 Sand Isopach



Add PUDs to Patterns

(Red Locations)

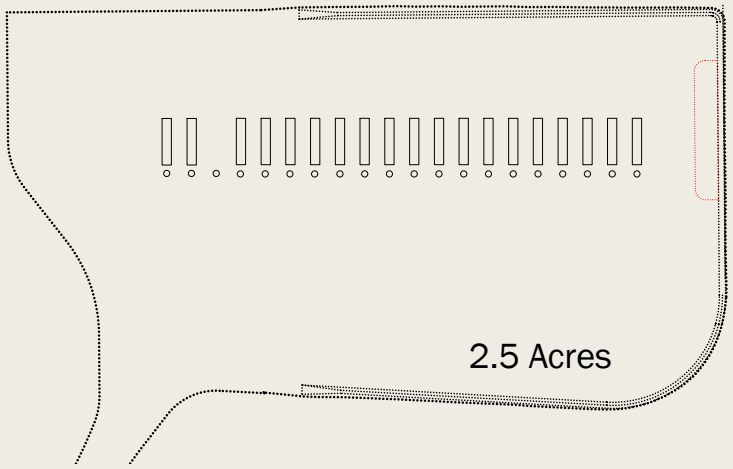


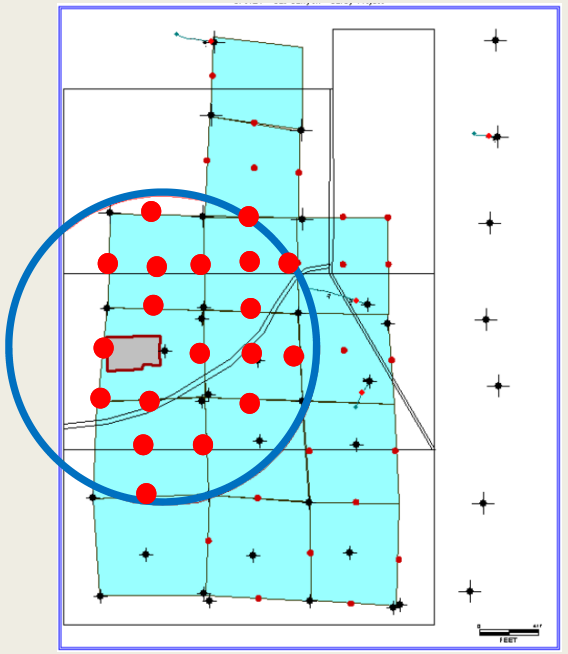
Salamander are everywhere. Can't drill on habitat.

Endangered Salamanders

The size of the drilling island determines how many wells.

The old Texaco Office is on disturbed lands. How many wells can we fit?

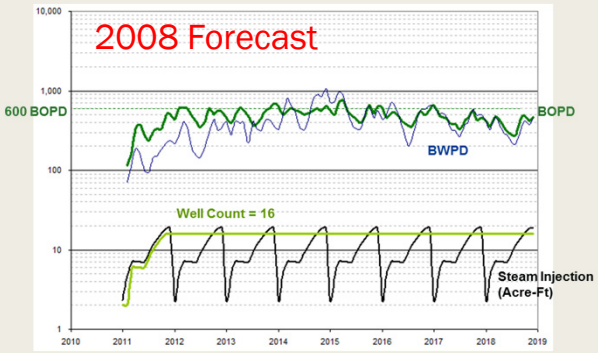


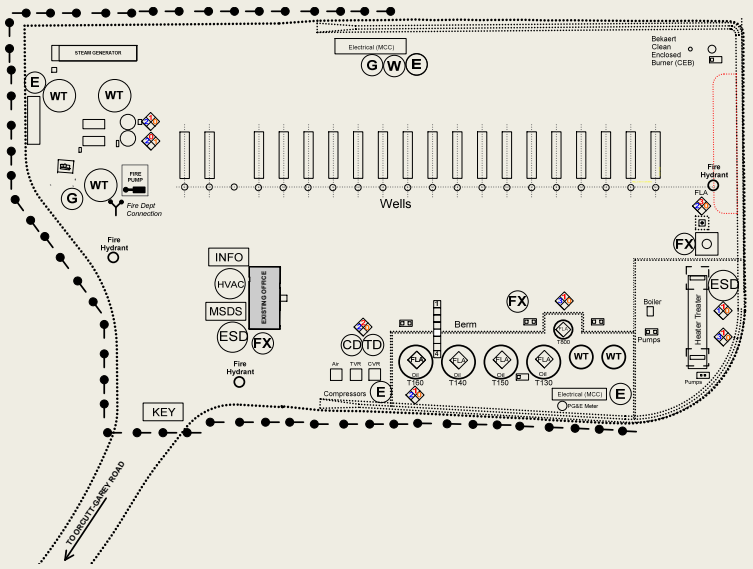


1,100' Radius from drilling pad is extent we can drill directionally. 19 wells to drill.

We have to put the facilities with the wells, what will we need?

The type of facilities depends on how much wells will make.





When we estimated production and what equipment is needed, we addressed the air issues.

Tunnell Stationary Source Emissions

Equipment Category		NO_x	ROC	CO	SO_x	PM	PM_{10}	$CO_{2e,MT}$
Wash Tank								
	lbs/day		-					
	tons/year		-					
Stock Tank (2)								
	lbs/day		0.47					
	tons/year		0.17					
Blend Oil Tank								
	lbs/day		0.25					
	tons/year		0.04					
Produced Water Tank								
	lbs/day		0.23					
	tons/year		0.04					
Reject Tank								
	lbs/day		0.02					
	tons/year		-					
Crude Loading Racks								
	lbs/day		0.75					
	tons/year		0.03					
Blend Oil Unloading Racks								
	lbs/day		2.02					
	tons/year		0.37					
25 MMBtu/hr Steam Generator								
	lbs/day	6.60	3.24	178.20	10.80	4.50	4.50	
	tons/year	1.20	0.59	32.52	1.97	0.82	0.82	9,272
6 MMBtu/hr Heater Treater (two burners for a total of 6 MMBtu/hr)								
	lbs/day	2.10	0.78	42.77	2.59	1.08	1.08	
	tons/year	0.38	0.14	7.81	0.47	0.20	0.20	2,782
2 MMBtu/hr Hot Water Boiler								
	lbs/day	0.70	0.26	14.26	0.86	0.36	0.36	
	tons/year	0.13	0.05	2.60	0.16	0.07	0.07	927
Flare		0.390 MMCFPD						
	lbs/day	16.68	1.13	41.69	7.50	8.34	8.34	
	tons/year	3.04	0.21	7.61	1.37	1.52	1.52	8,068
Mobile Source (Truck Transportation)								
	lbs/day							
	tons/year							423
Fugitive Hydrocarbon Emissions								
	lbs/day		13.95					
	tons/year		2.55					
Total								
	lbs/day	26.08	23.10	276.91	21.76	14.28	14.28	
	tons/year	4.76	4.22	50.54	3.97	2.61	2.61	21,472

County Threshold is 55 lbs/day for NOx and ROC. We are below the threshold.

Water

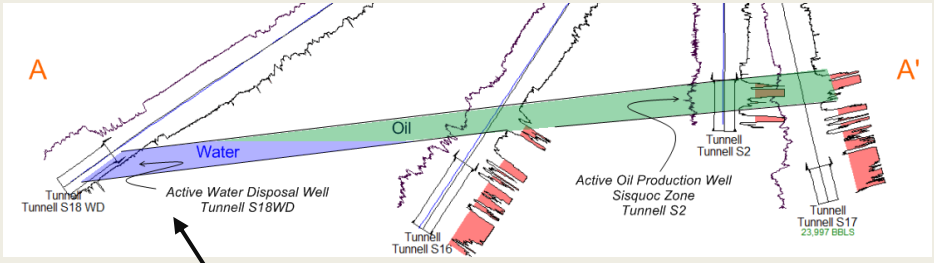
How much <u>fresh</u> water do we ask for?

19 wells need 19.5 Acre-Feet per year based on a 1 to 1 steam-oil ratio.

We asked for 18 Acre-Feet per year.

The project is in an overdraft basin and 25 Acre-Feet is the County Threshold.

What do we do with 1,000 BWPD of <u>produced</u> water?

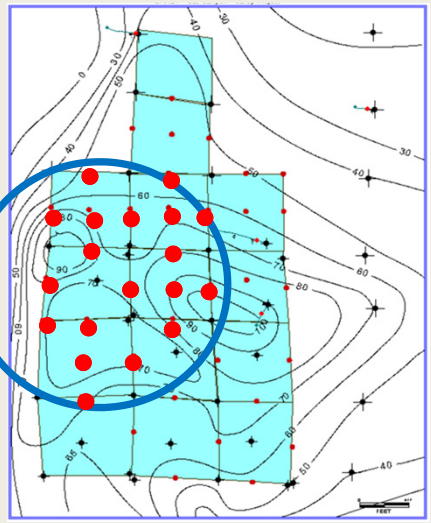


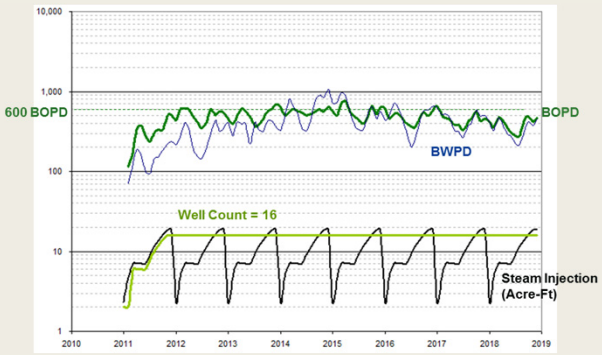
Aquifers

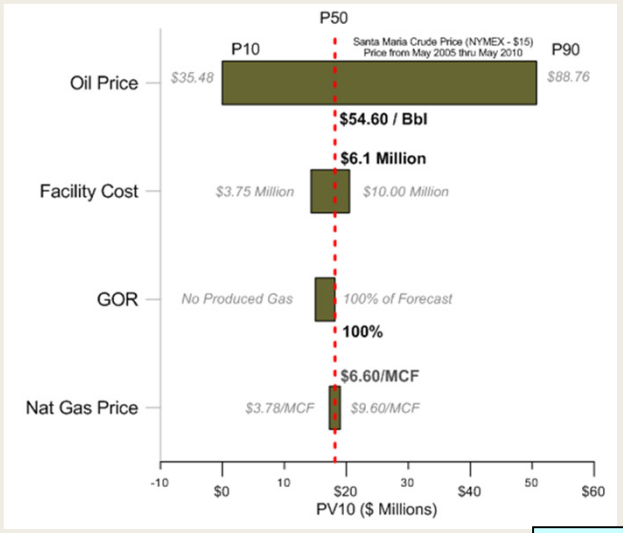
UIC Applications

How to get the S1b permitted when you have no clue as to the TDS of the water.

Economics: Can you sell it to the Board and the Bank?



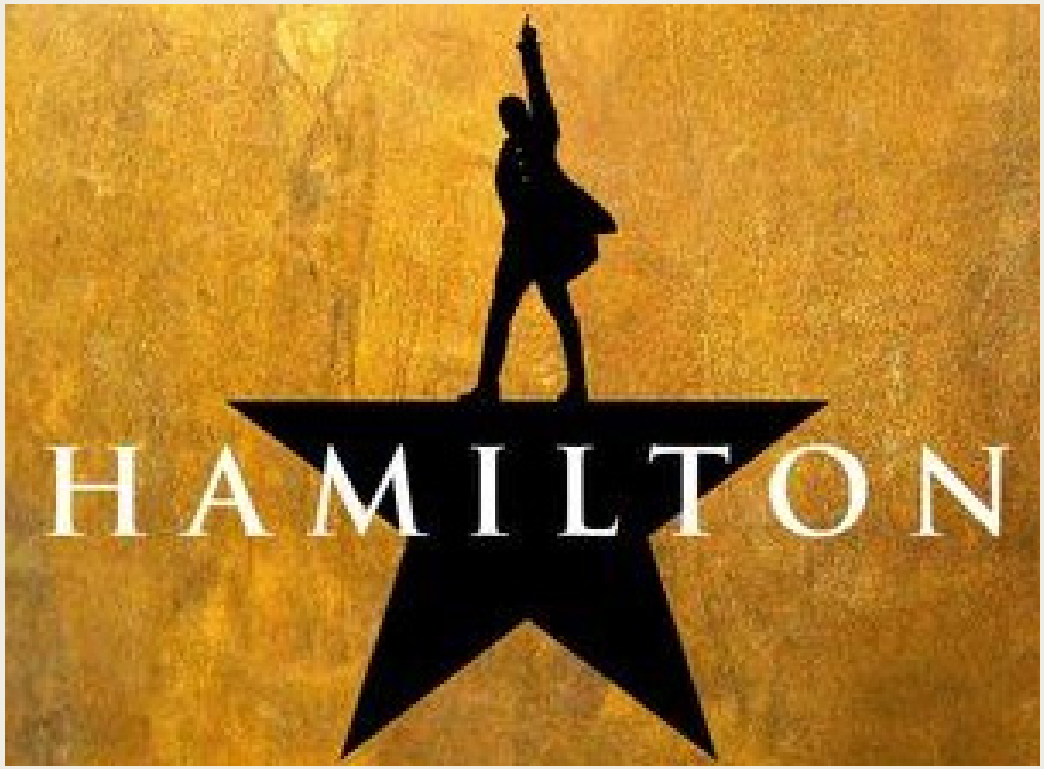


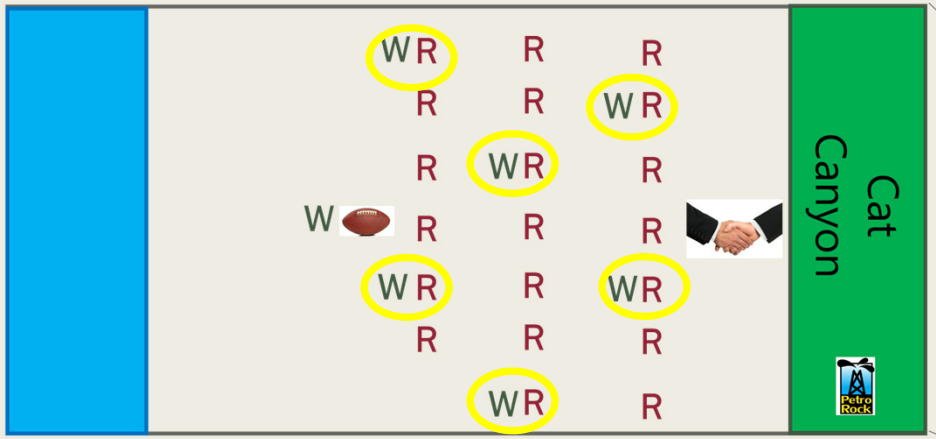


Expected Value in 2010

WTI Oil Price: $69.60/Bbl
Santa Maria 12 API: $54.60/Bbl

PV10%: $17.7 Million
Internal ROR: 34%
Payout: 4.5 years


HAMILTON



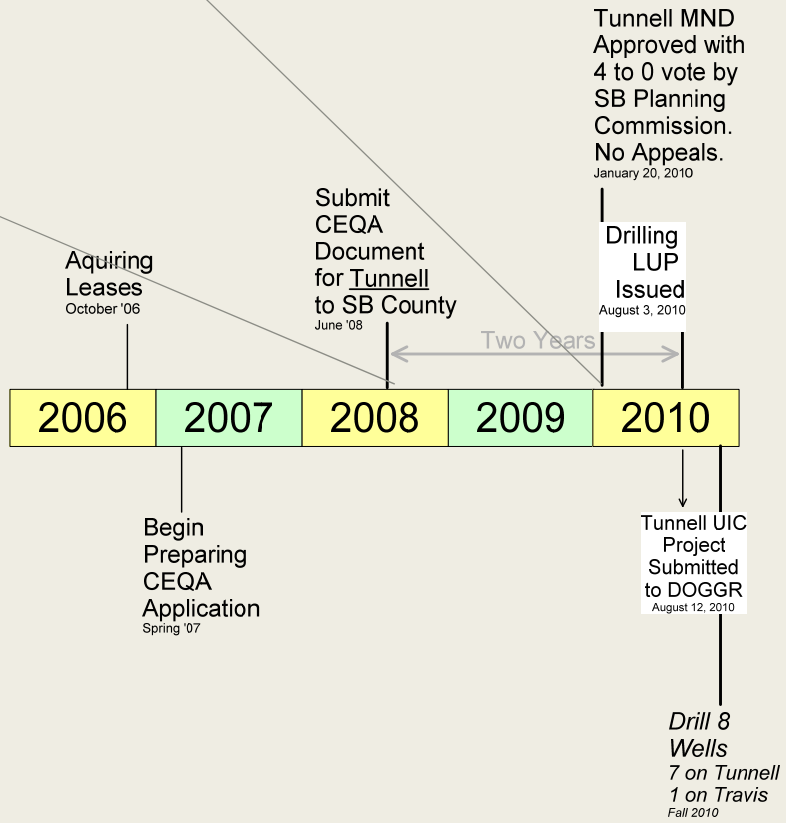
Lesson #2: Be in the room where it happens!

Santa Barbara Planning & Development

Orcutt DOGGR

Bank of Oklahoma

PetroRock Board of Managers



So, what happened?

Santa Barbara Planning & Development

COUNTY OF SANTA BARBARA

CALIFORNIA

PLANNING COMMISSION

carried by a vote of 4 to 0

Santa Barbara APCD

Santa Barbara County
Air Pollution Control District

Dear Ms. Hunter:

Enclosed is the final Authority to Construct (ATC) No. 12949

Orcutt DOGGR

CALIFORNIA CONSERVATION

WATER DISPOSAL PROJECT, CAT CANYON FIELD, SISQUOC AREA, SISQUOC FORMATION

The initiation of the project designated above is approved provided that all field operations

Bank of Oklahoma

BANK OF OKLAHOMA

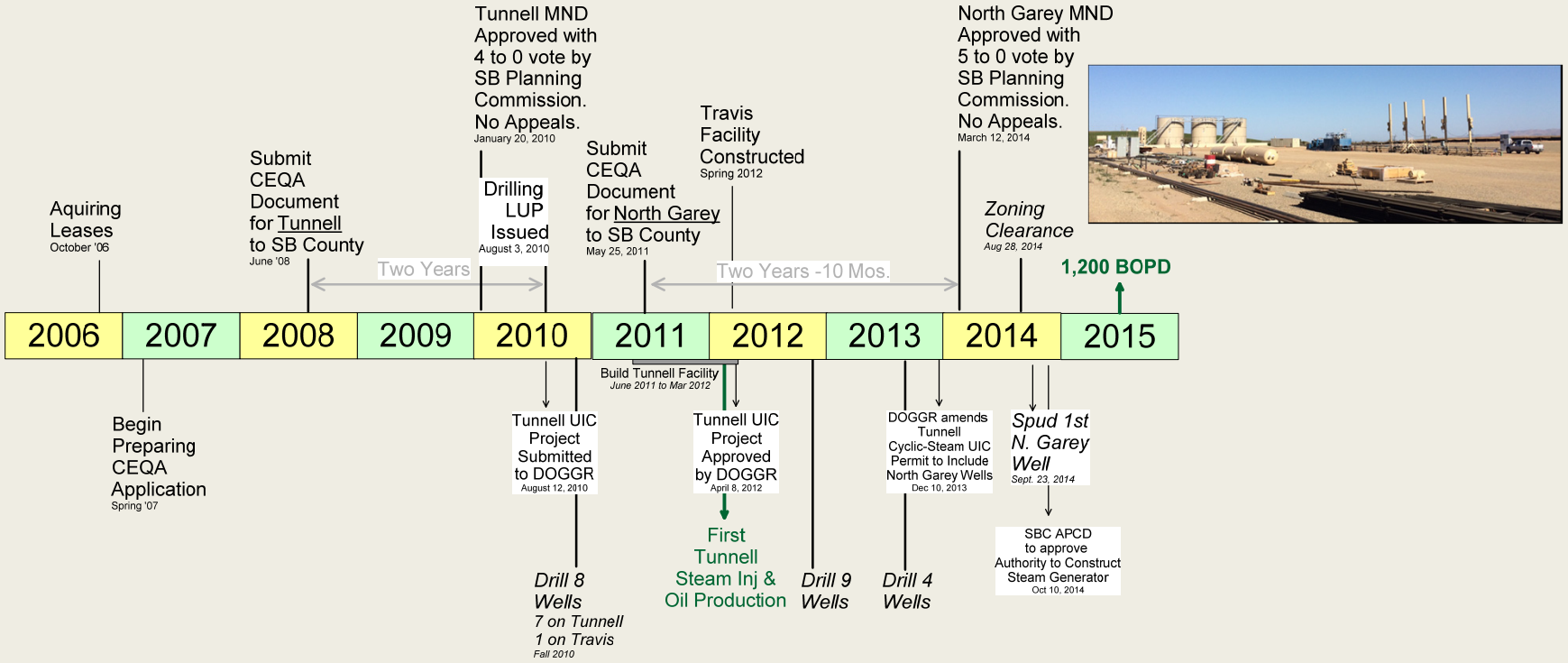
Petro Rock

$15,000,000 Senior Secured Revolving Credit Facility

Dated as of September 14, 2009

PetroRock Board of Managers

They approved it!



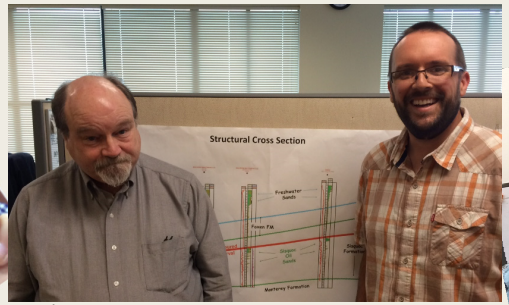
Economics of the original 19 wells

MBO	Op Rev ($mm)	Facility ($mm)	Drilling ($mm)	Total Rev ($mm)	PV10% ($mm)	IRR	Payout (years)
739	$27	($7)	($7)	$13	$8	43%	4.5

Angela

Joe

Ken



Ross

DOGGR

Jon

David & Mike

SBAPCD

Erik

The Modern Wildcatter

...A Team!

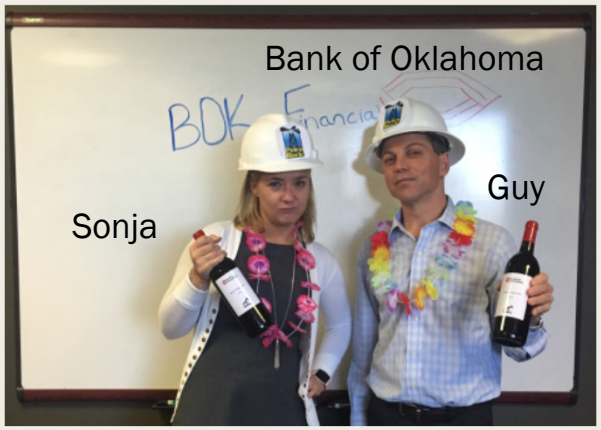
Seth

Chad

Stephen

Erin

County of SB



Sonja

Guy