M. Comment Letters Received After December 31, 2007

APPENDIX M

Comment Letters Received After December 31, 2007

The public review period on the Draft PEIR, initially scheduled for 90 days (from June 29, 2007 through October 1, 2007), was extended by an additional 15 days, to October 15, 2007. All comments received through December 31, 2007 were accepted by the San Francisco Planning Department and are responded to in this Comments and Responses document. Comment letters received after December 31, 2007 are presented below; these comments are not responded to individually, but the issues have already been addressed. **Table M.1** includes a cross reference for each of these letters to either a master response or another response that includes a discussion of related issues.

TABLE M.1
COMMENT LETTERS SUBMITTED ON THE DRAFT PEIR AFTER DECEMBER 31, 2007

Comment Letter Format	Name of Commenter	Organization/ Affiliation	Date of Letter	Issues	Pertinent Response
Letter	Arthur R. Jensen, Ph.D.	Bay Area Water Supply & Conservation Agency	02/21/08	Modified WSIP; agricultural conservation	Section 4.10, Master Response on Modified WSIP Alternative
Letter	Arthur R. Jensen	Bay Area Water Supply & Conservation Agency	07/17/08	Phased WSIP Variant; economic impacts of service interruption	Section 13.4, Phased WSIP Variant; Section 14.1, Master Response on WSIP Purpose and Need (Section 14.1.6)
Letter	John Stufflebean	City of San Jose	06/27/08	Phased WSIP Variant; economic impacts of service interruption	Section 13.4, Phased WSIP Variant; Section 14.1, Master Response on WSIP Purpose and Need (Section 14.1.6)
Letter	Alan Kurotori	City of Santa Clara	06/27/08	Phased WSIP Variant; economic impacts of service interruption	Section 13.4, Phased WSIP Variant; Section 14.1, Master Response on WSIP Purpose and Need (Section 14.1.6)
Letter	Keith Whitman	Santa Clara Valley Water District	06/24/08	Phased WSIP Variant; economic impacts of service interruption	Section 13.4, Phased WSIP Variant; Section 14.1, Master Response on WSIP Purpose and Need (Section 14.1.6)
Letter	Emily McGinty	Citizen	02/22/08	No additional Tuolumne River diversions; more conservation and recycling; impacts on San Joaquin River and Delta	Responses C_Form1-01 and -02; Section 14.8, Master Response on Delta and San Joaquin River Issues

BAWSCA
Bay Area Water Supply & Conservation Agency

February 21, 2008

Mr. William Wycko
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Dear Mr. Wycko:

The Bay Area Water Supply and Conservation Agency ("BAWSCA") submitted extensive comments last fall on the draft PEIR on the Water System Improvement Program developed by the San Francisco Public Utilities Commission. Those comments expressed BAWSCA's support for the "Modified WSIP" which the draft PEIR identified as the "Environmentally Superior Alternative." We also recommend that the final PEIR evaluate it in more detail.

The Modified WSIP contemplates additional water conservation/recycling in communities in San Mateo, Santa Clara and Alameda counties that currently purchase water from the SFPUC. It also envisions that increased diversions from the Tuolumne River would be offset by water use efficiencies (funded by Bay Area water agencies) in the agricultural lands bordering the Tuolumne River. Our comments were intended to corroborate the feasibility of this concept. They also conveyed the recommendation of the BAWSCA Board of Directors that the final PEIR "explore the feasibility of Bay Area water customers financially supporting water efficiencies in the [Turlock Irrigation District/Modesto Irrigation District] that will result in more water remaining in New Don Pedro than is currently the case, even after taking increased diversions by San Francisco into account." (BAWSCA comments, p. 47)

As further evidence of the feasibility of this approach, I am enclosing the following materials:

- Letter dated February 15, 2008 from Professor Brent Haddad, Director of the Center for Integrated Water Research at the University of California at Santa Cruz, substantiating the feasibility of the agricultural conservation element of the modified WSIP.

- Declaration dated July 23, 2007 by Peter Gleick, President of the Pacific Institute, submitted to the U.S. Federal District Court for the Eastern District of California demonstrating the feasibility of agricultural water users in the San Joaquin hydrologic region implementing additional long-term water management and efficiency measures.

Professor Haddad's resume is attached to his letter. The declaration submitted by Dr. Gleick summarizes his qualifications and experience at paragraphs 1 through 3. A more extensive biographical review is enclosed with this letter.

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I have also enclosed a copy of my own resume, which summarizes my academic training and my several decades of experience in planning and managing California water delivery systems, as support for my personal opinion that the agricultural water conservation element in the Modified WSIP is feasible.

I hope this information is helpful to the Planning Department as it prepares a Final PEIR. I trust, and request, that this letter and its accompany materials will be made part of the record prepared for review by the Planning Commission, and by the Board of Supervisors in the event of an appeal from the Planning Commission certification of the Final PEIR.

Sincerely,

Arthur R. Jensen, Ph.D.
Chief Executive Officer and General Manager

Enclosure (s)

1. February 15, 2008 letter from Prof. Brent Haddad, MA, MBA, Ph.D. regarding the feasibility of the agricultural conservation of the modified WSIP.
2. July 23, 2007 Declaration of Peter H. Gleick, Ph.D. to the U.S. Federal District Court of the Eastern District of California.
3. Resume of Arthur R. Jensen, Ph.D., BAWSCA Chief Executive Officer and General Manager.

cc: Ms. Susan Leal, General Manager, SFPUC
Ms. Irina Torrey, Director, Environmental and Regulatory Compliance Division
Ms. Diana Sokolove, Environmental Planner, San Francisco Planning Department

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BRENT M. HADDAD, M.A., MBA, Ph.D.
DIRECTOR, AND
PROFESSOR OF ENVIRONMENTAL STUDIES

February 15, 2008

Mr. Arthur R. Jensen
General Manager
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 302
San Mateo, California 94402

Dear Mr. Jensen:

As you requested, I have reviewed the Draft Program Environmental Impact Report (Draft PEIR) for the San Francisco Public Utilities Commission (SFPUC) Water System Improvement Plan (June 2007, http://www.sfgov.org/site/planning_index.asp?id=37672), as well as the comments on it submitted by the Bay Area Water Supply and Conservation Agency (BAWSCA). My particular focus has been the feasibility of the "Modified WSIP" alternative. Of the three aspects of the Modified WSIP proposal, I address the potential for water conservation and savings in the lower Tuolumne River watershed (LTRW), a region served by the Modesto Irrigation District (MID) and Turlock Irrigation District (TID). Based on my experience with the economics of both urban and agricultural water use in California, it is my opinion that this aspect of the Modified WSIP Alternative is definitely feasible.

The Modified WSIP is described as the "environmentally superior alternative" (p. 9-96). The Modified WSIP can be a source of environmental improvement by providing additional in-stream flows to the lower Tuolomne River while also providing additional water to the San Francisco Bay Area. The Draft PEIR anticipates joint projects involving BAWSCA and SFPUC in the LTRW (9-96), and correctly notes the value of collaboration in reducing overall environmental impacts on the Tuolumne River.

Below, I make the following points:

1. Water "conservation" as used in the Draft PEIR should be understood as water "savings" - the ultimate result of numerous water management strategies and technologies, not just reductions in quantities consumed by a particular end use of water.

2. Water conservation projects (broadly understood) could cost-effectively improve the long-term water supply reliability of the San Francisco Bay Area while simultaneously improving environmental conditions on the lower Tuolumne River through enhanced in-stream flows.

1. The Draft PEIR aims in the right direction by suggesting that water conservation projects yielding year-round supply enhancement can be pursued in the LTRW (Sec. 9-2-8 *Modified WSIP Alternative*; pp. 9-78 to 9-79). However, this categorization specifying conservation only (p. 9-81) is too narrow. Water conservation is typically understood to mean a reduction in end-use of water without loss of amenity or productivity. It is achieved by implementation of less-water-intensive technologies, economic incentives, or both. Narrowly understood, it is only one of numerous water-supply-enhancing strategies now available to water managers. More broadly, conservation simply means saving water: engaging in carefully-considered endeavors that help society achieve numerous goals with limited water supply. This latter understanding of conservation better serves state and regional interests in managing the Tuolumne River system since it provides a broader scope of action to meet the many demands on the system.

Other sections of the Draft PEIR list and comment on numerous water-management strategies proposed for implementation in the San Francisco Bay Area. The same list of management and new-technology alternatives proposed for the San Francisco Bay Area should also be available for consideration in the LTRW. These options include conservation (traditionally understood), water reclamation and reuse, desalination of inland brackish water, storm water management, improved management and retrofits of existing reservoirs and supply infrastructure, and groundwater-surface water management programs. As long as any of these approaches increases available water, improves environmental conditions, improves supply reliability, and is cost-effective, it doesn't matter where it occurs. If the conservation-only language appears in the Final PEIR, I hope it will be understood that conservation signifies a larger category of water-saving endeavors that includes at least the programs and technologies mentioned above.

2. Within the combined natural and engineered watershed of the Tuolumne River, it is possible to identify cost-effective water-saving projects that could provide both additional instream flows on the lower Tuolumne River and additional water to the San Francisco Bay Area. From an economic perspective, one should anticipate the potential for cost-effective agricultural and urban water savings in the LTRW. Water-conserving irrigation technologies have advanced in recent years, as have urban water reclamation and reuse technologies. Effective water-saving technologies such as drip irrigation are now in use in agricultural areas throughout California, on a variety of crops. Many end-users of water in the LTRW have not yet been offered strong financial incentives to implement them. One should anticipate that incentive programs similar to those implemented in Imperial Irrigation District would result in saved water in the LTRW.

The "Water Conservation and Transfer Program" involving Imperial Irrigation District (IID) and the Metropolitan Water District of Southern California (MWD), initiated in 1988, included 15 projects designed to conserve 105,000 acre-feet per year of water in IID's delivery system and on individual farms. District-level conservation projects included lining of earthen canals, constructing local reservoirs, installing spill-interceptor systems and non-leak gates, automating instrumentation and control systems, and altering water-delivery timetables. On-farm conservation measures included tailwater pumpback, drip irrigation, and linear-move irrigation systems. The program's EIR considered impacts on drainage, groundwater, native habitats, runoff, chemicals of concern, and eco-toxicological risks. The IID program, which provided direct economic benefits to farmers in IID, improved IID's infrastructure as well as water supply reliability in the MWD service territory.[i] A subsequent agreement between IID and the San Diego County Water Authority (1998) identified an additional 303,000 acre-feet of on-farm and distribution system conservation projects. These agreements serve as an example of what is possible when introducing positive economic incentives to manage water wisely.

Just as with IID, the LTRW has substantial water-savings capacity. The CALFED publication "Water Use Efficiency: Comprehensive Evaluation" supports the conclusion that efficiency improvements are available in the eastern San Joaquin Valley.[ii] CALFED's Agricultural Water Use Efficiency documentation also finds that potential savings exist in the larger CALFED region from reduced evapotranspiration and improved long-term diversion flexibility.[iii] The CALFED Efficiency Program analysis estimates 185-225 thousand af/year conservation potential for the larger region in which MID/TID is found (Table 5-8b), a region roughly four times larger than MID/TID.[iv] The bulk of the savings are in urban landscaping conservation measures. This suggests a roughly 50 thousand af/year (an average of 70 cfs) conservation potential in the MID/TID region. However, this estimation that does not take into account the range of targeted economic incentives and support for conservation that were successful in IID and are possible in the LTRW. The actual conservation potential in the LTRW is much higher, at least 100,000 acre-feet/year, depending upon the design of and commitment to conservation incentive programs.

MID's 1999 Water Management Plan identifies several potential efficiency activities (Table 43).[v] They include improving the efficiency of MID water supply operations, water reclamation and reuse, and others. Estimated water savings/production are not provided, but appear to be substantial. TID provides the same general information in Table II-1 of its Agricultural Water Management Plan Two-Year Progress Report.[vi]

In terms of urban Best Management Practice savings, the San Joaquin River region is one of the weakest performers in the CALFED territory (Fig 1.3, p. 16). Urban water is roughly 5% of overall water use, but the proportion is growing as urbanization continues.[vii] The 2000 regional population density was just under 200 persons per square mile, mostly concentrated in cities, less than one-tenth of the population densities of the urbanized BAWSCA territories. 1995 regional per capita water use was 301 gallons per

day in the MID/TID region, nearly three times the per capita use in the BAWSCA territories. Urban landscape acreage in the MID/TID region is expected to nearly double between 2000 and 2020. Without a system of incentives or regulations to guide landscaping choices, this acreage could become a large water consumer in the coming decades. A lack of available funding for programs of this sort appears to be hindering implementation.

By way of categories, the following general approaches to water supply management should be considered in the LTRW:

1. Surface-water/groundwater Conjunctive Management. This approach could include efforts to improve groundwater quality, as well as desalinating the brackish groundwater in near-surface aquifers in the western portion of the LTRW.
2. Spill and Drainage Recovery and Reservoir Improvement. This approach involves investing in improvements in the MID and TID storage and delivery infrastructures to improve delivery efficiency.
3. Water Reclamation and Reuse. This approach could take the form of (1) improving urban wastewater through advanced treatment to make it available for urban and agricultural reuse in the LTRW, and/or (2) improving agricultural waters, including waters used by the dairy and livestock industries. Water end-use is not reduced, but demand for water taken directly from the Tuolumne River is.
4. Water-Smart Landscaping. This approach provides incentive for urban and residential low-water-use landscaping.
5. Drip Irrigation. This approach reduces demand by farmers for water deliveries.
6. Other Urban Incentives. These include technology retrofits, stormwater capture and use, and low-water-use urban growth planning.

All of these categories have the potential to cost-effectively reduce demand for Tuolumne River water in the LTRW. Water saved could then be used to improve environmental conditions along the Lower Tuolumne River (by providing additional in-stream flows), while also providing additional water supply to the San Francisco Bay Area. Carefully selected programs would not harm the traditional agricultural character of the LTRW, and could support it by providing an additional source of income to the region's agricultural sector.

Please contact me if you have further questions on this topic. A copy of my Curriculum Vitae is enclosed.

Sincerely,

Brent M. Haddad

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[i] Metropolitan Water District, 1989. *Water Conservation Agreement Between the Metropolitan Water District of Southern California and the Imperial Irrigation District.* Los Angeles: MWD. Also Haddad, B. 2000. *Rivers of Gold: Designing Markets to Allocate Water in California.* Washington, D.C.: Island Press. Summaries also exist at: http://www.mwdh2o.com/mwdh2o/pages/yourwater/supply/conservation/conserv02.html and http://www.iid.com/Water/WaterConservation. Also Appendix 2: Private Sector Water Resource Capabilities and Projects (US-China Water Resource Management Program Draft Framework July 27, 1998, http://www.lanl.gov/chinawater/main.html). Accessed February 10, 2008.

[ii] CALFED, "Water Use Efficiency Comprehensive Evaluation," April 2006 Public Review Draft.

[iii] CALFED, "Details of Water Use Efficiency: CALFED Agricultural Water Use Efficiency," 2000, Table 1.1. http://www.calwater.ca.gov/Archives/WaterUseEfficiency/adobe_pdf/qo_detail.pdf, Accessed March 27, 2007.

[iv] CALFED Bay-Delta Program Water Use Efficiency Program Plan, Final Programmatic EIS/EIR Technical Appendix, 2000.

[v] Modesto Irrigation District, Water Management Plan for the Modest Irrigation District, July 13, 1999 (revised March 3, 2000).

[vi] Turlock Irrigation District 2003. Agricultural Water Management Plan Two-Year Water Management Plan (December).

[vii] CALFED Bay-Delta Program Water Use Efficiency Program Plan, Final Programmatic EIS/EIR Technical Appendix, 2000, p. 4-41.

Brent M. Haddad, MA, MBA, Ph.D.

Professor of Environmental Studies
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EMPLOYMENT HISTORY

2007-	Founder and Director, Center for Integrated Water Research, University of California, Santa Cruz
1997-	University of California, Santa Cruz. Professor of Environmental Studies
1991-	Consultant on energy, water, environmental regulation and policy, and market development.

EDUCATION

1996	University of California, Berkeley, Ph.D. in Energy and Resources
1991	University of California, Berkeley, Haas School of Business, MBA in Business and Public Policy
1985	Georgetown University, School of Foreign Service, Washington, D.C., M.A. in International Relations
1982	Stanford University, B.A. in International Relations

SELECTED AWARDS AND HONORS

2007	California Public Utilities Commission, Division of Ratepayer Advocates, research and administrative coordination of a process to identify a regional solution to Monterey County water supply needs, $326,000.
2007	Monterey Regional Water Pollution Control Agency, exploring the federal role in regional water treatment and supply projects. $42,000.
2006	California Public Utilities Commission, Division of Ratepayer Advocates, research support for analysis of the Central California Water Project, $100,000.
2005	California Department of Water Resources Proposition 50 grant competition. "Developing a Tool to Guide State and Local Desalination Planning," $2,597,149.
2003	WateReuse Foundation. Organized and held a research needs assessment workshop entitled, "Integrating Human Reactions to Water Reclamation and Reuse into Reuse Project Design." $30,000.
1998-99	*Excellence in Teaching Award*, University of California, Santa Cruz.
1999	*Educational Service Award*, University of California Educational Partnership Center.
1998-00	University of California Centers for Water and Wildland Resources. "An institutional analysis of the application of urban reclaimed water to agriculture in California." $50,500.

1997-98 University of California Fund for Toxics Research. "Assessing the Early Economic Impacts of the Salinas Valley Reclamation Project and the Castroville Seawater Intrusion Project." $30,000.

SELECTED PUBLICATIONS

2007 Haddad, B. "The Professional and Intellectual Challenges of Sustainable Water Management," Chapter in *Proceedings of the 3rd Dubrovnik Conference on Sustainable Development of Energy, Water and Environment Systems, 2005.* N. Afgan, Z. Bogdan, N. Duic, & Z. Guzovic, eds. Singapore: World Scientific Publishing.

2007 Haddad, B. *Introduction to Environmental Politics and Economics: Course Book.* Mason, OH: Thompson.

2006 Haddad, B. "Achieving Numerous Watershed-Management Goals in a Multi-Watershed System," extended abstract in *Proceedings,* International Conference on Forest and Water in a Changing Environment (Beijing, August 8-10).

2004 Huxman, T.E., M. Smith, P. Fay, A.K. Knapp, M.R. Shaw, M.E. Loik, S.D. Smith, D.T. Tissue, J.C. Zak, J.F. Weltzin, W.T. Pockman, O.E. Sala, B. Haddad, J. Harte, G.W. Koch, S. Schwinning, E.E. Small, D.G. Williams. "Convergence across biomes to a common rain-use efficiency," *Nature* 429: 651-654.

2004 Haddad, B. "New Ways to Understand Water Customers' 'Irrational' Behavior," *WateReuse Update* (June).

2004 Haddad, B. "Research Needs Assessment Workshop: Human Reactions to Water Reuse," Alexandria, VA: WateReuse Foundation.

2004 Haddad, B. "Water," in S. Krech III, J.R. McNeill, and C. Merchant, eds., *Encyclopedia of Environmental History.* Volume 3, 1299-1303.

2003 Loik, M.E. and Haddad B. "PrecipNet: An International Network for Precipitation and Ecosystem Change Interdisciplinary Research." Poster presented at the Biennial Meeting of the U.S. Society for Ecological Economics, Saratoga Springs, NY (May 24).

2003 Weltzin, J.F., M.E. Loik, S. Schwinning, D.G. Williams, P. Fay, B. Haddad *and in alphabetical order*: J. Harte, T.E. Huxman, A.K. Knapp, G. Lin, W.T. Pockman, M.R. Shaw, E.E. Small, M.D. Smith, D.T. Tissue, J.C. Zak. "Assessing the response of terrestrial ecosystems to potential changes in precipitation," *BioScience* 53(10):941-952.

2003 Haddad, B. "Property rights, ecosystem management, and John Locke's labor theory of ownership," *Ecological Economics* 46(1):19-31.

2003 Haddad, B., Sloan, L., Snyder, M., and Bell, J. "Regional climate change impacts and freshwater systems: focusing the adaptation research agenda," *International Journal of Sustainable Development* 6(3): 265-282.

2003 Haddad, B. and D. Kelso. "Understanding the Public Reaction to Indirect Potable Reuse Projects," Proceedings, U.S. Centers for Disease Control and Prevention Workshop on Water Reuse, Atlanta, GA.

2002 Haddad, B. "Monterey County Water Recycling Project: An Institutional Study," *Journal of Water Resources Planning and Management* 28(4): 280-287.

2002 Haddad, B. "The Role of the Private Sector in Fresh Water Supply: Contracting and Public Benefits Considerations." *Proceedings*, Institute of the Americas H_2O Conference, April 24, San Diego, CA.

2001 Ludwig, D., Mangel, M. and Haddad, B. "Ecology, Conservation, and Public Policy," *Annual Review of Ecology and Systematics* 32: 481-517.

2001 Haddad, B., L. Sloan, J. Bell, and M. Snyder. "Regional Climate Modeling and Water Forecasting at the District Level," *Proceedings*, Annual meeting of the American Water Resources Association, Albuquerque, NM.

2001 Haddad, B. "The Challenge of Large-Scale Water Reallocation: Lessons from the California Experience," *Proceedings*, International Conference on the Spanish Hydrological Plan and Sustainable Water Management, Zaragoza, Spain.

2001 Haddad, B., and Merritt, K. "Evaluating regional impacts and adaptations to climate change: the case of California water," in D. Hall and R.B. Howarth, eds. *The Long-Term Economics of Climate Change: Beyond a Doubling of Greenhouse Gas Concentrations*. New York: JAI Press.

2000 Haddad, B. "Reply to Discussion: Economic Incentives for Water Conservation on the Monterey Peninsula: The Market Proposal," *Journal of the American Water Resources Association*, August.

2000 Haddad, B. "Economic Incentives for Water Conservation on the Monterey Peninsula: the Market Proposal," *Journal of the American Water Resources Association* 36(1): 1-15.

2000 Haddad, B. *Rivers of Gold: Designing Markets to Allocate Water in California*. Washington, D.C.: Island Press.

PUBLIC LECTURE AND FORUM PARTICIPATION

2007 Legal Seminar on Water Recycling, "Future Potential for Recycled Water," Monterey, California, February 2.

2007 "Report on a Water Reclamation Survey," presented at a meeting jointly sponsored by the City of San Jose and the Government of Queensland, Australia, San Jose, CA, January 28.

2006 Interviewee, "Talk of the Nation Science Friday," NPR (Oct. 13).

2006 Member, Organizing Committee and Scientific Advisory Board, 2007 Dubrovnik Conference on Sustainable Development of Energy, Water, and Environmental Systems, sponsored by UNESCO.

2006 Interviewee, "World of Possibilities" syndicated radio program on the topic of desalination (August 15).

2006 Participant, "Recycled Water...changing public perception and addressing negative branding," hosted by US Bureau of Reclamation and Southern California Water Recycling Projects Initiative, Los Angeles (June 7)

2006 Interviewee, "Which Way L.A.," Los Angeles-based radio program on the topic of water reclamation and reuse (May 17).

2006 Panelist, "Water Reuse & Future Limitations – Pharmaceutical Effects on People and Fish Alike," Washington Association of Sewer and Water Districts (April 21).

2006 Participant, national Joint Water Reuse & Desalination Task Force meeting on institutional issues in desalination and water purification, San Antonio, Texas (April 17-18).

2006 Presenter, Administrative Law Judges Lunchtime Seminar Series, California Public Utilities Commission, "New Directions for California Water Governance," San Francisco (March 16).

2005 "California Water Policy: Planning for Climate Change, Growth, and Natural Heritage Preservation," 25th Biennial Groundwater Conference and 14th Annual Meeting of the Groundwater Resources Association of California, Sacramento (October 26).

2005 Moderator, Panel on Groundwater. California Water Law Symposium. University of San Francisco School of Law, San Francisco, CA. (January 22).

2004 Panelist, Fall Meeting of the Dissertation-Year Fellowship Program and the President's Postdoctoral Fellowship Program, Oakland, Ca. (October 1).

2004 "Global Warming and Environmental Justice," California League of Conservation Voters Environmental Justice Alliance. San Francisco, CA (May 20).

2004 Participant, Workshop on Developing a Water Reuse Economic Framework, sponsored by the National Water Research Institute and WateReuse Foundation. Pomona, CA (May 10-12).

2004 "Not an accident? Understanding Why One Billion People Worldwide Lack Reliable Drinking Water." Inaugural talk of the Synergy Lecture Series. U.C. Santa Cruz Science and Engineering Library (April 27).

2004 Participant, Water Reuse Research Needs Workshop. San Diego, CA (February 2-4).

2003 "Environmental Justice and Urban Water Management," Los Angeles Area Monthly Environmental Justice Luncheon Series, sponsored by The California League of Conservation Voters. Santa Monica, CA (October 30).

2003 PrecipNet research meeting, National Center for Ecological Analysis and Synthesis. Santa Barbara, CA (March 21-23).

2003 "Reporting on the Colorado River and the Salton Sea," U.C. Berkeley Center for Water Resources, sponsored symposium for journalists (March 15).

2003 "Innovations in State Environmental Policy," presented to State Senators and their staffs. U.C. Berkeley (January 23).

2002 Participant, California Water Law and Policy Conference, April 8-9, San Francisco.

2002 Invited speaker, Institute of the Americas H_2O Americas Conference, on the topic of challenges and benefits of water privatization, April 24, San Diego.

2002 "Property Rights, Ecosystem Services, and Climate Change in the Rural West," to the Analysis and Synthesis of Precipitation and Ecosystem Change Conference, National Center for Ecological Analysis and Synthesis (NCEAS), September 5-7.

2002 "Salton Sea: Historical Accident, Modern Enigma," Santa Cruz Museum of Natural History, February.

2001 "Regional Climate Modeling at the District Level," Annual Meeting of the American Water Resources Association, Albuquerque, NM, Nov. 13.

2000 Guest Speaker, "Community Forum" of *Action Pajaro Valley*. Topic: "Meeting the Challenge of Seawater Intrusion in the Pajaro Valley," Watsonville, CA, September 21.

2000 Presenter, "Water Reallocation in Theory and Practice," before the Berkeley Water Working Group. March 3. Presentation is available at: http://www.cnr.berkeley.edu/csrd/html/projects/0004/index.html

2000 "Evaluating Regional Impacts and Adaptations to Climate Change: The Case of California Water," (co-author K. Merritt) presented to the quarterly C-DELSI Meeting, Santa Cruz. May 19.

2000 Featured Guest, *Eco Review* television show, on the topic of watershed management, April 25.

2000 Lectured on *Rivers of Gold*, Capitola Book Café, Capitola, Ca., March 28.

2000 Featured Guest, KUSP Radio talk show, on water reallocation. March 27.

2000 Featured Guest, KSCO Radio "Saturday Morning Agricultural Hour," on water reallocation, February 26.

1998 3-day Workshop on International Water Policy for graduate students of the Monterey Institute of International Studies, October 16-18.

1998 "Water: A Precious Resource," panelist at a community forum on water issues along California's Central Coast," April 29.

1998 "Market-based Water Conservation on the Monterey Peninsula: The Fair-Use Management Proposal," Monterey Bay Regional Studies Seminar Series, April 24.

1998 "Water Marketing in California: an Update," International Water Issues Seminar, University of California, Santa Cruz, February 9.

1997 "Domestic and International Water Quality Issues," Monterey Institute of International Studies, Monterey CA. October 23.

1997 "The Economics of Fresh Water Policy," Natural Resource Economics Class, University of California, Santa Cruz, October 14.

1997 "California Water Marketing: An Alternative Route to Reform," Environmental Studies Board Seminar Series, University of California, Santa Cruz, January 29.

1996 "A New Approach to Reallocating California's Water Resources," Energy and Resources Group Spring Colloquium Series. April 3.

1995 "Links Between Water Science and Water Policy," presented to the course, "Scientific Foundations of International Environmental Policy," Monterey Institute of International Studies, Monterey CA. November 7.

MEMBERSHIPS AND ACTIVITIES IN PROFESSIONAL ORGANIZATIONS

2006- Member, Project Advisory Committee, WateReuse Foundation, Exploring the Value of Reliability Benefits for Reuse and Desalination Projects, WRF 06-002.

2005- Member, Research Advisory Committee, WateReuse Foundation, a national committee that provides long-term advising on the research direction of the Foundation. Reappointed 2007.

2001 Member, Proposal Advisory Committee, WateReuse Foundation Research Program. Attended workshop to making funding decisions for the 2001 Call for Proposals, San Diego, September 7.

1998 Participant, Water Education Foundation 1998 Update on Recent Water Law and Policy, San Diego, CA. July 9-10

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Attorneys for Plaintiff NRDC

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF CALIFORNIA

NATURAL RESOURCES DEFENSE COUNCIL, *et al.* Plaintiffs, v. DIRK KEMPTHORNE, Secretary, U.S. Department of the Interior, *et al.* Defendants. SAN LUIS & DELTA-MENDOTA WATER AUTHORITY and WESTLANDS WATER DISTRICT; CALIFORNIA FARM BUREAU FEDERATION; GLENN-COLUSA IRRIGATION DISTRICT, *et al.*; CALIFORNIA DEPARTMENT OF WATER RESOURCES, and STATE WATER CONTRACTORS, Defendant-Intervenors.	Case No. 05-CV-01207 OWW TAG DECLARATION OF PETER H. GLEICK, Ph.D. IN SUPPORT OF PLAINTIFFS' PROPOSED INTERIM REMEDIES Date: August 21, 2007 Time: 9:00 a.m. Courtroom: 3 Judge: Hon. Oliver W. Wanger

I, Peter H. Gleick, declare as follows:

1. I am a founding member, and current President, of the Pacific Institute for Studies in Development, Environment, and Security in Oakland, California, created in 1987. I have more than 20 years of professional experience analyzing, assessing, measuring, modeling, and reporting on freshwater issues, with a focus on water-use efficiency. I have a B.S. in Engineering and Applied Science (1978 cum laude and with distinction) from Yale University. I have an M.S. in Energy and Resources (1980) from the University of California, Berkeley. I have a Ph.D. in Energy and Resources (1986) from the University of California, Berkeley. Both of these graduate degrees were given for work on water resources in California. I am an elected member of the United States National Academy of Sciences. In 2001, I was appointed an Academician of the International Water Academy in Oslo, Norway. In 2003, I was awarded a MacArthur Foundation Fellowship for my work on water conservation science and policy. I have served on the California Department of Water Resources Public Advisory Committee for the California Water Plan.

2. The Pacific Institute is a non-profit corporation dedicated to finding solutions to the related problems of regional and global environmental degradation, unsustainable development, and political conflict through interdisciplinary research, policy analysis, and public outreach. We work collaboratively with water users, corporations, environmental and community groups, local, state, and national governments, and international organizations to address water issues.

3. As founding member and President, I have guided and participated in the Pacific Institute's work on California water issues since its inception in 1987. In 1993, the Institute began comprehensive water conservation and efficiency analysis for the State of California's urban and agricultural sector, including residential, commercial, industrial, and institutional water use, and we published an analysis of this in 1995.[1] I served as a Science Advisory Expert for the CALFED Independent Review Panel on Agricultural Water Conservation Potential in 1998. In 1998, we were contracted by the U.S. Department of the Interior to conduct an independent review of the water-use efficiency analyses of CALFED.[2] In 2003, the Institute published a report on the potential for urban water conservation and efficiency statewide.[3] The results of this work have been adopted in state water planning documents, including the 2005 California Water Plan, and the work of the Planning

and Conservation League. Local water agencies and organizations have requested that the Institute expand this work to address local water concerns. In September 2005, the Pacific Institute released a new study with an analysis of a "high efficiency" scenario for California urban and agricultural users to the year 2030.[4] I was the lead author of this study.

4. This declaration will address three main issues: the kinds of natural and human-caused variations in water supply that face California water users; the ways they have responded to those variations in the past; and the potential for future responses to changes in water availability. The conclusion of my analysis is that substantial reductions in water demands from the Delta are possible in both the short-term and long-term, and that these reductions can be made cost-effectively, with existing technologies and oft-used water strategies. In formulating this declaration, I have considered the materials specifically identified in the endnotes to this report.

5. Water users throughout the State of California are faced with natural wet and dry variations in water supply associated with the natural hydrologic cycle. Increasingly, human factors are playing a role in water supply reliability, including growing competition among users and efforts to restore natural ecosystems by returning water allocations to them, or altering the timing of existing withdrawals.

6. California water users have demonstrated the ability to develop and implement creative and collaborative responses to these variations, including especially a wide range of "conservation" and "efficiency" actions that permit both temporary and permanent reductions in water use. These include changes in technology and policy. Indeed, these actions are considered the foundation of future water policy for the State of California, as described in the most recent California Water Plan from the Department of Water Resources, which states:

> The water plan provides a Framework for Action, or roadmap, that lays out the role of State government and the water community to ensure that California has sustainable water uses and reliable water supplies in 2030 for all beneficial uses. *The framework identifies three foundational actions—use water efficiently, protect water quality, and support environmental stewardship—that will ensure sustainable water uses.* These foundational actions must be central to California water management.[5] (emphasis added)

7. Conservation and efficiency policies and technologies are not merely hypothetical approaches to increasing water savings; they are proven effective tools for reducing demand over time. For example, total water use in California was less in 2001 than it was in 1975 according to the U.S. Geological Survey national water use reports, yet population increased by nearly 60 percent and gross state product increased 2.5 times during this period. Forty years ago, we used nearly 2000 gallons for every person in the state every day. Today, we use half that amount.

7a. Although Californians have improved efficiency of our water use over the past 25 years, current water use is still wasteful. The research I have directed at the Pacific Institute for 20 years concludes that there is substantial untapped potential for both urban and agricultural water users that receive water from the Sacramento-San Joaquin river basins to permanently reduce wasteful uses of water and improve their water-use efficiency. There is also the potential for temporary, shorter-term conservation actions that can reduce water demands.

7b. The Pacific Institute's 2003 report ("Waste Not, Want Not"), funded by California foundations and state water agencies and extensively peer reviewed, provides a comprehensive statewide analysis of the conservation potential in California's urban sector. This study funds that existing, cost-effective technologies and policies can reduce current (year 2000) urban demand by more than 30 percent. The Institute's report "California Water 2030: An Efficient Future" found that similar, substantial savings are available from the agricultural sector as well. More than 65 percent of all crops in California are still grown with inefficient flood or sprinkler irrigation systems. Studies have shown, as cited in that report, that installing efficient irrigation technology such as drip systems can reduce water use and increase agricultural yields. Given that the agricultural sector is responsible for consuming around 80 percent of Californian's use of water, even small efficiency improvements can produce tremendous water savings. Additional water savings are possible if farmers continue to the trend of moving away from water-intensive crops like cotton, pasture, rice, and alfalfa in favor of more valuable, low-water crops like many vegetables, fruits, and nuts.

8. Research from the Pacific Institute and data available from the State of California and California water users also shows that water users in the San Joaquin and Sacramento hydrologic regions, or in regions that use water exported from these watersheds, have not fully implemented

long-term water management and efficiency measures used by similarly situated water users that also face potential water shortages. There is additional potential for both agricultural and urban water users to reduce demand on a temporary basis through short-term actions, some of which can be implemented at little or no cost.

Defining "Water-Use Efficiency" and "Water Conservation"

9. A wide range of water-management actions are available to lessen the effect of any reduction of water supply. Two broad management responses are the focus of this declaration: (1) "efficiency" responses focused on reducing demand by permanently improving the efficiency of existing agricultural and urban uses; and (2) "conservation" responses focused on reducing diversions and pumping requirements by temporarily changing uses or behavior.

10. There are many and varied definitions of "water-use efficiency." In this declaration, improving "water-use efficiency" refers to the potential to provide the same beneficial use to water users while utilizing less water, *i.e.,* to reduce the water needed to do a specific task or satisfy a specific need. Examples include crop shifting while producing the same or more income, replacement of inefficient irrigation methods to boost yields per unit water (or to boost income per acre, or income per gallon), replacement of inefficient water appliances, removal of outdoor water-intensive landscaping in commercial, residential, and institutional settings, and changes to industrial and commercial water processes. Efficiency improvements can be measured and evaluated at the field, crop, household, or business level, or at a larger "basin" level. The focus here is to reduce the use of water that is not used productively to produce a good or service.

11. In this declaration, water "conservation" refers to the additional potential to cut water use by changing benefits, goods, and services. Examples include single-season crop shifting, fallowing, and land retirement for agricultural users, and eliminating lawn watering, taking shorter showers, reducing car washing, and comparable urban actions commonly applied during severe droughts as voluntary responses.

12. Both approaches may be appropriate in certain circumstances, such as drought, temporary or intentional cutoffs of water supplies resulting from changes to operations of the Delta pumps, and changes in allocations.

Discussion and Analysis

13. Water availability naturally fluctuates with wet and dry extremes around the long-term average. Water districts and users may also experience significant short-term reductions in water allocations due to political, economic, or technical factors. Perhaps the most important function of water agencies and irrigation districts is to help water users manage these fluctuations through the development of water supply infrastructure and management practices.

14. These actions are also at the heart of official California water policy. As described in the latest California Water Plan, their official Framework for Action identifies "*three foundational actions—use water efficiently, protect water quality, and support environmental stewardship.* Describing "use water efficiently," DWR goes on to say:

> To minimize the impacts of water management on California's natural environment and ensure that our state continues to have the water supplies it needs, *Californians must use water efficiently to get maximum utility from existing supplies.* Californians are already leaders in water use efficiency measures such as conservation and recycling. Because competition for California's limited water resources is growing, we must continue these efforts and be innovative in our pursuit of efficiency.
>
> Water use efficiency will continue to be a primary way that we meet increased demand. In the future, we must broaden our definition of efficient water use to include other ways of getting the most utility out of our groundwater and surface water resources and water management systems: Increase levels of urban and agricultural water use efficiency...[6]

I. Agricultural Use

15. Growers understand their sensitivity to climatic variability and supply uncertainties, and they understand the value and potential of improving efficiency. A survey by the Center for Irrigation Technology at California State University, Fresno, asked growers "What contingency plans do you have in the event of a prolonged drought?" Growers responded with a wide variety of tools, but the answer chosen more often than any other was "improve system efficiency," showing that the potential to do so is not only there, but considered their first choice. The next two listed were "develop a deficit irrigation plan" and "modified cropping plan."[7]

16. A practical example of the historical capacity to act in the face of supply shortfalls is the Westlands Water District (the largest member of the San Luis and Delta-Mendota Water

Authority). Like other water agencies, Westlands experiences allocation reductions on a somewhat regular basis due to the natural variation in California's water supply and its position as a junior water right holder. During the severe 1987-1992 drought in California, reductions in the delivery of federal surface water from the Central Valley Project (CVP) to Westlands were as large as 70 percent. During this drought, growers within the Westlands Water District responded to water-supply changes by using both conservation and efficiency tools including:

A. Short-term replacement of lost surface supplies with other sources including water marketing, transfers, and increased groundwater pumping,

B. Short-term fallowing of lower valued crops.

C. Long-term permanent improvements in the efficiency of their water use.

D. Long-term changes in crop types.

These actions, described in detail below, are common to all water agencies or districts, including urban agencies, and help reduce the economic and employment impacts of those reductions.

Short-Term Changes in Water Supplies

17. As Figure 1 shows, Westlands relies on a mix of sources of water over time. While CVP water is the dominant source, the District also uses groundwater, transfers from other Districts and users, and other supplies. As the availability of federal surface supplies changes up and down, their reliance on other sources also changes up and down to compensate.

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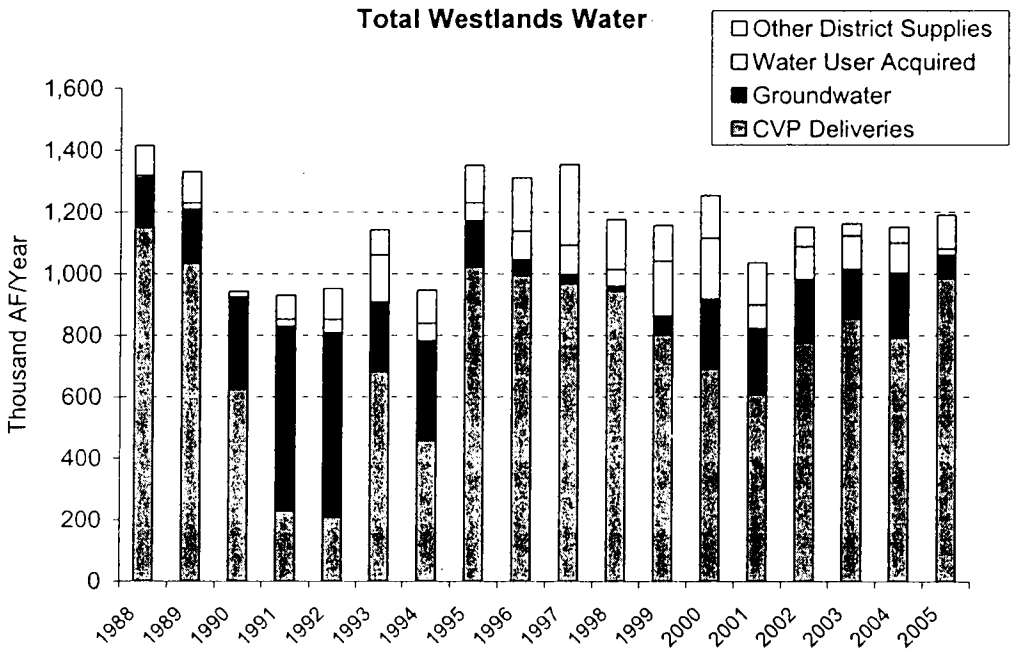

Figure 1. The use of water by the Westlands Water District from 1988 to 2005, showing the source of water. Data come from the Westlands Water District.[8]

18. The option of temporarily relying on increased groundwater pumping is a particularly important one: Central Valley growers regularly rely on short-term increases in groundwater pumping in dry years. Using Westland's data, Figure 2 shows that during the 1987-1992 drought period, CVP surface water deliveries to Westlands dropped approximately 70 percent, from an average of 1,150,000 acre-feet ("af") per year to nearly 300,000 af per year. To make up this shortfall, groundwater pumping increased from 160,000 af per year to 600,000 af per year and has now dropped again during the recent wet years. Particularly when groundwater levels are relatively high (as is currently the case), farmers can pump additional groundwater for very little cost. The current drought has increased groundwater withdrawals to make up for reduced surface supplies – precisely what managed groundwater is intended to do. Similarly, the expansion of groundwater recharge and innovative water banking arrangements made by water districts in Kern County with MWD and other Delta customers, were designed to help buffer drought impacts for both urban and agricultural users.

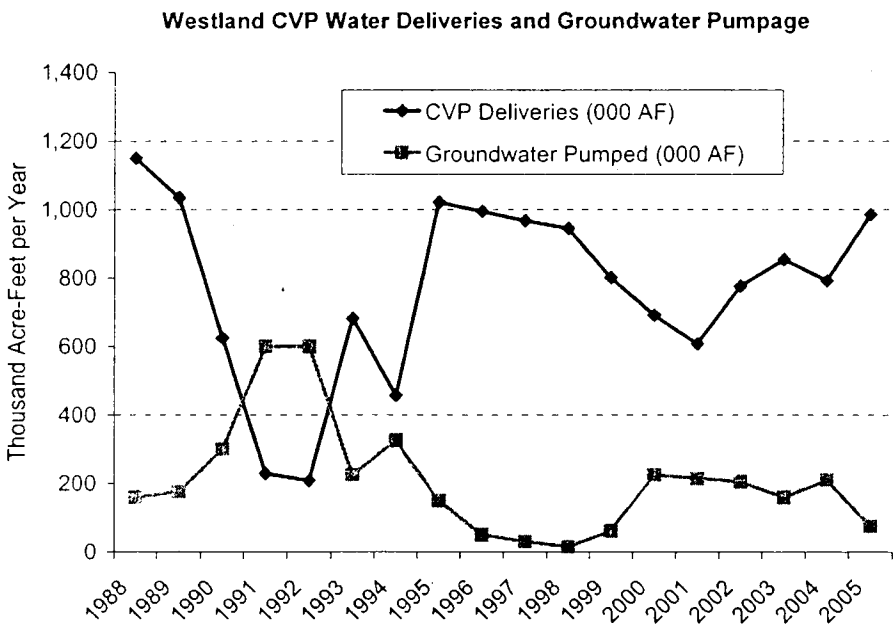

Figure 2. Groundwater and surface water use by Westlands Water District. During the drought of the late 1980s and early 1990s, surface water deliveries dropped and groundwater pumping increased substantially. Groundwater pumping in recent years has dropped back to around or below 200,000 acre-feet per year.[9]

19. There is the risk that increased pumping, even if temporary, could cause long-term environmental impacts, reduced groundwater storage capacity, and land subsidence in some regions, but in many basins in the Central Valley careful conjunctive use of surface and groundwater is common. As Figure 3 shows, high rates of groundwater pumping by Westlands lead to drops in groundwater levels, but groundwater levels recover when pumping declines. Indeed, at present, groundwater levels are relatively high, showing that groundwater is again readily available for use in an emergency drought, for emergency shutdown of surface deliveries, or for other needs. Water districts in Kern County, including KCWA, Semi-Tropic, and Arvin Edison have also developed large water banks to store surface supplies for later use in dry years. These districts have access to multiple supply sources, including local water, state water project supplies, and the San Joaquin River watershed, and have stored large amounts of water in the recent wetter years.

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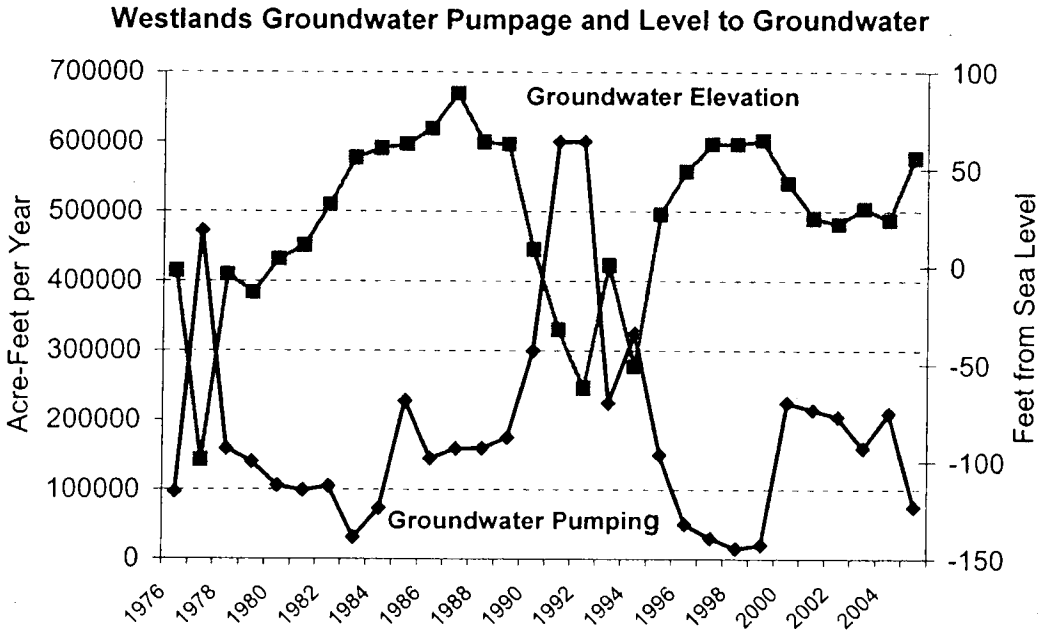

Figure 3: Groundwater pumping volumes (acre-feet per year) and groundwater levels (elevation in feet from sea level) over time for the Westlands Water District. Groundwater levels may drop during high pumping periods but recover during wetter periods. Current groundwater levels are high.[10]

Short-Term Fallowing of Lower-Valued Crops

20. In addition to longer term efficiency improvements, agricultural water users have the potential to implement shorter-term reductions in water use. For example, they can fallow land during severe droughts, reducing total agricultural water demand. All water districts typically fallow some land every year as part of regular rotations, but large amounts of fallowing are usually considered only as a last resort. Any policies encouraging such fallowing must also consider the economic impacts of such policies. This option is comparable to short-term cutbacks in urban water use that occur during extreme shortages.

21. Data from Westlands Water District show that some fallowing always occurs, even during wet years, and that farmers are unlikely to substantially fallow land even during very dry years – preferring instead to find other sources of water (see section A, above), change crop type, or improve efficiency. Figure 4 shows that Westlands growers may fallow as much as 125,000 acres during dry years, but even in the recent wet years over the past decade have typically fallowed between 50,000 and 100,000 acres.

21a. Other water districts have similar options. For example, the San Joaquin River Exchange Contractors currently make up to 150,000 acre-feet per year of their water supply available for sale or exchange with other users.[11] The NEPA/CEQA review of this program notes that the Exchange Contractors have developed this supply largely through conservation efforts (up to 100,000 acre-feet), with additional contributions through temporary land fallowing and idling crops.[12]

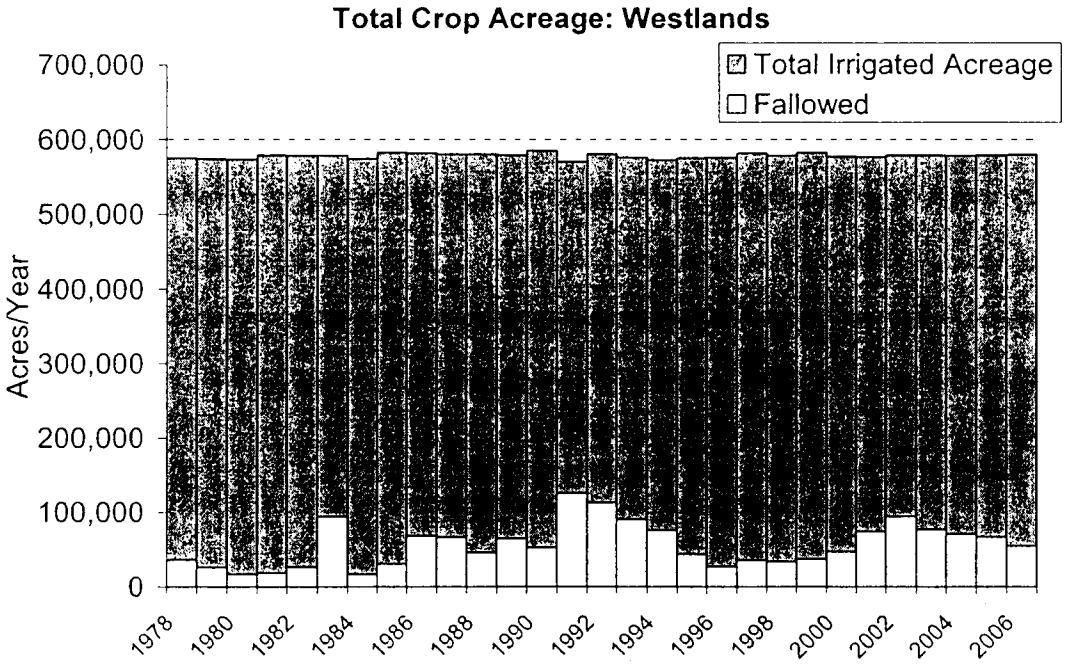

Figure 4: Total irrigated and fallowed acreage in the Westlands Water District from 1978 to present.[13]

Long-Term Improvements in Agricultural Water-Use Efficiency

22. Water is not used as efficiently as possible by Delta water users, even given current economics and technologies. This is one of the major conclusions of State of California analyses and the work of the Pacific Institute.[14] One of the most important arguments in support of the conclusion that improvements in the efficiency of water use are possible comes from growers themselves. A survey of more than 400 growers in the San Joaquin Valley, conducted by the Center for Irrigation Technology at California State University, Fresno, very clearly notes that farmers *themselves* understand that they can do more with the water they have, or even reduce current uses.

In some ways, this is the clearest evidence of the potential to use water more efficiently – academics can argue about data and methods, but farmers themselves have a strong sense of what is possible in their own fields. In this survey, 436 growers responded to the question, "do you irrigate as efficiently as you think you could." *Forty percent* of these growers responded "no" and indeed they offered a list of many dozens of different ways they felt they could improve irrigation efficiency.[15]

23. There has been a substantial change in irrigation type throughout California, permitting increased yields, increased water-use efficiency, and reduced water applied per acre for many crops. In particular, California growers are slowly but consistently moving toward more efficient irrigation methods. Figure 5 shows statewide changes in irrigation method applied to vegetable crops between 1972 and 2001, as reported by DWR surveys. These surveys show that drip irrigation overall has been increasing at a rapid rate, while less efficient gravity/surface irrigation has been declining.[16] Figure 6 shows the same trend statewide for all cropland in California. This trend is likely to continue and could be further accelerated by appropriate policies. Drip irrigation can boost crop yields and production while reducing overall water use. *See* Appendix.

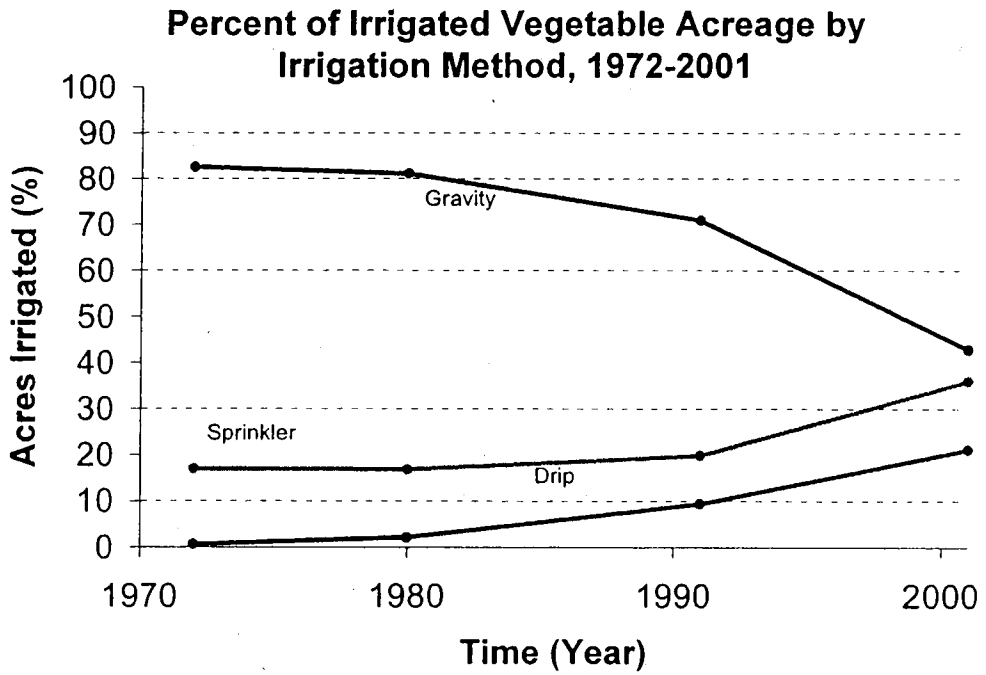

Figure 5: Percentage of vegetable crop area irrigated with gravity, sprinkler, and drip systems for 1971, 1980, 1992, and 2001 from the California Dept. of Water Resources, showing changes in irrigation method over time toward more water efficient systems. The 2001 survey is the most recent statewide.[17]

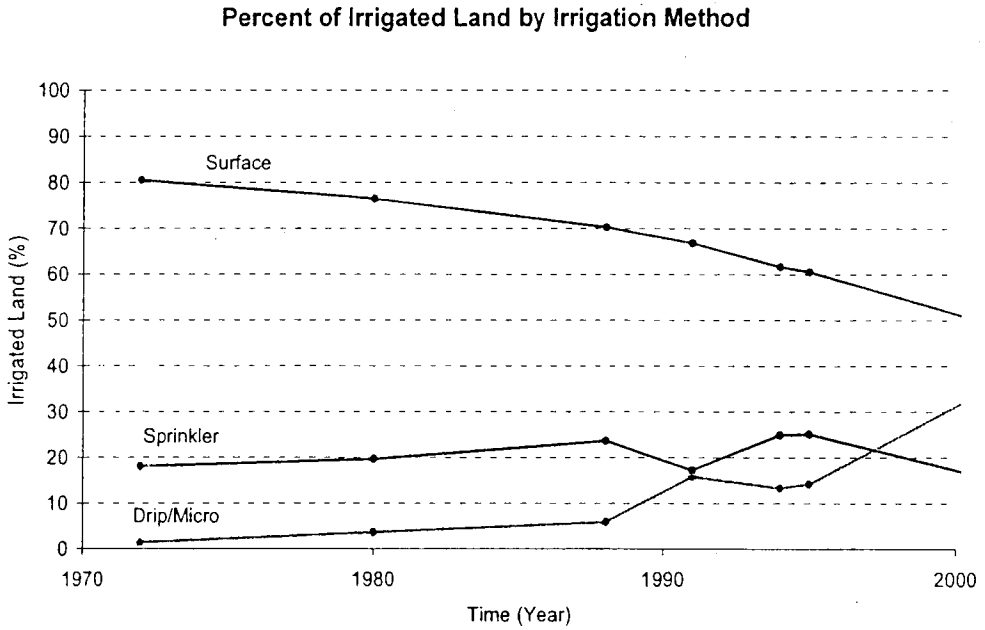

Figure 6: Historical data on the percent of irrigated land (all crops) under each irrigation method between 1972 and 2001. (Data from California DWR surveys and Orang et al. 2005.)[18]

24. The change toward more efficient irrigation methods has been slower in the San Joaquin and Sacramento Valleys than statewide. For example, Figure 7 shows the irrigation methods used on field crops statewide, and in the San Joaquin and Tulare hydrologic regions, according to the Department of Water Resources.[19] As this graph clearly shows, the San Joaquin and Tulare regions are still relying on more wasteful surface irrigation methods, and have shifted more slowly than other parts of the state to more efficient sprinkler systems.

25. At a hydrologic level, the Tulare Lake and San Joaquin regions apply water less efficiently than the state average for all crop types. Surface irrigation is used on 95 percent of field crops in the Tulare and San Joaquin hydrologic regions, compared to 87 percent in the State on average. For vineyards, the difference is even greater: 45 percent of vineyards in the Tulare Lake and San Joaquin hydrologic regions are irrigated with less-efficient surface methods, compared to only 21 percent in the State as a whole. For orchards and vegetables, the San Joaquin and Tulare Lake regions are slightly less efficient than the state average.

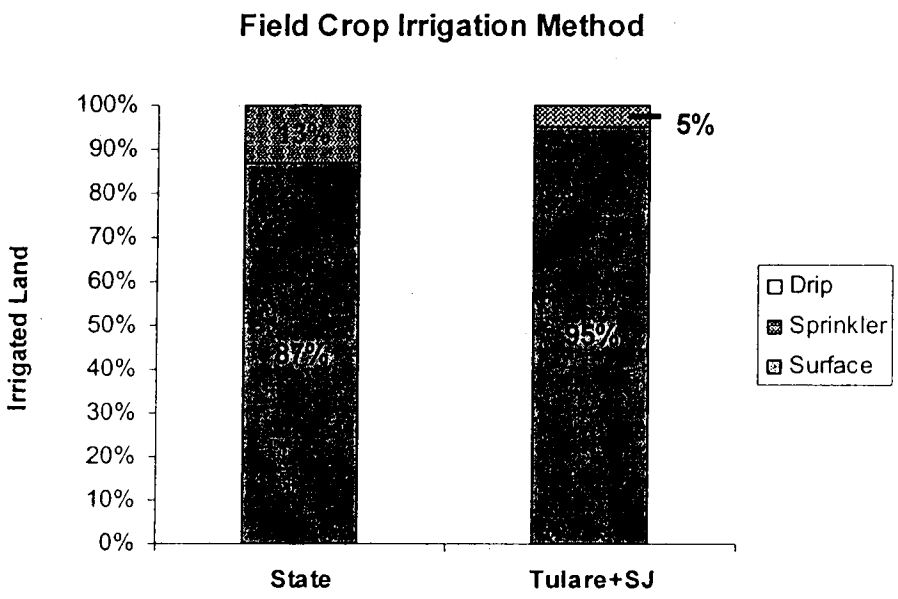

Figure 7. Percent of field crops statewide and in the Tulare and San Joaquin (SJ) hydrologic regions under drip, sprinkler, and surface irrigation, in 2001. Less efficient technologies are used more frequently on field crops in the Tulare and San Joaquin regions than statewide.[20]

26. While it is difficult to accurately measure unproductive evaporation, it is quite clear that such wasted water exists in all irrigation systems. For example, "most measurements have shown spray evaporation and drift to range from 5 to 20 percent of the water discharged."[21] In a series of field-level water balances, Molden found that evaporation losses accounted for 17 percent of total depletion in wheat crops and 30 percent in cotton crops.[22] Hillel estimates that, under surface flood irrigation, 20 to 30 percent of applied water is lost to evaporation from open water surfaces and transpiration by weeds.[23]

27. There are a number of different ways to reduce unproductive evaporation losses. It is widely understood that changing irrigation frequency, irrigation method, mulching, shading, and so forth can modify evaporation.[24] Unproductive evaporation can be reduced without adversely affecting crop production, soil quality, or yields. For example, some water is lost to winds immediately during and following field application. Changing irrigation technology has been shown to have a major effect on reducing evaporative wind losses while maintaining or improving crop yields. Efficient crop maintenance is also important: a well-watered crop with dry soil and plant

surfaces (full cover, no weeds) requires less water than a well-watered crop with wet soil and plant surfaces and weeds in between plants.

28. Irrigation methods that introduce water directly into the root zone, such as drip irrigation, without sprinkling the foliage or wetting the entire soil surface minimize deep percolation, surface runoff, and unproductive evaporative loss, while surface application induces depletion by evaporation. Drip irrigation offers the additional benefit of keeping the soil surface between the rows of crop plants dry, discouraging the growth of weeds that compete with the crops for nutrients and moisture.[25] Evaporation can also be reduced by improving irrigation timing and providing the crops with water when they need it most. For example, there is a greater potential to reduce ET during the midday when transpiration is reduced and evaporation is at its highest. Improvements in irrigation technology and irrigation management can both decrease evaporative losses.

29. According to Piper and Cappelluci, efficient irrigation systems tend to increase crop yield or decrease crop production inputs, an effect noted by many others as well.[26] Bernardo and Whittlesey reported that the potential for conserving water without greatly affecting producer income runs up to 35 percent for surface irrigation and up to 25 percent under center pivot irrigation.[27] Because a substantial amount of irrigated land in the Central Valley is still irrigated with surface or sprinkler methods, these results suggest that total crop yields can be maintained or improved with a smaller input of water; or conversely that crop yields can be significantly boosted with the water currently being used by the agricultural sector. Recent experience with precision irrigation systems in California supports this conclusion (see Appendix).

30. Reductions in evaporation can also be achieved by reducing surface water exposure, evaporation from soils, and mis-application of irrigation water. Indeed, the switch from surface flooding/gravity irrigation to sprinklers or precision drip systems is done in part to reduce this unproductive evaporative loss of water.

31. These data suggest that if growers in Central Valley districts improved irrigation technology even up to the current state average, water savings would result. Moreover, irrigation efficiency can be significantly improved beyond current state average levels.[28]

Long-Term Changes in Crop Type

32. A fourth option regularly employed by growers in response to the perception or imposition of long-term changes in water conditions is changing the type of crop grown. As water becomes more expensive or scarcer, farmers often switch to higher-valued, lower water-using crops.

33. In California agriculture, approximately half of all water used goes to grow rice, cotton, alfalfa, and irrigated pasture. Yet these four crops typically only produce 5 percent of total agricultural revenue, according to data from the California Department of Water Resources.[29] This vast mismatch in economic productivity of water use is driven by many factors, including water availability, pricing, federal subsidies, soil conditions, and the experience of growers with particular crops and equipment.

34. Discussions of crop switching (i.e., growing different kinds of crops on the same land) have traditionally been excluded from California water policy debates. Yet such changes in cropping patterns over time in California have probably had a greater impact on total agricultural water demand, water quality, and consumptive use than any other factor. Policies aimed at encouraging more water-efficient crops could have very large long-term benefits for the California water balance without adversely affecting farm income, and there is evidence that such changes can improve farm income.[30] For example, an analysis from the Pacific Institute shows that crop revenue could actually increase overall by switching a modest amount of acreage out of rice, cotton, alfalfa, and pasture to higher-valued crops, while saving as much as 1.5 million acre-feet of water.[31]

35. Figure 8 shows the shift in the Westlands District away from field crops toward less water-intensive vegetable crops over the past 35 years. As the figure shows, acreage planted in fruits and vegetables has tripled, while acreage planted in water-intensive cotton and other field and row crops has dropped enormously. Yet total agricultural income has more than tripled over the past 30 years to over $1 billion annually.[32]

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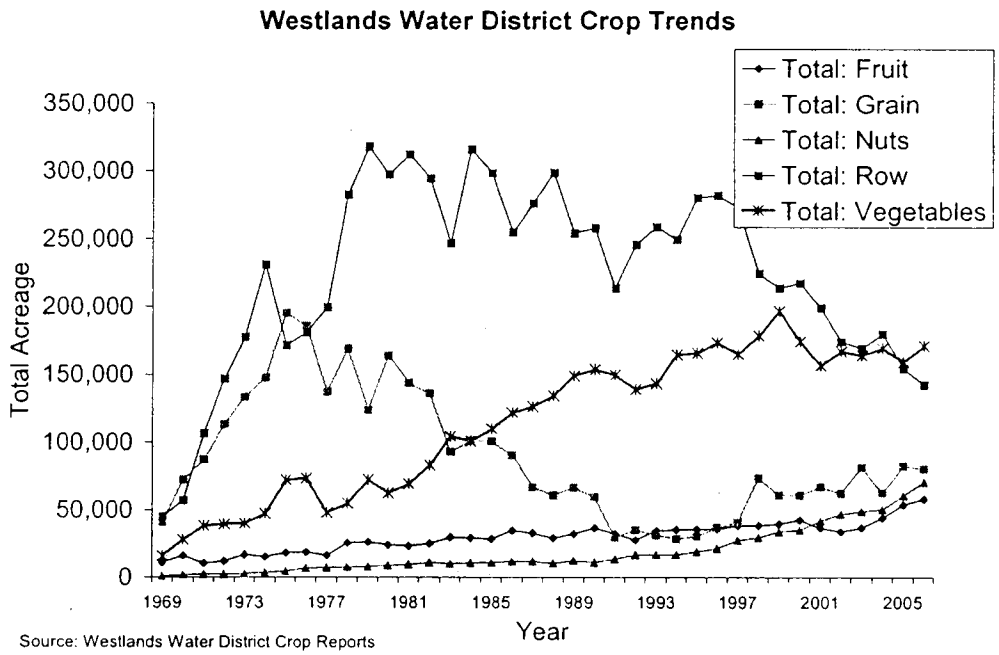

Figure 8: Trends in crop types grown in the Westlands Water District from 1969 to 2006. Total row and grain crops are slowly but consistently being replaced with higher valued, lower-water using fruit, nut, and vegetable crops.[33]

36. There has a similar trend over the past 20 years in the Friant Division away from grain and field crops toward more profitable vegetables, orchards, and vineyards. Figure 9 shows the historical trends in crops planted in the Friant Division between 1987 and 2004. While total crop area has not changed during this period, significant crop shifting has occurred; field crop acreage has declined by 20 percent, whereas vegetable and vineyard acreages have increased by 11 percent and orchard acreage has increased by 26 percent. Orchards and vineyards now account for over 60 percent of the crop area.

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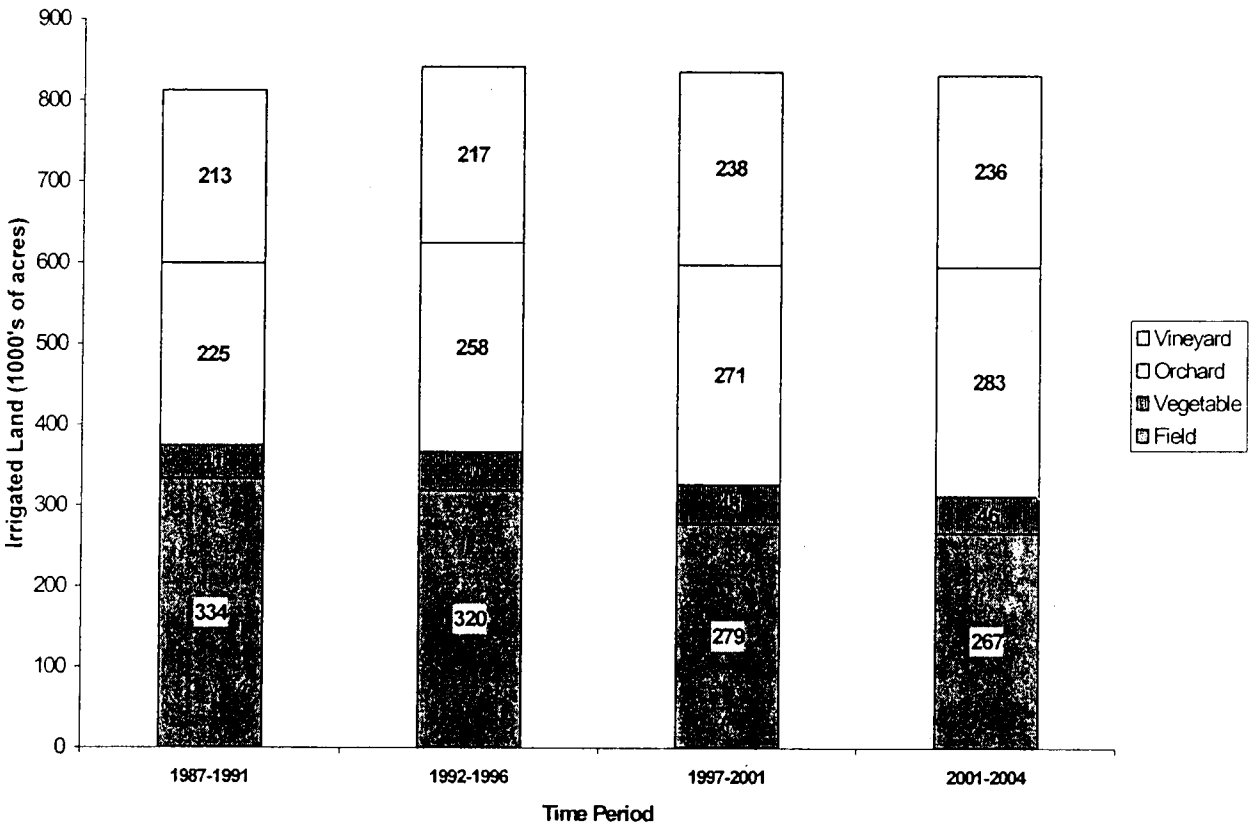

Figure 9: Irrigated acreage in the Friant Division by major crop type between 1987 and 2004.[34] Area devoted to orchards and vineyards is growing; field crop area is decreasing.

37. There is no reason to believe that this trend will stop, and many reasons to believe it will continue or even accelerate. These include:

- Growing pressures on water availability, which encourage growers to plant crops with lower water demands, or permanent crops likely to be given higher water priority during droughts;
- Higher profit for food crops, which can be grown productively on California farmland;
- The ability to better control evaporative losses using precision irrigation, which is more suited to orchards, vineyards, and row crops than low-valued field and grain crops.

38. Crop shifting trends suggest that the potential for water savings may be even greater in the future. Although studies have shown that drip systems apply water more efficiently than

surface irrigation for field crops, the adoption of this technology for field crops has been slower than for other crop types.[35] Over 50 percent of orchards and vineyards statewide are irrigated with drip, while less than one percent of field crops are irrigated with drip. Thus as agricultural land in the Friant Division is converted to higher-value orchards and vineyards, overall water needs will go down, and the ability to install even more efficient irrigation systems goes up.

39. Finally, even without changes in the actual crop types planted in California, we expect to see the introduction of new varieties of crops that are more water-efficient. Traditional crop genetics and efforts to develop new crop varieties with advanced genetic engineering are likely to permit increasing crop yields with either similar or lower water requirements in the future.

II. Urban Use

40. Urban water use in the some of the regions dependent on the Delta is also substantially higher than in other regions of California, largely because of wasteful outdoor landscape irrigation in the hotter climates of the Central Valley and inland areas of Southern California and the Bay Area. Similar to agriculture, urban water savings in areas outside of the Delta export regions can free up water that in many cases can be transferred to Delta users. These outdoor water uses are not critical for health and well-being, and could easily be reduced temporarily (during a short-term emergency) or permanently (through changes in garden irrigation methods, landscape design, and management). Table 1 shows the high average total urban water use per person for the Sacramento, San Joaquin, and Tulare hydrologic regions, compared to the State average. The Table also shows that residential water use in these regions is higher than the State average, including both indoor and outdoor use. A comprehensive assessment of the potential for improving urban water use in the state as a whole showed that total urban needs can be satisfied with about 30 percent less water, simply by applying existing cost-effective water-efficiency technologies.[36]

41. Urban users can also respond to shortages in the short-term through behavioral changes such as taking shorter showers, using dishwashers and washing machines only when full, reducing unnecessary water use when shaving or teeth cleaning, etc. Urban water users can respond quickly to supply shortages caused by drought and the need to provide additional water for the

environment. In the early 1990s, the City of Los Angeles reduced water usage over 100,000 acre-feet in a year (17 percent reduction) as the drought continued and legal efforts to reduce diversions from the Mono Lake Basin succeeded and users became aware of the need and ability to protect ecosystems.[37]

Table 1: Urban Water Use is High in Central Valley Regions

Region	Total Urban Water Use (Gallons per Person per Day)	Residential Water Use (Gallons Per Person Per Day)
Sacramento Region	296	177
San Joaquin Region	312	220
Tulare Region	310	242
State Average	**233**	**145**

Data from the California Department of Water Resources (DWR). 2005. The California Water Plan Update. Public Review Draft (May 2005). Bulletin 160-05. Sacramento, California. Volume 3.

42. Data on specific regional urban uses in the parts of the Central Valley such as the Friant Division service area support the conclusion that comparable, and even greater, water savings are possible here. While Friant service area users get little water from the Delta, it can be a source of water for Westlands and other water users who depend on Delta water. They are, therefore, a potential source of water transfers in any future water management arrangement.

43. According to the California Department of Water Resources California Water Plan, current urban use (per person) in the Tulare Lake hydrologic region is around 310 gallons per person per day. Similarly, regional average per capita urban use in the San Joaquin River hydrologic region is around 304 gallons per person per day.[38] These levels are substantially higher than average statewide use. In part, this higher use is the result of the failure of major cities in the region from Sacramento to Fresno to meter household water use. Such meters have been shown to reduce urban water use when combined with rate structures that charge based on the volume of use.

44. It can be argued that urban water use is higher in these regions because of the warmer, drier climate, and larger average garden and lawn size. This is partly true, but when I correct for this difference and simply look at average indoor residential water use alone, the urban areas in this region still use substantially more water per person than the statewide average. Table 2 shows this comparison. As this Table shows, the state average of indoor residential water use is

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did not receive from the commenter.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed in Oakland, California, on July 23, 2007.

Dr. Peter H. Gleick

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[1] Gleick, P., Loh, P., Gomez, S., and Morrison, J. 1995. California Water 2020: A Sustainable Vision. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

[2] Gleick, P.H. and D. Haasz. 1998. "Review of the CALFED Water-Use Efficiency Component Technical Appendix." Report to the United States Department of the Interior, Bureau of Reclamation, Grant No. 8-FG-20-16250. Pacific Institute for Studies in Development, Environment, and Security, Oakland, California (June 1998).

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[7] Zoldoske, D.F. 2002. "San Joaquin Valley Grower Irrigation Survey." CATI Pub. #021201. Center for Irrigation Technology, California State University, Fresno, California, pp.14-16.

[8] Data from Westlands Water District: http://www.westlandswater.org/resources/watersupply/supply.asp?title=Annual%20Water%20Use%20and%20Supply

[9] Data from Westlands Water District, "Deep Groundwater Conditions: December 2005," Westlands Water District publication March 2006.

[10] Data from Westlands Water District, "Deep Groundwater Conditions: December 2005," Westlands Water District publication March 2006.

[11] See Final EIS/EIR, Water Transfer Program for the San Joaquin River Exchange contractors, Water Authority 2005-1014 (Dec. 2004; Draft Environmental Assessment/Initial Study, Groundwater Pumping/Water Transfer Project for 25 Consecutive Years (July 3, 2007), available at http://www.usbr.gov/mp/nepa/nepa_base.cfm?location=all.)

[12] FEIS, 12/04, at ES-6; DEA/IS, 7/07 at 2-11 to 2-12.

[13] Data from Westlands District annual crop reports.

[14] See the CalFed Water Use Efficiency conclusions, the Dept. of Water Resources Bulletin 160-05 (California Water Plan Update), and Gleick, P.H., H. Cooley, D. Groves. 2005. California Water 2030: An Efficient Future. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

[15] Zoldoske, D.F. 2002. "San Joaquin Valley Grower Irrigation Survey." CATI Pub. #021201. Center for Irrigation Technology, California State University, Fresno, California, pp.14-16.

[16] Orang, Morteza N., Richard L. Snyder, and J. Scott Matyac. 2005. "Survey of Irrigation Methods in California in 2001". In California Department of Water Resources (DWR). The California Water Plan Update. B160-05, Sacramento, California.

[17] Orang, M.N., R.L. Snyder, and J. S. Matyac. 2005. "Survey of irrigation methods in California in 2001." In California Department of Water Resources (DWR). The California Water Plan Update. Bulletin 160-05. Sacramento, California.

[18] Orang, M.N., R.L. Snyder, and J. S. Matyac. 2005. "Survey of irrigation methods in California in 2001." In California Department of Water Resources (DWR). The California Water Plan Update. Bulletin 160-05. Sacramento, California.

[19] Source: Orang, Morteza. Personal communication on 8/31/05. Data extracted from Orang, M.N., R.L. Snyder, and J. S. Matyac. 2005. "Survey of irrigation methods in California in 2001." In California Department of Water Resources (DWR). The California Water Plan Update. Bulletin 160-05. Sacramento, California.

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[27] Bernardo, D.J. and N.K. Whittlesey. 1989. "Factor Demand in Irrigated Agriculture Under Conditions of Restricted Water Supplies." Resources and Technology Division, Economic Research Service, U.S. Department of Agriculture, Technical Bulletin No. 1765. Washington, D.C.

[28] As noted earlier from Gleick, P.H., H. Cooley, D. Groves. 2005. California Water 2030: An Efficient Future. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

[29] According to the US Department of Agriculture and the California Agricultural Statistics Service, in 2002, these four crops (rice, cotton, alfalfa, and irrigated pasture) generated about $1.5 billion in revenue to farmers, out of a total annual gross agricultural revenue of around $27.5 billion (http://www.cdfa.ca.gov/). During that same period, these four crops used about 15 million acre-feet of water out of the total agricultural use of about 30 million acre-feet (Personal communication,

Scott Matyac, Department of Water Resources, October 20, 2004, data from file CaLWU092404.mdb, qry_AW_State(TAF)).

[30] Gleick, P., Loh, P., Gomez, S., and Morrison, J. 1995. California Water 2020: A Sustainable Vision. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

[31] See Table 20 of Gleick et al. 1995, California Water 2020: A Sustainable Vision. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

[32] Westlands reported that in 1978 total crop value was $333 million. They have now stopped posting total crop values on their website, but the $1 billion figure comes from a 2001 San Francisco Chronicle article "Central Valley irrigation district fights to save arid farmland, despite cost to taxpayers" by Eric Brazil, January 28, 2001.

[33] Data from the Westlands Water District annual crop reports.

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[36] Gleick, P.H. et al. 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California (hereafter "Waste Not, Want Not").

[37] See Table and Figure on page 1-6 of The 2005 LADWP Urban Water Management Plan (available at http://www.ladwp.com/ladwp/cms/ladwp007157.pdf). This table shows a 110 TAF drop in demand from 1990 to 1991.

[38] California Department of Water Resources. 2005. Draft California Water Plan, Bulletin 160. Volume 3, Sacramento, CA.

[39] California Department of Water Resources. 2005. Draft California Water Plan, Bulletin 160. Volume 3. Sacramento, CA.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed in Oakland, California, on July 23, 2007.

Dr. Peter H. Gleick

Oakland 7-23-07

[1] Gleick, P., Loh, P., Gomez, S., and Morrison, J. 1995. California Water 2020: A Sustainable Vision. Pacific Institute Report, Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.

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[12] FEIS, 12/04, at ES-6; DEA/IS, 7/07 at 2-11 to 2-12.

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[15] Zoldoske, D.F. 2002. "San Joaquin Valley Grower Irrigation Survey." CATI Pub. #021201. Center for Irrigation Technology, California State University, Fresno, California, pp.14-16.

Appendix to the Declaration of Peter H. Gleick

Drip Irrigation Water Savings: Selected Case Studies [1]

- In Los Banos in Fresno County in the late 1990s, Trecho Farms began using subsurface drip irrigation to grow fresh market and processing tomatoes. Trecho Farms reports that applied water use was reduced by as much as 50 percent from previous gravity/flood systems.

- At Hammond Ranch in Firebaugh, Fresno County, the owner established subsurface drip irrigation on 560 acres of cotton, tomatoes, and asparagus. Hammond Ranch reported improvements in yields and reduced water use. Cotton on drip requires 20 percent less water than the region's average (2.1 acre-feet of water per acre, instead of 2.7 acre-feet per acre) and has produced yields approximately 15 percent above the region's average. Yields on asparagus were 50 percent higher than those typical produced using furrow or sprinkler irrigation.

- Turlock Fruit Company, also in Firebaugh, started testing subsurface drip systems in the early 1990s on 300 acres of asparagus, 150 acres of melons, and 150 acres of cotton. The company reported that drip irrigation increased yields on these fields by 30 to 40 percent and reduced water use by 20 to 30 percent, as well as eliminating drainage problems. Soil salinity is monitored, and they have seen no increase in soil salinity on drip-irrigated fields.

- In the early 1990s, the California Energy Commission (CEC) granted low-interest loans to two California farmers to help cover the costs of converting bell pepper row crops to drip irrigation. In 1993, High Rise Farms near Gilroy installed buried drip irrigation equipment on forty acres, and Underwood Ranches near Oxnard installed buried drip irrigation on fifty acres. Technical assistance and monitoring were provided by the Irrigation Training and Research Center (ITRC) at Cal Poly San Luis Obispo. Both farms found that buried drip irrigation substantially increased pepper yields, decreased water consumption, and greatly improved profits. The average net revenue increase for High Rise Farms was $1,100 per acre per year; the average net revenue increase for Underwood Ranches was $1,900 per acre per

year. Applied water use dropped between 16 and 25 percent at Underwood Ranches while yields went up between 10 and 50 percent. Applied water use at High Rise Farms dropped as much as 11 percent while yields went up as much as 56 percent. Initial installation and operation problems often experienced with new systems were successfully addressed and both farms subsequently expanded their drip irrigation systems with their own money. All these cases reported additional savings from reduced fertilizer and a pesticide application.

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[1] These case studies come from M. Fidell, P.H. Gleick, A. Wong, 1998. "Converting to Drip Irrigation: Underwood Ranches and High Rise Farms," Sustainable Use of Water: California Success Stories. Pacific Institute for Studies in Development, Environment, and Security, Oakland (September 1998), pp. 164-178, and from Cohen R. and Curtis J. 1998. "Agricultural solutions: Improving Water Quality in California Through Water Conservation and Pesticide Reduction." Natural Resources Defense Council, New York

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EDUCATION

Doctorate (PhD)	**University of California, Berkeley, Energy and Resources, 1986.**
Master of Science (MS)	**University of California, Berkeley, Energy and Resources, 1980.**
Bachelor of Science (BS)	**Yale University, in Engineering and Applied Science, 1978. Cum laude, with distinction.**

PROFESSIONAL EMPLOYMENT

Pacific Institute for Studies in Development, Environment, and Security.
Co-Founder and President. 1987-present

MacArthur Foundation Research and Writing Fellowship.
Fellowship in International Peace and Security. 1988-1990.

MacArthur Foundation Fellow in International Security.
Social Science Research Council/MacArthur Foundation. Post-doctoral position at the Energy and Resources Group, University of California, Berkeley. 1986-1988.

University of California, Berkeley.
Research Associate in the Energy and Resources Group. 1983-1986.

Office of the Governor of California.
Deputy Assistant for Energy and Environment. 1980-1982.

University of California and Lawrence Berkeley Laboratory.
Energy and Resources Group, Research and Teaching Associate. 1980-1981. Ecology Research Group Assistant, Energy and Environment Division. 1978-1980.

HONORS, AWARDS, FELLOWSHIPS

- Named MacArthur Fellow. October 2003
- Elected to Phi Beta Delta: Honor Society for scholarly achievement in international education. April 2003.
- Appointed to Water Science and Technology Board, National Academy of Sciences, Washington. June 2001.
- Named by the BBC as a "visionary on the environment" in its Essential Guide to the 21st Century.
- Elected Academician of the International Water Academy, Oslo, Norway. October 1999.
- MacArthur Foundation Research and Writing Fellowship. 1988-1990.
- Social Science Research Council-MacArthur Foundation Post-Doctoral Fellow in International Peace and Security Studies, June 1986 to June 1988.
- San Francisco Chronicle, one of "90 People to Watch in the '90s."
- *Cum laude*, Yale University 1978; *Distinction*, Engineering and Applied Science

PUBLIC AND PROFESSIONAL SERVICE (Current)

- Water Science and Technology Board, National Academy of Sciences, 2001-present.
- Public Advisory Committee: California Water Plan 2003. Department of Water Resources, 2001-present
- Board of Directors: Pacific Institute for Studies in Development, Environment, and Security, 1988-present.
- Editorial Board, Annual Reviews of Energy and the Environment, 2001-2006
- Editorial Board, Climatic Change, 1990-present.
- Editorial Board, Water Policy, 1997-present
- Advisory Council, International Water Academy, Oslo,Norway, 2003-2005.
- Scientific Advisor: IMAX Film "The Water Planet," 2003-present

PUBLIC AND PROFESSIONAL SERVICE (Past)

- Co-Chair: Water Sector: National Assessment of the Potential Impacts of Climatic Variability and Change on the United States, 1998-2000.
- Board of Directors: International Water Resources Association, 1997-2000.
- Global Environmental Change Committee, American Geophysical Union, 1993-1998.
- Public Advisory Forum: American Water Works Association, 1993-1998.
- 1990 Water Task Group, Second World Climate Conference, Geneva, Switzerland.
- Advisor, Comprehensive Freshwater Assessment, Stockholm Environment Institute, 1996-1997.
- Advisory Board: documentary film *Cadillac Desert* 1995-1997
- Advisory Committee: Climate Institute's Environmental Refugee Program, 1993-1995.
- Board of Directors: Environmental Science and Policy Institute, 1991-1997.
- Climate and Water Panel, American Association for the Advancement of Science, 1986-1990.
- Co-Chair, Working Group 2, Advisory Group on Greenhouse Gases (AGGG), WMO/UNEP, 1989-91.
- Committee on Science & International Security, American Association for the Advancement of Science, 1993-95.
- Editorial Board, Environment and Security, 1993-2001.
- Editorial Board, Encyclopedia of Life Support Systems, 1997-2002.
- Editorial Board, Encyclopedia of Global Change (Oxford University Press), 1996-2000.
- Editorial Board: Global Change and Human Health, 1999-2003
- Interim Board of Directors: Middle East Water Information Network, 1994-1996
- Project Steering Committee: IUCN (World Conservation Union): Water Demand Management in Southern Africa, 2000-2003.
- Scientific Review Group, President's Council on Sustainable Development, 1994-1996.
- Surface Water Committee, American Geophysical Union, 1992-1993.
- Working Group VIII Special Report, United States-Soviet Agreement on Protection of the Environment, 1989-90.

A full publications list is available upon request.

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Holdren, J.P., Anderson, K., Deibler, P.M., Gleick, P.H., Mintzer, I., Morris, G. 1983. "Health and safety aspects of renewable, geothermal, and fusion energy systems." In C.C. Travis and E.L. Etnier (eds.) Health Risks of Energy Technologies. American Association for the Advancement of Science. (Westview Press, Inc., Boulder, Colorado.)

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ARTHUR (ART) R. JENSEN

Chief Executive Officer/General Manager
Bay Area Water Supply & Conservation Agency

1976: **Major Consulting firm in California – Principle Project Engineer**

Produced planning studies on San Francisco water system hydraulic upgrades, produced reports on water supply planning, wastewater outfall environmental impacts, reservoir yield analyses, wastewater and water system capital improvements.

1984: **San Francisco Water Department – Deputy General Manager and Acting General Manager**

Managed department response following the Loma Prieta earthquake. Initiated $104 million bond funded program for treatment and water system improvement. Provided analyses of water supplies and demand leading to water rationing and purchase of supplemental water supplies after the Hetch Hetchy water supply was impacted by drought and hydroelectric operations.

1990: **Contra Costa Water District: Assistant General Manager and Director of Planning**

Developed multi-agency agreement for water supply planning. Negotiated wastewater recycling agreement with local sanitation agency. Oversaw development of 10-year capital improvement program and subsequent updates. Managed development of water distribution plans, agency environmental documents and comments on environmental reports prepared by other entities.

1995-Current: **General Manager of the Bay Area Water Users Association (BAWUA), predecessor organization of the Bay Area Water Supply & Conservation Agency (BAWSCA)**

Currently Chief Executive Officer and General Manager of BAWSCA, comprising 27 cities, water districts and water companies that purchase water from the San Francisco Public Utilities Commission (SFPUC) for resale to their local service areas. The Agency represents its members' collective interests in their relationship with the SFPUC and on matters related to water conservation, water supply, facility reliability, operations, water quality and wholesale water rates. Manages development and implementation of regional water conservation programs. Worked on successful passage of the Wholesale Regional Water System Security Reliability Act.

Education: MS and Ph.D. in Environmental Engineering Science from California Institute of Technology.

BS in Engineering Physics from UC Berkeley.

Taught courses in water engineering and water resources management at both Stanford and UC Berkeley.

155 Bovet Road, Suite #302 San Mateo, CA 94402 Phone: 650-349-3000 Fax: 650-349-8395

BAWSCA
Bay Area Water Supply & Conservation Agency

July 17, 2008
Via e-mail and U.S.P.S

Mr. Bill Wycko
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Re: Analysis of New Variant to Water System Improvement Program Program Environmental Impact Report

Dear Mr. Wycko:

The Bay Area Water Supply & Conservation Agency (BAWSCA) represents the interests of 25 cities and water districts, an investor-owned utility, and Stanford University, who purchase water wholesale from the San Francisco Regional Water System. These agencies provide retail water service to 1.7 million people and over 30,000 businesses and community organizations in Santa Clara, San Mateo and Alameda counties.

The Limitation.
The San Francisco Public Utilities Commission (SFPUC) General Managers have sent two letters to the San Francisco Planning Department introducing the concept of using 2018 as an interim date for future water supply decisions in connection with the Program Environmental Impact Report (PEIR) and Water System Improvement Program (WSIP). The first letter was sent by Susan Leal on March 21 and the second was sent by Ed Harrington on May 2. The letters request that the Major Environmental Analysis (MEA) Division analyze a variant of the "No Purchase Request Alternative," examining the environmental impacts of limiting deliveries to the wholesale customers to 184 mgd through the year 2018.

The Demand.
This 184 mgd limitation is 10 mgd short of meeting the wholesale customers' projected 2018 demand of 194 mgd. The 194 mgd projected demand is based on the wholesale customers' extensive collaboration with the SFPUC which created reasonable and defensible demand projections of future water needs. In addition, the projected demand incorporates wholesale customer commitments to conservation, recycling and groundwater that will meet 19 percent of their total demands by 2030. However, if San Francisco honors its commitment to the 25 wholesale customers who have perpetual contracts and the customers' demand happens to be at least 184 mgd in 2018, then it is possible the SFPUC will, by necessity, choose to limit deliveries to the two interruptible wholesale customers, the cities of Santa Clara and San Jose.

Consequences of an Interruption of Supply.
If San Francisco interrupted or decreased supplies to these cities, the impacts would be severe. Families, businesses, hospitals and schools in San Jose and Santa Clara are dependent on the reliable high quality water that they have paid for year after year for almost 40 years. San Jose has 2332 customers with a residential population of 14,800 and 365 businesses of which 263 are industrial customers receiving this water. The portions of these cities served by the Regional Water System are isolated from the parts of the cities that are served by other water supplies.

Before the cities began purchasing water from the Regional Water System in the 1970's, both cities experienced over-draft of groundwater supplies and the resulting negative environmental impacts of land subsidence. San Francisco deliveries have been key to halting the over-drafting and associated subsidence and have allowed the Santa Clara Valley Water District to manage groundwater pumping. Despite these efforts, groundwater is not a sustainable substitution for water from the Regional Water System.

The Santa Clara Valley Water District, the primary water resources manager in Santa Clara County, states that any reduction in supplies to San Jose and Santa Clara would need to be addressed with an increase in development of and exportation of water from the already beleaguered Delta. Furthermore, additional infrastructure would be needed to treat and deliver the new supplies. The environmental impacts of the new water supply and infrastructure would be in addition to those already associated with the WSIP, could be significant, and have not yet been adequately analyzed as part of the WSIP PEIR.

The Cities are Maximizing Their Resources.
Both San Jose and Santa Clara have thriving recycled water programs and implement all the current Best Management Practices for water conservation. For example, in North San Jose, the area of that City that receives water from San Francisco, 13 percent of water needs are met with recycled water. This is projected to expand to 30 percent in the future, preserving high quality potable water for the most valuable uses, but will not eliminate the need for water from the Regional Water System. Santa Clara currently offsets 2.7 mgd of its needs with recycled water.

BAWSCA supports the idea of placing a realistic limit on increased deliveries from San Francisco's watersheds to the SFPUC service area until 2018 so that sustainable demand management and water supply alternatives can be examined and to the extent feasible, developed. BAWSCA opposes alternatives or variants that would ignore the needs of long-standing retail or wholesale customers of the system.

A Constructive Solution.
As noted by MEA in the draft PEIR, the impacts of increased diversions on the Lower Tuolumne River can be mitigated by investments in agricultural water conservation in the Tuolumne River basin. The MEA should evaluate the variant the SFPUC wants analyzed in conjunction with this mitigation measure. This approach could prevent an increase in net diversions from watersheds until the year 2018 while maintaining water deliveries to San Jose and Santa Clara. In our comments on the draft PEIR, BAWSCA proposed that the amount conserved should exceed the increase in diversions so the Lower Tuolumne River would experience a net increase in flow at times important to the endangered fish species present in that part of the river. As BAWSCA noted in its comments on the draft PEIR such a program should exclude land fallowing or other elements that might be detrimental to the farming community or cause third-party impacts.

This type of proposal has been supported by two environmental organizations. The Environmental Defense Fund has supported this specific proposal of investing in agricultural conservation, and the Pacific Institute has suggested that urban investment in agricultural conservation is a possible solution to future water management that should be explored.

Please ensure that the final PEIR fully examines and analyzes environmental and other consequences of cutting off deliveries to San Jose and Santa Clara as well as the opportunity to honor a limitation on net withdrawals from watersheds by implementing this mitigation measure.

Sincerely,

Arthur R. Jensen
Chief Executive Officer and General Manager

CC: Ed Harrington, General Manager, San Francisco Public Utilities Commission
Diana Sokolove, Environmental Planner, San Francisco Planning Department
Alan Kurotori, Director of Water and Sewer Utilities, City of Santa Clara
Mansour Nasser, Division Manager, Environmental Services Department, City of San Jose

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CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

June 27, 2008

Mr. Bill Wycko, Acting Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Re: Additional Information from City of San José as Part of WSIP PEIR Alternative Analysis

Dear Mr. Wycko:

The City of San José (City) is pleased to offer additional comments on the Program Environmental Impact Report (PEIR) for the San Francisco Public Utility Commission's (SFPUC) Water System Improvement Program (WSIP). San José previously commented on the PEIR (letter of September 27, 2007), generally supporting the PEIR as written and expressing support for the environmentally superior alternative (specifically, the Modified WSIP), which, along with the proposed program, includes the continued delivery of water from the San Francisco Regional Water System (RWS) to meet the projected water supply needs of San José. In addition, the City believes this alternative can be enhanced (as suggested by BAWSCA) to provide not only sufficient water supply for the projected water demand of all BAWSCA wholesale customers (including those for the Cities of San José and Santa Clara) but to also provide for greater flows in the lower Tuolumne River.

It has now come to our attention that the SFPUC has directed the San Francisco Planning Department to evaluate a variation of the "No Purchase Request Increase Alternative," a less desirable alternative, that may preclude a long-term assured supply of water to the City from the San Francisco RWS (letter of May 2, 2008, from Mr. Ed Harrington to SF Planning Dept).

Since 1969, the San José Municipal Water System has received water from the San Francisco RWS and distributed this water to customers in the North San José area. Under the current Master Water Sales Agreement, the cities of San José and Santa Clara receive water as "temporary and interruptible" customers. San José, with a population of nearly 990,000, is the largest city in the suburban service area, yet only accounted for 2.7% of the water purchased from SFPUC in 2006-07. The City desires to become a permanent customer of the SFPUC to ensure the continued delivery of water from the RWS to the North San José Area for the following reasons:

- The North San José area has no other viable alternative water supply available. San José firmly believes that continued delivery of this small amount of water supply to this area is the most environmentally responsible option for a long-term water supply to the North San José area.

- San José has a proven track record of aggressive water conservation and recycling to assure the most efficient use of water from the San Francisco RWS.

- There would be severe environmental and economic implications from San Francisco ceasing to provide water supply to San José.

San José has proven to be a cooperative customer and an asset to San Francisco and the Bay Area Water Supply and Conservation Agency (BAWSCA) in terms of supporting agency and state-wide water supply issues. Continuation of SFPUC supplies to North San José is the best and most environmentally responsible alternative for future water supply in this area.

No Viable Alternative Water Supply Available

San José relies on water from the San Francisco RWS to meet the water supply needs for the North San José area as no alternate potable water supply is available to accommodate normal deliveries. This area is hydraulically separate from the other water supplies that serve the City. Specifically, the Santa Clara Valley Water District has stated that it is not feasible for it to provide treated water to this area due to a lack of distribution system and treatment plant capacity. In addition, while this area does have access to local groundwater, this water supply is not a consistently dependable long-term source due to the known potential for groundwater overdraft and consequent land subsidence during times of increased use or drought. Prior to receiving water from the San Francisco RWS in the late 1960's, the North San José area was completely supplied by groundwater wells, resulting in land subsidence in the area.

San José Has a Proven Track Record of Aggressive Water Recycling and Conservation

San José has been implementing successful conservation and water recycling programs that have supported the efficient use of water from the San Francisco RWS since 1988 and 1998, respectively. San José and its tributary agencies have invested more than $250 million in a recycled water system. Recycled water has been supplied to North San José since 1998, and the system has continued to expand since that time. Recycled water is supplied to the area for a variety of uses, including irrigation, industrial processing, and dual plumbing. In 2006-07, recycled water accounted for approximately 13% of the water supplied to the North San José area. As of the end of 2007, recycled water has supplied a total of nearly 1.5 billion gallons to the North San José area. Ultimately, recycled water is projected to be used to meet almost 30% of the water demand in the North San José area, preserving high quality water from the San Francisco RWS for the highest value uses.

In 2006-2007, approximately 387,000 gallons per day of water savings was achieved in the greater San José/Santa Clara area through water conservation programs funded and implemented by the City. These programs include water use surveys, rebates for high efficiency clothes washers and toilets, and a comprehensive incentive program for commercial, industrial and institutional users to retrofit their facilities with water efficient technologies. As a signatory to the California Urban Water Conservation Council's Memorandum of Understanding for Urban Water Conservation, San José implements all fourteen of the conservation Best Management Practices.

Severe Economic and Environmental Implications from Curtailing This Water Supply

The delivery of water supply from the San Francisco RWS has been vital to the growth of the electronic industries in North San José and the entire Bay Area. In San José and Santa Clara, Hetch Hetchy water is provided mainly to industrial customers who rely on high purity water with low mineral content for their manufacturing. Without this pure water supply companies such as Cisco Systems, Cypress Semiconductor, Novellus Systems and others, would need to increase on-site treatment of water used for manufacturing, which in turn would increase operating costs. These industrial customers are essential to providing jobs and supporting the economic structure of the entire Bay Area region, not just San José. The manufacturing companies in this area continue to emphasize that it is essential to have water from the San Francisco RWS water as a reliable high quality source. The Santa Clara County Manufacturing Group in a letter to the City stated that "the high-tech electronics industry in Santa Clara County is heavily dependent on an adequate and predictable supply of water."

Obtaining water supplies from the SFPUC is the most environmentally responsible option for long-term water supply, as there is no other viable long term water supply to the North San José area at this time. A decision by San Francisco to curtail water supply to this area would require the identification and development of a new potable water supply as well as the design, construction, and implementation of a new water delivery system. As shown in San Francisco's draft Program EIR for the WSIP, obtaining water supplies from any other source would involve a greater cumulative environmental impact than would the continued delivery of water from the San Francisco RWS.

San José Supports the WSIP and Desires To Become A Permanent Customer

As a long term customer of the San Francisco RWS, the City has provided valuable support to the City of San Francisco and to the Bay Area in matters regarding state-wide water supply as well as state and national environmental issues. San Francisco and the greater Bay Area are facing several current and ongoing water supply challenges. Issues including climate change, the integrity of the Bay Delta and its habitat, implications of legal actions impacting Delta water supplies, seismic security, and upgrading of the San Francisco RWS all benefit from cooperative efforts, with water users throughout the Bay Area working together to provide a sufficient supply

of quality water for the future. San José's support for these and other efforts will continue to be a great asset to the San Francisco.

The City desires to become a permanent customer of the SFPUC and to continue to pay for the benefits received from an assured water supply from the San Francisco RWS and for the environmental mitigation associated with the WSIP and the operations of the San Francisco RWS.

The City is concerned with maintaining the reliability and sustainability of its water supply and the water supplies of its neighboring cities. We have made investments and taken the steps available to us to ensure our ability to supply water to the residents and businesses in this portion of San José. We are concerned that the new alternative being examined by the San Francisco Planning Department at the direction of the SFPUC could result in significant environmental, operational and other impacts to the customers, businesses and residents. The City believes the PEIR will be inadequate unless it addresses these impacts satisfactorily.

In pursuing the environmentally superior alternative and ensuring that the San Francisco RWS is the long-term water supply source for the North San José area, San Francisco will be pursuing the best and most environmentally responsible approach towards the goal of providing a high quality, reliable water supply to the public.

If you have any questions regarding any of the information provided, please feel free to contact me at (408) 535-8560. We will contact your office in the first part of July to set up a meeting where the City can provide further details of the potential environmental and other impacts to the City and the region from the proposed variation of the "No Purchase Request Increase Alternative."

Sincerely,

John Stufflebean, Director
Director, Environmental Services

c: A. Jensen, General Manager, BAWSCA
C. Reed, Mayor and Member, BAWSCA Board of Directors
D. Figone, City Manager
E. Harrington, General Manager SFPUC
O. Martin-Steele, CEO SCVWD

Santa Clara
All-America City
2001

Water & Sewer Utilities

June 27, 2008

Bill Wycko, Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Re: Additional Information as Part of WSIP PEIR Alternatives Analysis

Dear Mr. Wycko:

The City of Santa Clara is pleased to offer additional comments on the draft Water System Improvement Program (WSIP) Program Environmental Impact Report (PEIR). Specifically, this letter provides additional detail as to the potential environmental and economic impacts that would result from a decision by San Francisco to interrupt the delivery of water supply to the City of Santa Clara. As part of your analysis of alternatives that consider the restriction of water sales to San Francisco's existing wholesale customers, we believe that specific information is a critical element that must be addressed as part of the impact analysis for any such alternative.

The City of Santa Clara provided comments in a letter dated August 23, 2007 that included supporting the draft PEIR. The City of Santa Clara also supported the "Modified WSIP/Environmentally Superior Alternative" that was presented in the draft PEIR. In addition, the City believes this alternative could be enhanced (as suggested by BAWSCA) to provide not only sufficient water supply for the projected water demand of all BAWSCA wholesale customers including those for the Cities of Santa Clara and San Jose while still providing for greater flows in the (lower) Tuolumne River.

In our earlier letter dated August 23, 2007, we emphasized the need to proceed with the WSIP for regional water supply reliability. The San Francisco Public Utility Commission's (SFPUC) proposed program included treating the City of Santa Clara as a full partner in this endeavor along with all other BAWSCA agencies. We have been a steady wholesale customer from the San Francisco Regional Water Supply (RWS) since 1974 and we understand that the SFPUC has directed the San Francisco Planning Department to evaluate a variation of the "No Purchase Request Increase Alternative", a less desirable alternative, that may preclude a long-

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term assured supply of water to the City of Santa Clara from the San Francisco Regional Water Supply (RWS) (letter of May 2, 2008 from Mr. Ed Harrington to SF Planning Dept).

The City of Santa Clara is committed to the efficient use and sustainability of all of our regional water supplies. The City has demonstrated this commitment through the implementation of extensive water conservation, use of recycled water, and smart growth development. However, we are concerned that San Francisco may take unilateral action that would preclude providing the City of Santa Clara an assured long-term supply of water from the San Francisco RWS. In particular we would like to detail specific undesirable consequences that could or would occur as result of any termination or interruption of that supply.

1. Under our current contract this water supply is distributed within that part of Santa Clara north of US 101 (Bayshore Freeway). This service area is to a considerable degree hydraulically isolated from the rest of the City's water system. While San Francisco RWS water comprises about 17% of the whole City's water supply, it represents nearly 90% of the drinking water in the northerly portion of the City on an average day.

2. The City does not have good alternative treated water supply sources. Although the City has the ability to pump groundwater to help offset an interruption of San Francisco RWS supply, and has constructed two new wells in the north of US 101 service area to help improve our water system reliability, one of these wells require additional treatment to remove naturally occurring constituents in the groundwater.

3. Ultimately any attempt to offset the loss of San Francisco RWS supply would impact the regional groundwater supply of Santa Clara Valley. The groundwater basin is managed by the Santa Clara Valley Water District. They have provided separate comments on the PEIR. The District's (Mr. Whitman) letter to you, dated September 26, 2007, includes the following: "We urge San Francisco to adopt the proposed... WSIP and meet all the program goals and objectives. ***Any diminution in levels of service provided by SFPUC could result in significant impacts to water resources in Santa Clara County with associated environmental and socio-economic consequences.***" [emphasis added]. Mr. Whitman's letter dated June 24, 2008 also identifies certain impacts of over-pumping the groundwater basin. The greatest detrimental effect of excessive extraction of groundwater is land subsidence with the accompanying affects of collapse of existing water wells and the loss of flood flow carrying capacity of all creeks and rivers with levees. Santa Clara Valley has a history of land subsidence from over-drafting this valuable aquifer. Past land subsidence has also reduced the water storage capacity of the regional aquifers.

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4. While not directly served by District's imported treated water, it could be possible to offset some of the loss of San Francisco RWS supply in the northerly portion of the City of Santa Clara by an increase in supply from the District's treated water. As was stated in Mr. Whitman's letters, this in turn would increase reliance on water supplies from the State Water Project and Central Valley Project; both sources are faced with restrictions on pumping from the Delta.

5. Although the City has 9.4 million gallons of storage located in the northerly service area, this storage is adjacent to and replenished by San Francisco RWS water supply. Any long-term interruption of San Francisco RWS supply would reduce our over-all system reliability for emergencies and peak demands.

6. Many Silicon Valley technology companies corporate headquarters are among the City's retail water customers in this northerly service area. Many of these use de-mineralized water in their manufacturing processes, and have come to depend on the low mineral content and high quality of San Francisco RWS water. Any interruption of this high-quality supply will force these industries to expend more energy treating the water they need and will increase their overall water demand due to reduced recovery ratios. The additional reject water and blow-down from cooling towers will also increase the flows to the regional wastewater treatment plant. Based on our experience of the past few interruptions of water supply from the San Francisco RWS, water demand increases from 10% to 20% when using groundwater and sanitary sewers increases up to 200%. This increase to sanitary sewer discharge will increase energy use at the wastewater treatment plant. Both results will increase the carbon footprint for these industries.

7. The resulting impact of higher operating costs as outlined in item 6, could suppress job creation within the City of Santa Clara and the region due to large companies relocating part of their business or smaller companies relocating altogether.

Even though over the last 20 years the City's populations has increased by 25%, the residential water demand has stayed relatively flat or decreased due to our local and regional water conservation programs, changes in the plumbing code and the use of recycled water. As was mentioned in our letter of August 23, 2007, the City of Santa Clara has managed to provide for all of the increased water demand for the past two decades in the North of Bayshore area by expanding our recycled water delivery system to serve irrigation, dual-plumbed buildings and industrial customers.

The City of Santa Clara is concerned with maintaining the reliability and sustainability of its water supply and the water supplies of its neighboring cities. We have made investments and taken the steps available to us to ensure our ability to supply water to the residents and

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The City of Santa Clara desires to become a permanent customer of the SFPUC and to continue to pay for the benefits received from an assured water supply from the San Francisco RWS. We remain concerned about the known risks of failure of the San Francisco RWS following a major seismic event and therefore continue to urge the SFPUC to proceed with the implementation of the Environmentally Superior Alternative for the WSIP as expeditiously as possible.

If you have any questions regarding the information in these comments, please feel free to contact me at (408) 615-2010. We will contact your office in the next week to set up a meeting where the City of Santa Clara can provide further details of the potential impacts to the City of Santa Clara from the proposed variation of the "No Purchase Request Increase Alternative."

Sincerely,

Alan Kurotori
Director of Water & Sewer Utilities

ak

cc: Jennifer Sparacino, City Manager – City of Santa Clara
Mr. Pat Kolstad, City Council and Santa Clara Member BAWSCA Board of Directors
Mr. Arthur Jensen, General Manager BAWSCA
Mr. Kevin Riley, Director of Planning & Inspection – City of Santa Clara
Mr. Robin Saunders, Consultant – City of Santa Clara Water Utility
Mr. Ed Harrington, General Manager San Francisco Public Utilities Commission

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Santa Clara Valley Water District

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www.valleywater.org
AN EQUAL OPPORTUNITY EMPLOYER

June 24, 2008

Mr. Bill Wycko
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Mr. Ed Harrington
General Manager
San Francisco Public Utilities Commission
1155 Market Street – 11th Floor
San Francisco, CA 94103

Re: March 21, 2008 and May 2, 2008 Letters Regarding Analysis of Variant to WSIP PEIR

Dear Mr. Wycko and Mr. Harrington:

I am writing to express our concerns regarding San Francisco Public Utilities Commission's (SFPUC) request to consider a variant to the proposed program in the final PEIR. Our specific concerns relate to SFPUC's desire to cap its water delivery service to the wholesale customers at 184 mgd until 2018 and uncertain amount of supply delivery beyond 2018.

As described in my September 26, 2007 comment letter on the draft PEIR (see attached), Santa Clara Valley Water District (District) is the primary water resources manager for Santa Clara County. SFPUC and the District share the responsibility of providing a clean, safe and reliable water supply to cities and entities in the northern portion of Santa Clara County. SFPUC supplies constitute 100% of some of these cities' water supply in those areas and there is very little or no alternative supply from the District or elsewhere.

In particular, we are very concerned with implications and potential consequences of the 184 mgd delivery cap on the cities of San Jose and Santa Clara since they both hold "interruptible" contracts with San Francisco. If SFPUC supplies to these two cities are not included in the 184 mgd cap or their future deliveries are dramatically diminished from their current and historical purchases, it will create immense impacts to health and safety of the communities, water and environmental resources in Santa Clara County, as well as economic viability of the region.

San Jose and Santa Clara are the historical "epicenters" of land subsidence due to overdraft of groundwater. If SFPUC supplies to the two cities are cut-off or reduced, the cities will have to use more groundwater as replacement since there is insufficient capacity in both the District's and the cities' treated water systems. This potential increase in groundwater extraction could lead to re-initiation of land subsidence and erase decades of conjunctive use management efforts undertaken by the District.

Furthermore, reduced SFPUC supplies to Santa Clara County could create a ripple effect to water and environmental resources in the Delta. More than half of the average year supplies in Santa Clara County is imported by the District from the Delta. Any reduction in SFPUC supplies would need to be mitigated with additional supply development and could lead to increased reliance on exportation of water from the Delta.

We are extremely concerned with the adequacy of analysis, disclosure, documentation and mitigation for this proposed variant to the WSIP PEIR, especially because it was proposed after the release of the draft PEIR and it was not widely publicized. The District welcomes any opportunity to work with San Francisco to understand the implications and impacts from this variant and to develop acceptable mitigation measures if it were to be incorporated into the final program alternative.

Sincerely,

Keith Whitman
Deputy Operating Officer
Water Supply Management Division

Attachment: September 26, 2007 District comments on the Draft PEIR

cc: Michael Carlin
Jim Fiedler
Art Jensen
Alan Kurotori
Olga Martin-Steele
Mansour Nasser
Robin Saunders
John Stufflebean

Santa Clara Valley Water District

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September 26, 2007

Mr. Paul Maltzer
Environmental Review Officer
Water System Improvement Program PEIR
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Subject: Comments on the Draft PEIR

Dear Mr. Maltzer:

The Santa Clara Valley Water District (District) provides wholesale drinking water supply for 1.7 million residents and is the primary water resources manager for Santa Clara County. We manage the conjunctive use of surface and groundwater resources to ensure that water supply is reliable to meet current and future demands. We actively manage the groundwater basin to optimize beneficial uses and aggressively protect the groundwater basin from contamination and minimize inelastic land surface subsidence.

As you well know, San Francisco Public Utilities Commission (SFPUC) and the District share the responsibility of providing a clean, safe and reliable water supply to cities and entities in the northern portion of Santa Clara County. SFPUC supply comprises 15% of the overall water supply in Santa Clara County and constitutes 100% of the water supply to some cities.

We expect SFPUC to continue providing its water supply in Santa Clara County and meet the projected 2030 purchase requests submitted by the wholesale customers. This expectation is described and documented in the District's and the cities' 2005 Urban Water Management Plans. The cities collaborated with SFPUC on its demand projection and water use efficiency studies and arrived at reasonable and defensible projections on future water needs. These water supply and demand projections constitute the foundation of water resources planning for the next 30 years, for the cities, SFPUC and the District.

We urge San Francisco to adopt the proposed Water System Improvement Program (WSIP) and meet all the program goals and objectives. Any diminution in levels of service provided by SFPUC could result in significant impacts to water resources in Santa Clara County with associated environmental and socio-economic consequences.

Santa Clara Valley had a legacy of land subsidence in the 1920's and 1930's due to over-extraction of ground water. Through the District's water importation and conjunctive use management, land subsidence was halted by the late 1960's and the District has been vigilant in preventing its re-occurrence. Understandably, we are very concerned with any potential re-directed impacts on our groundwater basin and local or imported surface water resources due to SFPUC's reduction in supplies or level of service provided to Santa Clara County. We also urge San Francisco to fully address any potential impacts on water supplies for the State Water Project and Central Valley Project users.

The mission of the Santa Clara Valley Water District is a healthy, safe and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally sensitive manner.

We support SFPUC's goal to maximize water conservation, recycling and desalination. The District has been very aggressive in implementing programs to maximize water use efficiency and further diversify our sources of supply. We believe these program areas are ideal for SFPUC and the District to partner with local land-use entities in their implementation. However, there are practical limits in "implementability" of these programs and they cannot be used as "stand-alone" substitute alternatives or variants because they fail to meet the overall program goals.

We look forward to San Francisco addressing our concerns adequately and adopting the PEIR and WSIP expediently so that the critical work of securing the water supply for the Bay Area communities can begin.

Sincerely,

Keith Whitman

Keith Whitman
Deputy Operating Officer
Water Supply Management Division

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PLANNING DEPARTMENT
M E A

February 22, 2008

Paul Maltzer, Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Fransisco, CA 94103

Dear Mr. Maltzer,

Your environmental review of the San Francisco Public Utilities Commission's plan to take more water from the Tuolumne River fails to adequately identify and address all of the environmental impacts to the River. I urge you to undertake additional studies before finalizing this document. I also urge you to view the water from the Tuolumne, as water being taken from the entire watershed, thus reducing the health of the Tuolumne itself, the San Joaquin and the San Francisco Bay Delta.

I support the alternatives identified in draft document that protect the Tuolumne River from new diversions. Requiring more water conservation, efficiency, and recycling is the best way to lessen impacts on the Tuolumne River while promoting a sustainable water plan for the Bay Area.

Only by ensuring that healthy amounts of water continue to flow into the Tuolumne River can we protect this irreplaceable treasure.

Sincerely,
Emily McGinty
24000 Cima Loma Road
Groveland, CA 95321