



City of Santa Barbara
Public Works Department

Interoffice Memorandum

DATE: July 8, 2009
TO: Board of Water Commissioners
FROM: Rebecca Bjork, Water Resources Manager 
SUBJECT: Upper Santa Ynez River Operations Agreement ("Pass Through Agreement")

This memo provides background information for our discussion of the Pass Through Agreement at your July 13, 2009 meeting. Our goal will be to provide the Commission with a general understanding of the agreement and how it fits into the City's water supply planning.

The context for the 1989 agreement was the City's desire to raise Gibraltar Dam to address ongoing loss of capacity and yield due to siltation, and concern by downstream interests that such enlargement would have detrimental affects on their water supplies. The agreement represents a compromise by which the City agreed to defer enlargement of Gibraltar Reservoir (Gibraltar) in return for the right to take a portion of its Gibraltar water through Lake Cachuma. Most of the agreement is devoted to the details of how much water and how it is accounted for at Cachuma. A key component of this accounting is a hypothetical "Base Reservoir" that is fixed at the 1988 Gibraltar volume of 8,567 acre-feet (AF) and "operated" (with computer simulation) according to a compromise interpretation of the 1930's Gin Chow Judgment regarding the City's water rights at Gibraltar. The modeled Base Operations are compared to actual Gibraltar operations to determine the amount of water available to the City at Cachuma, in addition to allowed diversions directly from Gibraltar through Mission Tunnel.

For more detail, we have attached a project memorandum prepared as an information document for staff of the Bureau of Reclamation as a part of the development of a Warren Act contract to implement the agreement. Note that this focuses more on the portion of the City's Gibraltar water that is delivered through Cachuma than the diversions through Mission Tunnel. Both are important as a part of our yield from Gibraltar. Also attached is a sample of the monthly Upper Santa Ynez River Operations Agreement report that has been prepared each month since the agreement was implemented in 1991.

BF/dm

Attachments:

Warren Act Project Memorandum
Sample Monthly USYROA Report



**City of Santa Barbara Public Works Department
Water Resources Division**

**Project Memorandum:
Proposed Warren Act Agreement for Storage and Conveyance of
Gibraltar Pass Through Water in Cachuma Project**

November 13, 2008

Background

The City of Santa Barbara ("City") has diverted water from the Santa Ynez River at Gibraltar Reservoir through the City's Mission Tunnel to the City's water system for municipal supply purposes since the tunnel was completed in 1911. The City owns and operates Gibraltar Reservoir, which was completed in 1920 with an initial storage capacity of 15,374 acre-feet (AF). In 1949, to preserve the City's water supply, Gibraltar Dam was raised by 23 feet, increasing the gross volume to 22,500 AF, with a usable storage volume of 14,000 AF after adjustment for the siltation present at that time. Continued siltation has reduced the storage capacity to a current volume of about 5,300 AF as discussed further below. As shown in Figure 1, Gibraltar Reservoir is located on the Santa Ynez River upstream of Lake Cachuma.

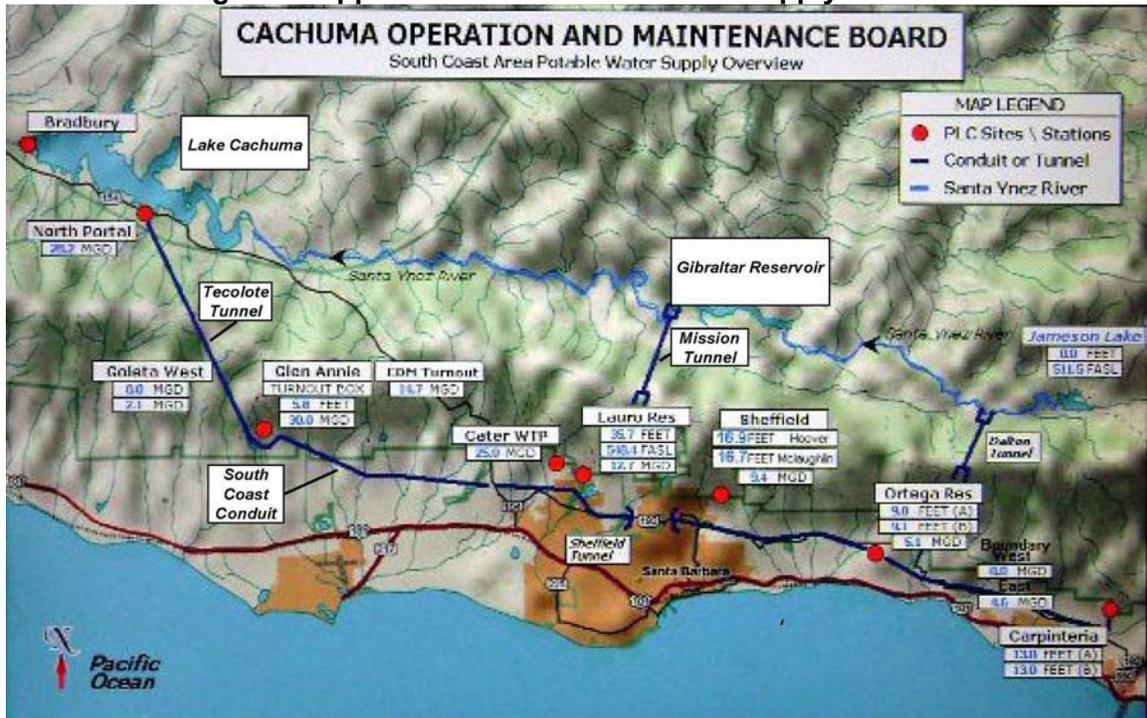
Lake Cachuma is the reservoir formed by Bradbury Dam. It is a regional water supply reservoir constructed as a part of the Cachuma Project on behalf of the Member Units by the United States Department of the Interior, Bureau of Reclamation ("Reclamation"). The Member Units are Carpinteria Valley Water District, Montecito Water District, City of Santa Barbara, Goleta Water District, and Improvement District No. 1 of the Santa Ynez River Water Conservation District. Other Cachuma Project facilities include the Tecolote Tunnel, which conveys water from Lake Cachuma through the Santa Ynez Mountains, and the South Coast Conduit, which conveys project water by gravity to South Coast Member Units, as shown in Figure 1. Lake Cachuma is operated by Reclamation. The other Cachuma Project facilities are operated by the Cachuma Operation and Maintenance Board (COMB), a Joint Powers Agency made up of the five Cachuma Project Member Units.

Lake Cachuma has a current storage capacity of 186,636 AF. Average inflow is about 91,000 AF per year (AFY). Annual spills range from zero to as high as 468,000 AFY. Deliveries through Tecolote Tunnel to South Coast Member Units have averaged about 25,000 AFY over the last 15 years. Evaporation from the reservoir averages about 11,000 AFY. The Central Coast Water Authority (CCWA) has delivered an average of about 3,000 AFY of State Water Project water into Lake Cachuma on behalf of participating South Coast agencies since deliveries began in 1998.

Siltation of Gibraltar Reservoir has continued since the reservoir was constructed. In 1983, the City and the State's Division of Safety of Dams agreed that Gibraltar Dam should be strengthened to withstand the maximum probable earthquake. The City planned and engineered a project to reinforce the dam. This project also included the

buttressing of the existing dam to permit its possible future enlargement. In May 1988, some of the other purveyors of Santa Ynez River water sued the City, contending that the City's proposal to reinforce the dam was the beginning of a project to raise the dam and enlarge the reservoir, and that this project would have significant adverse effects on flows in the Santa Ynez River and downstream water uses and purveyors, and other environmental impacts.

Figure 1. Upper Santa Ynez River Water Supply Facilities



Discussions to settle that litigation ultimately led the City and the other water purveyors, including all of the other Cachuma Project Member Units, to enter into the 1989 Upper Santa Ynez River Operations Agreement. The Upper Santa Ynez River Operations Agreement often is called the "Pass Through Agreement." This agreement is a key background document for the proposed project described here and is widely recognized as a historic compromise and an example of interagency cooperation on regional water management. Although Reclamation is not a party to this agreement, Reclamation did sign a consent to and acknowledgement of this agreement.

In the Pass Through Agreement, the City agreed, for the term of the agreement, to defer construction of any project to raise Gibraltar Dam in consideration of agreement provisions that allow the City to stabilize the City's water supply yield from Gibraltar Reservoir at 1988 levels. The Pass Through Agreement establishes a hypothetical "Base Reservoir" as a reference point for calculations under the agreement. The Base Reservoir capacity is fixed at the 1988 reservoir capacity of 8,567 AF and operation of the Base Reservoir is modeled according to a specified compromise regarding how the City's Gibraltar water rights are to be interpreted during the term of the agreement. Base Reservoir operations are hypothetical and exist only in the monthly computer modeling used to implement the agreement. Base Reservoir operations are used to represent the concept of the "stabilized" reservoir yield that is a key element of the Pass Through Agreement.

Recognizing that siltation of Gibraltar Reservoir would increasingly impact the City's ability to store and divert water under the City's established water rights, the Pass Through Agreement provides for two modes of actual operations of Gibraltar Reservoir.

The initial operational mode was intended for the near-term, before significant additional siltation of Gibraltar Reservoir. Under this mode, the City declared a maximum intended annual diversion amount and then relinquished water in Lake Cachuma each month in accordance with the agreement to compensate for the effect of the declared level of the City's diversions at Gibraltar Reservoir on downstream purveyors. The initial operational mode was in effect from the time the Pass Through Agreement first was implemented in 1991 until the City's October 2008 election to commence the second operational mode, which is referred to as "pass through" operations and is discussed in the following paragraphs.

The second mode of operation is the Pass Through mode. Pass through operations are intended to implement the Pass Through Agreement in the long term, upon significant siltation of Gibraltar Reservoir. Under pass through operations, reservoir spills and releases are calculated both for actual reservoir operations and for the Base Reservoir operations described above. Reservoir spills and releases under actual and Base Reservoir operations are then compared each month. To the extent that actual Gibraltar Reservoir spills and releases are more than the Gibraltar Reservoir spills and releases under Base Reservoir operations, the difference, after adjusting for estimated losses due to evaporation and percolation of the additional water that flows down the Santa Ynez River from Gibraltar Reservoir to Lake Cachuma, is credited to a "Gibraltar Pass Through Account" at Lake Cachuma (the "Pass Through Account"). Water in the Pass Through Account is then available for conveyance to the City from Lake Cachuma through Cachuma Project facilities, subject to applicable laws.

Amounts of water in the Pass Through Account are subject to reductions due to spills and evaporation at Lake Cachuma. The City's total diversions from Gibraltar Reservoir are defined as the sum of the City's actual diversions of water from Gibraltar Reservoir into Mission Tunnel plus the amounts of water stored in Lake Cachuma that are credited to the Pass Through Account. These total diversions are limited to the amount of total annual diversions calculated under Base Reservoir operations.

During the summer of 2007, the Zaca fire burned over 60% of the Gibraltar Reservoir watershed. Erosion of this watershed during the following rainy season resulted in a sudden loss of capacity in Gibraltar Reservoir of approximately 1,500 acre feet (AF). This loss of capacity, combined with the approximately 2,000 AF of additional loss of capacity that had occurred since the signing of the Pass Through Agreement, made it logical for the City to elect to shift from the initial operations mode to pass through operations. Certain aspects of pass through operations, including discontinuance of the monthly relinquishments under the initial operational mode and a change from monthly to annual limitations on the City's diversions through Mission Tunnel, are being implemented now. However, under federal law (specifically the Warren Act), the use of Cachuma Project facilities to store and convey pass through water requires a contract between Reclamation and the City. Accordingly, implementation of the storage and conveyance of pass through water will not occur until Reclamation and the City execute a Warren Act contact.

Project Description

The proposed project that is described here consists of the execution of a Warren Act contract (the "Project Contract") between the City and Reclamation. This contract would provide for the accounting of pass through water in Lake Cachuma, and for the conveyance of this water to the City through Tecolote Tunnel and the South Coast Conduit, as provided in the Pass Through Agreement. The Project Contract would consist of a temporary contract with a term of up to five years, to be replaced by a long-term contract with a termination date in 2020. Execution of the Project Contract would result in the following actions:

- Reclamation's accounting of water stored in Lake Cachuma would be modified to create the Pass Through Account. The appropriate spill/release amount of pass through water (adjusted for conveyance losses) under the Pass Through Agreement would be credited to or debited from this account each month. This accounting would be based on reports prepared each month under the procedures that Reclamation, the City, and the Cachuma Operation and Maintenance Board have used since implementation of the Pass Through Agreement began in 1991, with the necessary changes to calculate amounts of pass through water and to allocate these amounts to the Pass Through Account. This accounting procedure would reflect that amounts of water in the Pass Through Account are subject to reductions due to spills at Lake Cachuma, using the rule that Pass Through Account water would be deemed to spill from Lake Cachuma: (a) before any Cachuma Project water and water in the Above Narrows and Below Narrows accounts spills; and (b) on a pro-rata basis with spills of any State Water Project water stored in Lake Cachuma. Debits from the Pass Through Account also would be made to account for a portion of the daily evaporation from Lake Cachuma, with these debits made in proportion to the ratio of the amount of water in the Pass Through Account to the total amount of water stored in Lake Cachuma.
- Accounting for deliveries of water from Lake Cachuma would be modified to distinguish between deliveries to the City of water from the Pass Through Account and water from the City's regular Cachuma Project account. The City would decide which account should be debited for deliveries of water from Lake Cachuma to the City. The City normally would elect to use water from the Pass Through Account first so as to minimize loss of water due to evaporation and potential spill at Lake Cachuma.
- Calculation procedures for inflow to Lake Cachuma, and its apportionment to Cachuma Member Units and/or downstream accounts, would be modified in accordance with the Pass Through Agreement, to account for water accruing to the Pass Through Account.

The Project Contract would not affect the City's operations of Gibraltar Reservoir or the amount of water spilled or released from Gibraltar Reservoir. Instead, the Project Contract would affect only Reclamation's accounting of the relatively small portion of Lake Cachuma inflow that would be attributable to the difference in total spills and releases from Gibraltar Reservoir under actual conditions compared to the total spills and releases from Gibraltar Reservoir under Base Reservoir conditions. This is the accounting that is described in the Pass Through Agreement.

No Project Alternative

Under the No Project alternative, the City would operate Gibraltar Reservoir and its diversions into the Mission Tunnel under pass through operations as specified in the Pass Through Agreement, but Reclamation would not change its accounting of water stored in Lake Cachuma as described for the Proposed Project. As a result, under the No Project alternative, water that would be credited to the Pass Through Account under the Proposed Project would instead be treated like any other inflow of water into Lake Cachuma, and therefore would accrue as Project Water for use by all Member Units, or to the Above Narrows and Below Narrows Accounts under the existing accounting rules.

Analysis

The following paragraphs describe the potential effects of the Project Contract on various aspects of Gibraltar Reservoir and Cachuma Project operations, and Santa Ynez River flows:

- Gibraltar Inflow: Inflow to Gibraltar Reservoir is determined by the quantity and timing of rainfall in the watershed and therefore would not be affected by the implementation of the Project Agreement.
- Gibraltar Reservoir Operations: The City operates Gibraltar Reservoir under its water rights and the Pass Through Agreement. The City has elected to commence pass through operations under that agreement. Under the Project Contract, the City would be able to store and convey a portion of its Gibraltar water through Lake Cachuma, but the City would incur an undetermined but not insignificant additional cost to do so. In contrast, under the No Project alternative, the City would only be able to receive water from Gibraltar Reservoir through Mission Tunnel. Under either scenario, the City normally would maximize its authorized diversions of water from Gibraltar Reservoir through Mission Tunnel, so the City's Gibraltar storage and diversion of water from Gibraltar Reservoir to Mission Tunnel would be the same under either the Project Contract or the No Project alternative.
- Gibraltar Outflows and Inflows to Lake Cachuma: Because inflow to Gibraltar Reservoir and Gibraltar Reservoir operations would be the same under the Project Contract and the No Project alternative, the amounts and timing of water flows out of Gibraltar Reservoir, the amounts of water stored in Gibraltar Reservoir, storage volumes and outflows as siltation of the reservoir occurs, the amounts of Santa Ynez River flow between Gibraltar Reservoir and Lake Cachuma, and the amounts of inflow into Lake Cachuma all would be the same under either the Project Contract or the No Project alternative.
- Accounting for Pass Through Water at Lake Cachuma: A simplified model of Gibraltar Reservoir and Lake Cachuma operations was developed by City staff to estimate the amounts of pass through water that would be available to the City at Cachuma if the Project Contract is approved and implemented. Under the No Project alternative, these amounts instead would accrue as Project Water for use by the Member Units or to the Above Narrows and Below Narrows Accounts for downstream releases from Cachuma.

The period of 1991 through 2007 was used for this analysis, because key data used in the pass through calculations are available for that period as a result of the regular data collection and reporting for the Pass Through Agreement. For this analysis, various actual Gibraltar Reservoir capacities were assumed, ranging from 2,500 AF to 4,500 AF to represent varying degrees of anticipated future siltation at Gibraltar that will to reduce the storage capacity below the current amount of 5,300 AF. The recent rate of delivery of water to the City from Lake Cachuma has ranged from 15 to 27 AF per day. Consistent with these amounts, an average rate of 20 AF per day was assumed for delivery of water from Lake Cachuma to the City. The following table summarizes the estimated annual amounts that would be available to the City from the Pass Through Account with these assumptions.

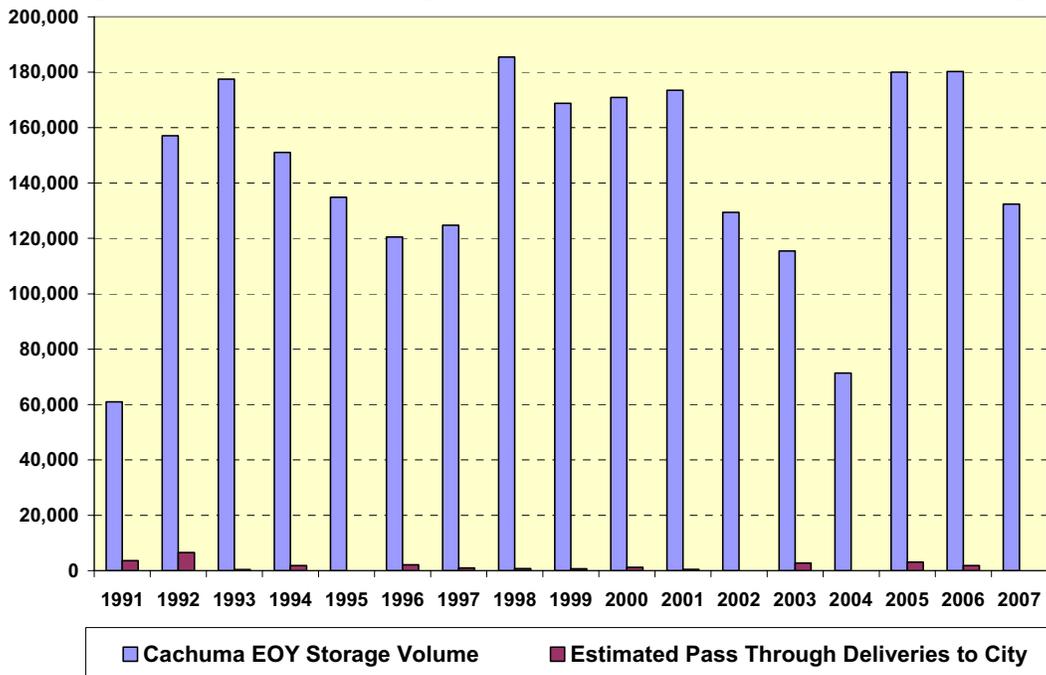
**Estimated Annual Amounts of Water Available to City
From Pass Through Account (AFY)**

Various Assumptions as to Gibraltar Storage Capacity (AF)					
	2,500	3,000	3,500	4,000	4,500
Pass Through Account Amounts Available to City By Water Year Type (AF)					
Average	1,768	1,673	1,563	1,394	1,282
Maximum	7,320	7,304	6,554	5,558	4,865
Minimum	0	0	0	0	0

For example, for an assumed Gibraltar Reservoir capacity of 3,000 AF, the estimated average annual amount of water available from the Pass Through Account for delivery to the City would be 1,673 AF, with a maximum of 7,304 AF and a minimum of zero. In comparison, Lake Cachuma has a current storage capacity of 186,636 AF with average end-of-year storage of approximately 140,000 AF. Figure 2 uses data from the same 1991 to 2007 period to show a comparison of annual end-of-year storage at Lake Cachuma to estimated annual deliveries from the Pass Through Account.

With implementation of the Project Contract, the amounts of Pass Through Account water listed in the table above would be available to the City for delivery through Tecolote Tunnel and the South Coast Conduit. Under the City's operating criteria, deliveries from the Cachuma Project are used to meet demands that cannot be met by other available sources. To minimize loss of Pass Through Account water, the City would take deliveries of water from this account first and leave the City's Cachuma Project water in Lake Cachuma for later use, thereby stretching the City's Cachuma Project supplies for use by the City in the event of a severe drought. This means that, in normal supply years, the amounts of water that would be delivered to the City from Lake Cachuma would be approximately equal, either with or without the Project Contract. The difference would be that, with the Project Contract, in the third or fourth year of a drought, more Cachuma Project water would remain available to the City as a result of the use of water from the Pass Through Account during the earlier years of the drought, than would occur under the No Project alternative. During such multi-year droughts, the City would either use this remaining Cachuma Project water to reduce shortages during a particular year or save it for use during potential future years of the drought.

Figure 2. Estimated Pass Through Deliveries Compared to End of Year Cachuma Storage



Under the No Project alternative, the amounts of water from the Pass Through Account discussed above would not be available to the City, as provided in the Pass Through Agreement, and instead would be available to all Member Units as Project Water or would be available to the downstream user accounts. To the extent this water became Project Water, it is likely that the Member Units would use it in much the same way as the City would use it under the Project Contract. It would provide some drought protection to all Cachuma Project Member Units by extending the time before Lake Cachuma storage drops below 100,000 AF, which is when Member Units typically agree to reductions in deliveries to hedge against a continuing drought. Any additional water that benefited downstream users would be used to defer drought impacts on them by replenishing groundwater basins on the Santa Ynez River downstream of Lake Cachuma. Another likely effect of the No Project alternative would be an impact on the City’s water supply. Based on the provisions agreed to under the Pass Through Agreement, the City depends on availability of water from the Pass Through Account. If this water were to be unavailable, the City would need to explore options for replacing it, including, restoring storage at Gibraltar Reservoir, additional delivery of State Water, more groundwater pumping, or use of desalination.

- Loss of Water at Lake Cachuma to Spills: Because the amounts of water flowing into Lake Cachuma and the uses of such water would be the same under either the Project Contract or the No Project alternative, no significant differences in reservoir elevations or spill amounts would be expected to occur under the Project Contract as compared to the No Project alternative. Losses of water due to spills are specifically addressed in the Pass Through Agreement and in the Warren Act for the storage and conveyance of State Water Project water in and through Lake Cachuma. The Pass Through Agreement provides that Pass Through Account

water will be treated as spilling before any spill of either Cachuma Project water or water in the Above Narrows and Below Narrows accounts. The SWP Warren Act contract provides that non-Cachuma Project water stored by a Member Unit pursuant to a subsequent Warrant Act agreement, such as the Project Contract, will have equal priority with State Water Project water for Lake Cachuma spills. Because State Water Project water typically is not conveyed to Lake Cachuma during periods of potential spill, the City's Pass Through Account water probably would be the first water to spill from Lake Cachuma.

- Storage of Water For Fishery Flows: The Member Units have an obligation to make releases of water from Lake Cachuma to support endangered steelhead in the Lower Santa Ynez River pursuant to the Lower Santa Ynez River Fish Management Plan and a Biological Opinion issued by the National Marine Fisheries Service. This obligation is met, when possible, with surcharge water accumulated in Lake Cachuma at the end of a spill, or alternatively with use of Cachuma Project water. There would be no impact on this arrangement as a result of the Project Contract.

Summary

The proposed project is the approval of a Warren Act contract between Reclamation and the City, which is referred to here as the "Project Contract." This contract would allow accounting for and conveyance of the City's pass through water in Lake Cachuma to fulfill the regional water management compromise embodied in the 1989 Pass Through Agreement. A defined portion of the flow into Lake Cachuma would be identified, for accounting purposes, to implement the Project Contract. The amount of water used by the City based on the Pass Through Account would average between 1,000 and 2,000 AF per year, compared to an overall Lake Cachuma storage capacity of about 186,636 AF. The physical flows of water into and out of Lake Cachuma are expected to be essentially the same with or without the proposed Project Contract.

