DOWNEY BRAND
ATTORNEYS LLP

555 Capitol Mall, 10th Floor
Sacramento, CA 95814

P: 916/444-1000
F: 916/444-2100
downeybrand.com

Joseph S. Schofield
jschofield@downeybrand.com

May 24, 2005

BY HAND DELIVERY

Victoria Whitney, Chief, Division of Water Rights
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Re: Sacramento Municipal Utility District Water Rights Requests

Dear Ms. Whitney:

Per our discussion of last Tuesday, May 17, 2005, enclosed are

(i) a letter request to administratively amend the Sacramento Municipal Utility District's existing licenses and permit for the Upper American River Project (UARP) to include Standard Permit Term 27 and to clarify that several points of diversion are also points of rediversion;

(ii) an application for new direct diversion and storage rights from Rubicon River sources for existing facilities on the UARP; and

(iii) an application for storage rights on Silver Creek and the South Fork American River for four existing regulating reservoirs on the UARP.

Included in the supporting material for the applications is a water availability analysis we believe indicates that sufficient water is available in the requested quantities and that granting the applications will not interfere with senior rights.

Because of the voluminousness of the supporting material, we would be pleased to meet with your or your staff to discuss the technical basis for our determinations. We trust that the State Water Resources Control Board will process these requests expeditiously, and we will assist in that effort.

Thank you in advance for your cooperation in these matters. Please feel free to contact me or my colleague David Aladjem if you or your staff have any questions.

Very truly yours,

DOWNEY BRAND LLP

Joseph S. Schofield

cc: Paul Bender, SMUD
Leslie Dunsworth, SMUD
Marc Van Camp, MBK Engineers
David Lindgren (firm)
David Aladjem (firm)

TYPE OR PRINT
IN BLACK INK
(For instructions, see booklet: "How to File an Application to Appropriate Water in California)

APPLICATION NO. _____
(leave blank)

California Environmental Protection Agency

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
www.waterrights.ca.gov

APPLICATION TO APPROPRIATE WATER

SECTION A: NOTICE INFORMATION

1. APPLICANT/AGENT

a.

	APPLICANT	ASSIGNED AGENT (if any)
Name	Sacramento Municipal	Joseph Schofield
	Utility District	Downey Brand LLP
Mailing Address	P.O. Box 15830	555 Capitol Mall, 10th Flr.
City, State & Zip	Sacramento, CA 95852-1830	Sacramento, CA 95814
Telephone		(916) 444-1000
Fax		(916) 444-2100
E-mail		jschofield@downeybrand.com

2. OWNERSHIP INFORMATION (Please check type of ownership.)

☐ Sole Owner ☐ Limited Liability Company (LLC) ☐ General Partnership*
☐ Limited Partnership* ☐ Business Trust ☐ Husband/Wife Co-Ownership
☐ Corporation ☐ Joint Venture ☒ Other Municipal Utility District

*Please provide a copy of your partnership agreement.

3. PROJECT DESCRIPTION (Provide a detailed description of your project, including, but not limited to, type of construction activity, area to be graded or excavated, and how the water will be used.)

See attached

☒ *See Attachment No. 1*

4. PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

a. PURPOSE OF USE (irrigation, domestic, etc.)	DIRECT DIVERSION				STORAGE		
	AMOUNT		SEASON OF DIVERSION		AMOUNT	SEASON OF COLLECTION	
	Rate (cfs or gpd)*	Acre-feet per year	Beginning date (month & day)	Ending date (month & day)	Acre-feet per year	Beginning date (month & day	Ending date (month & day)
See attached							

☒ *See Attachment No. 1*

*If rate is less than 0.025 cubic feet per second (cfs), use gallons per day (gpd).

b. Total combined amount taken by direct diversion and storage during any one year will be _____ acre-feet.

c. Reservoir storage is: ☒ onstream ☐ offstream ☐ underground (If underground storage, attach Form APP-UGSTOR.)

d. County in which diversion is located: El Dorado County in which water will be used: El Dorado

e. Assessor's Parcel Number(s): unknown

5. SOURCES AND POINTS OF DIVERSION/REDIVERSION

a. Sources and Points of Diversion (POD)/Points of Rediversion (PORD):

☐ POD / ☐ PORD #___: ___See attached_____ tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____

☒ *See Attachment No. 1*

b. State Planar and Public Land Survey Coordinate Description:

POD/ PORD #	CALIFORNIA COORDINATES (NAD 27)	ZONE	POINT IS WITHIN (40-acre Subdivision)	SECTION	TOWN-SHIP	RANGE	BASE AND MERIDIAN
	See attached		¼ of ¼				
			¼ of ¼				
			¼ of ¼				
			¼ of ¼				

☒ *See Attachment No. 1*

c. Name of the post office most often used by those living near the proposed point(s) of diversion:
U.S. Post Office in Kyburz

6. WATER AVAILABILITY

a. Have you attached a water availability analysis for this project? ☒ YES ☐ NO

This application seeks the right to store water for the purpose of stream regulation and maintaining head for maximum power generation. The water will be collected downstream from existing points of diversion and will be used to generate power (nonconsumptive use) at existing places of beneficial use downstream from the listed reservoirs.

If NO, provide sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation:
___This application is limited to collecting water to storage that has already been diverted upstream under
_____
_____

☒ *See Attachment No. 2*

b. Is your project located on a stream system declared to be fully appropriated by the State Water Resources Control Board during your proposed season of diversion? ☒ YES ☐ NO The project is located on American River sources, which are considered a fully appropriated stream. However, the application is for a nonconsumptive use that will not substantially diminish the quantity or quality of water in the source and will not regulate flow in the source in such manner as to impair any other existing reasonable and beneficial use, including instream use.

c. In an average year, does the stream dry up at any point downstream of your project? ☐ YES ☒ NO If YES, during which months? ☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

d. What alternate sources of water are available if a portion of your requested diversion season must be excluded because water is not available for appropriation? (e.g., percolating groundwater, purchased water, etc.)
None

☐ *See Attachment No. ___*

7. PLACE OF USE

USE IS WITHIN (40-acre subdivision)	SECTION*	TOWNSHIP	RANGE	BASE & MERIDIAN	IF IRRIGATED	
					Acres	Presently cultivated?
¼ of ¼	See attached					☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
				Total:		

*Please indicate if section is projected with a "(P)" following the section number.

☒ *See Attachment No. 1*

8. PROJECT SCHEDULE

a. Project is:

☐ proposed. Year construction will begin: _____

☐ partially complete. Extent of completion: _____

_____

_____

☒ complete. Year completed: 1985

b. Year of first use: 1959 Year water will be used to the full extent intended: 2057

SECTION B: MISCELLANEOUS DIVERSION INFORMATION

1. JUSTIFICATION OF AMOUNTS REQUESTED

a. ☐ IRRIGATION: Maximum area to be irrigated in any one year: _____ acres.

CROP	ACRES	METHOD OF IRRIGATION (sprinklers, flooding, etc.)	WATER USE (Acre-feet/Yr.)	SEASON OF WATER USE	
				Beginning date (month & day	Ending date (month & day)

☐ *See Attachment No. ___*

b. ☐ DOMESTIC: Number of residences to be served: _____ Separately owned? ☐ YES ☐ NO

Number of people to be served: _____ Estimated daily use per person is: _____ gallons per day

Area of domestic lawns and gardens: _____ square feet

Incidental domestic uses: _____

(dust control area, number and kind of domestic animals, etc.)

c. ☐ STOCKWATERING: Kind of stock: _____ Maximum number: _____

Describe type of operation: _____

(feedlot, dairy, range, etc.)

d. ☒ RECREATIONAL: Type of recreation: ☒ Fishing ☒ Swimming ☒ Boating ☐ Other _____

e. ☐ MUNICIPAL:

POPULATION List for 5-year periods until use is completed		MAXIMUM MONTH		ANNUAL USE		
Period	Population	Average daily use (gallons per capita)	Rate of diversion (cfs)	Average daily use (gallons per capita)	Acre-foot (per capita)	Total (acre-feet)
Present						

☐ *See Attachment No. ___*

Month of maximum use during year: _____ Month of minimum use during year: _____

f. ☐ HEAT CONTROL: Area to be heat controlled: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
Heat protection season will begin _____ and end _____.
(month & day) (month & day)

g. ☐ FROST PROTECTION: Area to be frost protected: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
The frost protection season will begin _____ and end _____.
(month & day) (month & day)

h. ☐ INDUSTRIAL: Type of industry: _____
Basis for determination of amount of water needed: _____

i. ☐ MINING: Name of the claim: _____ ☐ Patented ☐ Unpatented
Nature of the mine: _____ Mineral(s) to be mined: _____
Type of milling or processing: _____
After use, the water will be discharged into _____ (watercourse)
in _____ ¼ of _____ ¼ of Section _____, T _____, R _____, _____B. & M.

j. ☒ POWER: Total head to be utilized: 61 to 1,530 feet, depending on the facility
Maximum flow through the penstock: 1120 to 3,950 cfs, depending on the facility
Maximum theoretical horsepower capable of being generated by the works (cfs x fall ÷ 8.8): 13,170 to 339,060
Electrical capacity (hp x 0.746 x efficiency): 688 megawatts kilowatts at: varies by unit, head, and flow rate % efficiency
After use, the water will be discharged into South Fork American River (watercourse)
in NE ¼ of SE ¼ of Section 25, T 11, R 10, MD B. & M. FERC No.: 2101

k. ☐ FISH AND WILDLIFE PRESERVATION AND/OR ENHANCEMENT: List specific species and habitat type that will be preserved or enhanced in Item 7a of Section C.

l. ☐ OTHER: Describe use: _____
Basis for determination of amount of water needed: _____

2. DIVERSION AND DISTRIBUTION METHOD

a. Diversion will be by gravity by means of: dams and tunnels
(dam, pipe in unobstructed channel, pipe through dam, siphon, weir, gate, etc.)

b. Diversion will be by pumping from: _____
(sump, offset well, channel, reservoir, etc)

Pump discharge rate: _____ ☐ cfs or ☐ gpd Horsepower: _____ Pump Efficiency: _____

c. Conduit from diversion point to first lateral or to offstream storage reservoir:

CONDUIT (pipe or channel)	MATERIAL (type of pipe or channel lining; indicate if pipe is buried or not)	CROSS-SECTION (pipe diameter, or ditch depth and top and bottom width) (inches or feet)	LENGTH (feet)	TOTAL LIFT OR FALL		CAPACITY (cfs, gpd or gpm)
				feet	+ or -	
	See attached					

☒ *See Attachment No. 1*

d. Storage reservoirs: (For underground storage, complete and attach form APP-UGSTOR)

RESERVOIR NAME OR NUMBER	DAM					RESERVOIR	
	Vertical height from downstream toe of slope to spillway level (feet)	Construction material	Length (feet)	Freeboard: dam height above spillway crest (feet)	Surface area when full (acres)	Capacity (acre-feet)	Maximum water depth (feet)
	See attached						

☐ *See Attachment No. 1*

e. Outlet pipe: Complete for storage reservoirs having a capacity of 10 acre-feet or more.

RESERVOIR NAME OR NUMBER	OUTLET PIPE				
	Diameter (inches)	Length (feet)	Fall: vertical distance between entrance and exit of outlet pipe (feet)	Head: vertical distance from spill-way to entrance outlet pipe (feet)	Dead Storage storage below entrance of outlet pipe (acre-feet)
See attached					

☐ *See Attachment No. ____*

f. If water will be stored and the reservoir is not at the point of diversion, the maximum rate of diversion to off-stream storage will be _____ cfs. Diversion to offstream storage will be made by: ☐ Pumping ☐ Gravity

3. CONSERVATION AND MONITORING

a. What methods will you use to conserve water? Explain. Non-consumptive use

b. How will you monitor your diversion to be sure you are within the limits of your water right and you are not wasting water? ☐ Weir ☐ Meter ☐ Periodic sampling ☒ Other (describe) stream gages

4. RIGHT OF ACCESS

a. Does the applicant own all the land where the water will be diverted, transported and used? ☐ YES ☒ NO
If NO, I ☒ do ☐ do not have a recorded easement or written authorization allowing me access.

b. List the names and mailing addresses of all affected landowners and state what steps are being taken to obtain access: See attached

☒ *See Attachment No. 1*

5. EXISTING WATER RIGHTS AND RELATED FILINGS

a. Do you claim an existing right for the use of all or part of the water sought by this application? ☐ YES ☒ NO
If YES, please specify: ☐ Riparian ☐ Pre-1914 ☐ Registration ☐ Permit ☐ License
☐ Percolating groundwater ☐ Adjudicated ☐ Other (specify) _____

b. For each existing right claimed, state the source, year of first use, purpose, season and location of the point of diversion (to within quarter-quarter section). Include number of registration, permit, license, or statement of water diversion and use, if applicable. _____

c. List any related applications, registrations, permits, or licenses located in the proposed place of use or that utilize the same point(s) of diversion? See attached.

☒ *See Attachment No. 1*

6. OTHER SOURCES OF WATER

Are you presently using, or do you intend to use, purchased water or water supplied by contract in connection with this project? ☐ Yes ☒ No If yes, please explain: _____

7. MAP REQUIREMENTS

The Division cannot process your application without accurate information showing the source of water and location of water use. You must include a map with this application form that clearly indicates the township, range, section and quarter/quarter section of (1) the proposed points of diversion and (2) the place of use. A copy of a U.S.G.S. quadrangle/topographic map of your project area is preferred, and can be obtained from sporting goods stores or through the Internet at http://topomaps.usgs.gov. A certified engineering map is required when (1) appropriating more than three cfs by direct diversion, (2) constructing a dam which will be under the jurisdiction of the Division of Safety of Dams, (3) creating a reservoir with a surface area in excess of ten acres or (4) appropriating more than 1000 acre-feet per annum by underground storage. See the instruction booklet for more information.

☒ *See Attachment No. 5*

SECTION C: ENVIRONMENTAL INFORMATION

Note: Before a water right permit may be issued for your project, the State Water Resources Control Board (SWRCB) must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared for your project, a determination must be made of who is responsible for its preparation. If the SWRCB is determined to be responsible for preparing the CEQA document, the applicant will be required to pay all costs associated with the environmental evaluation and preparation of the required documents. Please answer the following questions to the best of your ability and submit with this application any studies that have been conducted regarding the environmental evaluation of your project.

1. COUNTY PERMITS

a. Contact your county planning or public works department and provide the following information:

Person contacted: N/A Date of contact: _____

Department: _____ Telephone: (____)

County Zoning Designation: _____

Are any county permits required for your project? ☐ YES ☐ NO If YES, check appropriate box below:

☐ Grading permit ☐ Use permit ☐ Watercourse ☐ Obstruction permit ☐ Change of zoning

☐ General plan change ☐ Other (explain): _____

The UARP is an existing project and already has all necessary permits.

b. Have you obtained any of the required permits described above? ☐ YES ☐ NO

If YES, provide a complete copy of each permit obtained.

☐ *See Attachment No. ___*

2. STATE/FEDERAL PERMITS AND REQUIREMENTS

a. Check any additional state or federal permits required for your project:

☐ Federal Energy Regulatory Commission ☐ U.S. Forest Service ☐ U.S. Bureau of Land Management

☐ U.S. Corps of Engineers ☐ U.S. Natural Res. Conservation Service ☐ Calif. Dept. of Fish and Game

☐ State Lands Commission ☐ Calif. Dept. of Water Resources (Div. of Safety of Dams)

☐ Calif. Coastal Commission ☐ State Reclamation Board ☐ Other (specify) _____

SMUD is in the process of obtaining a new FERC license, which will be in effect from approximately 2007 to 2057.

b. For each agency from which a permit is required, provide the following information:

AGENCY	PERMIT TYPE	PERSON(S) CONTACTED	CONTACT DATE	TELEPHONE NO.

☐ *See Attachment No. ___*

c. Does your proposed project involve any construction or grading-related activity that has significantly altered or would significantly alter the bed, bank, or riparian habitat of any stream or lake? ☐ YES ☒ NO

If YES, explain: The UARP is a completed project.

☐ *See Attachment No. ___*

d. Have you contacted the California Department of Fish and Game concerning your project? ☐ YES ☒ NO
If YES, name and telephone number of contact: _____

3. ENVIRONMENTAL DOCUMENTS

a. Has any California public agency prepared an environmental document for your project? ☐ YES ☒ NO
c. If YES, submit a copy of the latest environmental document(s) prepared, including a copy of the notice of determination adopted by the California public agency. Public agency: _____
d. If NO, check the appropriate box and explain below, if necessary:
☐ The applicant is a California public agency and will be preparing the environmental document.*
☐ I expect that the SWRCB will be preparing the environmental document.**
☐ I expect that a California public agency other than the State Water Resources Control Board will be preparing the environmental document.* Public agency: _____
☐ *See Attachment No. ___*

* Note: When completed, submit a copy of the final environmental document (including notice of determination) or notice of exemption to the SWRCB, Division of Water Rights. Processing of your a application cannot proceed until these documents are submitted.

** Note: CEQA requires that the SWRCB, as Lead Agency, prepare the environmental document. The information contained in the environmental document must be developed by the applicant and at the applicant's expense under the direction of the SWRCB, Division of Water Rights.

Given that the water sought by this application will be used for a single-purpose hydroelectric project licensed by the Federal Energy Regulatory Commission (FERC), environmental review by the SWRCB under CEQA is federally preempted. A thorough environmental review of the environmental effects of the UARP is currently being undertaken by FERC, and SWRCB staff is participating in that review.

4. WASTE/WASTEWATER

a. Will your project, during construction or operation, (1) generate waste or wastewater containing such things as sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation?
☒ YES ☐ NO
If YES, or you are unsure of your answer, explain below and contact your local Regional Water Quality Control Board for the following information (See instruction booklet for address and telephone no.):
UARP is an existing project, and SMUD already uses NPDES "General Permit CAG 990002."
☐ *See Attachment No. ___*

b. Will a waste discharge permit be required for your project? ☒ YES ☐ NO operates under existing permit
Person contacted: _____ Date of contact: _____
c. What method of treatment and disposal will be used? _____
☐ *See Attachment No. ___*

5. ARCHEOLOGY

a. Have any archeological reports been prepared on this project? ☒ YES ☐ NO
b. Will you be preparing an archeological report to satisfy another public agency? ☐ YES ☐ NO
c. Do you know of any archeological or historic sites located within the general project area? ☐ YES ☐ NO
☒ *See Attachment No. 4*

6. ENVIRONMENTAL SETTING

Attach **three complete sets of color photographs**, clearly dated and labeled, showing the vegetation that exists at the following three locations:
☒ Along the stream channel immediately downstream from the proposed point(s) of diversion.
☒ Along the stream channel immediately upstream from the proposed point(s) of diversion.
☒ At the place(s) where the water is to be used.
☒ *See Attachment No. 3*

SECTION D: SUBMITTAL FEES

Calculate your application filing fee using the "Water Right Fee Schedule Summary" that was enclosed in the application packet. The "Water Right Fee Schedule Summary" can also be viewed at the Division of Water Rights' website (www.waterrights.ca.gov).

A check for the application filing fee, payable to the "Division of Water Rights" and an $850 check for the environmental review fee, payable to the "California Department of Fish and Game," must accompany this application. All applicable fees are required at the time of filing. Your application will be returned to you if it is not accompanied by all required fees.

SECTION E: DECLARATION AND SIGNATURE

I declare under penalty of perjury that all information provided is true and correct to the best of my knowledge and belief. I authorize my agent, if I have designated one above, to act on my behalf regarding this water right application.

Signature of Applicant	Title or Relationship	Date
Paul D. Jenk	Mgr., Power Generation	5-23-05
Signature of Co-Applicant (if any)	Title or Relationship	Date

"APPLICATION TO APPROPRIATE WATER" CHECKLIST

Before you submit your application, be sure to:

- ☐ **Answer each question completely in Sections A, B, and C.**
- ☐ **Number and include all necessary attachments.**
- ☐ **Include a legible map that meets the requirements discussed in the instruction booklet (Item B6).**
- ☐ **Include the Water Availability Analysis or sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation (Item A6).**
- ☐ **Include three complete sets of color photographs of the project site (Item C6).**
- ☐ **Enclose a check for the required fee, payable to the Division of Water Rights, as specified in Section D.**
- ☐ **Enclose a $850 check for the environmental review fee, payable to the Department of Fish and Game, as specified in Section D.**
- ☐ **Sign and date the application in Section E.**

Send the original and one copy of the entire application to:

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Supplemental Information

Attachment No. 1 to Sacramento Municipal Utility District's Water Right Application

SECTION A: NOTICE INFORMATION

3. PROJECT DESCRIPTION

The Upper American River Project (UARP) is a large hydroelectric development licensed by the Federal Energy Regulatory Commission. Located within the Rubicon, Silver Creek, and South Fork American River watersheds of the Western Sierra, the UARP consists of eleven dams and eight powerplants that provide electricity to customers with the Sacramento Municipal Utility District service boundaries. This application only involves the use of existing facilities. Placing the water that is the subject of this Application to beneficial use will not require additional construction and will not change the historical operation of the UARP.

4. PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

a. POINT OF DIVERSION	PURPOSE OF USE	DIRECT DIVERSION			
		AMOUNT		SEASON OF DIVERSION	
		Rate (cfs)	Acre-feet per year	Beginning date (month & day)	Ending date (month & day)
(1) Rubicon Reservoir	Power	800 cfs	The total amount to be taken from the source under this application and under License 11074 will not exceed 410,000 acre-feet per year. The total amount to be put to beneficial use (flow through Robbs Peak Powerhouse) under under this application and under License 11074 will not exceed 405,000 acre-feet per year.	January 1	December 31
(2) Buck Island Reservoir	Power	160 cfs		January 1	December 31
(3) Loon Lake Reservoir	Power	950 cfs		January 1	December 31
(4) Gerle Creek Reservoir	Power				
(5) Robbs Peak Reservoir	Power				

POINT OF STORAGE	PURPOSE OF USE	STORAGE		
		AMOUNT	SEASON OF COLLECTION	
		Acre-feet per year	Beginning date (month & day)	Ending date (month & day)
Rubicon Reservoir	Power and recreation	1,550 acre-feet*	October 1	September 30
Buck Island Reservoir	Power, recreation, fishery and wildlife protection/ enhancement	760 acre-feet*	October 1	September 30
Gerle Creek Reservoir	Power and recreation	1,200 acre-feet*	October 1	September 30
Robbs Peak Reservoir	Power	100 acre-feet*	October 1	September 30

* The maximum total amount of water to be collected to storage from all sources under this application and existing License 11074 shall not exceed 226,900 afy, the existing storage limitation in License 11074.

5. SOURCES AND POINTS OF DIVERSION/REDIVERSION

a. Sources and Points of Diversion (POD)/Points of Rediversion (PORD):

☑ POD / ☐ PORD # (1): Rubicon River, tributary to Middle Fork American River

☑ POD / ☑ PORD # (2): Little Rubicon River (aka Rockbound/Highland Creek), tributary to Rubicon River thence Middle Fork American River

☑ POD / ☑ PORD # (3): Gerle Creek, tributary to South Fork Rubicon River thence Rubicon River

☑ POD / ☑ PORD # (4): Gerle Creek, tributary to South Fork Rubicon River thence Rubicon River

☑ POD / ☑ PORD # (5): South Fork Rubicon, tributary to Rubicon River thence Middle Fork American River

☐ POD / ☑ PORD # (6): Silver Creek, tributary to South Fork American River thence American River

☐ POD / ☑ PORD # (7): Silver Creek, tributary to South Fork American River thence American River

☐ POD / ☑ PORD # (8): Silver Creek, tributary to South Fork American River thence American River

☐ POD / ☑ PORD # (9): Brush Creek, tributary to South Fork American River thence American River

☐ POD / ☑ PORD # (10): South Fork American River tributary to American River thence Sacramento River

☐ POD / ☑ PORD # (11): South Fork American River tributary to American River thence Sacramento River

b. State Planar and Public Land Survey Coordinate Description

POD/ PODR #	POINT IS WITHIN (40-acre subdivision)	SECTION	TOWNSHIP	RANGE	BASE AND MERIDIAN
# (1)	NW ¼ of SW ¼	9	13N	16E	MDB&M
# (2)	SW ¼ of NW ¼	6	13N	16E	MDB&M
# (3)	SE ¼ of NE ¼	5	13N	15E	MDB&M
# (4)	Lot 14	15	13N	14E	MDB&M
# (5)	SW ¼ of NE ¼	27	13N	14E	MDB&M
# (6)	SW ¼ of SW ¼	20	12N	14E	MDB&M
# (7)	SW ¼ of SW ¼	4	12N	14E	MDB&M
# (8)	Lot 9	4	11N	13E	MDB&M
# (9)	NW ¼ of SE ¼	10	11N	12E	MDB&M
# (10)	SE ¼ of NW ¼	25	11N	11E	MDB&M
# (11)	NE ¼ of SW ¼	25	11N	10E	MDB&M

7. PLACE OF USE

POWERPLANT	USE IS WITHIN (40-acre subdivision)	SECTION	TOWNSHIP	RANGE	BASE & MERIDIAN
Loon Lake Powerhouse	NE ¼ of NE ¼	18	13N	15E	MDB&M
Robbs Peak Powerhouse	NE ¼ of SW ¼	11	12N	14E	MDB&M
Union Valley Powerhouse	SW ¼ of SW ¼	20	12N	14E	MDB&M
Jaybird Powerhouse	NE ¼ of NW ¼	4	11N	13E	MDB&M
Camino Powerhouse	SW ¼ of SE ¼	15	11N	12E	MDB&M
Slab Creek Powerhouse	SE ¼ of NW ¼	25	11N	11E	MDB&M
White Rock Powerhouse	NW ¼ of NE ¼	31	11N	11E	MDB&M
Chili Bar Powerhouse	NE ¼ of SW ¼	25	11N	10E	MDB&M

SECTION B: MISCELLANEOUS DIVERSION INFORMATION

2. DIVERSION AND DISTRIBUTION INFORMATION

c. Conduits

CONDUIT (pipe or channel)	MATERIAL (type of pipe or channel lining; indicate if pipe is buried or not)	CROSS-SECTION (pipe diameter, or ditch depth and top and bottom width) (inches or feet)	LENGTH (feet)	TOTAL LIFT OR FALL		CAPACITY (cfs, gpd or gpm)
				feet	+ or -	
Rubicon–Rockbound Tunnel	concrete lined and unlined tunnel	13' diameter	1,170	3.5	–	1300 cfs
Buck–Loon Tunnel	concrete lined and unlined tunnel	13' diameter	8,225	37	–	1,260 cfs
Loon Lake Powerhouse Penstock Shaft	concrete and steel lined tunnel	8.5'–14' diameter	1,454	1046	–	1,120 cfs
Loon Lake Powerhouse Tailrace Tunnel	concrete lined and unlined tunnel	18' diameter	20,212	24	-	1120 cfs
Gerle Creek Canal	partially gunite-lined canal	22' wide at top 19' wide at bottom 19' deep	9,950	2.7	–	1,120 cfs
Robbs Peak Tunnel	steel lined and unlined tunnel	13' diameter	16,917	86	–	1,450 cfs
Robbs Peak Penstock	steel	8.25–9.75' diameter	2,235	288	-	1,250 cfs
Union Valley Tunnel	concrete-lined tunnel with steel pipe	11' diameter	556	1.4	–	1,577 cfs
Union Valley Penstock		9.5–10' diameter	1,435	187	-	1,577 cfs
Jaybird Tunnel	unlined tunnel	11.3–14.25' diameter	23,190	105	–	1,345 cfs
Jaybird Penstock	steel pipe	6.25–10.25' diameter	2,620	1350		1,345 cfs
Camino Tunnel	unlined and concrete-lined tunnel	13–14' diameter	26,589	140	–	2,100 cfs
Brush Creek Tunnel	unlined tunnel	14' diameter	4,447	125	–	1,900 cfs
Camino Penstock	steep pipe	5–12' diameter	1,560	852	-	2,100 cfs
Slab Creek Penstock	steel pipe	2' diameter	40	0	–	45 cfs
White Rock Tunnel	unlined tunnel	20.7-24.0' diameter	25,941	121	–	3,950 cfs
White Rock Penstock	steel pipe	9–15' diameter	1,675	560	-	3,950 cfs
Chili Bar Penstock	steel pipe	15' diameter	75	23	–	1,900 cfs

d. Storage Reservoirs

RESERVOIR NAME OR NUMBER	DAM				RESERVOIR		
	Vertical height from downstream toe of slope to spillway level (feet)	Construction material	Length (feet)	Freeboard: dam height above spillway crest (feet)	Surface area when full (acres)	Capacity (acre-feet)	Maximum water depth (feet)
Rubicon Reservoir	36	Concrete	644	6.0	108	1,450	25
Buck Island Reservoir	23	Concrete	293	6.0	78	1,070	26
Loon Lake Reservoir	108	Rockfill	2,130	8.0	1,450	76,200	165
Gerle Creek Reservoir	58	Concrete	444	9.5	60	1,260	51
Robbs Peak Reservoir	44	Concrete	320	8.0	2	30	36
Union Valley Reservoir	453	Earthfill	1,835	28.0	2,860	277,290	360
Junction Reservoir	168	Concrete	525	18.0	64	3,250	141
Camino Reservoir	133	Concrete	470	41.5	20	825	76
Brush Creek Reservoir	213	Concrete	780	8.0	20	1,530	140
Slab Creek Reservoir	250	Concrete	817	20.0	280	16,600	186

e. Outlet Pipes

RESERVOIR NAME OR NUMBER	OUTLET PIPE				
	Diameter (inches)	Length (feet)	Fall: vertical distance between entrance and exit of outlet pipe (feet)	Head: vertical distance from spill-way to entrance outlet pipe (feet)	Dead Storage storage below entrance of outlet pipe (acre-feet)
Rubicon Reservoir	156	1,170	0	22	442
Buck Island Reservoir	156	8,225	0	16	532
Loon Lake Reservoir	102–216	21,666	23	106	1,001
Gerle Creek Reservoir	228 wide	9,950	4.5	45	716
Robbs Peak Reservoir	102–156	19,152	4	34.5	*1*
Ice House Reservoir	72–96	10,140	18	122	3,889
Union Valley Reservoir	102–132	1,991	na	na	2,816
Junction Reservoir	75–168	25,810	0	116	184
Camino Reservoir	60–168	28,149	0	76	55
Brush Creek Reservoir	60–168	6,007	0	140	259
Slab Creek Reservoir	108–288	27,616	0	169	*1*

4. RIGHT OF ACCESS

The UARP FERC Project Boundary occupies approximately 9,150 acres of land, including all land needed for water diversion and storage but excluding land associated with transmission lines. Of this land, 64% is federal land managed by the Eldorado National Forest, 34% is owned by SMUD, less than 2% is owned by private entities, and less than 1% is federal land managed by the Bureau of Land Management. For the federal land, SMUD's access for project purposes is granted by FERC License No. 2101 and special use permits issued by the Eldorado National Forest. For the private land, SMUD's access for project purposes is granted by easements. (Source: UARP Land Use Technical Report, February 2005). Most of the private land is owned by Sierra Pacific Industries (SPI). The remaining private land lies entirely above the project tunnels. For the private property within the UARP FERC Project Boundary, the table below lists the assessors parcel number, the property owners and the property owner's mailing address.

Several parcels within the UARP Project Boundary

Sierra Pacific Industries
Tim Feller
P.O. Box 1450
Cedar Ridge CA 95924

Parcels above Slab-White Rock Tunnel

085-030-08
Inger Carleton
1930 Hidden Valley Lane
Camino, CA 95709

085-030-51
Austin and Laurina Chadwell
3341 Rio Vista Way
Camino, CA 95709

085-030-04
Pearl Keeler Trust
3281 Rio Vista Way
Camino, CA 95709

085-550-07
William H & E Anne Johnston Trust
781 Las Olas Drive
Aptos, CA 95003

085-450-05
Francis D & Sharlene M Lewis
3674 Fairway Drive
Shingle Springs, CA 95682

085-450-08
Webster B & Vonda L Brunette
2850 Hassler Road
Camino, CA 95709

084-030-21
Iva Ruth Kurtz Rev Trust
9020 Mosquito Road
Placerville, CA 95667

084-210-01
Byron D & Linda B Sher
1000 Fruitridge Road
Placerville, CA 95667

084-220-02
Stephen R & Barbara J Petersen
6712 Tulip Hill Terrace
Bethesda, MD 20816

084-220-06
Clinton & Mable Shankel Trust
2055 Prosperity Lane
Placerville, CA 95667

084-220-07
Auguste & Natalie Archer
2030 Prosperity Lane
Placerville, CA 95667

084-220-10
Dale W & Mary Lou Hall Trust
8625 Mosquito Road
Placerville, CA 95667

084-220-11
John P & Nadean J Music
1992 Prosperity Lane
Placerville, CA 95667

084-220-09
Steven T & Julie A Bowen
8661 Mosquito Road

Placerville, CA 95667
084-190-15
George E Jarzombek
45948 Omega Drive
Fremont, CA 94539

084-190-07
Joseph M & Mary M Keating Trust
8680 Mosquito Road
Placerville, CA 95667

084-190-08
Joseph M & Mary M Keating Trust
8680 Mosquito Road
Placerville, CA 95667

084-150-01
Crystal Elzer Trust, 1996
P O Box 246
Placerville, CA 95667

Parcels above Robbs Tunnel

010-080-43
Alanda Clementsen & Karen Freeman Trust
3918 Hancock Drive
Sacramento, CA 95821

010-080-25
Frank J & Anne-Marie Ohalloran
1390 Broadway B166
Placerville, CA 95667

010-080-42
The Last Resort At Robbs Valley LLC
1390 Broadway B166
Placerville, CA 95667

Parcel above Loon Powerhouse Tailrace Tunnel

010-060-35
Archie D & Ellen L Lawyer
P O Box 661
Lotus, CA 95651

Parcel above Buck-Loon Tunnel

010-120-04
Rubicon Trail Partnership
P O Box 1601
Rubicon, CA 95634

5. EXISTING WATER RIGHTS AND RELATED FILINGS

c. Related Licenses

Application/Permit/License

12323 / 10703 / 11073

12624 / 10704 / 11074

14963 / 10705 / 10495

20522 / 13746 / 10496

22110 / 15088 / 10513

26768 / 19025 / n/a

Licenses 10495, 11073 and 11074 impose the condition: "No diversion or use of water shall be made under this license which will in any way interfere with diversion or use of water for irrigation or domestic purposes, whether such higher uses are made under either prior or subsequent rights." The condition is based on a 1957 Facilities Use Agreement between the District and El Dorado County interests (EDC), as amended in 1961. That agreement states that EDC will not protest any application for additional water rights that the District may file for the UARP as long as the application (and resulting permit and license) are subject to the above condition. Accordingly, the District hereby requests that any permit or license resulting from this application include the same condition.

TYPE OR PRINT
IN BLACK INK
(For instructions, see booklet: "How to File an Application to Appropriate Water in California)

APPLICATION NO. _____
(leave blank)

California Environmental Protection Agency

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
www.waterrights.ca.gov

APPLICATION TO APPROPRIATE WATER

SECTION A: NOTICE INFORMATION

1. APPLICANT/AGENT

a.

	APPLICANT	ASSIGNED AGENT (if any)
Name	Sacramento Municipal	Joseph Schofield
	Utility District	Downey Brand LLP
Mailing Address	P.O. Box 15830	555 Capitol Mall, 10th Flr.
City, State & Zip	Sacramento, CA 95852-1830	Sacramento, CA 95814
Telephone		(916) 444-1000
Fax		(916) 444-2100
E-mail		jschofield@downeybrand.com

2. OWNERSHIP INFORMATION (Please check type of ownership.)

☐ Sole Owner ☐ Limited Liability Company (LLC) ☐ General Partnership*
☐ Limited Partnership* ☐ Business Trust ☐ Husband/Wife Co-Ownership
☐ Corporation ☐ Joint Venture ☒ Other Municipal Utility District

*Please provide a copy of your partnership agreement.

3. PROJECT DESCRIPTION (Provide a detailed description of your project, including, but not limited to, type of construction activity, area to be graded or excavated, and how the water will be used.)

See attached

☒ *See Attachment No. 1*

4. PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

a. PURPOSE OF USE (irrigation, domestic, etc.)	DIRECT DIVERSION				STORAGE		
	AMOUNT		SEASON OF DIVERSION		AMOUNT	SEASON OF COLLECTION	
	Rate (cfs or gpd)*	Acre-feet per year	Beginning date (month & day)	Ending date (month & day)	Acre-feet per year	Beginning date (month & day	Ending date (month & day)
See attached							

☒ *See Attachment No. 1*

*If rate is less than 0.025 cubic feet per second (cfs), use gallons per day (gpd).

b. Total combined amount taken by direct diversion and storage during any one year will be _____ acre-feet.

c. Reservoir storage is: ☒ onstream ☐ offstream ☐ underground (If underground storage, attach Form APP-UGSTOR.)

d. County in which diversion is located: El Dorado County in which water will be used: El Dorado

e. Assessor's Parcel Number(s): unknown

5. SOURCES AND POINTS OF DIVERSION/REDIVERSION

a. Sources and Points of Diversion (POD)/Points of Rediversion (PORD):

☐ POD / ☐ PORD #___: See attached tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____
☐ POD / ☐ PORD #___: _____ tributary to _____
thence _____

☒ *See Attachment No. 1*

b. State Planar and Public Land Survey Coordinate Description:

POD/ PORD #	CALIFORNIA COORDINATES (NAD 27)	ZONE	POINT IS WITHIN (40-acre Subdivision)	SECTION	TOWN-SHIP	RANGE	BASE AND MERIDIAN
	See attached		¼ of ¼				
			¼ of ¼				
			¼ of ¼				
			¼ of ¼				

☒ *See Attachment No. 1*

c. Name of the post office most often used by those living near the proposed point(s) of diversion:
U.S. Post Office in Kyburz

6. WATER AVAILABILITY

a. Have you attached a water availability analysis for this project? ☒ YES ☐ NO

If NO, provide sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation:

_____
_____
_____

☒ *See Attachment No. 2*

b. Is your project located on a stream system declared to be fully appropriated by the State Water Resources Control Board during your proposed season of diversion? ☒ YES ☐ NO The project is located on American River sources, which are considered a fully appropriated stream. However, the application is for a nonconsumptive use that will not substantially diminish the quantity or quality of water in the source and will not regulate flow in the source in such manner as to impair any other existing reasonable and beneficial use, including instream use.

c. In an average year, does the stream dry up at any point downstream of your project? ☐ YES ☒ NO If YES, during which months? ☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

d. What alternate sources of water are available if a portion of your requested diversion season must be excluded because water is not available for appropriation? (e.g., percolating groundwater, purchased water, etc.)
None

☐ *See Attachment No. ___*

7. PLACE OF USE

USE IS WITHIN (40-acre subdivision)	SECTION*	TOWNSHIP	RANGE	BASE & MERIDIAN	IF IRRIGATED	
					Acres	Presently cultivated?
¼ of ¼	See attached					☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
				Total:		

*Please indicate if section is projected with a "(P)" following the section number.

☒ *See Attachment No. 1*

8. PROJECT SCHEDULE

a. Project is:

☐ proposed. Year construction will begin: _____

☐ partially complete. Extent of completion: _____

_____

_____

☒ complete. Year completed: 1985

b. Year of first use: 1959 Year water will be used to the full extent intended: 2057

SECTION B: MISCELLANEOUS DIVERSION INFORMATION

1. JUSTIFICATION OF AMOUNTS REQUESTED

a. ☐ IRRIGATION: Maximum area to be irrigated in any one year: _____ acres.

CROP	ACRES	METHOD OF IRRIGATION (sprinklers, flooding, etc.)	WATER USE (Acre-feet/Yr.)	SEASON OF WATER USE	
				Beginning date (month & day)	Ending date (month & day)

☐ *See Attachment No. ___*

b. ☐ DOMESTIC: Number of residences to be served: _____ Separately owned? ☐ YES ☐ NO

Number of people to be served: _____ Estimated daily use per person is: _____ gallons per day

Area of domestic lawns and gardens: _____ square feet

Incidental domestic uses: _____

(dust control area, number and kind of domestic animals, etc.)

c. ☐ STOCKWATERING: Kind of stock: _____ Maximum number: _____

Describe type of operation: _____

(feedlot, dairy, range, etc.)

d. ☒ RECREATIONAL: Type of recreation: ☒ Fishing ☒ Swimming ☒ Boating ☐ Other _____

e. ☐ MUNICIPAL:

POPULATION List for 5-year periods until use is completed		MAXIMUM MONTH		ANNUAL USE		
Period	Population	Average daily use (gallons per capita)	Rate of diversion (cfs)	Average daily use (gallons per capita)	Acre-foot (per capita)	Total (acre-feet)
Present						

☐ *See Attachment No. ___*

Month of maximum use during year: _____ Month of minimum use during year: _____

f. ☐ HEAT CONTROL: Area to be heat controlled: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
Heat protection season will begin _____ (month & day) and end _____ (month & day).

g. ☐ FROST PROTECTION: Area to be frost protected: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
The frost protection season will begin _____ (month & day) and end _____ (month & day).

h. ☐ INDUSTRIAL: Type of industry: _____
Basis for determination of amount of water needed: _____

i. ☐ MINING: Name of the claim: _____ ☐ Patented ☐ Unpatented
Nature of the mine: _____ Mineral(s) to be mined: _____
Type of milling or processing: _____
After use, the water will be discharged into _____ (watercourse)
in _____ ¼ of _____ ¼ of Section _____, T _____, R _____, _____B. & M.

j. ☒ POWER: Total head to be utilized: 61 to 1,530 feet, depending on the facility
Maximum flow through the penstock: 1120 to 3,950 cfs, depending on the facility
Maximum theoretical horsepower capable of being generated by the works (cfs x fall ÷ 8.8): 13,170 to 339,060
Electrical capacity (hp x 0.746 x efficiency): 688 megawatts kilowatts at: varies by unit, head, and flow rate % efficiency
After use, the water will be discharged into South Fork American River (watercourse)
in NE ¼ of SE ¼ of Section 25, T 11, R 10, MD B. & M. FERC No.: 2101

k. ☐ FISH AND WILDLIFE PRESERVATION AND/OR ENHANCEMENT: List specific species and habitat type that will be preserved or enhanced in Item 7a of Section C.

l. ☐ OTHER: Describe use: _____
Basis for determination of amount of water needed: _____

2. DIVERSION AND DISTRIBUTION METHOD

a. Diversion will be by gravity by means of: dams and tunnels
(am, pipe in unobstructed channel, pipe through dam, siphon, weir, gate, etc.)

b. Diversion will be by pumping from: _____
(sump, offset well, channel, reservoir, etc)

Pump discharge rate: _____ ☐ cfs or ☐ gpd Horsepower: _____ Pump Efficiency: _____

c. Conduit from diversion point to first lateral or to offstream storage reservoir:

CONDUIT (pipe or channel)	MATERIAL (type of pipe or channel lining; indicate if pipe is buried or not)	CROSS-SECTION (pipe diameter, or ditch depth and top and bottom width) (inches or feet)	LENGTH (feet)	TOTAL LIFT OR FALL		CAPACITY (cfs, gpd or gpm)
				feet	+ or -	
	See attached					

☒ *See Attachment No. 1*

d. Storage reservoirs: (For underground storage, complete and attach form APP-UGSTOR)

RESERVOIR NAME OR NUMBER	DAM					RESERVOIR	
	Vertical height from downstream toe of slope to spillway level (feet)	Construction material	Length (feet)	Freeboard: dam height above spillway crest (feet)	Surface area when full (acres)	Capacity (acre-feet)	Maximum water depth (feet)
	See attached						

☐ *See Attachment No. 1*

e. Outlet pipe: Complete for storage reservoirs having a capacity of 10 acre-feet or more.

RESERVOIR NAME OR NUMBER	OUTLET PIPE				
	Diameter (inches)	Length (feet)	Fall: vertical distance between entrance and exit of outlet pipe (feet)	Head: vertical distance from spill-way to entrance outlet pipe (feet)	Dead Storage storage below entrance of outlet pipe (acre-feet)
See attached					

☐ *See Attachment No. ____*

f. If water will be stored and the reservoir is not at the point of diversion, the maximum rate of diversion to off-stream storage will be _____ cfs. Diversion to offstream storage will be made by: ☐ Pumping ☐ Gravity

3. CONSERVATION AND MONITORING

a. What methods will you use to conserve water? Explain. Non-consumptive use

b. How will you monitor your diversion to be sure you are within the limits of your water right and you are not wasting water? ☐ Weir ☐ Meter ☐ Periodic sampling ☒ Other (describe) stream gages

4. RIGHT OF ACCESS

a. Does the applicant own all the land where the water will be diverted, transported and used? ☐ YES ☒ NO
If NO, I ☒ do ☐ do not have a recorded easement or written authorization allowing me access.

b. List the names and mailing addresses of all affected landowners and state what steps are being taken to obtain access: See attached

☒ *See Attachment No. 1*

5. EXISTING WATER RIGHTS AND RELATED FILINGS

a. Do you claim an existing right for the use of all or part of the water sought by this application? ☐ YES ☒ NO
If YES, please specify: ☐ Riparian ☐ Pre-1914 ☐ Registration ☐ Permit ☐ License
☐ Percolating groundwater ☐ Adjudicated ☐ Other (specify) _____

b. For each existing right claimed, state the source, year of first use, purpose, season and location of the point of diversion (to within quarter-quarter section). Include number of registration, permit, license, or statement of water diversion and use, if applicable. _____

c. List any related applications, registrations, permits, or licenses located in the proposed place of use or that utilize the same point(s) of diversion? See attached.

☒ *See Attachment No. 1*

6. OTHER SOURCES OF WATER

Are you presently using, or do you intend to use, purchased water or water supplied by contract in connection with this project? ☐ Yes ☒ No If yes, please explain: _____

7. MAP REQUIREMENTS

The Division cannot process your application without accurate information showing the source of water and location of water use. You must include a map with this application form that clearly indicates the township, range, section and quarter/quarter section of (1) the proposed points of diversion and (2) the place of use. A copy of a U.S.G.S. quadrangle/topographic map of your project area is preferred, and can be obtained from sporting goods stores or through the Internet at http://topomaps.usgs.gov. A certified engineering map is required when (1) appropriating more than three cfs by direct diversion, (2) constructing a dam which will be under the jurisdiction of the Division of Safety of Dams, (3) creating a reservoir with a surface area in excess of ten acres or (4) appropriating more than 1000 acre-feet per annum by underground storage. See the instruction booklet for more information.

☒ *See Attachment No. 5*

SECTION C: ENVIRONMENTAL INFORMATION

Note: Before a water right permit may be issued for your project, the State Water Resources Control Board (SWRCB) must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared for your project, a determination must be made of who is responsible for its preparation. If the SWRCB is determined to be responsible for preparing the CEQA document, the applicant will be required to pay all costs associated with the environmental evaluation and preparation of the required documents. Please answer the following questions to the best of your ability and submit with this application any studies that have been conducted regarding the environmental evaluation of your project.

1. COUNTY PERMITS

a. Contact your county planning or public works department and provide the following information:

Person contacted: N/A Date of contact: _____

Department: _____ Telephone: (_____)

County Zoning Designation: _____

Are any county permits required for your project? ☐ YES ☐ NO If YES, check appropriate box below:

☐ Grading permit ☐ Use permit ☐ Watercourse ☐ Obstruction permit ☐ Change of zoning

☐ General plan change ☐ Other (explain): _____

The UARP is an existing project and already has all necessary permits.

b. Have you obtained any of the required permits described above? ☐ YES ☐ NO

If YES, provide a complete copy of each permit obtained.

☐ *See Attachment No. ___*

2. STATE/FEDERAL PERMITS AND REQUIREMENTS

a. Check any additional state or federal permits required for your project:

☐ Federal Energy Regulatory Commission ☐ U.S. Forest Service ☐ U.S. Bureau of Land Management

☐ U.S. Corps of Engineers ☐ U.S. Natural Res. Conservation Service ☐ Calif. Dept. of Fish and Game

☐ State Lands Commission ☐ Calif. Dept. of Water Resources (Div. of Safety of Dams)

☐ Calif. Coastal Commission ☐ State Reclamation Board ☐ Other (specify) _____

SMUD is in the process of obtaining a new FERC license, which will be in effect from approximately 2007 to 2057.

b. For each agency from which a permit is required, provide the following information:

AGENCY	PERMIT TYPE	PERSON(S) CONTACTED	CONTACT DATE	TELEPHONE NO.

☐ *See Attachment No. ___*

c. Does your proposed project involve any construction or grading-related activity that has significantly altered or would significantly alter the bed, bank, or riparian habitat of any stream or lake? ☐ YES ☒ NO

If YES, explain: The UARP is a completed project.

☐ *See Attachment No. ___*

d. Have you contacted the California Department of Fish and Game concerning your project? ☐ YES ☒ NO
If YES, name and telephone number of contact: _____

3. ENVIRONMENTAL DOCUMENTS

a. Has any California public agency prepared an environmental document for your project? ☐ YES ☒ NO
c. If YES, submit a copy of the latest environmental document(s) prepared, including a copy of the notice of determination adopted by the California public agency. Public agency: _____
d. If NO, check the appropriate box and explain below, if necessary:
☐ The applicant is a California public agency and will be preparing the environmental document.*
☐ I expect that the SWRCB will be preparing the environmental document.**
☐ I expect that a California public agency other than the State Water Resources Control Board will be preparing the environmental document.* Public agency: _____
☐ *See Attachment No. ___*

* Note: When completed, submit a copy of the final environmental document (including notice of determination) or notice of exemption to the SWRCB, Division of Water Rights. Processing of your a application cannot proceed until these documents are submitted.

** Note: CEQA requires that the SWRCB, as Lead Agency, prepare the environmental document. The information contained in the environmental document must be developed by the applicant and at the applicant's expense under the direction of the SWRCB, Division of Water Rights.

Given that the water sought by this application will be used for a single-purpose hydroelectric project licensed by the Federal Energy Regulatory Commission (FERC), environmental review by the SWRCB under CEQA is federally preempted. A thorough environmental review of the environmental effects of the UARP is currently being undertaken by FERC, and SWRCB staff is participating in that review.

4. WASTE/WASTEWATER

a. Will your project, during construction or operation, (1) generate waste or wastewater containing such things as sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation?
☒ YES ☐ NO
If YES, or you are unsure of your answer, explain below and contact your local Regional Water Quality Control Board for the following information (See instruction booklet for address and telephone no.):
UARP is an existing project, and SMUD already uses NPDES "General Permit CAG 990002."

☐ *See Attachment No. ___*

b. Will a waste discharge permit be required for your project? ☒ YES ☐ NO operates under existing permit
Person contacted: _____ Date of contact: _____
c. What method of treatment and disposal will be used? _____

☐ *See Attachment No. ___*

5. ARCHEOLOGY

a. Have any archeological reports been prepared on this project? ☒ YES ☐ NO
b. Will you be preparing an archeological report to satisfy another public agency? ☐ YES ☐ NO
c. Do you know of any archeological or historic sites located within the general project area? ☐ YES ☐ NO

☒ *See Attachment No. 4*

6. ENVIRONMENTAL SETTING

Attach **three complete sets of color photographs**, clearly dated and labeled, showing the vegetation that exists at the following three locations:
☒ Along the stream channel immediately downstream from the proposed point(s) of diversion.
☒ Along the stream channel immediately upstream from the proposed point(s) of diversion.
☒ At the place(s) where the water is to be used.
☒ *See Attachment No. 3*

SECTION D: SUBMITTAL FEES

Calculate your application filing fee using the "Water Right Fee Schedule Summary" that was enclosed in the application packet. The "Water Right Fee Schedule Summary" can also be viewed at the Division of Water Rights' website (www.waterrights.ca.gov).

A check for the application filing fee, payable to the "Division of Water Rights" and an $850 check for the environmental review fee, payable to the "California Department of Fish and Game," must accompany this application. All applicable fees are required at the time of filing. Your application will be returned to you if it is not accompanied by all required fees.

SECTION E: DECLARATION AND SIGNATURE

I declare under penalty of perjury that all information provided is true and correct to the best of my knowledge and belief. I authorize my agent, if I have designated one above, to act on my behalf regarding this water right application.

Signature of Applicant	Title or Relationship	Date
[signature]	Mgr., Power Generation	5-23-05
Signature of Co-Applicant (if any)	Title or Relationship	Date

"APPLICATION TO APPROPRIATE WATER" CHECKLIST

Before you submit your application, be sure to:

- ☐ **Answer each question completely in Sections A, B, and C.**
- ☐ **Number and include all necessary attachments.**
- ☐ **Include a legible map that meets the requirements discussed in the instruction booklet (Item B6).**
- ☐ **Include the Water Availability Analysis or sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation (Item A6).**
- ☐ **Include three complete sets of color photographs of the project site (Item C6).**
- ☐ **Enclose a check for the required fee, payable to the Division of Water Rights, as specified in Section D.**
- ☐ **Enclose a $850 check for the environmental review fee, payable to the Department of Fish and Game, as specified in Section D.**
- ☐ **Sign and date the application in Section E.**

Send the original and one copy of the entire application to:

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Archaeological Report for the UARP

Attachment No. 4 to Sacramento Municipal Utility District's Water Right Application

Because of the potential for release of confidential information about archaeological or historical resources in the National Forest System, the U.S. Forest Service has requested that SMUD offer the attached confidentiality agreement before releasing the archaeological report for the UARP. We will transmit the archaeological report to the State Water Resources Control Board (SWRCB) once we have received a completed version of the confidentiality agreement with an original signature from SWRCB management.

Confidentiality Agreement

Eldorado National Forest
Pacific Southwest Region, USDA Forest Service

This Confidentiality Agreement is to be used for authorized release of data about archaeological resources and historic properties on National Forest System lands administered by the Eldorado National Forest, USDA Forest Service, Pacific Southwest Region, in California.

Date of USFS authorization:

Name of USFS authorizing unit:

Purpose for release of data:

[ ] Cultural resource management investigation
[ ] Planning
[ ] Scientific research
[x] Other: review of water rights application by Sacramento Municipal Utility District

Project name for release: Upper American River Project, FERC Project No. 2101

Type of data released (identify each released):

[ ] Site record(s) consulted:
[ ] Site record(s) copied:
[ ] Project report(s) consulted:
[ ] Project report(s) copied:
[ ] Map(s) consulted:
[ ] Map(s) copied:
[ ] Other consulted:
[ ] Other copied:

Name of requester:

Affiliation of requester:

Requester's business address:

Requester's E-mail address:

Requester's business phone:

Requester's FAX #:

I, the undersigned, have been granted access to the above listed information about archaeological resources and/or historic properties on National Forest System lands. I understand that the data received about the nature or character of sites, site locations, and site ownership are confidential, pursuant to the Archaeological Resources Protection Act and the National Historic Preservation Act. These data are to be kept confidential, and used only for the purpose cited above; they are not to be made public, given to unauthorized persons, or used for any other purposes. I understand that any confidentiality breach shall be pursued by the USDA Forest Service to the full extent of applicable laws and regulations.

Signature:_____.

Date:_____.

Attachments to Water Availability Analysis for Upper American River Project

Combined UARP Diversion Limits

Key Rubicon River measurable limits are highlighted in yellow

Direct Diversions: License 11074 [cfs]

	Rubicon	Buck Island	Loon	Gerle	Robbs
Lic. 11074:	500	200	325		175
Combined:	500	200	500		

Direct Diversions: Licenses 11073, 10495, 10496, 10513; Permit 19025 [cfs]

	Ice House	Union Valley	Junction	Camino	Brush	Slab	Chili
Per. 19025:	270	cannot be rediverted below Union Valley					
Lic. 11073:		400					
Lic. 10495:			400			800	
Lic. 10496:					1900		
Lic. 10513:						800	
Combined:	270 +Ice(11073)	800 -Jun - Cam + min(270,Ice)	800 -Uni -max(0, Ice -270)		3500		

Diversion to Storage: Licenses 11074, 11073; Permit 19025 [AF/yr]

	Rubicon	Buck Island	Loon	Union Valley	Ice House
Lic. 11074:	450	440	226,010		
			license also notes maximum past storage in each		
Lic. 11073:				238,900	
				license also notes maximum past storage in each	
Per. 19025:				60,000	
Combined:	525,800				
" "	450	440	226,010 - Uni(11074)		298,900 - Uni(11073) - Uni(19025)

Throughput: Licenses 11074, 11073, 10495 [AF/yr]

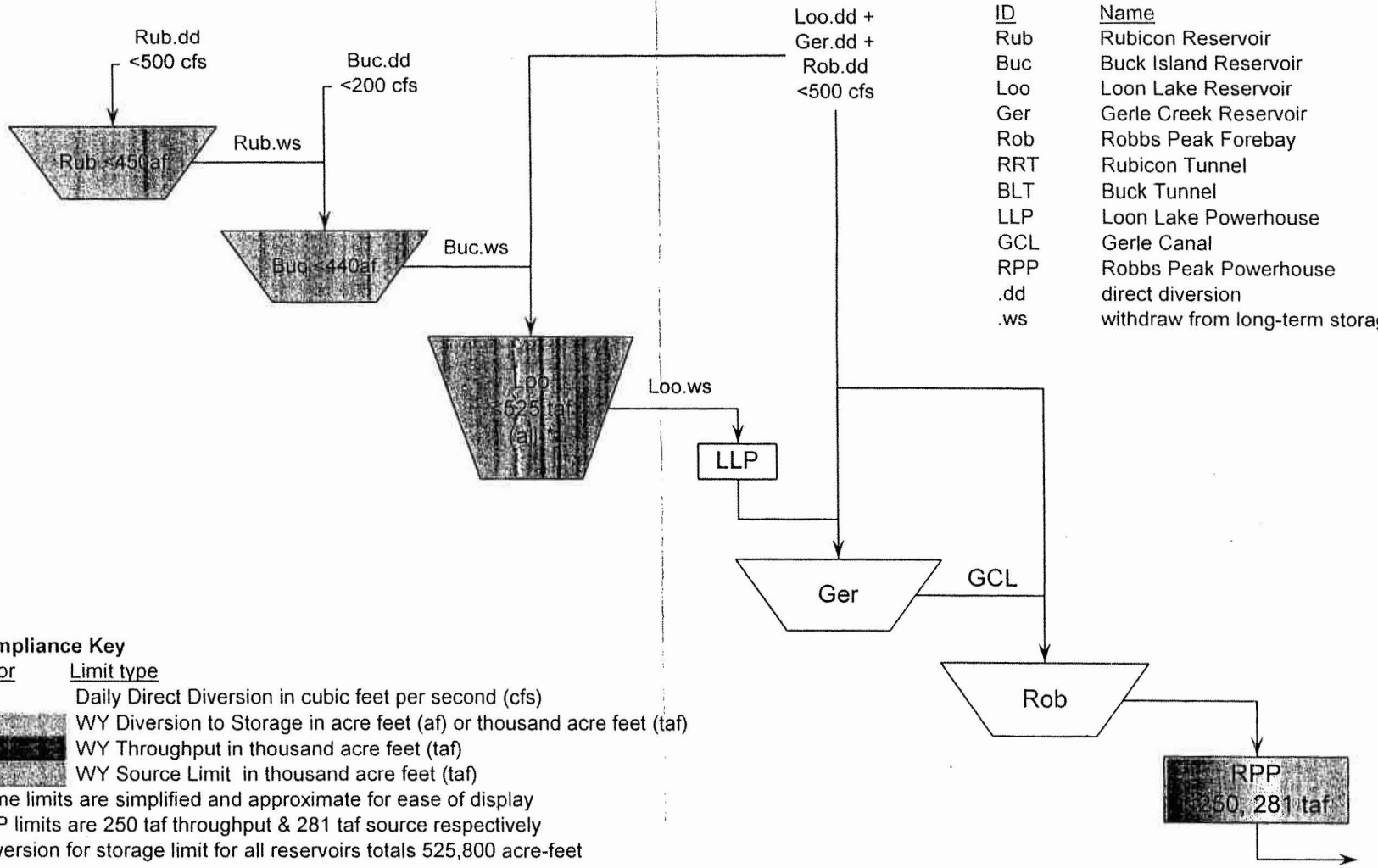
	Robbs PH	Jaybird PH	
Lic. 11074:	250,000		
" "		*250,000*	*max possible*
Lic. 11073:		528,400	
		from lic. 11073 & 10495 diversions	
Lic. 10495:			
Combined:	250,000	*778,400*	
		actual limit depends on detailed accounting	

Source Limit (Direct+Storage): Licenses 11074, 11073 [AF/yr]

	Robbs PH	Jaybird PH	
Lic. 11074:	281,100		
" "		*281,100*	*max possible*
Lic. 11073:		459,300	
		from lic. 11073 diversions	
Lic. 10495:		*289,587*	
		max possible from lic. 10495 diversions	
Combined:	281,100	*1,029,987*	
		actual limit depends on detailed accounting	

Upper American River Project Schematic: Compliance Points

Rubicon River Basin



Name Key

ID	Name
Rub	Rubicon Reservoir
Buc	Buck Island Reservoir
Loo	Loon Lake Reservoir
Ger	Gerle Creek Reservoir
Rob	Robbs Peak Forebay
RRT	Rubicon Tunnel
BLT	Buck Tunnel
LLP	Loon Lake Powerhouse
GCL	Gerle Canal
RPP	Robbs Peak Powerhouse
.dd	direct diversion
.ws	withdraw from long-term storage

Compliance Key

Color	Limit type
	Daily Direct Diversion in cubic feet per second (cfs)
	WY Diversion to Storage in acre feet (af) or thousand acre feet (taf)
	WY Throughput in thousand acre feet (taf)
	WY Source Limit in thousand acre feet (taf)

Some limits are simplified and approximate for ease of display

RPP limits are 250 taf throughput & 281 taf source respectively

*Diversion for storage limit for all reservoirs totals 525,800 acre-feet

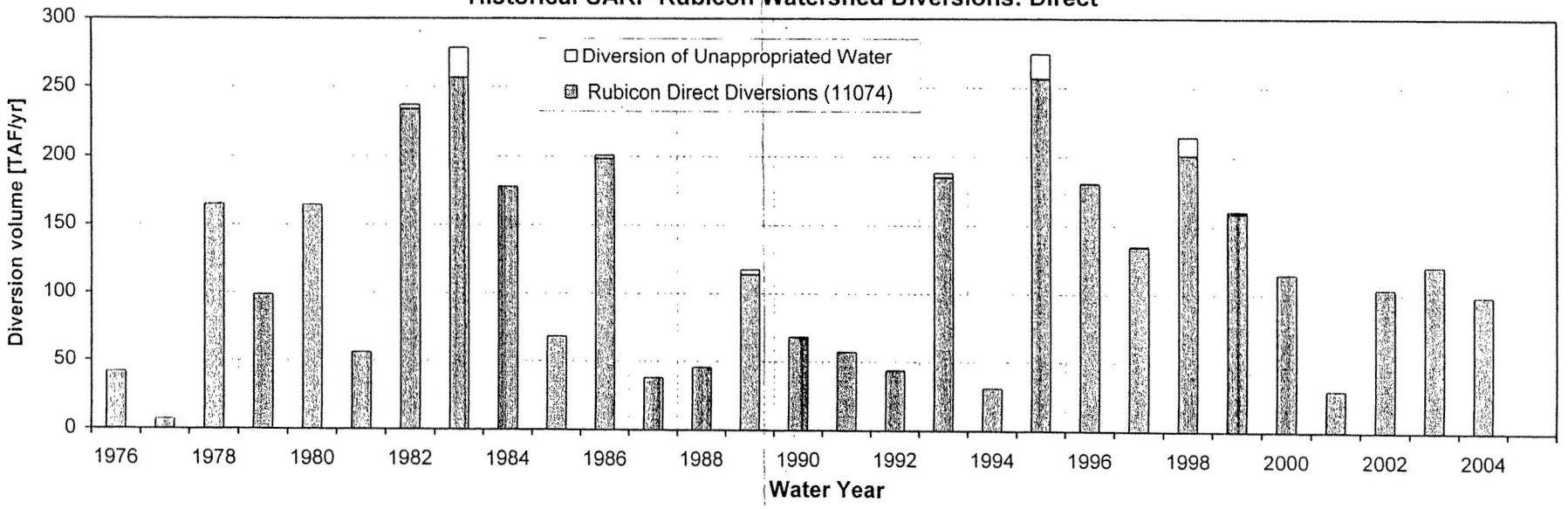
Historical UARP Rubicon River Water Year Diversion Volumes

Water year sum of diversions in [1000 AF], estimates in *italic*

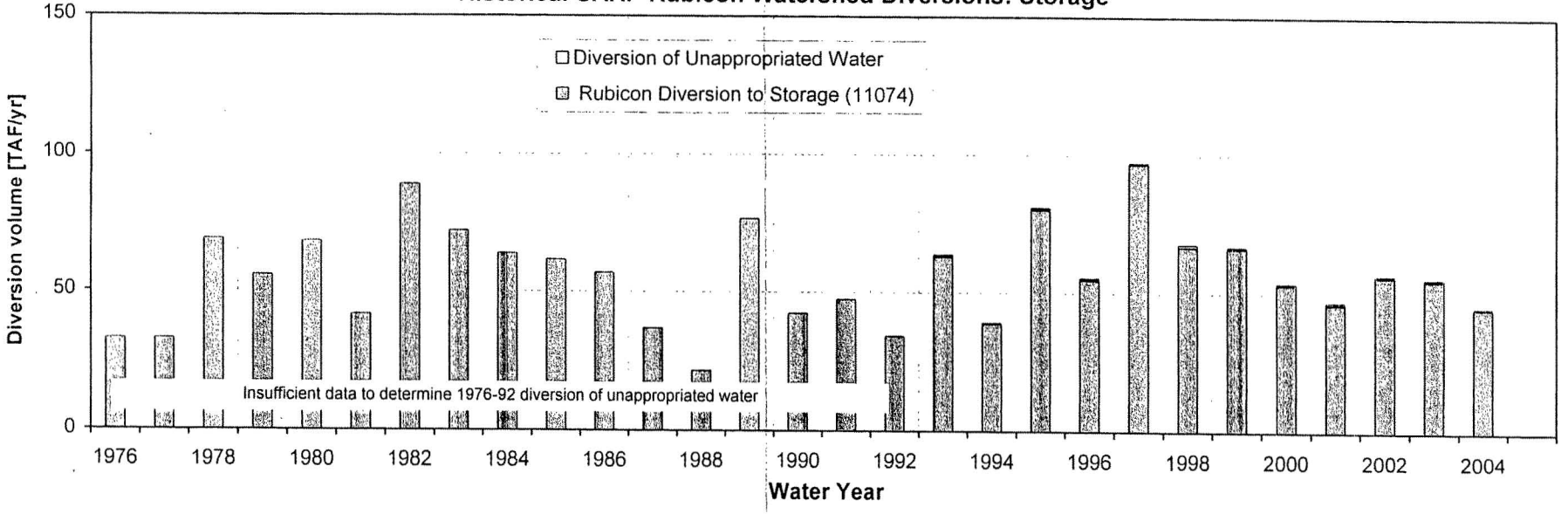
Year	'Direct Diversions'*		'Diversion to Storage'		'Powerhouse Throughput'		'Diversion from Source'	
Point:	Upper & South Rubicon		Upper & South Rubicon		at Robbs PH		above Robbs PH	
Part:	Lic 11074	Unapprop	Lic 11074	Unapprop	Lic 11074	Unapprop	Lic 11074	Unapprop
1976	*42*	*0*	*33*		107	0	*75*	*0*
1977	*7*	*0*	*33*		36	0	*40*	*0*
1978	*165*	*1*	*69*		200	0	*234*	*0*
1979	*99*	*0*	*56*		163	0	*154*	*0*
1980	*164*	*0*	*68*		228	0	*232*	*0*
1981	*56*	*0*	*42*		118	0	*98*	*0*
1982	*234*	*3*	*89*		250	49	*281*	*45*
1983	*256*	*22*	*72*		250	104	*281*	*69*
1984	*178*	*0*	*64*		250	1	*241*	*0*
1985	*68*	*0*	*62*		123	0	*130*	*0*
1986	*198*	*3*	*57*		250	10	*258*	*0*
1987	*38*	*0*	*37*		76	0	*75*	*0*
1988	*46*	*0*	*21*		114	0	*67*	*0*
1989	*114*	*4*	*77*		138	0	*194*	*0*
1990	*68*	*0*	*42*		116	0	*110*	*0*
1991	*57*	*0*	*48*		103	0	*104*	*0*
1992	*44*	*0*	*34*		103	0	*78*	*0*
1993	185	4	63	1	231	0	252	0
1994	31	0	39	0	92	0	70	0
1995	256	18	80	1	250	105	281	74
1996	181	0	55	1	220	0	236	0
1997	135	1	97	0	250	1	232	0
1998	201	14	67	1	250	22	281	1
1999	159	1	66	1	221	0	227	0
2000	115	0	53	1	195	0	169	0
2001	30	0	46	1	57	0	77	0
2002	104	0	56	1	155	0	161	0
2003	121	0	55	1	194	0	177	0
2004	99	0	45	0	142	0	144	0
Mean	*119*	*2*	56	1	168	10	*171*	*7*
Max	*256*	*22*	97	1	250	105	*281*	*74*

Note: Lic 11074 = Water diverted under license 11074*
Unappropriated = Diversion of unappropriated water
**1976-'92 w/o Rubicon, Buck Island diversion to storage*

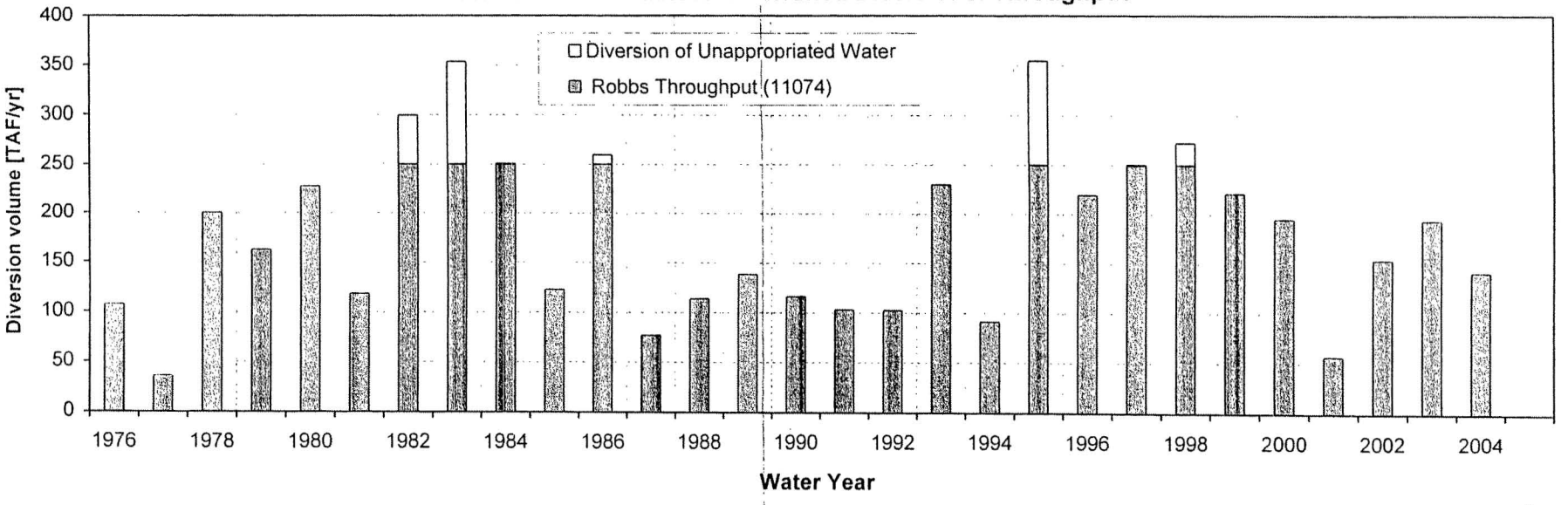
Historical UARP Rubicon Watershed Diversions: Direct



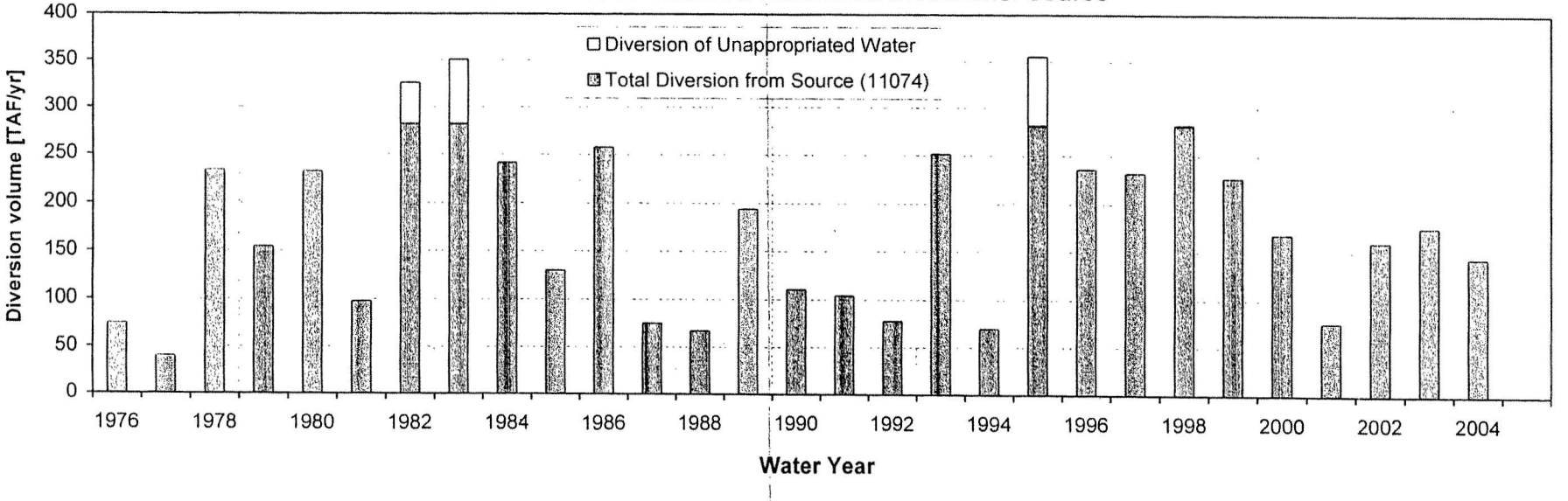
Historical UARP Rubicon Watershed Diversions: Storage



Historical UARP Rubicon Watershed Diversions: Throughput



Historical UARP Rubicon Watershed Diversions: Source



Historical UARP Rubicon River Maximum 'Direct Diversion' Rates

Calendar year maximum diversion in [14-day average cfs], estimates in *italic*

CalYr	Total 'Direct Diversion'*			Diversion of Unappropriated Water*		
Threshold:				>500cfs	>200cfs	>500cfs
Location:	Rubicon Reservoir	Buck Isld Reservoir	Loo,Ger,Rob Reservoirs	Rubicon Reservoir	Buck Isld Reservoir	Loon,Gerle Robbs
1976	*96*	*23*	*155*	*0*	*0*	*0*
1977	*23*	*6*	*239*	*0*	*0*	*0*
1978	*245*	*209*	*571*	*0*	*9*	*71*
1979	*205*	*121*	*529*	*0*	*0*	*29*
1980	*508*	*164*	*495*	*8*	*0*	*0*
1981	*285*	*64*	*498*	*0*	*0*	*0*
1982	*628*	*150*	*592*	*128*	*0*	*92*
1983	*708*	*206*	*950*	*208*	*6*	*450*
1984	*354*	*166*	*376*	*0*	*0*	*0*
1985	*119*	*51*	*499*	*0*	*0*	*0*
1986	*536*	*176*	*651*	*36*	*0*	*151*
1987	*69*	*33*	*276*	*0*	*0*	*0*
1988	*190*	*50*	*156*	*0*	*0*	*0*
1989	*330*	*65*	*613*	*0*	*0*	*113*
1990	*129*	*33*	*319*	*0*	*0*	*0*
1991	*133*	*40*	*310*	*0*	*0*	*0*
1992	*97*	*49*	*269*	*0*	*0*	*0*
1993	333	145	652	0	0	152
1994	59	26	196	0	0	0
1995	756	187	738	256	0	238
1996	504	187	578	4	0	78
1997	331	89	499	0	0	0
1998	565	161	774	65	0	274
1999	296	163	578	0	0	78
2000	261	98	495	0	0	0
2001	48	30	314	0	0	0
2002	130	88	494	0	0	0
2003	251	103	497	0	0	0
2004	256	45	500	0	0	0
Mean	*291*	*101*	*476*	*24*	*1*	*59*
Max	*756*	*209*	*950*	*256*	*9*	*450*

Notes: **1976-92 w/o Rubicon, Buck diversion to storage.*

Historical UARP Rubicon River 'Direct Diversion' & Long-Term Storage Water Year Volumes

Water year sum of diversions & withdrawals in [1000 AF], estimates in *italic*

WaterYr	Total 'Direct Diversions'*				Direct Diversion of Unappropriated Water			'Diversion to Storage'				Withdrawal from storage**				Through -put	Total from Source
Location:	Rub Res	Buc Res	Lo,Ge +Rob	Sum	Rub Res	Buc Res	Lo,Ge +Rob	Rub Res	Buc Res	Loo Res	Sum	Rub Res	Buc Res	Loo Res	Sum	Robbs PH	Rubicon sources
1976	*14*	*5*	*23*	*42*	*0*	*0*	*0*			*33*	*33*			*65*	*65*	107	75
1977	*2*	*1*	*5*	*7*	*0*	*0*	*0*			*33*	*33*			*29*	*29*	36	40
1978	*37*	*22*	*107*	*165*	*0*	*0*	*1*			*69*	*69*			*35*	*35*	200	234
1979	*24*	*12*	*62*	*99*	*0*	*0*	*0*			*56*	*56*			*64*	*64*	163	154
1980	*55*	*20*	*89*	*164*	*0*	*0*	*0*			*68*	*68*			*64*	*64*	228	232
1981	*12*	*6*	*39*	*56*	*0*	*0*	*0*			*42*	*42*			*62*	*62*	118	98
1982	*95*	*24*	*118*	*237*	*3*	*0*	*1*			*89*	*89*			*62*	*62*	299	326
1983	*93*	*29*	*157*	*279*	*6*	*0*	*16*			*72*	*72*			*75*	*75*	354	351
1984	*55*	*24*	*98*	*178*	*0*	*0*	*0*			*64*	*64*			*73*	*73*	251	241
1985	*12*	*6*	*50*	*68*	*0*	*0*	*0*			*62*	*62*			*55*	*55*	123	130
1986	*80*	*24*	*97*	*201*	*0*	*0*	*2*			*57*	*57*			*59*	*59*	260	258
1987	*7*	*3*	*27*	*38*	*0*	*0*	*0*			*37*	*37*			*39*	*39*	76	75
1988	*18*	*5*	*23*	*46*	*0*	*0*	*0*			*21*	*21*			*68*	*68*	114	67
1989	*31*	*7*	*79*	*118*	*0*	*0*	*4*			*77*	*77*			*21*	*21*	138	194
1990	*14*	*5*	*49*	*68*	*0*	*0*	*0*			*42*	*42*			*48*	*48*	116	110
1991	*12*	*3*	*42*	*57*	*0*	*0*	*0*			*48*	*48*			*46*	*46*	103	104
1992	*10*	*4*	*30*	*44*	*0*	*0*	*0*			*34*	*34*			*59*	*59*	103	78
1993	49	18	121	188	0	0	4	1	0	62	64	2	1	40	42	231	252
1994	4	2	24	31	0	0	0	1	0	38	39	1	1	59	61	92	70
1995	91	31	152	274	5	0	13	1	0	80	81	2	1	78	80	355	355
1996	60	20	102	181	0	0	0	1	0	54	55	1	1	37	39	220	236
1997	32	11	92	135	0	0	1	1	0	96	97	2	1	113	116	251	232
1998	59	19	137	215	1	0	12	1	1	66	68	2	1	55	58	272	282
1999	34	21	106	160	0	0	1	1	0	66	67	1	1	59	61	221	227
2000	27	9	78	115	0	0	0	1	0	53	54	1	1	78	80	195	169
2001	1	1	28	30	0	0	0	1	0	46	47	1	1	25	27	57	77
2002	23	10	71	104	0	0	0	1	0	56	57	1	1	49	51	155	161
2003	29	11	81	121	0	0	0	1	1	54	56	2	1	71	74	194	177
2004	30	2	67	99	0	0	0	1	0	44	45	1	1	41	44	142	144
Mean	*35*	*12*	*74*	*121*	*1*	*0*	*2*	1	0	56	56	1	1	56	57	178	178
Max	*95*	*31*	*157*	*279*	*6*	*0*	*16*	1	1	96	97	2	1	113	116	355	355

Notes: **1976-92 w/o Rub, Buc diversion to storage.*

**From long-term storage

Historical Water Year Summary of UARP 'Diversion to Storage'

WaterYr	Diversion to Storage in [AF]											
Reservoir:	Rubicon Res		Buck Island Res		Loon Lake		Gerle Creek Res		Robbs Peak Res		Ice House Res	
Period:	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep
1976					32,800	0					13,900	0
1977					32,830	0					11,670	0
1978					68,900	0					33,200	0
1979					55,600	0					23,000	0
1980					68,200	0					28,500	0
1981					41,700	0					21,800	0
1982					88,500	300		42			42,100	0
1983					71,990	0	442	9			38,350	0
1984					63,600	0	585	62			**48,150**	0
1985					61,500	0	647	40			26,900	0
1986					56,800	0	**904**	146			29,600	0
1987					36,900	0	*192*				18,600	0
1988					21,400	0		152			11,250	0
1989					76,434	102	412	206			36,440	0
1990					42,344	0	241	23			20,641	0
1991					47,501	0	704	75			18,244	0
1992					34,321	0	525	90			13,477	0
1993	1,692	0	**1,132**	0	62,352	0	694	25			33,844	0
1994	832	0	522	0	38,331	0	338	10			16,220	0
1995	1,522	338	970	194	79,502	0	588	69			29,986	0
1996	1,367	0	803	0	54,262	0	681	38			23,522	0
1997	1,633	0	972	0	**96,329**	0	819	0	55	0	43,539	0
1998	1,351	305	682	264	66,071	0	573	0	**61**	0	32,123	0
1999	**1,852**	0	762	0	65,662	0	489	46	46	4	30,342	0
2000	1,299	67	756	39	52,712	0	534	0	39	0	24,733	0
2001	943	0	456	0	45,873	0	641	20	55	2	18,196	0
2002	1,303	0	760	0	55,671	0	513	0	29	1	26,054	0
2003	1,624	0	1,016	0	54,349	0	436	70	47	3	23,838	0
2004	1,090	0	747	0	44,331	0	441	19	56	0	20,199	0
2005												
Mean	1,376	59	798	41	55,751	14	543	52	49	1	26,152	0
Max	1,852	338	1,132	264	96,329	300	904	206	61	4	48,150	0
Limit	450	0	440	0	shared	0	0	0	0	0	shared	0

Historical Water Year Summary of UARP 'Diversion to Storage'

WaterYr	Diversion to Storage in [AF]										Combined Totals*	
Reservoir:	Union Valley Res		Junction Res		Camino Res		Brush Creek Res		Slab Creek Res		Rub+Buc+Loo+Ice+Uni	
Period:	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep
1976	37,300	0									*84,000*	*0*
1977	51,400	500									*95,900*	*500*
1978	205,000	1,200									*307,100*	*1,200*
1979	122,000	0									*200,600*	*0*
1980	152,200	0									*248,900*	*0*
1981	89,900	0									*153,400*	*0*
1982	243,600	0									***374,200***	*300*
1983	172,300	2,900									*282,640*	*2,900*
1984	89,700	0									*201,450*	*0*
1985	130,800	0									*219,200*	*0*
1986	174,800	0									*261,200*	*0*
1987	45,100	0									*100,600*	*0*
1988	84,200	0	1,542	241	170	40	457	10	3,568	232	*116,850*	*0*
1989	**244,300**	0	1,053	222	584	85	653	5	3,895	268	*357,174*	*102*
1990	127,542	0	1,049	0	384	14	408	457	4,736	1,594	*190,527*	*0*
1991	126,140	805	824	217	777	0	647	0	3,959	320	*191,885*	*805*
1992	91,259	0	2,780	104	670	46	998	39	**15,796**	407	*139,057*	*0*
1993	201,456	703	2,741	217	804	42	688	70	6,363	814	300,476	703
1994	60,961	0	1,930	142	249	8	487	19	3,274	298	116,866	0
1995	194,540	0	2,041	74	**1,019**	102	1,632	37	9,234	101	306,520	532
1996	136,461	0	1,582	171	506	130	1,237	383	6,272	2,028	216,415	0
1997	149,071	0	**5,440**	130	611	14	**2,175**	173	10,879	290	291,544	0
1998	165,302	0	3,401	22	604	70	997	412	10,843	1,857	265,529	569
1999	167,638	0	2,125	136	555	8	800	202	11,300	1,492	266,256	0
2000	169,279	0	2,887	45	865	95	982	343	7,222	0	248,779	106
2001	80,113	486	3,341	170	766	78	1,012	190	5,930	1,800	145,581	486
2002	187,722	0	2,790	110	728	30	806	150	5,930	0	271,510	0
2003	133,999	0	1,799	286	607	117	580	57	8,560	660	214,826	0
2004	130,326	0	1,788	315	697	75	819	25	6,992	771	196,693	0
2005												
Mean	136,704	227	2,301	153	623	56	905	151	7,338	761	219,506	283
Max	244,300	2,900	5,440	315	1,019	130	2,175	457	15,796	2,028	374,200	2,900
Limit	shared	0	0	0	0	0	0	0	0	0	525,800	0

Notes

*w/o Rub & Buc 1976-92

UARP Rubicon River Diversion Accounting Formulas at Diversion Points

Direct Diversions, License 11074

Diversion Point	Terms
Rubicon Reservoir	= Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Rubicon Tunnel - Buck Island *diversion to storage* through Rubicon Tunnel
Buck Island Reservoir	= Buck-Loon Tunnel flow - (Rubicon-Rockbound Tunnel flow - Buck Island *diversion to storage* through Rubicon Tunnel) - Buck Island Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* from Buck Island Reservoir
Combined Upper Rubicon	= Buck-Loon Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Buck-Loon Tunnel
Loon + Gerle Reservoirs	= Gerle Canal flow - (Buck-Loon Tunnel flow - Loon Lake *diversion to storage* through Buck-Loon Tunnel) - Loon Lake *withdrawal from storage*
Robbs Peak Reservoir	= Robbs Powerhouse flow - Gerle Canal flow
Combined South Rubicon	= Robbs Peak Powerhouse flow - (Buck-Loon Tunnel flow - Loon Lake *diversion to storage* through Buck-Loon Tunnel) - Loon Lake *withdrawal from storage*
Combined Upper & South Rubicon	= Combined Upper Rubicon *direct diversion* + Combined South Rubicon *direct diversion* = Robbs Peak Powerhouse flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage* - Loon Lake *withdrawal from storage*

Notes:
All direct diversions are averaged over 14 days after combining terms.
Direct diversion is water put to beneficial use that is not *withdrawn from storage*.
Diversion to storage is water diverted and held in storage at least 30 days.
Withdrawal from storage is withdrawal of water *diverted to storage*.
Diversion to storage components for Loon and Buck Island are on Figure C.2.
Except for combined points, diversions are from local inflow between the diversion point and any upstream points.

UARP Rubicon River Diversion Accounting Formulas at Diversion Points

Diversion to Storage Components

Diversion Component	Terms
Loon Lake total	= Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel + Loon Lake *diversion to storage* from Gerle Creek
Loon Lake thru Rubicon Tunnel	= smaller of ((Loon Lake *diversion to storage*) (- Loon Lake unimpaired inflow if Loon flag set to optimize South Rubicon)) and (Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage*) {limited to more than or equal to zero}
Loon Lake thru Buck Tunnel	= smaller of ((Loon *diversion to storage*) (- Loon Lake unimpaired inflow if Loon flag set to optimize South Rubicon)) and (Buck-Loon Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage*) {limited to more than or equal to zero}
Loon Lake from Buck Island Res	= Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel - Loon Lake *diversion to storage* through Rubicon-Rockbound Tunnel
Loon Lake from Gerle Creek	= Loon Lake total *diversion to storage* - Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel
Buck Island Res from Rubicon Res	= smaller of ((Buck Island Res *diversion to storage*) and (Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Rubicon-Rockbound Tunnel) {limited to more than or equal to zero}

Notes:
Diversion to storage is water diverted for initial fill or diverted and held in storage at least 30 days .
Withdrawal from storage is withdrawal of water *diverted to storage* .
Loon flag determines if Rubicon River or Gerle Creek is primary source of diversion to storage in Loon.
Regulatory storage change ignored in computing components of *diversion to storage* .

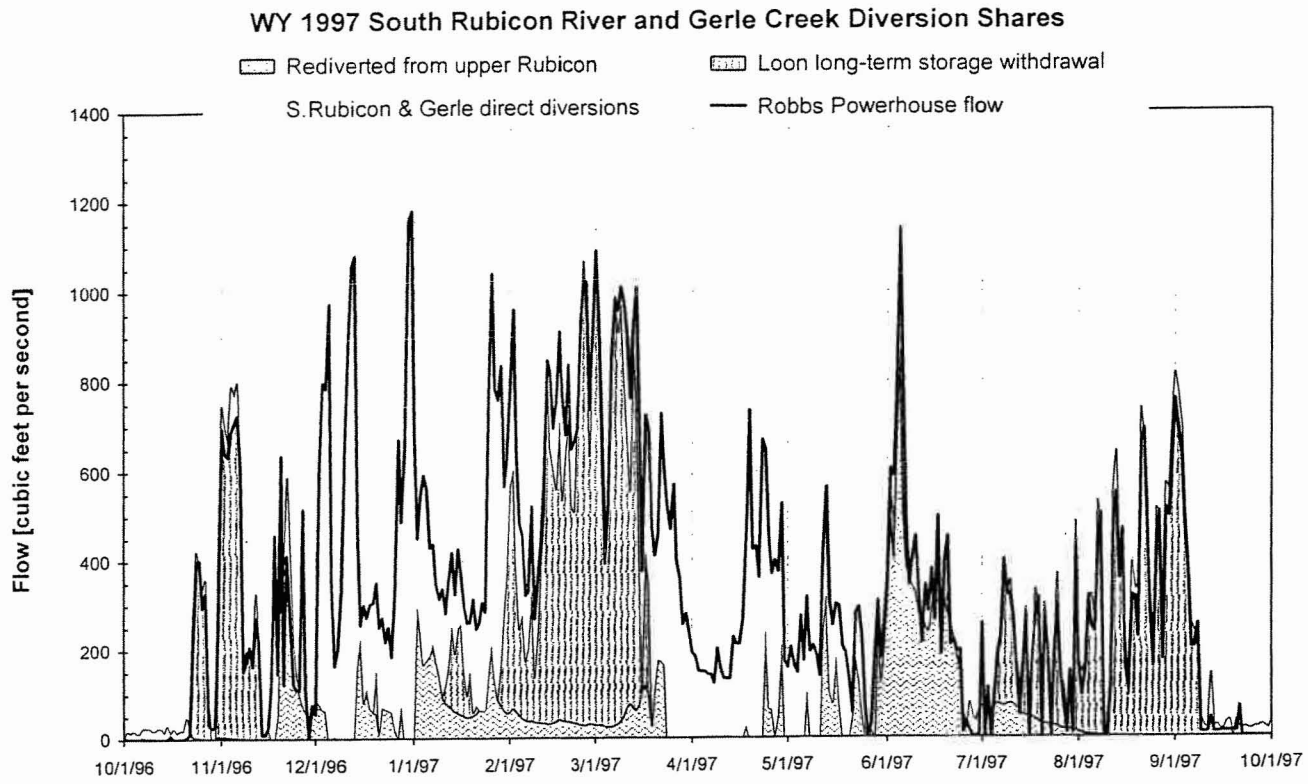
UARP Rubicon River Diversion Accounting Formulas at Diversion Points

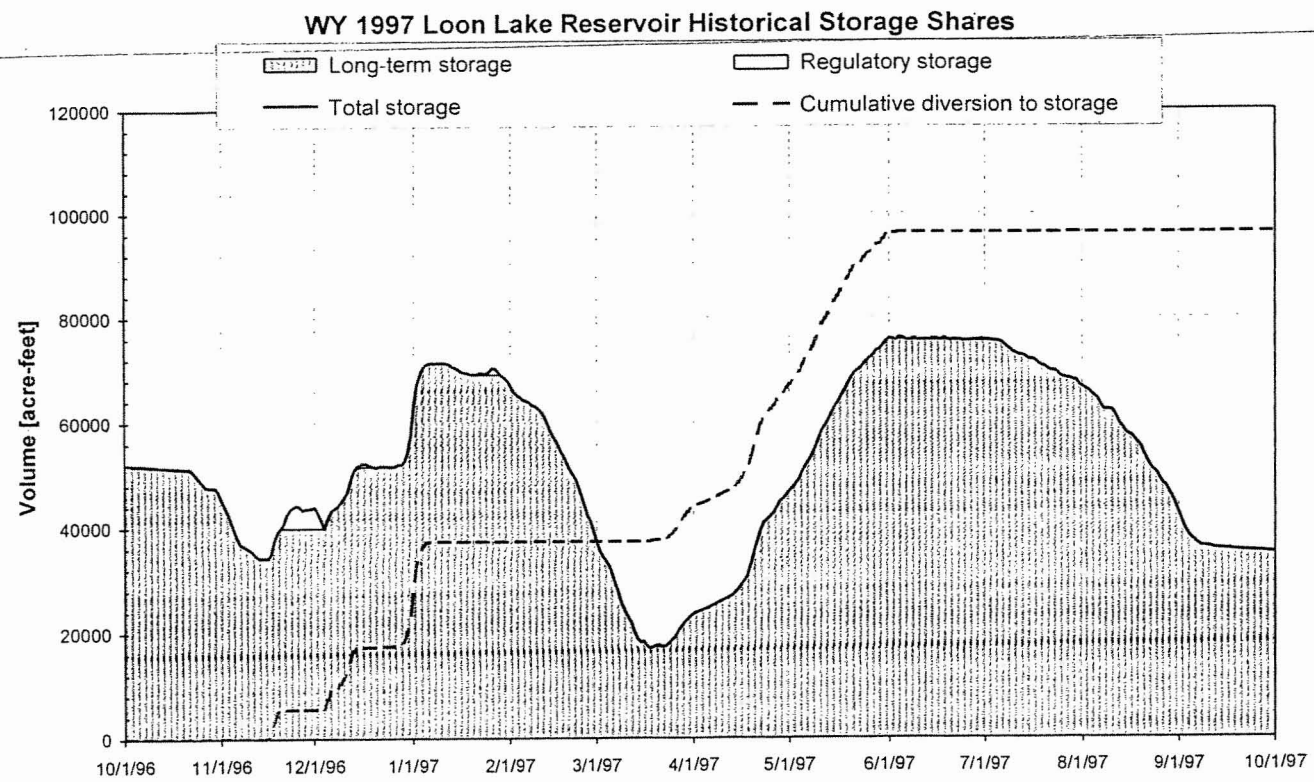
Diversion to Storage Computations

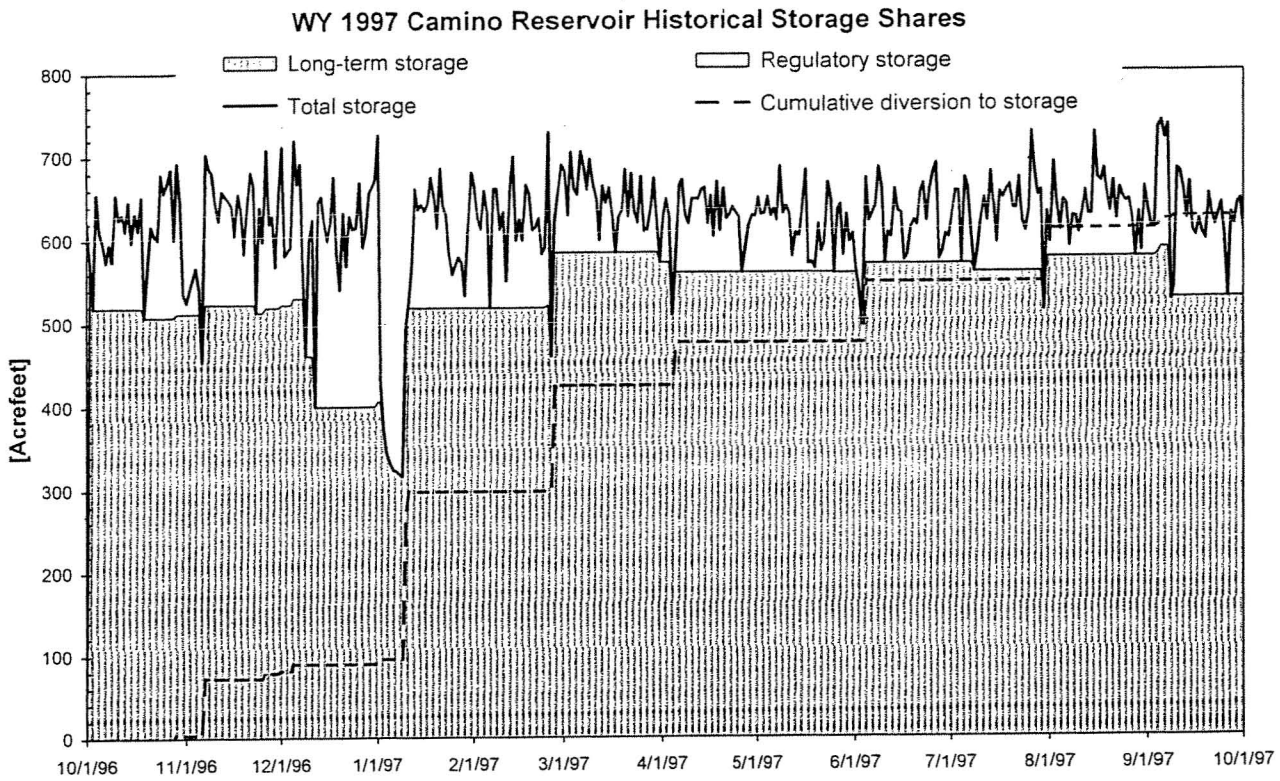
Term / Abbreviation		Description / Computation
Storage		End of day observed reservoir storage
	Stor(t)	= End of day observed reservoir storage in acre-feet on day 't'
Daily storage gain		Increase in storage since prior day
	DayGain(t)	= Stor(t) - Stor(t-1)
Initial storage fill		Storage gain on day 't' above highest storage so far in water year
	IniFill(t)	= Stor (t) - max(Stor(d), where d = 0 to t-1) {limited to more than or equal to zero}
Net fill balance		Storage gain above minimum storage to date in water year that will be held 30 days
	NetFill(t)	= min(Stor(d), where d = t to t+30) -min(Stor(d), where d = 0 to t-1) {limited to more than or equal to zero}
Refill storage collection		Storage gain held 30 days less any Initial Fill
	ReFill(t)	= min(DayGain(t) - IniFill(t), NetFill(t) - NetFill(t-1)) {limited to more than or equal to zero}
Diversion to storage		Sum of Initial Fill and ReFill
	DivStor(t)	= IniFill(t) + ReFill(t)
Regulatory storage change		Direct diversion or withdrawal of water from reservoir refill held less than 30 days
	RegStor(t)	= DayGain(t) - DivStor(t)
Regulatory storage volume		Total volume of water held in regulatory storage
	VolRegStor(t)	= DayGain(t) - DivStor(t)
Withdrawal from storage		Withdrawal of water from storage that was earlier diverted to storage
	DivStorDraw(t)	= -(DayGain(t) - RegStor(t)) {limited to more than or equal to zero}

Notes:
Calculations are based on sample hydrograph provided by SWRCB to SMUD in fall 2004, titled
"Storage/Regulatory Determination for Reservoirs Filled in Whole or Part More Than Once During a Single Water Year"

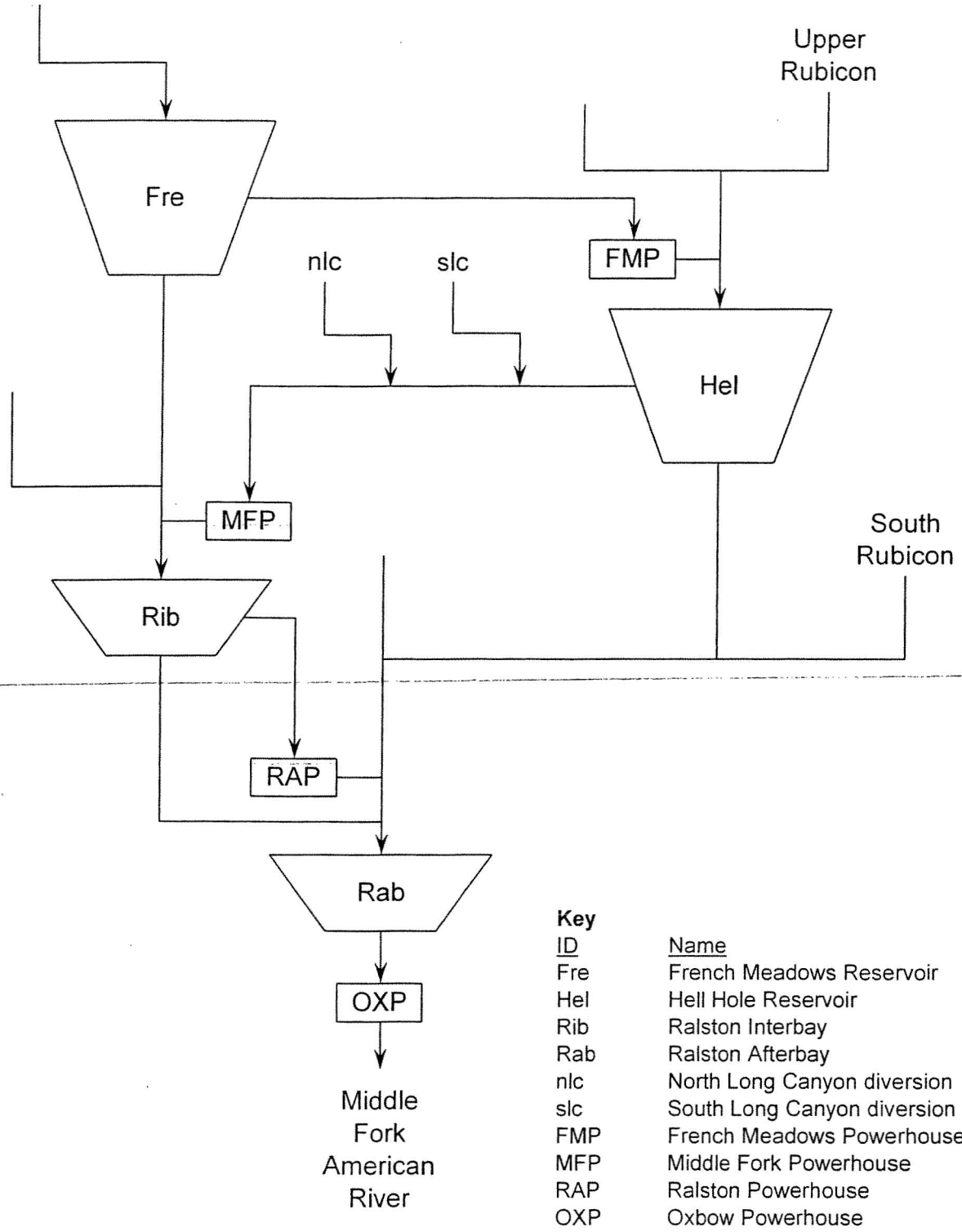
Sample Plots of UARP Daily Diversion Accounting






WY 1997 Camino Reservoir Historical Storage Shares
Long-term storage
Regulatory storage
Total storage
Cumulative diversion to storage
[Acrefeet]
800
700
600
500
400
300
200
100
0
10/1/96
11/1/96
12/1/96
1/1/97
2/1/97
3/1/97
4/1/97
5/1/97
6/1/97
7/1/97
8/1/97
9/1/97
10/1/97

PCWA Middle Fork Project Schematic



Key

ID	Name
Fre	French Meadows Reservoir
Hel	Hell Hole Reservoir
Rib	Ralston Interbay
Rab	Ralston Afterbay
nlc	North Long Canyon diversion
slc	South Long Canyon diversion
FMP	French Meadows Powerhouse
MFP	Middle Fork Powerhouse
RAP	Ralston Powerhouse
OXP	Oxbow Powerhouse

Historical PCWA/UARP Rubicon River Diversion Summary

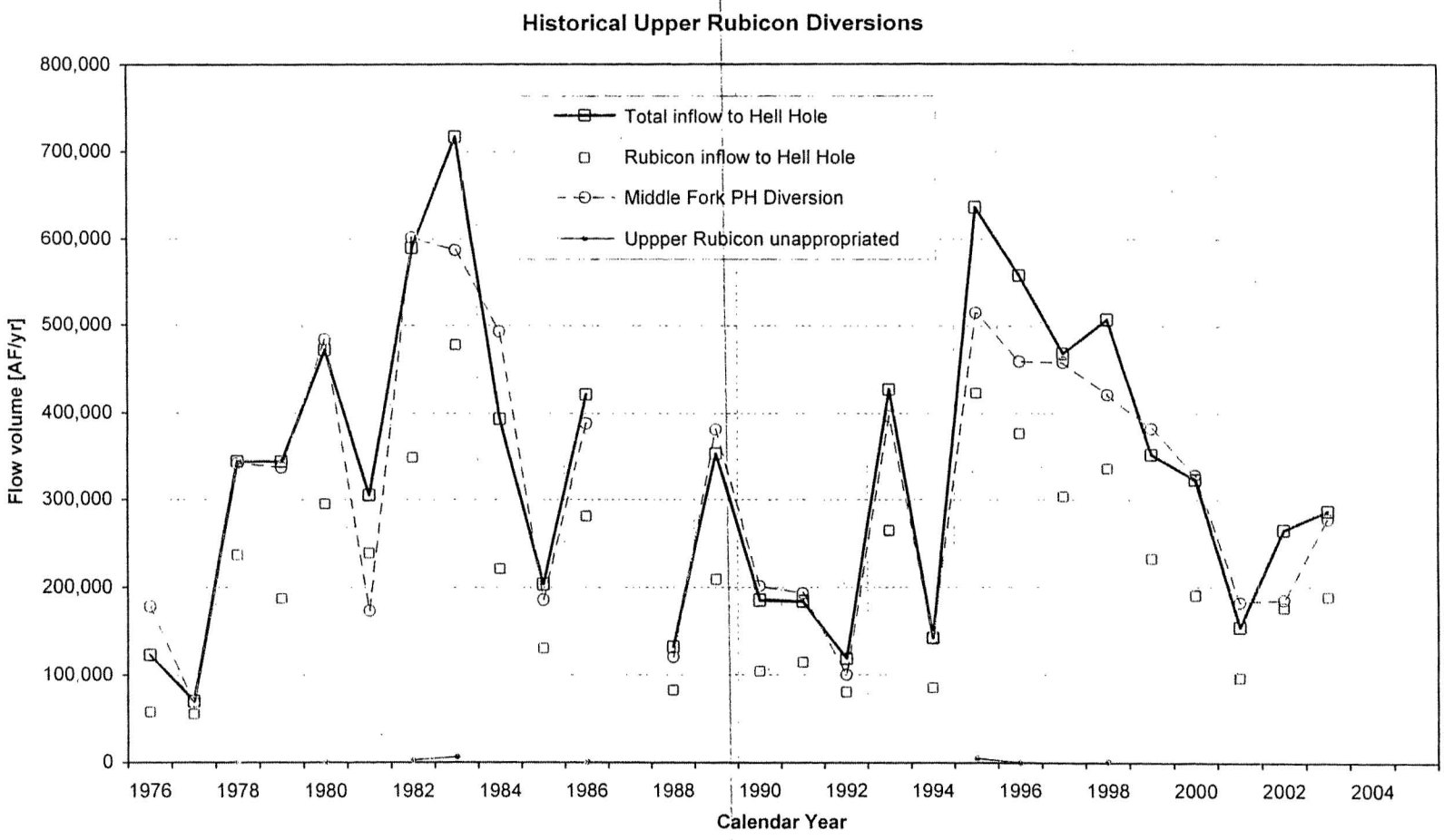
Calendar year and period volume in **[AF]** of UARP diversion of unappropriated water & PCWA flow, estimates in *italic*

Cal Year	Annual Totals: Hell Hole / Upper Rubicon				Annual Totals: Ralston AB / South Rubicon			Sub-Totals During Periods with Upstream Diversion of Unappropriated Water: Hell Hole / Upper Rubicon					Sub-Totals During Periods with Upstream Diversion of Unappropriated Water: Ralston AB / South Rubicon		
	Hell Hole Tot inflow	Hell Hole Rub inflow	Mid Fork PH div	Up Rub[3] Unappr.[1]	Ralston est inflow[2]	Oxbow PH Div	S. Rub Unappr.[1]	Hell Hole Rub inflow	Mid Fork PH Div	Up Rub[3] Unappr.[1]	Hell Hole Res.[4] peak Stor	spill?	Ralston est Inflow	Oxbow PH Div	S. Rub Unappr.[1]
1976	123,389	58,099	178,193	*0*	242,829	107,637	*0*								
1977	70,069	55,108	68,440	*0*	123,314	37,898	*0*								
1978	344,732	236,678	342,301	*45*	712,058	258,257	*613*	9,081	6,597	*45*	194,696		*33,598*	19,408	*613*
1979	344,267	187,222	337,192	*0*	560,296	270,476	*200*				200,464		*12,780*	7,978	*200*
1980	471,970	295,021	483,723	*16*	1,047,737	291,620	*0*	925	-12	*16*	204,061		*0*	0	*0*
1981	305,038	238,915	173,226	*0*	572,009	137,128	*0*								
1982	589,335	349,404	601,408	*2,513*	1,529,905	353,866	*801*	21,733	27,945	*2,513*	211,050	yes	*84,149*	18,530	*801*
1983	716,503	478,308	586,703	*6,091*	1,688,247	360,330	*16,112*	66,597	48,349	*6,091*	209,348	yes	*167,941*	52,680	*16,112*
1984	393,217	220,925	492,956	*0*	757,079	255,867	*0*								
1985	203,373	130,846	185,641	*0*	359,935		*0*								
1986	421,424	280,893	388,243	*296*	1,060,759	253,938	*2,414*	10,033	13,283	*296*	210,700	yes	*342,572*	13,584	*2,414*
1987				*0*	210,019	84,917	*0*								
1988	132,316	82,516	120,455	*0*	220,372	84,880	*0*								
1989	353,732	209,087	381,346	*0*	593,696	260,821	*3,768*				206,100		*155,080*	56,575	*3,768*
1990	185,108	104,165	201,267	*0*	296,178	140,288	*0*								
1991	183,683	114,387	192,796	*0*	326,976	124,561	*0*								
1992	118,919	80,299	100,221	*0*	220,043		*0*								
1993	427,154	264,708	396,582	*0*	756,323		3,533				199,000		*81,012*	na	3,533
1994	142,674	85,258	142,955	*0*	240,630	99,797	0								
1995	636,165	423,413	514,788	*4,951*	1,292,549	213,866	13,069	52,274	38,039	4,951	209,200	yes	*417,871*	82,964	13,069
1996	557,544	376,982	459,779	*11*	1,199,983		696	3,371	3,822	11	211,100	yes	*21,727*	na	696
1997	468,765	303,958	458,763	*0*	989,016		0								
1998	507,263	336,614	421,312	*1,066*	954,780		12,471	41,266	23,326	1,066	209,100	yes	*110,975*	na	12,471
1999	352,697	232,495	382,814	*0*	786,498	278,182	1,403				204,600		*104,025*	5,199	1,403
2000	323,558	190,990	328,935	*0*	612,555	243,025	0								
2001	154,720	96,489	182,753	*0*	323,087	138,148	0								
2002	265,072	176,946	185,410	*0*	426,642	172,464	0								
2003	287,083	189,196	277,477	*0*	499,341	219,183	0								
2004				*0*			0								
Mean	**336,288**	214,775	317,988	***517***	**664,388**	199,416	***1,899***	25,660	20,169	*1,874*	205,785		*127,644*	28,546	*4,590*
Max	716,503	478,308	601,408	*6,091*	1,688,247	360,330	*16,112*	66,597	48,349	*6,091*	211,100		*417,871*	82,964	*16,112*

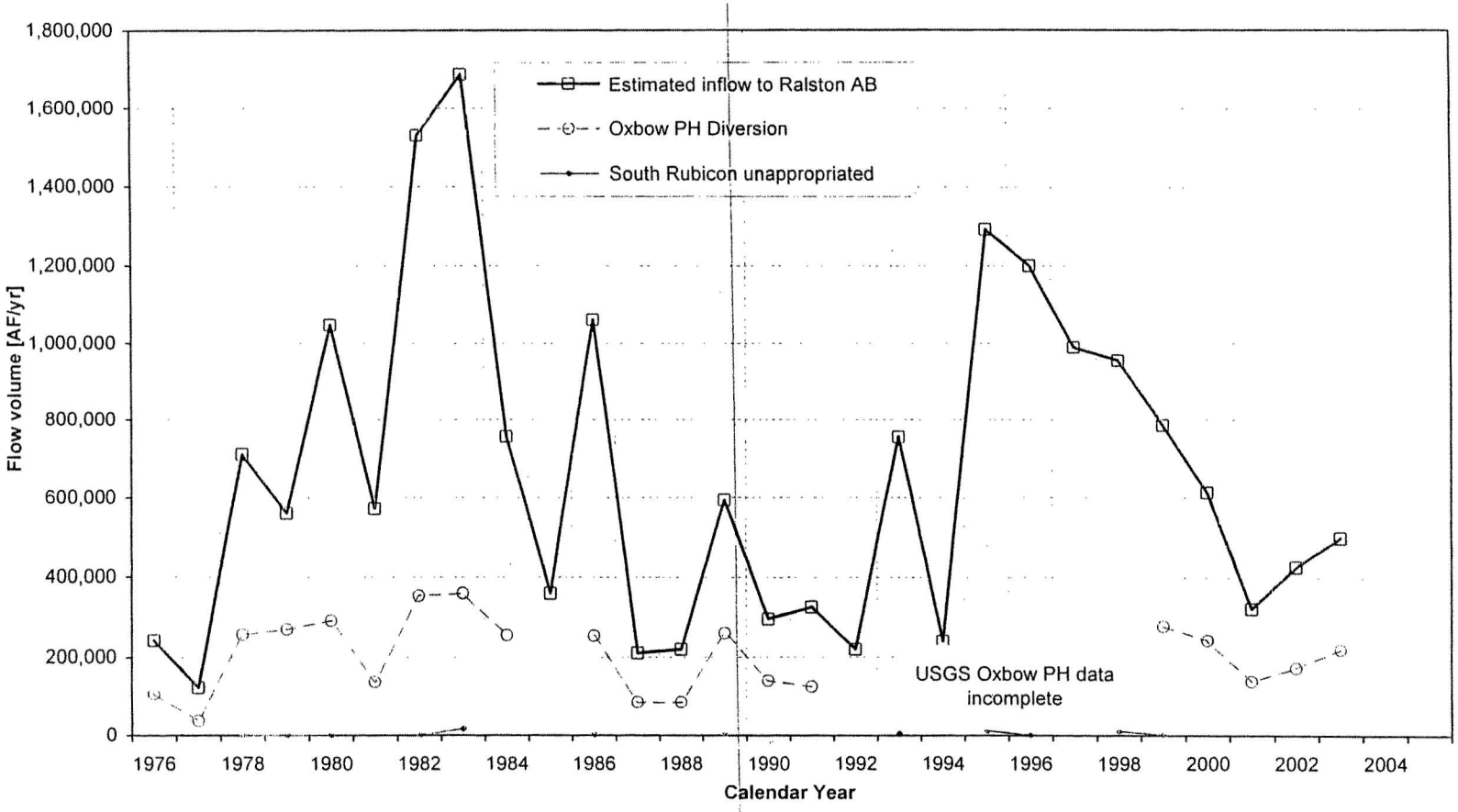
Notes:

1) Unappr. = Upstream diversion of unappropriated water.
2) Ralston AB inflow scaled from downstream gage USGS 11433300 by ratio of tributary areas.
3) 1976-92 upstream diversions computed without Rubicon and Buck Island diversion to storage.
4) Heil Hole peak storage is highest volume held in storage in given year; 'yes' in spill column indicates stream release of >50 cfs. (actual releases exceeded 900 cfs in these years)

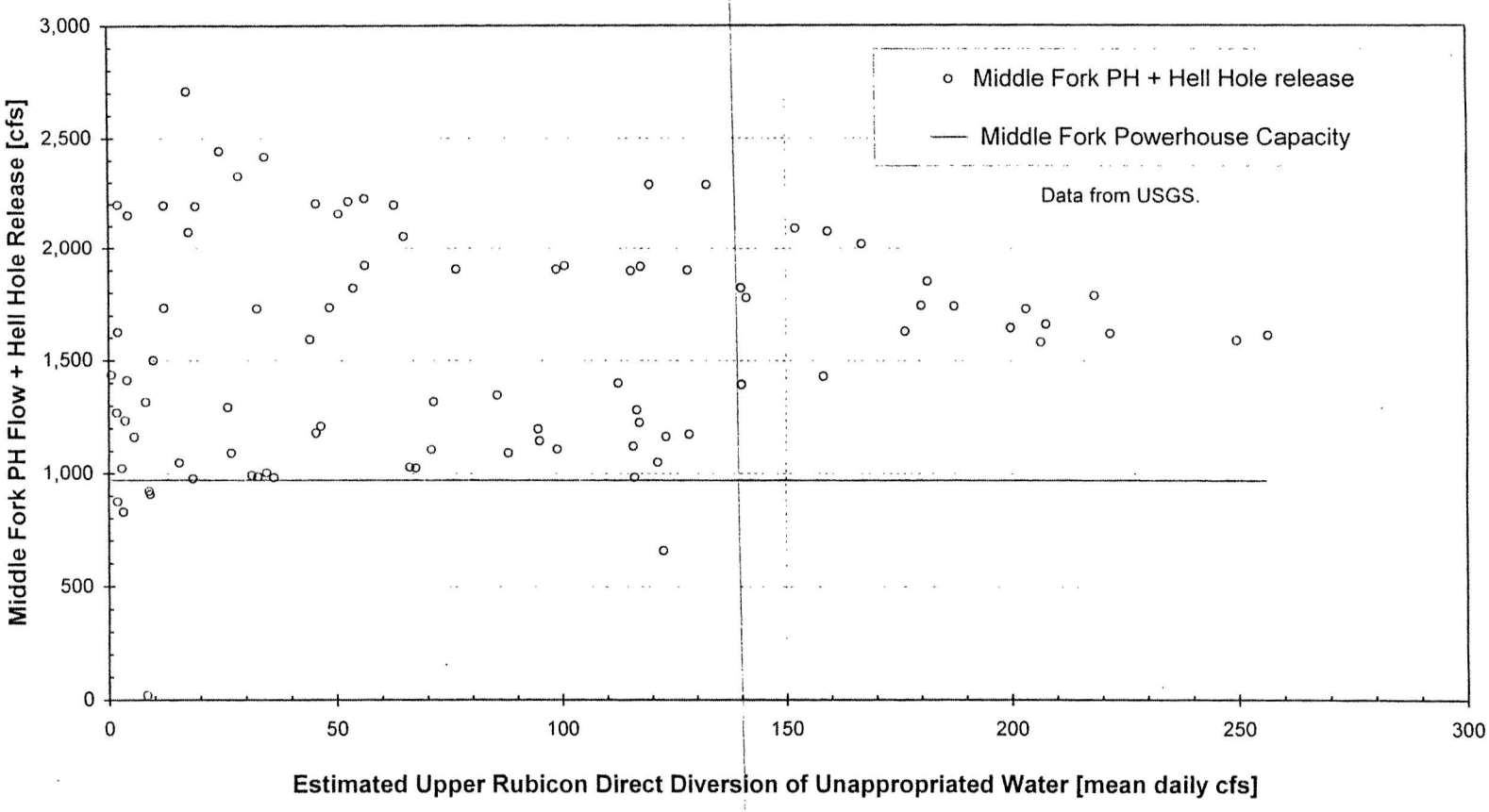
na = data not available


Historical Upper Rubicon Diversions
Total inflow to Hell Hole
Rubicon inflow to Hell Hole
Middle Fork PH Diversion
Uppper Rubicon unappropriated
Flow volume [AF/yr]
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Calendar Year

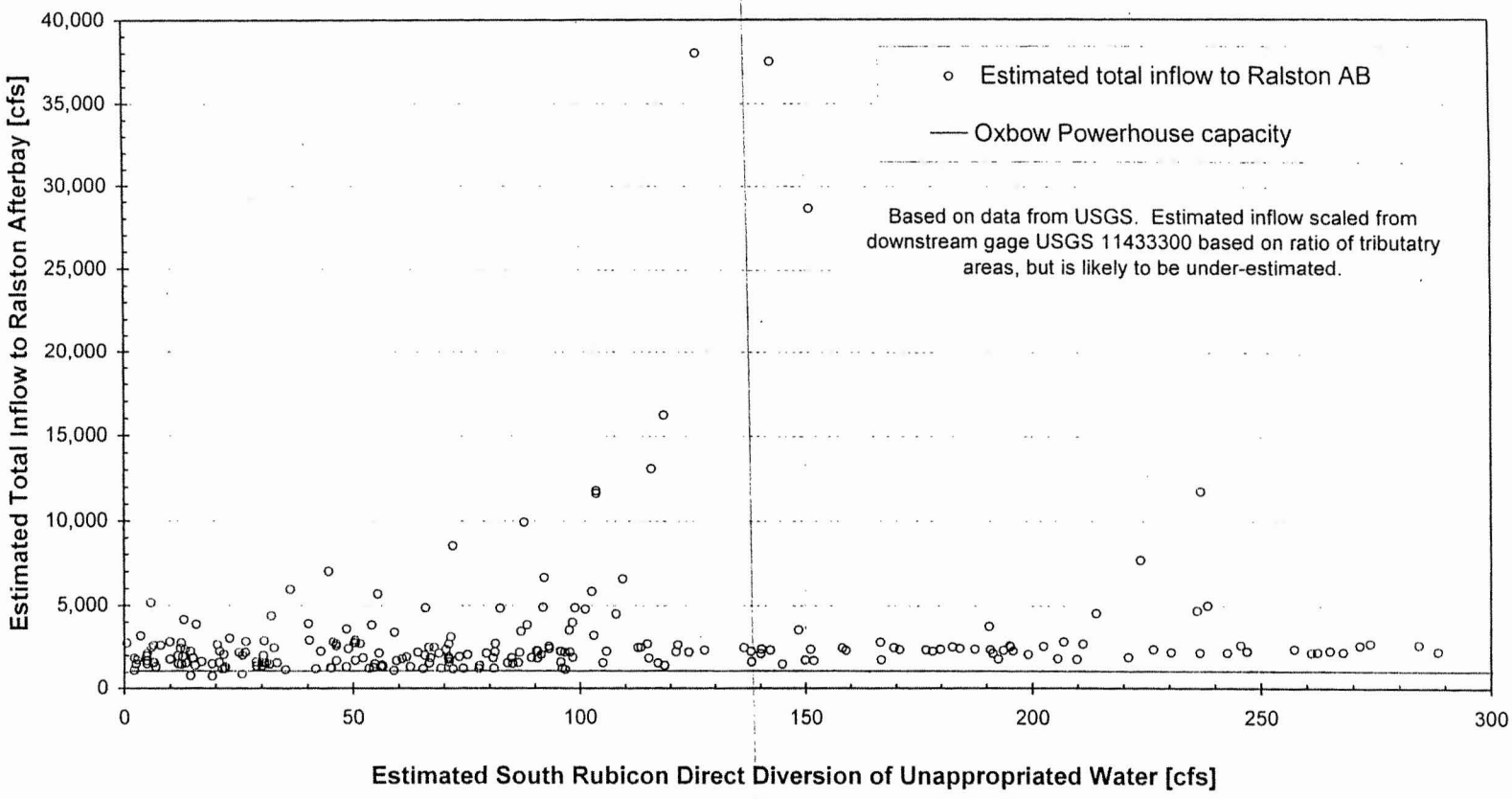
Historical Middle Fork American Diversions



Hell Hole Operations during Days with Upstream Diversion of Unappropriated Water 1978-2003



Oxbow Powerhouse Operations during Days with Upstream Diversion of Unappropriated Water 1978-2003



Water Availability Analysis

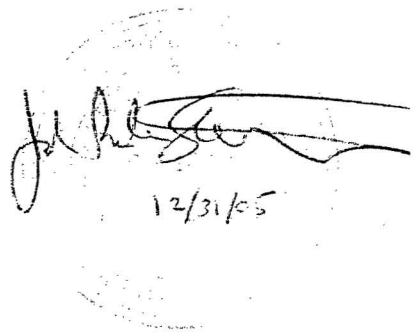
Attachment No. 2 to Sacramento Municipal Utility District's Water Right Application

Availability of Water for Appropriation in the Rubicon River Basin:

Upper American River Project Area

Sacramento Municipal Utility District
Power Generation Department
May 23, 2005

John 'Pierre' Stephens, PE
Dudley McFadden III, PE



Executive Summary

The purpose of this analysis is to examine the availability of water for appropriation from the Rubicon River, Little Rubicon River, Gerle Creek, and South Fork Rubicon River within the reaches of the Sacramento Municipal Utility District's (SMUD's) Upper American River Project (UARP), a hydropower generation project licensed by the Federal Energy Regulatory Commission (FERC Project No. 2101). Diversion to storage throughout the UARP was also examined.

The analysis is based on a comprehensive and detailed evaluation of UARP daily diversions and associated streamflows in the Rubicon River basin and reservoir operation throughout the UARP. Historical diversions were computed based on UARP license terms as well as materials and interpretations provided by State Water Resources Control Board (SWRCB) staff.

This analysis shows that water is available in the Rubicon River basin in rates and volumes exceeding those covered under any existing water rights in the area, including License 11074, held by SMUD and Pacific Gas & Electric Co. This conclusion is strongly supported by an in-depth comparison of historical stream flows in and all major diversions from the Rubicon River, Little Rubicon River (including Highland/Rockbound Creek), Gerle Creek, and South Fork Rubicon River as well as on the Middle Fork American River just downstream of its confluence with the Rubicon River. The additional water available is summarized in Section 1.3 of this report. Furthermore, SMUD has analyzed historical runoff trends in the Rubicon River basin and beyond, and determined that annual peak flows have been increasing and are projected to continue increasing. This finding indicates a strong likelihood that an increasingly greater volume of water will be available for appropriation during peak flow periods. Analysis of historical data also shows that appropriation of available water will have at most a de minimis effect on downstream water rights holders.

The analysis also determined that water is available to be diverted to storage at several regulating reservoirs in the UARP to cover the occasional diversion to storage in the small regulating reservoirs caused by normal daily fluctuations beyond control of SMUD or the need to draw down reservoirs for repair or maintenance.

1 Introduction

The primary purpose of this analysis is to examine the availability of water for appropriation from the Rubicon River, Little Rubicon River (including Rockbound/ Highland Creek), Gerle Creek, and South Fork Rubicon River within the reaches of the Sacramento Municipal Utility District's (SMUD's) Upper American River Project (UARP). A second purpose is to determine the availability of water for diversion to storage in the UARP's smaller reservoirs (that regulate flows en route to the powerhouses) using the current interpretation provided by the SWRCB staff. This section summarizes the analysis and results.

1.1 Period of record and data sources

We chose water years 1976 to 2004 as the period of record for the bulk of this analysis because it is the period for which sufficient daily data in the Rubicon basin has been published or archived to enable daily accounting.

To estimate future runoff trends, we analyzed peak discharge data from gages on the South Fork American River near Kyburz because they represent the longest comparable data set, having been collected since the early part of the 20th century. We used the entire published record from 1923-2003 for this analysis.

We assembled, reviewed, and analyzed period-of-record data from stream gage and reservoir elevation gages from several sources, using data reviewed and archived by the United States Geological Survey (USGS) wherever possible. These published data were supplemented with unpublished records and estimated data based on engineering judgment.

1.2 Formulation

Based on SMUD licenses and input from SWRCB staff, we developed mathematical formulas for tracking *direct diversion*, *diversion to storage*, *throughput*, and *source* diversion quantities. These licenses and formulas are summarized in Appendix C.

We then computed SMUD's historical diversions at each Rubicon basin facility for each day in the period of record. The data and annual diversions are summarized in Appendix B. We then made the following analyses:

- We determined the largest 14-day average *direct diversion* at each UARP facility in the Rubicon basin, the highest annual *diversion to storage* at all UARP reservoirs, the highest volume of water put to beneficial use in one water year at Robbs Peak Powerhouse (*throughput*, consisting of *direct diversions* plus withdrawal from storage), and the highest volume of water taken from all Rubicon basin *sources* in one water year (*direct diversions* plus *diversions to storage*). The methodology is described in Section 2.1. The unappropriated water available from the Rubicon basins in excess of License 11074 diversion rates is summarized in Section 1.3.
- We evaluated long-term runoff trends in the area and found that Rubicon basin streams will support higher *direct diversion* rates in the future. This study is summarized in Section 2.2.

- Using public data, we evaluated the effect of increased upstream diversions on other users' facilities on the Rubicon and Middle Fork American Rivers, and found there to be an extremely minimal effect on downstream operations. This study is summarized in Section 2.3.

1.3 Results

The following table summarizes the water available for appropriation in the Rubicon basins for each diversion type. The values in column 2 were developed from our historical data analysis covering a 29-year period. The direct diversion rates in column 3 were developed from our assessment of future runoff. The values in column 4 are the amounts in SMUD's new application, and are the smaller of those in column 3 and the physical diversion limits of the facilities. All diversion values are given at the 1 percent annual exceedence probability level from a Log Pearson Type III distribution fitted to the historical annual maximum diversions, and are in excess of the limits in License 11074.

The total diversions on which these values are based are summarized in Appendix A.

Location (1)	Unappropriated Water Available, 1976-2004 (2)	Unappropriated Water Available, 2057 (3)	Unappropriated Water, Requested in Application (4)
Direct Diversion Rate [cubic feet per second, 14-day average]			
Rubicon Dam	650	950	800
Buck Island Dam	90	160	160
Loon + Gerle Creek + Robbs Peak Dams	800	1100	950
Throughput Volume [acre feet per water year][1]			
Robbs Peak Powerhouse	155,000	155,000	155,000
Total from Source [acre feet per water year][1]			
Above Robbs Powerhouse	128,900	128,900	128,900

The next table summarizes the historical maximum annual *diversion to storage* in all UARP reservoirs based on the latest interpretation provided by SWRCB staff. The annual totals were developed from our historical data analysis covering the period of daily data availability. Column 2 shows the maximum historical diversions during the diversion period of October through September, while column 3 shows the rounded sum of water year diversions in these years plus an adjustment for minimum storage from the prior year. Since the record is short, this is to account for the possibility that the historical maximum *diversion to storage* would have been be even higher if the minimum historical storage had occurred in that year. Column 4 shows the increased or new storage volumes that would be required at each regulating reservoir to continue operating them as they have been historically. The diversions on which these values are based are also summarized in Appendix A.

[1] Values shown in column 3 under *throughput*, and *total from source* are the same as the values shown under column 2. This is because our analysis shows a trend in peak daily runoff, but not in annual runoff volume.

The table thus shows how much water the UARP would need to divert to storage in the smaller, regulating reservoirs as a consequence of both normal water level fluctuation that occurs beyond the control of SMUD and reservoir drawdowns that are necessary for repairs or maintenance. Since these fluctuations and drawdowns may occur during all months, this storage is needed throughout the full water year. Diverting water at these smaller reservoirs would not cause the UARP's total maximum diversion to storage in any given year to exceed existing licensed and permitted storage limits.

Location (1)	Historical Maximum Oct to Sep (2)	Historical + Adjustment,[2] Oct to Sep (3)	Historical + Adjustment – Existing License Limit (4)
Diversion to Storage Volume [acre-feet per water year]			
Rubicon Reservoir	1,852	2,000	1,550
Buck Island Reservoir	1,132	1,200	760
Gerle Creek Reservoir	1,050	1,200	1,200
Robbs Peak Reservoir	61	100	100
Junction Reservoir	5,570	6,300	6,300
Camino Reservoir	1,121	1,400	1,400
Brush Creek Reservoir	2,348	2,500	2,500
Slab Creek Reservoir	16,203	17,000	17,000
Combined Rubicon, Buck Island, Loon Lake, Ice House, Union Valley Reservoirs	374,500	472,000	not applicable

2 Analysis Methodology

2.1 Assessment of historical water availability

We performed a comprehensive review of historical daily data from 1976 through 2004 to compute *direct diversions*, *diversions to storage*, *throughput* (consisting of *direct diversions* plus withdrawal from storage) at Robbs Peak Powerhouse, and total water taken from the *source* (by *direct diversion* and *diversion to storage*) from Rubicon basin streams. The daily accounting algorithm incorporates *direct diversions* and *diversions to storage* at each facility. The analysis summarized in this section shows that *direct diversions* and total *source* and *throughput* volumes are available in excess of the limits in the UARP's existing Rubicon basin water rights license (#11074). This new methodology shows higher diversions than were observed during the licensing process for License 11074 in part due to using daily data for all terms, which was not deemed necessary for the original analysis.

Direct diversions are based on 14-day averages and were calculated by deducting the following terms from the measured flow in a diversion tunnel, canal, or penstock:

1) Withdrawals from (non-regulatory) upstream storage,

[2] Rounded total of historical maximum diversion to storage for water year plus adjustment if minimum storage in given year was more than the historical minimum.

2) Water being *diverted to storage* (conveyed directly into a reservoir as initial fill or as refill when it will be held for more than 30 days before being released or put to beneficial use), and

3) Rediversions or continuing diversions of water diverted at an upstream facility.

Diversion to storage is any water diverted into a reservoir as initial fill plus refill of initial storage held in the reservoir for more than 30 days. Initial fill was interpreted as a gain in storage above the highest storage reached up to that point in the water year.

Throughput is the water year sum of the flow through Robbs Peak Powerhouse, while the total from the *source* is the water year sum of all water *directly diverted* from Rubicon basin sources and *diverted to storage* in Rubicon basin reservoirs.

The extensive daily computations, which cover many diversion and storage facilities and track numerous overlapping diversions of multiple types, are summarized in Appendices A and B. A single SWRCB-issued license (#11074) applies to UARP diversions made in the Rubicon basin.

2.2 Assessment of future water availability

Our analysis of runoff trends in the region shows that both peak flows and annual volumes were higher in the 25 years following the licensing period for License 11074 than they were in the period preceding licensing. Annual peak flows have increased over the entire period of record as shown below. By contrast, overall annual runoff volume was frequently higher both before and after the licensing period, and shows no significant trend.

South Fork American River near Kyburz (USGS gage # 11439500) stream flow data was analyzed for trend in peak runoff. This gage has a long record, and the watershed above the gage is similar to the nearby Rubicon watersheds. Analysis of annual peak flows that exceeded the median value of 1736 cfs from the period 1923-2003 indicates that the 14-day annual peak runoff will increase by 26% by the year 2057. Figure 1 shows these data and a least-squares linear trend line.

This trend was applied to annual peak historical *direct diversions* in the Rubicon basins. Further information about this analysis is available in the UARP Diversion Trend report.

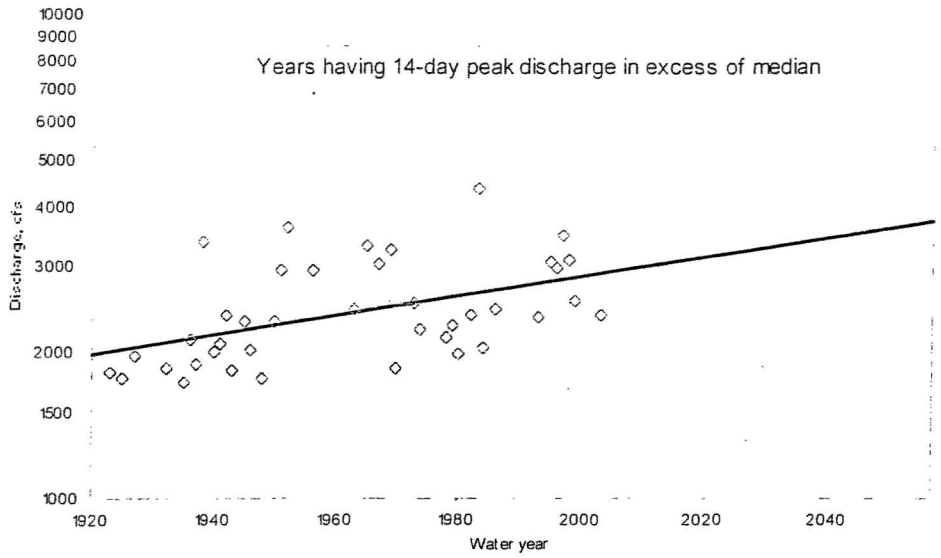


Figure 1. Trend in Kyburz streamflow data: selected years

2.3 Assessment of effect on downstream water users

The only major diversion/storage project upstream of Folsom Reservoir and downstream of the UARP's Rubicon basin facilities is Placer County Water Agency's (PCWA) Middle Fork Project[3]. PCWA holds five permits and one license to use Rubicon River water, all of which are junior in time to SMUD's License 11074. Our analysis shows that SMUD's appropriating the excess flows available in the Rubicon River, Little Rubicon River (including Highland/Rockbound Creek), Gerle Creek, and South Fork Rubicon River would have, at most, a de minimis effect on the authorized use of water pursuant to the water rights of the Middle Fork Project. The text following refers to the tables and plots in Appendix D.

PCWA's historical diversions in and downstream of the Rubicon River basin are summarized in figures D.2 and D.3, covering the analysis period of 1976-2004. Each plot shows the historical annual volume of inflow into PCWA reservoirs, PCWA's historical diversions, and any volume of unappropriated water directly diverted at upstream UARP facilities during periods of very high streamflow in the same years. UARP diversions of unappropriated water upstream of PCWA facilities occurred only during the highest-flow periods of the wettest years, and would have constituted at most approximately 0.3% of the flow available at PCWA facilities over the analysis period. Furthermore, in all water years with significant diversion of unappropriated water above Hell Hole Reservoir, so much water was available to PCWA that large spill releases were made at Hell Hole Dam.

To determine if SMUD's diversion of currently unappropriated water in the Rubicon basin might have an impact on Middle Fork Project daily operations, we compared the

[3] In fact, from SWRCB records, it appears that the only other water right holder downstream of the UARP's Rubicon basin diversions and upstream of Folsom is Lonestar Timber II, which has filed statements of water diversion and use on the Rubicon River and the Middle Fork American River totaling roughly 0.083 cfs. Statements S000274, S000289, S004947, S008092, and S008967.

total water available for PCWA powerhouse operations to the physical powerhouse capacity for every day over the period of record on which the UARP diverted unappropriated water upstream. Figures D.4 and D.5 in conjunction with Figure D.2 support the following conclusions:

- At Hell Hole Reservoir, downstream from UARP facilities at Rubicon and Buck Island Reservoirs: Over the 27-year period of review, PCWA diverted enough water to exceed the physical capacity of the Middle Fork Powerhouse and Ralston Powerhouse (the primary powerhouses downstream of Hell Hole) on all but 6 of the days on which the UARP diverted unappropriated water upstream. And on those 6 days, the UARP's upstream diversions of unappropriated water totaled only 305 acre-feet, or 0.004% of the Middle Fork powerhouse generation of 8.59 million acre-feet over the analysis period (with Middle Fork powerhouse generation and Hell Hole Reservoir release of 8348 acre-feet on those 6 days). There is no a clear relationship between the very small amount of unappropriated water diverted at Rubicon and Buck Island Reservoirs and a reduction in power generation at Middle Fork Project facilities.
- At Ralston Afterbay and Oxbow Reservoir, downstream from UARP facilities on Gerle Creek (Loon Lake, Gerle Creek Reservoir) and the South Fork Rubicon River (Robbs Peak Reservoir): On all but 3 days during the 28 year period of record when upstream UARP facilities directly diverted unappropriated water, the estimated inflow at Ralston Afterbay far exceeded the capacity of Oxbow Powerhouse. On the three remaining days, the UARP diverted a total of 118 acre-feet over a 28-year period that saw about 18.6 million acre-feet flow into Ralston Afterbay (with about 4657 acre-feet on those 3 days). Furthermore, actual inflow to Ralston Afterbay is probably higher than the estimate used for this analysis due to the conservative assumptions made in scaling the publicly available data from the surrogate downstream gage.

Nor would SMUD's appropriating a greater annual volume (120,000 acre-feet) of currently unappropriated water (i.e., increasing beneficial use at Robbs Peak Powerhouse) interfere with the Middle Fork Project's authorized use. This water that would be released from Robbs Peak Dam down the South Fork Rubicon River to Ralston Afterbay (entering the Rubicon River below Hell Hole Reservoir) would only be available during the wettest years, when PCWA has historically spilled 600,000 to 1,200,000 acre-feet unused past Oxbow Reservoir. See Figures B.4 and D.3 in Appendices B and D.

Therefore, SMUD's application to appropriate currently unappropriated water in the Rubicon basin could not cause injury to PCWA.

The only remaining water project downstream of the UARP is Folsom Reservoir, operated by the United States Department of Interior's Bureau of Reclamation. The Bureau of Reclamation would not be injured by SMUD's appropriating all available unappropriated flows from the Rubicon basin. Although the UARP would transfer Rubicon flows from the Middle Fork American River drainage into the South Fork American River drainage, both systems flow into Folsom Reservoir. Since SMUD's use is non-consumptive (power and recreation), the appropriation would not reduce flow into

Folsom Reservoir. Significant diversion of unappropriated water through Robbs Powerhouse occurred in water years 1982, 1983, 1986, 1995, and 1998. Folsom Reservoir and the UARP conservation reservoirs (Loon, Union Valley, and Ice House) filled in all of these years, peaking in June or July. In these wet years, upstream storage of unappropriated flows in the UARP conservation reservoirs during spring snowmelt resulted in increased summer releases to Folsom. These allowed higher summer water levels, releases, and power generation at Folsom, when the natural inflow is low and water, power, and recreation demands are high. Had this water been made available to Folsom during the earlier spring snowmelt period, Bureau operations would have been unable to benefit from these UARP summer flow releases.

Approving new storage rights at the small regulating reservoirs would have no effect on downstream water users. As shown in Figures B.6 and B.7, water has been stored in the regulating reservoirs historically, and this water derives almost exclusively from upstream storage releases. Water stored in Loon Lake is used to offset the normal storage fluctuations in the small Gerle Creek and Robbs Peak Reservoirs. Likewise, water stored in Union Valley Reservoir is used to offset the normal storage fluctuations in the small Junction, Camino, Brush Creek, and Slab Creek Reservoirs. These reservoirs are used to regulate flow in Jaybird, Camino, and White Rock Penstocks before it is released to Chili Bar Reservoir, where it is re-regulated by Pacific Gas and Electric (PG&E) for release to the South Fork of the American River. Furthermore, much of the water diverted to storage at the small regulating reservoirs on Silver Creek and South Fork American River (Junction, Camino, Brush Creek, Slab Creek) is "foreign" water that has been added to these streams from the Rubicon system.

While daily storage in the regulating reservoirs continually fluctuates, there is very little seasonal storage, as shown in Figure C.6. Except for refill after infrequent reservoir maintenance, the seasonal storage that does occur is associated with summer lowering of outlet gates at Rubicon, Buck Island, and Robbs Peak Reservoirs. Storage at Rubicon and Buck Island for summer recreation use is a condition of the FERC license for the UARP. All other diversion to storage that occurs is unplanned and incidental to normal operation of forebays and afterbays in a hydroelectric system. Fluctuation of water levels in the regulating reservoirs is due to hydro plant unit limitations and power grid considerations, and has no effect on the total amount of water used in a year. Because of the relatively small size of the regulating reservoirs, there is no intentional carry-over of water from one year to the next.

Storage at any of the regulating reservoirs does not reduce required stream releases, and thus has no effect on downstream users. Indeed, subsequent withdrawal of this storage is sometimes necessary to maintain these stream flows, which are a condition of the FERC license for the UARP. For example, at Rubicon, Buck Island, and Brush Creek Reservoirs, stream release requirements usually exceed any local inflow during summer, so reservoir storage is necessary to meet them. Even higher stream releases are being proposed in the new FERC license for the UARP, which will necessitate even more use of stored water. There is no effect on Silver Creek flows nor on the other water users who have rights to divert from Silver Creek or it's tributaries. The diversion rights of these users total less than 1 cubic foot per second, much less than SMUD's required stream releases.

Appendix A: Summary of maximum diversions

The following figures are overall summary tables of the unappropriated water available in the Rubicon basin and *diversion to storage* throughout the UARP.

Figure A.1 summarizes the volumes of Rubicon basin water available for appropriation within the UARP as compared to the diversion rates in License 11074 and the physical limits of the facilities. The table shows how much water has been diverted historically at UARP facilities, adjusts the diversion rates to a 1% exceedence value from a Log Pearson Type III distribution, and further increases the *direct diversion* rates based on a study indicating that increasing volumes of water will be available at peak flow periods through the year 2057, the estimated final year of the new FERC license SMUD is in the process of obtaining for the UARP.

Figure A.2 summarizes the historical *diversion to storage* in UARP reservoirs as compared to the diversion volumes in Licenses 11073 and 11074 and the theoretical maximum diversion based on the physical limits of the facilities and the range of estimated inflow in the watershed. The table shows how much water has been diverted historically at UARP facilities, adds an adjustment for minimum storage based on the low storage during the year, and rounds this value upwards to determine the amount of storage needed for the smaller UARP reservoirs. Rounding up was done to provide some allowance for higher diversion to storage due to hydrologic variability than occurred during the short analysis period.

Supporting data for these summaries is included in Appendix B.

Total Water Available for Diversion from UARP Rubicon River Basin Sources

Based on analysis of historical diversion of appropriated and unappropriated water

Location	Existing Diversion Limit (License 11074)	Maximum Historical Diversion of Rubicon Basin Flows at UARP Facilities			Historical 1% Exceedence Value Adjusted for 2057 Forecasted Peak Flow Increase[4]	Physical Diversion Limits of Facilities[5]	Total Volume Available for Appropriation (Forecast maximum diversion adjusted for physical facility limits less existing license limit)
		Year	Observed Historical Diversion	1% Exceedence Value from Historical Diversion Distribution [6]			
Water Available for Direct Diversion (in cfs)[7]							
Rubicon River at Rubicon Reservoir	500	1983	756	1,150	1,450	1,300	(1,300 – 500) = 800
Little Rubicon River (including Highland/ Rockbound Creek) at Buck Island Reservoir	200	1978	209	290	360	1,300	(360 – 200) = 160
Gerle Creek at Loon Lake and at Gerle Creek Reservoir, and South Fork Rubicon River at Robbs Peak Reservoir[8]	500	1983	950	1,300	1,600	1,450	(1,450 – 500) = 950
Water Available for Throughput at Robbs Peak Powerhouse (in acre-feet)							
Robbs Peak Powerhouse	250,000	1995	354,600	405,000	—	944,000	(405,000 – 250,000) = 155,000
Water Available from Rubicon Basin Sources (in acre-feet)							
Above Robbs Peak Powerhouse	281,100	1995	355,200	410,000	—	1,094,000	(410,000 – 281,100) = 128,900 or ~129,000

Figure A.1 Water available for appropriation at UARP facilities in Rubicon basin

[4] Projected future direct diversions based on peak flow trend discussed in Section 2.2.

[5] Physical limits are based on maximum theoretical powerhouse flow at low head or maximum theoretical tunnel/canal flow at maximum stage.

[6] 1% annual exceedence probability from Log Pearson type III distribution. This statistical adjustment was made to determine potential diversion rate over a longer period than the historical record provided.

[7] Based on 14-day running average (Standard Permit Term 27).

[8] Under License 11074, Loon and Gerle have a combined diversion rate of 325 cfs on Gerle Creek, and Robbs Peak has a diversion rate of 175 cfs on South Fork Rubicon. Because the facilities are not individually gaged, the unappropriated water calculation reflects combined diversions at all three facilities.

Total Diversion to Storage at UARP Reservoirs

Based on analysis of historical diversion of appropriated and unappropriated water

Location	Existing Diversion Limit (Licenses 11073 and 11074, Permit 19025)	Maximum Historical Diversion at UARP Reservoirs		Minimum Storage (minimum winter storage in given year)	Adjustment (Minimum storage – historical minimum storage)	Observed + Adjustment (rounded up)[9]
		Year [10]	Observed Historical Diversion [Oct-Sep]			
Water Available for Diversion to Storage (in acre-feet per year)						
Rubicon Reservoir	450	1999	1,852	402	12	2,000
Buck Island Reservoir	440	1993	1,132	413	43	1,200
Gerle Creek Reservoir	0	1986	1,050	780	80	1,200
Robbs Peak Reservoir	0	1998	61	9	9	100
Junction Reservoir	0	1997	5,570	891	691	6,300
Camino Reservoir	0	1995	1,121	278	228	1,400
Brush Creek Reservoir	0	1997	2,348	617	117	2,500
Slab Creek Reservoir	0	1992	16,203	3,917	17	17,000
Combined Rubicon, Buck Island, Loon Lake, Ice House, Union Valley Reservoirs	525,800	1982	374,500	22,000 +15,500 +71,000 = 108,500	96,900	472,000

Figure A.2 Maximum UARP *diversion to storage* summary

[9] Needed storage rounded up to next 100 or 1000 acre-feet to allow for more hydrologic variability than occurred during the short analysis period.

[10] Maximum year is from the periods of daily data availability as follows: Rubicon and Buck Island Reservoirs 1993-2004; Loon, Ice House and Union Valley Reservoirs 1976-2004; Gerle Creek Reservoir 1983-2004; Robbs Peak Reservoir 1997-2004; Junction, Camino, Brush Creek, and Slab Creek Reservoirs 1988-2004.

Appendix B: Existing Licenses and Historical Data Analysis

B.1 Summary of existing license diversion limits

The following figures illustrate in graphical form the UARP's existing license diversion limits.

These water rights derive from five overlapping licenses and one permit. The limits in the licenses consist of four types: 1) 14-day average *direct diversion* limits on the water diverted and put to beneficial use, 2) seasonal *diversion to storage* limits on the amount of water used for initial fill or refill held in storage for more than 30 days, 3) annual *throughput* limits on the flow through a powerhouse, and 4) *source* limits on the annual sum of the *direct diversions* and *diversions to storage* above a point.

Figure B.1 summarizes the current UARP diversion limits and how they are combined across licenses and compliance points. For further detail, refer to the licenses and orders.

Figure B.2 shows the current diversion limits for the Rubicon basin portion of the UARP in schematic form. Diversion flows are represented by arrows, storage by trapezoids, and powerhouses by rectangles.

Combined UARP Diversion Limits

Key Rubicon River measurable limits are highlighted in yellow

Direct Diversions: License 11074 [cfs]

	Rubicon	Buck Island	Loon	Gerle	Robbs
Lic. 11074:	500	200	325		175
Combined:	500	200	500		

Direct Diversions: Licenses 11073, 10495, 10496, 10513; Permit 19025 [cfs]

	Ice House	Union Valley	Junction	Camino	Brush	Slab	Chili
Per. 19025:	270	cannot be rediverted below Union Valley					
Lic. 11073:	400						
Lic. 10495:		400				800	
Lic. 10496:					1900		
Lic. 10513:						800	
Combined:	270 +Ice(11073)	800 -Jun - Cam + min(270,Ice)	800 -Uni -max(0, Ice -270)		3500		

Diversion for Storage: Licenses 11074, 11073; Permit 19025 [AF/yr]

	Rubicon	Buck Island	Loon	Union Valley	Ice House
Lic. 11074:	450	440	226,010		
			license also notes maximum past storage in each		
Lic. 11073:				238,900	
				license also notes maximum past storage in each	
Per. 19025:				60,000	
Combined:	525,800				
" "	450	440	226,010 - Uni(11074)		298,900 - Uni(11073) - Uni(19025)

Throughput:
Licenses 11074, 11073, 10495 [AF/yr]

	Robbs PH	Jaybird PH	
Lic. 11074:	250,000		
" "		*250,000*	*max possible*
Lic. 11073:		528,400	
		from lic. 11073 & 10495 diversions	
Lic. 10495:			
Combined.	250,000	*778,400*	
		actual limit depends on detailed accounting	

Source Limit (Direct+Storage):
Licenses 11074, 11073 [AF/yr]

	Robbs PH	Jaybird PH	
Lic. 11074:	281,100		
" "		*281,100*	*max possible*
Lic. 11073:		459,300	
		from lic. 11073 diversions	
Lic. 10495:		*289,587*	
		max possible from lic. 10495 diversions	
Combined.	281,100	*1,029,987*	
		actual limit depends on detailed accounting	

Figure B.1 Combined UARP diversion limits

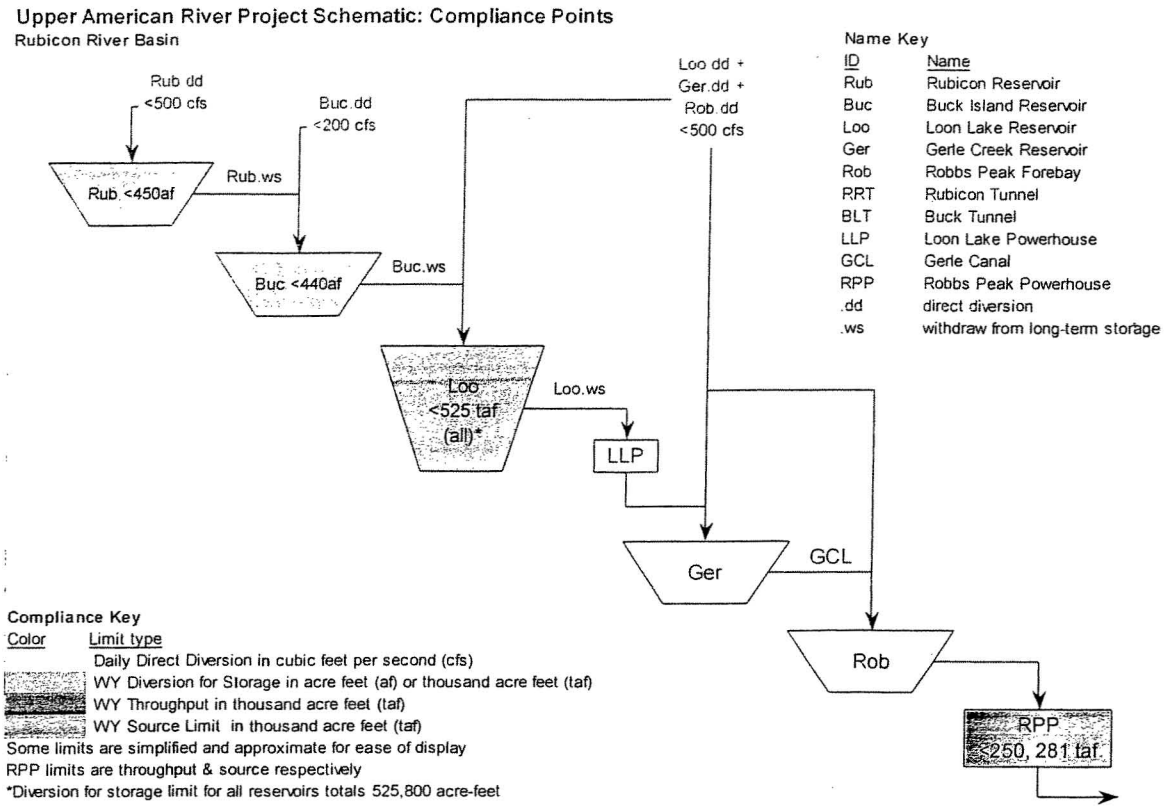


Figure B.2 UARP Rubicon diversion schematic

B.2 Summaries of historical direct diversions and diversions to storage

The following figures tabulate diversion values computed from the historical data. These tables provide the annual data that was summarized in Appendix A. The formulas used for these tables are described in Appendix C.

Figure B.3 lists the water year diversion volumes by diversion type for the Rubicon basin facilities. The annual sum is based on daily accounting and the *direct diversions* and *diversion to storage* are summed over all the facilities.

Figure B.4 shows the above annual Rubicon basin diversion volumes on timelines for each diversion type. Diversion of unappropriated water is stacked on top of the License 11074 diversions.

Figure B.5 lists the calendar year maximum *direct diversion* and diversion of unappropriated water for each diversion point in the Rubicon basin.

Figures B.6 and B.7 list the water year *diversion to storage* volumes by season for all UARP reservoirs.

Figure B.8 lists the water year diversion and storage withdrawal volumes that comprise the *throughput* and *source* totals. Total diversions from the *source* are the sum of the total *direct diversions* and total *diversions to storage*.

Historical UARP Rubicon River Water Year Diversion Volumes

Water year sum of diversions in [1000 AF], estimates in *italic*

Year	'Direct Diversions'*		'Diversion to Storage'		'Powerhouse Throughput'		'Diversion from Source'	
Point:	Upper & South Rubicon		Upper & South Rubicon		at Robbs PH		above Robbs PH	
Part:	Lic 11074	Unapprop	Lic 11074	Unapprop	Lic 11074	Unapprop	Lic 11074	Unapprop
1976	*42*	*0*	*33*		107	0	*75*	*0*
1977	*7*	*0*	*33*		36	0	*40*	*0*
1978	*165*	*1*	*69*		200	0	*234*	*0*
1979	*99*	*0*	*56*		163	0	*154*	*0*
1980	*164*	*0*	*68*		228	0	*232*	*0*
1981	*56*	*0*	*42*		118	0	*98*	*0*
1982	*234*	*3*	*89*		250	49	*281*	*45*
1983	*256*	*22*	*72*		250	104	*281*	*69*
1984	*178*	*0*	*64*		250	1	*241*	*0*
1985	*68*	*0*	*62*		123	0	*130*	*0*
1986	*198*	*3*	*57*		250	10	*258*	*0*
1987	*38*	*0*	*37*		76	0	*75*	*0*
1988	*46*	*0*	*21*		114	0	*67*	*0*
1989	*114*	*4*	*77*		138	0	*194*	*0*
1990	*68*	*0*	*42*		116	0	*110*	*0*
1991	*57*	*0*	*48*		103	0	*104*	*0*
1992	*44*	*0*	*34*		103	0	*78*	*0*
1993	185	4	63	1	231	0	252	0
1994	31	0	39	0	92	0	70	0
1995	256	18	80	1	250	105	281	74
1996	181	0	55	1	220	0	236	0
1997	135	1	97	0	250	1	232	0
1998	201	14	67	1	250	22	281	1
1999	159	1	66	1	221	0	227	0
2000	115	0	53	1	195	0	169	0
2001	30	0	46	1	57	0	77	0
2002	104	0	56	1	155	0	161	0
2003	121	0	55	1	194	0	177	0
2004	99	0	45	0	142	0	144	0
Mean	*119*	*2*	56	1	168	10	*171*	*7*
Max	*256*	*22*	97	1	250	105	*281*	*74*

Note: Lic 11074 = Water diverted under license 11074*
Unappropriated = Diversion of unappropriated water
**1976-'92 w/o Rubicon, Buck Island diversion to storage*

Figure B.3 UARP annual diversion volumes

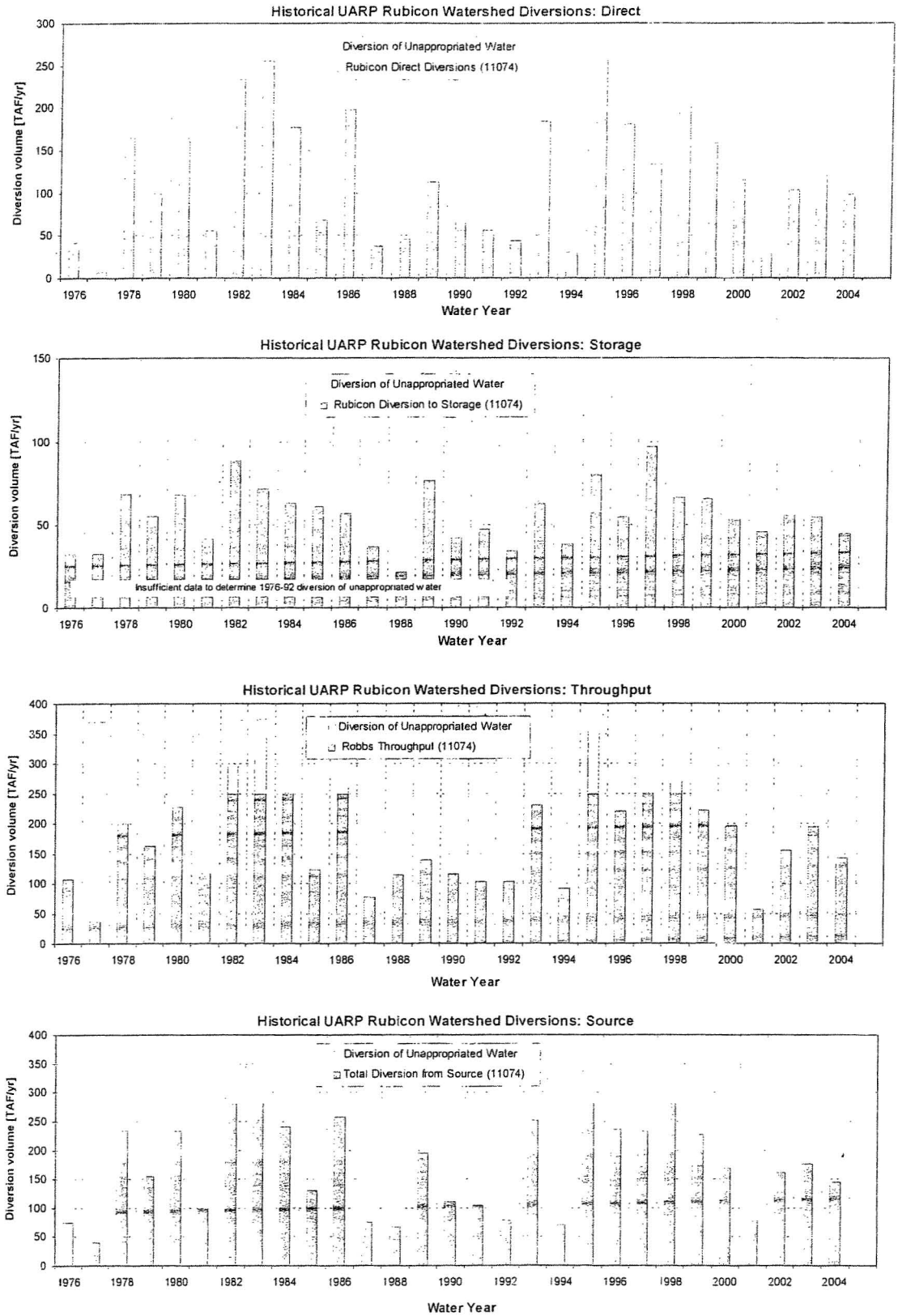


Figure B.4 UARP annual diversion volume plots

Historical UARP Rubicon River Maximum 'Direct Diversion' Rates

Calendar year maximum diversion in [14-day average cfs], estimates in *italic*

CalYr	Total 'Direct Diversion'*			Diversion of Unappropriated Water*		
Threshold:				>500cfs	>200cfs	>500cfs
Location:	Rubicon Reservoir	Buck Isld Reservoir	Loo,Ger,Rob Reservoirs	Rubicon Reservoir	Buck Isld Reservoir	Loon,Gerle Robbs
1976	*96*	*23*	*155*	*0*	*0*	*0*
1977	*23*	*6*	*239*	*0*	*0*	*0*
1978	*245*	*209*	*571*	*0*	*9*	*71*
1979	*205*	*121*	*529*	*0*	*0*	*29*
1980	*508*	*164*	*495*	*8*	*0*	*0*
1981	*285*	*64*	*498*	*0*	*0*	*0*
1982	*628*	*150*	*592*	*128*	*0*	*92*
1983	*708*	*206*	*950*	*208*	*6*	*450*
1984	*354*	*166*	*376*	*0*	*0*	*0*
1985	*119*	*51*	*499*	*0*	*0*	*0*
1986	*536*	*176*	*651*	*36*	*0*	*151*
1987	*69*	*33*	*276*	*0*	*0*	*0*
1988	*190*	*50*	*156*	*0*	*0*	*0*
1989	*330*	*65*	*613*	*0*	*0*	*113*
1990	*129*	*33*	*319*	*0*	*0*	*0*
1991	*133*	*40*	*310*	*0*	*0*	*0*
1992	*97*	*49*	*269*	*0*	*0*	*0*
1993	333	145	652	0	0	152
1994	59	26	196	0	0	0
1995	756	187	738	256	0	238
1996	504	187	578	4	0	78
1997	331	89	499	0	0	0
1998	565	161	774	65	0	274
1999	296	163	578	0	0	78
2000	261	98	495	0	0	0
2001	48	30	314	0	0	0
2002	130	88	494	0	0	0
2003	251	103	497	0	0	0
2004	256	45	500	0	0	0
Mean	*291*	*101*	*476*	*24*	*1*	*59*
Max	*756*	*209*	*950*	*256*	*9*	*450*

Notes: **1976-92 w/o Rubicon, Buck diversion to storage.*

Figure B.5 UARP annual direct diversion rates

Historical Water Year Summary of UARP 'Diversion to Storage'

WaterYr	Diversion to Storage in [AF]											
Reservoir:	Rubicon Res		Buck Island Res		Loon Lake		Gerle Creek Res		Robbs Peak Res		Ice House Res	
Period:	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep
1976					32,800	0					13,900	0
1977					32,830	0					11,670	0
1978					68,900	0					33,200	0
1979					55,600	0					23,000	0
1980					68,200	0					28,500	0
1981					41,700	0					21,800	0
1982					88,500	300		42			42,100	0
1983					71,990	0	442	9			38,350	0
1984					63,600	0	585	62			**48,150**	0
1985					61,500	0	647	40			26,900	0
1986					56,800	0	**904**	146			29,600	0
1987					36,900	0	*192*				18,600	0
1988					21,400	0		152			11,250	0
1989					76,434	102	412	206			36,440	0
1990					42,344	0	241	23			20,641	0
1991					47,501	0	704	75			18,244	0
1992					34,321	0	525	90			13,477	0
1993	1,692	0	**1,132**	0	62,352	0	694	25			33,844	0
1994	832	0	522	0	38,331	0	338	10			16,220	0
1995	1,522	338	970	194	79,502	0	588	69			29,986	0
1996	1,367	0	803	0	54,262	0	681	38			23,522	0
1997	1,633	0	972	0	**96,329**	0	819	0	55	0	43,539	0
1998	1,351	305	682	264	66,071	0	573	0	**61**	0	32,123	0
1999	**1,852**	0	762	0	65,662	0	489	46	46	4	30,342	0
2000	1,299	67	756	39	52,712	0	534	0	39	0	24,733	0
2001	943	0	456	0	45,873	0	641	20	55	2	18,196	0
2002	1,303	0	760	0	55,671	0	513	0	29	1	26,054	0
2003	1,624	0	1,016	0	54,349	0	436	70	47	3	23,838	0
2004	1,090	0	747	0	44,331	0	441	19	56	0	20,199	0
2005												
Mean	1,376	59	798	41	55,751	14	543	52	49	1	26,152	0
Max	1,852	338	1,132	264	96,329	300	904	206	61	4	48,150	0
Limit	450	0	440	0	shared	0	0	0	0	0	shared	0

Figure B.6 UARP annual diversion to storage volumes, Rubicon through Ice House

Historical Water Year Summary of UARP 'Diversion to Storage'

WaterYr	Diversion to Storage in [AF]										Combined Totals*	
Reservoir:	Union Valley Res		Junction Res		Camino Res		Brush Creek Res		Slab Creek Res		Rub+Buc+Loo+Ice+Ur	
Period:	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep	Oct-Jul	Aug-Sep
1976	37,300	0									*84,000*	*0*
1977	51,400	500									*95,900*	*500*
1978	205,000	1,200									*307,100*	*1,200*
1979	122,000	0									*200,600*	*0*
1980	152,200	0									*248,900*	*0*
1981	89,900	0									*153,400*	*0*
1982	243,600	0									***374,200***	*300*
1983	172,300	2,900									*282,640*	*2,900*
1984	89,700	0									*201,450*	*0*
1985	130,800	0									*219,200*	*0*
1986	174,800	0									*261,200*	*0*
1987	45,100	0									*100,600*	*0*
1988	84,200	0	1,542	241	170	40	457	10	3,568	232	*116,850*	*0*
1989	**244,300**	0	1,053	222	584	85	653	5	3,895	268	*357,174*	*102*
1990	127,542	0	1,049	0	384	14	408	457	4,736	1,594	*190,527*	*0*
1991	126,140	805	824	217	777	0	647	0	3,959	320	*191,885*	*805*
1992	91,259	0	2,780	104	670	46	998	39	**15,796**	407	*139,057*	*0*
1993	201,456	703	2,741	217	804	42	688	70	6,363	814	300,476	703
1994	60,961	0	1,930	142	249	8	487	19	3,274	298	116,866	0
1995	194,540	0	2,041	74	**1,019**	102	1,632	37	9,234	101	306,520	532
1996	136,461	0	1,582	171	506	130	1,237	383	6,272	2,028	216,415	0
1997	149,071	0	**5,440**	130	611	14	**2,175**	173	10,879	290	291,544	0
1998	165,302	0	3,401	22	604	70	997	412	10,843	1,857	265,529	569
1999	167,638	0	2,125	136	555	8	800	202	11,300	1,492	266,256	0
2000	169,279	0	2,887	45	865	95	982	343	7,222	0	248,779	106
2001	80,113	486	3,341	170	766	78	1,012	190	5,930	1,800	145,581	486
2002	187,722	0	2,790	110	728	30	806	150	5,930	0	271,510	0
2003	133,999	0	1,799	286	607	117	580	57	8,560	660	214,826	0
2004	130,326	0	1,788	315	697	75	819	25	6,992	771	196,693	0
2005												
Mean	136,704	227	2,301	153	623	56	905	151	7,338	761	219,506	283
Max	244,300	2,900	5,440	315	1,019	130	2,175	457	15,796	2,028	374,200	2,900
Limit	shared	0	0	0	0	0	0	0	0	0	525,800	0

Notes

*w/o Rub & Buc 1976-92

Figure B.7 UARP annual diversion to storage volumes, Union Valley through Slab Creek

Historical UARP Rubicon River 'Direct Diversion' & Long-Term Storage Water Year Volumes

Water year sum of diversions & withdrawals in [1000 AF], estimates in *italic*

WaterYr	Total 'Direct Diversions'*				Direct Diversion of Unappropriated Water			'Diversion to Storage'				Withdrawal from storage**				Through -put	Total from Source
Location:	Rub Res	Buc Res	Lo,Ge +Rob	Sum	Rub Res	Buc Res	Lo,Ge +Rob	Rub Res	Buc Res	Loo Res	Sum	Rub Res	Buc Res	Loo Res	Sum	Robbs PH	Rubicon sources
1976	*14*	*5*	*23*	*42*	*0*	*0*	*0*			33	*33*			65	*65*	107	75
1977	*2*	*1*	*5*	*7*	*0*	*0*	*0*			33	*33*			29	*29*	36	40
1978	*37*	*22*	*107*	*165*	*0*	*0*	*1*			69	*69*			35	*35*	200	234
1979	*24*	*12*	*62*	*99*	*0*	*0*	*0*			56	*56*			64	*64*	163	154
1980	*55*	*20*	*89*	*164*	*0*	*0*	*0*			68	*68*			64	*64*	228	232
1981	*12*	*6*	*39*	*56*	*0*	*0*	*0*			42	*42*			62	*62*	118	98
1982	*95*	*24*	*118*	*237*	*3*	*0*	*1*			89	*89*			62	*62*	299	326
1983	*93*	*29*	*157*	*279*	*6*	*0*	*16*			72	*72*			75	*75*	354	351
1984	*55*	*24*	*98*	*178*	*0*	*0*	*0*			64	*64*			73	*73*	251	241
1985	*12*	*6*	*50*	*68*	*0*	*0*	*0*			62	*62*			55	*55*	123	130
1986	*80*	*24*	*97*	*201*	*0*	*0*	*2*			57	*57*			59	*59*	260	258
1987	*7*	*3*	*27*	*38*	*0*	*0*	*0*			37	*37*			39	*39*	76	75
1988	*18*	*5*	*23*	*46*	*0*	*0*	*0*			21	*21*			68	*68*	114	67
1989	*31*	*7*	*79*	*118*	*0*	*0*	*4*			77	*77*			21	*21*	138	194
1990	*14*	*5*	*49*	*68*	*0*	*0*	*0*			42	*42*			48	*48*	116	110
1991	*12*	*3*	*42*	*57*	*0*	*0*	*0*			48	*48*			46	*46*	103	104
1992	*10*	*4*	*30*	*44*	*0*	*0*	*0*			34	*34*			59	*59*	103	78
1993	49	18	121	188	0	0	4	1	0	62	64	2	1	40	42	231	252
1994	4	2	24	31	0	0	0	1	0	38	39	1	1	59	61	92	70
1995	91	31	152	274	5	0	13	1	0	80	81	2	1	78	80	355	355
1996	60	20	102	181	0	0	0	1	0	54	55	1	1	37	39	220	236
1997	32	11	92	135	0	0	1	1	0	96	97	2	1	113	116	251	232
1998	59	19	137	215	1	0	12	1	1	66	68	2	1	55	58	272	282
1999	34	21	106	160	0	0	1	1	0	66	67	1	1	59	61	221	227
2000	27	9	78	115	0	0	0	1	0	53	54	1	1	78	80	195	169
2001	1	1	28	30	0	0	0	1	0	46	47	1	1	25	27	57	77
2002	23	10	71	104	0	0	0	1	0	56	57	1	1	49	51	155	161
2003	29	11	81	121	0	0	0	1	1	54	56	2	1	71	74	194	177
2004	30	2	67	99	0	0	0	1	0	44	45	1	1	41	44	142	144
Mean	*35*	*12*	*74*	*121*	*1*	*0*	*2*	1	0	56	56	1	1	56	57	178	178
Max	*95*	*31*	*157*	*279*	*6*	*0*	*16*	1	1	96	97	2	1	113	116	355	355

Notes: **1976-92 w/o Rub. Buc diversion to storage.* **From long-term storage

Figure B.8 UARP annual throughput and diversion from source

Appendix C: Diversion Formulas

The following figures include the formulas used for computing the values shown in the tables provided in Appendix B.2, as well as two example line graphs illustrating in pictorial form the daily diversion accounting used to generate the water availability analysis.

Figure C.1 lists the formulas used to compute UARP *direct diversions* as a function of measured flows and storage terms.

Figure C.2 lists the formulas used to compute the components of UARP *diversion to storage* where water is diverted at several points to storage in a downstream reservoir with no intervening use.

Figure C.3 lists the formulas used to compute *diversion to storage* as a function of current, prior, and future reservoir storage during the water year.

Figure C.4 is an example plot showing *direct diversion* from the South Rubicon River and Gerle Creek in water year 1997. The total flow at Robbs Powerhouse is the sum of the *direct diversions*, re-diversions from the Upper Rubicon basin, and withdrawals of long-term storage in Loon Lake.

Figure C.5 is an example plot showing Loon Lake Reservoir *diversion to storage* in water year 1997. The dashed line shows the cumulative diversion to storage, which increases whenever storage increases due to initial fill or refill held for 30 days.

Figure C.6 is an example plot showing Camino Reservoir *diversion to storage* in water year 1997. The dashed line shows the cumulative diversion to storage, which increases whenever storage increases due to initial fill or refill held for 30 days. The diversions in regulatory reservoirs such as this occur due to occasional short drawdowns (such as for maintenance or a flood, in this case) and normal fluctuations.

UARP Rubicon River Diversion Accounting Formulas at Diversion Points

Direct Diversions, License 11074

Diversion Point	Terms
Rubicon Reservoir	= Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Rubicon Tunnel - Buck Island *diversion to storage* through Rubicon Tunnel
Buck Island Reservoir	= Buck-Loon Tunnel flow - (Rubicon-Rockbound Tunnel flow - Buck Island *diversion to storage* through Rubicon Tunnel) - Buck Island Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* from Buck Island Reservoir
Combined Upper Rubicon	= Buck-Loon Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Buck-Loon Tunnel
Loon + Gerle Reservoirs	= Gerle Canal flow - (Buck-Loon Tunnel flow - Loon Lake *diversion to storage* through Buck-Loon Tunnel) - Loon Lake *withdrawal from storage*
Robbs Peak Reservoir	= Robbs Powerhouse flow - Gerle Canal flow
Combined South Rubicon	= Robbs Peak Powerhouse flow - (Buck-Loon Tunnel flow - Loon Lake *diversion to storage* through Buck-Loon Tunnel) - Loon Lake *withdrawal from storage*
Combined Upper & South Rubicon	= Combined Upper Rubicon *direct diversion* + Combined South Rubicon *direct diversion* = Robbs Peak Powerhouse flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage* - Loon Lake *withdrawal from storage*

Notes:
All direct diversions are averaged over 14 days after combining terms.
Direct diversion is water put to beneficial use that is not *withdrawn from storage*.
Diversion to storage is water diverted and held in storage at least 30 days.
Withdrawal from storage is withdrawal of water *diverted to storage*.
Diversion to storage components for Loon and Buck Island are on Figure C.2.
Except for combined points, diversions are from local inflow between the diversion point and any upstream points.

Figure C.1 UARP direct diversion formulas

UARP Rubicon River Diversion Accounting Formulas at Diversion Points

Diversion to Storage Components

Diversion Component	Terms
Loon Lake total	= Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel + Loon Lake *diversion to storage* from Gerle Creek
Loon Lake thru Rubicon Tunnel	= smaller of ((Loon Lake *diversion to storage*) (- Loon Lake unimpaired inflow if Loon flag set to optimize South Rubicon)) and (Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage*) {limited to more than or equal to zero}
Loon Lake thru Buck Tunnel	= smaller of ((Loon *diversion to storage*) (- Loon Lake unimpaired inflow if Loon flag set to optimize South Rubicon)) and (Buck-Loon Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Buck Island Reservoir *withdrawal from storage*) {limited to more than or equal to zero}
Loon Lake from Buck Island Res	= Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel - Loon Lake *diversion to storage* through Rubicon-Rockbound Tunnel
Loon Lake from Gerle Creek	= Loon Lake total *diversion to storage* - Loon Lake *diversion to storage* from Rubicon River through Buck-Loon Tunnel
Buck Island Res from Rubicon Res	= smaller of ((Buck Island Res *diversion to storage*) and (Rubicon-Rockbound Tunnel flow - Rubicon Reservoir *withdrawal from storage* - Loon Lake *diversion to storage* through Rubicon-Rockbound Tunnel) {limited to more than or equal to zero}

Notes:
Diversion to storage is water diverted for initial fill or diverted and held in storage at least 30 days .
Withdrawal from storage is withdrawal of water *diverted to storage*.
Loon flag determines if Rubicon River or Gerle Creek is primary source of diversion to storage in Loon.
Regulatory storage change ignored in computing components of *diversion to storage*.

Figure C.2 UARP diversion to storage component formulas

UARP Rubicon River Diversion Accounting Formulas at Diversion Points

Diversion to Storage Computations

Term / Abbreviation		Description / Computation
Storage		End of day observed reservoir storage
	Stor(t)	= End of day observed reservoir storage in acre-feet on day 't'
Daily storage gain		Increase in storage since prior day
	DayGain(t)	= Stor(t) - Stor(t-1)
Initial storage fill		Storage gain on day 't' above highest storage so far in water year
	IniFill(t)	= Stor (t) - max(Stor(d), where d = 0 to t-1) {limited to more than or equal to zero}
Net fill balance		Storage gain above minimum storage to date in water year that will be held 30 days
	NetFill(t)	= min(Stor(d), where d = t to t+30) -min(Stor(d), where d = 0 to t-1) {limited to more than or equal to zero}
Refill storage collection		Storage gain held 30 days less any Initial Fill
	ReFill(t)	= min(DayGain(t) - IniFill(t), NetFill(t) - NetFill(t-1)) {limited to more than or equal to zero}
Diversion to storage		Sum of Initial Fill and ReFill
	DivStor(t)	= IniFill(t) + ReFill(t)
Regulatory storage change		Direct diversion or withdrawal of water from reservoir refill held less than 30 days
	RegStor(t)	= DayGain(t) - DivStor(t)
Regulatory storage volume		Total volume of water held in regulatory storage
	VolRegStor(t)	= DayGain(t) - DivStor(t)
Withdrawal from storage		Withdrawal of water from storage that was earlier diverted to storage
	DivStorDraw(t)	= -(DayGain(t) - RegStor(t)) {limited to more than or equal to zero}

Notes:
Calculations are based on sample hydrograph provided by SWRCB to SMUD in fall 2004, titled
"Storage/Regulatory Determination for Reservoirs Filled in Whole or Part More Than Once During a Single Water Year"

Figure C.3 Diversion to storage formulas

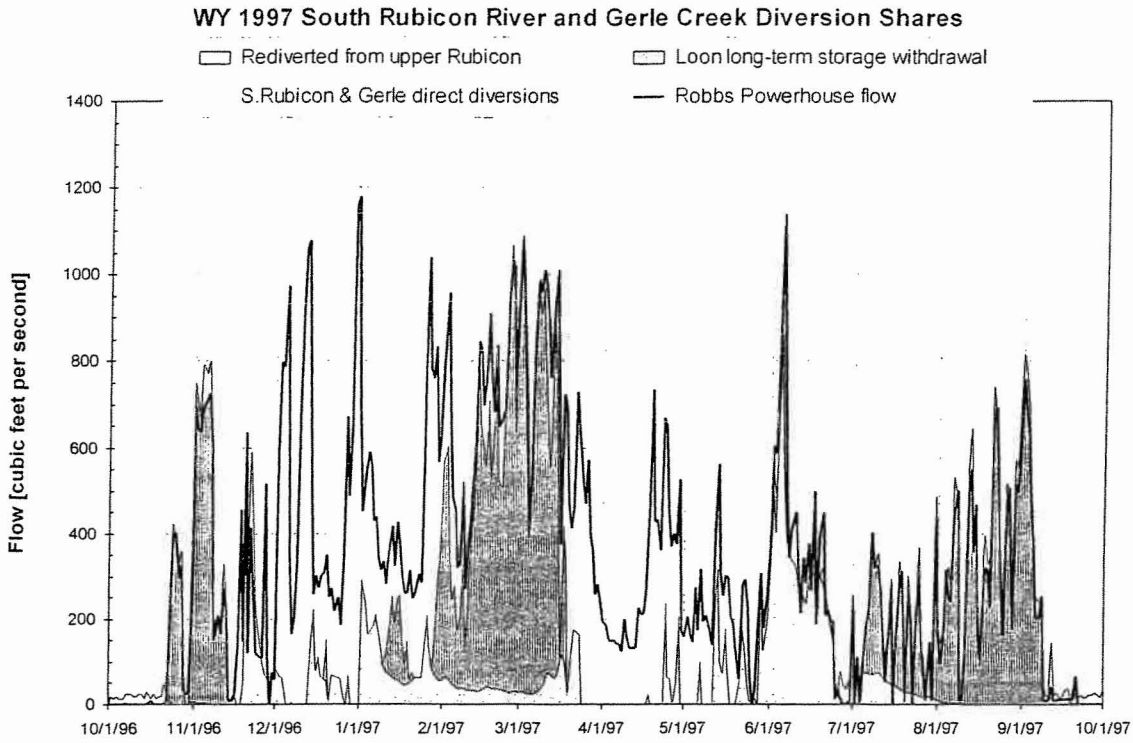


Figure C.4 South Fork Rubicon River and Gerle Creek diversion shares

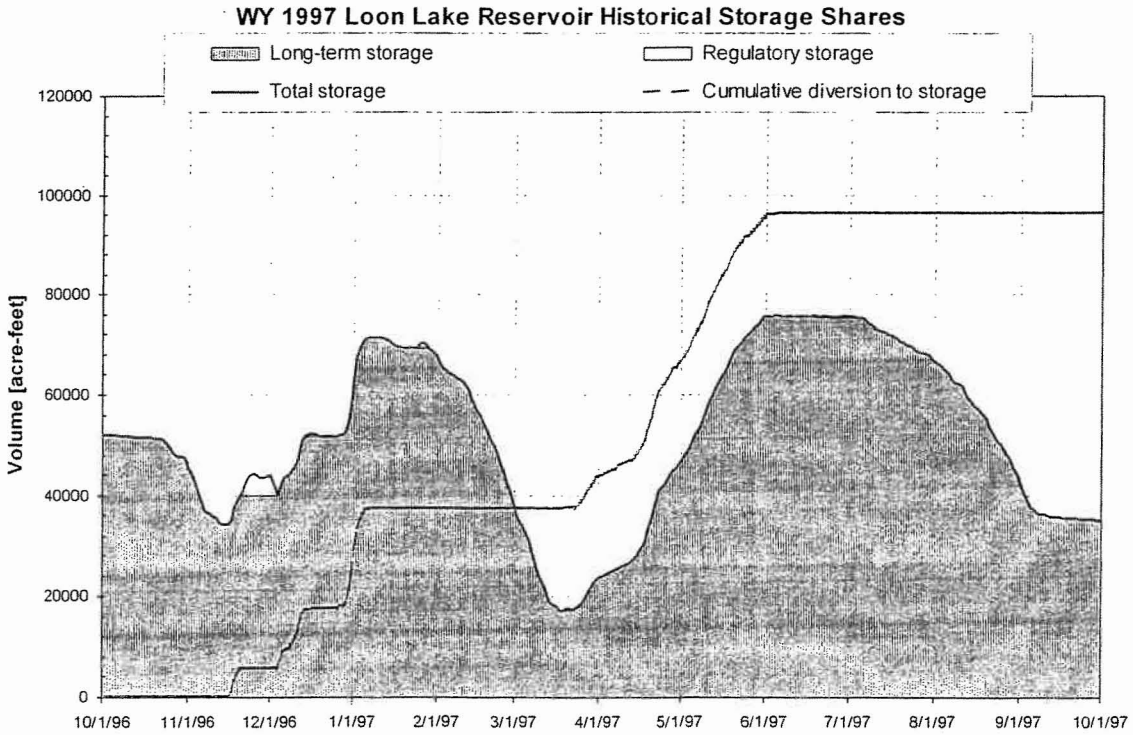


Figure C.5 Loon Lake historical storage shares

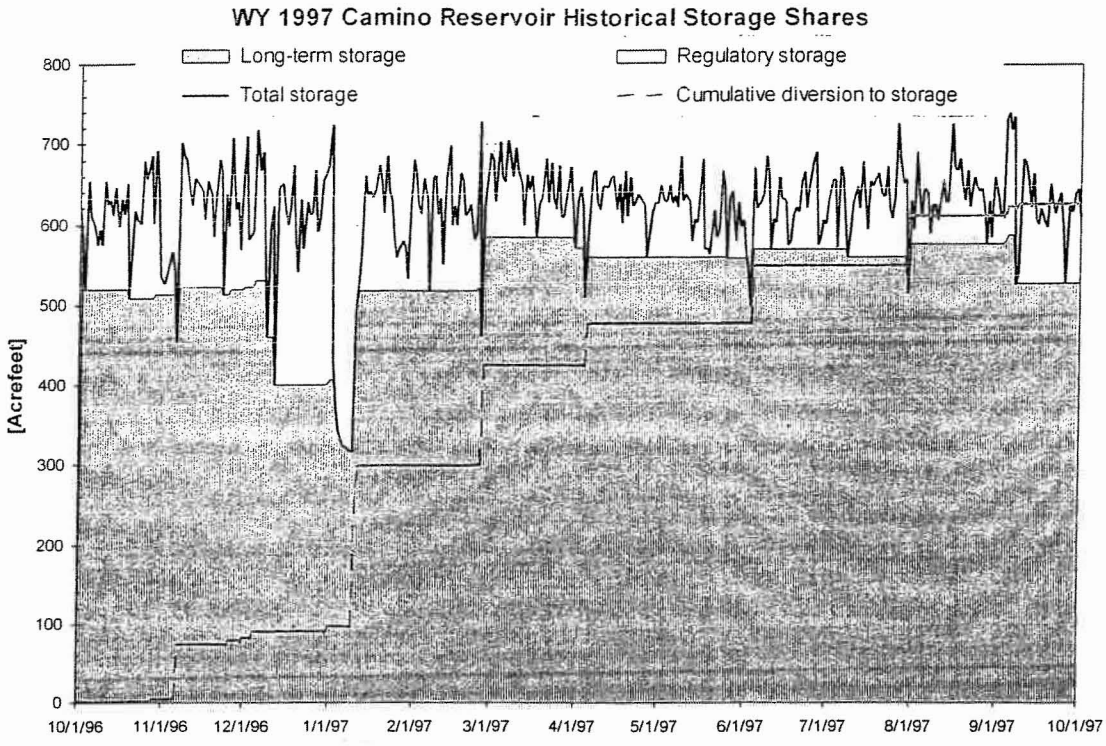


Figure C.6 Camino Reservoir historical storage shares

Appendix D: Downstream Rubicon River Users Analysis

The following figures show the results of the analysis of the operation of PCWA's Middle Fork Project during times of high UARP diversions.

Figure D.1 is a schematic of the Middle Fork Project.

Figures D.2 and D.3 show the annual diversion volume from the Middle Fork Project in comparison with upstream UARP diversions of unappropriated water in table and graph formats for the upper Rubicon River above Hell Hole Reservoir and the South Rubicon River upstream of Ralston Afterbay.

Figures D.4 and D.5 are scatter plots showing the water available to PCWA at Hell Hole Reservoir and Ralston Afterbay during days with upstream UARP diversion of unappropriated water.

PCWA Middle Fork Project Schematic

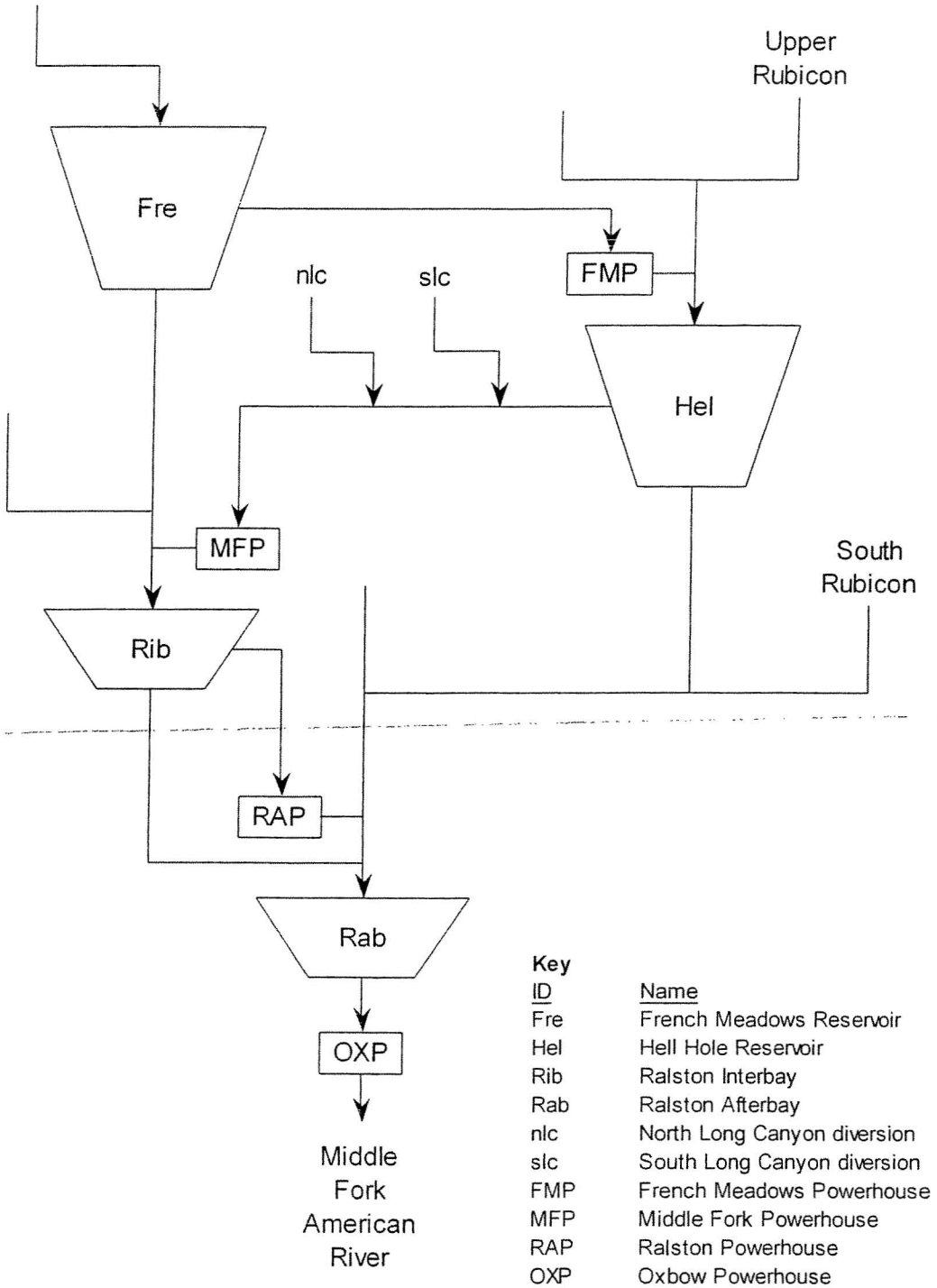


Figure D.1 Middle Fork Project schematic

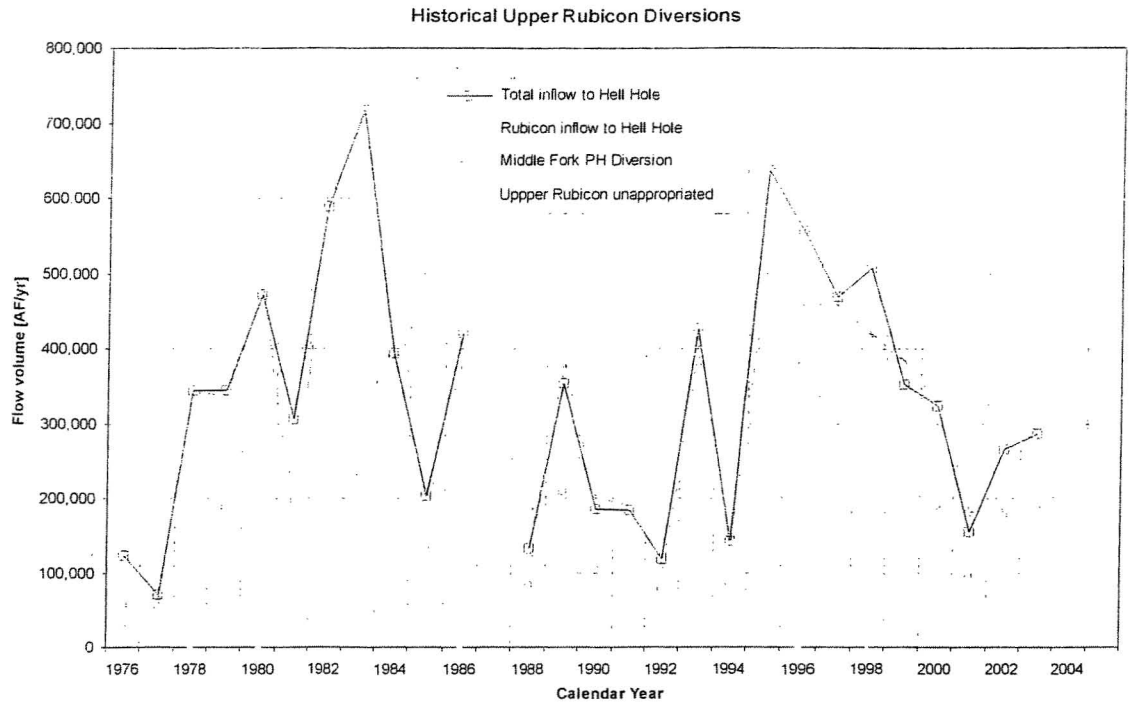
Historical PCWA/UARP Rubicon River Diversion Summary

Calendar year and period volume in [AF] of UARP diversion of unappropriated water & PCWA flow. estimates in *italic*

Cal Year	Annual Totals: Heil Hole / Upper Rubicon				Annual Totals: Ralston AB / South Rubicon			Sub-Totals During Periods with Upstream Diversion of Unappropriated Water: Heil Hole / Upper Rubicon				Sub-Totals During Periods with Upstream Diversion of Unappropriated Water: Ralston AB / South Rubicon		
	Heil Hole Tot inflow	Heil Hole Rub inflow	Mid Fork PH div	Up Rub[3] Unappr.[1]	Ralston est inflow[2]	Oxbow PH Div	S. Rub Unappr.[1]	Heil Hole Rub inflow	Mid Fork PH Div	Up Rub[3] Unappr.[1]	Heil Hole Res.[4] peak Stor spill?	Ralston est inflow	Oxbow PH Div	S. Rub Unappr.[1]
1976	123,389	58,099	178,193	*0*	242,829	107,637	*0*							
1977	70,069	55,108	68,440	*0*	123,314	37,898	*0*							
1978	344,732	236,678	342,301	*45*	712,058	258,257	*613*	9,081	6,597	*45*	194,696	*33,598*	19,408	*613*
1979	344,267	187,222	337,192	*0*	560,296	270,476	*200*				200,464	*12,780*	7,978	*200*
1980	471,970	295,021	483,723	*16*	1,047,737	291,620	*0*	925	-12	*16*	204,061	*0*	0	*0*
1981	305,038	238,915	173,226	*0*	572,009	137,128	*0*							
1982	589,335	349,404	601,408	*2,513*	1,529,905	353,866	*801*	21,733	27,945	*2,513*	211,050 yes	*84,149*	18,530	*801*
1983	716,503	478,308	586,703	*6,091*	1,688,247	360,330	*16,112*	66,597	48,349	*6,091*	209,348 yes	*167,941*	52,680	*16,112*
1984	393,217	220,925	492,956	*0*	757,079	255,867	*0*							
1985	203,373	130,846	185,641	*0*	359,935		*0*							
1986	421,424	280,893	388,243	*296*	1,060,759	253,938	*2,414*	10,033	13,283	*296*	210,700 yes	*342,572*	13,584	*2,414*
1987				*0*	210,019	84,917	*0*							
1988	132,316	82,516	120,455	*0*	220,372	84,880	*0*							
1989	353,732	209,087	381,346	*0*	593,696	260,821	*3,768*				206,100	*155,080*	56,575	*3,768*
1990	185,108	104,165	201,267	*0*	296,178	140,288	*0*							
1991	183,683	114,387	192,796	*0*	326,976	124,561	*0*							
1992	118,919	80,299	100,221	*0*	220,043		*0*							
1993	427,154	264,708	396,582	*0*	756,323		3,533				199,000	*81,012*	na	3,533
1994	142,674	85,258	142,955	*0*	240,630	99,797	0							
1995	636,165	423,413	514,788	*4,951*	1,292,549	213,866	13,069	52,274	38,039	4,951	209,200 yes	*417,871*	82,964	13,069
1996	557,544	376,982	459,779	*11*	1,199,983		696	3,371	3,822	11	211,100 yes	*21,727*	na	696
1997	468,765	303,958	458,763	*0*	989,016		0							
1998	507,263	336,614	421,312	*1,066*	954,780		12,471	41,266	23,326	1,066	209,100 yes	*110,975*	na	12,471
1999	352,697	232,495	382,814	*0*	786,498	278,182	1,403				204,600	*104,025*	5,199	1,403
2000	323,558	190,990	328,935	*0*	612,555	243,025	0							
2001	154,720	96,489	182,753	*0*	323,087	138,148	0							
2002	265,072	176,946	185,410	*0*	426,642	172,464	0							
2003	287,083	189,196	277,477	*0*	499,341	219,183	0							
2004				*0*			0							
Mean	**336,288**	214,775	317,988	***517***	**664,388**	199,416	***1,899***	25,660	20,169	*1,874*	205,785	*127,644*	28,546	*4,590*
Max	716,503	478,308	601,408	*6,091*	1,688,247	360,330	*16,112*	66,597	48,349	*6,091*	211,100	*417,871*	82,964	*16,112*

Notes:
1) Unappr. = Upstream diversion of unappropriated water.
2) Ralston AB inflow scaled from downstream gage USGS 11433300 by ratio of tributary areas.
3) 1976-92 upstream diversions computed without Rubicon and Buck Island diversion to storage.
4) Heil Hole peak storage is highest volume held in storage in given year, 'yes' in spill column indicates stream release of >50 cfs. (actual releases exceeded 900 cfs in these years)
na = data not available

Figure D.2 Comparison of PCWA & UARP Rubicon River diversions



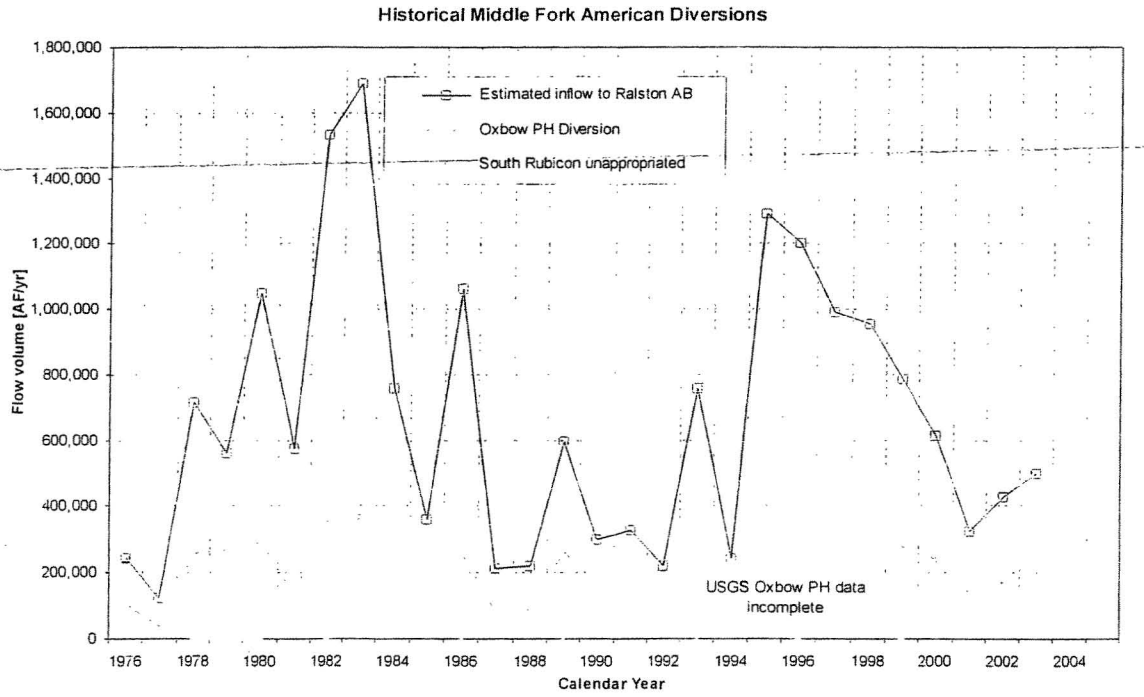


Figure D.3 PCWA & UARP Rubicon River diversion timeline

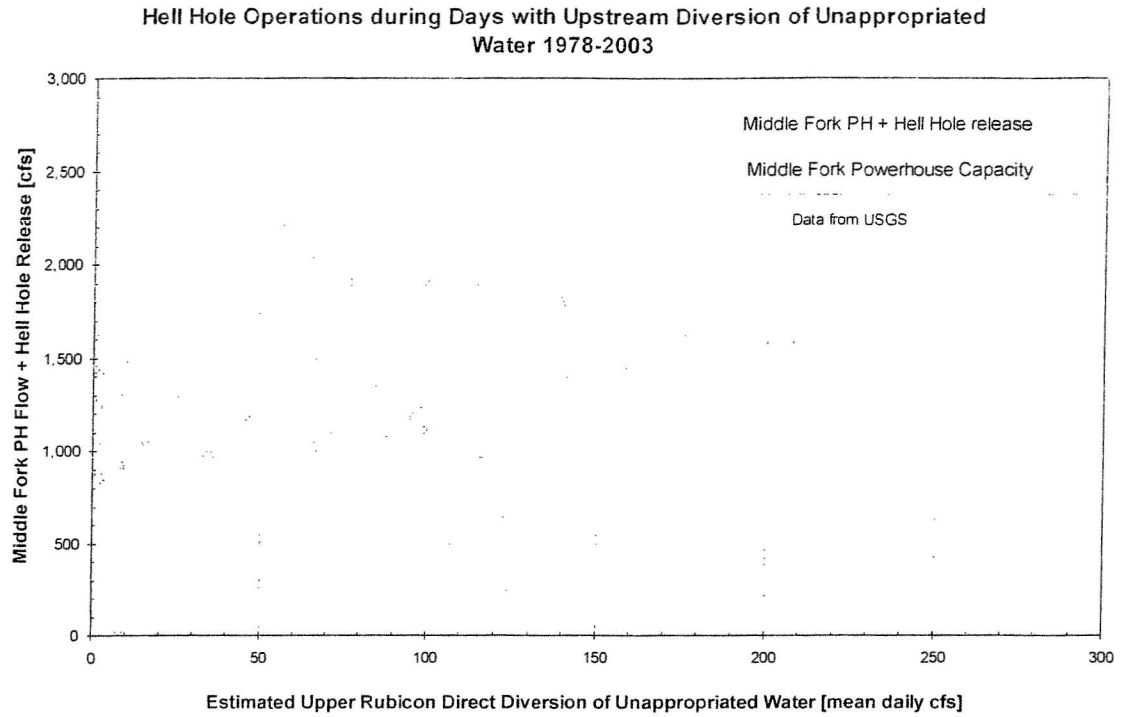


Figure D.4 Middle Fork Powerhouse operations during days with upstream diversion of unappropriated water

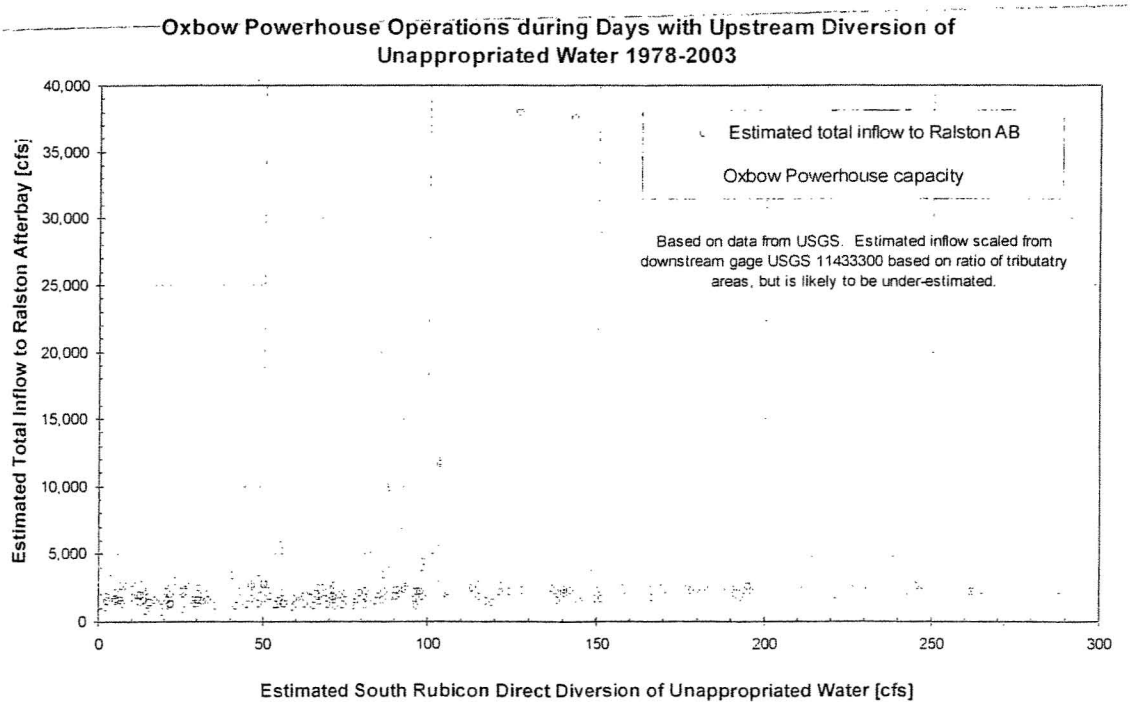


Figure D.5 Oxbow Powerhouse operations during days with upstream diversion of unappropriated water

Supplemental Information

Attachment No. 1 to Sacramento Municipal Utility District's Water Right Application

SECTION A: NOTICE INFORMATION

3. PROJECT DESCRIPTION

The Upper American River Project (UARP) is a large hydroelectric development licensed by the Federal Energy Regulatory Commission. Located within the Rubicon, Silver Creek, and South Fork American River watersheds of the Western Sierra, the UARP consists of eleven dams and eight powerplants that provide electricity to customers with the Sacramento Municipal Utility District service boundaries. This application only involves the use of existing facilities, and although it will recognize additional storage locations, the water stored will not exceed that to which SMUD already has storage rights, will not require additional construction, and will not change the historical operation of the UARP.

4. PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

a. POINT OF STORAGE	PURPOSE OF USE	STORAGE		
		AMOUNT	SEASON OF COLLECTION	
		Acre-feet per year	Beginning date (month & day)	Ending date (month & day)
(1) Camino Junction	Power and recreation	1,400 acre-feet*	October 1	September 30
(2) Junction Reservoir	Power and recreation	6,300 acre-feet*	October 1	September 30
(3) Brush Creek Reservoir	Power and recreation	2,500 acre-feet*	October 1	September 30
(4) Slab Creek Reservoir	Power and recreation	17,000 acre-feet*	October 1	September 30

* The maximum total amount of water to be collected to storage from all sources under this application and the existing Licenses 11073 and 11074 shall not exceed 465,800 acre-feet, the combined existing storage limitation in Licenses 11073 and 11074.

5. SOURCES AND POINTS OF DIVERSION/REDIVERSION

a. Sources and Points of Diversion (POD)/Points of Rediversion (PORD):

☑ POD / ☐ PORD # (1): Rubicon River, tributary to Middle Fork American River

☑ POD / ☑ PORD # (2): Little Rubicon River (aka Rockbound/Highland Creek), tributary to Rubicon River thence Middle Fork American River

☑ POD / ☑ PORD # (3): Gerle Creek, tributary to South Fork Rubicon River thence Rubicon River

☑ POD / ☑ PORD # (4): Gerle Creek, tributary to South Fork Rubicon River thence Rubicon River

☑ POD / ☑ PORD # (5): South Fork Rubicon, tributary to Rubicon River thence Middle Fork American River

☑ POD / ☐ PORD # (6): South Fork Silver Creek, tributary to Silver Creek thence South Fork American River

☑ POD / ☑ PORD # (7): Silver Creek, tributary to South Fork American River thence American River

☑ POD / ☑ PORD # (8): Silver Creek, tributary to South Fork American River thence American River

☑ POD / ☑ PORD # (9): Silver Creek, tributary to South Fork American River thence American River

☑ POD / ☑ PORD # (10): Brush Creek, tributary to South Fork American River thence American River

☑ POD / ☑ PORD # (11): South Fork American River tributary to American River thence Sacramento River

☑ POD / ☑ PORD # (12): South Fork American River tributary to American River thence Sacramento River

b. State Planar and Public Land Survey Coordinate Description

POD/ PODR #	POINT IS WITHIN (40-acre subdivision)	SECTION	TOWNSHIP	RANGE	BASE AND MERIDIAN
# (1)	NW ¼ of SW ¼	9	13N	16E	MDB&M
# (2)	SW ¼ of NW ¼	6	13N	16E	MDB&M
# (3)	SE ¼ of NE ¼	5	13N	15E	MDB&M
# (4)	Lot 14	15	13N	14E	MDB&M
# (5)	SW ¼ of NE ¼	27	13N	14E	MDB&M
# (6)	SW ¼ of SW ¼	26	12N	14E	MDB&M
# (7)	SW ¼ of SW ¼	20	12N	14E	MDB&M
# (8)	SW ¼ of SW ¼	4	12N	14E	MDB&M
# (9)	Lot 9	4	11N	13E	MDB&M
# (10)	NW ¼ of SE ¼	10	11N	12E	MDB&M
# (11)	SE ¼ of NW ¼	25	11N	11E	MDB&M
# (12)	NE ¼ of SW ¼	25	11N	10E	MDB&M

7. PLACE OF USE

POWERPLANT	USE IS WITHIN (40-acre subdivision)	SECTION	TOWNSHIP	RANGE	BASE & MERIDIAN
Jaybird Powerhouse	NE ¼ of NW ¼	4	11N	13E	MDB&M
Camino Powerhouse	SW ¼ of SE ¼	15	11N	12E	MDB&M
Slab Creek Powerhouse	SE ¼ of NW ¼	25	11N	11E	MDB&M
White Rock Powerhouse	NW ¼ of NE ¼	31	11N	11E	MDB&M
Chili Bar Powerhouse	NE ¼ of SW ¼	25	11N	10E	MDB&M

SECTION B: MISCELLANEOUS DIVERSION INFORMATION

2. DIVERSION AND DISTRIBUTION INFORMATION

c. Conduits

CONDUIT (pipe or channel)	MATERIAL (type of pipe or channel lining; indicate if pipe is buried or not)	CROSS-SECTION (pipe diameter, or ditch depth and top and bottom width) (inches or feet)	LENGTH (feet)	TOTAL LIFT OR FALL		CAPACITY (cfs, gpd or gpm)
				feet	+ or -	
Rubicon–Rockbound Tunnel	concrete lined and unlined tunnel	13' diameter	1,170	3.5	–	1300 cfs
Buck–Loon Tunnel	concrete lined and unlined tunnel	13' diameter	8,225	37	–	1,260 cfs
Loon Lake Powerhouse Penstock Shaft	concrete and steel lined tunnel	8.5'–14' diameter	1,454	1046	–	1,120 cfs
Loon Lake Powerhouse Tailrace Tunnel	concrete lined and unlined tunnel	18' diameter	20,212	24	-	1120 cfs
Gerle Creek Canal	partially gunite-lined canal	22' wide at top 19' wide at bottom 19' deep	9,950	2.7	–	1,120 cfs
Robbs Peak Tunnel	steel lined and unlined tunnel	13' diameter	16,917	86	–	1,450 cfs
Robbs Peak Penstock	steel	8.25–9.75' diameter	2,235	288	-	1,250 cfs
Union Valley Tunnel	concrete-lined tunnel with steel pipe	11' diameter	556	1.4	–	1,577 cfs
Union Valley Penstock		9.5–10' diameter	1,435	187	-	1,577 cfs
Jaybird Tunnel	unlined tunnel	11.3–14.25' diameter	23,190	105	–	1,345 cfs
Jaybird Penstock	steel pipe	6.25–10.25' diameter	2,620	1350		1,345 cfs
Camino Tunnel	unlined and concrete-lined tunnel	13–14' diameter	26,589	140	–	2,100 cfs
Brush Creek Tunnel	unlined tunnel	14' diameter	4,447	125	–	1,900 cfs
Camino Penstock	steep pipe	5–12' diameter	1,560	852	-	2,100 cfs
Slab Creek Penstock	steel pipe	2' diameter	40	0	–	45 cfs
White Rock Tunnel	unlined tunnel	20.7-24.0' diameter	25,941	121	–	3,950 cfs
White Rock Penstock	steel pipe	9–15' diameter	1,675	560	-	3,950 cfs
Chili Bar Penstock	steel pipe	15' diameter	75	23	–	1,900 cfs

d. Storage Reservoirs

RESERVOIR NAME OR NUMBER	DAM				RESERVOIR		
	Vertical height from downstream toe of slope to spillway level (feet)	Construction material	Length (feet)	Freeboard: dam height above spillway crest (feet)	Surface area when full (acres)	Capacity (acre-feet)	Maximum water depth (feet)
Rubicon Reservoir	36	Concrete	644	6.0	108	1,450	25
Buck Island Reservoir	23	Concrete	293	6.0	78	1,070	26
Loon Lake Reservoir	108	Rockfill	2,130	8.0	1,450	76,200	165
Gerle Creek Reservoir	58	Concrete	444	9.5	60	1,260	51
Robbs Peak Reservoir	44	Concrete	320	8.0	2	30	36
Union Valley Reservoir	453	Earthfill	1,835	28.0	2,860	277,290	360
Junction Reservoir	168	Concrete	525	18.0	64	3,250	141
Camino Reservoir	133	Concrete	470	41.5	20	825	76
Brush Creek Reservoir	213	Concrete	780	8.0	20	1,530	140
Slab Creek Reservoir	250	Concrete	817	20.0	280	16,600	186

e. Outlet Pipes

RESERVOIR NAME OR NUMBER	OUTLET PIPE				
	Diameter (inches)	Length (feet)	Fall: vertical distance between entrance and exit of outlet pipe (feet)	Head: vertical distance from spill-way to entrance outlet pipe (feet)	Dead Storage storage below entrance of outlet pipe (acre-feet)
Rubicon Reservoir	156	1,170	0	22	442
Buck Island Reservoir	156	8,225	0	16	532
Loon Lake Reservoir	102–216	21,666	23	106	1,001
Gerle Creek Reservoir	228 wide	9,950	4.5	45	716
Robbs Peak Reservoir	102–156	19,152	4	34.5	*1*
Ice House Reservoir	72–96	10,140	18	122	3,889
Union Valley Reservoir	102–132	1,991	na	na	2,816
Junction Reservoir	75–168	25,810	0	116	184
Camino Reservoir	60–168	28,149	0	76	55
Brush Creek Reservoir	60–168	6,007	0	140	259
Slab Creek Reservoir	108–288	27,616	0	169	*1*

4. RIGHT OF ACCESS

The UARP FERC Project Boundary occupies approximately 9,150 acres of land, including all land needed for water diversion and storage but excluding land associated with transmission lines. Of this land, 64% is federal land managed by the Eldorado National Forest, 34% is owned by SMUD, less than 2% is owned by private entities, and less than 1% is federal land managed by the Bureau of Land Management. For the federal land, SMUD's access for project purposes is granted by FERC License No. 2101 and special use permits issued by the Eldorado National Forest. For the private land, SMUD's access for project purposes is granted by easements. (Source: UARP Land Use Technical Report, February 2005). Most of the private land is owned by Sierra Pacific Industries (SPI). The remaining private land lies entirely above the project tunnels. For the private property within the UARP FERC Project Boundary, the table below lists the assessors parcel number, the property owners and the property owner's mailing address.

Several parcels within the UARP Project Boundary

Sierra Pacific Industries
Tim Feller
P.O. Box 1450
Cedar Ridge CA 95924

Parcels above Slab-White Rock Tunnel

085-030-08
Inger Carleton
1930 Hidden Valley Lane
Camino, CA 95709

085-030-51
Austin and Laurina Chadwell
3341 Rio Vista Way
Camino, CA 95709

085-030-04
Pearl Keeler Trust
3281 Rio Vista Way
Camino, CA 95709

085-550-07
William H & E Anne Johnston Trust
781 Las Olas Drive
Aptos, CA 95003

085-450-05
Francis D & Sharlene M Lewis
3674 Fairway Drive
Shingle Springs, CA 95682

085-450-08
Webster B & Vonda L Brunette
2850 Hassler Road
Camino, CA 95709

084-030-21
Iva Ruth Kurtz Rev Trust
9020 Mosquito Road
Placerville, CA 95667

084-210-01
Byron D & Linda B Sher
1000 Fruitridge Road
Placerville, CA 95667

084-220-02
Stephen R & Barbara J Petersen
6712 Tulip Hill Terrace
Bethesda, MD 20816

084-220-06
Clinton & Mable Shankel Trust
2055 Prosperity Lane
Placerville, CA 95667

084-220-07
Auguste & Natalie Archer
2030 Prosperity Lane
Placerville, CA 95667

084-220-10
Dale W & Mary Lou Hall Trust
8625 Mosquito Road
Placerville, CA 95667

084-220-11
John P & Nadean J Music
1992 Prosperity Lane
Placerville, CA 95667

084-220-09
Steven T & Julie A Bowen
8661 Mosquito Road
Placerville, CA 95667

084-190-15
George E Jarzombek
45948 Omega Drive
Fremont, CA 94539

084-190-07
Joseph M & Mary M Keating Trust
8680 Mosquito Road
Placerville, CA 95667

084-190-08
Joseph M & Mary M Keating Trust
8680 Mosquito Road
Placerville, CA 95667

084-150-01
Crystal Elzer Trust, 1996
P O Box 246
Placerville, CA 95667

Parcels above Robbs Tunnel

010-080-43
Alanda Clementsen & Karen Freeman Trust
3918 Hancock Drive
Sacramento, CA 95821

010-080-25
Frank J & Anne-Marie Ohalloran
1390 Broadway B166
Placerville, CA 95667

010-080-42
The Last Resort At Robbs Valley LLC
1390 Broadway B166
Placerville, CA 95667

Parcel above Loon Powerhouse Tailrace Tunnel

010-060-35
Archie D & Ellen L Lawyer
P O Box 661
Lotus, CA 95651

Parcel above Buck-Loon Tunnel

010-120-04
Rubicon Trail Partnership
P O Box 1601
Rubicon, CA 95634

5. EXISTING WATER RIGHTS AND RELATED FILINGS

c. Related Licenses

Application/Permit/License

12323 / 10703 / 11073

12624 / 10704 / 11074

14963 / 10705 / 10495

20522 / 13746 / 10496

22110 / 15088 / 10513

26768 / 19025 / n/a

Licenses 10495, 11073 and 11074 impose the condition: "No diversion or use of water shall be made under this license which will in any way interfere with diversion or use of water for irrigation or domestic purposes, whether such higher uses are made under either prior or subsequent rights." The condition is based on a 1957 Facilities Use Agreement between the District and El Dorado County interests (EDC), as amended in 1961. That agreement states that EDC will not protest any application for additional water rights that the District may file for the UARP as long as the application (and resulting permit and license) are subject to the above condition. Accordingly, the District hereby requests that any permit or license resulting from this application include the same condition.