

**Fillmore and Piru Basins Groundwater Sustainability Agency
Board of Directors Meeting**

Monday, January 29, 2018 - 6:00 p.m.

**City of Fillmore City Hall, City Council Chambers
250 Central Avenue, Fillmore, CA 93015**

MINUTES

Directors in Attendance

Chair Kelly Long
Vice Chair/Secretary/Treasurer Ed McFadden
Director Carrie Broggie
Director Gordon Kimball
Director Candice Meneghin
Director Glen Pace

Staff Present

Kris Sofley, interim executive director

Public Present

Rebecca August, Los Padres Forest Watch
Karen Bagley
Alasdair Coyne, Keep Sespe Wild
Sue Cuttriss
Bill De La Espriella, Ventura County IT Services
Lynn Edmonds
Kate English, One Step a La Vez
Susan Hopher
Allen King
Dwight V Moore
Tim Moore, UWCD
Tony Morgan, UWCD
Ann Ohlenkamp
Kris Ohlenkamp
Steven O'Neill, OMLO
Kathy Pace
Helen Perri
Kimberly Rivers, CFROG
Sarah Walker

- 1. Call to Order 6:03pm**

- 2. Pledge of Allegiance**

3. Public Comments

Chair Long confirmed that the members of the public were there to address agenda item 8D and asked if there was any member of the public that wished to address the Board on any other matter on the agenda or on any non-agenda item within the jurisdiction of the Board. No other public comments were offered.

4. Approval of Agenda

Motion

Chair Long suggested that the Board move agenda item 8D up in the discussion to immediately follow the motion to approve the agenda due to the number of community members that were present to participate in that discussion. Motion to move Agenda item 8D to the start of the Board's discussion and approve the agenda with that one change, Director McFadden; Second, Director Broggie. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0

8.D Sespe Aquifer Exemption Proposal

Information Item

Chair Long opened the discussion of the Sespe Aquifer Exemption Proposal by stating that the Board has asked for further clarification of the situation back in November, when this was first brought to the Board's attention. This was also the day before the State Water Resources Control Board (SWRCB) deadline for public comment. The Board asked UWCD's Assistant Hydrogeologist Tim Moore for a brief update on the Sespe Aquifer Exemption Proposal.

Mr. Moore stated that Seneca Resources was seeking an expansion of approximately 70% in the size of its current Sespe Oil Field aquifer exemption area. Mr. Moore said that, according to the proposal submitted by Seneca Resources Corporation, the original aquifer exemption was approved in 1983 in conjunction with the US EPA for the enhanced oil recovery injection and the disposal of produced fluids associated with oil and gas production. In reviewing the eight water wells in the area, Mr. Moore said five had been converted to oil and gas wells, and four of those were no longer used, and one well was located in the buffer zone. Seneca submitted the expansion proposal to the SWRCB's DOGGR (Division of Oil, Gas and Geothermal Resources) in September 2017. A public meeting was held on October 24, 2017, which Mr. Moore attended, and the deadline for submission of public comments was November 7, 2017. The City of Fillmore filed a letter of opposition to the exemption proposal with DOGGR. The SWRCB was tasked with approving the proposal and, if it was approved, is required to notify the

Environmental Protection Agency (EPA) and each injection well would need its own Class 2 permit.

Mr. Moore displayed a map on the projection system which showed the Basal Sespe AE Application area in October 2016 and the proposed expansion area from the map presented at the DOGGR public meeting in October 2017. Mr. Moore explained that blue dots signified public water supply wells for the City of Fillmore and Fillmore Irrigation. He said there were no individual domestic private wells within one mile of the buffer and exemption area. Mr. Moore stated that the proposal represented a 70 percent expansion from its previous exemption area and that the limit line moved slightly closer to Fillmore.

Director Pace asked if the exemption allows Seneca to use other sites within the total exemption area and also wanted to know if there were cross sectional elevations for the area.

Mr. Moore said that the application is about 150 pages and is available online. For the purpose of this update, he used two attachments -- the November 9, 2017 letter from SWRCB to the US EPA and the letter requesting exemption expansion of the Sespe Oil Field dated September 25, 2017.

Director McFadden said this was good background for intelligent discussions in the future.

Director Broggie asked if there were any results from the comment letters. Mr. Moore said while he attended the DOGGR/DWR public meeting it was before the deadline for public comments so he doesn't have any insight on that.

Director Broggie said that she thought Seneca had submitted paperwork improperly, and Mr. Moore said that he thought three wells were outside the expansion area and that a cease and desist order was filed and those wells are not currently operating.

Chair Long then said the Board would call upon the public to share their comments and reminded the public that comments were limited to three minutes and that she would wave a speaker card when their time was about to run out so they could conclude their comments.

Kate English thanked the Board for listening to the concerns of the public. She said that humans drink water from the area near the injection sites and that the State has not done its due diligence in prepare to approve this proposal. She asked if

seismology studies had been conducted and encouraged the board members to talk to SWRCB and the EPA. She reminded the board that the area of the exemption expansion was a popular recreation area, that condors and other wildlife lived in this area and the Sespe aquifer comes up to the earth's surface and agencies need to think about future generations and the technology that may be available then and feels this process is short sighted and that oil companies shouldn't be allowed to pump waste into a natural reservoir and encouraged the board to contact the State regarding other options.

Kris Ohlenkamp addressed the Board, stating that he lived in Fillmore and that Seneca had four wells which were illegally drilled. Three of those wells are used for injecting radioactive, carcinogenic materials and other toxic matter into wells and that SWRCB and DOGGR have a long history of being unresponsive to the public. He said that rocks are nearly impenetrable except sandstone and that fracture zones in the sandstone make it possible for water to find its way over time. He also said that the injected fluid is expected to remain in one spot, but that hasn't been studied over time, there have been no outside studies regarding fracture zones and fault lines and the risk of leaking pipes. All of these things need to be considered as they impact the quality of water in the Fillmore Piru Basins.

Lynn Edmonds said this was a case about the environment and laws and the illegal operating of wells that could damage the public's water. She said we export oil, not water, and if there is any contamination, what would we do? She said that Fillmore is a low income at risk area and she didn't want her grandkids to not have fresh water.

Ann Ohlenkamp of Fillmore, identified herself as a representative of CFROG (Californians for Responsible Oil and Gas) Action Team. She asked the Board to please protect the water. Seneca's expansion threatens the basin and the company is injecting waste a half mile from the Fillmore aquifer. We are in an earthquake prone area and no one has addressed broken or damaged pipes and how that would impact the water. She asked the Board to consider, at a future meeting, asking DOGGR to redo the process for the Sespe Aquifer exemption. She said DOGGR inaccurately reported information at the public meeting regarding the distance of the Fillmore sub basin and the proposed injection site. She said 5,330 feet from sub basin which is about 2,000 feet closer. The information about the San Cayetano Fault was wrong in that it is not a barrier but a conduit. The Sespe application should be resubmitted with the correct information and there should be a public meeting in Fillmore, which would be very helpful to engage more of the community.

Kimberly Rivers, who also identified herself as being with CFROG, asked the Board if she could distribute a map and an article from KQED to the Board and enter these materials into the public record. She said DOGGR is asleep at the wheel regarding monitoring exemptions and the EPA needs to crackdown. She said Director Pace was correct in recognizing that the proposed exemption area is closer to the Fillmore basin, within a half of a mile. Forest Watch also asked for a redo on public comments period because of inaccurate information included in Seneca's application. She said it is DOGGR's responsibility to reiterate trustworthy information and be accountable regarding the accuracy of the information provided.

Allen King, a farmer and retired geologist with the Forest Service said he was disappointed that DOGGR representatives were not present to answer the public's questions. He also stressed that the San Cayetano Fault is not a barrier but a conduit and fractures to the joint system and cross sections of geological maps need to be studied to determine the risk. He urged the Board to take seriously the concerns of local folks as this was about their drinking water now and in the future.

Rebecca August, who identified herself as being a representative of the Los Padres Forest Watch, presented a copy of a letter to the Board. She said that of the 670 public comments made about Seneca's expansion request, 98 percent opposed the proposal. She said Fillmore residents and local farmers are concerned about contamination of private water wells and that the wastewater injection poses an unreasonable risk. She said licensed geologists have confirmed that the Sespe aquifer is connected to Sespe Creek. She also added that of the 18 public comments received in favor of the proposal, all had ties to oil, including 11 Seneca company employees, and oil lobby group and a fracking company. She stated that inaccurate information was provided in Seneca's application for expansion of the exemption area, including misinformation about the San Cayetano Fault, which unfairly affected the State Water Board's decision.

Helen Perry stated that she was interested in Fillmore drinking water and wonders how wastewater stays only where it is injected and does not impact drinking water or agricultural irrigation when it is in such close proximity. She stated that in Pennsylvania, fracking and reinjecting has caused earthquakes and seismic activity vulnerability. She said she was disappointed in the slides presented to the Board and that questions were not answered and that a lot of unanswered questions still remain, like why are we injecting *chemicals* back into land? She said she looks forward to more informational meetings and urged the board to protect our water not oil companies.

Director McFadden explained that Mr. Moore and UWCD's expertise is in water, not petroleum.

Alasdair Coyne, of Keep Sespe Wild, stated that he had concerns about pollutants in Sespe Creek. He reminded the Board that San Cayetano Fault runs east and west along Good Enough Road from Santa Paula to Upper Ojai and that the fault line wasn't mentioned at all in the DOGGR analysis. He said that oil drilling doubled the risk potential. He added that in 1812, the San Cayetano Fault experienced a 7.5 quake which caused the ground to shift four and a half yards and asked how a similar experience could not do damage to Sespe oil field? He said DOGGR only mentioned a 1954 study and that there is one pipeline from Sespe through town all the way to Long Beach, which crosses the fault and DOGGR didn't study that, which makes him think they are a facilitator for oil and not a public watchdog.

Chair Long thanked the public for their comments and thanked Mr. Moore for summarizing the DOGGR presentation and clarifying as much as he could. Director Meneghin recognized the community support in opposition to DOGGR's authorization of the Sespe expansion proposal and asked that the Board consider sending a letter to DOGGR in opposition of the proposed expansion at its next meeting.

5. Director Announcements/Board Communications

Chair Long welcomed the Board back to regular session and added that she was glad to see the end of the fires and winds.

6. Interim Executive Director Update Information Item

The Interim Executive Director advised the Board that, since the previous Special Board meeting of January 11, 2018, the agency had acquired a Post Office Box in Fillmore for receipt of mail; had received the General Liability policy from the agency's insurance company; and would be provided a look at the beta version of the agency's new website.

7. CONSENT CALENDAR

7A Approval of Minutes

Motion to approve the minutes from the Board Meeting of January 11, 2018, Director Broggie, Second, Director McFadden. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0

8. INFORMATION ITEMS

8A Website Design Review

Information Item

Ventura County's Information Technology Services Department Deputy Chief Information Officer Bill De La Espriella presented the preliminary design for the Fillmore and Piru Basins Groundwater Sustainability Agency's website for review and input by the Board. Chair Long asked that the orange type used in the agency's new logo be replaced as it was hard to read. Director Meneghin asked if there would be hyperlinks to all of the members of the Environmental consortium and offered to rewrite the descriptions for that page of the website. The Board also asked that more presentations, agenda, etc. be included. Chair Long and Director Broggie both commented that the website represented strong value for dollars.

Motion to contract with Ventura County IT Services Department for the completion of the website and to contract with the County's IT Services Department to host the site for a year at a cost of \$360 on behalf of the Fillmore and Piru Basins Groundwater Sustainability Agency, Director Meneghin; Second, Director Kimball. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0

8B Financial Report from UWCD's Tony Morgan

Information Item

Mr. Morgan presented an overview of reimbursable expenses incurred to date by United Water Conservation District on behalf of the Fillmore and Piru Basins Groundwater Sustainability Agency from July through December 2017. Mr. Morgan pointed out that the grant writer had originally been estimated at \$15,000 and was later increased to \$28,000, however, the writer delivered the grant submission for around \$18,000, so the agency caught a bit of a break there. According to Mr. Morgan's slide, the grant writer fees were \$18,031.55; public notices and ads costs \$221.50; and UWCD staff time comes in at \$25,804.88 for a total of \$44,057.93 to date. Mr. Morgan stated that \$79,000 had been budgeted.

Chair Long said she liked that and it showed good team work and reminded the Board that administrative costs were lower because the City of Fillmore provides meeting space so there is no rent or utility bills.

Mr. Morgan reminded the Board that these costs did not include the cost of the website, and Chair Long said that bill was paid with money from Ventura County. He also said that UWCD's CFO asked that everything be squared up by the end of June 2018.

Director Broggie asked Mr. Morgan if the agency was close to the \$79,000 estimated expenses projected during the previous budget discussion and Mr. Morgan reported that the agency was significantly under that amount, estimated total expenses were about \$48,000. Mr. Morgan also reminded the board that the \$51,300 cash advance from the County was due to be repaid at the end of June, and that legal fees, writing bylaws, etcetera would be incurring additional costs.

8C **Budget Workshop Strategy**

Information Item

The Board reviewed the proposed agenda for the Budget Workshop and discussed talking points, strategy and presentation materials required, if any, for the public outreach event. Ms. Sofley confirmed that she would bring the laptop, projector, documents and handouts. Director Kimball said that he would secure the public address system used by the Pumpers association. Mr. Morgan said he would prepare the budget spreadsheet with assumptions and variances in extraction fees. Mr. Morgan asked if an ad hoc committee could help whittle down assumptions and help in determining conservative estimations for pumping based on data from the past 10 years.

Chair Long added that if the agency was awarded the 50 percent grant, pumpers would want to know how that would reduce costs. Mr. Morgan added that the agency's administrative costs could also depend on board policy regarding building reserved in the budget.

Chair Long thought it was important that one of the pumpers participate in the ad hoc committee and that she agreed with a reserve and suggested three months of operating costs was standard, but if the agency were to bill every six months in sync with United, should the reserve be for six months of operating costs?

Director Pace said he thought it would be better to start with higher extraction fees and then reduce the fees as the GSP is completed and the agency migrates to maintenance.

Mr. Morgan said the fees could top off at \$13 and go down as the plan was completed or start at \$10 and stay consistent across the billing cycles. Director Meneghin also reminded the board that grants could be used for reimbursable costs.

Mr. Morgan also advised the board that once the GSP was filed in 2022, maintenance level would be between \$60-\$80,000 per six month window.

Chair Long asked Director Kimball and Director McFadden to be the ad hoc committee and meet with Mr. Morgan in advance of the Budget Workshop meeting to refine the budget figures.

Director Meneghin also suggested that the budget reflect both additional costs for grant writing as well as potential grant awards looking forward.

The Board discussed the billing cycle and were in agreement that it should sync with United. Mr. Morgan suggested sending invoices out in March 2018, covering the period of July through December 2017. He also suggested that the public outreach meetings on boundary modifications could be held in March and April as the Board has until the beginning of June to submit modifications to DWR. March and April meetings still allow for public comment periods, and that the focus for the Budget workshop should just be on the budget as boundary modification would be too much to contend with at one meeting.

Chair Long then reviewed guidelines for the meeting prepared by Rachael Kimball and Director Broggie agreed the guidelines were most helpful. Mr. Morgan said he would provide copies of the cleaned-up budget spreadsheet to Directors before the Budget Workshop on February 7 and they could reach out to him with comments.

9. ACTION ITEMS

9A Clerk of the Board (Executive Director) Position

Motion

The Board of Directors reviewed Mr. Morgan's proposed job description for the position formerly known as Executive Director, but Mr. Morgan is suggesting changing the job title to Clerk of the Board. The Board agreed to add "and website" to item number 7 so that it now reads "Maintain Agency master files and website." The Board also agreed to remove the "Minimum and" from Qualifications so that it now reads: "Desired qualifications will be determined by the Board. The following experience..."

Director Kimball asked if there was any way to fill the position before the next budget cycle.

Mr. Morgan said that he would try to have a draft agreement at the February Board meeting, including a scope of work, bookkeeping and Clerk of the Board role, assuming one person could do the books as it really only requires AP/AR services a couple times a year and could be incorporated into the duties of UWCD's existing staff and the clerk's duties would be only about 20 hours per month.

Chair Long asked what the Board is desiring and Mr. Morgan asked if the GSA could afford to this perhaps if UWCD combined the bookkeeping duties for the Mound Basin with the FPB GSA, as the City of Fillmore and County of Ventura have already turned down the offer to participate in this manner.

Chair Long asked if there were any other modifications. Hearing none, she then asked for a motion.

Motion to approve the job description for the Executive Director position and change the job title of that position to Clerk of the Board, Director McFadden; Second, Director Pace. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0

9B Grant Opportunities

Motion

The Board reviewed various grant opportunities suggested by Director Meneghin which were listed in a spreadsheet that, when duplicated for the Board packet, became quite unmanageable and difficult to read and follow. Ms. Sofley said that she would email the actual excel spreadsheet to each of the Directors after the meeting, for their future review.

Director Meneghin explained that she had divided the grant opportunities into several “buckets,” beginning with reoccurring grants, then Federal, State, Local and Private grant opportunities. She explained that it was also difficult to focus on grants without having specific projects to source. She also said that once a grand application has been created, it may be possible to repackage elements of that grant and adjust for specific requirements. Director Meneghin said that one in three grant applications are awarded funding, but that some grants are more competitive than others.

She highlighted the CDFW Prop 1 Watershed Restoration grant, which had a June deadline, and a Wildlife Conservation grant that was due in August. There were also some related opportunities through the Bureau of Reclamation.

Chair Long asked how to evaluate opportunities.

Director Meneghin said the Board needs to build relationship with the various administrators of grant programs, and that the FPB GSA needs to relate its projects to the grant opportunities.

Chair Long suggested that Board be proactive in pursuing grant opportunities while staying within the budget for grant writing and application submissions.

Director McFadden suggested that Director Meneghin proactively review grants and bring those that are most appropriate to the Board for discussion.

Mr. Morgan said that Kennedy Jenks was retained by UWCD to identify grant opportunities that are best suited to projects and that sometimes it requires broadening the circle to include anything applicable to the GSA.

Motion to pursue grant applications as applicable using Director Meneghin's matrix of potential grant opportunities with a not to exceed budget of \$9,900 through June 2018, Director McFadden; Second, Director Broggie. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0.

9C Legal Services Agreement

Motion

The Board reviewed the Olivarez Madruga Lemieux O'Neill contract for legal services and the suggested changes presented by the ad hoc Legal committee. The Board provided the various changes and recommendations to the existing language to Mr. O'Neill, and he agreed to update and amend the contract as requested.

Motion to approve the legal services agreement with amendments as discussed, and retain Olivarez Madruga Lemieux O'Neill, LLP, as legal counsel for the Fillmore and Piru Basins Groundwater Sustainability Agency, Director Meneghin; Second, Director McFadden. Six aye votes (Broggie, Kimball, Long, McFadden, Meneghin, Pace). None opposed. Motion carries unanimously 6/0.

ADJOURNMENT 8:36 p.m.

The Board will adjourn to the next **Regular Board Meeting** on **Tuesday, February 20, 2018** or call of the Chair.

ATTEST: _____


Kelly Long, Chair, FPB GSA Board of Directors

I certify that the above is a true and correct copy of the minutes of the Fillmore and Piru Basins Groundwater Sustainability Agency's Board of Directors meeting of January 29, 2018.

ATTEST: _____


Kris Sofley, Clerk of the Board

FILLMORE AND PIRU BASINS
GROUNDWATER SUSTAINABILITY AGENCY

250 Central Avenue, Fillmore, CA 93015

(805) 525-4431

Board of Directors' Meeting

January 29, 2018

Name: Ann Diklenkamp

Organization: _____

Phone: 818 646 2905

E-mail: annohlenkamp@msn.com

Name: Susan Hopkins

Organization: _____

Phone: 805 535-0079

E-mail: sus.hopkins@gmail.com

Name: Kiss Diklenkamp

Organization: _____

Phone: 805 323-5429

E-mail: _____

Name: KATE ENGLISH

Organization: ONE STEP A LAYER

Phone: 805 207-5013

E-mail: Kate@myonestep.org

Name: Lynn Edmonds

Organization: _____

Phone: 805-907-6576

E-mail: _____

Name: DWIGHT V. MOORE

Organization: _____

Phone: _____

E-mail: dwrightmoore@yahoo.com

Name: Karen Bagley

Organization: _____

Phone: 805 524-3005

E-mail: _____

Name: Kimberly Rivers

Organization: OPROA

Phone: 805-727-1393

E-mail: FR@OPROA.org

Name: Sue Cuttriss

Organization: _____

Phone: 805 524 1835

E-mail: _____

Name: Kathy Pace

Organization: Resident/unincorporated

Phone: 524-0534

E-mail: _____

**FILLMORE AND PIRU BASINS
GROUNDWATER SUSTAINABILITY AGENCY**

250 Central Avenue, Fillmore, CA 93015

(805) 525-4431

Board of Directors' Meeting

January 29, 2018

Name: SARAH WACKER

Name: _____

Organization: _____

Organization: _____

Phone: _____

Phone: _____

E-mail: _____

E-mail: _____

Name: _____

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Fillmore & Piru Basins Groundwater Sustainability Agency Board of Directors Meeting – January 29, 2018

AGENDA

- 1. Call to Order
- 2. Pledge of Allegiance
- 3. Public Comments
- 4. Approval of Agenda
- 5. Director Announcements/Board Communications
- 6. Interim Executive Director Update
- 7. Consent Calendar
- A - Approval of Minutes

8. Information Items

- A – Website Design Review
- B – Financial Report
- C – Budget Workshop Strategy
- D – Sespe Aquifer Exemption Proposal

9. Action Items

- A – Clerk of the Board (Executive Director) Position
- B – Grant Opportunities
- C – Legal Services Agreement

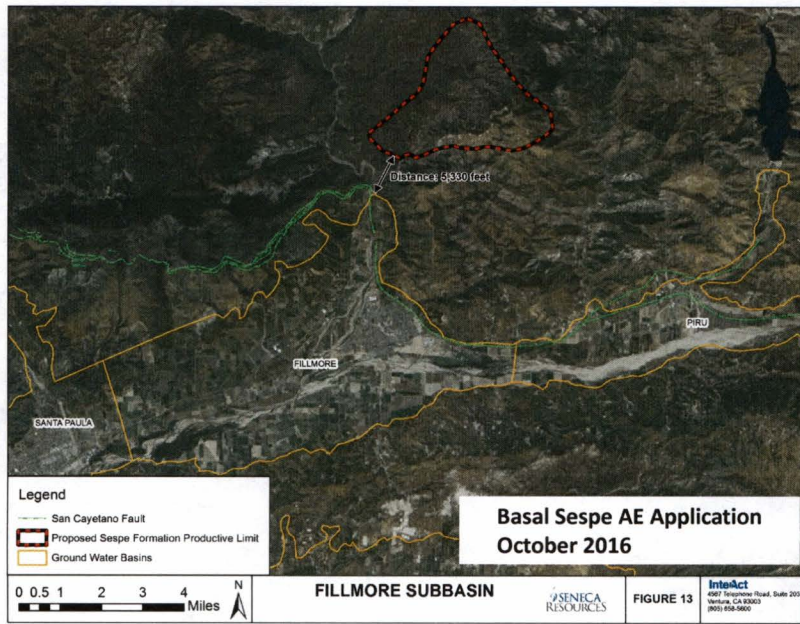
Adjournment

8B Financial Report

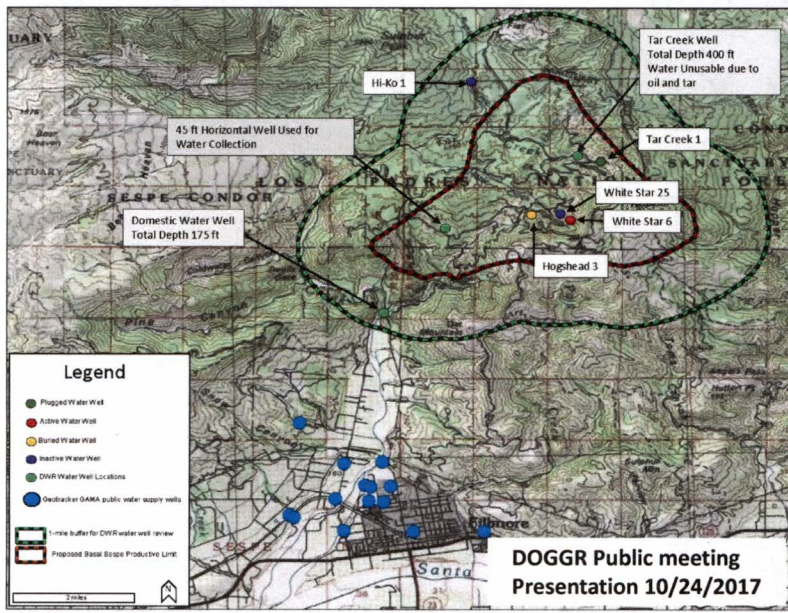
Costs (Jul-Dec 2017)

Grant Writer	\$ 18,031.55
Legal, Public Notices, etc.	\$ 221.50
UWCD Staff	\$ 25,804.88
Total	\$ 44,057.93

8D Sespe Aquifer Exemption Proposal



8D Sespe Aquifer Exemption Proposal





November 7, 2017

Tim Shular, Regulations Manager
Department of Conservation
801 K Street, MS 24-02
Sacramento, CA 95814
VIA EMAIL: comments@conservation.ca.gov

RE: Proposed Aquifer Exemption, Basal Sespe Formation
Sespe Oil Field, Ventura County, California

Dear Mr. Shular:

Thank you for this opportunity to submit comments on the request by Seneca Resources, Inc. ("Seneca") to expand the aquifer exemption for the Basal Sespe Formation in the Sespe Oil Field, which underlies portions of the Los Padres National Forest in Ventura County. Specifically, Seneca is seeking permission to inject wastewater into new areas of the aquifer that are currently protected under the federal Safe Drinking Water Act.

We have carefully reviewed the *Production Limit Update and Aquifer Exemption Request for the Basal Sespe Formation in the Tar Creek Topatopa Area of the Sespe Oilfield* ("AE Request") prepared by Seneca; the *Statement of Basis for the Expansion of the Aquifer Exemption at the Sespe Oil Field* ("Statement of Basis") prepared by the California Division of Oil, Gas & Geothermal Resources ("DOGGR") and the State Water Resources Control Board ("SWRCB"); and other pertinent records. Our review indicates that Seneca has not satisfied the federal aquifer exemption criteria outlined in 40 C.F.R. § 146.4, nor has it satisfied the State of California's exemption criteria set forth in Pub. Res. Code § 3131.

To assist in our review, we retained the professional services of Dr. Bradley Newton, Ph.D., P.G. of Newton Geo-Hydrology Consulting Services. His *Technical Memorandum* is submitted under separate cover, and is hereby incorporated by reference. Dr. Newton's findings are summarized as follows:

Additional information is required to demonstrate that the portion of the Basal Sespe Zone of the Sespe Formation (Basal Sespe Formation) proposed for Aquifer Exemption (AE) does not currently serve as a source of drinking water, in that water contained in the Basal Sespe Formation may be hydraulically connected to drainage areas northwest of Tar Creek and may contribute flow to the Sespe Creek, an important source of recharge to the Fillmore groundwater subbasin. In addition, further clarification is needed for the basis for specific exemption boundaries proposed and more technical information demonstrating the injected fluids will not flow beyond these proposed boundaries.

For these reasons – and as outlined in detail below – we urge your agencies to (1) withhold your preliminary approvals of Seneca's aquifer exemption, and (2) request additional information from Seneca prior to forwarding the application to the U.S. Environmental Protection Agency ("EPA") for further review.

1. Seneca Has Failed to Demonstrate Adequate Containment

Under Pub. Res. Code § 3131(a)(3), Seneca must prove that “[t]he injected fluids are expected to remain in the portion of the aquifer proposed for exemption.” The Statement of Basis claims that this criterion is fulfilled because “the net withdrawal of fluids from the aquifers proposed for exemption due to historic oilfield operations has created hydraulic gradients towards the production centers of the Sespe Oil Field, contributing to the containment of injected fluids in the Proposal Area.” This is based on a survey of well casing pressures performed by Seneca in 2016, the results of which are provided in Figure 10 (“Basal Sespe Containment Map”) of Seneca’s AE Request. As Seneca explains in its AE Request, “This pressure gradient is the mechanism that contains fluids (both oil and water) in the produced reservoirs to the area of the proposed Aquifer Exemption.”

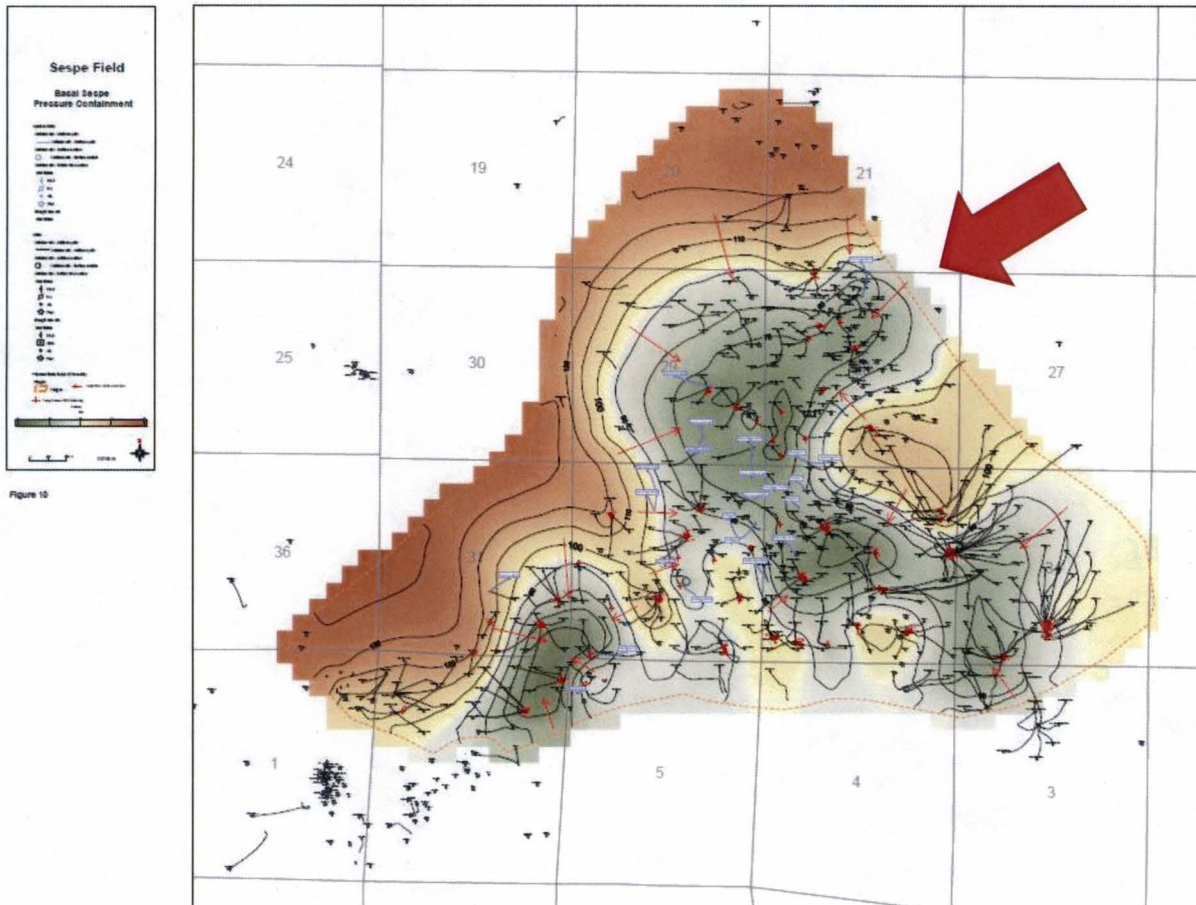


Figure 10

Seneca’s pressure survey results as presented in its AE Request do not provide your agencies with an adequate basis to support an aquifer exemption, for the following reasons. First, the survey should extend well beyond the boundary of the proposed exempt area to ensure that pressure gradients outside of the area are sufficient to contain fluids. Second, Figure 10 shows a large area of low pressure in Section 28 that intersects with the proposed exemption boundary. Without evidence of higher pressure gradients outside of this area, this area could serve as a conduit for fluids to escape to outlying areas, and as such there is no basis to conclude that fluids will be contained within the proposed aquifer exemption boundary. And third, it is unclear what methodology was used in the survey, and what operating conditions were present during those surveys. It is unclear whether the pressures detected

during the surveys are typical of the area, and whether these pressures are variable depending on oil field operations.

The SWRCB has acknowledged the challenges associated with relying on hydraulic containment to support an aquifer exemption. Specifically, a Regional Water Quality Control Board ("RWQCB") Staff Report dated January 5, 2017 states:

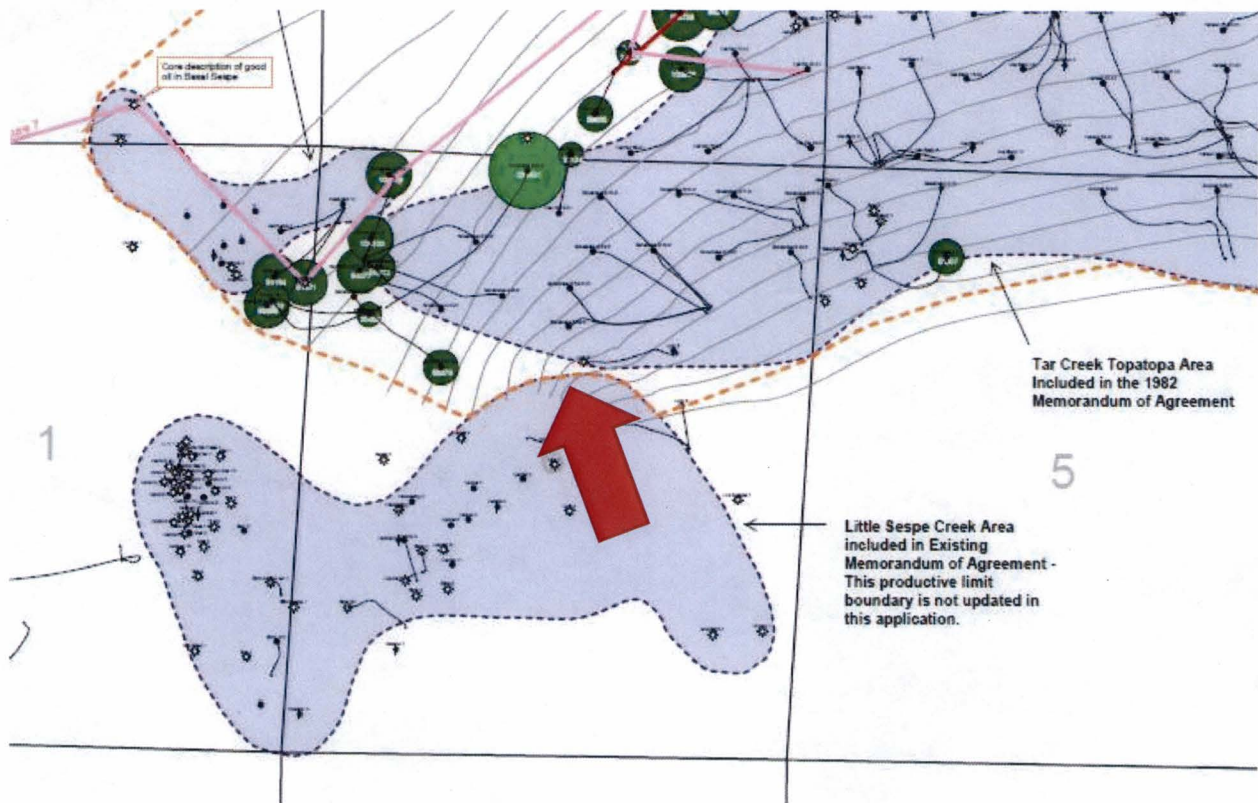
Hydraulic containment is more difficult to document and is challenging to ensure beyond the operational life of the oil field because it is primarily induced by the oil field operations that change over time (e.g., changes in extraction and injection locations and volumes), although it can also be induced by natural conditions. As discussed in more detail within the challenges discussion below, uncertainties regarding containment, particularly hydraulic containment or poorly defined structural containment, may require controls at the UIC project level to ensure and document compliance with the aquifer exemption containment criteria.

More often than not, the complex nature and uncertainties of the geology and hydrogeology of the formation and oil field operations requires the identification of multiple lines of evidence to validate concurrence with the proposed aquifer exemptions. This multiple lines of evidence approach often warrants documenting, as part of the aquifer exemption process, that monitoring or other conditions will need to be required for subsequent UIC projects to ensure containment of injected fluids within the exempted area into the future.

To address this challenge, the Staff Report states that DOGGR and the SWRCB will incorporate conditions into approvals of future injection projects such as "requiring the implementation of a water quality and/or pressure monitoring program in and/or in proximity to the proposed exempted areas. However, the Statement of Basis only suggests that "The Division and State Water Board staff will *consider* incorporating conditions into approvals of injection projects to verify that injected fluids remain in the proposed exempted areas." (emphasis added).

We suggest that your agencies commit to incorporating *mandatory* conditions as part of the aquifer exemption process. This would ensure that the conditions are implemented immediately for all current injection operations, instead of relying on a site-specific injection well application at some unknown time in the future. If you wait to impose such conditions as part of future injection projects, then current injection operations may be allowed to continue indefinitely without the benefit of any pressure and/or water quality monitoring.

Finally, the proposed exemption boundary at the southwestern tip is drawn in a manner that raises doubts about whether that section is geologically contained. Here – as shown in Figure 4 – the boundary is drawn to exclude the Little Sespe Creek Area, along with a notation stating "Little Sespe Creek Area included in Existing Memorandum of Agreement – This productive limit boundary is not updated in this application." Simply drawing the new boundary to exclude an existing exempt area does not provide an adequate basis for granting the AE Request.



Recommendation: We urge your agencies to require Seneca to conduct additional pressure surveys inside and outside of the proposed exemption area, and to provide a detailed description of the survey methods and protocol. In addition, we recommend that conditions be placed upon any aquifer exemption to ensure that pressure and water quality monitoring are implemented immediately. In addition, Seneca should submit a plan for how it intends to maintain the pressure gradient, in the likely event that its operations in the Sespe Oil Field change or cease over time.

2. Additional Water Quality Testing Must Be Performed

As we pointed out in a letter to your agencies dated October 25, 2017, two wells (Red Rock 67-29 and Red Rock 68-29) are currently injecting wastewater into non-exempt portions of the subject aquifer.

In November 2015, the SWRCB ordered Seneca to prepare a Formation Water Sampling Work Plan to describe procedures and reasoning for collecting representative formation water samples from the injection zones for these two wells, along with a third idle injection well (Cal-Pac 65-31). Seneca prepared the Work Plan and submitted it to the SWRCB in January 2016, and according to a SWRCB letter dated February 19, 2016, implemented the Work Plan without approval by the Regional Board. In addition, according to a letter from SWRCB dated June 10, 2016, "Additional sampling and analysis is required to determine the accurate TDS for the Cal Pac injection well. As noted in the February 19, 2016 correspondence, the formation water samples were collected without Regional Board approval." To the best of our understanding, this additional sampling and analysis was never completed, and we can find no evidence that the SWRCB ever approved the Work Plan.

In addition, the SWRCB June 10, 2016 letter concludes, "The native formation water collected from nearby production wells and within the injection zone has been determined to have less than 10,000

mg/L TDS, which is considered an underground source of drinking water (USDW) and could have current or future beneficial uses.” The AE Request relies on the same data, so it is unclear why your agency has now determined that the aquifer does *not* have current or future beneficial uses.

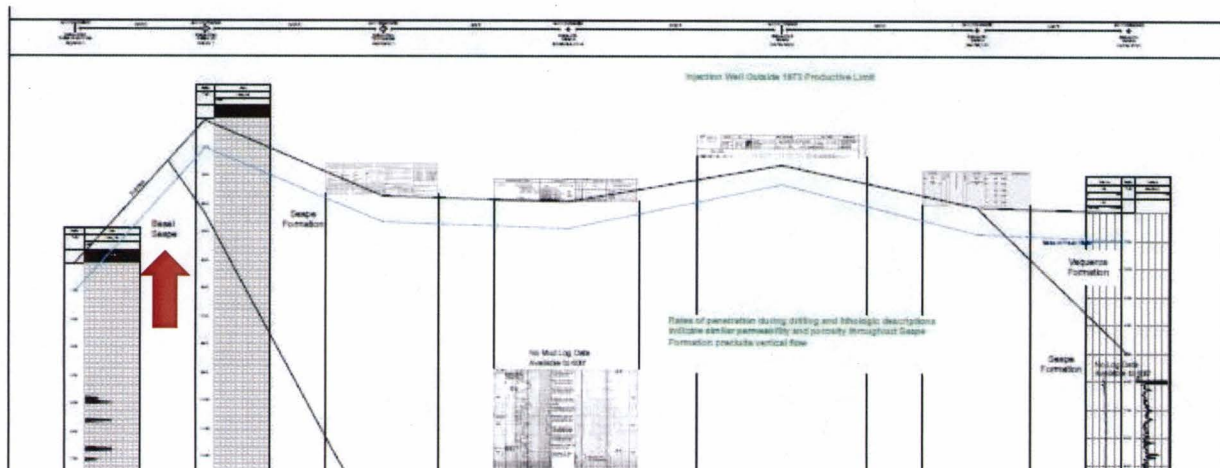
Seneca’s AE Request does not contain any water testing data based on its own Work Plan as mandated by the SWRCB. Instead, Seneca relies on samples collected in December 2015, prior to the development and approval of the water sampling Work Plan. In addition, the AE Request relies on data that formed the basis of the SWRCB’s opinion last year that the aquifer has beneficial uses.

Recommendation: The review of Seneca’s AE Request would benefit from a more robust water quality testing sample, consistent with an approved Work Plan. In addition, Seneca should conduct additional sampling and analysis of the Cal-Pac well as ordered by SWRCB, and must provide an analysis to disprove the SWRCB’s previous conclusion that the aquifer has beneficial uses.

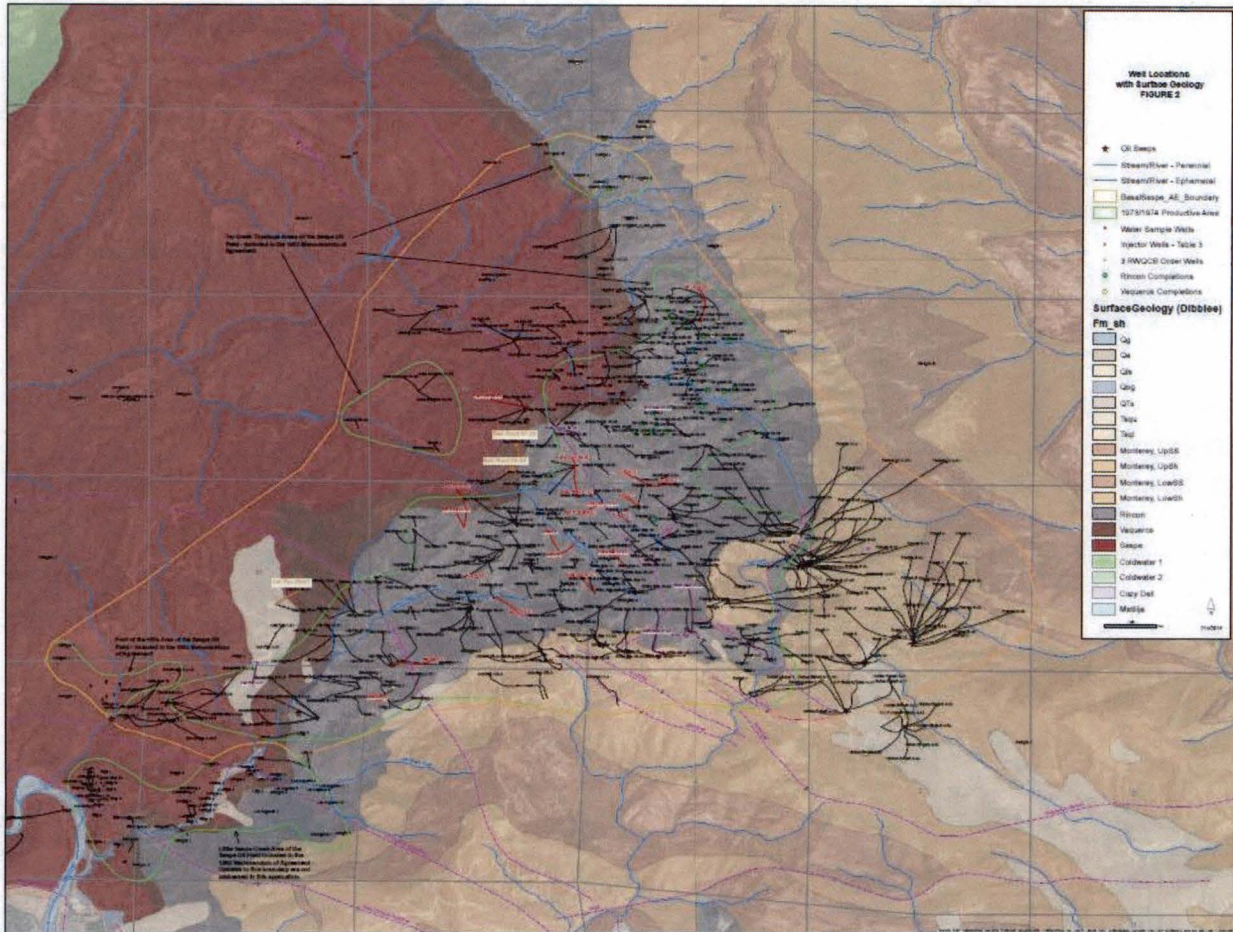
3. The AE Request Should Disclose the Surface Connectivity of Basal Sespe Aquifer

The intended injection zone is the Basal Sespe, but the zone intersects the surface in some areas. This surface connection could threaten perennial and ephemeral streams in the area which feed into the Sespe Creek, which itself provides recharge for the Fillmore subbasin.

Figure 7 in the AE Request indicates that the Basal Sespe intersects the surface. Specifically, the area between wells Supreme 1 and Phillips Oil Well No. 1 shows the Basal Sespe extending to the surface. This is significant because (1) the cross-section is located approximately one-half mile from Sespe Creek, and (2) encompasses a tributary to Sespe Creek. We are concerned that injected wastewater could migrate to this portion of the aquifer and contaminate the base of fresh water that underlies the area, as well as the surface water in Sespe Creek and its tributaries.



In addition, Figure 2 (Surface Geology Map) in the AE Request shows the Sespe Formation (in red) covering a large portion of the surface geology inside and outside of the proposed exemption boundary (orange line). However, the various layers of the Sespe Formation – Basal, Middle, and Upper – are not delineated on this surface map.



There are no defined barriers (e.g. confining silt or clay layers) precluding fluid flow between the Basal Sespe zone, the Sespe zone above, and the Coldwater zone below. Similarly low porosities and permeabilities amongst the layers are supposed to prevent fluid flow. However, without definite barriers, interactions between these zones can occur. Moreover, there is not a defined boundary between the Basal Sespe and the Sespe zone, so injection in the Basal Sespe zone can potentially impact the Sespe zone, which also intersects the surface.

Given the risk of potential surface water contamination in this area, it seems prudent to require Seneca to provide more information about the intersection of the Basal Sespe with the surface geology, and the relationship between these areas and Sespe Creek, and tributaries thereto.

Recommendation: Disclose more information about the Basal Sespe surface geology, base of fresh water, and surface waters in and near the proposed exemption area.

4. Acknowledge that Faults Can Act as Conduits to Groundwater Contaminants

The AE Request discloses the presence of two faults in and around the proposed exemption area – the San Cayetano thrust fault, and the Oak Ridge thrust fault – and concludes without any supporting documentation that these faults act as barriers to hydrologic flow.

While faults can act as barriers to hydrologic flow, the AE Request should also consider that “faults can also form preferential flow paths for vertical fluid flow where lateral hydraulic head gradients suggest

they impede flow. See, e.g., *Bense, V.F., and M.A. Person (2006)*, Faults as conduit-barrier systems to fluid flow in siliciclastic sedimentary aquifers, *Water Resour. Res.*, 42, W05421, citing extensive mineralization patterns [e.g., *Mozley and Goodwin, 1995; Garven et al., 1999*], leakage of contaminated groundwater along faults [e.g., *Nuclear Energy Agency, 1996; Mal'kovskii and Pek, 2001; Ofoegbou et al., 2001*], preferential oil migration via faults [e.g., *Link, 1952; MacDonald et al., 1993; Moretti, 1998*] geothermal anomalies [e.g., *Person and Garven, 1992; López and Smith, 1995; Bredehoeft, 1997; McKenna and Blackwell, 2004*] expulsion of overpressured fluids along faults [e.g., *Roberts et al., 1996*] and few detailed hydraulic head data [*Bense et al., 2003a*].

Recommendation: Evaluate the possibility that the faults identified in the AE Request may serve as conduits for contaminants to enter adjacent aquifers that serve as sources of clean drinking water.

5. The AE Request Fails to Disclose All Nearby Drinking Water Wells

The AE Request identifies several water wells located inside and outside of the proposed aquifer exemption boundary, and explains the methodology that Seneca used to identify the water wells. Specifically, the AE Request is based on Well Completion Reports provided by the California Department of Water Resources, DOGGR files for water supply wells inside the study area, and the GeoTracker GAMA website, focusing on wells within one mile of the proposed aquifer exemption boundary.

This survey omitted several known water wells in and near the study area, including but not limited to wells operated by the Goodenough Mutual Water Company and the Fillmore Irrigation Company.

The RWQCB has identified how an applicant can best substantiate exemption criteria 1 (targeted formation does not currently serve as a source of drinking water) and criteria 3 (adverse effect to existing/future beneficial uses):

Items 1 and 3 above are primarily substantiated by the inclusion of a comprehensive well survey identifying the location and depth of all existing wells in an area extending at least one-quarter mile beyond the proposed aquifer exemption boundary.

Comprehensive well surveys require the review and compilation of well information from multiple sources (e.g., Department of Water Resources, county level well and drinking water permitting agencies, local water agencies/districts, GeoTracker and USGS databases, etc.) as well as aerial photography and in-field "windshield" surveys as needed to confirm well locations and identify potential well locations based on land uses and associated structures. In cases where there are significant uncertainties regarding containment of injected fluid, Water Board staff typically recommend extending the required well survey beyond the one-quarter mile minimum to ensure at-risk wells are identified and protected.

Central Coast Regional Water Quality Control Board, 2017. Staff Report dated January 5, 2017. The AE Request is not based on a review and compilation from multiple sources of well records, aerial photography and in-field surveys. In addition, given the uncertainties regarding hydraulic containment, contaminant conduits along fault lines, and surface exposure of the Basal Sespe in close proximity to Sespe Creek tributaries, the water well survey area should extend much beyond one mile to ensure that all downstream wells are identified and protected from possible contamination.

Recommendation: Conduct a thorough inventory of well records along with aerial photography and in-field surveys to ensure that all potentially affected water wells are identified. Expand the study area to include downstream portions of Sespe Creek.

6. Conclusion

For the reasons stated above, the AE Request and the Statement of Basis fail to provide the evidence necessary to satisfy the criteria for an exemption to the Safe Drinking Water Act. As DOGGR, the SWRCB, and the RWQCB further consider this AE Request, we hope that you will account for the concerns and recommendations outlined above. Given the environmental sensitivity of this area underlying the Los Padres National Forest – along with its proximity to Sespe Creek, residential and agricultural water wells, and groundwater supplies in the City of Fillmore – any request to exempt this area from the protections of the Safe Drinking Water Act must be evaluated with the highest level of scrutiny. Thank you for taking all steps necessary to ensure that aquifers underlying our national forest lands are protected from contamination so that they can continue to provide sources of clean water for nearby communities.

Sincerely,



Jeff Kuyper
Executive Director

cc: Samuel Unger, Executive Officer, RWQCB – Los Angeles
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January 22, 2018

Clifford Knight, Engineer and Geologist
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VIA EMAIL: clifford.knight@conservation.ca.gov; comments@conservation.ca.gov

RE: Supplemental Comment, Proposed Aquifer Exemption, Basal Sespe Formation
Sespe Oil Field, Ventura County, California

Dear Mr. Knight:

We are writing to supplement the comments we submitted on November 7, 2017 in response to the Public Notice regarding the Proposed Aquifer Exemption, Basal Sespe Formation, Sespe Oil Field, Ventura County, California.

It has come to our attention that the Department of Oil, Gas, and Geothermal Resources presented inaccurate information in the Public Notice Documents and Hearing Documents relating to the Sespe Aquifer Exemption Application, and in its presentation in a public hearing on October 24, 2017. The inaccuracies were used to substantiate the claim that the application meets state exemption criteria as specified in PRC 3131(a): "The injection of fluids will not affect the quality of water that is, or may reasonably be, used for any beneficial use," and "The injected fluid will remain in the aquifer or portion of the aquifer that would be exempted."

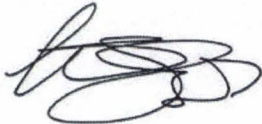
The map of the Fillmore subbasin DOGGR used has not been valid for two years, and establishes the Sespe aquifer exemption boundary at 5,330 feet from the Fillmore sub-basin. The current California Department of Water Resources map, revised in 2016, delineates the Fillmore sub-basin boundary at 3,300 feet from the Sespe Aquifer Exemption Boundary, more than 2,000 feet closer. The invalid map was presented at the public hearing, and DOGGR verbally expressed that the proposed exemption was "over a mile" from the Fillmore subbasin.

Further, as evidence of "Field Containment from Regional Hydrologic Groundwater Basin," DOGGR cites the following, "... the subbasin as bounded to the north by impervious rocks of the Topatopa Mountains and the San Cayetano Fault which acts as a barrier to hydrologic flow." The San Cayetano Fault bisects the Fillmore sub-basin, with water on both sides and circulating through. Therefore, the assumption that this fault serves as an impenetrable barrier between the Fillmore sub-basin and the exemption area is false. Please refer to the attached map which shows the current sub-basin boundary and the fault running through it.

In a letter submitted to DOGGR during the public comment period, the City of Fillmore stated that it "strongly opposes the proposed expansion of the current aquifer exemption" because the "Sespe aquifer proposed for exemption is just over one mile from the Fillmore Sub-basin - the sole source of drinking water for the residents of the City of Fillmore. Permitting Seneca Resources Corporation to continue injecting fluids produced by oil and gas extraction (i.e. fracking) so near a source of drinking water presents an unreasonable and unnecessary risk of danger to human health, in violation of both the State and EPA exemption criteria." Safety of Fillmore's water supply was a concern echoed by many of the Fillmore residents who made public comments.

The materials and public presentation left the State Water Board, elected officials, and the public with the false impression that the proposed exemption area, and the Fillmore sub-basin, are separated by an additional 2,000 feet and a hydrologically impenetrable fault barrier. This may have affected the opinion of the SWB and the number and content of public comments. To correct this error, DOGGR must resubmit the corrected application to the SWB, and restart the exemption application process from the beginning with the request for preliminary approval, subsequent public comment period and hearing, if granted, with final review by the SWB before the application can be considered legitimate and complete for submission to the EPA.

Sincerely,



Rebecca August
Public Lands Advocate

cc: Donald Drysdale, Information Officer 2, Public Affairs, DOGGR
Samuel Unger, Executive Officer, RWQCB – Los Angeles
Joshua Cwikla, Engineering Geologist, RWQCB – Los Angeles
John Borkovich, Chief, Groundwater Monitoring Section, SWRCB
Ken Harris, State Oil & Gas Supervisor, DOGGR
Pat Abel, Deputy – Coastal District, DOGGR
Jonathan Schwartz, Minerals Program Manager, Los Padres National Forest
David Rowlands, City Manager, City of Fillmore
Hanna-Beth Jackson, California State Senate, District 19
Monique Limon, California State Assembly, District 37

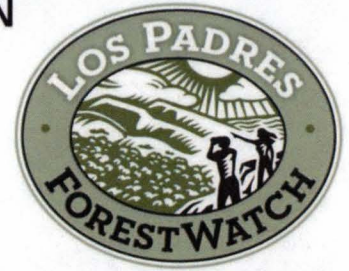
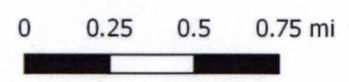
Proposed Aquifer Exemption Area and Fillmore Groundwater Basin

Los Padres National Forest

5,750 ft

3,550 ft

- Los Padres National Forest
- Proposed Exemption Area
- Current Fillmore Basin Boundary
- Old Fillmore Basin Area
- San Cayetano Fault
- Oil Wastewater Disposal Wells
- Currently Non-Exempt Wells



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How Much Drinking Water Has California Lost to Oil Industry Waste? No One Knows

www2.kqed.org/science/2017/08/03/how-much-drinking-water-has-california-lost-to-oil-industry-waste-no-one-knows/

Lauren Sommer

California survived its historic drought, in large part by using groundwater. It was a lifeline in the Central Valley, where it was the only source of water for many farmers.

California regulators are charged with protecting that groundwater, but for years they failed to do so. Through a series of mistakes and miscommunication, they allowed oil companies to put wastewater into drinking water aquifers that were supposed to be safeguarded.

Now, a KQED investigation reveals that regulators still know little about the actual impact on the state's groundwater reserves.

One of those errors was discovered by an unlikely person: Bill Samarin, a farmer in California's San Joaquin Valley.

Oil and agriculture are the big employers in Tulare County, where Samarin lives. Among the citrus and almond orchards, you see steel pumpjacks bobbing above the treetops. So criticizing either of those industries doesn't make you popular.

"That doesn't set well with people around here," Samarin said. "You're some kind of environmentalist, which isn't a very accepted thing to be if you're a farmer out in this area."

Samarin is not an environmentalist. He describes himself as a "pretty conservative guy." So what he discovered about the oil industry put him in unfamiliar territory, straining relationships in this tight-knit community.

The Biggest Issue

It started with the oil field not far from his orchard.

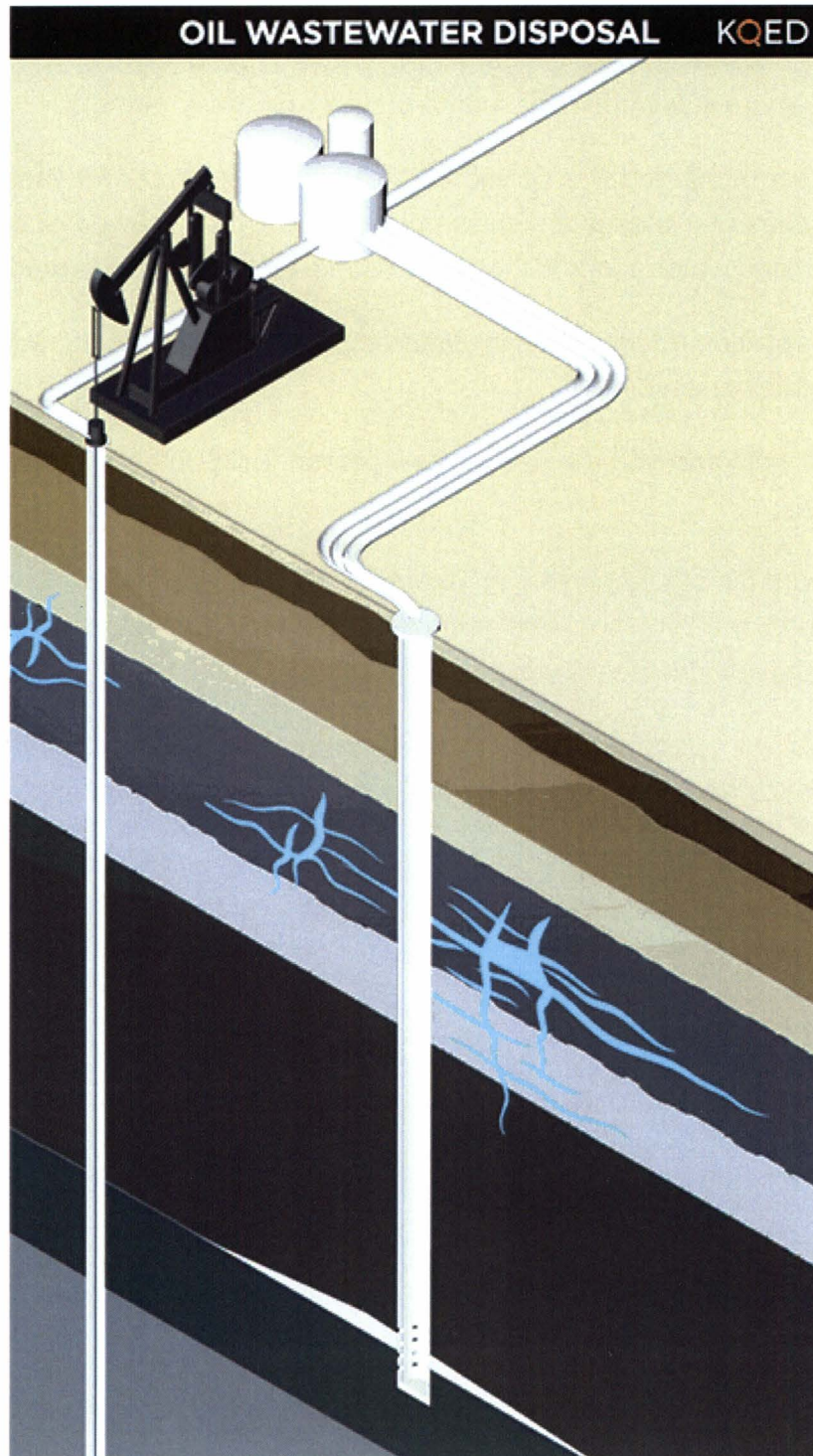
"From our house, we could look across and it's probably about three-quarters of a mile," he said.

County officials had received an application to expand that oil field and allow more drilling. Given how close it was to his property, Samarin started doing some homework.

"When I looked into it further, I found out actually that the biggest issue out here isn't the things you see on top of the ground," he said. "The biggest issue out here is the wastewater and how they're getting rid of it."

Oil companies in California produce tons of wastewater. On average, for every barrel of oil, a California oil well produces 19 barrels of water, often laden with salts, trace metals and chemicals like benzene.

“They have to get rid of it somehow and in this area here, they pump it into the ground,” he said.



It's the standard way in which oil companies dispose of wastewater in California: using injection wells, which are not much more than a pipe going into the ground with a gauge to monitor water pressure.

Generally, the wastewater is deposited pretty deep, below the usable groundwater, into aquifers that are already too salty to be drinkable.

Samarin decided to look up all the wells near his orchard, to see where the wastewater was going. He couldn't believe what he found.

"I was just stunned, stunned by how close it was to groundwater," Samarin said. He uses groundwater on his crops, along with a lot of other farmers in the area.

"I just drilled a well here," he said. "We drilled down to 740 feet. The injection wells in this area are injecting at similar depths."

Alarmed, Samarin went to the local water regulators, the Central Valley Regional Water Quality Control Board. They told him how a water law, known as the Safe Drinking Water Act, works. Groundwater that's potentially drinkable is automatically off limits for oil companies for wastewater disposal.

But if groundwater quality is already tainted by oil or salts, then companies can get permission from state agencies and the federal Environmental Protection Agency to put wastewater there.

The regulators gave Samarin a map of the land around his orchard that had been approved for wastewater disposal, as well as the areas that were protected.

Most people probably would have stopped there, but not Samarin. He wanted to know how close those injection wells were to his protected aquifer.

Digging Through the Maps

Samarin didn't have to turn very far for help. His son, Alex, works with maps for a living.

"I think we're both curious people," said the younger Samarin. "Once the question is asked, we want to see what the answer is."

He plotted coordinates for all the wastewater wells on top of the land approved for wastewater.

"Six out of the seven did fall within the allowable aquifer," he said. "One was completely outside of it."

That meant an oil company was putting its wastewater into a protected aquifer that was supposed to be off-limits.

"We were just stunned," recalls Bill. "It was like: is this even possible that they could be taking wastewater and injecting it into drinking water? Can you imagine that that actually occurs in California in this day and age?"



A wastewater injection well in San Joaquin County. (Lauren Sommer/KQED)

He decided to take it to county officials.

In 2014, Tulare County held hearings about whether to allow the oil operation near Samarin's orchard to expand, and he filed an appeal against it.

He wanted the county to know about the mistake: that regulators with the state's Division of Oil, Gas, and Geothermal Resources had permitted a wastewater well that it shouldn't have. Over a decade, it had pumped 80 million gallons of wastewater into the aquifer.

At the hearing, Samarin presented his report, going over everything he and his son had found.

"Produced water associated with oil production can contain many constituents that may endanger the environment or the public health," he testified.

When the meeting was opened for comments, Burton Ellison, a recently-retired regulator with DOGGR, challenged Samarin's findings, calling them untrue. "Every one of those wells went through a rigorous review," Ellison told the hearing. "As a matter of fact, I reviewed some of them back in 2008."

In the end, county supervisors denied Samarin's appeal, stating that regulating wastewater was the state's job, not theirs.

Samarin let it drop for the time being. "I left it to other contacts," he said. "The state water board knew about it."

Six months later, those state water regulators reviewing wastewater wells discovered that Samarin had been right.

They ordered the errant injection well that Samarin had found be shut down. The oil company, Modus, Inc., responded that its wastewater didn't contaminate the aquifer because it had the same salt level as the aquifer it was going into.

What Samarin didn't know was that his wasn't an isolated case. It was happening all over California.

“Broken System”

“There are thousands of wells spread all across the state that are potentially impacting clean drinking water,” says Briana Mordick of the Natural Resources Defense Council.

State oil regulators grant permits for wastewater injection wells, so knowing the boundaries between protected and unprotected aquifers is crucial. But for decades, Mordick says, state regulators confused those boundaries.

“It's just a pretty shocking state of affairs,” says Mordick. “Just poor communication, poor record-keeping. It looks like a completely broken system.”

“Our records weren't solid,” admits Teresa Schilling, a spokesperson for the division of oil and gas. “They were missing in many cases and it's essential that we have accurate records.”

<https://www.kqed.org/stream/anon/radio/science/2017/08/ScienceOilWastewaterSommer170802.mp3>

In some cases, the aquifer maps were decades old with fuzzy boundaries. In other cases, the records regulators used to make decisions were mixed up 30 years ago. The Environmental Protection Agency had a complete list of the protected aquifers, but for unknown reasons, California oil regulators were working from an incomplete list that didn't include 11 protected aquifers.

“We understand that the public has concern about what's at stake with their drinking water,” says Schilling. “We all know we have a right to clean drinking water and we have a right to expect that our government will take care of that for us.”

What regulators are doing now, Schilling says, is reviewing records for thousands of wastewater injection wells, looking for mistakes. So far, about 175 wells have been shut down.

But six years after the problems emerged, there are still hundreds of wastewater wells operating in protected aquifers, mostly in Kern and Tulare counties. Schilling says these aquifers aren't drinking-water quality and the state is going through the process of approving them for wastewater disposal. That was supposed to happen by February, but the process is still unfinished.

“It's very hard as a government entity to move fast but this has been a top priority at the Department of Conservation,” she says.

Minimal Testing

Still not fully understood is what impact all this has had on the quality of California's drinking-water aquifers.

"The testing that has been performed has been minimal, I would say," says John Borkovich of the State Water Resources Control Board.

The agency has tested some of the drinking water wells within a mile of the wastewater wells that were wrongly permitted. The tests looked at the quality of the drinking water.

Borkovich says officials have found no correlation between wastewater injection and "anything we're finding in the water supply wells." So far.

"Just because we haven't seen anything, doesn't mean there isn't an issue out there," he said.

The next, bigger challenge is determining what the long-term impact of wastewater has been on the larger aquifers. Some wastewater wells have been operating for decades.

<https://www.kqed.org/.stream/anon/radio/science/2017/08/oilwastewaterpt2.mp3>

KQED asked oil regulators for records showing contamination levels of the wastewater that oil companies put into the cleanest aquifers. Officials say they can't produce those records for KQED, because the information is in stacks of paperwork, spread across several regional offices. They also say the division of oil and gas isn't looking at that question.

Given how far back the permitting problems go, it could be a challenge for the state to reconstruct what's happened underground.

"We don't necessarily have good records of what the quality of that water would have been 20 years ago when they started doing this," said NRDC's Mordick. "So trying to figure out whether their actions have impacted the water is really difficult at this point."

Mordick adds that the state may be overlooking certain chemicals in their testing.

"One of the complicating things is that the state doesn't require disclosure of most of the stuff that oil and gas operators use," Mordick says. "Things like drilling fluids, or maintenance fluids, enhanced oil recovery operations, so really, we wouldn't know what to test for."

The aquifers in question may not contain groundwater that California needs right now, but future droughts are inevitable.

"Those resources are becoming more and more valuable over time," says Mordick. "Protecting our groundwater is really important. They need to follow the rules and California needs to step up and take this seriously because they haven't been for a long time."

State water regulators say they hope to figure out what the larger impacts have been in the years ahead, but have no set timeline. The risk is that they've allowed oil companies to contaminate drinking water aquifers to such an extent that Californians may have permanently

lost those sources of fresh water.

How Much Drinking Water Has California Lost to Oil Industry Waste? No One Knows 1

September, 2017 Lauren Sommer

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