

DWR RESPONSE TO DELTA VISION TASK FORCE QUESTIONS (April 30, 2008)

General:

1. How do your department's activities contribute to achieving the co-equal values of sustaining both Delta ecosystem and water reliability functions, recognizing the California Delta as a unique and valued area warranting special legal status?

The Department of Water Resources (DWR) has significant responsibility related to the Delta in the areas of water supply reliability, levee system integrity, ecosystem restoration, and water quality.

2. How do your department's activities contribute to achieving the remaining ten recommendations in the adopted vision?

Specifically DWR has programs that contribute to recommendations: 3, 4, 5, 6, 7, 8 and 9. The DWR Delta Initiatives website: <http://www.water.ca.gov/deltainit> has an up to date list of interim projects and programs that are contributing to these recommendations. Additional information may be found in the Department's responses to the following questions.

Agency Specific:

1. Water resources in California are developed (captured, stored, conveyed and treated) by many different entities (local districts, the federal government, the state). What are the advantages and disadvantages of such a system?

California has a very large and complex water system with a highly decentralized system of governance involving State and federal agencies, thousands of local agencies, governments and private firms, and millions of households and farms. Decentralization has a major influence on daily management, planning, and policymaking. Given the size and diversity of California, this decentralized system of water development and governance has historically allowed local water purveyors, sanitation districts, and levee districts to develop and operate water and flood systems and services according to local conditions and community needs. Today, more than ever, California water managers need to consider a broad range of resource management issues, competing water demands, and diverse water management tools.

Competing, conflicting and narrowly-focused roles and responsibilities make it difficult to integrate regional water management. Differing roles of the various State, federal, and local governments and agencies during planning can create coordination problems. The organizational structure of State government can cause insufficient communication, coordination, and cooperation among numerous State agencies and departments responsible for water. The State and federal governments are responsible for representing and protecting the public trust (certain types of property of high public value held for the benefit of all citizens). Together, the State and federal governments need to provide assistance, guidance, and oversight to local governments (city and county-owned municipal water systems, etc.), American Indian tribes, and special districts (*California Water Plan Update 2005*).

California Government

Many State departments and agencies oversee California's water resources. DWR operates the State Water Project (SWP) and is responsible for overall water planning. SWRCB integrates water rights and water quality decision-making authority. SWRCB and the nine Regional Water

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Quality Control Boards are responsible for protecting California's water resources. Pursuant to the Porter-Cologne Water Quality Control Act, water quality control plans for each of the nine regions become part of the California Water Plan. Many other State agencies have roles in water, water quality, and flood management.

DWR has long-term water supply contracts for water service from the SWP with 29 local agencies for about 4.2 million acre-feet annually. The majority of the SWP goes to urban uses. These long-term contracts were updated in the Monterey Amendments, and their provisions were revised in 2003 as part of a settlement agreement with the Planning and Conservation League.

Federal Government

USBR operates the Central Valley Project (CVP), the largest water project in California, and regulates diversions from the Colorado River. A number of other federal agencies play important roles in the regulation and management of California's water resources. The CVP supplies water to more than 250 long-term water contractors extending from Shasta County in the north to Kern County in the south. Collectively, the contracts call for a maximum annual delivery of 9.3 million acre-feet: 4.8 million acre-feet is classified as project water, and 4.5 million acre-feet is classified as water right settlement water. In October 2004, the Bureau of Reclamation released the draft environmental impact statement (EIS) for the proposed long-term renewal of contracts between Reclamation and up to 145 Sacramento River Settlement Contractors. Starting in February 2005, USBR began signing long-term contracts for 25 or 40 years, depending on contract type. The contracts will provide water for 3.4 million acres of farmland in the Sacramento and San Joaquin Valleys that produce billions of dollars in gross farm revenue and provide municipal and industrial water for more than 3 million people and businesses, including Silicon Valley. Delivering this water also generates enough electricity for 2 million households.

American Indian Tribes

American Indian tribes exist under a unique relationship with the federal government—as beneficiary and trustee, respectively. In a broad sense, the federal government has a fiduciary responsibility to tribes; however, the execution and effectiveness of this responsibility differ between the three branches of the federal government. When reservation lands were set aside, the natural resources of the reservations also were reserved for tribal people. The federal government is legal titleholder to all trust resources. American Indian tribes operate in this government-to-government relationship and help plan water resource projects affecting tribal land. Several landmark decisions have defined legal principles for intergovernmental relationships and tribal rights. In California and elsewhere, tribes without federal recognition have not enjoyed governmental status or benefits.

Public Agencies, Districts, and Local Governments

Local city and county governments and special districts have ultimate responsibility for providing safe and reliable water to their customers, and manage about 85 percent of California's developed water supplies. Over 400 cities and 58 counties are the land management and planning entities as well as resource management agencies that most influence the location and amount of population growth within the state. Many counties have adopted ordinances that require permits for certain uses of groundwater within their boundaries.

California has hundreds of special districts that develop and distribute water, control water quality and manage flood flows (*What's So Special about Special Districts? A Citizen's Guide to Special Districts in California, Third Edition*). According to this citizen's guide, special districts are a type of local government that delivers specific public services in a specific area (place-based governance), including water supply, sanitation and wastewater treatment, sewers,

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drainage, flood and stormwater management, water conservation and storage, levee reclamation, utilities, resource conservation, and others. The guide reported 3,361 special districts in 1999, about half of which were related to water and flood management. The guide goes on to say that special districts have been both “celebrated as the best example of democracy and cursed as the worst form of fragmented government.”

Individual Water Users

Collectively, the millions of urban businesses, individual households, and farms fund the operation and maintenance of California’s water systems through payment of taxes and water bills. Each makes decisions on water use and conservation for its own circumstances. Individual water users must dispose of used water, usually through a sewer or gutter, which in turn can create water pollution. This return flow can provide water to downstream water users. During drought periods, many households modify outdoor watering to conserve water. Each year, farmers make decisions on planting and water application based on weather conditions, forecasted water supply, and individual tolerance for market risk. Taken together, these individual decisions about water use have an enormous impact on both water demand and water quality and present many opportunities for individuals to play positive roles in better managing California’s water quantity and quality.

1.b. In particular, how does integration of policy and operations occur?

Finding ways to improve communication, coordination and cooperation among State, federal and local governments and agencies will improve the integration of water policy and operations. As described in the California Water Plan Update 2005, California is placing more emphasis on integrated water and flood management on a regional basis because it:

- makes better use of existing local resources.
- provides for coordination and improved efficiency and flexibility in the actions of local agencies and governments within a region.
- integrates all aspects of water management, including water quality, local surface water, groundwater, conservation, recycled water, conveyance, ecosystem restoration, and imported supplies.
- reflects regional diversity and values when setting management objectives.

A key initiative of Update 2005 is for State government to promote integrated regional water and flood management, and recent water bonds (Propositions 50 and 84) will provide about \$2 billion to regional partnerships to develop integrated regional water and flood management plans and to begin implementing projects. Throughout California, stakeholders have begun working together to develop regional and watershed programs that cover multiple jurisdictions and provide multiple resource benefits. Throughout California, local agencies and governments have formed over 50 partnerships to combine capabilities, diversify their water portfolios, and share costs. Integrated regional water management has taken a foothold and is on the rise.

Newly-formed regional partnerships are beginning to integrate their water and flood management activities across institutional boundaries, based on watershed boundaries, using multiple land use and water management strategies, and by pooling their data, information and technical tools. By coming together, partnership members are realizing new opportunities to resolve water, water quality, environmental, and flood problems by combining their assets and resources.

Local and regional agencies are looking more intensely at local water management options such as water conservation and recycling measures and groundwater storage to improve their

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regional self-sufficiency. Water managers are learning that planning for sustainable water use must address multiple resource objectives—water use efficiency, water quality protection, and environmental stewardship—and consider broad needs—economic growth, environmental quality, and social equity.

2. What water uses do you project by region of California for the year 2030? For 2070? For 2100?

With the publication of Update 2005, the California Water Plan has become a strategic planning document that describes the role of State government and the growing role of California's regions in managing water resources throughout California. Update 2005 focused more on strategic elements of water resources planning than previous Updates. This shift was based on extensive participation by California's water agencies, stakeholders and new State laws. The California Department of Water Resources (DWR) expanded the public forum for updating the California Water Plan by establishing a 65-member Advisory Committee, a 350-person Extended Review Forum, and by seeking input from about 2,000 interested members of the public.

Update 2005 introduced several new concepts within the analytical approach for evaluating statewide and regional water conditions (as compared to previous Updates). While not fully implemented in Update 2005, these new concepts helped define the long-term direction for the Update process. DWR worked extensively with the Water Plan Advisory Committee to outline three groups of quantitative deliverables that are becoming the technical foundation for the California Water Plan.

- *Water Portfolios* that describe annual, regional water balances. Update 2005 included water balances for 1998, 2000, and 2001. Update 2009 will add the years 1999 and 2002-2005.
- *Future Scenarios* that describe alternative, plausible base conditions of future water use and water supply throughout California. Scenarios are distinguished from each other by different assumptions used for key factors over which water managers have little control like population growth, land use changes, and climate conditions. Update 2005 estimated annual future water uses for each hydrologic region from 2000 to 2030 for three scenarios. Update 2009 will expand the complexity of scenario analysis to include a more integrated look at water use, climate change, and water supply out to the year 2050.
- *Alternative Response Packages* of water resource management strategies that are designed to improve performance of the water management system with regards to management objectives. The expected system performance of alternative response packages are analyzed under each plausible future scenario using evaluation criteria. Update 2005 provided a low and high estimate of potential 2030 supply augmentation and demand reduction for 8 resource management strategies. Update 2009 will expand the complexity of response package analysis to consider operation of the statewide water management system and Delta constraints out to 2050.

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2030 Water Uses

The following water use estimates from Update 2005 are described in the Volume 4 article, "Quantified Scenarios of 2030 Water Demand".

Table 24a,b: Water use by region for 2000 and three 2030 scenarios (TAF).

Region	2000				2030 - Current Trends				2030 - Less Resource Intensive				2030 - More Resource Intensive			
	Urb WU	Ag WU	Env WU	Total WU	Urb WU	Ag WU	Env WU	Total WU	Urb WU	Ag WU	Env WU	Total WU	Urb WU	Ag WU	Env WU	Total WU
NC	150	806	19,190	20,150	186	777	19,360	20,320	160	747	19,530	20,440	220	797	19,190	20,210
SF	1,069	110	28	1,207	1,267	110	28	1,405	1,115	111	28	1,254	1,467	98	28	1,592
CC	296	1,016	125	1,437	349	855	125	1,329	304	864	125	1,293	409	891	125	1,424
SC	4,249	908	76	5,233	5,122	629	76	5,827	4,340	643	76	5,059	6,259	574	76	6,909
SR	860	8,714	13,490	23,060	1,388	8,385	13,580	23,350	1,180	8,535	13,670	23,390	1,825	8,901	13,490	24,210
SJ	600	7,018	4,637	12,260	1,005	6,231	4,867	12,100	913	6,416	5,098	12,430	1,296	6,745	4,637	12,680
TL	653	10,800	1,405	12,860	965	9,537	1,405	11,910	881	9,802	1,405	12,090	1,192	9,987	1,405	12,580
NL	40	471	344	856	47	590	344	981	44	503	344	891	54	604	344	1,002
SL	269	361	89	719	431	261	89	781	345	307	89	741	575	251	89	914
CR	684	4,013	30	4,727	1,079	3,360	30	4,470	952	3,475	30	4,457	1,397	3,510	30	4,937
Totals	8,870	34,220	39,410	82,500	11,840	30,730	39,900	82,480	10,230	31,400	40,400	82,040	14,690	32,360	39,410	86,460
Change from 2000					33%	-10%	1%	0%	15%	-8%	3%	-1%	66%	-5%	0%	5%

2070 and 2100 Water Uses

Currently there are no plans to quantify water uses out to 2070 or 2100 for Update 2009.

Update 2009 will quantify future water uses annually from 2005 to 2050 and will report results for 2005, 2010, 2020, 2030, 2040, and 2050. 2050 was chosen as the planning horizon after discussion with the Update 2009 Advisory Committee, and is believed to be sufficient for the strategic focus of the Water Plan. The following activities are planned to quantify future water uses for Update 2009.

- a) DWR, working with a consultant team, will develop a modeling framework within the Water Evaluation and Planning system model (WEAP) that can demonstrate an entire integrated scenario analysis framework for two key hydrologic regions in California—Sacramento River and San Joaquin River. Actual analysis within WEAP will occur at the Planning Area or finer scale and be aggregated up for these two hydrologic regions.
- b) The above framework will be used to assess the full spectrum of uncertainties that confront water planning in California, including global climate change, land use and demographic changes, and others.
- c) Results of these analyses will be evaluated against an appropriate set of performance metrics, introducing the notions of robustness and risk as part of the evaluation process.
- d) A strategy will be developed to evaluate the statewide implications of the most promising regional water management strategies identified with the WEAP model by integrating the analysis with CalSim or CalLite.
- e) In addition to the Planning Area scale analysis performed under 1 above, DWR will perform a coarser analysis within WEAP for all 10 hydrologic regions. This analysis will be more complex than performed for Update 2005, by including climate as a factor for estimating future water uses and supplies. However, it will not include the detailed integration with the water management system planned under the Planning Area scale analysis under 1 above.

DWR Support of Immediate Delta Vision Needs

DWR is providing support to assist the Delta Vision with determining 2050 water uses to meet their immediate needs. DWR will provide Tully and Young, Inc. with yearly population for the

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Sacramento River and San Joaquin River Hydrologic Regions out to year 2050. DWR will also provide Tully and Young with agricultural land use estimates for the Sacramento River and San Joaquin River Hydrologic Regions for the year 2050. Tully & Young will work with David Groves of the RAND Corporation to incorporate the population and land use information developed by DWR into the Scenario Analysis model that Mr. Groves developed and used for 2030 projections documented in the Update 2005.

3. If charged with achieving 20 percent additional efficiencies in water use in California by 2020, what would the Department do? List the actions proposed with costs and time to achieve effects. How will the efficiencies achieved vary by region and by sector?

Governor Schwarzenegger has charged state agencies with developing a more aggressive plan of conservation to achieve the Governor's target of a 20% reduction in per capita water use by 2020. State agencies including DWR, the State Water Resources Control Board, the California Energy Commission, the California Public Utilities Commission and the Department of Public Health are working together to develop this more aggressive plan. We are also collaborating with the U.S. Bureau of Reclamation and the California Urban Water Conservation Council.

Although it is quite early in our deliberations, the involved agencies have developed a draft list of potential measures to improve efficiency. These measures are listed below. To date, the agencies have not developed cost and schedule information for these potential measures. It is our intention to identify measures suitable for early action and implementation this year, select other measures that should be part of a more aggressive long-term plan, and provide updated information to the DVTF in time for inclusion in the final DVTF Strategic Plan.

Some of the potential programs and measures that might be considered include:

- Strengthen the "loading order" in the Water Code
- Accelerate metering deadline from 2025 to 2020
- De-couple revenue generation from sales
- Require more aggressive tiered pricing
- Require local planning to address specific higher levels of uncertainty in supplies
- Improve coordination between land planning and water planning
- Require partial or total conservation offsets for new development
- Require plumbing fixture replacement on resale
- Encourage reduction in connection fees for low-impact development
- Pursue more vigorous regulatory action against inefficient users/suppliers
- Establish a certification program for water supplier efficiency performance
- Expand educational programs

Clearly, some communities have implemented more conservation measures than others, so the potential for additional savings will vary among communities. In addition, climate and outdoor water use vary among regions of the state, so some regions will likely have greater capacity to reduce outdoor water use. The agencies are grappling with issues related to baseline and uneven past and current implementation of conservation measures between service areas, so that our plan will treat all regions equitably.

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4. What provisions (performance metrics) would be available and used to document compliance with achieving a 20 percent additional water efficiency charge?

There are several different approaches that could be taken to apply the governor's 20% per capita reduction target: by connection, by water supplier, by region, or statewide. Each approach has advantages and disadvantages.

The reduction target could be applied by connection. Agencies that meter their deliveries can easily calculate a 20% reduction, and water agency customers usually have a high degree of control over the implementation of conservation measures on their side of the meter. Programs to provide incentives or disincentives can be readily applied at the connection level. However, there can be a high degree of variation in water use per connection that is not related to conservation efforts. A household may add or lose residents, a factory may increase production, and so forth. Also, this approach would be unfair to households or businesses that have already taken aggressive action to conserve.

Applying the per capita target by agency overcomes some of the limitations of the per-connection approach. Per capita use is readily measurable by agency. Programs to provide incentives or disincentives can be readily applied at the supplier level. However, this approach would be unfair to agencies that have taken aggressive action to conserve. Some agencies, due to climate or land use patterns, may have much greater capacity to conserve than other agencies.

A regional approach to achieving the 20% target overcomes some of the limitations of the by-agency approach because agency characteristics and performance are averaged across a larger geographic area. DWR uses well-established hydrologic regions in its water planning. Proposition 84 specifies the disbursement of grant funding for integrated regional water management according to regions that are nearly identical to those used by DWR. Access to these grant funds could be a powerful incentive to meet the Governor's target. However, there are big climatic differences between regions that could affect conservation potential, and some regions may have already implemented conservation measures more aggressively than others.

A statewide approach is most comparable to the Governor's statewide target, but does not allow for targeted implementation of incentives or disincentives at other levels of use. This could be a serious impediment to achieving the Governor's target.

The involved agencies will consider this information in devising performance metrics for assessing progress in meeting the Governor's target.

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5. If a major seismic event occurred in the second quarter of 2008 and most levees in the western and central Delta collapsed, what would be the effects on water supply? What is the distribution of those effects, geographically and by sector of the California economy? What responses are expected? Provide any plans that describe the specific actions that would be taken and any information regarding time sequence of actions. How much time and money would be required to return to pre event operations? To 50 percent of the level of reliable water supply?

Answers are provided only where information exists in the DRMS Phase 1 report. The exact hydrologic year (second quarter 2008) was not modeled in the DRMS Phase 1 report. In order to represent the closest condition for this question, an average water year and summer season were used. Economic costs (direct) and impacts (indirect) will increase by a factor of 3 to 6 when failure is considered to occur during a dry water year and fall season. The 30 Flooded Island scenario, developed in the DRMS Phase 1 report, is used to answer the questions. Please note that in this scenario, while 30 Delta islands will be flooded, there will be many miles of levees that will be damaged, but will not flood with the initial event.

The effects of such a failure on water supply would be a curtailment of pumping for 16 to 23 months and an additional 7 to 9 months where water would be non-treatable for drinking but usable for agricultural irrigation. The economic losses associated with this would be \$26 million to Delta agriculture and about \$46 million to San Joaquin Valley agriculture. The economic loss to urban water users would be \$7 billion. The total economic impacts to agriculture would be about \$300 million, while the impacts to urban water users would be about \$8 billion.

Responses and actions are limited only to those associated with recovery of selected flooded islands. There is no commitment by the Department of Water Resources to conduct any of these actions on any specific island. The sequence of restoration events will be determined from conditions existing at the time.

The flooded islands will fill in a few days. Conceptually, the emergency response and sequence of actions consist of:

- Move salvageable equipment to the levee crest
- Evacuate people and livestock
- Perform triage on delta islands to determine which are quickly repairable
- Repair damaged islands first, then work on repairing the flooded islands
- Cap levee breaches
- Place barriers in selected channels to minimize salt intrusion
- Protect internal levee slopes from erosion of flooded islands
- Raise levee crest, as needed to restore freeboard
- Close breaches
- Reduce water level in flooded islands
- Rebuild damaged, un-failed, levee sections
- Complete pump out of flooded islands
- Restore interior slopes, crest elevation, seepage, erosion protection
- Pumped out islands.

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The emergency response to a major seismic event will initially be focused on life safety, rescue, and securing roads, and utilities to prevent further damage. However, there will be a major effort focused on the Delta, both from the life safety perspective and from the restoration of infrastructure perspective. The response will be combined with local, State, and federal responders dividing the work according to capability and authority. In past events the State Office of Emergency Services and Department have worked closely with our emergency response partners under the Standardized Emergency Management System (SEMS). Any future response would be conducted under SEMS or its federal counterpart, the National Incident Management System (NIMS). In anticipation for responding to a Delta catastrophic event, DWR has added stockpiled rock and emergency response supplies to 3 sites and developed contingency contracts for placing the materials. As funding is available, we are continuing to purchase large quantities of rock and other materials, to be used to fill breaches. During this past year, DFM has prepared a DRAFT Emergency Response Plan for the Delta and is working with consultants to complete it.

For the 30 Flooded Island scenario, it would take about 80 to 120 months to repair damaged levees and restore islands at a cost of about \$8 billion. This cost does not include the cost to the water contractors to come back to normal operation and the cost to restore lost water from the upstream reservoirs used to flush salt water out.

6. How are the relationships among surface water and groundwater managed? In your response, include consideration of both adjudicated and non-adjudicated ground water basins, conjunctive use, water transfers and other factors of importance. What could be done to manage these relationships more effectively?

In the past, surface water and groundwater supplies have been regarded as separate water resources. However, because surface water and groundwater are hydrologically interconnected, they should be managed as a single resource. However, groundwater and surface water are not treated alike under California law. The process for appropriating surface water in California is contained in the California Water Code. Rights to use groundwater have evolved through a series of court decisions dating back to the late 1800's. In many parts of the state, management of surface and groundwater has and continue to occur independently.

Groundwater used in California can be managed by: 1) overlying property rights, 2) statutory authority; 3) adjudicated groundwater basins; 4) groundwater management districts or agencies; 5) groundwater management plans; or 6) City or County ordinances. These methods have typically focused on developing more effective groundwater management strategies, without consideration of integrating surface water supplies into the management plan. However, with increasing demands on available water supplies, groundwater management efforts are identifying and utilizing other sources, including surface water, in developing their strategies.

Development of additional water supply has been pursued through water transfers. Water transfer proposals include groundwater substitution and direct delivery of groundwater. The change from surface water diversions to groundwater pumping can increase the available water supply thereby creating "new", or transferable, water. Although water balance accounting for transfers should account for stream flow losses induced by groundwater pumping, this typically has not been the case. Using groundwater pumping to deliver water rather than surface water diversions, increases the period over which stream flow losses occur.

With the increased demand for available water supplies, it is critical that strategies be developed for utilizing both surface and groundwater supplies conjunctively. Through conjunctive water

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management of surface and groundwater, local agencies have been able to more effectively manage water resources to improve their water supply reliability.

Through integrated regional water management planning, local and regional agencies are now developing programs for use and management of available water resources, including surface water and groundwater, to implement projects providing multiple benefits to meet identified needs and increasing future demands.

In order to manage surface and groundwater more effectively, efforts towards continuing to promoting locally and regionally driven conjunctive and integrated regional water management will be required.