WESTCARB Regional Partnership

Hydrocarbon Pool Sizes in the Bunker, Millar, and Conway Ranch Gas Fields - Southern Sacramento Basin, California.

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Lodi, CA
October 26, 2011

California Stationary Source CO_2 Emissions*

Facility Type and Number	Annual CO_2 Production (Mt)**	Average Annual CO_2 Production (Mt)**
Power Plants (18)	36.5	2.0
Cement Plants (6)	6	1.0
Refineries (7)	11.3	1.6
Total (31)	53.8	1.7

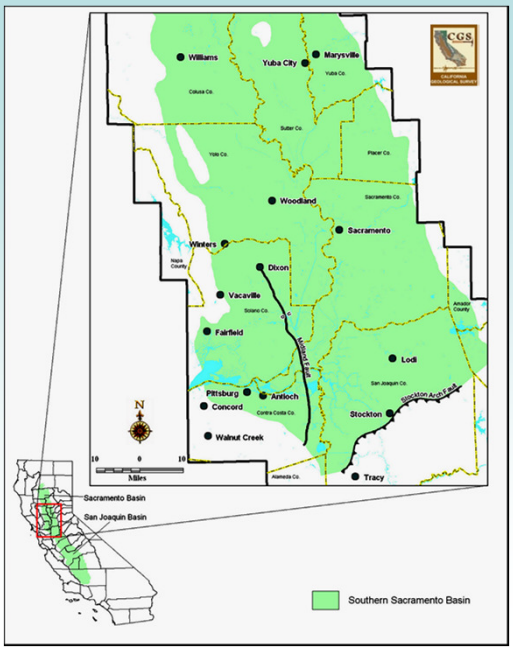
* Data from Herzog, 2005 **Mt = million metric tons

Field Selection

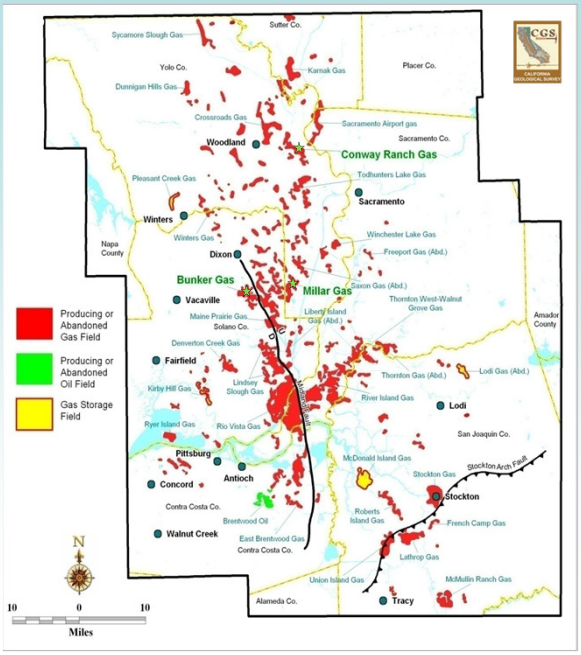
The goal of the study was to characterize typical pool sizes in the Southern Sacramento Basin (SSB).

- It was not intended to identify specific fields or pools for sequestration
- No attempt was made to identify fields with largest pools or the pools with the greatest sequestration potential.
- The selected fields are thought to be geologically representative of the fields in the SSB.
- Selected fields – Bunker, Millar, and Conway Ranch gas fields

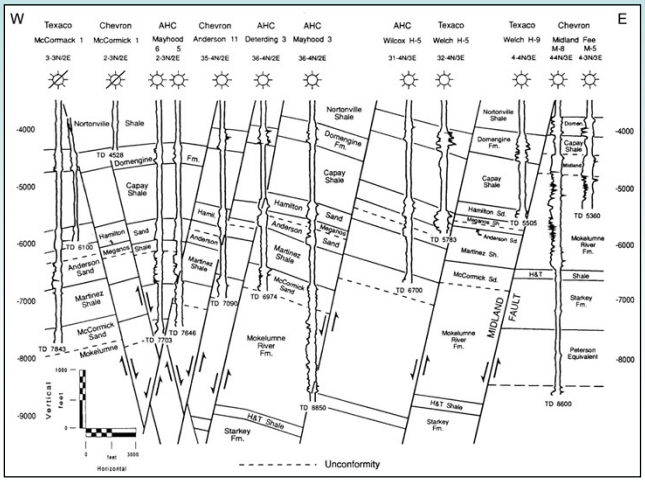
Southern Sacramento Basin Study Area



Oil and Gas Fields in the Southern Sacramento Basin



Generalized Cross-Section of the Rio Vista Gas Field

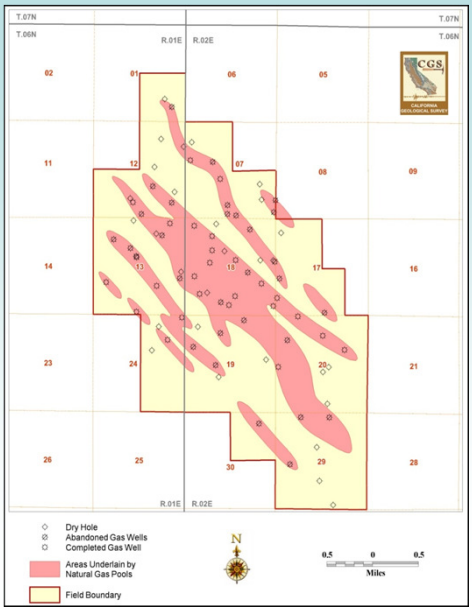


After Pepper & Johnson, 1992

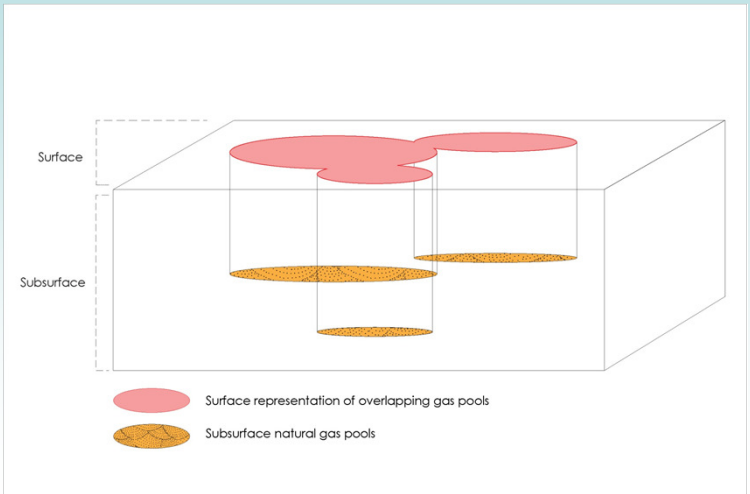
General Field Information

Field	Bunker	Millar	Conway Ranch
Approximate Area (miles^2)	8	42	13
Production	191 BCFG 831 MBO	160 BCFG	38 BCFG
Producing Wells	58	146	56
Pools	44	178	91
Completions	98	269	157

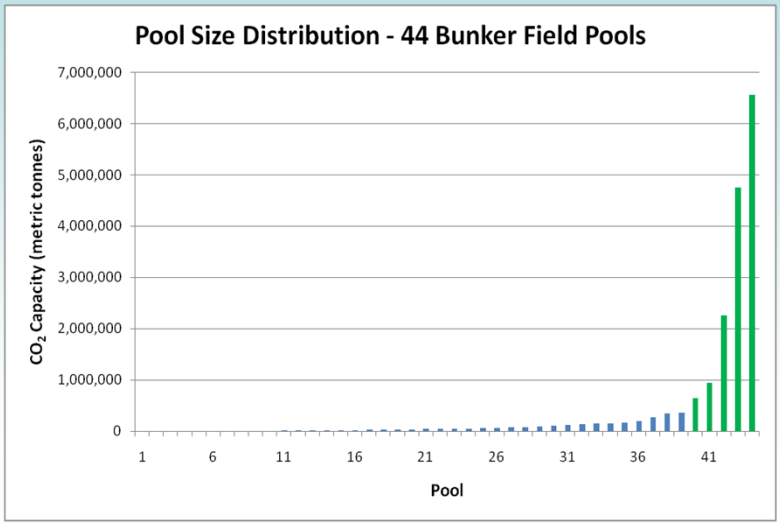
Bunker Gas Field Areas Underlain by Natural Gas Pools



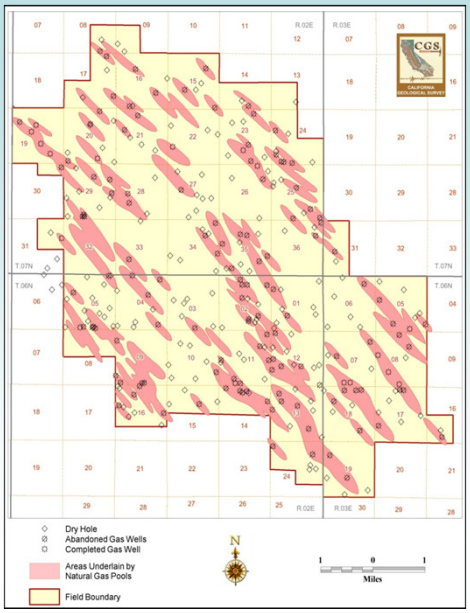
Gas Pools in the Subsurface



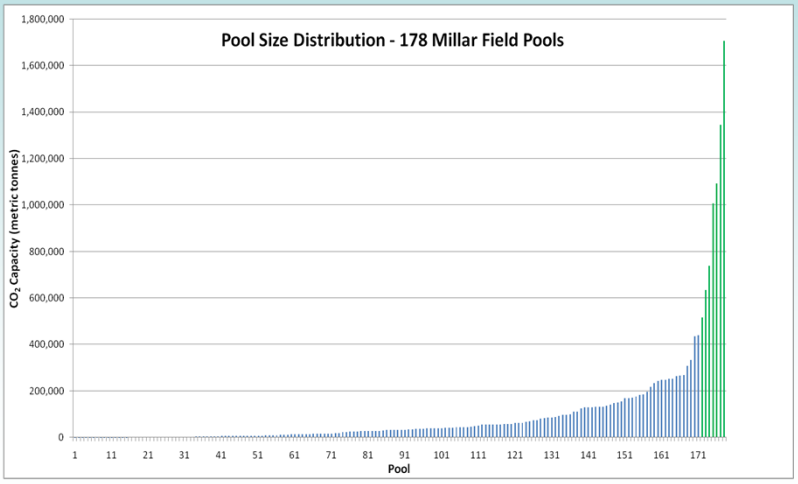
Bunker Gas Field



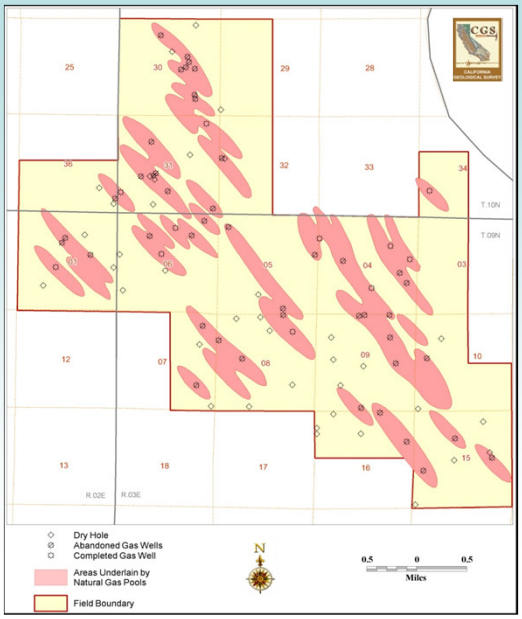
Millar Gas Field Areas Underlain by Natural Gas Pools



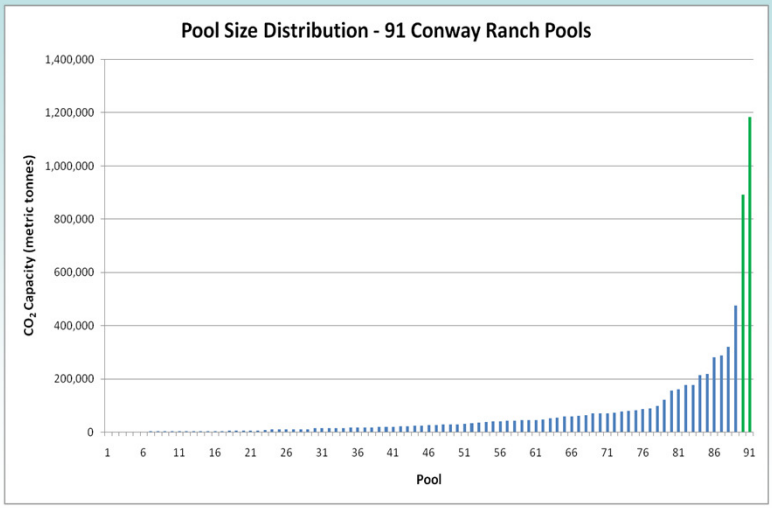
Millar Gas Field



Conway Ranch Gas Field Areas Underlain by Natural Gas Pools



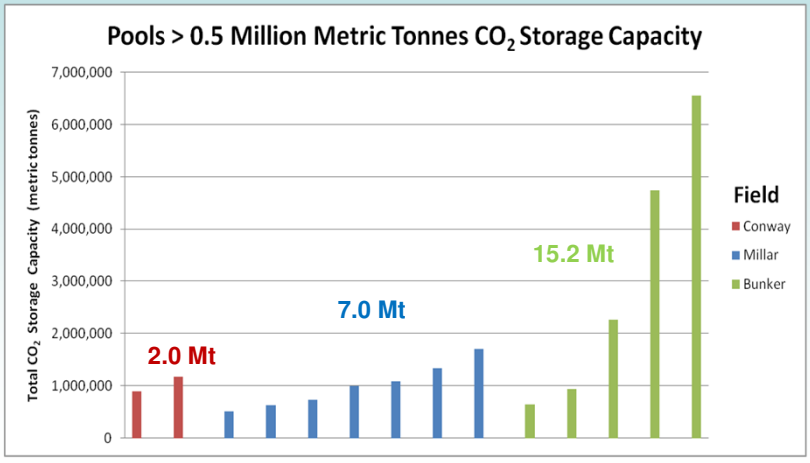
Conway Ranch Gas Field



CO_2 Storage Resource Estimates (Mt)

Field	Bunker	Millar	Conway Ranch
Number of Pools	44	178	91
CO_2 Capacity (Total)	17.9	17.7	6.8
Smallest Pool	0.0004	0.0001	0.00007
Median Pool	0.05	0.03	0.03
Average Pool	0.4	0.1	0.07
Largest Pool	6.5	1.7	1.2

Largest Pools



Summary and Conclusions

- Individual pool capacities are typically much less than annual power plant CO_2 emissions.
- Field storage capacity utilizing multiple pools is significantly less than lifetime power plant CO_2 emissions.
- Other fields in similar geologic settings could have similar compartmentalized reservoir capacity.
- Historic hydrocarbon production may not accurately reflect available CO_2 storage capacity.

Summary and Conclusions

- Other larger gas fields in the SSB may offer better CO_2 storage opportunities.
- Additional CO_2 storage capacity likely exists in saline aquifers in and adjacent to the gas fields.
- Detailed studies to assess pool size distribution will be required to properly evaluate the suitability of particular depleted or abandoned gas fields in the SSB for CO_2 storage.

Department of Conservation
California Geological Survey

http://www.conservation.ca.gov/CGS/