



APPROVED
BY THE CITY COUNCIL

MAY 5 1987

OFFICE OF THE
CITY CLERK

(21)

DEPARTMENT OF
PUBLIC WORKS

OFFICE OF THE DIRECTOR

CITY OF SACRAMENTO
CALIFORNIA

CITY HALL
ROOM 207
915 I STREET
SACRAMENTO, CA
95814-2673

916-449-5283

May 5, 1987

CITY MANAGER'S OFFICE

RECEIVED

APR 29 1987

MELVIN H. JOHNSON
DIRECTOR
LESLIE M. FRINK
DEPUTY DIRECTOR
REGINALD YOUNG
DEPUTY DIRECTOR

City Council
Sacramento, California

Honorable Members in Session:

SUBJECT: RESOLUTION SUPPORTING ADDITIONAL FLOOD PROTECTION
FOR THE LOWER AMERICAN RIVER

SUMMARY

The attached report to the joint Budget and Finance / Transportation and Community Development Committees recommends adoption of a resolution supporting additional flood control studies by the Army Corps of Engineers. The resolution declares the City's support for a project that would provide a minimum of 200 year flood protection and could be constructed in a relatively short period of time. The joint committees considered this report at their April 28, 1987 meeting and voted to recommended adoption of the resolution.

BACKGROUND

The resolution recommending additional flood control measures was prompted, in part, by the Army Corps of Engineers' "Special Study on the Lower American River." The report concluded that high levels of protection (i.e., 200 years or better) can be achieved only by construction of new storage upstream of Folsom Reservoir. The findings of the Corps study are discussed in greater detail in the attached report to the joint committees.

Resolution Supporting Additional Flood Protection for the Lower American River
May 5, 1987
Page 2

RECOMMENDATION

It is recommended that the City Council adopt the attached resolution supporting additional studies by the Army Corps of Engineers and declaring the City's support for a flood control project which would provide a minimum of 200 year protection to the greater Sacramento area.

Respectfully submitted,

Melvin H. Johnson
Melvin H. Johnson
Director of Public Works

RECOMMENDATION APPROVED:

Walter J. Slipe
Walter J. Slipe
City Manager

May 5, 1987
All Districts

RESOLUTION No. 87-346

Adopted by The Sacramento City Council on date of

APPROVED
BY THE CITY COUNCIL

MAY 5 1987

OFFICE OF THE
CITY CLERK

**A RESOLUTION SUPPORTING COMPLETION OF STUDIES OF THE
LOWER AMERICAN RIVER FLOOD CONTROL ALTERNATIVES
AND OTHER RELATED STUDIES**

WHEREAS, the Corps of Engineers has completed a Special Study on the Lower American River, California, and

WHEREAS, that study establishes that a serious flood threat exists long the Lower American River and that the current level of flood protection is only 63 years, and

WHEREAS, the study indicates that flood protection for the greater Sacramento area is much less than previously believed, and

WHEREAS, the floodplain areas in the greater Sacramento area and along the Lower American River contain an estimated 325,000 people and about \$15 billion in damageable property, and

WHEREAS, the City believes 200-year protection is a minimum desirable for the greater Sacramento area, and

WHEREAS, the existing threat of life and property is significant, and a project needs to be implemented in a minimum period of time, and

WHEREAS, the Special Study indicates upstream storage is the preferable alternative which could provide a minimum of 200-year protection, and

WHEREAS, the Special Study indicates upstream storage at the Auburn site could be implemented in a short period of time

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SACRAMENTO THAT:

1. The City supports a flood control project on the American River which will provide a minimum of 200-year protection and can be constructed within the shortest possible time frame.
2. The City supports completion of benefit studies on the Lower American River alternatives.

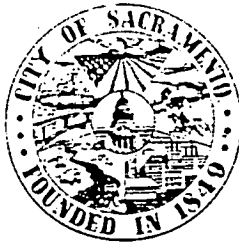
3. The City supports completion of other flood control studies affecting the City of Sacramento, namely:
 - a. Dry Creek General Investigation
 - b. Sacramento Flood Control System Evaluation
 - c. Sacramento Metro Area General Investigation

4. The City staff upon completion review and various studies and costs to the City of various alternatives and recommend a course of action to the Council.

MAYOR

ATTEST:

CITY CLERK



24

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CITY OF SACRAMENTO
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CITY HALL
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OFFICE OF THE DIRECTOR

April 28, 1987

916-449-5283

Transportation and Community Development/
Budget and Finance Committee

MELVIN H. JOHNSON
DIRECTOR
LESLIE M. FRINK
DEPUTY DIRECTOR
REGINALD YOUNG
DEPUTY DIRECTOR

Honorable Members in Session:

RE: Resolution Supporting Additional Flood Protection
for the Lower American River

SUMMARY

The storms of February 1986 raised the question of how much flood protection the American River flood control system provided to the greater Sacramento area. The answer to this question has come via a special study conducted by the Corps of Engineers and made public in their report, "Special Study on the Lower American River," dated March 1987.

In the study the Corps reviewed the American River basin hydrology, incorporating data gathered since 1961. The data prior to 1961 indicated that the flood control system (Folsom Dam and Levees) could control all flows up to the 120 year flood. The updated hydrology based on 82 years of record (1905-1986) demonstrates that the American River flood control system is capable of only controlling a 63 year flood. Consequently the system needs to be improved in order to provide a reasonable level of flood protection.

It is the opinion of the Public Works Department that the City should support a flood control project which would provide at the very minimum, 200 year protection to the greater Sacramento area. Due to the threat to life and the estimated \$15 billion of damageable property, the City should also support a project which can be constructed within a short period of time. The project identified in the report which could meet these requirements is a dam at the Auburn site.

The attached resolution supports additional Corps of Engineers studies and states the City supports a project that would provide a minimum of 200 year protection and be able to be constructed in a minimum amount of time. It is recommended that this resolution be forwarded to Council for adoption.

BACKGROUND

A Special Study was conducted by the Sacramento District, Corps of Engineers, at the request of the U. S. Bureau of Reclamation, Mid-Pacific Region (USBR) and the California Department of Water Resources, Central District, with an objective to accomplish the following:

Review and update the hydrology of the American River and determine areas of potential flooding and flood damages.

Review and update alternative flood control measures provided to the USBR in 1974 and 1982 and described in previous studies by USBR and DWR.

Reevaluate the flood control benefits of the alternative measures.

The primary study area is about 23 miles of the lower American River between Nimbus Dam and the Sacramento River. Other areas considered were the American River and its tributaries upstream from Nimbus Dam, Natomas East Main Drainage (NEMD) Canal from the American River upstream to about Dry Creek, Sacramento River from the American River upstream to the Sacramento Weir, and Yolo Bypass and its immediate tributaries. Major flood control facilities in the study area are Folsom Dam and Reservoir, located about 25 miles east of Sacramento, and a complex system of levee and channel improvements downstream along the American and Sacramento Rivers and in the Yolo Bypass.

In February 1986, major storms in northern California caused record floodflows in the American River Basin. Peak outflows from Folsom Reservoir of 130,000 cubic feet per second (cfs) exceeded the objective reservoir releases of 115,000 cfs. Prior to this study, it was believed that a flow of 115,000 cfs would not be exceeded more frequently than once in 100 years on the average. Studies of Folsom Reservoir flood operation and flow-frequency relationships were conducted incorporating an additional 25 years of record (1961-1986). These studies show that the February 1986 flood was about a 70-year event and that Folsom Reservoir is capable of controlling only about the 63-year flood to 115,000 cfs. In addition, the currently estimated peak flow for the 100-year flood along the lower American River is about 230,000 cfs.

For economic evaluation purposes and using the updated hydrologic information and other available data, a potential levee failure scenario was formulated and four major flood plains were delineated. Three of the flood plains (north side of river upstream from the NEMD Canal, south side of river near Watt Avenue, and, for rare events, Downtown Sacramento) are primarily affected by flows in the American River. Potential flooding in the fourth area, Natomas, is also influenced by flows in the NEMD Canal and the Sacramento River. Together, these flood plain areas contain an estimated 325,000 people and about \$15 billion in damageable property. It is believed the threat to life from flooding is significant. Also, average annual flood damages in the areas are estimated at about \$123 million. A map delineating the approximate 100 year and 200 year flood events is attached as Exhibit "A".

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April 28, 1987

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A number of measures to reduce the flood threat have been identified in previous studies and reports by USBR, DWR, and the Corps. They generally fall into one or more of the following categories:

Increase flood control storage in Folsom Reservoir,

Increase Folsom Reservoir's objective outflows (i.e., increase downstream levee and channel flood carrying capacity),

Construct new upstream flood control storage,

Use existing upstream reservoir storage for flood control, and

Perform structural modification of Folsom Dam to permit increased releases at lower pool elevations.

Two other potential measures include construction of offstream storage and construction of levee and channel improvements along the NEMD Canal.

Primary findings of the Special Study are: (1) an area of Sacramento where over 325,000 people live and having a value of flood damageable property of about \$15 billion is estimated to have as low as a 63-year level of flood protection in certain areas, (2) most of the measures reviewed in this study, or their combinations, are capable of achieving increases in the level of flood protection along main-stem American River to about 100 years, and (3) high levels of protection (i.e., about 200 years or better) can be achieved by construction of new storage upstream from Folsom Reservoir.

Major impacts of the measures considered, directly relating to the flood control, were developed by the USBR and are described as a part of this study. A summary comparison tabulation of the accomplishments, benefits, costs (to the extent they are known), and impacts to water supply and hydropower is also included. (See Exhibit "B"). Based on this tabulation the only project capable of providing a minimum of 200 year protection is new upstream storage.

In addition to this special study for the USBR and DWR, the Corps, as the Federal flood control agency, has three flood-related investigations underway in the greater Sacramento area. They include the Congressionally authorized American River Watershed Investigation, Sacramento River Flood Control System Evaluation, and the Dry Creek Investigation. A fourth study, Sacramento Metropolitan Area Reconnaissance Study, is included in the President's Budget for initiation in Fiscal Year 1988. With these studies, the Corps will evaluate potential solutions to flood problems in the area and solicit or confirm non-Federal sponsorship in the implementation of these solutions. A schedule for completing these studies can be found on Exhibit "C". It should be pointed out that the American River Watershed (G1), the Sacramento Metro River (G1) and the Dry Creek (G1) studies will require local cost sharing starting at the feasibility phase of these projects.

April 28, 1987

Page 4

FINANCIAL

Federal legislation now requires non-federal agencies to pay 50% of the feasibility phase and a minimum of 25% and a maximum of 50% of the construction cost, including engineering, for a flood control project. Therefore, the City will be required to provide funding for the lower American River (G1) and the Sacramento Metro (G1) studies. The proposed 1987/88 Capitol Improvement Budget includes \$250,000 for this purpose and the 1988/89 Capitol Improvement Budget includes a similar amount. The amount of local share for a 200 year protection project is not known at this time. However, the value of the property protected by such a project indicates that it would be cost effective..

CONCLUSION

A serious flood threat exists along the lower American River and, if left unresolved, will put about 325,000 people within the 200 year flood plain. The estimate of potential flood damageable property is \$15 billion with estimated annual equivalent flood damages in the flood plain of 123 million dollars.

The Public Works department concurs with the Corps' Statement, "A high level of flood protection (i.e. about 200 years or greater) is desirable for metropolitan areas where levee failure would result in catastrophic losses to life and property, such as Sacramento." and therefore believes that City should support a project that provides a minimum of 200 year protection to the greater Sacramento area.

RECOMMENDATION

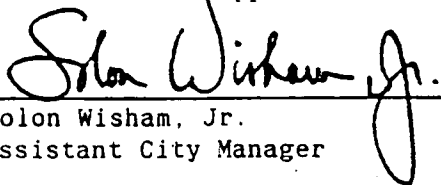
It is recommended that the attached resolution supporting the additional Army Corps of Engineers studies and stating that the City supports a flood control project which would provide a minimum of 200 year protection to the greater Sacramento area be forwarded to Council for adoption.

Respectfully submitted,



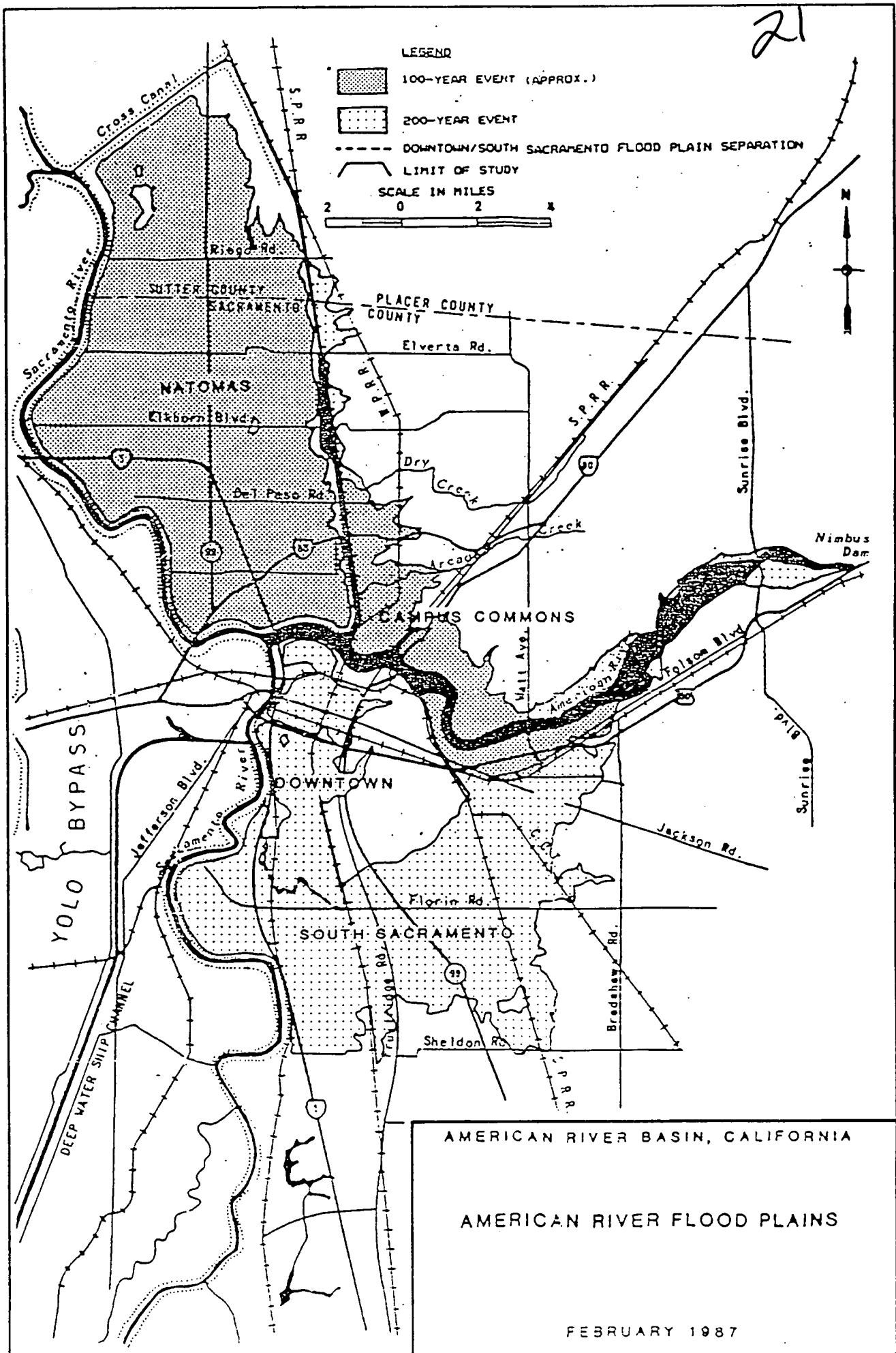
Melvin H. Johnson
Director of Public Works

Recommendation Approved:



Solon Wisham, Jr.
Assistant City Manager

April 28, 1987
All Districts



MEASURE SUMMARY AND COMPARISON

Measure	Folsom Reservoir		Other Storage		Flood Protection <u>1/</u>	Flood Control Benefits <u>2/</u>	First Cost of Construction for Flood Reduction	Outputs Foregone <u>3/</u>			
	Flood Control Space	Object Release	New Flood Space	Exist-ing	(Return Period - yrs)	(\$ Mil. /yr)	(\$ Mil.)	Water Supply	Hydro-power	Recreation	
	(1,000 ac-ft)	(1,000 cfs)	(1,000 ac-ft)	(1,000 ac-ft)				(1,000 ac-ft /yr)	(GWH /yr)	(1,000 Rec. Days/yr)	
Increase Folsom Flood Space	500	115	0	47 <u>5/</u>	75	14	0	14.0	12.8	20 <u>4/</u>	
	590	115	0	47	85	24	0	25.4 <u>6/</u>	29.6 <u>6/</u>	20 <u>4/</u>	
	650	115	0	47	94	29	0	33.0	40.9 <u>7/</u>	20 <u>4/</u>	
Increase Folsom Objective Release <u>8/</u>	400	130	0	47	75	14	60	0	0	0	
	520	130	0	47	85	24	60	16.6 <u>5/</u>	16.6 <u>5/</u>	20 <u>4/</u>	
	650	130	0	47	104	37	60	33.0	40.9 <u>7/</u>	20 <u>4/</u>	
	400	150	0	47	85	26	100	0	0	0	
	500	150	0	47	97	28	100	14.0	12.8	20 <u>4/</u>	
	650	150	0	47	112	41	100	33.0	40.9 <u>7/</u>	20 <u>4/</u>	
New Upstream Storage 2.3 million ac-ft at	Auburn	300 <u>9/</u>	115	720	47	250(SPF)	87	1,393	+ <u>11/</u>	+	+
	850,000 ac-ft at Auburn	300	115	720	47	250(SPF)	87	877	+	+	+
	650,000 ac-ft at Auburn, 250-yr only	300	115	720	47	250(SPF)	87	606	0	+	+
	315,000 ac-ft at Auburn, 100-yr only	300	115	385	47	100	35	522	0	+	+
	350,000 ac-ft at Auburn, 85-yr only <u>5/</u>	300	115	320	47	85	24	-	0	+	+
	Existing upstream Storage	100-year only	500	115	0	200	100	35	0	14.3 <u>12/</u>	12.8 <u>12/</u>
85-yr only		450/500	115	0	150/200	85	26	0	14.0 <u>12/</u>	12.8 <u>12/</u>	20 <u>4/</u>
Structural Modification of Folsom	Raise Dam	400+	115	0	47	100+	35	14/	0	0	0
	Lower Spillway <u>13/</u>	400	115	0	47	71	6	<u>14/</u>	0	0	0
		650	115	0	47	111	44	<u>14/</u>	33.0	40.9	20 <u>4/</u>
		650	150	0	47	151	57	<u>14/</u>	33.0	40.9	20 <u>4/</u>
Offstream Storage	Willow Creek	400	115	60	47	70	6	14/	0	0	0
	Out of Basin Div.	400	115	NA	47	100+	35	<u>14/</u>	0	0	0

1/ Level of protection along main-stem American River only.
2/ Does not reflect outputs foregone.
3/ Provided by USBR.
4/ Estimated recreation days lost at Folsom Lake resulting from 600 boats needing to be removed from the water.
5/ Vacant space in upstream reservoirs that can be considered for flood control.
6/ Interpolated by Corps from information provided by USBR.
7/ Would also result in a loss in dependable capacity to CVP of about 6 megawatts.
8/ Assume all levee modification on the landside (outside).
9/ See footnote 6/, Table 13.
10/ Being developed by USBR.
11/ Increase in system accomplishments.
12/ Needs to include influence of water supply and hydropower generation lost at upstream reservoirs, which is not known.
13/ Spillway lowered 15 feet. The capability of actually being able to accomplish this measure is not known.
14/ Cost not estimated.

SACRAMENTO AREA STUDIES - SCHEDULES

SACRAMENTO DISTRICT, CORPS OF ENGINEERS

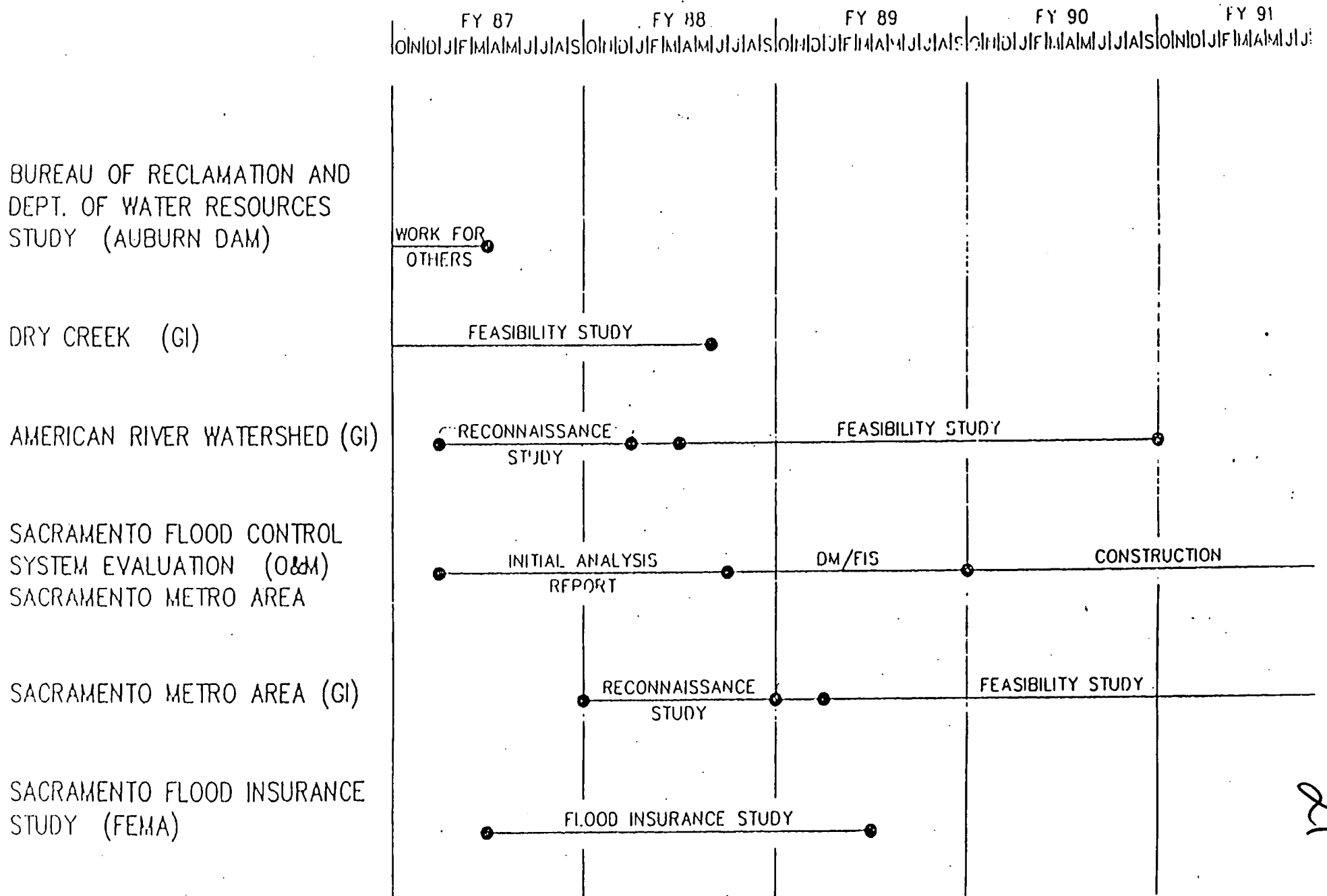


EXHIBIT "C"

21

RESOLUTION No.

Adopted by The Sacramento City Council on date of

A RESOLUTION SUPPORTING COMPLETION OF STUDIES OF THE LOWER AMERICAN RIVER FLOOD CONTROL ALTERNATIVES AND OTHER RELATED STUDIES

WHEREAS, the Corps of Engineers has completed a Special Study on the Lower American River, California, and

WHEREAS, that study establishes that a serious flood threat exists along the Lower American River and that the current level of flood protection is only 63 years, and

WHEREAS, the study indicates that flood protection for the greater Sacramento area is much less than previously believed, and

WHEREAS, The floodplain areas in the greater Sacramento area and along the Lower American River contain an estimated 325,000 people and about \$15 billion in damageable property, and

WHEREAS, the City believes 200-year protection is a minimum desirable for the greater Sacramento area, and

WHEREAS, the existing threat to life and property is significant, and whereas a project needs to be implemented in a minimum period of time, and

WHEREAS, the Special Study indicates upstream storage is the preferable alternative which could provide a minimum of 200-year protection, and

WHEREAS, the Special Study indicates upstream storage at the Auburn site could be implemented in a short period of time

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SACRAMENTO THAT:

1. The City supports a flood control project on the American River which will provide a minimum of 200-year protection and can be constructed within the shortest possible time frame.
2. The City supports completion of benefit studies on the Lower American River alternatives.

3. The City supports completion of other flood control studies affecting the City of Sacramento, namely:
 - a. Dry Creek General Investigation
 - b. Sacramento Flood Control System Evaluation
 - c. Sacramento Metro Area General Investigation

4. The City staff upon completion review the various studies and costs to the City of various alternatives and recommend a course of action to the Council.

MAYOR

ATTEST:

CITY CLERK



21
1B.

DEPARTMENT OF
PUBLIC WORKS

CITY OF SACRAMENTO
CALIFORNIA

CITY HALL
ROOM 207
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OFFICE OF THE DIRECTOR

April 28, 1987

916-449-5283

Transportation and Community Development/
Budget and Finance Committee

MELVIN H. JOHNSON
DIRECTOR
LESLIE M. FRINK
DEPUTY DIRECTOR
REGINALD YOUNG
DEPUTY DIRECTOR

Honorable Members in Session:

RE: Resolution Supporting Additional Flood Protection
for the Lower American River

SUMMARY

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BACKGROUND

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April 28, 1987

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Primary findings of the Special Study are: (1) an area of Sacramento where over 325,000 people live and having a value of flood damageable property of about \$15 billion is estimated to have as low as a 63-year level of flood protection in certain areas, (2) most of the measures reviewed in this study, or their combinations, are capable of achieving increases in the level of flood protection along main-stem American River to about 100 years, and (3) high levels of protection (i.e., about 200 years or better) can be achieved by construction of new storage upstream from Folsom Reservoir.

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April 28, 1987

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CONCLUSION

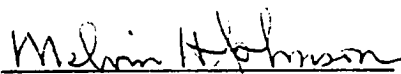
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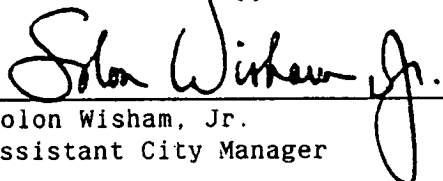
RECOMMENDATION

It is recommended that the attached resolution supporting the additional Army Corps of Engineers studies and stating that the City supports a flood control project which would provide a minimum of 200 year protection to the greater Sacramento area be forwarded to Council for adoption.

Respectfully submitted,


Melvin H. Johnson
Director of Public Works

Recommendation Approved:


Solon Wisham, Jr.
Assistant City Manager

April 28, 1987
All Districts

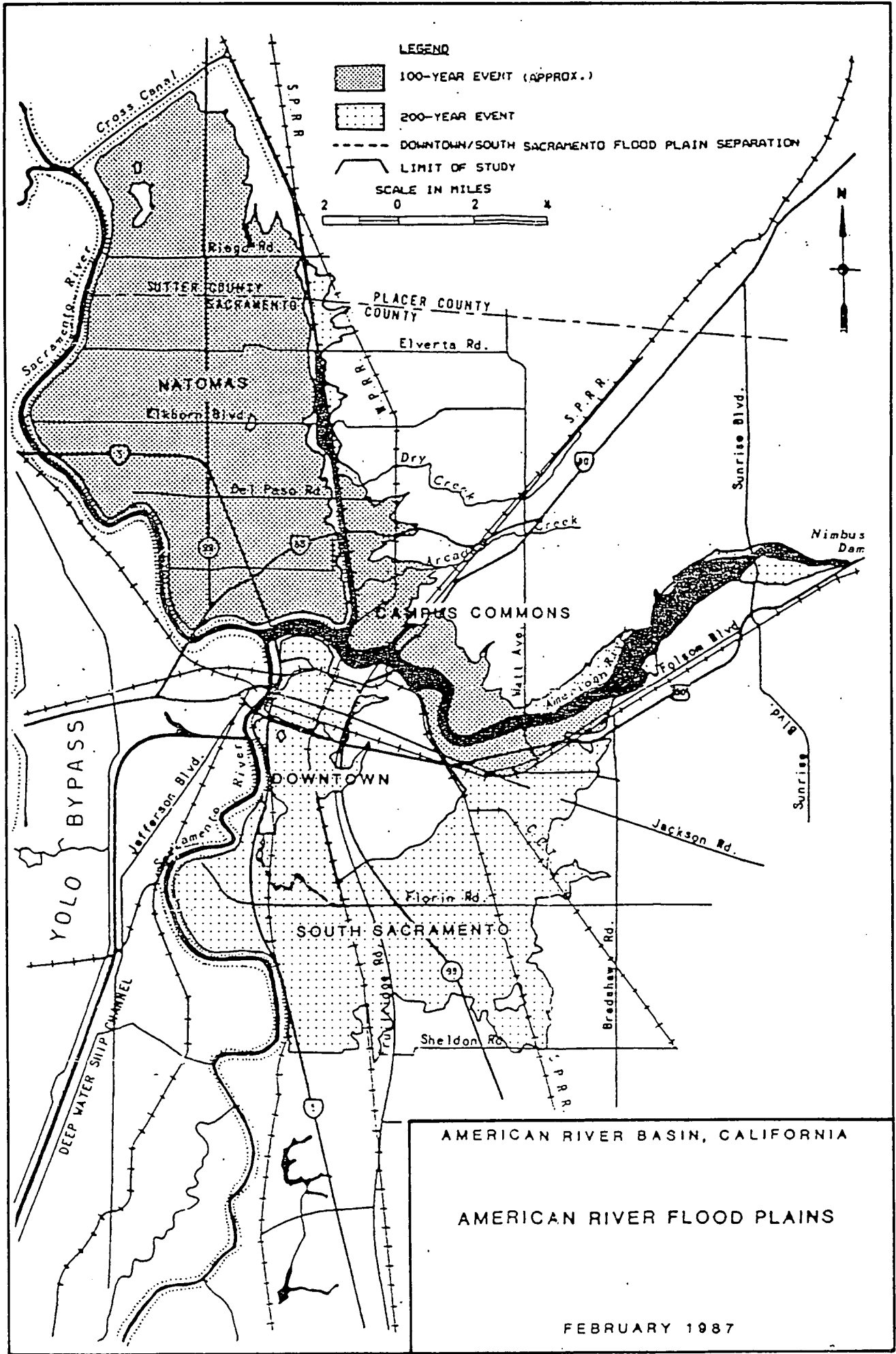


EXHIBIT "A"

MEASURE SUMMARY AND COMPARISON

Measure	Folsom Reservoir		Other Storage		Flood Protection 1/	Flood Control Benefits 2/	First Cost of Construction for Flood Reduction	Outputs Foregone 3/				
	Flood Control Space	Object Release	New Flood Space	Exist-ing	(Return Period - yrs)	(\$ Mil. /yr)	(\$ Mil.)	Water Supply	Hydro-power	Recreation		
	(1,000 ac-ft)	(1,000 cfs)	(1,000 ac-ft)	(1,000 ac-ft)				(1,000 ac-ft /yr)	(GWH /yr)	(1,000 Rec. Days/yr)		
Increase Folsom Flood Space	500	115	0	47	5/	75	14	0	14.0	12.8	20	4/
	590	115	0	47		85	24	0	25.4	29.6	20	4/
	650	115	0	47		94	29	0	33.0	40.9	20	4/
Increase Folsom Objective Release 8/	400	130	0	47		75	14	60	0	0	0	
	520	130	0	47		85	24	60	16.6	16.6	20	4/
	650	130	0	47		104	37	60	33.0	40.9	20	4/
	400	150	0	47		85	26	100	0	0	0	
	500	150	0	47		97	28	100	14.0	12.8	20	4/
	650	150	0	47		112	41	100	33.0	40.9	20	4/
New Upstream Storage 2.3 million ac-ft at												
Auburn	300	115	720	47		250(SPF)	87	1,393	+	+	+	
850,000 ac-ft at												
Auburn	300	115	720	47		250(SPF)	87	877	+	+	+	
650,000 ac-ft at												
Auburn, 250-yr only	300	115	720	47		250(SPF)	87	606	0	+	+	
315,000 ac-ft at												
Auburn, 100-yr only	300	115	385	47		100	35	522	0	+	+	
350,000 ac-ft at												
Auburn, 85-yr only 5/	300	115	320	47		85	24	-	0	+	+	
Existing upstream Storage 100-year only	500	115	0	200		100	35	0	14.3	12.8	20	4/
85-yr only	450/500	115	0	150/200		85	26	0	14.0	12.8	20	4/
Structural Modification of Folsom												
Raise Dam	400+	115	0	47		100+	35	14/	0	0	0	
Lower Spillway 13/	400	115	0	47		71	6	14/	0	0	0	
	650	115	0	47		111	44	14/	33.0	40.9	20	4/
	650	150	0	47		151	57	14/	33.0	40.9	20	4/
Offstream Storage												
Willow Creek	400	115	60	47		70	6	14/	0	0	0	
Out of Basin Div.	400	115	NA	47		100+	35	14/	0	0	0	

- 1/ Level of protection along main-stem American River only.
- 2/ Does not reflect outputs foregone.
- 3/ Provided by USBR.
- 4/ Estimated recreation days lost at Folsom Lake resulting from 600 boats needing to be removed from the water.
- 5/ Vacant space in upstream reservoirs that can be considered for flood control.
- 6/ Interpolated by Corps from information provided by USBR.
- 7/ Would also result in a loss in dependable capacity to CVP of about 6 megawatts.
- 8/ Assume all levee modification on the landside (outside).
- 9/ See footnote 6/, Table 13.
- 10/ Being developed by USBR.
- 11/ Increase in system accomplishments.
- 12/ Needs to include influence of water supply and hydropower generation lost at upstream reservoirs, which is not known.
- 13/ Spillway lowered 15 feet. The capability of actually being able to accomplish this measure is not known.
- 14/ Cost not estimated.

RESOLUTION No.

Adopted by The Sacramento City Council on date of

A RESOLUTION SUPPORTING COMPLETION OF STUDIES OF THE LOWER AMERICAN RIVER FLOOD CONTROL ALTERNATIVES AND OTHER RELATED STUDIES

WHEREAS, the Corps of Engineers has completed a Special Study on the Lower American River, California, and

WHEREAS, that study establishes that a serious flood threat exists along the Lower American River and that the current level of flood protection is only 63 years, and

WHEREAS, the study indicates that flood protection for the greater Sacramento area is much less than previously believed, and

WHEREAS, The floodplain areas in the greater Sacramento area and along the Lower American River contain an estimated 325,000 people and about \$15 billion in damageable property, and

WHEREAS, the City believes 200-year protection is a minimum desirable for the greater Sacramento area, and

WHEREAS, the existing threat to life and property is significant, and whereas a project needs to be implemented in a minimum period of time, and

WHEREAS, the Special Study indicates upstream storage is the preferable alternative which could provide a minimum of 200-year protection, and

WHEREAS, the Special Study indicates upstream storage at the Auburn site could be implemented in a short period of time

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SACRAMENTO THAT:

1. The City supports a flood control project on the American River which will provide a minimum of 200-year protection and can be constructed within the shortest possible time frame.
2. The City supports completion of benefit studies on the Lower American River alternatives.

SACRAMENTO AREA STUDIES - SCHEDULES

SACRAMENTO DISTRICT, CORPS OF ENGINEERS

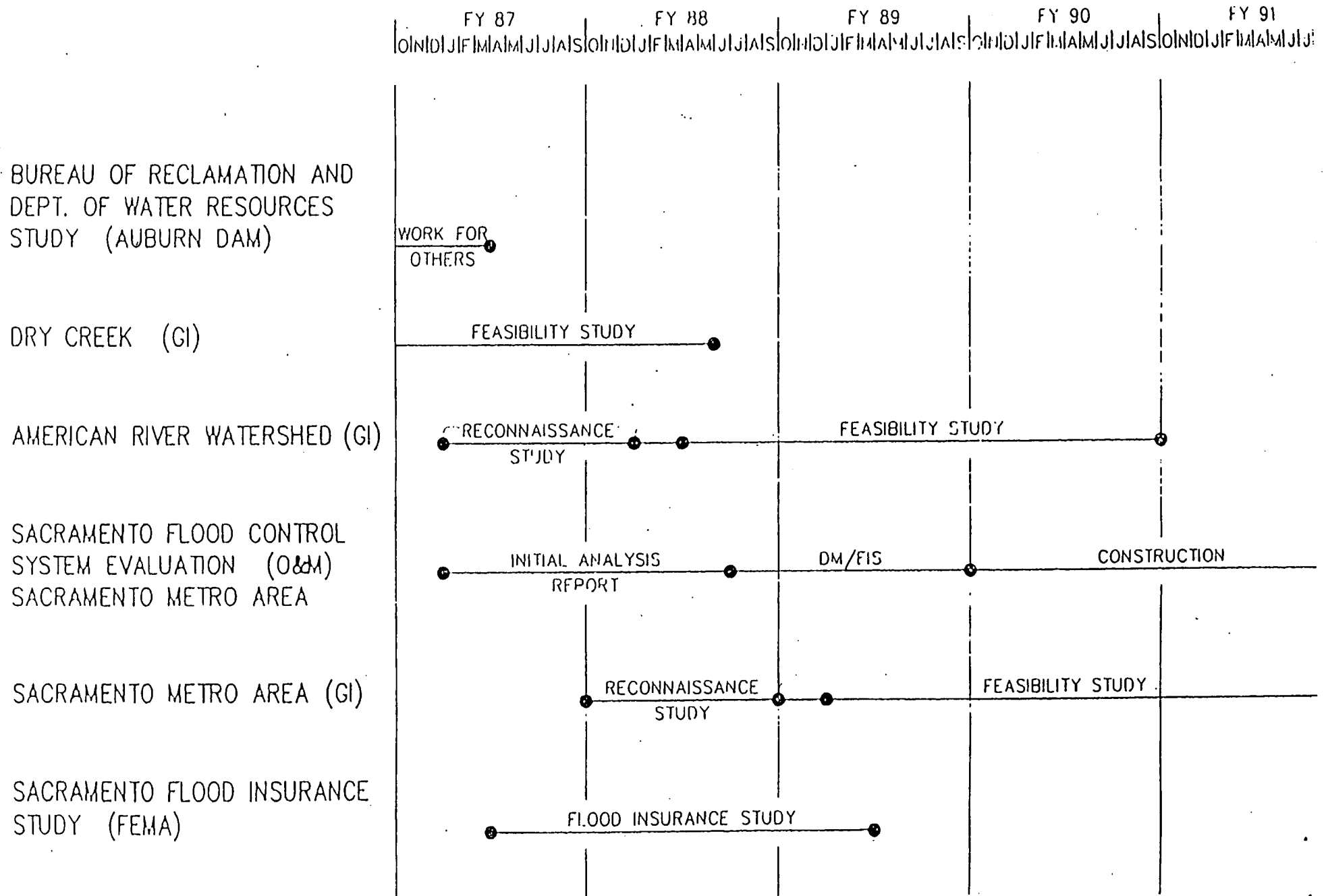


EXHIBIT "C"

3. The City supports completion of other flood control studies affecting the City of Sacramento, namely:
 - a. Dry Creek General Investigation
 - b. Sacramento Flood Control System Evaluation
 - c. Sacramento Metro Area General Investigation
4. The City staff upon completion review the various studies and costs to the City of various alternatives and recommend a course of action to the Council.

MAYOR

ATTEST:

CITY CLERK