

**INFORMATIONAL
CALENDAR ITEM
51**

A
S Statewide

08/11/09
G. Scott

**HEARING ON COMPARATIVE
ADVANTAGES AND DISADVANTAGES OF
DEVELOPING OFFSHORE OIL RESOURCES FROM
OFFSHORE OR ONSHORE SITES**

BACKGROUND:

At the request of the Lieutenant Governor, staff has prepared a presentation addressing offshore oil and gas development in California waters and the comparative advantages and disadvantages of developing these resources either from onshore or offshore drill sites. The presentation will discuss the current capability of extended reach drilling technology, operational limitations, risk factors, and environmental factors. Presenters will include, in addition to staff presentations, representatives from the oil and gas industry, Santa Barbara County, and the environmental community.

INFORMATIONAL HEARING

Comparative Advantages and Disadvantages of
Developing Offshore Oil Resources from
Offshore or Onshore Sites

California State Lands Commission

August 11, 2009

Outline

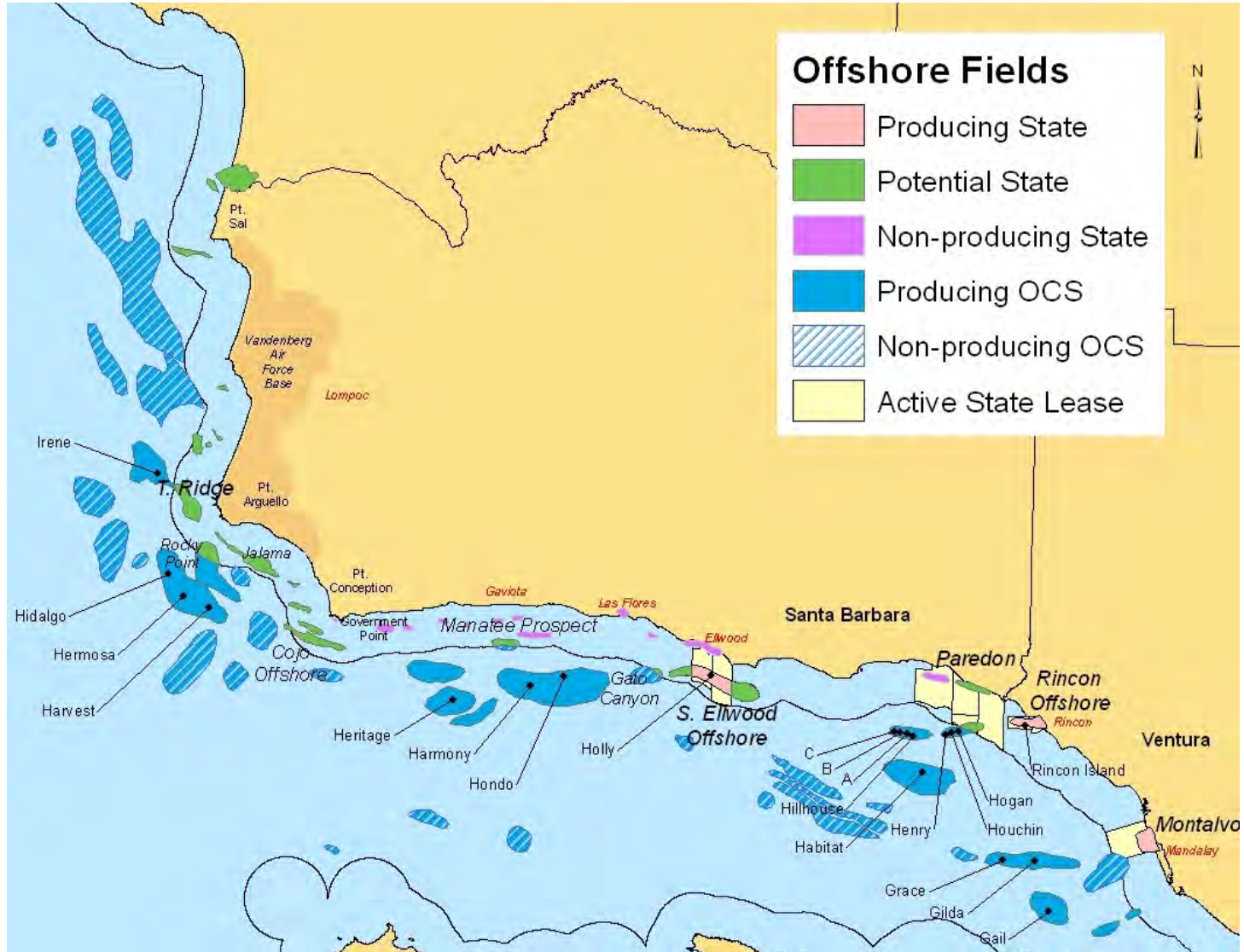
- Overview of Offshore California Oil Fields: *Greg Scott, CSLC*
- Statutory Framework: *Mark Meier, CSLC*
- Technology of Extended Reach Drilling: *Steve Curran, CSLC*
- Operational Consideration-Limitations: *Pete Johnson, CSLC*
- Environmental Factors: *Eric Gilles, CSLC*
- Access – Onshore Constraints: *Doug Anthony, Santa Barbara County*
- Environmental Advocate Perspectives:
 - *Linda Krop, Environmental Defense Ctr.*
 - *Steve Uhring- Malibu Coastal Land Conservancy*
 - *Richard Charter- Defenders of Wildlife*
- Industry Perspective: *Bob Poole, Western States Petroleum Association*
- Potential State Resource Areas: *Jeff Planck, CSLC*
- Staff Evaluation Methodology: *Greg Scott, CSLC*
- Policy Considerations: *Paul Thayer, CSLC*

Overview of Offshore California Oil Fields

Greg Scott, CSLC
Chief, Mineral Resources
Management Division

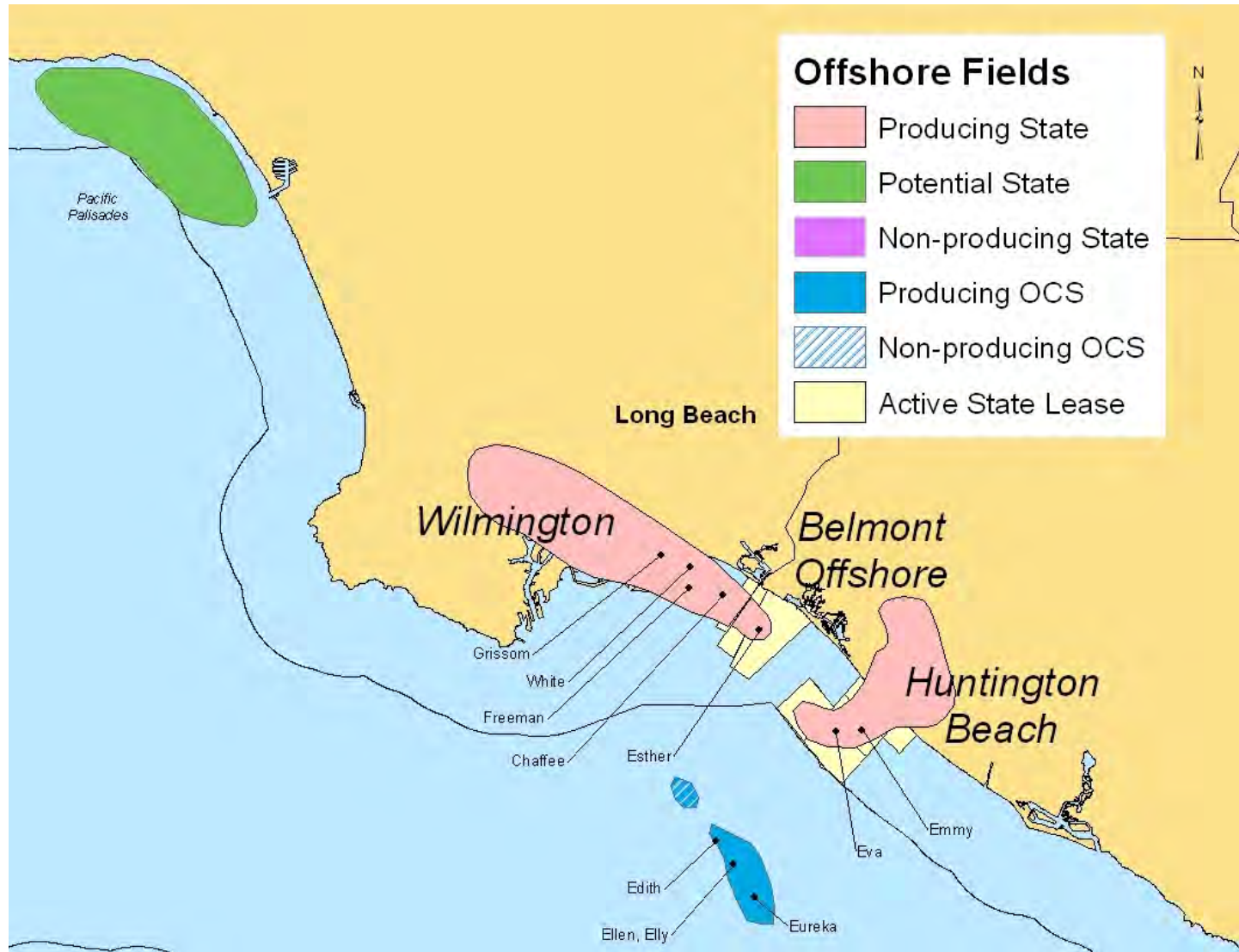
Offshore California Oil & Gas Resources

(Santa Barbara & Ventura Counties)



Offshore California Oil & Gas Resources

(Los Angeles & Orange Counties)



California Offshore Platforms

State Platforms

Holly

Eva

Esther

Emmy

5 Islands (4 in Long Beach Unit, 1 at Rincon)

Federal Platforms

23 Platforms Statewide

4 in southern California

4 in Santa Maria area (north county)

15 in Santa Barbara Channel

Offshore California Platforms



Potential Onshore Drill Sites

Current development sites

1. Long Beach Tidelands
2. Huntington Beach
3. Montalvo
4. Rincon
5. Molino

Future possible onshore sites

6. Vandenberg Air Force Base
7. Government Point
8. Gaviota Oil Processing Facility
9. Carpinteria
10. Santa Monica Bay



Statutory Constraints

Mark Meier

Asst. Chief Counsel

Statutory Constraints

Provisions Enacted Prior to 1969 Promoting Full Development and Maximized Recovery

- PRC §§6828, 6829(b), 6829(c): Prevention of Waste – offsetting drainage and diligence in producing the resource in a safe manner
- PRC §6830: Maximize recovery – prevent waste and promote maximum economic recovery and conservation of reservoir energy
- PRC §6830.1: Legislative findings – produce the optimum quantities of oil and gas and leave a minimum of unrecovered oil and gas

Statutory Constraints

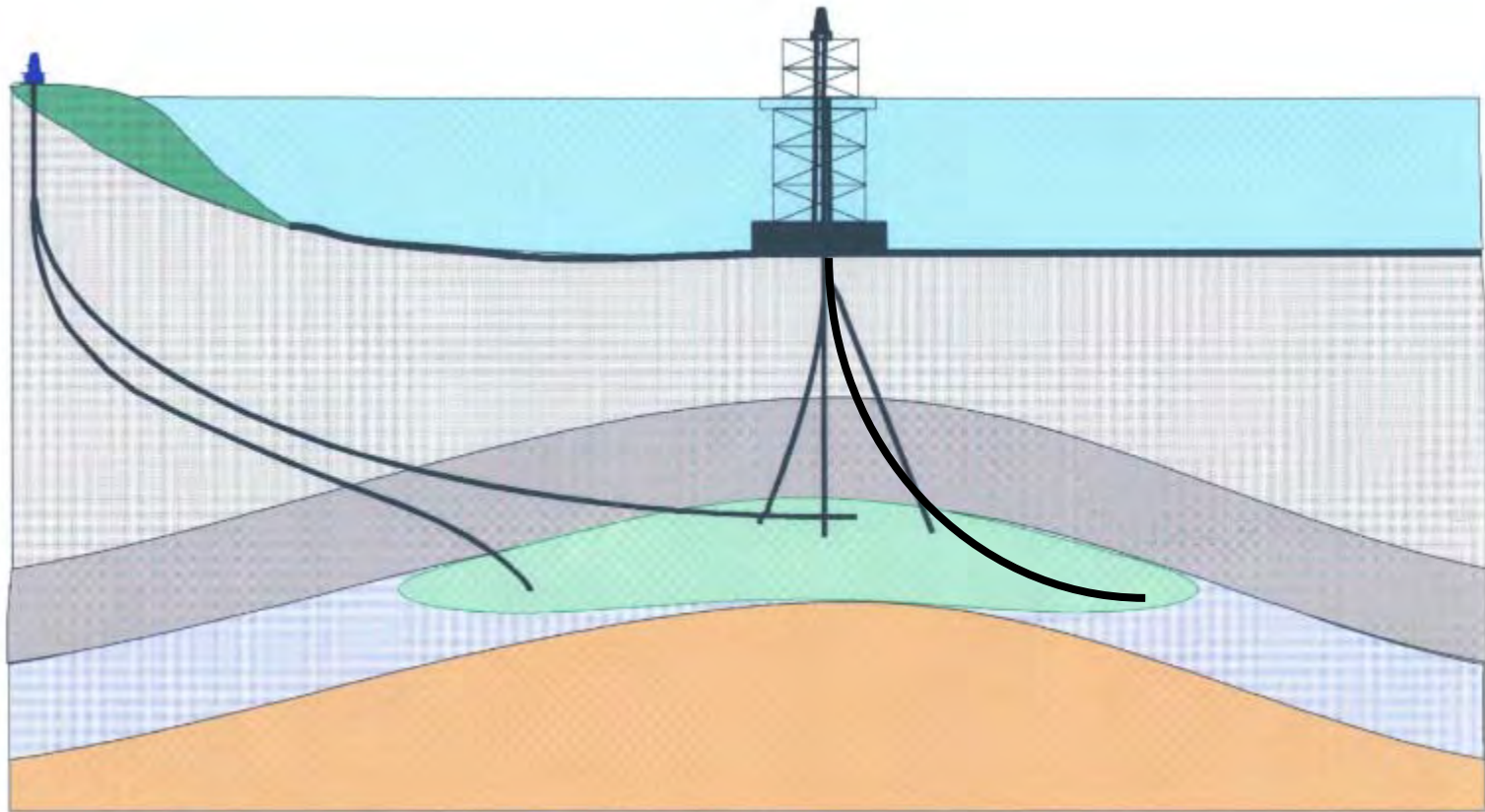
Provisions After 1969 Imposing Environmental and Land Use Constraints

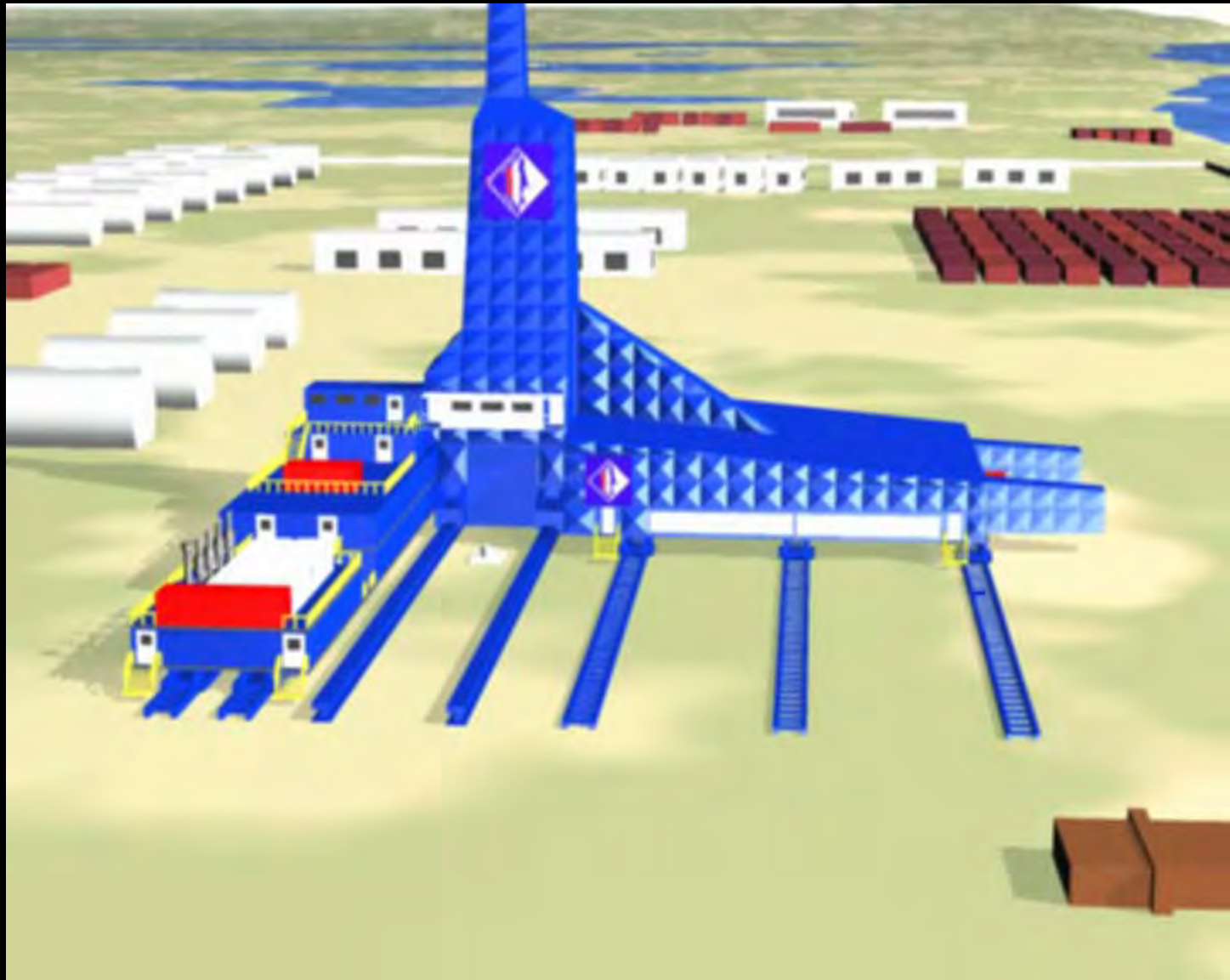
- California Environmental Quality Act (CEQA) – PRC §§21000 *et seq.*
- California Coastal Act – PRC §§30000 *et seq.*
- California Coastal Sanctuary Act – PRC §§6240 *et seq.*
 - **PRC §6241:** Production of offshore oil & gas in certain areas of state waters poses an unacceptably high risk of damage and disruption of the state's marine environment.
 - **PRC §6242:** California Coastal Sanctuary is established covering all State offshore lands not under lease in 1994 or under leases that are later terminated.
 - **PRC §6243:** New oil & gas leasing is prohibited in the Sanctuary unless strict conditions are met and the Legislature approves exception.
 - **PRC §6244:** New leases are permitted if oil or gas deposits are being drained by wells upon adjacent federal lands and lease is in the best interests of the State
 - **PRC §6872.5:** Adjustment of boundaries of existing leases are permitted to encompass all of a field to permit more efficient resource recovery providing no new platforms are required.

Current State of Technology for Extended Reach Drilling

Steve Curran, CSLC
Petroleum Drilling Engineer

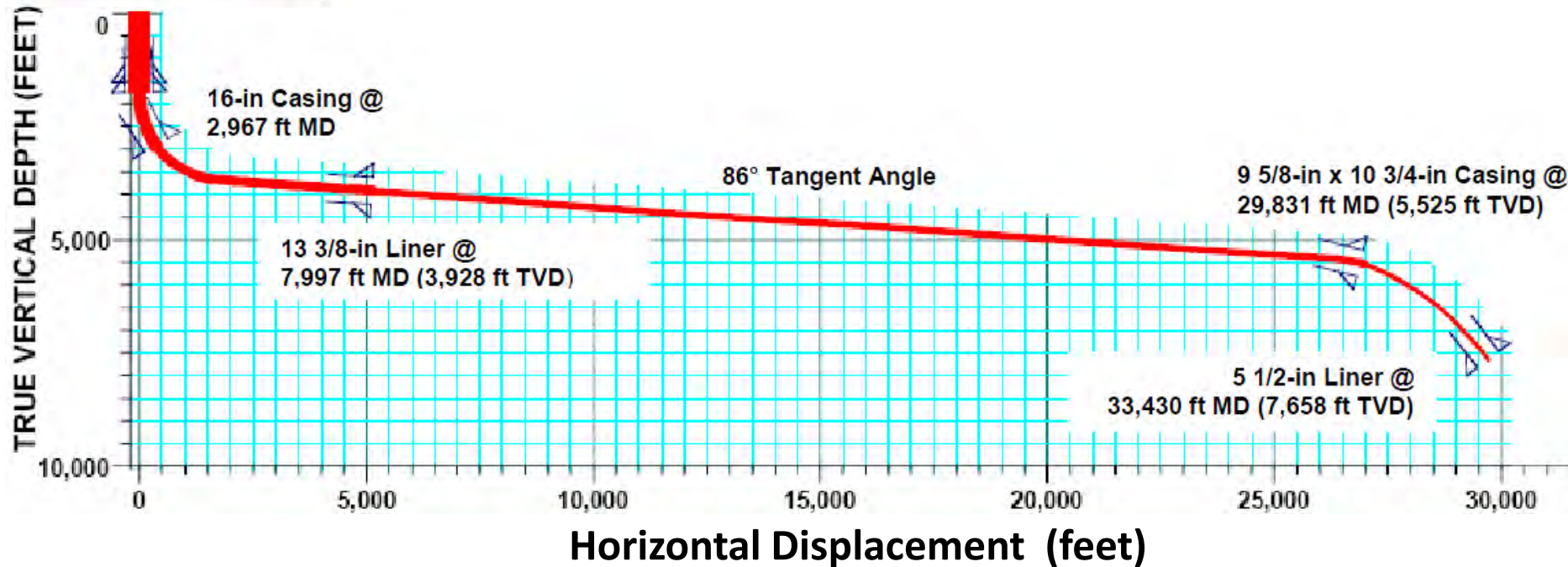
Extended Reach Drilling (ERD)







Since 1999, the company has drilled 15 ERD wells at Sacate, using Platform Heritage at the adjacent Pescado Field and is the longest ERD well in North America.



Sakhalin -- World Record Extended Reach Well



ExxonMobil Sakhalin-1 on Russia's east coast was drilled from shore at a distance of nearly 7 miles.

Offshore and Onshore Operational Considerations

Pete Johnson

Chief Operations, CSLC

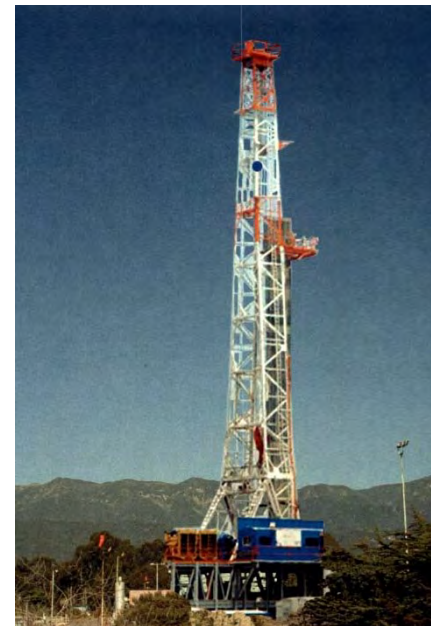
OFFSHORE OPERATIONS

- Limited Space
 - Drilling rig & equipment
 - Processing facilities
- Increased costs
 - Marine transportation
 - Platform maintenance
- Increased Operational Risk
 - Ocean oil spill
 - Worker safety
 - Equipment reliability
- Platform Capacity
 - Larger, heavier drilling rig & equipment



ONSHORE BASED OPERATIONS

- Adequate space & structural flexibility
- Reduced transportation costs
- Urban sites
 - Visual cover
 - Sound attenuation
 - Operating hour restrictions
 - Sour gas (higher public risk)



EXTENDED REACH DRILLING

- Platform capacity
 - Larger, heavier drilling rig & equipment
 - Mast, draw works, mud pumps, mud pits
 - Increased weight, increased space requirements
- Increased well cost
 - More expensive to drill & equip
 - More expensive to produce
 - More energy to lift fluids
 - Downhole maintenance more difficult

SAFETY RISKS

RISK	ONSHORE	OFFSHORE
Public Safety	<p><i>fire/explosion</i></p> <p><i>toxic gases</i></p>	<p><i>Little or no risk</i></p>
Worker Safety	<p><i>fire/explosion</i></p> <p><i>toxic gases</i></p> <p><i>industrial environment risks</i></p>	<p><i>Transfers to platform</i></p> <p><i>Limited crew (response)</i></p> <p><i>Limited space</i></p> <p><i>Storm surge / tsunami</i></p>

Environmental Factors Relating to Offshore Oil Development in California

Eric Gillies, CSLC

Staff Environmental Scientist

Oil and Gas Offshore Infrastructure

Santa Barbara Channel

- marine resources/habitats
- marine mammals
- coastal biological resources
- offshore biological resources
- commercial/recreational fishing
- offshore water quality
- recreation
- visual
- lighting
- oil spill risk
- air quality/GHG emissions

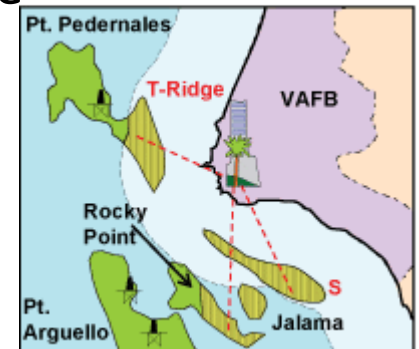
Generalized Impact Summary

- **OFFSHORE IMPACTS** – Risk of Oil Spill, Marine Resources, Marine Mammals, Coastal Biological Resources, Commercial & Recreational Fishing, Recreation.
- **ONSHORE IMPACTS** – Onshore Biological Resources & Water Quality, Land Use, Cultural Resources, Recreation, Noise.
- **VARIES BY PROJECT** – Risk and Public Safety, Visual/Aesthetics.
- Air Quality Impacts and GHG Emissions can be substantial regardless of location.

Construction Impacts: Offshore vs. Onshore

Onshore Construction Impacts (PXP example)

- visual
- **terrestrial biology** (threatened and endangered species)
- **habitat disturbance (e.g., wetlands, coastal scrub)**
- water quality
- **land use**
- recreation
- **cultural resources**
- spill risks into local waterways, but less than offshore
- **noise**
- **transportation**
- **risk to public safety**
- air quality/GHG emissions



Construction Impacts: Offshore vs. Onshore

Offshore Construction Impacts (Montalvo Wells example)

- visual (new structure in the ocean difficult to mitigate)
- marine biology/water quality
- marine mammals
- marine habitat disturbance (e.g., kelp)
- commercial/recreational fishing
- recreation
- oil spill risk in marine/ocean environment
- air quality/GHG emissions (increased drilling and lifting)
- **lighting (new platform)**
- **seafloor disturbance (new platform and pipelines)**
- **underwater noise (due to construction)**



Regional Factors

Remote vs. Existing Oil and Gas Infrastructure Regions

North and Central Coast (Offshore Platform & Pipelines)

- visual (new structure in the ocean difficult to mitigate)
- marine biology/water quality
- marine mammals
- marine habitat disturbance (e.g., kelp)
- commercial/recreational fishing
- recreation
- lighting
- seafloor disturbance (new platform and pipelines)
- oil spill risk in marine/ocean environment
- air quality/GHG emissions

Regional Factors

Remote vs. Existing Oil and Gas Infrastructure Regions

North and Central Coast (Offshore Platform Supporting Processing Facilities)

- Visual (new onshore facilities)
- Terrestrial biology (threatened and endangered species)
- habitat disturbance (e.g., wetlands, coastal habitats)
- water quality
- land use
- recreation
- cultural resources
- spill risks into local waterways, but less than offshore
- noise
- transportation
- risk to public safety (gas processing)(less in rural areas; more near communities)
- air quality/GHG emissions

Regional Factors

Remote vs. Existing Oil and Gas Infrastructure Regions

North and Central Coast (Onshore Drilling Facility)

- visual (new onshore facilities)
- terrestrial/coastal biology (threatened and endangered species)
- habitat disturbance (e.g., wetlands, coastal habitats)
- water quality
- land use
- recreation
- cultural resources
- spill risks into local waterways, but less than offshore
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Operational Impacts: Offshore vs. Onshore

	Torch/Platform Irene Pipeline	PRC 421 Pipeline
Year	1997	1994
Barrels of oil spilled	163	170
Spill type	Offshore pipeline leak (Platform Irene to shore)	Onshore pipeline leak
Location	Offshore Vandenberg (Santa Barbara County)	Near Coastal Bluff in Goleta (Santa Barbara County)
Spill extent	17 miles of coastline	< 1 acre on golf course green
Impacted resources	<ul style="list-style-type: none">• marine biology (seabirds, sandy and gravel beach habitats, rocky intertidal shoreline habitats)• marine water quality (crude oil in ocean)• recreation (beaches)	<ul style="list-style-type: none">• recreation (golf course)

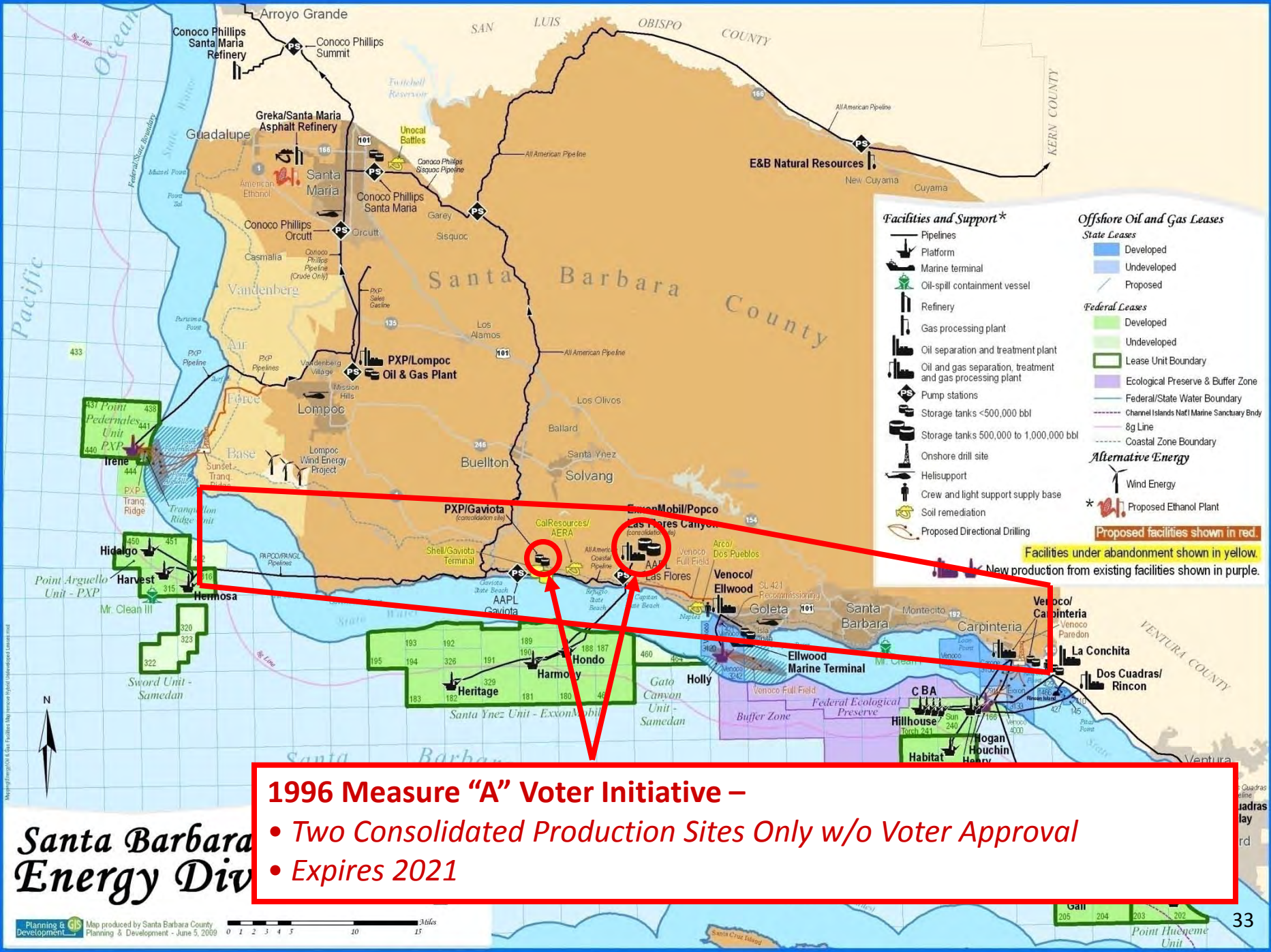
Operational Impacts: Offshore vs. Onshore

General Conclusions:

- Offshore oil development has more environmental disadvantages than drilling from onshore with regard to oil spills.
- Spills from an onshore facility and associated onshore pipelines can be more easily contained compared the fluid environment of the ocean currents offshore where containment is much more difficult.
- Many impacts are specific to location of the oil development (offshore vs. onshore)
- Some impacts are dependent on location but also the specifics of the project.
- Air quality impacts and GHG emissions can be substantial regardless of location.

Access – Onshore Constraints

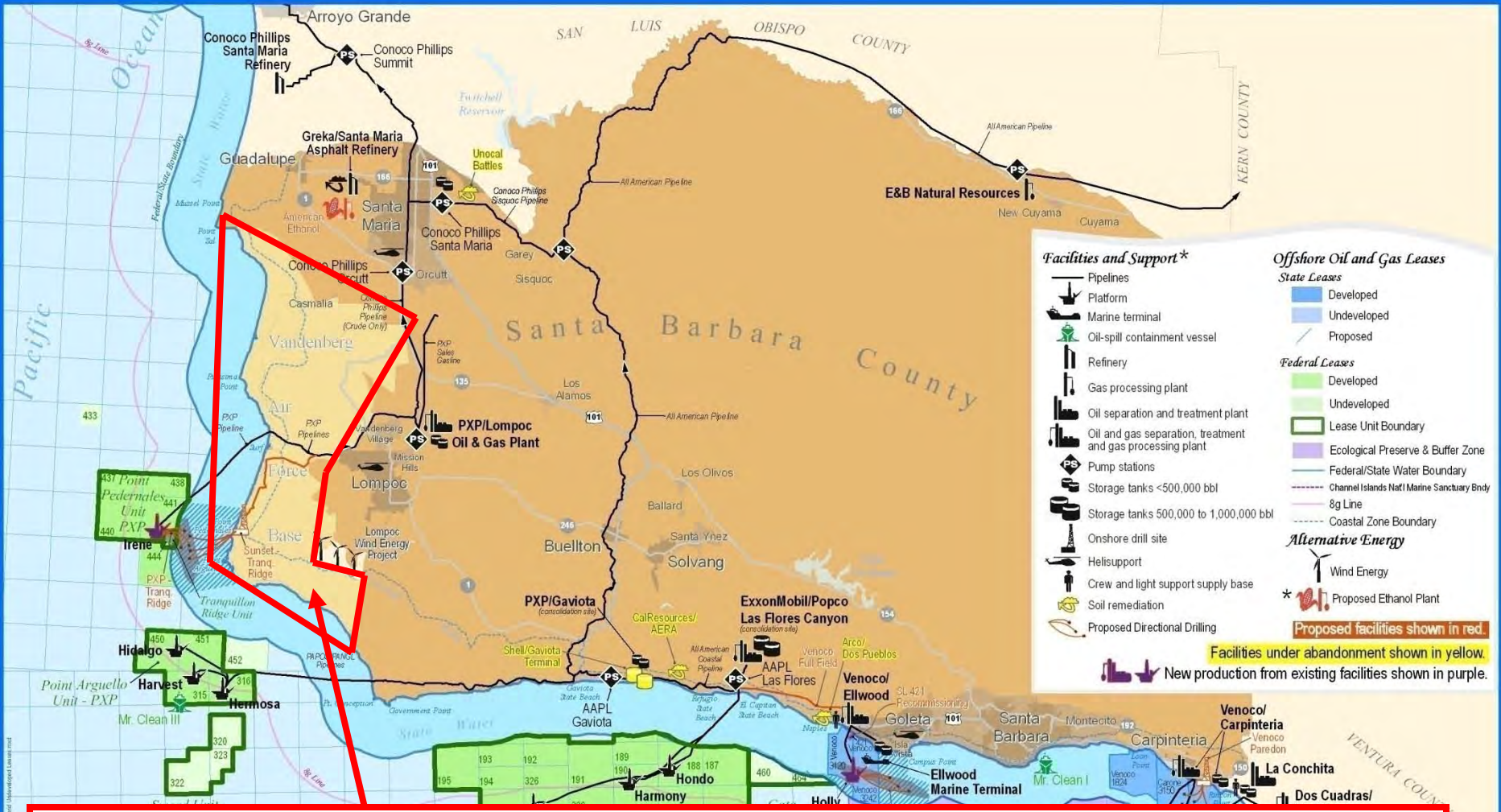
Doug Anthony, Deputy Director
Planning & Development Dept., Energy Division
Santa Barbara County



1996 Measure "A" Voter Initiative –

- Two Consolidated Production Sites Only w/o Voter Approval
- Expires 2021

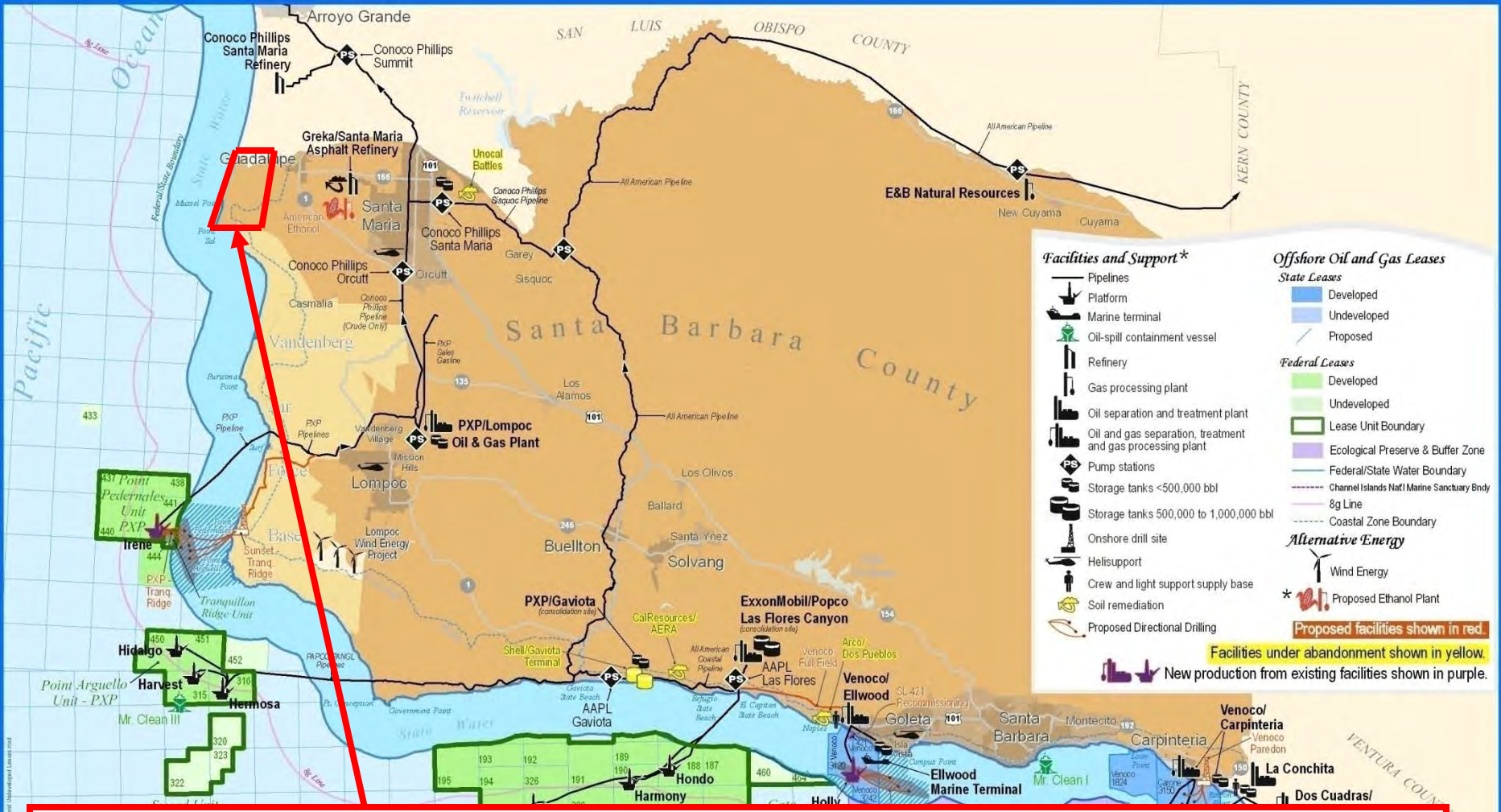
Santa Barbara Energy Div



Vandenberg Air Force Base –

- As of 8-8-08, VAFB unwilling to commence NEPA process
- VAFB willing to conduct an Enhance Use Lease process
- If a suitable site(s) is identified, AF would initiate competitive bidding process

Energy Division Map



Point Sal Area –

- No OCS leases that could drain State resources
- No existing oil/gas leases in area

Santa Barbara County Energy Division Map



Primary Siting/Design Considerations

- Human Safety - populated vs. remote
- Biology – Construction & Operations
- Archaeology & Cultural Resources
- Visual & Noise
- Conflict with Other Uses
- Permittable Zones
 - Conditionally in rural agriculture zone, or
 - Coastal-Related Industry

Environmental Advocates Perspective

Linda Krop
Environmental Defense Center

Offshore Oil Development

Offshore Platforms vs Onshore Drilling Sites

California State Lands Commission

August 11, 2009

Linda Krop, Chief Counsel
Environmental Defense Center

www.edcnet.org



Offshore Oil Drilling Impacts

- Oil spills
- Air and water pollution
- Biological resources
- Energy
- Climate change & ocean acidification
- Safety: hazardous materials, toxics
- Seismic
- Recreation & fishing
- Visual blight
- Land use

Onshore Oil Drilling Impacts

- Oil spills
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Mobil Clearview

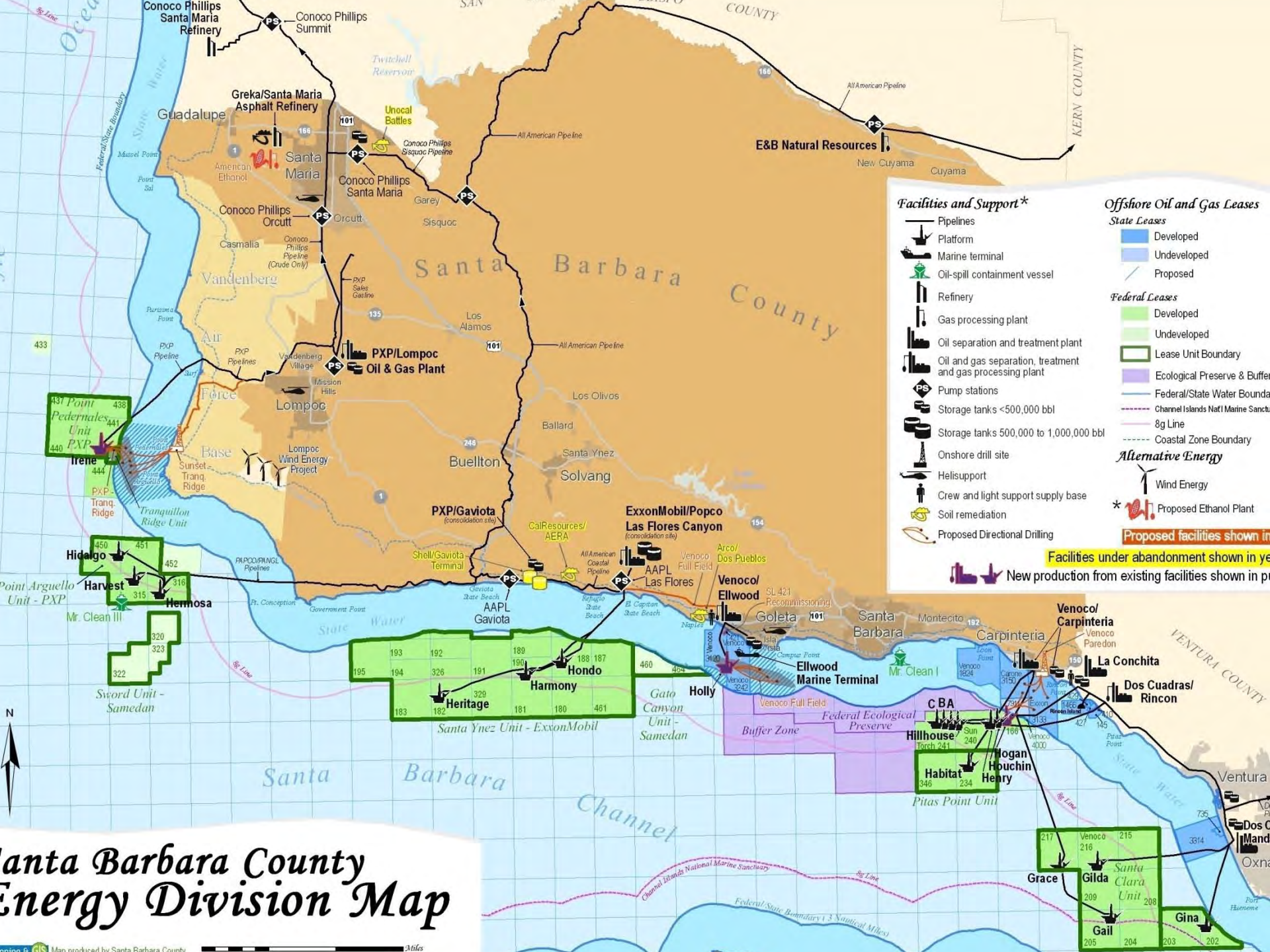
- Proposal to slant drill from onshore into the South Ellwood Field via an expanded state lease (inc. removal of Platform Holly)
- UCSB analysis: impacts from oil spills, biology, public safety, recreation, views, air and water quality, noise, toxics

Venoco Paredon

- Proposal to slant drill from onshore in Carpinteria into offshore state leases (vs. slant drilling from existing platform)
- FEIR: “Class 1” impacts: hazardous materials releases; oil spills (marine resources and mammals, onshore biology and water quality, recreation); land use; visual resources

Tranquillon Ridge

- Proposal to slant drill from Platform Irene, which produces oil from the federal Pt. Pedernales Unit, as well as Tranquillon Ridge
- Onshore alternative: slant drill from VAFB



Facilities and Support*

- Pipelines
- Platform
- Marine terminal
- Oil-spill containment vessel
- Refinery
- Gas processing plant
- Oil separation and treatment plant
- Oil and gas separation, treatment and gas processing plant
- Pump stations
- Storage tanks <500,000 bbl
- Storage tanks 500,000 to 1,000,000 bbl
- Onshore drill site
- Helisupport
- Crew and light support supply base
- Soil remediation
- Proposed Directional Drilling

Offshore Oil and Gas Leases

- State Leases**
- Developed
 - Undeveloped
 - Proposed
- Federal Leases**
- Developed
 - Undeveloped
 - Lease Unit Boundary
 - Ecological Preserve & Buffer
 - Federal/State Water Boundary
 - Channel Islands Nat'l Marine Sanct.
 - 8g Line
 - Coastal Zone Boundary
- Alternative Energy**
- Wind Energy
- * Proposed Ethanol Plant
- New production from existing facilities shown in purple

Santa Barbara County Energy Division Map

Tranquillon Ridge

- FEIR: onshore alternative reduces, but does not eliminate risk of marine oil spills.
- Increases impacts to biology, air quality, water quality, energy, fire protection, geology, risk of upset, ag, cultural resources, noise, public facilities, transportation

Tranquillon Ridge

- Post FEIR analysis of PXP Agreement
 - Eliminated offshore impacts related to extended life of Pt. Pedernales facilities
 - *“[T]he reduced-life Tranquillon Ridge Project will result in fewer significant and unavoidable impacts than a new long-term onshore drilling and production project and is preferred to the VAFB Onshore Alternative”*

Tranquillon Ridge

- Onshore drilling is not an “alternative” to offshore drilling
 - Offshore drilling would continue as Platform Irene produces from Pt. Pedernales and TR
 - As with any other project, the onshore drilling would be additional and would result in new facilities, operations & impacts

Other Environmental Perspectives

Steve Uhring
Malibu Coastal Land Conservancy

Other Environmental Perspectives

Richard Charter
Defenders of Wildlife

Oil & Gas Industry Perspective

Bob Poole
Western States
Petroleum Association

California State Lands Commission



California Crude Oil Production
Bob Poole

Western States Petroleum Association
August 11, 2009

Access to domestic energy resources

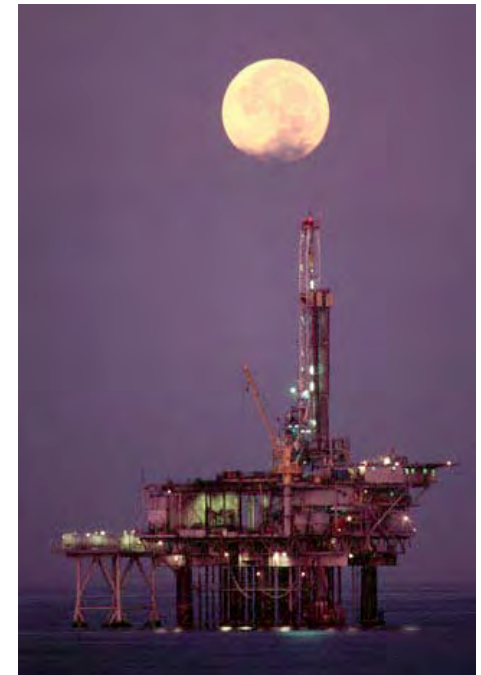
- Additional offshore production can provide significant new jobs, and more revenues for state and local governments
- Petroleum industry has demonstrated it can produce needed energy supplies from offshore California safely and responsibly
- Domestic production will benefit California consumers
- Existing technology provides access to new leases with minimal impacts
- Infrastructure is in place to support additional offshore production



Expanded energy access = more jobs/economic stimulus

Estimated economic benefits of increased OCS access:¹

- More than 14,000 new jobs in California
- 10.4 billion more barrels of oil
- 18 trillion more cubic feet of natural gas
- \$3 billion in new economic output
- \$691 million in additional employment income
- \$12 billion in new government revenue

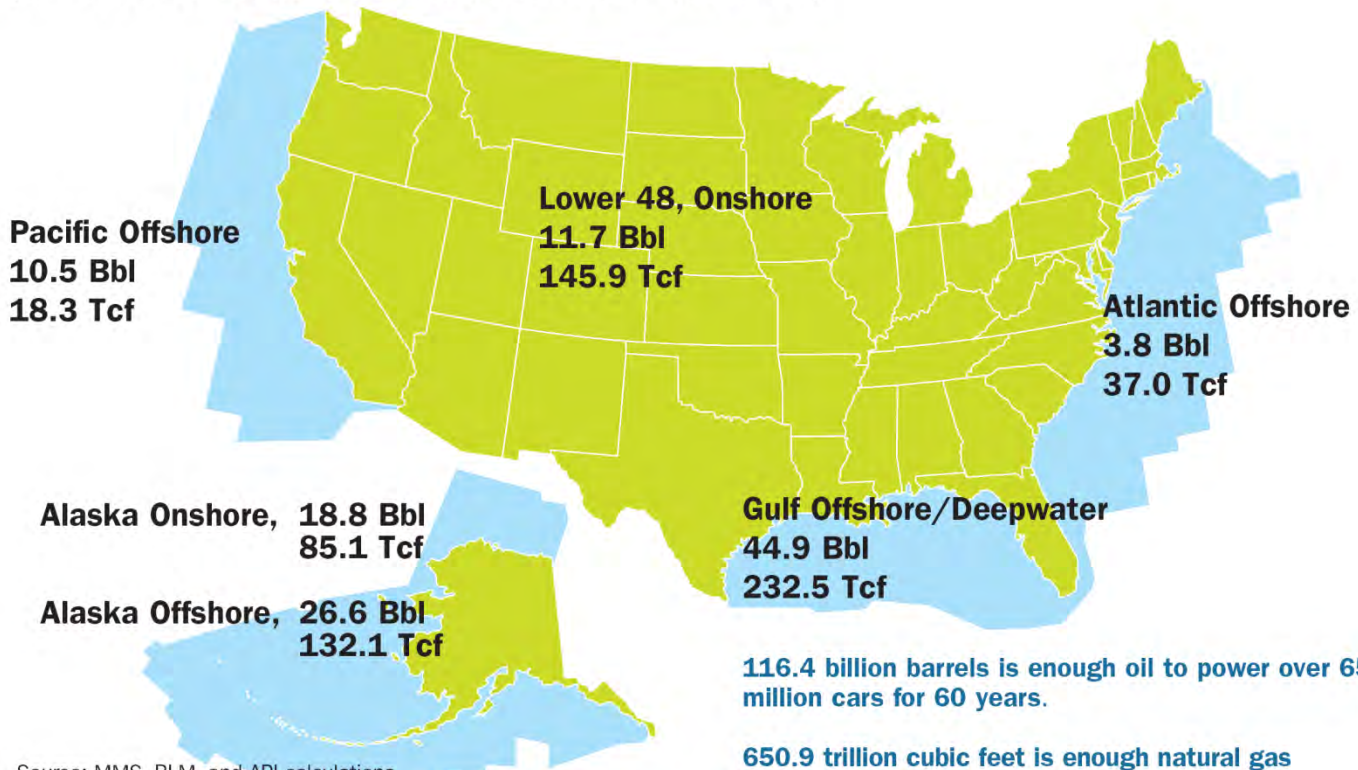


¹As of 2030, assuming development of currently off limits California OCS resources

Access to domestic energy resources

U.S. Crude Oil (Bbl) and Natural Gas (Tcf) Resources

(Undiscovered Technically Recoverable Federal Resources)*



Source: MMS, BLM, and API calculations

*Figures may not add exactly to total due to rounding.

Access to domestic energy resources - technology reduces footprint, improves safety

**Minerals Management Service
Pacific OCS Region**

Message from the Regional Director

Energy security is on the minds of many Americans. Lately, it seems not a day goes by that we aren't reminded of the far-reaching impact energy has in our daily lives and on our economy. Through close consultation and coordination with West Coast States, other government agencies, and key stakeholders, the MMS Pacific OCS Region is working to seek possible solutions to our Nation's complex energy situation.

To date, the MMS Pacific OCS Region continues to diligently pursue its mission of effectively and responsibly managing America's offshore energy resources on the Pacific OCS. Led by a vision based on collaboration, the Pacific OCS Region carries out its day-to-day operations through a diverse and well-trained staff dedicated to working closely with State and local governments, ocean-users and other key stakeholders. Through these working relationships, the Pacific OCS Region obtains a greater appreciation of regional and local issues; this, in turn, provides the agency with insight to better understand and respond to issues of concern while pursuing the Region's core principles of **safety, science and sustainability**.

Safety
The Region is committed to ensuring clean and safe energy and mineral operations on the OCS, and protecting coastal and marine environments potentially affected by the activities we regulate. This commitment is demonstrated by our impressive spill record. Since 1970, a total of only 850 barrels of oil have been lost into the marine environment from Pacific OCS operations. This is less than the amount of oil seeping naturally into the ocean from cracks in the seafloor during any given week offshore California.

Our inspectors are offshore 365 days a year, inspecting the 23 OCS platforms for compliance with MMS regulations and various other conditions of operation. Additionally, the Region's inspection protocol includes engineers and environmental scientists, many of whom participate in systemic reviews of the facilities as well as in ongoing and regular inspections. The Region continues to improve its regulations and enforcement procedures to further ensure clean and safe management of OCS resources.

Science
Scientific research and advancement are essential to the success of the Region. From an operational perspective, technological improvements within the energy industry have the potential to increase access to resources while reducing associated adverse environmental impacts. Moreover, since 1973, the MMS **Regional Environmental Studies Program** has cumulatively funded 189 studies addressing Pacific OCS issues at a value of almost \$124 million. In many cases, these studies represent pioneering research for the entire California coastline. The scientific information obtained from these studies assists the Region in assessing the impacts of OCS operations on the marine and coastal ecology along California. Information from existing and future studies will become invaluable in understanding the effects of alternative energy development on the OCS.

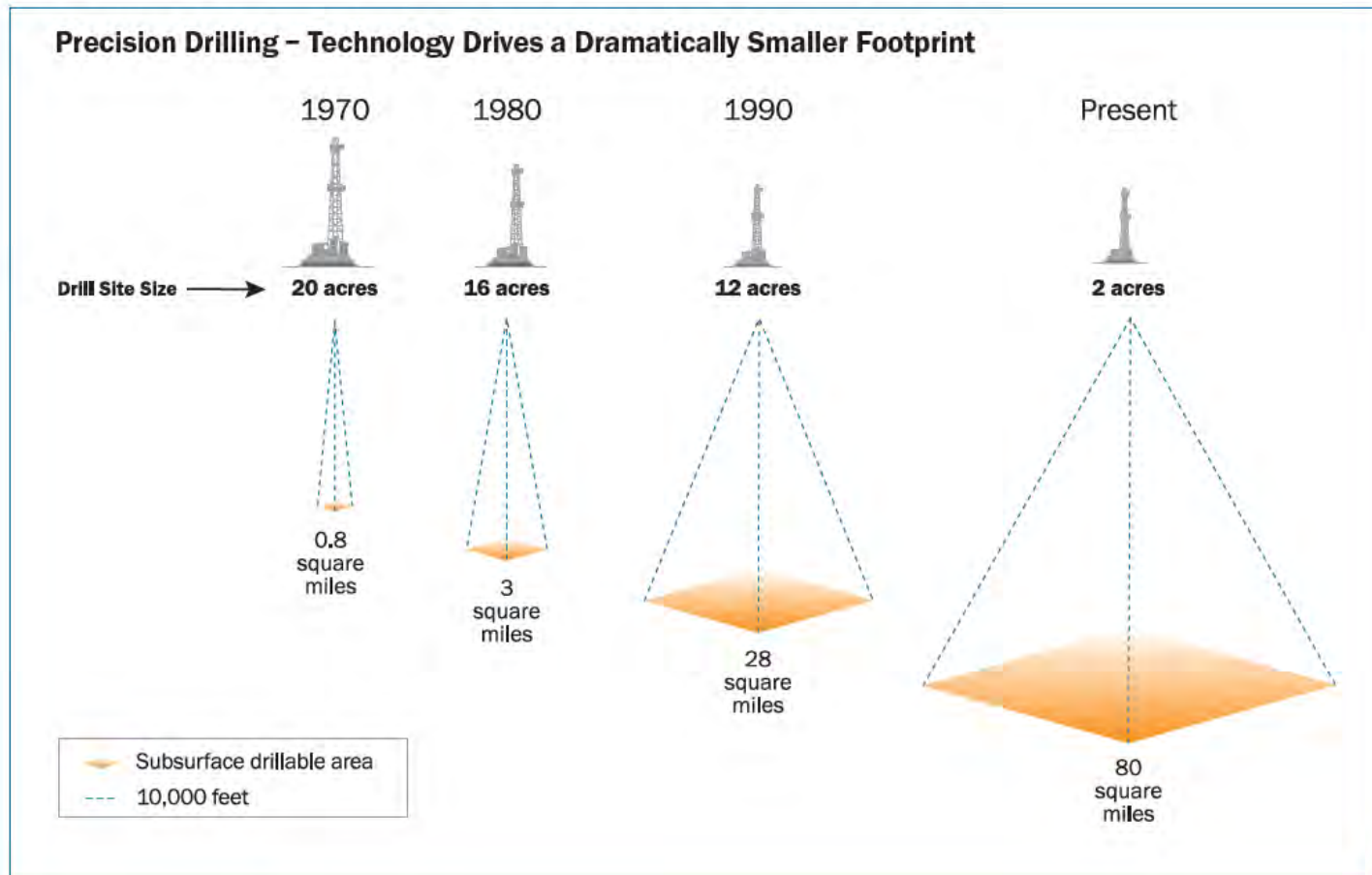
“Since 1970, a total of only 850 barrels of oil have been lost into the marine environment from Pacific OCS operations. This is less than the amount of oil seeping naturally into the ocean from cracks in the seafloor during any given week offshore California.”

Technology reduces footprint, improves safety

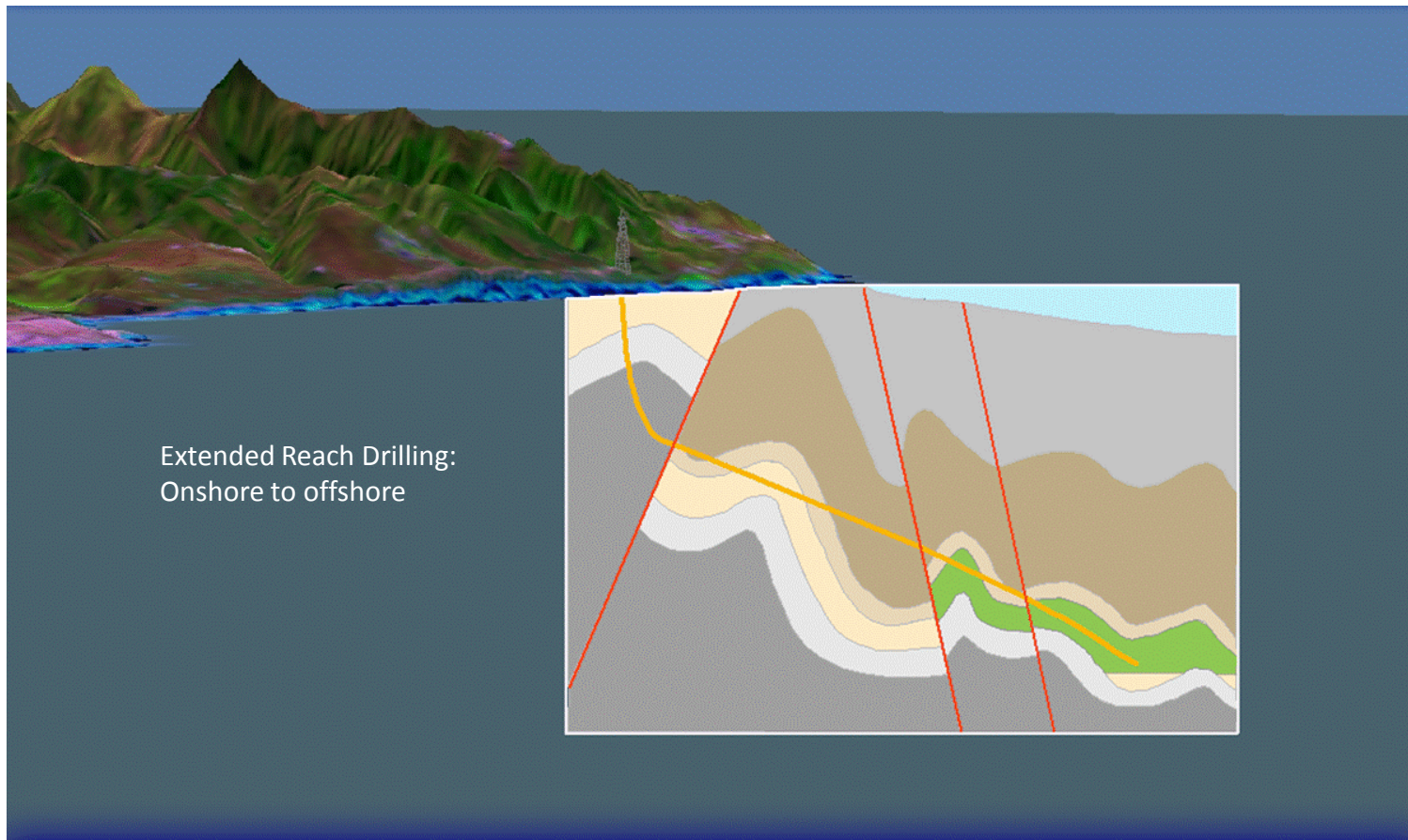
- Since 1970, over 1 billion barrels of oil have been produced off California, according to the U.S. Minerals Management Service.
- During that time, only 850 barrels of oil have been accidentally released into the marine environment.
- About 55,000 barrels of crude oil are introduced from natural seeps each year into the ocean off Santa Barbara.



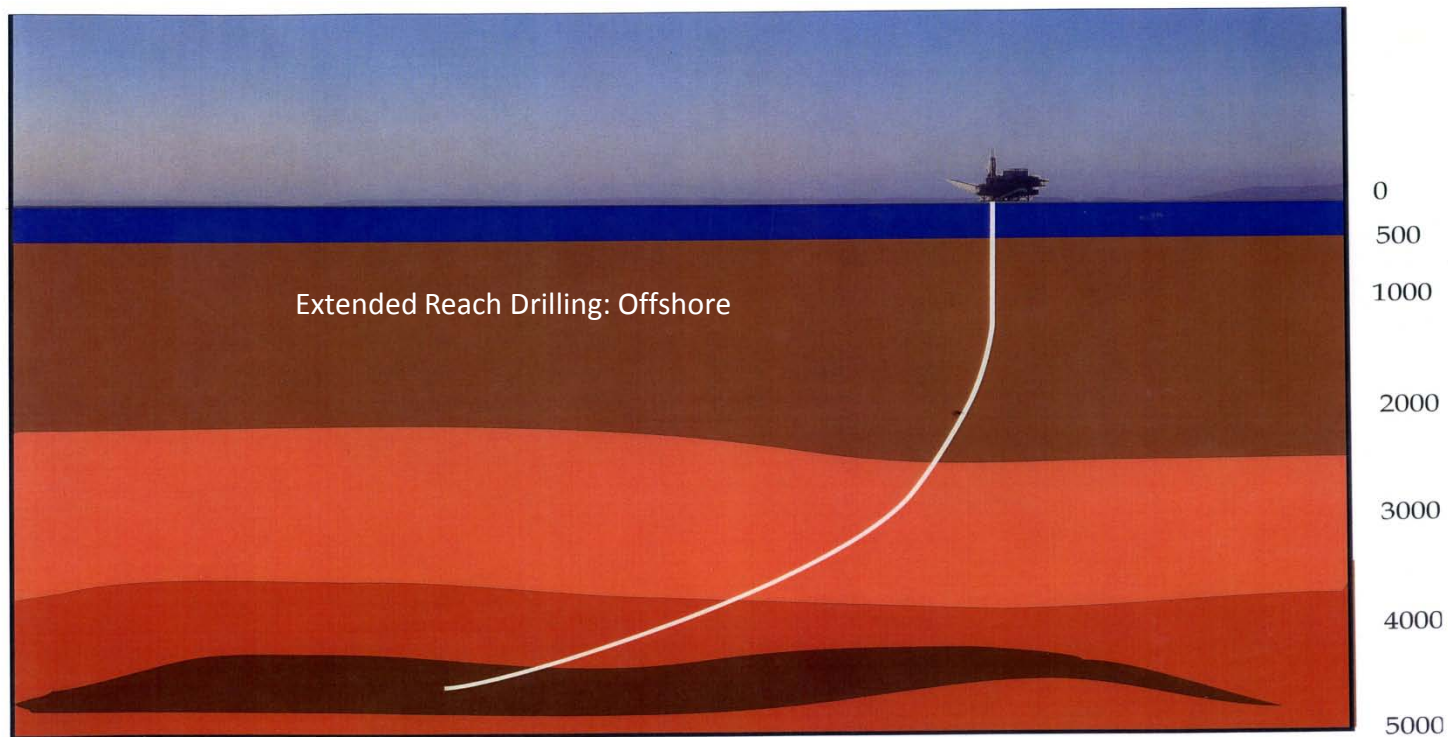
Technology reduces footprint, improves safety



Technology reduces footprint, improves safety



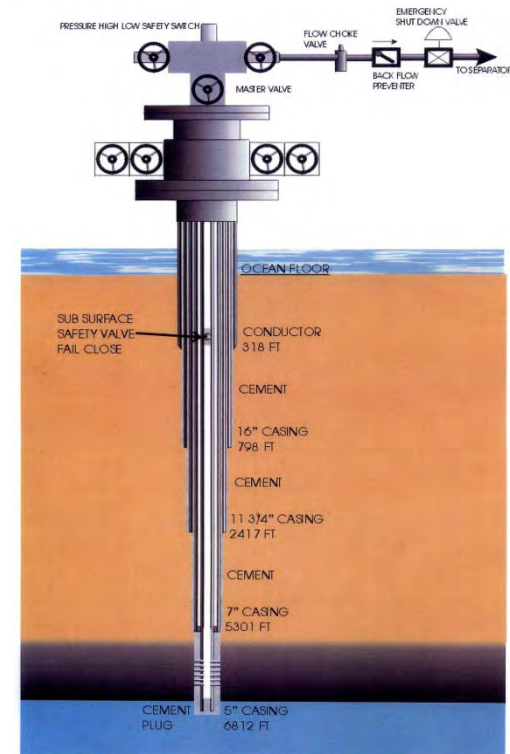
Technology reduces footprint, improves safety



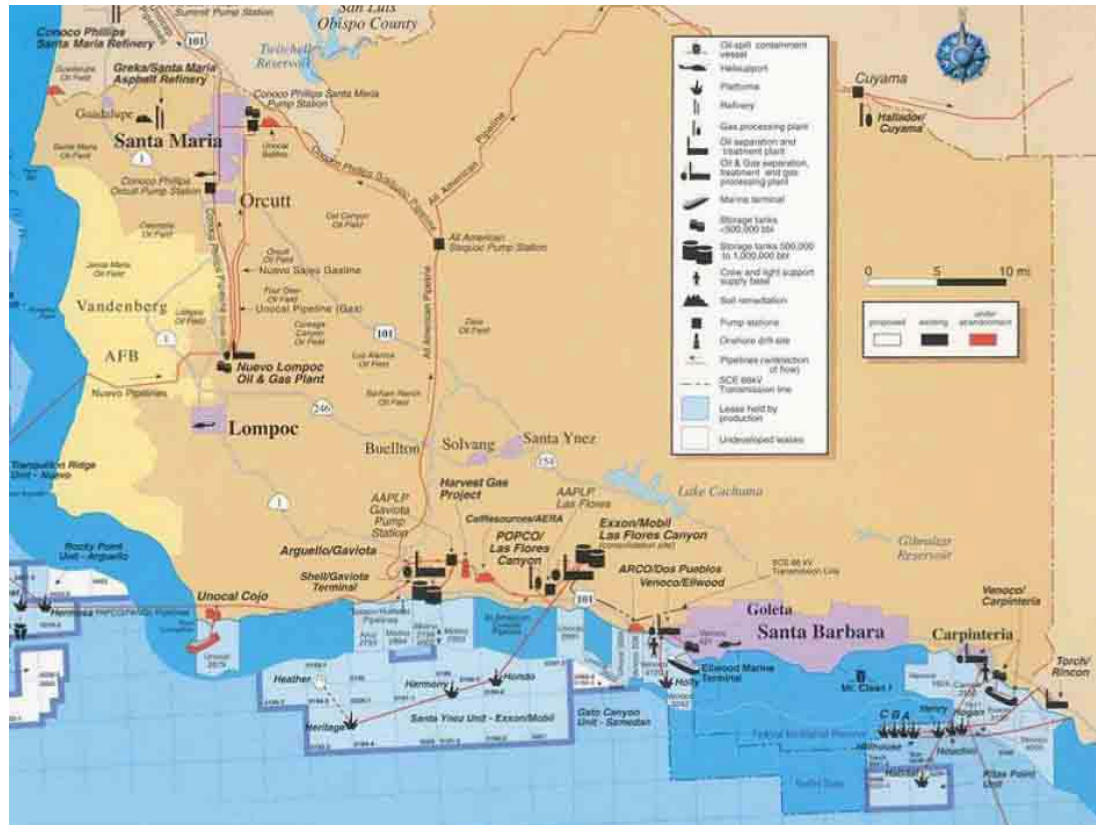
Technology reduces footprint, improves safety

Oil industry is constantly developing sophisticated safety processes and equipment, such as:

- Measurement-while-drilling technology
- Global positioning systems
- High resolution inspection and monitoring devices
- Remotely-operated underwater vehicles
- 3-D and 4-D Seismic Technology

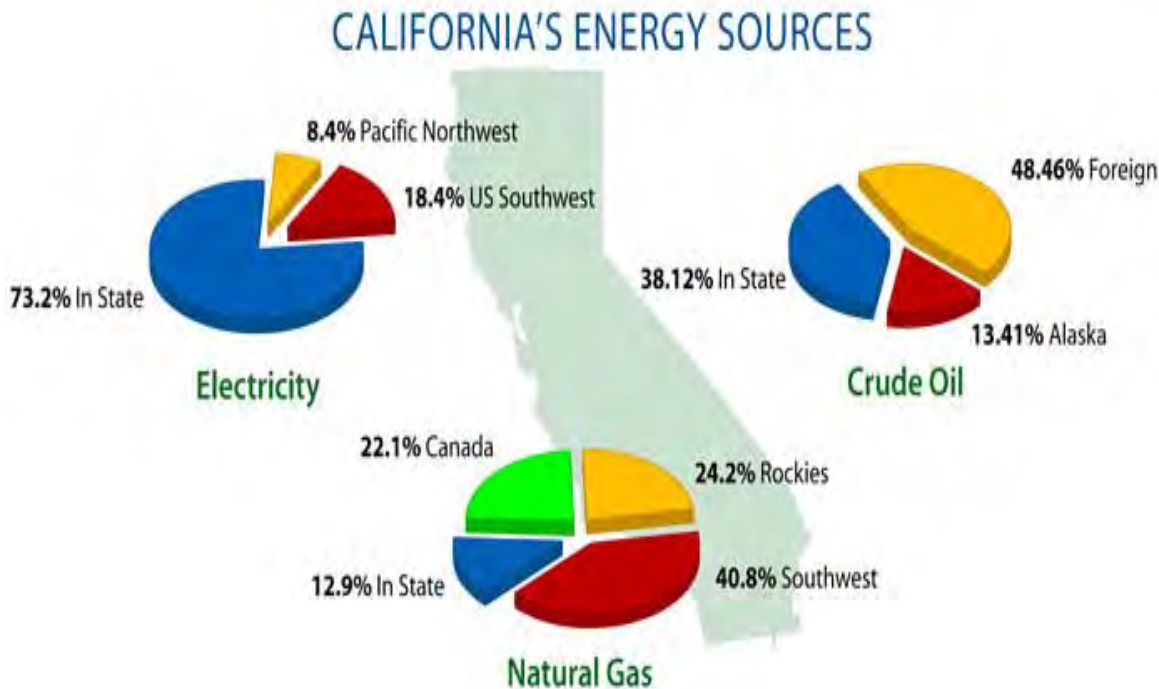


Infrastructure in place to support offshore resources



Santa Barbara County oil and gas facilities

California Energy Sources



Crude Oil (2008)

- In-State 38.1%
- Alaska 13.41%
- Foreign 48.5%

Electricity (2008)

- In-State 73.2%
- Natural Gas 46.5%
- Nuclear 14.9%
- Large Hydro 9.6%
- Coal* 15.5%
- Renewable 13.5%
- Imports 26.8%
- PNW 8.4%
- USSW 18.4%

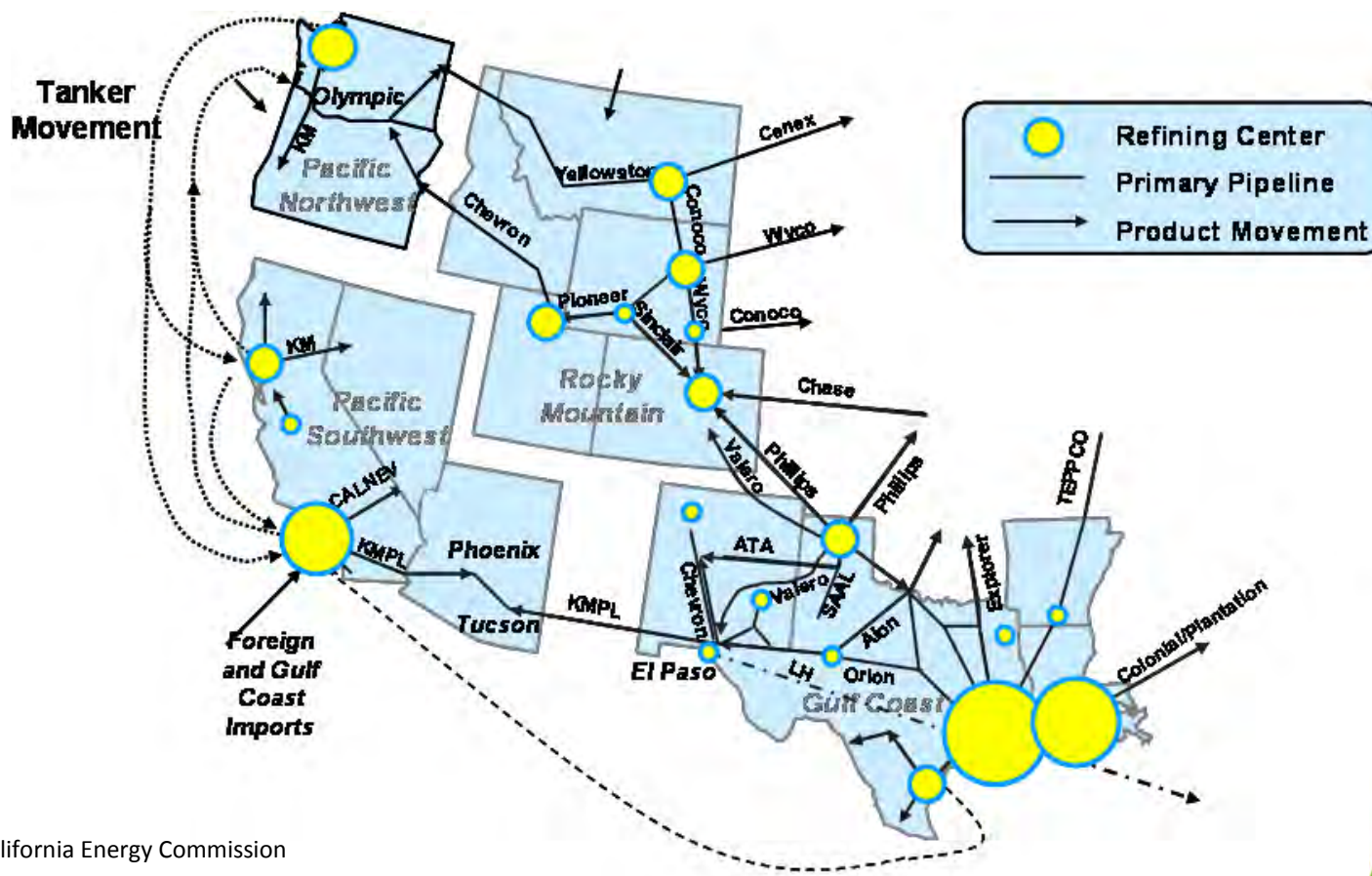
Natural Gas (2007)

- In-State 12.9%
- Canada 22.1%
- Rockies 24.2%
- Southwest 40.8%

* Intermountain and other California utility-owned coal plants, though outside California, are considered "in-state," since they are in California utilities' control areas.

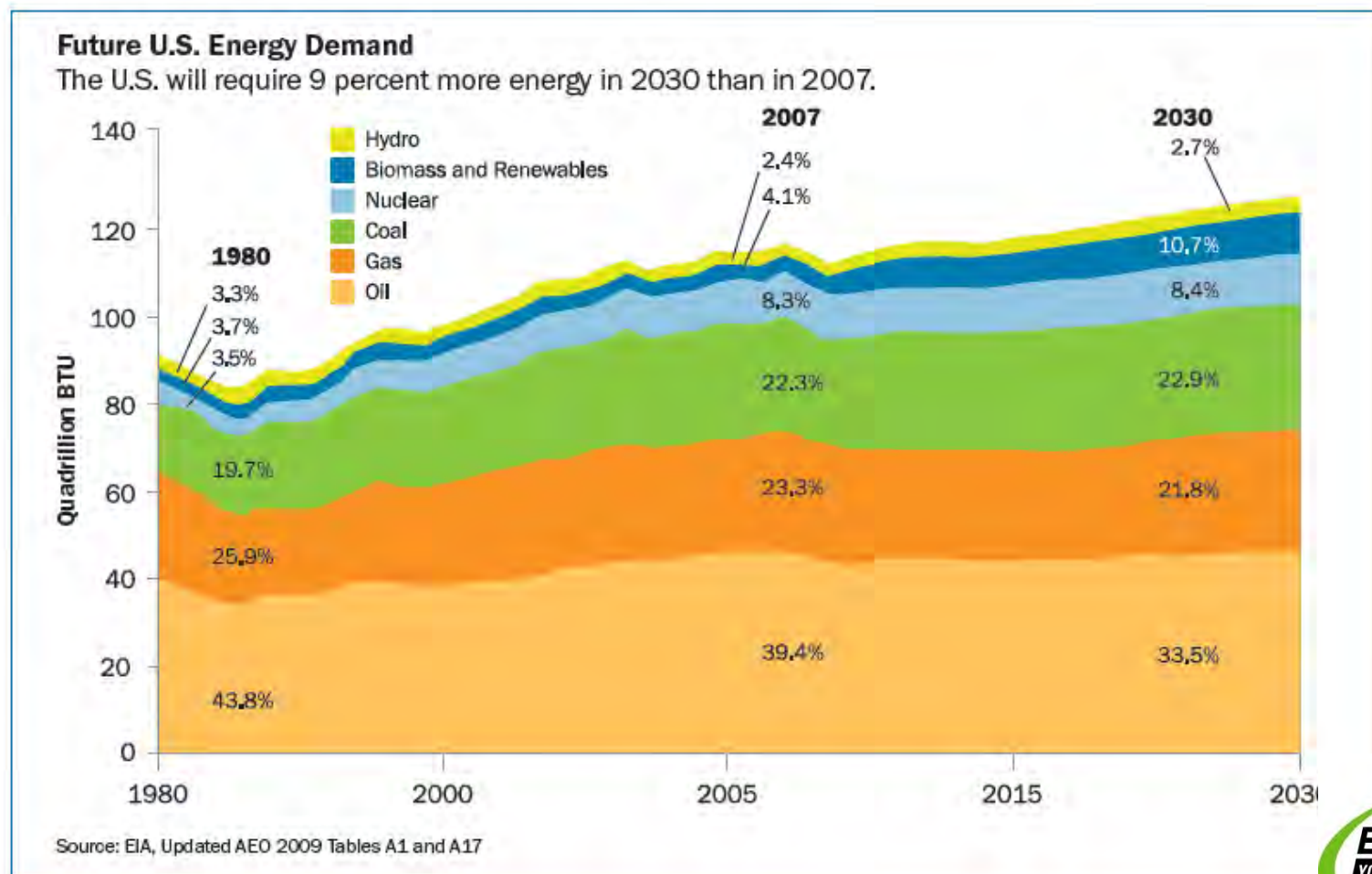
Western States Petroleum Association

California is an energy island



Source: California Energy Commission

Putting future energy into perspective



The future will require multiple sources/strategies

- Despite drop in demand, the U.S. needs to improve energy security by better utilizing domestic energy supplies
- We can develop U.S. energy safely and with environmental sensitivity
- We must:
 - ✓ Add domestic supplies through greater access
 - ✓ Conserve energy
 - ✓ Use energy more efficiently
 - ✓ Develop alternative and renewable fuels and technologies



Offshore State Resource Proposals & Potential

Jeff Planck
Senior Engineer, CSLC

Potential State Resources

- There are at least 8 proven and undeveloped oil and gas fields in the offshore basins of Southern California
- The total reserve potential of the undeveloped fields and prospects in State waters may range from 500 million to 1.2 billion barrels of oil
- Other “unproven” fields could increase this estimate by 50-100%

Potential State Resources



Potential State Resource Areas

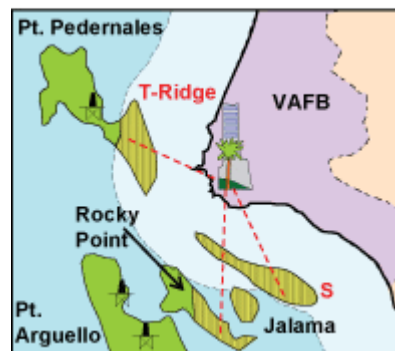
- At least 6 of the 8 undeveloped fields can be reached from available onshore drill sites to develop reserves within State waters off the Santa Barbara and Ventura coast:
 - Tranquillon Ridge (VAFB): 90-200 Million barrels of oil
 - COJO (Gov. Pt.): 110-210 Million barrels of oil
 - Manatee (Gaviota): 100 Million barrels of oil
 - Paredon (Carpinteria): 30 Million barrels of oil
 - West Montalvo (McGrath): 40-90 Million barrels of oil
 - Santa Monica Bay (LA County): 50+ Million barrels of oil

Santa Maria Basin

("North County" Santa Barbara)



- State Resource Areas
 - Tranquillon Ridge (90-200)
 - Sudden Area (Unkown)
- State-OCS Resource Areas
 - Rocky Point (34 MBO)
- All reachable from onshore or federal offshore platforms
- New leases required

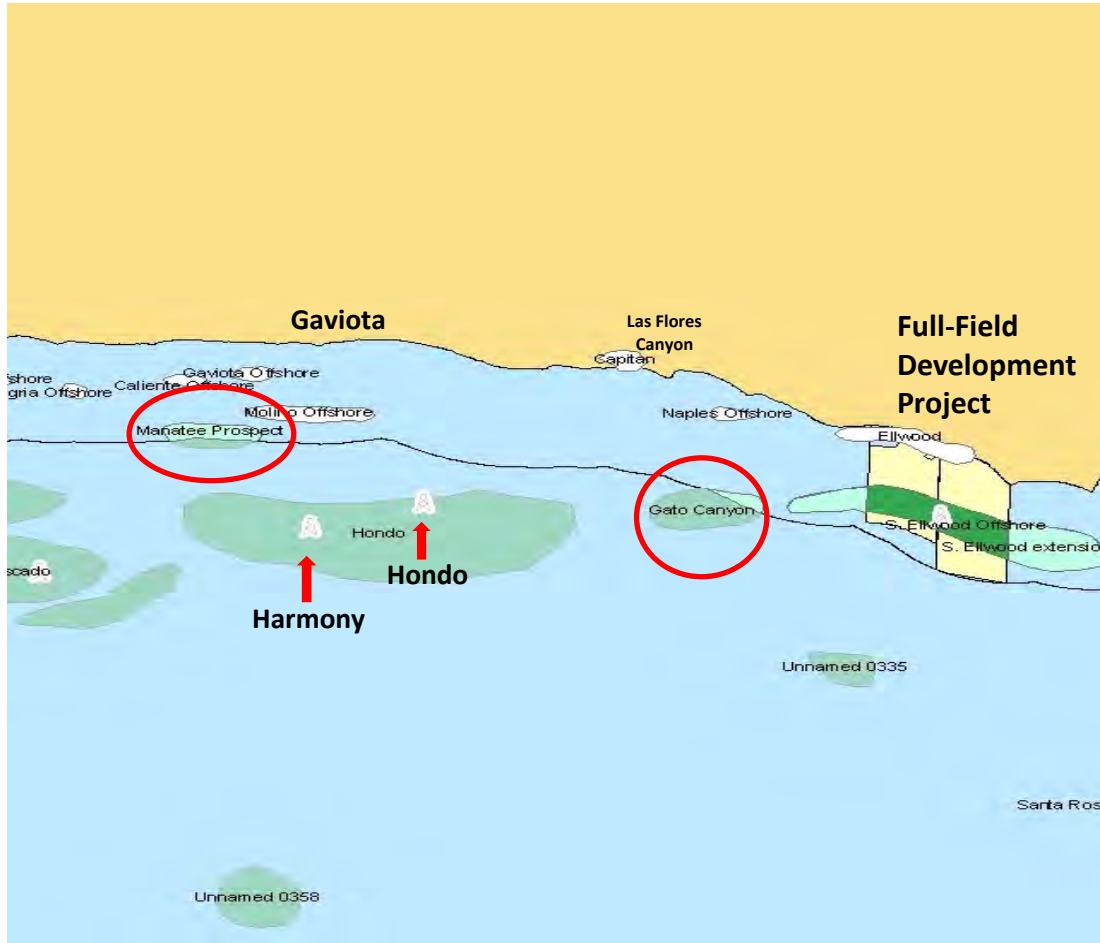


North Santa Barbara County



- COJO
 - Onshore Site Available at Government Point (previous site of Federal drilling and production)
 - 110 - 200 MBO
 - New lease required

South Santa Barbara County



- State Resource Areas
 - Manatee
 - Platform Harmony or onshore
 - 100 MBO
 - New Lease required
 - Gato Canyon
 - No current access
 - 20 MBO
 - New Lease required
 - South Elwood Field
 - Platform Holly
 - 200 MBO
 - Currently leased but requires a boundary extension

Carpinteria Area and Ventura County



- **Carpinteria Area Projects**

- Paredon
 - Onshore site
 - 30 MBO
 - Current lease
- Carpinteria Offshore
 - Platform Hogan
 - 20 MBO
 - Current leases
- Ventura
 - Montalvo (40-90 MBO) – currently leased
 - West Montalvo (gas) – would require lease boundary extension

State Prospects and Projects

Field	Offshore Platform available	Onshore Site available	Fed. Drainage Occurring	Published Potential (in Million bbls of oil)
T-Ridge	✓ (Irene)	✓ (VAFB)	✓	90-200
Rocky Pt	✓ (Harvest, et al)	✓ (VAFB)	✓	34
Sudden	✓ (Harvest, et al)	✓ (VAFB)	?	Unknown
COJO	No	✓ (Gov. Pt.)	No	110-210
Manatee	✓ (Hondo-Heritage)	✓ (Gaviota)	?	100
Gato Canyon	(Future / Subsea)	? (Las Flores Cyn?)	No	20 - 30
South Elwood	✓ (Holly)	No	No	200 MBO (incr. 10KB/D)
Paredon	No	✓ (Paredon)	No	30
Carpinteria	✓ (Hogan)		✓	20
Montalvo	✓ (?)	✓	No	40-90

In Sanctuary – would require new leases

Currently Leased

Staff Evaluation Methodology

Greg Scott, CSLC

Chief, Mineral Resources
Management Division

Staff Evaluation of Development Applications

- Consistent with CSLC Mission Statement
- Development projects are reviewed by CSLC staff and evaluated on a case by case basis
- Extensive environmental and engineering review to ensure that the highest standards of public safety and environmental protection are met
- Ensure state resources are protected from inefficient development activities or unauthorized drainage
- Development plans must conform to requirements of affected state, federal, and local jurisdictions

Policy Considerations

Paul Thayer

Executive Officer, CSLC