

February 8, 2017

By E-mail

County of Monterey
Resource Management Agency – Planning
Attn: Carl Holm, Director of Planning
168 West Alisal, 2nd Floor
Salinas, CA 93901
CEQAcomments@co.monterey.ca.us

Re: Slama Kenneth Eugene TR, File Number PLN140223

Dear Mr. Holm:

We write on behalf of LandWatch Monterey County and The Open Monterey Project to comment on the Initial Study and proposed negative declaration (“IS/ND”) for the combined development permit sought by Kenneth Slama for development of apartments and a self-storage use at 14 Spreckles Lane (the Project”). The County cannot approve the Project for the following reasons:

- The Project requires an environmental impact report to assess cumulative water supply impacts.
- The Project cannot be found consistent with General Plan Policies PS 3.1, which requires a finding of a long term sustainable water supply; and
- The Project cannot be found consistent with General Plan policy LU 1.19, which requires adoption of a Development Evaluation system to provide a “systematic, consistent, predictable, and quantitative method for decision-makers to evaluate developments of five or more lots or units and developments of equivalent or greater traffic, water, or wastewater intensity.”
- The Initial Study and proposed negative declaration are not adequate as CEQA documents.

LandWatch and The Open Monterey Project ask that the County refrain from any further action on this project until these problems have been addressed.

1. The County must prepare an environmental impact report to address cumulative water supply impacts.

The Project will obtain its water supply from pumping groundwater from a new well in the Pressure Subarea of the Salinas Valley Groundwater Basin (“SVGB”). The IS/ND entirely fails to assess potential cumulative impacts from the Project’s water use to the Pressure Subarea and the SVGB. An initial study must provide the factual basis, with analysis included, for making the determination that no significant impact will result from the project. 14 Cal.Code.Reg. § 15063(d)(3). Because the IS/ND does not discuss cumulative water supply impacts, and, indeed, does not even quantify baseline or proposed water use, it fails to provide any factual basis for a determination that there would be no significant impact.

CEQA requires an EIR be prepared when there is evidence (1) that there is a significant cumulative impact and (2) that the proposed project would make a considerable contribution to that impact – even if the proposed project’s impact is “individually limited.” 14 Cal.Code.Reg. § 15064(h)(1).

As explained in the attached letter from hydrologist Tim Parker, there is clearly a significant cumulative impact from groundwater pumping in the Pressure Subarea and the SVGB, and there are no currently committed or funded groundwater management projects that could be relied upon to avoid this significant impact. Furthermore, the Project’s increase in groundwater pumping would make a considerable contribution to this significant cumulative impact, especially in light of the current recommendation that the County reduce, not increase, groundwater pumping in the Pressure Subarea in order to mitigate persistent, long-term overdraft conditions, falling groundwater levels, and seawater intrusion.

An agency must prepare an EIR whenever it is presented with a “fair argument” that a project may have a significant effect on the environment, even if there is also substantial evidence to indicate that the impact is not significant. *No Oil, Inc. v. City of Los Angeles*, 13 Cal.3d 68, 75 (1974); *Friends of B St. v. City of Hayward*, 106 Cal.App.3d 988, 1002 (1980); Guidelines § 15064(f)(1); *see also* Pub. Res. Code § 21151. Critically, where there are conflicting opinions regarding the significance of an impact, California courts reflect “a preference for resolving doubts in favor of environmental review when the question is whether any such review is warranted.” *Stanislaus Audubon Soc’y v. County of Stanislaus*, 33 Cal.App.4th 144, 150-51 (1995). “For purposes of CEQA, “substantial evidence” is defined as including: “facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.” 14 Cal.Code.Reg. § 15064(f) (5). Thus, under the CEQA statute and regulations, if there is disagreement among expert opinion supported by facts over the significance of an effect on the environment, the lead agency “shall treat the effect as significant and shall prepare an EIR.” *Id.* at subd. 15064(g).

Here, the expert opinion of hydrologist Tim Parker, supported by the facts he cites, requires that the County prepare an environmental impact report for the Project.

2. The Project cannot be found consistent with Policy PS 3.1 of the 2010 Monterey County General Plan.

Policy PS 3.1 of the 2010 Monterey County General Plan requires a specific finding based on substantial evidence that there is a long-term, sustainable water supply, both in quality and quantity, to serve any new development for which a discretionary permit is required. PS 3.1 provides that there is a *rebuttable* presumption of a long-term, sustainable water supply in Zone 2C of the Salinas Valley Groundwater Basin. The attached comments by Tim Parker do rebut that presumption and demonstrate that there is no substantial evidence of a long-term, sustainable water supply for new development projects in the Pressure Subarea. Indeed, in the most recent definitive report on the state of the Salinas Valley Groundwater Basin, the County's own consultants have advised the Board of Supervisors that current groundwater pumping is "not sustainable" and have recommended pumping *reductions*:

Based on the continued large storage declines in the East Side and Pressure Subareas (and resulting groundwater head declines and seawater intrusion), the current distribution of groundwater extractions is not sustainable.¹

In light of this, the County cannot find that this project is consistent with Policy PS 3.1.

3. The Project cannot be found consistent with Policy LU 1.19 of the 2010 Monterey County General Plan.

The County has not yet implemented General Plan Policy LU 1.19, which mandates preparation of a Development Evaluation System ("DES") "to provide a systematic, consistent, predictable, and quantitative method for decision-makers to evaluate developments of five or more lots or units and developments of equivalent or greater traffic, water, or wastewater intensity." The DES applies to this Project because it is not within a Community Area, Rural Center, or Affordable Housing Overlay district.

General Plan Policy LU 1.19 mandates that the County establish the DES "within 12 months of adopting this General Plan," i.e., by October 26, 2011. The DES is now *five years* overdue. Planning staff did not bring the first workshop proposal for the DES to the Planning Commission until July 31, 2013. The Planning Commission did not review the proposal in detail. Instead, based on a discussion led by Commissioners Diehl, Vandevere, and Brown, the Commission provided direction to staff to return with

¹ Monterey County Water Resources Agency, State of the Salinas River Groundwater Basin, 2015, pp. ES-16,6-3, available at http://www.mcwra.co.monterey.ca.us/hydrogeologic_reports/documents/State_of_the_SRGBasin_Jan16_2015.pdf

a modified proposal at some uncertain date in the future. LandWatch has provided specific comments to staff regarding the scope and content of the DES.

The DES is a mandatory requirement of the General Plan and a critical constraint on sprawl development. Projects subject to the DES cannot be approved until the County establishes the objective, systematic scoring system that Policy LU 1.19 requires. Accordingly, the County should not approve this Project until it implements its General Plan by establishing the DES and evaluating this Project with the DES.

i. Relevant provisions of the DES

The DES must be an objective and predictable scoring system to determine which projects may be approved. Thus, it must be “a pass-fail system and shall include a mechanism to quantitatively evaluate development in light of the policies of the General Plan and the implementing regulations, resources and infrastructure, and the overall quality of the development.”

The DES is required to include evaluation criteria, including but not limited to the following:

- a. Site Suitability
- b. Infrastructure
- c. Resource Management
- d. Proximity to a City, Community Area, or Rural Center
- e. Mix/Balance of uses including Affordable Housing consistent with the County Affordable/Workforce Housing Incentive Program adopted pursuant to the Monterey County Housing Element
- f. Environmental Impacts and Potential Mitigation
- g. Proximity to multiple modes of transportation
- h. Jobs-Housing balance within the community and between the community and surrounding areas
- i. Minimum passing score

Since the DES must be objective, quantitative, and predictable, and must create a pass-fail system with a minimum score, the County must devise a scoring system that implements at least the criteria enumerated in LU Policy 1.19.

LU Policy 1.19 also provides specific criteria for affordable housing for residential development subject to the DES, i.e., any project of five or more units outside Community Areas, Rural Centers, and Affordable Housing Overlay districts. These affordable housing requirements are as follows:

- 1) 35% affordable/Workforce housing (25% inclusionary; 10% Workforce) for projects of five or more units to be considered.
- 2) If the project is designed with at least 15% farmworker

inclusionary housing, the minimum requirement may be reduced to 30% total.

- ii. *The purpose of the DES is to avoid sprawl development and encourage development that meets General Plan aspirational goals.*

LU 1.19 is an important form of mitigation to avoid impacts associated with sprawl development. The announced purpose of LU 1.19 was also to ensure that the Community Areas and Rural Centers remain the priority areas for growth and that only 20% of future growth occurs outside these designated growth areas. See, e.g., 2010 General Plan FEIR, Master Response 2.1.2.

When the Planning Commission reviewed and rejected staff's initial version of the DES, they provided essential guidance that illuminated the purpose of the DES.

- The DES is not a device for determining whether a project is consistent with the General Plan. If a project is not consistent with the General Plan, it should not even be reviewed under the DES.
- The DES must be designed to screen out all but the exceptional projects that justify departing from the goal of focusing growth in Community Areas and Rural Centers.
- The DES must be designed to implement the General Plan goal to limit growth outside these areas 20% of overall growth.
- The DES must provide a pass/fail system, with a minimum passing score.
- The DES must provide objective criteria.
- Projects should be rewarded for meeting the General Plan's aspirational goals and exceeding its minimum standards.

- iii. *The County should move to establish the DES promptly, and it should not deem applications complete or approve projects subject to the DES until it establishes the DES.*

The County has a mandatory duty to establish a DES, and to do so timely, since LU Policy 1.19 states that it "shall be established within 12 months." Accordingly LandWatch and The Open Monterey Project ask that the County ensure that implementation of LU 1.19 be made a priority.

LU Policy 1.19 provides that the development projects subject to its provisions must meet the minimum passing score of a DES. Approval of such projects without scoring them through a DES, which must be established as a "systematic, consistent, predictable, and quantitative method for decision-makers to evaluate developments," would be inconsistent with the General Plan.

In short, establishment of the DES is an essential prerequisite to approving projects subject to LU Policy 1.19. Until the County establishes a DES, approving a

residential project of 5 or more units, or a development of equivalent traffic, water or wastewater intensity, outside a Community Area, Rural Center, or Affordable Housing overlay would be *ultra vires* because the County is powerless to issue permits that are inconsistent with the General Plan.

Until the DES is established, LandWatch and The Open Monterey Project ask that the County refrain from deeming any development application for a project subject to LU 1.19 complete or from approving any such project, including the Slama Project.

4. The Initial Study and proposed negative declaration are not adequate as CEQA documents.

If it were adequate, which it is not, the CEQA document should be called a mitigated negative declaration, instead of a negative declaration. On its face, Initial Study states that Project will only be “consistent *after compliance with conditions of approval*” (initial study, p. 7, emphasis added) and “*impacts . . . would be reduced to less than significant impact through implementation of a condition of requiring submittal of an approved drainage plan*” (p. 19, emphasis added), and other conditions and mitigations would be imposed (see pp. 34, 36). There is no evidence that the applicant has agreed with the proposed conditions and mitigations, as required before the environmental document is released for public review. Because the required conditions are not identified as mitigation measures, the IS/ND is not an adequate CEQA document.

As noted by Mr. Parker, the Initial Study fails to present an adequate investigation and quantification of the baseline water use and the proposed water use. If there is an existing water use at the site, and what is the amount pumped? How much is used for potable purposes? The existing well appears to be on another parcel, not on the project parcel, according to the Project plans.

The Initial Study fails adequately to describe the current residential use called a “caretaker unit.” How many square feet is it, how many bedrooms and how many bathrooms, and is it habitable or abandoned? Is it occupied? This information is relevant to traffic and water use but it is absent from the initial study.

The Initial Study states that an EIR “was written in June 1974” to permit removal and storage of sand from the riverbed” (p. 18). Why is this information included in the Initial Study? Was the EIR certified? Is sand removal permitted now, and if so, in what quantities? Is sand removal part of the project? What activities are proposed to take place at the property, in addition to the proposed Project activities?

There is no statement of how many square feet of new impervious coverage the Project will create. The Project description merely describes one of the project elements as follows: “asphalting circulation areas,” without adequate quantification of the new asphalt areas. The new development and additional impermeable coverage foreseeably will require water capture and detention and retention systems to comply with the new

RWQCB and County stormwater requirements. These requirements and the infrastructure that will be necessary are not adequately addressed or disclosed as part of the Project, and their impacts have not been adequately addressed.

The Project plans state the project would develop 89,895 square feet of buildings and “92,347 SF” of “FLOOR AREA.” That is more than 10% greater than the claimed “80,195” s.f. claimed in the initial study (p. 3).

The Initial Study claims that the project will not develop the 3 acres closes to the Salinas River. However, Building G on the Project plans looks quote close to the river. We cannot tell how close because we cannot find an obvious statement of the scale that should be stated on the plans.

The traffic analysis is internally inconsistent and illogical. The analysis does not present a logical baseline. The claimed “existing uses trip generation” in the application is a theoretical calculation, and not an actual on-the-ground baseline, which is what is required. The claimed “existing uses trip generation” results in a figure that is materially and significantly higher than the actual baseline as reported by observation by individuals, including the observations of the traffic consultant reported in the traffic study.

For example, the applicant’s traffic study claims that the RV Storage would have 82.55 trips per day. This large figure puffs up the total “existing uses trip generation” to a claimed 224.16 per day, according to the applicant. (Taluban ltr, p. 2.) However, the applicant’s traffic study reports the on-the-ground reality as one trip (1) attributable to the RV storage use on the day the traffic consultant visited the site (Taluban ltr, p. 1).

As another example, the Initial Study claims that the mini-storage will have “an expected twenty (20) . . . visitors daily.” That claim of 20 visitors is not consistent with and materially less than the applicant’s traffic study which states that the Mini-Storage” use will generate 115.15 daily trips. There is no explanation of the inconsistency between the terms “visitors” and “trips.”

The project appears to propose a massive building and “concrete masonry wall” on the ag buffer area. (Applicant Project Plans, sheet B-1.) The building would replace the existing trees. There is no analysis of the visual impact of this proposal. The height of the building is not disclosed, nor the visual appearance.

The Initial Study improperly presents the “concept landscape plan” as the “proposed site plan.” (P. 3.) In fact, the “Site Plan” sheet C-1a of the applicant’s Project plans is not presented in the Initial Study. That page contains important and material information that is relevant to the Project and that was omitted by the Initial Study. For example, the Site Plan states that the “Land Use Designation” is “Farmlands - 40 acre”; that claim is not consistent with the Initial Study claim that the designation is “commercial.” As another example, the Site Plan states that the “Zoning” is “HC &

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F/127-D”; that claim is not consistent with the Initial Study claim that the designation is “commercial.”

LandWatch and The Open Monterey Project ask that the County correct the foregoing informational inadequacies of the Initial Study, and do so in an EIR for the Project.

Yours sincerely,

M. R. WOLFE & ASSOCIATES, P.C. and STAMP | ERICKSON



John Farrow
Molly Erickson

JHF:hs
Enclosure

Technical Memorandum

February 8, 2017

To: John H. Farrow, M.R. Wolfe Associates, P.C., Attorneys-at-Law

From: Timothy K. Parker, PG, CEG, CHG, Parker Groundwater

Subject: Technical Review of Initial Study for the Kenneth Slama project at 14 Spreckles Lane.

At your request I have reviewed the Initial Study for the Kenneth Slama project at 14 Spreckles Lane together with the documents cited in the discussion below. My conclusions are set out below.

I am a California Professional Geologist (License #5584), Certified Engineering Geologist (License # EG 1926), and Certified Hydrogeologist (License #HG 12), with over 25 years of geologic and hydrologic professional experience. I serve as a member of the Technical Advisory Committee to the Monterey County Water Resources Agency in connection with its ongoing study of the Salinas Valley Groundwater Basin that is mandated by Policy PS 3.1 of the 2010 Monterey County General Plan. The purpose of that study is to evaluate historic data and trends in seawater intrusion and groundwater levels in the Salinas Valley Groundwater Basin, to evaluate the likely future groundwater demand, to determine whether groundwater level declines and seawater intrusion are likely to continue through 2030, and to make recommendations for action. This study has not been concluded, but a preliminary report was released in January 2015 by the prime consultant for the PS-3.1 study.¹ My Resume and Project Experience are attached.

A. Cumulative pumping in the Salinas Valley Groundwater Basin (SVGB) and the Pressure Subarea of the Salinas River Groundwater Basin (Basin) has resulted in aquifer depletion and associated seawater intrusion, and current groundwater management efforts are not sufficient to avoid this significant cumulative impact.

1. Overdraft and seawater intrusion in the Salinas Valley Groundwater Basin

The project will obtain its water supply from a new well in the California Department of Water Resources Bulletin 118 180/400-Foot Aquifer Subbasin ("180/400-Foot Aquifer") at the northwest end of the Salinas Valley Groundwater Basin², and within the Pressure

¹ Brown And Caldwell, State of the Salinas River Groundwater Basin, January, 2015, available at http://www.mcwra.co.monterey.ca.us/hydrogeologic_reports/documents/State_of_the_SRGBasin_Jan16_2015.pdf.

² County of Monterey, Initial Study, Kenneth Slama project at 14 Spreckles Lane, January 19, 2017, p. 3.

Subarea of the Salinas River Groundwater Basin. The Pressure Subarea is one of the seven hydrologic subareas making up the Salinas River Groundwater Basin (Basin)³, and roughly encompasses the 180/400-Foot Aquifer, Seaside and Monterey groundwater subbasins (previously 180/400-Foot Aquifer, Seaside and Corral de Tierra subbasins until DWR modified the boundaries and names in 2016). Overdraft in the Pressure Subarea has averaged about 2,000 acre-fee per year (“afy”) from 1944 to 2014, and the Basin as a whole is “currently out of hydrologic balance by approximately 17,000 to 24,000 afy.”⁴ Pumping from the Basin has exceeded recharge since the 1930s, causing seawater intrusion as inland groundwater elevations dropped below sea level, permitting the hydraulically connected seawater to flow inland.⁵ Seawater intrusion has advanced more than 5 miles inland, rendering significant groundwater unusable for irrigation or domestic uses.⁶

The rate of seawater intrusion is variable, increasing and decreasing with changes in precipitation, but the long-term trend has been a progressive advance in both the 180-foot and 400-foot aquifers.⁷ The current prognosis for the Pressure Subarea is for further seawater intrusion due to continued groundwater elevations below sea-level including the latent effects of the recent drought:

The fact that groundwater elevations are well below the documented protective elevations indicates that the P-180 Aquifer continues to be susceptible to seawater intrusion, and it is unlikely that this situation will be reversed in the coming years, particularly if the current drought conditions continue. Based on the observed time lag (latency) between the end of the historic drought (WY 1991) and the end of the resulting chloride concentration increase (around 1999), one can predict that the 2013 chloride levels reported for coastal wells could show upward concentration trends over the coming years as the SWI front advances, even if wetter climate

³ MCWRA, Protective Elevations to Control Seawater Intrusion in the Salinas Valley (“Protective Elevations”), 2013, p. 2, available at http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/documents/ProtectiveElevationsTechnicalMemorandum.pdf; Brown and Caldwell, State of the Salinas River Groundwater Basin, 2015, Section 3.

⁴ Brown And Caldwell, State of the Salinas River Groundwater Basin, pp. 6-3.

⁵ MCWRA, Protective Elevations, pp. 4—5; Brown and Caldwell, State of the Basin, pp. 2-4, 5-2; MCWRA, Salinas Valley Water Project Draft EIR (“SVWP DEIR”), 2001, pp. 1-2 to 1-8, available at http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_1/documents/DEIR_EIS_2001/2001%20SVWP_DEIR_2001.pdf.

⁶ Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 5-2 to 5-6; *see also* California Department of Water Resources, Bulletin 118, Salinas Valley Groundwater Basin, 180/400 Foot Aquifer Subbasin, available at <http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/3-04.01.pdf>.

⁷ Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 5-2 to 5-9.

conditions return. The study area has had three straight years of severe drought conditions, and continued drought conditions are projected to cause substantial declines in both groundwater head (Section 3.4) and storage (Section 4.4).⁸

The California Department of Water Resources (DWR) is required by the Sustainable Groundwater Management Act to designate as “critically overdrafted” basins those groundwater basins for which “continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.”⁹ DWR identified the 180/400-Foot Aquifer of the Salinas Valley Groundwater Basin as critically overdrafted in January 2016.¹⁰

2. Efforts to control seawater intrusion

The Monterey County Water Resources Agency (“MCWRA”) and predecessor agencies have implemented several projects to address seawater intrusion by storing surface water, increasing recharge, and reducing groundwater pumping along the coast.¹¹ These include the Nacimiento and San Antonio Reservoirs, water recycling to support the Castroville Seawater Intrusion Project, and the Salinas Valley Water Project (SVWP). The SVWP is the most recent of these projects, completed in 2010.

The EIR for the SVWP explains that seawater intrusion is determined by the amount and location of pumping, and varies in response to annual patterns of precipitation. Because coastal pumping causes greater intrusion impacts, the most effective mitigation for seawater intrusion is a reduction of pumping in coastal areas.¹² However, total pumping in the hydraulically connected SVGB also matters:

[P]umping in the coastal area closest to the seawater intrusion front has a greater influence on seawater intrusion than pumping in a valley area more distant from the

⁸ Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 5-7 to 5-8, see Tables 3-2 and 4-6 in Sections 3.4 and 4.4.

⁹ DWR, Critically Overdrafted Basins, available at <http://www.water.ca.gov/groundwater/sgm/cod.cfm>.

¹⁰ DWR, Critically Overdrafted Basins (1/2016), available at http://www.water.ca.gov/groundwater/sgm/pdfs/COD_BasinsTable.pdf.

¹¹ Marina Coast Water District (MCWD), 2015 Urban Water Management Plan (UWMP), 2016, pp. 42-43, available at http://www.mcwd.org/docs/agenda_minutes/2016-06-06_board/Item%2011-A%20-%20MCWD%20Draft%202015%20UWMP%20v20160520.pdf.

¹² MCWRA, SVWP Final EIR, p. 2-36, available at http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_1/documents/Final%20EIR-EIS%20SVWP_RTC-Vol%201.pdf.

front. Nevertheless, pumping in each area affects seawater intrusion because each subarea draws water from the same Basin.¹³

The 2002 SVWP EIR predicted that the SVWP could halt seawater based on the amount and location of 1995 demand.¹⁴ However, it could not assure that the SVWP would halt seawater intrusion in 2030, even though total demand was estimated to decline, because of projected urban growth and associated higher demand in the northern end of the Basin, e.g., the Fort Ord area.¹⁵

As noted in Section 3.2.4, overall water demand in the Basin is anticipated to decline by 2030, but total urban needs are projected to increase from 45,000 acre-feet per year (AFY) in 1995 to 85,000 AFY (a 90% increase) based on projected growth, a large part of which is expected to occur in the northern end of the valley. The modeling shows that with projected 2030 demands, seawater intrusion with implementation of the proposed project may total 2,200 acre-feet per year (AFY) (10,500 AFY of intrusion is anticipated to occur without the project). For this reason, the Draft EIR/EIS reports that the SVWP may not halt seawater intrusion in the long term.¹⁶

The SVWP EIR also cautioned that “any additional water needs within an intruded groundwater basin would exacerbate seawater intrusion.”¹⁷

3. Seawater intrusion will not be controlled by current management efforts because demand has exceeded projections.

Attachment 1 presents a discussion of the SVWP modeling assumptions compared to subsequent conditions and a discussion of MCWRA’s current acknowledgement and scientific documentation that the existing groundwater management projects are not sufficient to halt seawater intrusion in the SVGB. Attachment 1 demonstrates that:

- The SVWP EIR assumed that Basin groundwater pumping would decline substantially from 1995 to 2030, from 463,000 afy to 443,000 afy, based on large expected reductions in agricultural pumping, which dominates Basin water demand. However, groundwater pumping in the 20 years since 1995 substantially exceeded 1995 levels, averaging well over 500,000 afy.

¹³ MCWRA, SVWP Final EIR, p. 2-35 to 2-36 (emphasis in original).

¹⁴ MCWRA, SVWP DEIR, pp. 3-23 to 3-24.

¹⁵ Id.

¹⁶ MCWRA, SVWP Final EIR, p. 91.

¹⁷ MCWRA, SVWP Draft EIR, p. 7-7.

- Modeling for the SVWP understated the level of post-1995 pumping that has actually occurred and that, in any event, the SVWP EIR only claimed the SVWP would halt seawater intrusion based on 1995 land use.
- The existing groundwater management projects have only been able to slow seawater intrusion. While reports show that the rate of seawater intrusion has declined since the last drought-induced spike in intrusion during 1997-1999, intrusion continues. Furthermore, a new drought-induced spike, which typically follows a drought after a lag period of some years, is now likely to occur due to the latent effects recent drought.¹⁸
- Thus, MCWRA has concluded that a new project or projects supplying an additional 48,000 afy of groundwater recharge, over and above that supplied by the SVWP, would be required in order to maintain protective groundwater elevations sufficient to control seawater intrusion.

B. The project will increase pumping from the Pressure Subarea and this will make a cumulatively considerable contribution to a significant cumulative impact.

The CEQA Guidelines, Appendix G, threshold of significance recited by the Project's Initial Study at page 25, defines a significant groundwater impact to include aquifer depletion leading to declining groundwater levels and net deficits. Based on this threshold, there is a significant cumulative impact from all cumulative groundwater pumping in the Basin as a whole and the Pressure Subarea in particular. The Initial Study for the Project fails to acknowledge this in its discussion of cumulative impacts at pages 34-35.

The Initial Study fails also to quantify baseline water use from the current use or to estimate water uses from the proposed new uses. Attachment 2 provides an estimate of current baseline water use and projected future water use based on the description of existing and proposed uses in the Initial Study using available data sources for typical water demand for the baseline and proposed land uses. We estimate that the project would increase water use over baseline conditions by approximately 1.4 afy.

In light of the critical overdraft condition of the Basin as a whole, the Pressure Subarea with continuing and chronic seawater intrusion, any additional pumping in the Pressure Subarea should be deemed a considerable cumulative contribution to the significant cumulative impact from all pumping sources. Additionally, the County's consultants charged with assessing the state of the Salinas Valley Groundwater Basin have recommended reductions in pumping of the Subarea as one of the mitigations.¹⁹

¹⁸ Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 5-7 to 5-8.

¹⁹ Brown and Caldwell, State of the Salinas River Groundwater Basin, p. 6-4.

Attachment 1 – Modeling assumptions and outcomes for the SVWP; MCWRA’s acknowledgment that the SVWP will not halt seawater intrusion

1. The SVWP EIR did not project that the SVWP would halt long-term seawater intrusion.

MCWRA prepared and certified an EIR for the SVWP in 2001 and 2002. (MCWRA, SVWP EIR, 2002.) Based on specific assumptions about future demand and safe yield (discussed below), the SVWP EIR projected that the proposed SVWP “would reverse the annual reduction in groundwater storage to an approximately 2,500 AFY increase in groundwater storage.” (SVWP FEIR 3-30.) Thus, it projected that seawater intrusion could be halted. However, the SVWP EIR qualified this conclusion in two critical respects.

First, the SVWP EIR cautioned that “any additional water needs within an intruded groundwater basin would exacerbate seawater intrusion.” (SVWP EIR, p. 7-7.) So the conclusion was tied to specific assumptions regarding water use. As discussed below, future water use is projected to exceed the levels projected in the SVWP EIR. Indeed, MCWRA’s Rob Johnson acknowledged to the Monterey County Planning Commission that the SVWP EIR demand projections were not accurate and that pumping was more than projected. (Transcript of Monterey County Planning Commission, Oct. 29, 2014, p. AR005187; available in video file at http://monterey.granicus.com/MediaPlayer.php?view_id=14&clip_id=2745.)

Second, the SVWP EIR acknowledged that the proposed project would only halt seawater intrusion based on 1995 levels of demand:

While the SVIGSM indicates that seawater intrusion will be halted by the project (in conjunction with the CSIP deliveries) based on current (1995) demands, with a projected increase in water demands (primarily associated with urban development) in the north valley area in the future, seawater intrusion may not be fully halted based on year 2030 projections. For the year 2030, modeling indicates seawater intrusion may be 2,200 AFY with surface water deliveries only to the CSIP area. (SVWP DEIR, p. 3-23.)

The Department of the Interior pointed out that the SVWP EIR contradicts itself in stating that “the proposed action would halt seawater intrusion” and also that “hydrologic modeling shows that the project may not halt seawater intrusion in the long-term future” and asked for clarification. (SVWP FEIR, p. 2-82, comment 2-12.) In response, the SVWP FEIR again acknowledged that its modeling only showed that the SVWP would “halt seawater intrusion in the near term” based on 1995 water demand. (SVWP FEIR, p. 2-91.) However, with anticipated 2030 demand, that modeling showed that “seawater intrusion with implementation of the proposed project may total 2,200 acre-feet per year (AFY) (10,500 AFY of intrusion is anticipated to occur without the project). For this reason, the Draft EIR/EIS reports that the SVWP may not halt seawater intrusion in the long term.”

(SVWP FEIR, p. 2-91.) The 2010 Monterey County General Plan EIR itself acknowledges that the SVWP may only halt seawater intrusion in the short term. (2010 General Plan EIR, p. 4.3-38.)

Questioned about this at the October 29, 2014 Monterey County Planning Commission hearing, MCWRA’s Rob Johnson acknowledged that the SVWP would only halt seawater intrusion based on 1995 land use. (Transcript of Monterey County Planning Commission Hearing, Oct. 29, 2014, p. AR005188.) As discussed below, Mr. Johnson also acknowledged that groundwater pumping is higher than anticipated by the SVWP EIR and that an additional 58,000 afy of groundwater, beyond that provided by the current suite of water supply projects, is still needed to halt seawater intrusion. (*Id.*, pp. AR005178-005179, 005189-005190.)

2. As MCWRA acknowledges, groundwater pumping has exceeded the level assumed in the SVWP EIR, and this vitiates its analysis, which was expressly based on the assumption that groundwater pumping would decline over time.

MCWRA reports show that pumping is much higher than predicted by the SVWP EIR. To determine the extent of overdraft and seawater intrusion, the SVWP EIR relied on modeling provided by the Salinas Valley Integrated Ground and Surface Water Model (“SVGISM”), which in turn was based on assumptions regarding land use, population, and water use. (SVWP EIR, pp. 5-1 (identifying baseline and future conditions), 5.3-10 to 5.3-11 (overview of SVGISM), 7-4 to 7-5 (detailing major assumptions used in the SVGISM regarding population and irrigated acreage).)

As set out in the table below, the SVWP EIR reported its assumptions and modeling results for two scenarios: 1995 baseline conditions and 2030 future conditions:

SVWP EIR: population and land use assumptions with baseline and projected water use	1995	2030
Population	188,949 persons	355,829 persons
Urban water pumping	45,000 afy	85,000 afy
Farmland	196,357 acres	194,508 acres
Agricultural water pumping	418,000 afy	358,000 afy

Source: SVWP EIR, pp. 1-7 (Table 1-2, “Estimated Existing and Future Water Conditions”); pp. 5-1, 6-3, 7-3, 7-10 (identifying baseline and future conditions).

The SVWP EIR assumed that agricultural water use would decline by 60,000 afy from 1995 to 2030 due to a 5% increase in water conservation, changes in crop uses, and a 1,849 acre decrease in irrigated agricultural acreage. (SVWP EIR pp. 1-7, 7-5, 7-10.) The SVWP EIR assumed that urban water use would increase by 40,000 afy between 1995 and 2030 based on population growth and an assumed 5% per capita reduction in water demand due to conservation. (SVWP EIR, pp. 1-7, 7-5.)

In sum, the SVWP EIR assumed that groundwater pumping in Zone 2C would decline 20,000 afy over a 35 year period, from a total of 463,000 afy in 1995 to 443,000 afy in 2030.

In fact, in the first 20 years since 1995 pumping has greatly exceeded the SVWP EIR projection. Reported groundwater pumping in Zones 2, 2A, and 2B has averaged 502,161 afy. Adjusted to include an estimate for non-reporting wells in these zones, the average is 529,024. These data are based on the annual Ground Water Summary Reports published by MCWRA in 1995-2014, available at

http://www.mcwra.co.monterey.ca.us/groundwater_extraction_summary/groundwater_extraction_summary.php. The data are summarized in the table below.

Year	Ag	Urban	Total	Percent of wells not reporting	Total divided by percent of wells reporting to adjust for non-reporting wells
1995	462,268	41,884	504,512	2%	514,808
1996	520,804	42,634	563,438	4%	586,915
1997	551,900	46,238	598,139	7%	643,160
1998	399,521	41,527	441,048	7%	474,245
1999	464,008	40,559	504,567	9%	554,469
2000	442,061	42,293	484,354	11%	544,218
2001	403,583	37,693	441,276	18%	538,141
2002	473,246	46,956	520,202	7%	559,357
2003	450,864	50,472	501,336	3%	516,841
2004	471,052	53,062	524,114	3%	540,324
2005	443,567	50,479	494,046	2%	504,129
2006	421,634	49,606	471,240	4%	490,875
2007	475,155	50,440	525,595	3%	541,851

2008	477,124	50,047	527,171	3%	543,475
2009	465,707	45,517	511,224	3%	527,035
2010	416,421	44,022	460,443	3%	474,684
2011	404,110	44,474	448,584	3%	462,458
2012	446,620	42,621	489,241	3%	504,372
2013	462,873	45,332	508,205	3%	523,923
2014	480,160	44,327	524,487	2%	535,191
20 year average			502,161 afy		529,024 afy

Source: Ground Water Summary Reports published by MCWRA, 1995-2014, available at http://www.mcwra.co.monterey.ca.us/groundwater_extraction_summary/groundwater_extraction_summary.php.

The reported pumping data does not include any pumping from the portion of Zone 2C that is located outside of Zones 2, 2A, and 2B. (See Monterey County 2010 General Plan FEIR, pp. S-13, S-127.) The County estimated that this pumping amounted to at least 4,574 afy in 2005. (Monterey County 2010 General Plan FEIR, p. S-136.) Adding this to the adjusted average pumping total for Zones 2, 2A, and 2B, average pumping has been 533,598. This is 70,598 afy higher than the SVWP EIR's 1995 baseline and 90,598 afy higher than its projected 2030 demand.

As noted, the SVWP EIR analysis was based on specific assumptions about future water demand, and it cautioned that "any additional water needs within an intruded groundwater basin would exacerbate seawater intrusion." (SVWP DEIR, p. 7-7.)

In sum, for more than half of the planning period covered by the SVWP EIR's 1995-2030 projections, groundwater pumping has greatly exceeded its assumed demand levels. The amount by which actual demand exceeds assumed demand is two to three times greater than the amount of water that the SVWP was expected to provide.²⁰

²⁰ The SVWP was intended retain up to an additional 30,000 afy of water in dams and then provide about 9,700 afy of that water to the Castroville Seawater Intrusion Project ("CSIP") to replace groundwater pumping, about 10,000 afy to increase basin recharge, and another 10,000 afy for instream flow augmentation. Monterey County 2010 General Plan DEIR, pp. 4.3-36 to 4.3-38; Monterey County 2010 General Plan FEIR 2-68 to 2-71. The Monterey County General Plan DEIR, FEIR Supplemental materials, and FEIR are available at <http://co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-planning/resources-documents/2010-general-plan/draft-environmental-impact-report-deir>, <http://co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-planning/resources-documents/2010-general-plan/supplemental-material-to-final-environmental>, <http://co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-planning/resources-documents/2010-general-plan/final-environmental-impact-report-feir>.

MCWRA's Rob Johnson acknowledged that actual demand has exceeded the SVWP EIR's projections. (Transcript of Monterey County Planning Commission Hearing, Oct. 29, 2014, p. AR005187.) Mr. Johnson acknowledged that additional water supply projects delivering at least 58,000 afy will be required to halt seawater intrusion. (*Id.* pp. AR005178-005179, 005189-005190)

The growth in pumping is associated with increases in agricultural land use. As noted, the SVWP EIR assumed that irrigated agricultural acreage would decrease from 196,357 acres in 1995 to 194,508 acres in 2030. (SVWP EIR, p. 7-10.) However, agricultural acreage has actually increased since 1995.

- The SVWP Engineers Report reports that there were 212,003 acres of irrigated farmland in Zone 2C as of 2003. (SVWP Engineers Report, pp. 3-10, 3-15 (Tables 3-5 and 3-9 providing acreage totals for "Irrigated Agriculture"), available at http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_I/salinas_valley_water_project_I.php.) This is substantially more irrigated acreage than the 196,357 acres that the SVWP EIR reported for 1995. (SVWP EIR, p. 7-10.) The SVWP Engineers Report data were based on "parcel information, including land use, acreage, zone and other data" developed by MCWRA. (Engineers Report, p. 3-10.)
- The 2010 Monterey County General Plan EIR reported Department of Conservation farmland mapping data showing an increase of 8,209 acres of habitat converted to new farmland from 1996-2006 but only 2,837 acres of existing agricultural land lost to urban use. Monterey County 2010 General Plan DEIR, pp. 4.9-46 and 4.2-7 (showing farmland gains and losses 1996-2006 based on FMMP data). This represents a net gain of farmland of 5,372 acres, and does not account for additional water demands from multiple crops (2-4) per acre per season.

Furthermore, there is every reason to believe that the increase in irrigated acreage will continue and that the decrease in irrigated agricultural land between 1995 and 2030 projected in the SVWP EIR will not occur. Based on the past data related to conversion of habitat to farmland, the 2010 Monterey County General Plan DEIR projected that future agricultural acreage would increase from 2008 to 2030, and the General Plan FEIR admitted that the large future net increase in farmland would create additional water demand not anticipated by the SVWP EIR: 17,537 afy of water. (Monterey County 2010 General Plan DEIR, p. 4.9-64 (Table 4.9-8); Monterey County 2010 General Plan FEIR, pp. 2-38, 4-129 (revised table 4.9-8), S-19 to S-20, S-137 to S-138 (revised Table 4.3-9(c), note 7)).

3. MCWRA also acknowledges that the existing SVWP will not halt seawater intrusion and that additional water supply projects are required.

The MCWRA has acknowledged that the SVWP will not in fact be sufficient to halt seawater intrusion. In testimony to the Monterey County Planning Commission, MCWRA's Rob Johnson stated that the SVWP is not be the final water project needed to halt seawater intrusion and that it will in fact be necessary to find additional water supplies totaling at least 58,000 afy to achieve this. (Transcript of Monterey County Planning Commission

Hearing, Oct. 29, 2014, AR005164, 005178-005179, 005189-005190) The 58,000 afy figure is based on modeling performed by MCWRA in connection with its efforts to secure surface water rights on the Salinas River in order to mitigate seawater intrusion.

The MCWRA now seeks, under a settlement agreement with the State Water Resources Control Board, to perfect surface water rights to 135,000 afy of Salinas River water in order to construct an additional Salinas Valley water project to attempt to halt seawater intrusion. (See MCWRA, Salinas Valley Water Project Phase II, Overview, Background, Status, available at:

http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/salinas_valley_water_project_II_overview.php.)

MCWRA seeks to retain the right to the surface water entitlement by asserting the need for another project to halt seawater intrusion. Modeling undertaken for the MCWRA in 2013, establishes that an additional 135,000 afy of surface water flows will be needed in order to supply the additional 60,000 afy of groundwater that is now projected to be required to maintain groundwater elevations and a protective gradient to prevent further seawater intrusion. (Geoscience, Protective Elevations to Control Seawater Intrusion, Nov. 13, 2013, p. 11, available at:

http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/salinas_valley_water_project_II_overview.php (link to “Technical Memorandum.”))

The MCWRA has not yet conducted environmental review for a new project to supply the needed water. (See MCWRA, Salinas Valley Water Project Phase II, Status, available at:

http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/salinas_valley_water_project_II_project_status.php.) There is no assured funding source for it.

Although the MCWRA website refers to the currently proposed new project as “SVWP Phase II,” it is not the same project that was identified as a potential second phase of the SVWP in the 2001/2002 SVWP EIR. The second phase of the SVWP envisioned in the 2001/2002 SVWP EIR would have consisted of only an additional 8,600 afy of Salinas river diversion, increased use of recycled water, supplemental pumping in the CSIP area, and a pipeline and delivery to an area adjacent to the CSIP area. (SVWP EIR, p. 3-23 to 3-24.) The currently proposed project is much larger in scope and would include different and more extensive infrastructure: it would divert an additional 135,000 afy at two new diversion facilities and would deliver that water through injection wells, percolation ponds, direct supply of raw water, or a treatment system. (MCWRA, SVWP Phase II website, Project Description, available at:

http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/salinas_valley_water_project_II_overview.php)

To my knowledge, neither the SVWP Phase II project identified at the conceptual level in the 2001/2002 SVWP EIR nor the newly proposed SVWP Phase II has been planned at any level of significant detail or environmentally reviewed. The SVWP EIR and the Monterey County 2010 General Plan EIR both acknowledge that impacts related to the initially conceived second phase project have not been evaluated, and the Monterey County 2010 General Plan EIR treated these impacts as significant and unavoidable because they remain largely

unknown. (SVWP FEIR, pp. 2-92, 2-243; Monterey County 2010 General Plan, p. 4.3-146.) The phase two project now being discussed has not had any environmental review, but it would likely result in significant potential environmental impacts, based on MCWRA's determination that an EIR is required. (MCWRA Notice of Preparation of EIR, Salinas Valley Water Project Phase II, June 2014, available at: http://www.mcwra.co.monterey.ca.us/salinas_valley_water_project_II/salinas_valley_water_project_II_project_status.php.)

Finally, the 2015 State of the Salinas Valley Groundwater Basin report establishes that the SVGB as a whole and the Pressure Subarea are both being pumped unsustainably in excess of safe yield.²¹ This overdraft condition has caused, is causing, and will continue to cause seawater intrusion, particularly in the 180-foot and 400-foot aquifers of the Pressure Subarea.²²

In sum, the water supply provided by the SVWP is well documented to be insufficient to prevent cumulative groundwater pumping from further aggravating seawater intrusion. Major additional water supply projects with currently unknown potential environmental impacts will be required to address this significant cumulative impact.

²¹ Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 4-25 to 4-26.

²² Brown and Caldwell, State of the Salinas River Groundwater Basin, pp. 5-1 to 5-8, 6-1 to 6-4.

Attachment 2 – Estimated baseline and future water use for the Kenneth Slama project at 14 Spreckles Lane.

The existing uses include a 9,800 sq ft. commercial building containing 13 office spaces, 6 shop spaces, 8 reception areas, and three bathrooms. There is also a separate caretaker unit, an RV storage yard, and an agricultural equipment rental facility. The proposed uses would include replacement of the existing commercial building uses with a rental office, 4,300 sq. ft of storage, and 10 residential apartments. The rest of the existing uses would be replaced with an 80,195 square foot mini-storage facility in 13 buildings.

Existing and proposed non-residential water use can be estimated based on the Non-Residential Water Use Factors published by the Monterey Peninsula Water Management District.²³ Unit counts for the proposed self-storage use can be estimated based on industry suggested storage unit size mix.²⁴ Existing and proposed residential water use can be estimated based on the per capita water use data from the Cal Water 2016 Urban Water Management Plan.²⁵

²³ MPWMD, Rule 24, Non-Residential Water Use Factors, available at <http://www.mpwmd.net/wdd/forms/Non-Residential%20Factor%20List%20Revised%2020150701.pdf>. Office and warehouse use consumes 0.00007 AFY per sq. ft. Self-storage use consumes 0.0008 af/storage unit.

²⁴ Dan Curtis, Unit Mix for the Next Millennium, Inside Self-Storage, July 1, 1998, <http://www.insideselfstorage.com/articles/1998/07/unit-mix-for-the-next-millennium.aspx>. The average square footage of a storage unit ranges from 107 sf to 135 sf, depending on the target customer base (university/single family; mobile-home/multi-family; military; commercial). We use the mid-point of these averages, 121 sf.

²⁵ California Water Service, 2015 Urban Water Management Plan, June 2016, available at <https://www.calwater.com/conservation/uwmp/sln/>. Per capita data are from Appendix H, UWMP Standardized Tables, available at https://www.calwater.com/docs/uwmp2015/sln/Appendix_H_-_DWR_UWMP_Tables_Worksheets.pdf. Average per capita residential water use from 2001 to 2005 is 76.93 gpd. See Appendix H, Worksheet 15. The average number of persons per housing unit as of 2015 and projected through 2040 is 3.156. See Appendix H, Worksheet 12. Thus average use per residential unit, e.g., the existing caretaker unit, is (76.9 gpd x 3.156 persons per residential unit x 365 days per year) divided by 325,851 gallons per acre-foot, which comes to 0.2718548 acre-feet per residential unit per year. Average use per capita for the two-person studio apartments would be (76.9 gpd x 2 persons per residential unit x 365 days per year) divided by 325,851 gallons per acre-foot, which comes to 0.1722781 acre-feet per studio apartment per year

As estimated in the tables below, the proposed project would increase water use at the site by approximately 1.4 afy (rounded from 1.365 afy).

Existing use

Use	Water use factor	Water use
9,800 sf of office/shop space	0.00007 af/sf	0.686 afy
1 caretaker residence	0.2718548 afy	0.2718548 afy
total		0.958 afy

Proposed use

Use	Water use factor	Water use
10 studio apartments	0.1722781 af per 2 person apartment	1.723 afy
84,495 sf self-storage with average storage unit at 121 sf or 698 storage units	0.0008 af/storage unit	0.558 afy
600 sf office	0.00007 af/sf	0.042 afy
total		2.323 af



RESUME

Timothy K. Parker, PG, CEG, CHG
Principal

Sacramento, California ♦ tim@pg-tim.com

WORK EXPERIENCE

2009 – Present: Parker Groundwater, President/Principal. Sacramento, California. Independent technical consultant, specializing in strategic groundwater planning, SGMA comprehension and compliance, groundwater monitoring, groundwater modeling, groundwater recharge and aquifer storage recovery projects, program implementation, stakeholder facilitation, groundwater monitoring, policy and regulatory analysis, environmental document review and litigation support. Provides strategic planning, policy consulting and groundwater technical expertise to public and private sector clients to develop effective, sustainable solutions to complex problems in the water and evolving environmental and energy industries.

2005 – 2009: Schlumberger Water Services, Principal Hydrogeologist. Sacramento, California. Provided hydrogeologic expertise and project management on groundwater recharge and aquifer storage recovery projects, groundwater monitoring, groundwater resources management, and groundwater contaminant projects for public and private sector clientele. Application of advanced oilfield tools and technologies to groundwater projects. Integration of groundwater quality monitoring and protection on CO2 sequestration projects; liaison to Schlumberger Carbon Services, including planning, scope development, technical implementation, facilitation, and oversight. **Business Development** activities included strategic planning, prospect assessments, sales presentations, targeted workshops, client development and exploitation. Mentored and provided direction to staff; developed, tracked and controlled projects; worked closely with clients and other public and private organizations to implement projects on schedule, on budget with high level of quality.

2001 – 2005: California Department of Water Resources, Division of Planning and Local Assistance, Conjunctive Water Management Branch, Senior Engineering Geologist. Provided local technical and economic assistance to Sacramento and San Joaquin Valley groundwater authorities and water districts planning, developing, and implementing groundwater management plans and

program implementation, conjunctive water projects, groundwater recharge and aquifer storage recovery projects, and local and regional groundwater monitoring programs. Elements include developing technical scope, implementing work, providing geologic and groundwater technical expertise, attending and speaking at public meetings. **Central District, Groundwater Planning Section, Sacramento, California** (early 2001 prior to joining CWMB). **Senior Engineering Geologist, Groundwater Planning Section.** Elements included: Integrated Storage Investigations Program conjunctive use project technical support, coordination, and project management; technical support on local groundwater monitoring and subsidence programs; technical support on Bulletin 118; Proposition 13 groundwater grant applications screening and ranking process for Central District geographic area. Supervised and provided direction to staff; developed, tracked and controlled program budgets; worked closely with other DWR groups, agencies and outside organizations to develop additional local assistance opportunities for DWR.

2000-2001: California Department of Conservation, Division of Mines and Geology, Sacramento, California. Associate Engineering Geologist. Responsible for: multi-year aerial photograph review, identification of landslides and potentially unstable areas, field reconnaissance and confirmation, preparation of maps and images using MapInfo, Vertical Mapper, ArcView, Spatial Analyst, Model Builder, and ArcInfo working closely with GIS specialists; assisting in development of GIS methodologies and database for Northern California watersheds assessment/restoration project; review of timber harvest plans and pre-harvest inspections; review of regional CEQA documents as related to engineering geologic issues; watershed assessment; technical presentations at multi-agency meetings and landslide/mass wasting public workshops.

1997-2000: CalEPA Department of Toxic Substances Control, Stringfellow Branch, Sacramento, California. Hazardous Substances Engineering Geologist. Responsible for: groundwater monitoring and analysis; developing approach and preparing a work plan for a Stringfellow site revised hydrogeologic conceptual model; researching, providing, and maintaining a comprehensive environmental data management system; assembling and contracting with an expert panel for consultation on the site; evaluating an existing MODFLOW porous media groundwater flow model; providing direction on the strategy and approach for the development of a revised groundwater flow and fate & transport model for the Stringfellow site; providing input on an as

needed basis in support of the litigation and community relations elements of the project.

1993 - 1997: Law Engineering & Environmental Services, Inc., Sacramento, California. **Manager Project Management.** Responsible for supervising and providing direction to senior project managers; maintaining appropriate tracking system and controls for assurance of successful execution of scope, schedule and budget of major projects; maintaining quality assurance and controls on projects. Responsibilities included development/implementation of group budget spending plan, establishing performance standards and evaluating program progress and quality, staff recruiting, mentoring, maintaining utilization, business development, proposal preparation, commercial and government project marketing, client maintenance. **Project Manager** and **Senior Hydrogeologist** on hydrogeologic evaluations, site and regional groundwater quality monitoring programs, hazardous substance site investigations and remediation. Responsibilities included technical direction of projects, project scoping, schedule, budget, supervision of field activities, preparation of documents, developing cost-effective strategies for follow-on investigations and removal actions, and negotiating with state regulators on three Beale Air Force projects totaling more than \$15 million.

1988 - 1993: Dames & Moore, Sacramento and Los Angeles, California. **Senior Geologist.** Provided hydrogeologic technical support, project management, regulatory compliance, technical/regulatory strategy, and on a variety of commercial and industrial DTSC- and RWQCB-lead hazardous substance sites. Responsibilities included project technical direction, scope implementation, budgetary control, groundwater quality monitoring and analysis, supervision of field investigations, document preparation, client interface, negotiation with regulatory agencies on projects totaling approximately \$5 million.

1986 - 1988: California Department of Health Services, Toxic Substances Control Division, Southern California Region, Assessment and Mitigation Unit, Los Angeles, California. **Project Manager** in the Assessment and Mitigation Unit. Responsibilities included development and implementation of work plans and reports for, and regulatory oversight of, State Superfund preliminary site assessments, groundwater quality monitoring and analysis, remedial investigations, feasibility studies, remedial action, and interim remedial measures. **Engineering Geologist.** Provided technical support to Permitting, Enforcement, and Site Mitigation Unit staff, including evaluation of hydrogeologic assessments, groundwater quality monitoring programs,

work plans, and reports on federal and state Superfund sites and active facilities; assistance in budget preparation; assistance in zone drilling contract review.

1983-86: Independent Consultant, Sacramento, California. Provided technical assistance on variety of geologic and geophysics projects to other independent consultants in local area.

1982: Gasch & Associates, Sacramento, California. Geologic assistant conducting shallow seismic reflection surveys in the Sierra Nevada for buried gold-bearing stream deposits.

1981 - 1982: Geologic Assistant, Coast Ranges, Avawatz Mountains, White Mountains, and Kinston Peak Range. Geologic Assistant on various geological field studies, including gravity surveys, magnetic surveys, landslide and geologic mapping projects.

PROFESSIONAL REGISTRATIONS

California Professional Geologist No. 5594

California Certified Engineering Geologist No. 1926

California Certified Hydrogeologist No. 0012

ACADEMIC BACKGROUND

BS 1983, Geology, University of California, Davis

Graduate studies in hydrogeology, hydrology, engineering geology, waste management engineering

PROFESSIONAL AFFILIATIONS

American Ground Water Trust

2009 - 2012: Chair

2005 - 2013: Director

California Groundwater Coalition

2007-Present: Director, Founding Member

California Department of Water Resources, Public Advisory Committee, Water Plan Update 2013

2010-2013: Appointed to participate on PAC and to lead new Groundwater Caucus

Department of Interior, Advisory Committee on Water Information, Subcommittee on Ground Water

2010-Present: Working Group for Project Implementation, National Groundwater Monitoring Network

2007-2010: Co-Chair - Work Group on Implementation for development of the Framework for a Nationwide Ground Water Monitoring Network
2007-2010: Member - Work Group on Network Design for development of the Framework for a Nationwide Ground Water Monitoring Network

Groundwater Resources Association of California

2000 – Present: Director

2000 – 2001: President State Organization

2001 – Present: Legislative Committee Chair

1998-1999 Vice President

1996-1997 Secretary

1995-1996 President Sacramento Branch

1993-1994 Member-at-Large Sacramento Branch

International Association of Hydrogeologists

2016 – Present: Director, USA National Chapter

2017 - Present: Representative to American Geological Institute, Geoscience Policy Program Advisory Committee

2010 & 2016 – Planning Committee Member, International Symposium on Managed Aquifer Recharge, in Abu Dhabi and Mexico City.

National Ground Water Association

2014-Present: Director - Scientists and Engineers Section

2007- 2010: Director - Scientists and Engineers Section

2017-2018: Chairman, Government Affairs Committee

2007 - 2009: Member - Government Affairs Committee

2007 - 2014: Chair - Groundwater Protection and Management Subcommittee

2005 – 2010: Chair - Regional Groundwater Management Task Force, Government Affairs Committee

2004 – 2005, 2007, 2009-10: Chair – Theis Conference Committee

2002 – 2012: Member – Theis Conference Committee

2002 – 2014: Member - Regional Groundwater Management Task Force, Government Affairs Committee

2003 – 2014: Member – Groundwater Protection and Management Subcommittee

2009 – 2014: Member - ASR Task Force

2009 – 2014t: Member - Hydraulic Fracturing Task Force

2008 – 2009: Member – CO2 Sequestration Task Force

SELECTED PUBLICATIONS

California Groundwater Management, Second Edition, Groundwater Resources Association of California, co-author and project manager, 2005.

Water Contamination by Low Level Organic Waste Compounds in the Hydrologic System, in Water Encyclopedia, Wiley, 2004.

Potential Groundwater Quality Impacts Resulting from Geologic Carbon Sequestration, Water Research Foundation, co-author, 2009.

Aquifer Storage and Recovery in the US, ASR 9, American Ground Water Trust, Orlando Florida, September 2009 – a compilation of key ASR issues on DVD, contributing editor and speaker, 2010.

Sustainability From The Ground Up – Groundwater Management In California – A Framework, Association of California Water Agencies, principal author, 2011.

ISMAR9 Call to Action: Sustainable Groundwater Management Policy Directives, Principal Author, 2016.

PRESENTATIONS

“Challenges with Data and Statewide Standardization: From the Ground Down,” Sustainable Groundwater Management on the Central Coast Workshop, San Luis Obispo County, January 2017.

“Highlights from Groundwater Fact Finding Trip to Denmark – California Connections,” San Luis Obispo County, January 2017.

“Managed Aquifer Recharge,” Drought Summit, Irrigation Association & National Ground Water Association, Las Vegas, Nevada, December 2016.

“Got Groundwater? State of Low Impact Development & the Sustainable Groundwater Management Act: Recharging Streams and Groundwater,” Localizing California Waters, Yosemite, California, November 2016.

“Sustainable Groundwater Management – A New Law in California,” International Association of Hydrogeologists Congress – Montpelier, France – September 2016.

“Policy Directives for Groundwater Management,” Mexico City - Special Sessions on Groundwater Management Policy Principles, June 2016.

"California's New Sustainable Groundwater Management Law," ISMAR9 – Mexico City - Special Sessions on Groundwater Management Policy Principles, June 2016.

"Comprehensive Drought Legislation," National Ground Water Association Fly-in, Washington DC, February 2016.

"Capitalizing on Climate Crisis to Change to Sustainable Groundwater Management in California," 42nd International Association of Hydrogeologists Congress – Rome, Italy – September 2015.

"California's Sustainable Groundwater Management Act," National Ground Water Association Summit, San Antonio, Texas, March 2015.

"Improving Groundwater Management and Increasing Storage in California: A work in Progress and Perfect Storm for Change," 41st International Association of Hydrogeologists Congress – Marrakech, Morocco – September 2014.

"A Year of Groundwater and Recharge Streamlining in California?" 14th Biennial Symposium on Managed Aquifer Recharge, Orange California, July 2014.

"California Groundwater Management – time for a Change?" Climate Change, Water and Society, Climate Change and the Future of Water in California, UC Davis, April 2014.

"Understanding Groundwater Management," 23rd Annual Water Symposium, Association of Water Agencies of Ventura County, Oxnard, California, April 2014.

"Santa Rosa Plain Groundwater Study & Management Planning," Sonoma County Farm Bureau, March 2014.

"A Collaborative National Groundwater Monitoring Network," Briefing for State Water Resources Control Board and Department of Water Resources, Sacramento, March 2014.

"Groundwater in California: Policy, Legal and Regulatory Challenges," Water Education Foundation, Sacramento, California, January 2014.

"Managed Aquifer Recharge in California: Summary of Projects and Policy Issues," 8th International Symposium on Managed Aquifer Recharge, Beijing, China, October 2013.

"Hydraulic Fracturing and Groundwater: A Consultant's Perspective," San Gabriel Valley Groundwater Forum, October 2013.

"Options to Solve California's 22st Century Groundwater Challenges: Shifting from Through-Delta Imports to Regional Interdependence," 40th International Association of Hydrogeologists Congress - Perth, Australia, September 2013.

Recycled Water Managed Aquifer Recharge in California," Second Technical Workshop on Managed Aquifer Recharge with Recycled Water, Mexico City, August 2013.

"California Integrated Groundwater Management: What is Working & Not - road Map for Best Practices," National Ground Water Association Summit, San Antonio, Texas, May 2013.

"Managed Aquifer Recharge Policy, Legal and Regulatory Challenges: Options for Change," Groundwater Resources Association of California, Managed Aquifer Recharge in the Urban Environment, Burlingame, California, May 2013.

"California's Groundwater Basins - Challenges and Solutions to Replenishment," Session - Water Present: How are California's Water Infrastructure Projects Holding Up and What New Options Do We Have? 6th Annual Orange County Summit, Disneyland, May 2013.

"Technical and Policy Challenges to Streamline Groundwater Recharge and Storage," Sacramento Chapter of the Environmental & Water Resources Institute, Sacramento, California, November 2012.

"Technical Lessons Learned and Experience Gained from Managed Aquifer Recharge in California, Nevada and Florida," International Seminar on Aquifer Artificial Recharge, Belo Horizonte, Brazil, June 2012.

"What is Working and What is Challenging Managed Aquifer Recharge Progress and Why in California, Florida and Texas," International Seminar on Aquifer Artificial Recharge, Belo Horizonte, Brazil, June 2012.

"Status of Groundwater Monitoring and Well Log Data in California," 2012 Water Technology Conference, Clovis, California, May 2012.

"Challenges and Opportunities for Conjunctive Use and Groundwater Storage, California Water Commission, Sacramento, California, October 2011.

"California - State of the State - Groundwater Challenges," Aquifer Recharge Conference, Status of Projects, Issues, and Solutions, ASR 11, American Ground Water Trust, Orlando, Florida, September 2011.

"Overview of Recent Groundwater-Related Policy Documents," Groundwater Caucus Meeting, California Water Plan Update 2013, May 2011.

"State of the State of Groundwater Management in California," Statewide Issue Forum, *The Next Chapter: How Do We Really Sustain California's Groundwater?* - ACWA Spring Conference, Sacramento, California, May 2011.

"California Statewide Groundwater Elevation Monitoring (CASGEM)," National Ground Water Association, Groundwater Summit, Baltimore, MD, May 2011.

"NGWA Best Suggested Practice for Aquifer Storage & Recovery," National Ground Water Association, Groundwater Summit, Baltimore, MD, May 2011.

"Groundwater Management - New Initiatives at the State Capitol and in the Bay Area," Bay Area Water Forum, Oakland, CA, March 2011.

"Groundwater Monitoring: Can the State Plan Nice with the Locals?" California Water Policy Conference, Los Angeles, CA, March 2011.

"Santa Rosa Plain Preliminary Groundwater Management Planning Efforts," Santa Rosa Public Workshop, February 2011.

"Sonoma Valley Groundwater Management Program," California Roundtable on Water and Food Supply, Davis, CA, February, 2011.

"MAR Technical, Regulatory and Policy Challenges, Barriers and Evolving Solutions in the United States," ISMAR07, Abu Dhabi, United Arab emirates, October 2010.

"ASR Technical, Regulatory and Policy Challenges - Evolving Solutions," 40th Annual American Institute of Professional Geologists Meeting/10th Annual American Ground Water Trust ASR in Florida Meeting, Orlando Florida, September 2010.

"State of Sonoma County Water and Collaborative, Locally-Driven Solutions," NWRA 2010 Western Water Conference, Jackson, WY, July 2010.

"Development and Implementation of Pilots for a National Groundwater Monitoring Network," Towards Sustainable Groundwater in Agricultural, San Francisco, CA, June 2010.

Should there be a Separate Class of Underground Injection Well for Groundwater Replenishment?" NGWA Groundwater Summit, Denver, CO, April 2010.

"The California Legislature Mandates Statewide Comprehensive Groundwater Level Monitoring," NGWA Groundwater Summit, Denver, CO, April 2010.

"Sonoma's Buried Treasure: Groundwater," Water Wisdom and Energy workshop, Sonoma CA, February 2010.

"California ASR Status," Groundwater Protection Council Annual UIC Conference, Austin TX, January 2010.

"ACWA's Strategic Framework for Sustainable Groundwater Management," ACWA Fall Program, San Diego, California, December 2009.

"ASR Smorgasbord," Aquifer Storage and Recovery in the US, AGWT 9th Annual ASR Meeting, Orlando, FL, September 2009.

"National Water Quality Assessment Program Review," presented to National Academies of Science Committee to Review NAWQA Cycle 3 Proposed Program, on behalf of National Ground Water Association, Washington DC, September 2009.

"ASR Water Quality and Public Perception Challenges," ASR Issues Roundtable, Ground Water Protection Council, Salt Lake City, UT, September 2009.

"Opportunities and Challenges for Supplementing Water Supplies in California – a Local Approach," Ground Water Protection Council Energy and Water Forum, Salt Lake City, UT, September 2009.

"Managing Groundwater in the Wine Country: A Successful Approach in the Sonoma Valley," Napa Engineer's Society, Napa CA, September 2009.

"Wells and Monitoring – With Limited Groundwater Supplies How Do We Manage Our Resource Sustainably," Wine Country Water Forum, Rohnert Park, CA, July 2009.

"Sonoma Valley Groundwater Management Program," Sonoma Valley Citizen's Advisory Committee, Sonoma CA, April 2009.

"Geologic Carbon Sequestration Characterization and Monitoring Tools and Technologies," Groundwater Resources Association of California Groundwater Monitoring Conference, March 2009.

"Issues Surrounding Implementation of the Technology (ASR)", and moderator for ASR session, Ground Water Protection UIC Conference, San Antonio TX, January 2009.

"AWWA Research Foundation Study on The Potential Impacts of Geologic Carbon Sequestration on the Quality of Groundwater: A Summary of the Approach and Open Discussion of State Agency Stakeholders" (co-author), Ground Water Protection Council Annual Meeting, New Orleans, September 2008.

"Adapting to Increasing Demands in a Changing Climate with Managed Aquifer Recharge and Groundwater Storage: Do We Have the Right Tools?" Ground Water Protection Council Annual Meeting, New Orleans, September 2008.

"Implementation: Structure for Operation, Management and Oversight of the Nationwide Groundwater Monitoring Network," Ground Water Meeting, Department of the Interior, Advisory Committee on Water Information, Subcommittee on Ground Water, Sixth National Water Monitoring Conference, Atlantic City, New Jersey, May 2008.

"Implementation Structure Evolution, Framework for a Nationwide Ground Water Monitoring Network," Ground Water Monitoring Meeting, Department of the Interior, Advisory Committee on Water Information, Subcommittee on Ground Water, Reston, Virginia, March 2008.

"Citizen-Based Groundwater Resources Planning in California," Ground Water Summit, National Ground Water Association, Memphis, Tennessee, March 2008.

"Citizen-Based Groundwater Resources Planning on a Basin Scale, Sonoma Valley, California," co-author, Ground Water Summit, National Ground Water Association, Memphis, Tennessee, March 2008.

"Water Management Options Analysis Using a MODFLOW Ground Water Flow Model for the Sonoma Valley Groundwater Basin," co-author, Ground Water Summit, National Ground Water Association, Memphis, Tennessee, March 2008.

"Florida - Land Abundant in Water Resources, Drought and Regulation," National Ground Water Association EXPO, Orlando, Florida, December 2007.

"California's Quandary: Managed Aquifer Recharge under a Very Complex Regulatory Environment - Will it Work?" International Symposium on Managed Aquifer Recharge, Phoenix, Arizona, October 2007.

"So Many Tools, So Little time - Overview of Oilfield Tools and Technologies Applicable to Water Resources in Fractured Rock," Workshop, National Ground Water Association/EPA Fractured Rock Conference, Portland, Maine, September 2007.

"Technical and Policy Aspects of Managed Aquifer Recharge in California," National Ground Water Association Theis Conference, Park City, Utah, September 2007.

"California Ground Water Management - A Continuing Challenge in a Changing Environment," Keynote Presentation, Ground Water Protection Council Annual Forum, San Diego, California, September 2007.

"Integrated Regional Water Management and Sustainability in California - Can We Have It All?" 2007 Southwest Regional Water Symposium, Tucson, Arizona, August 2007.

"Integrated Regional Water Management California Style: How is it Working?" Pima Association of Governments, Tucson, Arizona, June 2007.

"Increasing Groundwater Storage to Meet California's Future Demand - Introduction to the Challenges and Solutions," Long Beach, California, June 2007.

"California Groundwater Monitoring Programs", Ground Water Meeting, Department of the Interior, Advisory Committee on Water Information, Subcommittee on Ground Water, Reston, Virginia, May 2007.

"Oilfield Tools and Technologies: Applications to Contaminant Sites," Department of Energy, Research and Development, Washington DC, March 2007.

"High Resolution Characterization, Simulation, and Monitoring of Water Resources Projects", Groundwater Resources Association of California High Resolution Characterization and Monitoring Symposium, Long Beach, California, November 2006.

"Future Expertise and Resource Needs for a Developing Technology Environment," National Ground Water Association 21st Century Water Systems, Irvine, California, October 2006.

"California Groundwater Monitoring Programs," Ground Water Monitoring Meeting, Department of Interior, Advisory Committee on Water Information, Subcommittee on Groundwater, Washington DC, May 2006.

"Groundwater Tools and Technologies - From the Archaic to the Sublime," Texas Ground Water Management Workshop, National Ground Water Association Groundwater Summit, San Antonio, Texas, April 2006.

"Groundwater Management Goals, Objectives, and Actions - How Do You Get There?" Texas Ground Water Management Workshop, National Ground Water Association Groundwater Summit, San Antonio, Texas, April 2006.

"Introduction to California Groundwater Policy Development", Groundwater Institute for Teachers, Sponsor American Groundwater Trust, Fresno, California, June 2005.

"Importance of Groundwater to the American River System," American River Science Conference, Public Session, April 2005.

"Some Groundwater Challenges for Conjunctive Use: ASR, Underground Storage Regulation, Arsenic, Viagra, and Yes There is More," California Department of Water Resources Workshop, Kern, November 2004.

"Groundwater 101" – Rohnert Park Public Session, Sponsored by Groundwater Resources Association of California, September 2004.

"California, Water and Sustainability in the 21st Century", Workshop on Water Sustainability in Silicon Valley: Vision for the Future, San Jose, California, April 2004.

"How Do We Balance Competing Needs on the Lower American River – Groundwater and Conjunctive Use", Lower American River Conference, Sacramento, California, June 2003.

"Levee Cutoff Walls and Groundwater Recharge", NGWA Southwest Focus Conference, Phoenix, Arizona, February 2003.

"Low Concentrations of Organic Compounds in the Hydrologic System," Groundwater Resources Association of California Annual Meeting, Newport Beach, California, September 2002.

"Comparing Two GIS Applications to Develop Relative Landslide Potential", ESRI Users Conference, San Diego, California, July 2002.

"Conjunctive Management of Groundwater and Surface Water", Central Sacramento County Groundwater Forum, Elk Grove, May 2002.

"Groundwater Wells Surveying or Mapping: Why We Need Flexibility in Well Location Data", California Land Surveyors Association, Lake Tahoe, March 2002.

"Overview of Groundwater Management Issues in California", Groundwater Resources Association, Fresno, California, January 2002.

"Where are we in West and Central Coast Basins?" Groundwater Law and Policy in California: Update on Recent Developments, Anaheim, California, October 2001.

"Groundwater Quality & Well Maintenance", Water Well Workshop, Sacramento, California, September 2001.

"Now That You Have Your Data What Do You Want to Do with it?" Association of California Water Agencies Workshop, Sacramento, California, August 2001.

"GIS in Developing a Relative Landslide Potential Framework, North Coast Ranges, California", ESRI Users Conference, San Diego, California, July 2001.

"Engineering Geologic Aspects of Timber Harvest in the Sierra Nevada", Association of Engineering Geologists/Groundwater Resources Association Annual Meeting, San Jose, California, September 2000.

"Industry Trends for Groundwater Cleanups: Where Have We Come From and Where Are We Going", Groundwater Resources Association Fifth Annual Meeting, Costa Mesa, California, October 1996.

"Selection, Design, Installation And Evaluation of Dedicated Groundwater Sampling Systems: a Case Study", Proceedings of the National Groundwater Sampling Symposium, Washington, DC, November 1992.

"Energy Dispersive X-Ray Fluorescence Analysis of Lead In Soil, Dust, and Paint Using Secondary Target Excitation and Scattered X-Ray Ratio Normalization", Workshop Proceedings, XRF Workshop, Denver X-ray Conference, 1994.

WORKSHOPS, SYMPOSIA AND COURSES

Developing Groundwater Sustainability Plans for Success – Conference Moderator GRA Symposium, Sacramento, California, June 2016.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA "Think Tank" Meeting, UC Davis, California, May 2016.

Developing Groundwater Sustainability Plans: Strategies and Process – Instructor, Webinar Course, UC Davis Extension, Land Use and Natural Resources, January-March 2016.

How to Fund Groundwater Sustainability – Conference Co-Chair and Moderator – GRA Symposium, Sacramento, California, March 2016.

15th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, March 2016.

Groundwater Biennial and GRA Annual Meeting – Conference Plenary Moderator, GRA Annual Meeting, Sacramento, California, October 2015.

The New Groundwater Sustainability Plans: Raising the Bar on Groundwater Management - Conference Chair and Moderator – GRA Symposium, Modesto, California, September 2015.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA “Think Tank” Meeting, UC Davis, California, May 2015.

14th Annual Legislative Symposium –Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, March 2015.

GRA Annual Meeting – Conference Plenary Moderator, Sacramento, California, October 2015.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA “Think Tank” Meeting, UC Davis, California, May 2014.

13th Annual Legislative Symposium –Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2014.

Collaborative Leadership Workshop, Negotiating Relationships to Improve Water Resources Planning – Chair, GRA Symposium, Sacramento, California, November 2013.

Groundwater Biennial and GRA Annual Meeting – Conference Plenary Moderator, GRA Annual Meeting, Sacramento, California, October 2013.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA “Think Tank” Meeting, UC Davis, California, May 2013.

Managed Aquifer Recharge in the Urban Environment: Technical and Policy Challenges – Chair, GRA Symposium, Burlingame, California, May 2013.

12th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2013.

GRA Annual Meeting – Co-Chair and Moderator, Santa Rosa, California, October 2012.

Managing Wells in California, Protecting Groundwater Resources – Chair, GRA Symposium, Sacramento, California, August 2012.

Hydraulic Fracturing and Water Resources – A California Perspective, Conference Co-Chair and Moderator, GRA Symposium, Long Beach, California, July 2012.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA “Think Tank” Meeting, UC Davis, California, May 2012.

11th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2012.

“California’s Water Future Goes Underground,” Conference Co-Chair, Biennial Groundwater Conference and GRA Annual Meeting, Sacramento, California, October 2011.

“Groundwater-Surface Water Interaction: California’s Legal and Scientific Disconnection,” Co-Chair, GRA Symposium, April 2011.

Contemporary Groundwater Issues Council Annual Meeting – Co-Chair, GRA “Think Tank” Meeting, UC Davis, California, April 2011.

10th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2011.

“Thinking Outside the Pipe – Exploring and Protecting Local Water Supplies,” Conference Chair, GRA Annual Meeting, San Francisco, California, September 2010.

“ASR Issues Session,” Session Moderator, 40th Annual American Institute of Professional Geologists Meeting/10th Annual American Ground Water Trust ASR in Florida Meeting, Orlando Florida, September 2010.

“Geophysics at the Beach,” Conference Co-Chair and Moderator, GRA Symposium, Santa Ana, California, May 2010.

“Water Crisis and Uncertainty: Shaping Groundwater’s Future,” Moderator, Biennial Groundwater Conference and GRA Annual Meeting, Sacramento, California, October 2009.

9th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2010.

8th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2009.

Groundwater Monitoring: Design, Analysis, Communication, and Integration with Decision-Making – Moderator, GRA Symposium, Orange, California, February 2009.

"Groundwater Monitoring: Methods, Needs, and Answers," Session Moderator, Sixth National Monitoring Conference, National Water Quality Monitoring Council, Atlantic City, New Jersey, May 2008.

7th Annual Legislative Symposium – Conference Co-Chair – GRA Symposium, Sacramento, California, April 2008.

"Geophysics for Fractured Rock Groundwater Systems," Session Moderator, Ground Water Summit, National Ground Water Association, Memphis, Tennessee, March 2008.

"The Changing Landscape of Regulatory Authority," Session Moderator, Long Range Policy and Water Planning in California, American Ground Water Trust, Ontario, California, February 2008.

"Groundwater Policy and Regional Management in Florida: a Changing World," Session Moderator, NGWA EXPO, Orlando, Florida, December 2007.

"Conjunctive Management of Ground Water and Surface Water: Application of Science to Policy," Co-Convener, National Ground Water Association This Conference, Park City, Utah, September 2007.

"Investing in Infrastructure - Pay Now or Pay Later," Session Moderator, Groundwater Biennial, Sacramento, California, September 2007.

"Increasing Groundwater Storage to Meet California's Future Demand - Challenges and Solutions," Chair Groundwater Resources Association of California Workshop, Long Beach, California, June 2007."

"Groundwater Management in New Mexico in the Year of Water - A Challenge of Increasing Demand, Limited Supply, and Statewide Implementation," Workshop, Chair, National Ground Water Association Groundwater Summit, Albuquerque, New Mexico, May 2007.

6th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2007.

"Geophysics in the Groundwater Industry: Basic Theory, Current and Future Application of Tools and Technology," Session Moderator, National Ground Water Association EXPO, Las Vegas, Nevada, December 2006.

"Groundwater Policy and Management in the Southwest – Focus on Nevada" Session Moderator, National Ground Water Association EXPO, Las Vegas, Nevada, December 2006.

"High Resolution Site Characterization and Monitoring," Co-Chair, Groundwater Resources Association of California Symposium, Long Beach, California, November 2006.

5th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2006.

"Groundwater Management in Texas - A Continuing Challenge in a Changing Environment," Workshop Chair, National Ground Water Association Groundwater Summit, San Antonio, Texas, April 2006.

"Salinity Issues: Past Practices and Future Strategies," Session Moderator, 2005 Groundwater Biennial, Sacramento, California, October 2005.

"Basin Yield and Overdraft: Technical and Legal Perspectives," Chair Groundwater Resources Association of California Workshop, Pasadena, California, September 2005.

"Groundwater Policy, Law and Science: What Can be Done About the Disconnect?" Moderator, Water Education Foundation Water Law and Policy Briefing, San Diego, California, July 2005.

"California Groundwater Management Course", Instructor, Groundwater Resources Association of California Course, Glendale, California, May 2005.

"California Groundwater Management Course", Instructor, Association of California Water Agencies Pre-conference, San Jose, California, May 2005.

4th Annual Legislative Symposium – Conference Co-Chair – GRA and CGC Joint Symposium, Sacramento, California, April 2005.

"Groundwater Law, Policy and the Tragedy of the Commons: Obstacles and Some Possible Solutions to Sustainable Groundwater Management in the Southwest," Session Chair, National Ground Water Association Groundwater Summit, San Antonio, Texas, April 2005.

"Artificial Recharge Workshop," Workshop Chair, Groundwater Resources Association of California, Sacramento, California, March 2005.

"Basic Groundwater Hydrology", California Department of Water Resources Basic Groundwater Course Sacramento, California, May 2004.

3rd Annual Legislative Symposium – Conference Co-Chair – GRA Symposium, Sacramento, California, April 2004.

"Artificial Recharge Workshop," California Department of Water Resources –US Geological Survey Joint Sponsorship, Workshop Chair, Sacramento, April 2003.

2nd Annual Legislative Symposium – Conference Co-Chair – GRA Symposium, Sacramento, California, April 2003.

1st Annual Legislative Symposium – Conference Co-Chair – GRA Symposium, Sacramento, California, April 2002.

WATER POLICY ANALYSIS, PRESENTATIONS, LEGISLATIVE TESTIMONY and BRIEFINGS

Reviews Federal and California State water and groundwater policy and legislation and provides comment and information dissemination to the groundwater industry through activities associated with the California Groundwater Coalition, Groundwater Resources Association of California, International Association of Hydrogeologists, and National Ground Water Association.

Annual National Groundwater Legislative Symposium - Presentations by Members of Congress and Staff, and Federal Administration - Visits to Congressional Offices at Capitol Hill - Groundwater Resources Association of California – 2003-2017.

Annual State Groundwater Legislative Symposium - Presentations by State Legislators and Staff, and State Administration - Visits to Legislator Offices at the Capitol - Groundwater Resources Association of California – Co-Chaired years 2002-2017.

Groundwater Legislation Stakeholder Process, Sustainable Groundwater Management Bills – Participation in State process to merge SB 1168 and AB 1739 into one bill (SB 1168 - Pavley & AB 1739 - Dickinson), July 2014.

"Groundwater Overview and Perspectives," California State Board of Food and Agriculture, Sacramento, California, June 2014.

"California Water Management Issues and Managed Underground Storage: Water Use and Water Rights Session," National Research Council Forum on Managed Underground Storage, Washington D.C., March 2008.

"Groundwater Storage in California," National Research Council Forum on Managed Underground Storage, Washington D.C., March 2008.

"Geologic Carbon Sequestration," 11th Annual Ground Water Industry Legislative Conference, National Ground Water Association, Washington D.C. - 2008.

California State Legislative Staff Briefing - California, Water, Sustainability, and Groundwater Basics - 2005.

California State Senate Select Committee on Air and Quality - Hearing on Status of Groundwater Management in California - 2005.

"California, Water, and Sustainability", Legislative Staff Briefing, State Capitol, Sacramento, California - 2004.

California State Senate Select Committee on Water Management, Storage, Conservation and Supply - Hearing on Perchlorate - 2004.

"California's Hidden Resource: Groundwater," Hearing on Perchlorate, Assembly Select Committee on Water Management, Storage, Conservation and Supply, State Capitol, August 2003.

"Now What! The Conundrum of the Contaminant Du Jour and Emerging Contaminants in Groundwater", Assembly Committee Hearing on AB599, State Capitol, California - 2003.

California State Senate Select Committee on Water Management, Storage, Conservation and Supply - Hearing on Groundwater Basics, Regulatory, and Drinking Water Issues and Challenges - 2003.

California State Assembly Select Committee on Water Quality and Availability - Hearing on California Groundwater Management Challenges and Issues - 2003.

"California's Hidden Resource: Groundwater", Legislative Staff Briefing, Sacramento, California - 2003.

California State Assembly Select Committee on Water Quality and Availability - Hearing on Life Cycle of a Contaminant - 2003.

California State Assembly Select Committee on Water Quality and Availability - Hearing on Groundwater Basics, Groundwater Demand, Management and Monitoring - 2002.