Proposed Sites Offstream Storage Reservoir

Real Facts & Issues – May 26, 2016

The Sites Offstream Reservoir Project is currently under study by the California Department of Water Resources (DWR), U.S. Bureau of Reclamation (BOR), and local irrigation districts that make up the Sites Joint Powers Authority (JPA). The focus of the North Of Delta Offstream Storage (NODOS) Investigation, the Sites Reservoir would be located in the western Sacramento Valley, about 10 miles west of the small town of Maxwell on Interstate 5 in northern California.

DWR, BOR, and the JPA have yet to release draft feasibility and environmental impact reports for public review. Much of the available information about Sites, including its alleged costs, benefits, and impacts, is found in DWR's incomplete Preliminary Administrative Draft Environmental Impact Report (PADEIR) available at: http://www.water.ca.gov/storage/northdelta/. Without completion of these vital documents, any alleged benefits that may be provided by the project are hypothetical and speculative.

The government's stated purpose of the Sites Reservoir is to increase water supplies to meet existing water contracts and provide greater flexibility in water management for agricultural, municipal, and environmental uses. Purported environmental benefits of the project may include increasing the survival of salmon and steelhead in the Sacramento River, increasing operational flexibility of other reservoirs (Trinity, Oroville, Folsom) for environmental purposes, providing water for wildlife refuges, and improving Delta water quality for consumptive purposes.

Conservation organizations are concerned that diversions from the Sacramento River to fill the Sites Reservoir will result in unacceptable impacts on the river's fish and wildlife habitat and water quality, and the reservoir itself will drown thousands of acres of habitat. In addition, much of the expense of building the multi-billion dollar project may be borne by taxpayers because government agencies are trying to justify the project as allegedly providing water for environmental purposes,[1] while most of the water stored in the reservoir will be sold to water contractors.

Project Description – The potential reservoir sizes evaluated in detail include a 1.27 million acre foot (MAF) reservoir and a 1.81 MAF reservoir (in comparison, Folsom Reservoir on the American River stores about 1 MAF). The reservoir would require the construction of two large dams up to 310 feet-high and up to nine smaller saddle dams.[2] Most of the water stored in Sites would be diverted from the Sacramento River using the existing Red Bluff Pumping Plant, Tehama-Colusa Canal, and Glenn-Colusa Irrigation District diversion and canal. In addition, a third facility – the Delevan diversion and pipeline, is under consideration to be constructed on the river north of Colusa. Combined, the diversions will have the capacity to take as much as 6,000 cubic feet per second (CFS) of water from the Sacramento River.[3]

Water Yield – Total storage volume is only indirectly related to water yield, which is the amount of controllable water a reservoir may make available for deliveries. The long-term average annual water supply provided by Sites is modeled to range from 425 to 637 thousand-acre feet (TAF) a year, depending on the ultimate size of the reservoir and how the reservoir is operated.[4] That's a bit over 1.5% of California's total annual water budget. How this yield would be divided between meeting water contracts and hypothetical environmental improvements depends on the final

project formulation and annual operations. DWR has projected one example that would allocate up to 246 TAF of water to urban and agricultural water agencies. About 16% of this amount would go to north of Delta water contractors and 54% to south of Delta water contractors.[5] The rest would be allocated to provide Delta water quality and environmental benefits. Much of the water allocated to environmental uses could be resold after use to water contractors. Exactly who will receive and benefit from Sites water remains unclear.

Cost –The current DWR cost estimate is now as much as $4.1 billion, with a total estimated annual operating cost of up to $204 million.[6] However, BOR apparently estimates the total cost of the project at $6.3 billion.[7] Theoretically, water agencies receiving water from Sites will pay for the cost of that water, but no agency has as yet committed any money to help build the project. Exactly who will pay for Sites and who will purchase its water for consumptive purposes remains unclear. The public will pay for water used for purported environmental purposes, Delta water quality, and other public benefits through the Proposition 1 water bond approved by voters in 2014, assuming the JPA meets California Water Commission requirements.

Sacramento River Diversions – Significant water diversions from the Sacramento River to fill Sites Reservoir could result in substantial adverse impacts on the river's ecosystem. Flow impacts from Sites diversions are downplayed by proponents since conceptually they will only occur during high winter flows. But current minimum flow standards for the Sacramento River ecosystem are inadequate[8] and will allow significant diversions throughout much of the year. Sites could divert from 15-21% of the river's flow in most months, *but at times, diversions from the river to fill the Sites Reservoir could take more than half of the flow of the river*.[9] CALSIM II is used to model Sites operations impacts on Sacramento River flows but this model is unable to adequately simulate daily impacts on flooding and temperatures.[10] Federal and state regulatory agencies are concerned that reducing flood flows in the Sacramento River and its flood bypasses could significantly affect riparian and aquatic habitats, and the many sensitive, threatened, and endangered fish and wildlife species that depend on these habitats.[11] Flow modifications could also adversely affect the habitat values of more 14,000 acres of public land in the Sacramento River National Wildlife Refuge, Sacramento River State Wildlife Area, and three state parks downstream of Sites diversions. DWR acknowledges potentially significant impacts on threatened and endangered Sacramento River salmon, green sturgeon, white sturgeon, and Sacramento splittail due to reduced flood flows in the river and the Yolo Bypass.[12] Potential salmon benefits derived from conjunctive operation of Sites with the Shasta, Trinity, Oroville, and Folsom Reservoirs is estimated using the SALMOD model, which has significant limitations that fail to account for population trends over time.[13]

Delta/Other Rivers/Reservoirs – Depending on alternative and water year, direct and conjunctive operations with Sites in some months will reduce flows in the Delta by 11%, Trinity River by .1-17%, Feather River by 12-18%, American River by 14-16%, Sutter Bypass by 2-21%, and Yolo Bypass by 10-36%.[14] Flows may increase in other months. Sites would also reduce end-of-month storage levels in Oroville Reservoir and San Luis Reservoir by up to 5 and 13% respectively.[15] California's reservoirs already lose more than 2 MAF of water from evaporation every year. Evaporation from Sites could waste more than 46,000 AF of water annually.[16]

Reservoir/Facilities Footprint – The Sites reservoir and its facilities result in the permanent loss of up to 15,500 acres of grassland, oak woodland, chaparral, riparian habitat, vernal pools, and wetlands (including 19 acres of rare alkali wetlands), as well as 700 acres of croplands.[17] DWR acknowledges significant and unavoidable impacts on the federally protected golden eagle and potentially significant impacts on a number of other sensitive and protected species, including bald eagle, Swainson's hawk, burrowing owl, tricolored blackbird, loggerhead shrike, western pond

turtle, valley elderberry longhorn beetle, pallid bat, and American badger.[18] There will also be significant and unavoidable impacts on two rare plants, potential impacts on 10 other rare plants, and potential impacts from the growth of noxious and invasive weeds in areas disturbed by project construction and operations.[19]

Cultural Resources – Field surveys are incomplete but more than 144 prehistoric and historic sites are located within the reservoir footprint, including the potential historic district associated with the small community of Sites. Some of the prehistoric and historic properties may be eligible for inclusion on the National Register of Historic Places.[20]

Water Quality – DWR claims that Sites could be used to improve water quality in the Delta. But the Delta water quality benefits of the reservoir disappear if the Delta tunnels are constructed (Governor Brown's so-called "Water Fix").[21] Sites water initially allocated to improve Delta water quality and paid for by the public will likely be sold to water contractors if the tunnels become a reality. DWR's estimate of impacts on Sacramento River water quality from releases from the Sites Reservoir is based on the SRWQM model, which results in a "crude representation" of flow and temperature conditions.[22]

Net Power User & Air Pollution – Because water diverted from the Sacramento River must be pumped into the reservoir, Sites will be a net power user, even though it might generate electricity when water is released form the reservoir. Depending on its source, the electricity used to pump water into the reservoir could produce greenhouse gases, thereby contributing to global warming.[23]

Seismic Issues – The Sites Reservoir is located on the Great Valley fault system. This system has produced at least two major and destructive earthquakes (1892 Winters-Vacaville, 1983 Coalinga). According to the most recent seismic studies, faults underneath and adjacent to the various Sites dams could produce a maximum credible earthquake of magnitude 7. The consequence of a powerful reservoir-induced earthquake on un-reinforced masonry structures in Maxwell and other local communities has yet to be assessed.[24]

Left: More than 14,000 acres of the beautiful Antelope Valley would drown under the Sites Reservoir. Right: Diversions to fill the Sites Reservoir could harm riparian and aquatic habitat and public lands along the Sacramento River. Photos by Steve Evans and Bruce King.

For the latest version of this fact sheet and other resources, see: www.friendsoftheriver.org/our-work/rivers-under-threat/sacramento-threat/

[1] The Sites Joint Powers Agency (JPA) has submitted a concept paper to the California Water Commission to receive $2.2 billion dollars for the purported public benefits of the project. (https://cwc.ca.gov/Documents/2016/WSIP/SitesJPA_SitesReservoir.pdf) The Commission has $2.7 billion dollars made available from the 2014 California Water Bond. This is a general obligation bond financed by the general fund from California taxes (https://cwc.ca.gov/Documents/2015/WSIP_GoalsObjectives_Final.pdf). If the project is federally authorized, federal funds can also be awarded the project for certain public benefits of the project Shasta Lake Water Resources Investigation (SLWRI) Feasibility Report, pp. 6-9, 6-10 table 6-1). (http://www.usbr.gov/mp/slwri/)

[2] NODOS PADEIR Executive Summary, Table ES. 2.5, pgs. ES-13–14, DWR, Dec. 2013. (http://www.water.ca.gov/storage/northdelta/prelim_admin_draft_eir_index.cfm)

[3] Ibid; FAQ: Sites Reservoir Diversion, DWR March 1, 2015. (http://www.water.ca.gov/storage/northdelta/sitesdiversionfaq.cfm) Diversions into the existing irrigation canals would have to use available capacity not otherwise in use. The Delevan diversion and pipeline would not be so constrained. 6,000 cfs equals 12,000 acre-feet per day. At that rate, it would require 100 days to fill a 1.2 million acre-foot reservoir.

[4] NODOS PADEIR Appendix G, Table G-16, pg. 5-54; NODOS Investigation Progress Report Appendix A, Table A3-2, pg. A-39, DWR December 2013. (http://www.water.ca.gov/storage/docs/NODOS%20Project%20Docs/NODOS_Progress_Report_12.26.2013.pdf)

[5] NODOS PADEIR, Table ES-5, pg. ES-23.

[6] NODOS Investigation Highlights, pg. 9, DWR May 2014. (http://www.water.ca.gov/storage/docs/Highlights/NODOS%20Highlights%20Booklet%2028May14.pdf) As noted above, the JPA has told the California Water Commission that the project cost is $4.4 billion. (https://cwc.ca.gov/Documents/2016/WSIP/SitesJPA_SitesReservoir.pdf)

[7] "Is the era of big dam-building over?" by Bettina Boxall, Los Angeles Times Dec. 27, 2015. (http://www.latimes.com/science/la-me-water-dams-20151227-story.html)

[8] Sacramento River minimum or required flows are based on navigation requirements and outflow/water-quality requirements in the Delta. With potential new diversions of 6,000 cfs, environmental requirements should be developed that at least would constrain diversions into Sites Reservoir. In the absence of such requirements, yield estimates for Sites Reservoir are speculative.

[9] NODOS PADEIR pgs. 6-8 thru 83, Tables 7-75, 6-76, 6-77, 6-78; Sacramento River Flow Impacts – Diversions to Sites Reservoir, table prepared by Friends of the River Dec. 9/31/2014, based on DWR's FAQ: Sites Reservoir Diversion March 1, 2015.

[10] Shasta Lake Water Resources Investigation Fish & Wildlife Coordination Act Report (SLWRI CAR), pg. 108, USFWS Nov. 2014. http://www.friendsoftheriver.org/our-work/rivers-under-threat/sacramento-threat/, Resources, Comments & Documents, Shasta Dam raise, Agency Comments. This document was later "rescinded to allow higher level review."

[11] Federal and state regulatory agencies have raised concerns about increasing the storage of winter flows on the Sacramento River that may modify flood flows and adversely impact ecosystems, habitats, and threatened and endangered wildlife and fish species in the river and its flood bypasses. These concerns were raised in response to the Shasta Lake Water Resources Investigation (SLWRI) DEIS/FEIS and include the SLWRI CAR, pgs. xii, 122, 127, 165–166, 178, USFWS Nov. 2014; SLWRI DEIS comments, pg. 4, California Dept. of Fish and Wildlife (CDFW) Aug. 2013; SLWRI DEIS comments, pgs. 2-3, U.S. Environmental Protection Agency (USEPA) Sep. 30, 2013. http://www.friendsoftheriver.org/our-work/rivers-under-threat/sacramento-threat/, Resources, Comments & Documents, Shasta Dam raise, Agency Comments

[12] NODOS PADEIR, Table ES-3, pgs. 9-12, DWR Dec. 2013.

[13] SLWRI DEIS comments, pgs. 2–3, U.S. Environmental Protection Agency (USEPA) Sep. 30, 2013.

[14] NODOS PADEIR pg. 6-107, Table 6-105; pg. 6-108, Table 6-107; pgs. 6-41 to 6-42, Table 6-40; pg. 6-93, Tables 6-89; pg. 6-105, Table 6-103; pg. 6-101, Table 6-99; pgs. 6-95 to 6-97, Tables 6-91, 6-92, 6-93, 6-94.

[15] NODOS PADEIR, pg. 6-91, Table 6-87; pg. 6-69, Table 6-63.

[16] DRAFT Narrative Of Evaporation From Lakes & Reservoirs For 1998 Water Year Portfolio, DWR June 27, 2002; analysis and extrapolation by Friends of the River.

[17] NODOS PADEIR, Table 14-19, pg. 14-126; Table 14-24, pg. 14-139.

[18] Ibid, Table ES-3, pg. 20 and pgs. 17–22; pg. ES-15; pg. 14-36; pg. 14-87; pg. 14-90, Table 14-25, pg. 14-14; pg. 14-87 thru 89; pgs. 14-140 thru 142.

[19] Ibid – Table ES-3, pg. 15; pg. 13-82; Table 13-12, pgs. 13-41 thru 42; pg. 13-83; pg. 13-92; pg. 13-106; Table 13-30, pgs. 13-124 thru 128.

[20] Ibid – pg. ES-15; pgs.-18-13 thru 16; pgs. 18-37 thru 46.

[21] NODOS Investigation Highlights, Figure 6, pg. 8, DWR May 2014.

[22] SLWRI CAR, pgs. 144–145, USFWS Nov. 2014.

[23] NODOS PADEIR pg. ES-20, DWR Dec. 2013. The JPA is considering not initially constructing the reservoir with power generation facilities to avoid, delay, or diminish Federal Energy Regulatory Commission licensing requirements and procedures and thus speed required approvals (personal communication with JPA). This would considerably increase operational costs since electricity generation is ordinarily used to partially defray pumping costs.

[24] Sites Compendium of Facts, pg. 8, Friends of the River May 11, 2016, based on "Seismicity possibly induced by Lake Mendocino" by T.R. Toppozada & C.H. Cramer, California Geology Dec. 1978; "on the nature reservoir-induced seismicity" by P. Talwani, Pure and Applied Geophysics 1997; South Carolina Dept. of Natural Resources.