

Active Oil Field Regulatory Program Update: Aquifer Exemption Process


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Central Coast Regional Water Quality Control Board

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Presentation Overview

- Underground Injection Control (UIC) Program
- Aquifer Exemption Applications
 - Criteria
 - Process & Agency Roles
 - Central Coast Overview
 - Challenges
- Summary



Not going to discuss specific projects or applications.

Underground Injection Control (UIC) Program

- Federal Safe Drinking Water Act (SDWA)
- DOGGR is lead agency for permitting Class II wells
- Recent audit and legislative mandate
 - Water Board technical advisory role
 - Review aquifer exemption applications
 - Evaluate compliance with state/federal criteria
 - Concurrence required for EPA review
- Bring the program back into compliance
- Injection project level reviews



Injection Project Permitting

- Well permit process
- Injection projects require:
 1. EPA approved aquifer exemption, or
 2. Determination that the injection zone is not an underground source of drinking water (USDW)



Not an USDW if TDS >10,000 mg/L

Aquifer Exemption Criteria

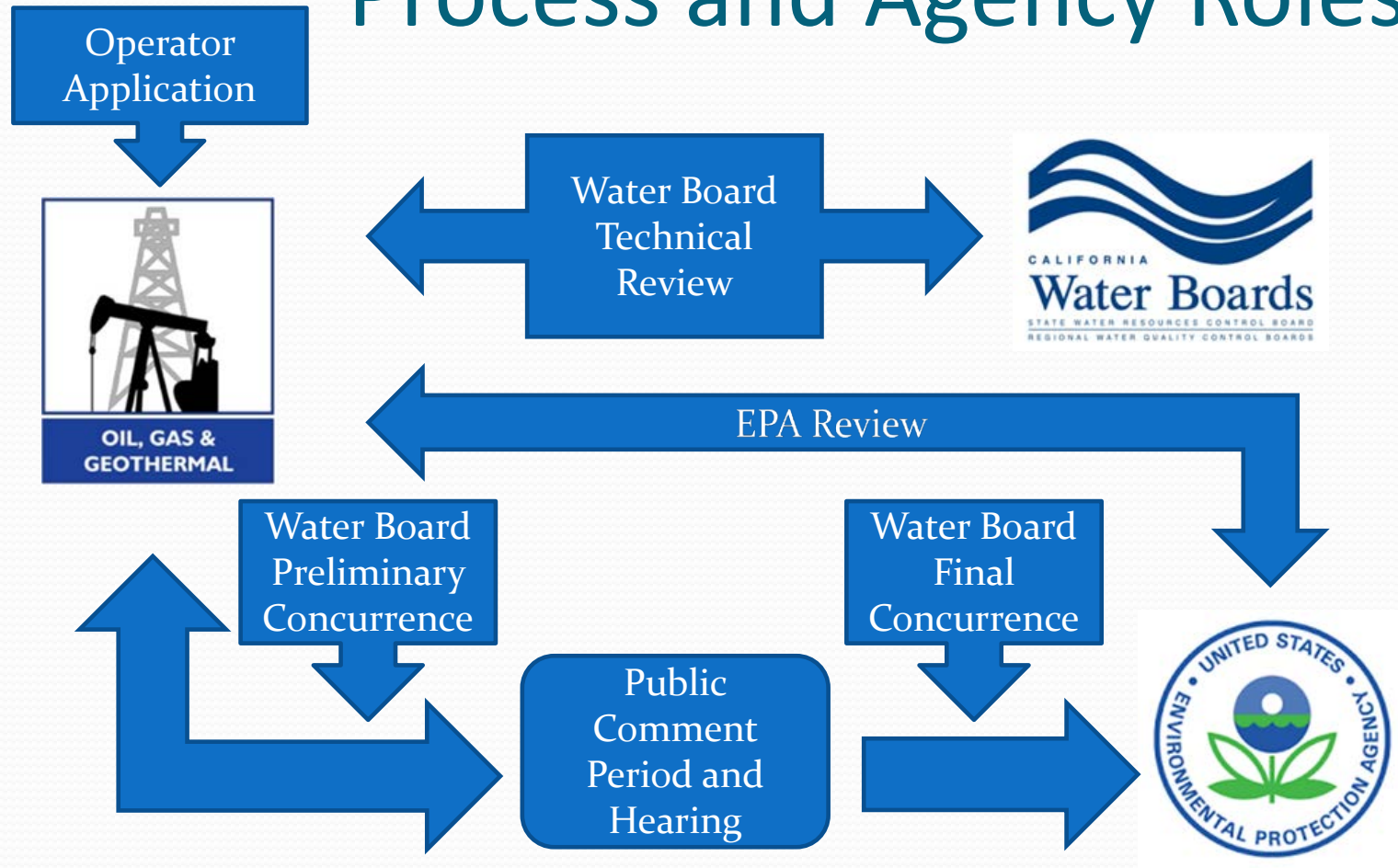
- Federal Safe Drinking Water Act UIC Program
 - 40 CFR 146.4
 - Protect underground sources of drinking water (USDW)
 - **public water system focus**
- CA Public Resources Code section 3131
 - Containment of injected fluids
 - Protect all beneficial uses of groundwater
 - Public process and reporting to legislature
- Guidance documents and checklists

AE Criteria - Simplified

- Aquifer is not a current source of drinking water,
- Aquifer is unlikely to be a future source of drinking water,
- Injected fluids must not impact current or potential future beneficial uses (not just drinking water!), and
- Injected fluids must remain in the exempted area.



Process and Agency Roles



Central Coast Actions

- Aquifer exemption application review
- Underground Injection Control (UIC) well reviews
 - Issued twelve 13267 Orders (47 disposal wells)
 - 39 wells subject to pending aquifer exemptions
 - 3 wells within exempted aquifers
 - 5 wells within non-USDW areas (>10,000 mg/L TDS?)
- non-USDW area UIC well reviews
- Pending UIC project reviews

AE Application Process Status

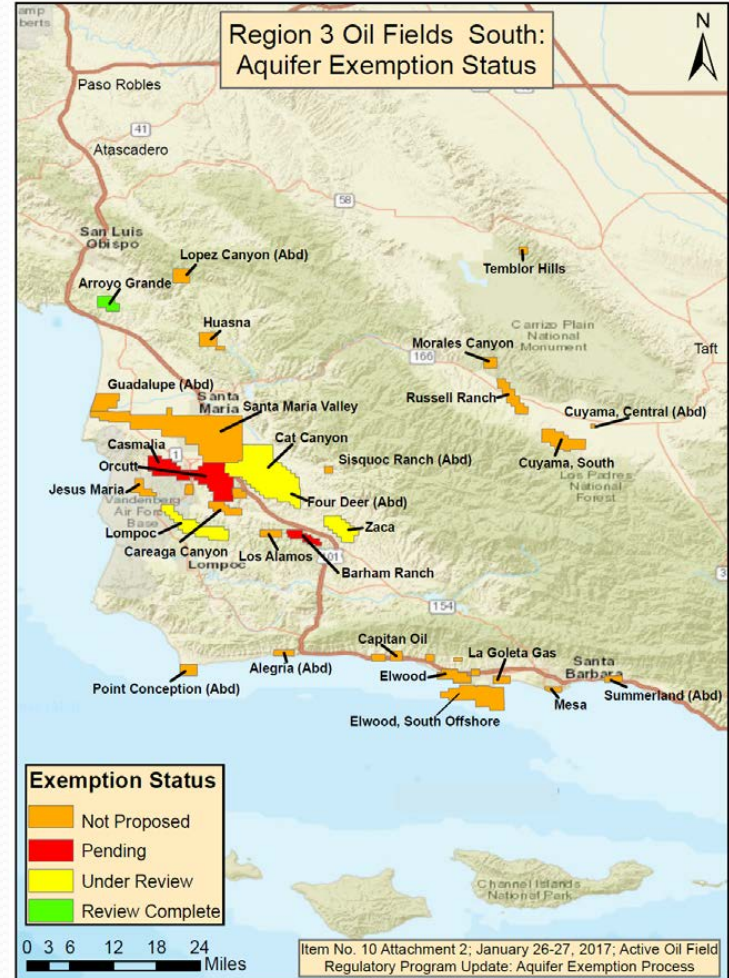
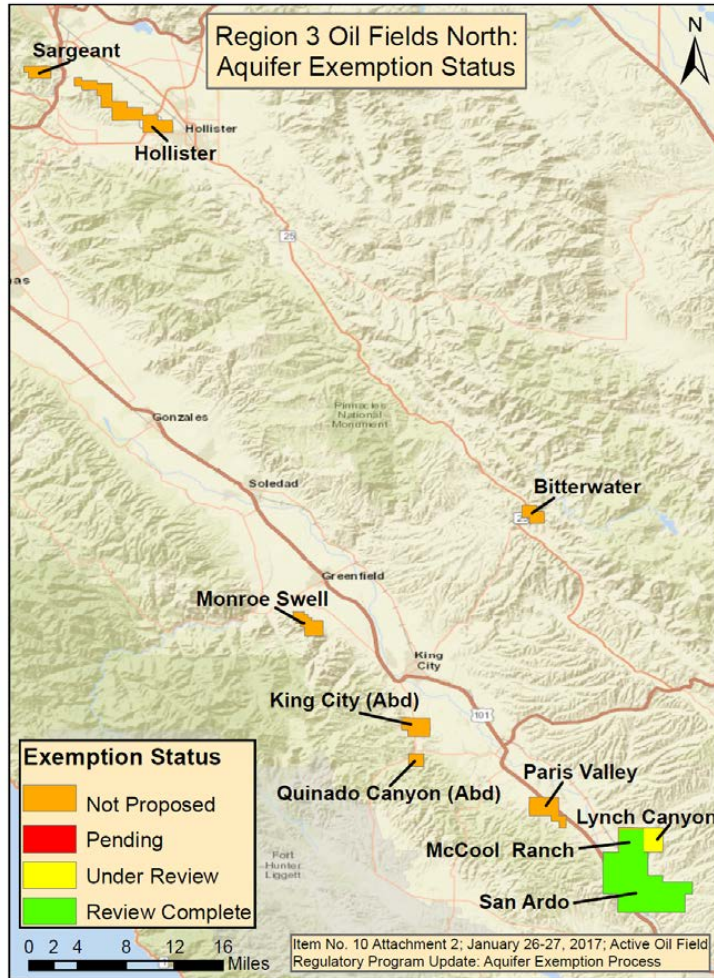
Aquifer Exemption Applications	Statewide	Central Coast
Anticipated	42	11
Received	29	8
“Denied” at Water Board review level	0*	0*
Preliminary Concurrence	7	2 (w/ 1 pending)
Public Hearing	6	1 (w/ 1 pending)
Submitted to EPA	4	1
Approved by EPA	0	0

* Several applications may result in preliminary concurrence for only a portion of the requested exemption area or limit the type of injection in certain areas.

Staff Report Table Corrections

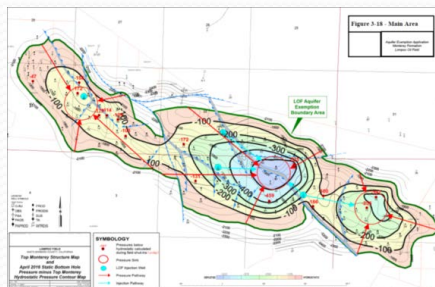
Central Coast Region Aquifer Exemption Application Status

Oil Field	Formation ¹	Application Received	Review ²	Preliminary Concurrence Letter Issued	Public Hearing	Submitted to EPA
Arroyo Grande	Pismo (Edna Member)	7/27/2015	complete ³	8/9/2015	complete	2/8/2016
Cat Canyon	<u>Sisquoc</u>	7/27/2016	ongoing ³	-	-	-
San Ardo & McCool Ranch	Lombardi & Aurignac Sands	8/15/2016	complete ³	12/5/ 2015 2016	2/9/ 2016 2017 (tentative)	pending
Lynch Canyon	<u>Lanigan Sand</u>	8/16/2016	ongoing ³	-pending	-	-
Lynch Canyon	Santa Margarita	8/30/2016	ongoing ³	-	-	-
<u>Zaca</u>	Monterey	10/28/2016	ongoing ³	-	-	-
Lompoc (NW & main area)	Monterey	12/15/2016	ongoing	-	-	-
<u>Casmalia</u>	Monterey	12/22/2016	ongoing	-	-	-
<u>Orcutt</u>	-	pending	-	-	-	-
Cat Canyon, Gato Ridge	-	pending	-	-	-	-
Barham Ranch	-	pending	-	-	-	-



Aquifer Exemption Applications

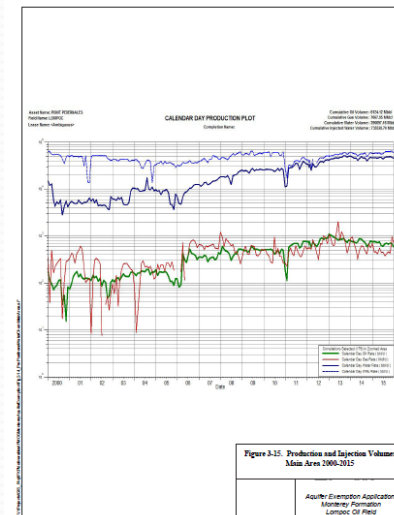
- Complex technical documents
 - Well surveys
 - Water quality data (total dissolved solids)
 - Geologic and hydrologic data
 - Hydrocarbon production data
 - Drinking water feasibility evaluations
- Review of other available data!



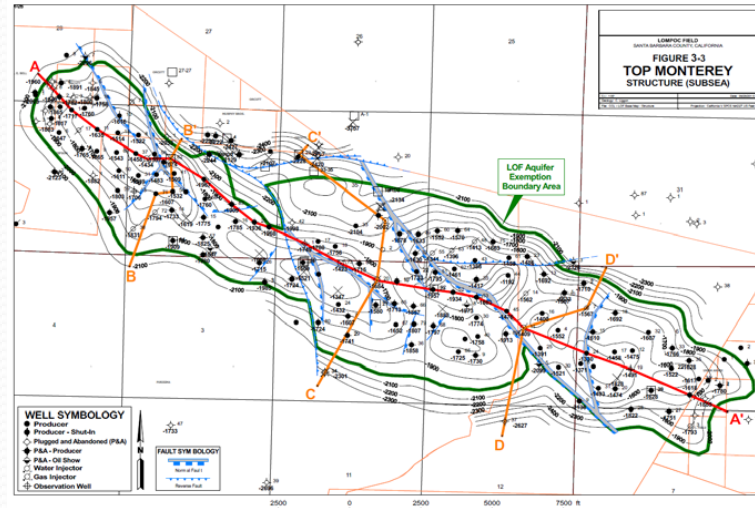
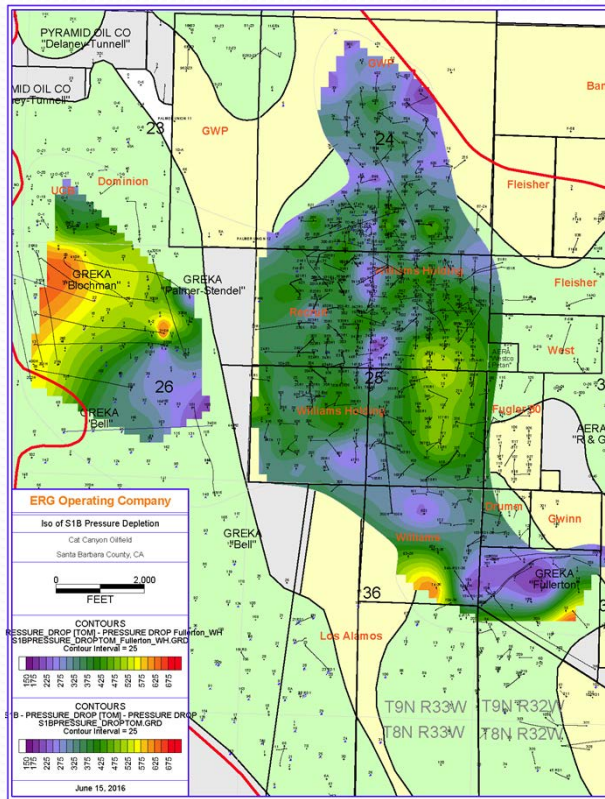
**AQUIFER EXEMPTION APPLICATION FOR THE MONTEREY FORMATION
LONDPOC OIL FIELD, SANTA BARBARA COUNTY, CALIFORNIA**

**TABLE 3-4
PRESSURE DATA AND CALCULATIONS**

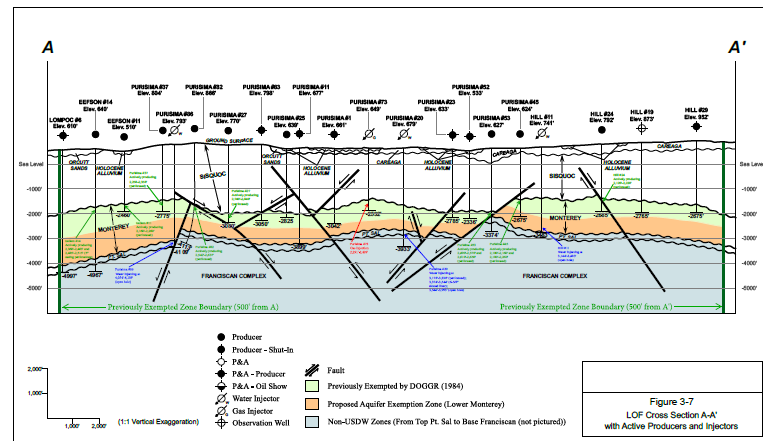
Well Information			BSP Depth Information		Pressure Calculations					
Well Name	Static Depth TVD	Well Depth MD	Well Depth TVD	Date of Measurement	Calculated BSP Pressure @ 100' Working Depth	Top Wellbore Pressure (psig)	Net Pressure (psig)	Gradient psig/ft		
L-6	2,300	960	2,310	4/19/2011	806	1,500	-694	0.439		
L-6	2,304	959	2,272	4/19/2011	842	1,500	-658	0.439		
H-12	2,185	920	2,243	4/27/2011	888	944	-944	0.439		
H-20	2,200	867	1,937	4/27/2011	884	481	-403	0.439		
H-20	2,187	904	2,249	4/27/2011	822	1,376	-554	0.439		
H-4	2,185	918	1,944	4/27/2011	828	480	-348	0.439		
H-17	2,180	919	2,210	4/19/2011	806	1,381	-575	0.439		
H-21	2,180	918	2,190	4/19/2011	792	867	-75	0.439		
H-27	2,180	917	2,081	4/19/2011	814	986	-172	0.439		
H-44	2,100	418	2,189	4/27/2011	806	918	-112	0.439		
H-22	2,180	944	2,193	4/27/2011	824	1,350	-526	0.439		
H-28	2,147	847	2,354	4/19/2011	845	1,384	-539	0.439		
H-22	2,180	944	2,194	4/27/2011	792	1,350	-558	0.439		
H-29	2,138	828	2,302	4/27/2011	803	1,336	-533	0.439		
H-26	2,200	818	2,452	4/27/2011	809	980	-171	0.439		
Main Area										
AMS-18	Jessie Marie 56-18	2,196	818	2,278	4/26/2011	830	1,278	-448	0.439	
AMS-19	Jessie Marie 65-19	2,282	698	2,293	2,182	4/27/2011	871	972	-911	0.439
AMS-19	Jessie Marie 75-19	2,272	641	2,169	2,176	4/27/2011	713	1,121	-408	0.439
AMS-19	Jessie Marie 82-19	2,390	811	2,316	2,226	4/27/2011	690	1,378	-688	0.439
AMS-24	Jessie Marie 44B-24	2,170	828	2,022	4/27/2011	810	1,162	-352	0.439	
BSP Subsurface pressure @ Measurement Depth										
1. The Monerey T-10 is 100' from TVD = 100' + 0.439 x 100 = 143.9										
2. The Monerey T-10 is 100' from TVD = 100' + 0.439 x 100 = 143.9										
3. The Monerey T-10 is 100' from TVD = 100' + 0.439 x 100 = 143.9										



Complexity!

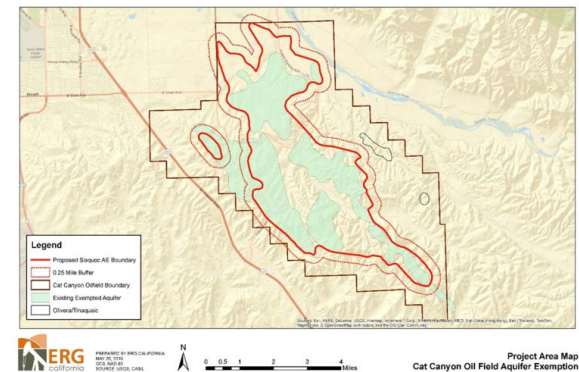
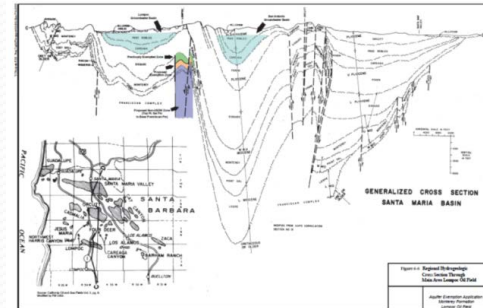


Lompoc Oil Field "Strike" Cross Section — A-A' (NW-SE)



Challenges

- Water quality data limitations
 - Non-USDW area approved UIC projects
- Uncertainties
 - Containment (PRC 3131)
 - Existing aquifer exemption boundaries
- Procedural
 - Water well surveys
 - Data management – GeoTracker
 - Timing and prioritization



Application Reviews Thus Far

- No deal breakers with respect to meeting criteria
- Multiple lines of evidence
- Rural areas with limited & shallow water supply wells
- Injection zones:
 - Deep formations with structural containment
 - High TDS and/or hydrocarbon producing
- Project level containment review!
 - Operating conditions?
 - Monitoring requirements?



Summary

- Advisory role limitations
- New emphasis on water quality protection
- Ongoing coordination
- High level of technical review
- Transparency - challenges and uncertainties
- Setting the stage for project reviews