STATE OF CALIFORNIA - THE NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

COLORADO RIVER BOARD OF CALIFORNIA
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1068
(818) 500-1625
(818) 543-4685 FAX

August 31, 2009

NOTICE OF REGULAR MEETING OF THE COLORADO RIVER BOARD

NOTICE IS HEREBY GIVEN pursuant to the call of the Chairperson, D. Bart Fisher, Jr., by the undersigned, the Executive Director of the Colorado River Board of California, that a regular meeting of the Board Members is to be held as follows:

Date:	September 9, 2009, Wednesday
Time:	10:00 a.m.
Place:	Vineyard Room Holiday Inn Ontario Airport 2155 East Convention Center Way Ontario, CA 91764-4452 TEL: (909) 212-8000, FAX: (909) 418-6703

The Colorado River Board of California welcomes any comments from members of the public pertaining to items included on this agenda and related topics. Oral comments can be provided at the beginning of each Board meeting; while written comments may be sent to Mr. D. Bart Fisher, Jr., Chairperson, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, California, 91203-1068.

An Executive Session may be held in accordance with provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and in accordance with Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River System waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from other states or the federal government.

Requests for additional information may be directed to: Gerald R. Zimmerman, Executive Director, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1068, or 818-500-1625. A copy of this Notice and Agenda may be found on the Colorado River Board's web page at www.crb.ca.gov.

A copy of the meeting agenda, showing the matters to be considered and transacted, is attached.

Gerald R. Zimmerman
Executive Director

attachment: Agenda

Regular Meeting
COLORADO RIVER BOARD OF CALIFORNIA
September 9, 2009, Wednesday
10:00 a.m.

Vineyard Room
Holiday Inn Ontario Airport
2155 East Convention Center Way
Ontario, CA 91764-4452

AGENDA

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated upon and may be subject to action by the Board. Items may not necessarily be taken up in the order shown.

1. Call to Order

2. Opportunity for the Public to Address the Board (Limited to 5 minutes)
   As required by Government Code, Section 54954.3(a)

3. Administration
   a. Minutes of the Meeting Held August 12, 2009, Consideration and Approval **(Action)** .TAB 1

4. Agency Managers Meetings
   Report from the Executive Director

5. Protection of Existing Rights
   a. Colorado River Water Report(s) ..... TAB 2
      Report from Board Staff on current reservoir storage, reservoir releases, projected water use, forecasted river flows, scheduled deliveries to Mexico, and salinity
   b. State and Local Water Reports ..... TAB 3
      Reports from Board members on current water supply and use conditions
   c. Colorado River Operations ..... TAB 4
      Report(s) from the Executive Director
      - 2010 Annual Operating Plan for Colorado River System Reservoirs (2010 AOP)
      - Reclamation News Release Regarding Public Review of Draft Finding of No Significant Impact for the Yuma Desalting Plant Pilot Study
      - House Subcommittee on Water and Power Letter to the Secretary of the Interior Regarding Potential Solutions for California's Water Crisis
      - Reclamation's Letter to Imperial Irrigation District (IID) Regarding 1ID' s Plan for Creation of Extraordinary Conservation Intentionally Created Surplus (ICS) for Calendar Year 2009
      - Basin States Senators' Letter to Senate Committee on Appropriations and Subcommittee on Energy and Water Development Regarding the Energy and Water Development Appropriations Bill, H.R. 3183

Agenda (continued)

- Water Organizations' Letter to the Secretary of the Interior Requesting At Least $1.2 Billion in the FY 2011 Presidential Budget for the U.S. Bureau of Reclamation's Water and Related Resources Programs

d. Basin States Discussions ..... TAB 5

Report(s) from the Executive Director

- Board Letter to International Boundary and Water Commission Regarding the Transboundary Aquifer Program
- Utah/Nevada Agreement on the Allocation and Management of the Snake Valley Groundwater System

e. Colorado River Environmental Issues ..... TAB 6

Report(s) from the Board Staff

- Secretary of the Interior's Letter to the Glen Canyon Dam Adaptive Management Work Group Regarding the Appointment of Assistant Secretary for Water and Science, Ms. Anne Castle, as Secretary's Designee

6. Water Quality

a. Colorado River Basin Salinity Control ..... TAB 7

- Secretary of the Interior's Announcing $11.1 Million in grants through the Colorado River Basinwide Salinity Control Program

7. Presentation on the Colorado River Basin Climate Change and Global Warming ..... TAB 8
- Mr. Brad Udall

8. Executive Session

An Executive Session may be held by the Board pursuant to provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River system waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from other states or the federal government.

9. Other Business

a. Next Board Meeting: Regular Meeting

October 14, 2009, Wednesday, starting 10:00 a.m.
Holiday Inn Ontario Airport
2155 East Convention Center Way
Ontario, CA 91764-4452
TEL: (909) 212-8000, FAX: (909) 418-6703

Ia. - Approval August 12, 2009, Board Meeting Minutes

Minutes of Regular Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Wednesday, August 12, 2009

A Regular Meeting of the Colorado River Board of California (Board) was held in the Vineyard Room, at the Holiday Inn Ontario Airport, at 2155 E. Convention Center Way, Ontario, California, Wednesday, August 12, 2009.

Board Members and Alternate Present

Dana B. Fisher, Jr., Chairman
Terese Maria Ghio
W. D. 'Bill' Knutson
John W. McFadden
James B. McDaniel
John Pierre Menvielle
Bill D. Wright

Jeanine Jones, Designee
Department of Water Resources

Board Members Absent

John V. Foley
Henry Merle Kuiper

David Elms, Designee
Department of Fish and Game

Others Present

Steven B. Abbott
Celia A Brewer
John P. Carter
Dave Fogerson
William J. Hasencamp
Michael L. King
Russell Kitahara
Thomas Levy
Jay W. Malinowski
Jan P. Matusak
Halla Razak
Steven B. Robbins
Jack Seiler
Ed W. Smith
Mark Stuart
William H. Swan
Joseph A. Vanderhorst

Abbas Amirteymoori
J.C. Jay Chen
Lindia Y. Liu
Mark Van Vlack
Gerald R. Zimmerman

CALL TO ORDER

Chairman Fisher announced the presence of a quorum and called the meeting to order at 10:07 a.m.

OPPORTUNITY FOR THE PUBLIC TO ADDRESS THE BOARD

Chairman Fisher asked if there was anyone in the audience who wanted to address the Board on items on the agenda or matters related to the Board. Hearing none, Chairman Fisher moved to the next agenda item.

ADMINISTRATION

Approval of Minutes

Chairman Fisher requested the approval of the July 15th meeting minutes. Mr. Knutson moved the July 15th minutes be approved. Mr. Wright seconded the motion. Unanimously carried, the Board approved the July 15th meeting minutes.

AGENCY MANAGERS MEETING

Mr. Zimmerman reported that the Agency Managers had not met since the July 15th Board meeting.

PROTECTION OF EXISTING RIGHTS

Colorado River Water Report

Mr. Amirteymoori reported that as of August 2nd, Lake Powell storage was about 16.1 million acre-feet (maf), or 66 percent of capacity. The water surface elevation was 3,641.0 feet above sea level. Lake Mead storage was 10.99 maf, or 42 percent of capacity. The water elevation was 1,094.3 feet above sea level. Total System storage was 35.48 maf, or 60 percent of capacity, whereas, this time last year the Total System storage was 34.95 maf. Total System storage this year is about 530,000 acre-feet greater than this time last year.

Mr. Amirteymoori reported that precipitation from October 1st to August 3rd, was 103 percent of normal. The snowpack in the headwaters regions has largely melted. The projected April through July unregulated inflow into Lake Powell was 7.81 maf, or 98 percent of normal. The projected water year inflow (October 1st through September 30th) was 11.048 maf, or 92 percent of normal.

Mr. Amirteymoori added that Reclamation's projected consumptive use (CU) for the State of Nevada is slightly under its entitlement of 300,000 acre-feet (292,000 acre-feet); and for Arizona, the CU is projected to be slightly under its basic entitlement of 2.8 maf (2.700 maf); and for California the CU is also projected to be slightly under its basic apportionment of 4.4 maf (4.303 maf). Currently the total projected CU in the Lower Basin is expected to be about 7.3 maf.

DRAFT

State and Local Water Reports

Mr. Mark Stuart, of the California Department of Water Resources (DWR), reported that as of August 1, 2009 surface water storage in the State Water Project (SWP) was about 47 percent of capacity, about 200,000 acre-feet over last year. Water storage in Lake Oroville was about 1.6 maf, about 45 percent of capacity. Projected deliveries from the SWP are currently 40 percent of Table A Entitlements.

Ms. Jeanine Jones, of the DWR, added that there was an accident at Lake Oroville involving one of the valves that has significant operational implications for next year. Combined with the need to conserve cold water in the reservoir for fishery purposes, she indicates that delivery capabilities next year will be reduced. The reduction has not been quantified.

Mr. Bill Wright, of The Metropolitan Water District of Southern California (MWD), reported that as of August 1st, storage in the main southern California reservoirs was about 535,000 acre-feet, or 52 percent of capacity. Diamond Valley Lake was about 349,000 acre-feet, or 43 percent of capacity. Lake Mathews was up about 15,000 acre-feet from last month, holding about 148,000 acre-feet, or 81 percent of capacity. Lake Skinner was 38,000 acre-feet, or 88 percent of capacity. Operationally, MWD wants at least 400,000 acre-feet held in Diamond Valley Lake for emergency storage. Much of the MWD system can be served by gravity flow. Mr. Wright mentioned that the boat ramps at Diamond Valley Lake are being extended down to the lower water surface elevation.

Mr. James McDaniel, of the Los Angeles Department of Water and Power (DWP), said that there was nothing to report regarding the climate conditions of the Los Angeles Aqueduct System. He reported that the DWP Commissioners voted at the last meeting to cap the amount of water going to Owens Lake at 95,000 acre-feet. The DWP has also explored waterless methods to control dust at Owens Valley Lake and development of a solar farm to generate electricity.

Colorado River Operations

Inadvertent Overrun Policy

Mr. Zimmerman reported that Reclamation has been working on development of the Inadvertent Overrun Policy (IOP) procedures. Reclamation is currently establishing a schedule to complete drafting the IOP procedures this fall.

House of Representatives Bill H.R. 3481: Lower Colorado River Protection Act

Mr. Zimmerman reported that Congressman Grijalva of Arizona introduced the Lower Colorado River Protection Act on August 11th, H.R. 3481. Within the legislation the Lower Colorado River is defined as the Colorado River below Lee Ferry. The purpose of the legislation is to restore and maintain the ecosystems and water quality of the Colorado River. The legislation provides for the development and implementation of a comprehensive plan for the prevention and elimination of pollution and the maintenance of a healthy ecosystem.

Specifically the legislation seeks to:

- Empower Region 9 of the Environmental Protection Agency to take the lead in the effort;
- Establish the Lower Colorado River Management Conference, a 37 plus member body;
- Charge the Conference to develop a pollution elimination and restoration plan;
- Address both point and non-point pollution sources;
- Establish a grant program that is cost-shared at 45 percent;
- Allow funding for projects that address pollution from the Upper Basin that may pose a threat to the Lower Basin;
- State that the plan must be developed within two years;
- Require annual reports to Congress beginning on December 31, 2011; and
- Authorize the appropriation of $20 million dollars.

Ms. Ghio expressed concern that the proposed legislation could duplicate current efforts and conflict with current programs and operations. Ms. Jones added that there was language in the legislation to cooperate with other federal agencies but no mention of cooperation with local and state agencies, other than the proposed conference identified in the legislation.

Mr. Zimmerman reported that the Board staff will review H.R. 3481 and coordinate with the California agencies and others on an appropriate response. A more detailed analysis of the legislation and staff recommendations will be available at the September Board meeting.

Letters of Concern Associated with Glen Canyon Dam Operations

As discussed at previous Board meeting, Mr. Zimmerman reported that the National Park Service (NPS), in response to complaints from concessionaires at Lake Mead about the low water surface elevations at Lake Mead, had requested that Reclamation take an increased role in Colorado River operations affecting Lake Mead water surface levels. Mr. Zimmerman reported that language in the Committee report associated with the Energy and Water Development Appropriations Bill, H.R. 3183 suggested that:

- The procedural requirements of the Grand Canyon Protection Act and Adaptive Management Work Group's charter have been disregarded;
- Federal responsibilities have been neglected and public transparency compromised; and
- Reclamation is encouraged, in cooperation and "concurrence" with the NPS, to revisit the operating criteria for Glen Canyon Dam.

Mr. Zimmerman reported that in response to the language of concern in the committee report; letters were written by the Colorado River Energy Distributers Association (CREDA) and the Basin states. On July 15th, CREDA sent a letter to Arizona U.S. Senator Jon Kyl. On July 27th, the Basin states sent letters to both Secretary Salazar and Senator Kyl, with copies to each of the Basin's senators. Each of the letters expressed concerns about the committee report language. The letters supported the Glen Canyon Adaptive Management process as providing the appropriate venue addressing stakeholder recommendations to the

Secretary of the Interior, and that the role and responsibilities of the NPS should not be expanded with less than complete information and a full discussion among all of the stakeholders and affected parties.

Mr. Zimmerman also reported that the letters to Senator Kyl requested that he works to ensure that recommendations contained within the House committee report do not become part of the final House and Senate report associated with the Fiscal Year 2010 Energy and Water Development Appropriations legislation. The Basin states' letter to Secretary Salazar provided extensive and detailed background information regarding management of the water resources and reservoir system within the Colorado River Basin.

Metropolitan Water District of Southern California's Letter to Central Arizona Water Conservation District

Mr. Zimmerman reported that on August 4th, MWD notified the Central Arizona Water Conservation District (CAWCD) of its intent to work with CAWCD in the recovery of 5,700 acre-feet of interstate underground storage credits projected to remain in MWD's account in 2010. The 5,700 acre-feet is the amount determined to be remaining in MWD's account after removal of 30,000 acre-feet from its account during 2009.

Basin States Discussion

Workshop on the Draft of Conceptual Framework for U.S.-Mexico Discussions on Colorado River Cooperative Actions

Mr. Zimmerman reported that a two-day workshop was held on August 4th and 5th with the Basin states, Reclamation, the IBWC, and federal and state representatives from Mexico. The purpose of the workshop was to further discuss the Basin States' Discussion Document Concerning Binational Water Management, the legal and policy framework to allow storage of Mexico's water in U.S. reservoirs and to address Colorado River operations under low reservoir conditions.

Mr. Zimmerman reported on the presentations that were made by the U.S. and Mexico representatives. For example, Mexico provided specific proposals regarding:

- Creation and use of 'Intentionally Created Mexican Apportionment' (ICMA);
- Environmental needs in Mexico and how the water for those needs should be shared;
- Binational participation in water use conservation projects in Mexico; and
- Joint investment in desalination projects in Mexico.

Mr. Zimmerman reported that Mexico's presentation proposed that ICMA could be created by Mexico and used under all reservoir conditions; however, in the discussions Mexico did recognize that there may be critical elevations in Lake Mead when the release of ICMA could be restricted, e.g., when the water surface elevation in Lake Mead was at 1,025 feet. Mexico was willing to accept the same evaporation charge of three percent of the annual volume stored, as the 'Intentionally Created Surplus' (ICS) stored by agencies within the U.S. Mexico proposed the storage of ICMA volumes up to 400,000 acre-feet per year, a

cumulative maximum of 1.5 maf, and annual withdrawal of up to 400,000 acre-feet per year. During a spill situation, due to flood control release, Mexico's proposed that up to 50 percent of the ICMA credits could be lost and that this release of water would be credited as Mexico's contribution to environmental use, such as the proposed quadrennial pulse flow. Mexico does not want a maximum term for its ICMA. Additionally, Mexico did not mention the five-percent system contribution that has been assessed to ICS created by U.S. entities.

There was some discussion about how U.S. entities must go through a process to prove how water is conserved before they can create ICS credits; however for Mexico this verification may not be required; but instead would be a reduction in the delivery of water at the Northerly International Boundary or Southerly International Boundary and included in Mexico's water delivery schedule.

There was also some discussion as to how the binational process began. During the process of developing the Lower Basin Shortage criteria, it was suggested that the tools that were being developed might benefit both countries and may even be needed in the event of an extended or severe drought. The IBWC efforts were made to explore the interest and possibility of cooperating across the border to better manage the available water supplies for both countries and to address potential water augmentation projects.

Mr. Zimmerman reported that Mexico's proposed environmental needs along the Colorado River corridor were:

- A base flow of 2-4 cubic meters per second (cms), (70-140 cubic feet per second (cfs)), or 50-100 KAF per year, below Morelos Dam;
- A pulse flow every four years of 20-40 cms (700-1,400 cfs) for three months, or 31-62 KAF per year for a release volume of 125-248 KAF during the three month period, every four years; and
- 106,000 acres of habitat restoration, 24,710 acres in the Limitrophe section (between Mexico and the State of Arizona)

Mr. Zimmerman reported that Mexico's presentation assumed that the Non-Governmental Organizations (NGO's) would contribute 51,000 acre-feet toward the base flow. Mexico and the U.S. would each contribute 25,500 acre-feet per year for the proposed pulse flow. Mexico and the U.S. would share in the restoration of the limitrophe section (24,710 acres). Ms. Razak, of the San Diego County Water Authority, added that there is a water banking system in Mexico where farmers can easily barter their water, if the farmer fallows some acreage for the season. This is how the NGO's have been able to secure some of the water for environmental purposes.

Mr. Zimmerman reported that regarding conservation projects in Mexico, Mexico's assumptions were:

- Investments in the conservation projects would be cost-shared on a 50/50 basis;
- Potential conservation identified was approximately 104,700 acre-feet;
- The U.S would receive conserved water for a specific time period; and
- Part of the U.S. water must go to Mexico as mitigation to address environmental impacts;
- Mexico proposes receiving 75 percent of the conserved water.

Mr. Zimmerman reported, regarding joint-investment in desalinization projects in Mexico, desalted water would be non-system water and not under the 1944 Mexican Water Treaty. Mexico presented the example of a project in the Tijuana area with a total volume of 56,000 acre-feet, where Mexico would receive 80 percent and San Diego 20 percent of the desalted product water. Provided the cooperative agreements can be attained, then Mexico could store 45 percent of its desalted water in the Colorado River system reservoirs with the remainder to supply municipal and industrial use in Mexico.

Mr. Zimmerman reported that U.S. representatives made presentations on the criteria for Mexico to store ICMA in the U.S., current operations of the reservoir system in the United States, and shortage management strategies used in the United States. Mr. Zimmerman added, that both countries seemed to reach agreement that future discussions are needed to focus on conservation projects in Mexico, joint investment in desalinization projects, ICMA, and environmental water use needs and shortage management.

Finally, Mr. Zimmerman reported that U.S. interests intend to respond to Mexico's specific proposals at the next binational meeting, scheduled to be held in early October, probably in Tecate, Mexico. The U.S. interests including the Technical Group and the Basin states principals will be meeting several times prior to that meeting. As proposals come out of these meetings, they will be brought before the Board for its review and consideration.

Basin States Study Proposal

Mr. Zimmerman reported that the Basin study proposal is being considered by the Reclamation-wide review committee. The committee is reviewing all of the proposals that were submitted and is expected to announce the selected proposals in late August. If the Basin states proposal is selected, a detailed plan of study will be developed that identifies the specific tasks to be completed during the study and the total costs. The cost-sharing agreements between Reclamation and the Basin states, and among the Basin states, will be prepared and executed. The board will be requested to review and approve the final plan of study and cost-sharing agreements when they become available.

Colorado River Environmental Issues

Status of the Grand Canyon Trust v. United States Lawsuit

Mr. Zimmerman reported that there was nothing new to report regarding the status of the *Grand Canyon Trust v. United States Bureau of Reclamation.*

OTHER BUSINESS

Next Board Meeting

Chairman Fisher announced that the next meeting of the Colorado River Board will be held on Wednesday, September 9, 2009 at 10:00 a.m., at the Holiday Inn Ontario Airport, 2155 East Convention Center Way, Ontario, California.

There being no further items to be brought before the Board, Chairman Fisher asked for a motion to adjourn. Mr. Knutson moved the Board meeting be adjourned. Mr. McDaniel seconded the motion, and with unanimous approval, the Board meeting was adjourned at 11:33 a.m. on August 12, 2009.

Gerald R. Zimmerman
Executive Director

DRAFT

5.a. - Colorado River Water Reports

SUMMARY WATER REPORT
COLORADO RIVER BASIN
September 1, 2009

RESERVOIR STORAGE (as of August 31)	MAF	ELEV. IN FEET	% of Capacity	August 5, 2009 MAF	ELEV. IN FEET	% of Capacity
Lake Powell	15.710	3,637.5	**65**	16.116	3,641.0	**66**
Flaming Gorge	3.448	6,032.5	**92**	3.477	6,033.3	**93**
Navajo	1.347	6,060.0	**79**	1.419	6,065.4	**84**
Lake Mead	10.938	1,093.7	**42**	10.990	1,094.3	**42**
Lake Mohave	1.669	641.9	**92**	1.646	641.0	**91**
Lake Havasu	0.584	448.2	**94**	0.582	448.1	**94**
Total System Storage	34.839		**58**	35.476		**60**
System Storage Last Year	34.521		**58**	34.953		**59**

		August 5, 2009
WY 2009 Precipitation (Basin Weighted Avg) 10/01/08 through 8/31/09	**99 percent (30.1")**	**103 percent (29.3")**
WY 2009 Snowpack Water Equivalent (Basin Weighted Avg) on day of 8/31/09	**NA (NA)**	**NA (NA)**
(Above two values based on average of data from 116 sites.)		**Observed**
		July 1, 2009
August 17, 2009 Final Forecasted Unregulated Lake Powell Inflow	MAF % of Normal	MAF % of Avg.
2009 April through July unregulated inflow forecast	7.814 **99**	7.813 **98**
2009 Water Year forecast	10.974 **91**	11.048 **92**

USBR Forecasted Year-End 2009 and 2008 Consum. Use, September 1, 2009 a./ MAF

			2009 Diversion	- Return	Net	2008
Nevada (Estimated Total)			0.499	0.209	0.290	0.269
Arizona (Total)			3.631	0.848	2.783	2.777
CAP Total					1.581	1.562
Az. Water Banking Authority					*0.134*	*0.214*
OTHERS					1.202	1.216
California (Total) b.			4.932	0.676	4.256	4.502
MWD					0.916	0.906
3.85 Agriculture	Total	Conserved			Forecasted	Estimated
IID c.	2.894	-0.263			2.631	2.825
CVWD d.	0.337	-0.030			0.307	0.299
PVID	0.312	0			0.312	0.376
YPRD	0.037	0			0.037	0.045
Island e.	0.006	0			0.006	0.007
Total Ag.	*3.586*	*-0.293*			*3.293*	*3.552*
Others					0.047	0.044
PVID-MWD fallowing to storage					0	0
Arizona, California, and Nevada Total f.			**9.062**	**1.733**	**7.329**	**7.549**

a. Incorporates July USGS monthly data and 75 daily reporting stations which may be revised after provisional data reports are distributed by USGS. Use to date estimated for users reporting monthly and annually.

b. California 2009 basic use apportionment of 4.4 MAF has been adjusted for approved paybacks for 01-02 obligations (3,751 AF), payback of Inadvertent Overrun and Payback Policy overruns (1,349 AF), (25,000 AF) ICS by IID, MWD recovery of interstate underground storage from Arizona (30,000 AF). Plus delivery of System Efficiency ICS (34,000 AF), and 2,750 Af Drop 2 Construction Water.

c. 0.105 MAF conserved by IID-MWD Agreement as amended in 2007: 90,000 AF for SDCWA under the IID-SDCWA Transfer Agreement as amended, 60,000 AF of which is being diverted by MWD; 8,000 AF for CVWD under the IID-CVWD Acquisition Agreement, 59,670 AF from the All-American Canal Lining Project.

d. 26,000 acre-feet conserved by the Coachella Canal Lining Project and 3,751 AF of payback.

e. Includes estimated amount of 6,136 acre-feet of disputed uses by Yuma Island pumpers and 0 acre-feet by Yuma Project Ranch 5 being charged by USBR to Priority 2.

f. Includes unmeasured returns based on estimated consumptive use diversion ratios by user from studies provided by Arizona Dept. of Water Resources, Colorado River Board of California, and Reclamation.

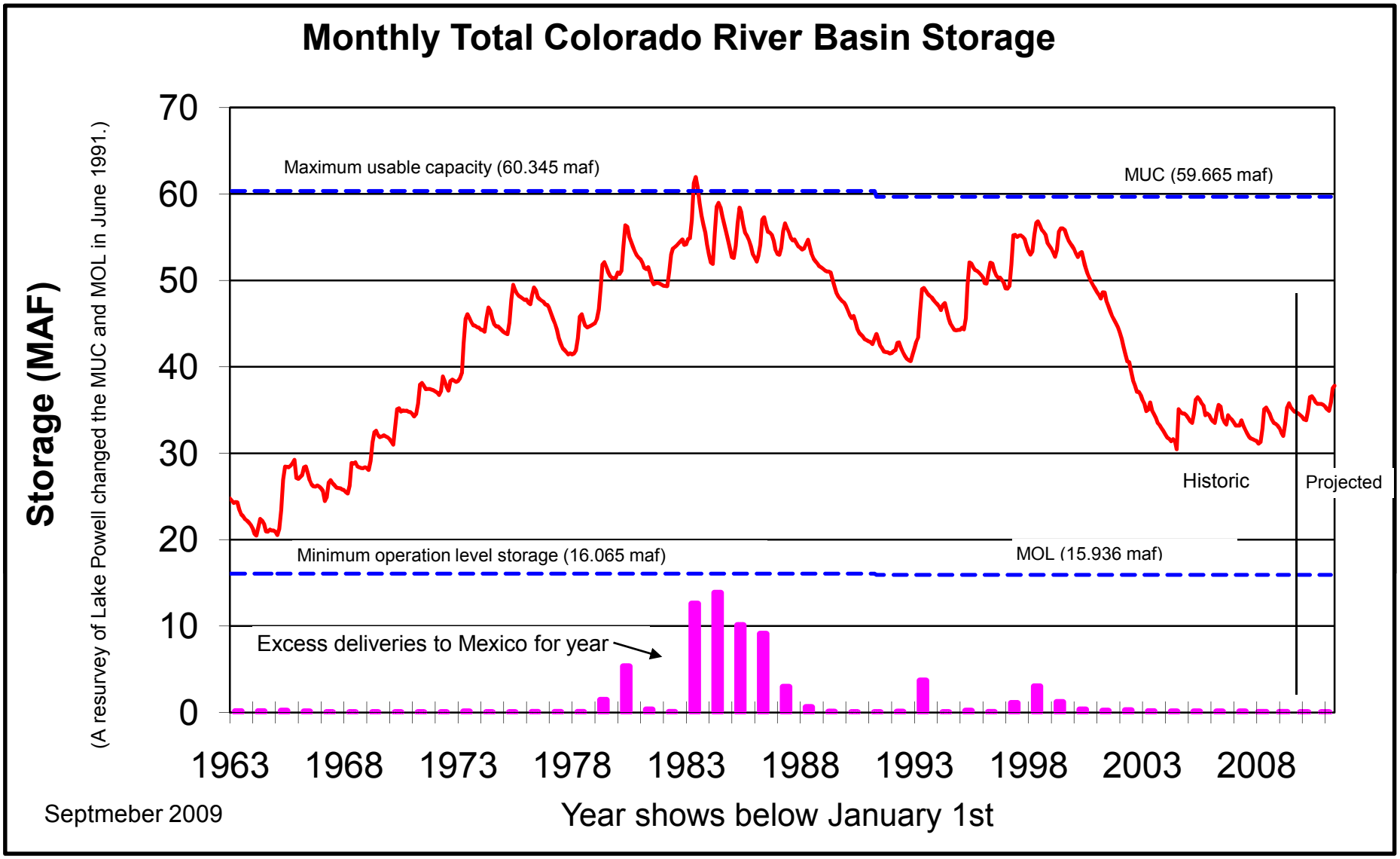
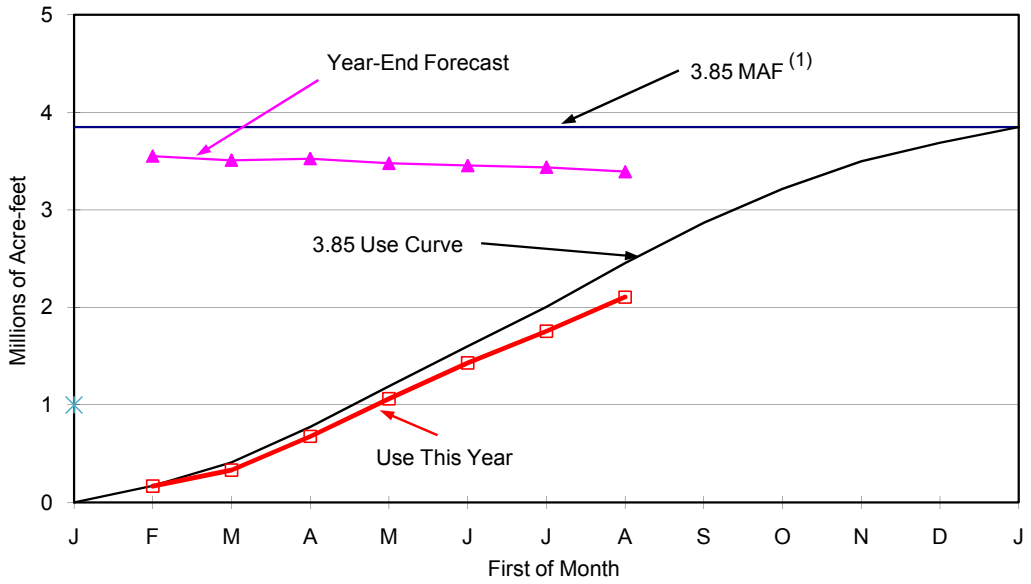

Monthly Total Colorado River Basin Storage
Storage (MAF)
(A resurvey of Lake Powell changed the MUC and MOL in June 1991.)
70
60
50
40
30
20
10
0
Maximum usable capacity (60.345 maf)
MUC (59.665 maf)
Historic
Projected
Minimum operation level storage (16.065 maf)
MOL (15.936 maf)
Excess deliveries to Mexico for year
1963
1968
1973
1978
1983
1988
1993
1998
2003
2008
Septmeber 2009
Year shows below January 1st

FIGURE 1
SEPTEMBER 1, 2009 FORECAST YEAR-END COLORADO RIVER WATER USE BY THE CALIFORNIA AGRICULTURAL AGENCIES



Forecast of Colorado River Water Use
by the California Agricultural Agencies
(Millions of Acre-feet)

Month	Use as of First of Month	Forecast of Year End Use	Forecast of Unused Water (1)
Jan	0.000	--------	--------
Feb	0.168	3.551	0.019
Mar	0.332	3.509	0.061
Apr	0.678	3.526	0.044
May	1.064	3.478	0.092
Jun	1.430	3.454	0.116
Jul	1.755	3.437	0.133
Aug	2.106	3.392	0.178
Sep			
Oct			
Nov			
Dec			
Jan			

(1) The forecast of unused water is based on the availability of 3.600 MAF under the first three priorities of the water delivery contracts. This accounts for the 85,000 af of conserved water available to MWD under the 1988 IID-MWD Conservation agreement and the 1989 IID-MWD-CVWD-PVID Agreement as amended; 60,000 af of conserved water available to SDCWA under the IID-SDCWA Transfer agreement as amended being diverted by MWD; 26,000 af of conserved water available to SDCWA and MWD as a result of the Coachella Canal Lining Project; 59,670 af of water projected to be available toSDCWA and MWD as a result of the All-American Canal Lining Project; 14,500 af ofwater IID and CVWD are forbearing to permit the Secretary of the Interior to satisfy aportion of Indian and miscellaneous present perfected rights use; 3,751 af of California Agricultural water paybacks; and 25,000 af of Intentionally Created Surplus by IID 2007. As USBR is charging disputed uses by Yuma islandpumpers to Priority 2, the amount of unused water has been reduced by those uses -6,136 af. The CRB does not concur wirh USBR's viewpoint on this matter.

COLORADO RIVER BOARD OF CALIFORNIA

August 28, 2009

COLORADO RIVER WATER REPORT

The following report summarizes data obtained from provisional reports of the U.S. Geological Survey, U.S. Bureau of Reclamation, International Boundary and Water Commission, and Imperial Irrigation District.

I. Active Surface Storage in Reservoirs at end of Month (Thousand Acre-feet).

July 2009

Upper Basin	Storage	Elevation in feet	`)/0 of Capacity	Change During Month	Change from 2008
Lake Powell	16,138	3,641.1	66%	77	947
Flaming Gorge	3,478	6,033.3	93%	136	412
Fontenelle	340	6,505.4	99%	10	10
Navajo	1,422	6,065.7	84%	-57	53
Blue Mesa	785	7,514.5	95%	-41	23
Morrow Point	113	7,155.3	97%	-2	2
Crystal	14	6,743.2	79%	-3	-2
Sub-total	22,291		72%	120	1,446
Lower Basin					
Lake Mead	10,978	1,094.2	42%	-93	-912
Lake Mohave	1,654	641.4	91%	-15	-12
Lake Havasu	582	448.1	94%	-8	5
Sub-total	13,214		46%	-116	-919
Upper and Lower BasinTotal	35,506		60%	5	528

1/ Figures shown do not include reservoir dead storage.

2/ Storage above minimum operation level is 35,506 - 15,936 = 19,570 thousand acre-feet. Minimum operation level (15,936 thousand acre-feet) is defined as the sum of active content at minimum power pool plus minimum active content required to make surface diversions at Lake Havasu and Navajo Reservoir.

II. Upper Basin Discharge (Acre-feet).

Station	Meas. Flow July 2009	Cumulative Flow October thru July	Meas. Flow Adjusted for CRSP Surface Storage Changes: July 2009	Meas. Flow Adjusted for CRSP Surface Storage Changes: `)/0 of July 87- year average (1922-2008 water years)
Green River at Green River, Utah	323,800	3,291,800	459,200	106%
Colorado River near Cisco, Utah	581,300	5,098,500	535,300	103%
San Juan River near Bluff, Utah	50,800	856,800	-6,500	_5%
At Lee Ferry (Compact Point)	829,600	6,963,000	938,900	82%

III. Lower Basin Discharge (Acre-feet).

Station	July 2009	Cumulative Flow October thru July
Below Hoover Dam	839,900	7,836,400
Below Davis Dam	924,700	8,120,900
Below Parker Dam	676,900	5,385,500
Above Imperial Dam	520,600	4,519,100

IV. Consumptive Use of Lower Colorado River Mainstream Water (Acre-feet).

July, 2009

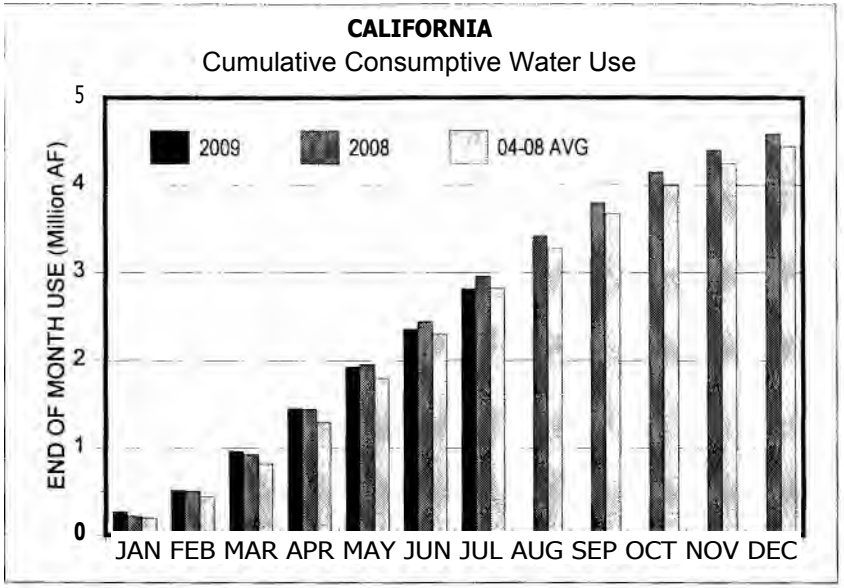
California Users	Diversion	Return	Consumptive Use	Change in Cons.Use From Jul. 2008	Cumulative Cons. Use January thru July	Change from prey. Jan. thru Jul.	12 Months thru July
Palo Verde Irrig. Dist.	89,230	38,560	50,670	-11,720	235,670	-55,230	370,800
Yuma Proj. (Res. Div.)'	4,040	2,420	1,620	-1,810	25,300	-10,320	36,590
Imperial Irrig. Dist. 2/	261,910		261,910	-54,150	1,649,760	-213,490	2,606,760
Salton Sea Mitigation	1,560		1,560	570	17,310	7,060	33,110
USBR SaltonSea Operations	0		0	0	0	0	0
‖D plus Salton Sea Mitigation	263,470		263,470	-53,580	1,667,070	-206,430	2,639,870
Coachella Val. Wat. Dist. L	35,300		35,300	1,380	177,200	4,150	302,680
Subtotal	392,040	40,980	351,060	-65,730	2,105,240	-267,830	3,349,940
Fort Mojave In Res. ci	4,300		4,300	0	14,820	0	24,760
Cal. Miscellaneous LI/	5,300		5,300	0	21,250	0	34,000
Metropolitan Water Dist.	99,980	430	99,550	12,850	675,760	127,300	1,035,530
Total	501,620	41,410	460,210	-52,880	2,817,070	-140,530	4,444,230
Arizona Users							
Central Arizona Project	74,920		74,920	-3,160	1,019,790	-14,510	1,547,120
Colorado River Ind. Res.	74,460	18,660	55,800	-7,620	302,630	11,760	444,260
Gila Gravity Main Canal	85,190	20,060	65,130	640	332,830	-17,060	507,980
Yuma Proj. (Valley Div.)	29,130	11,890	17,240	-240	135,480	-23,250	202,690
Fort Mojave Ind. Res. 2/	8,450		8,450	0	49,280	0	85,130
Havasu Nat. Wildlife Ref.	3,760	0	3,760	-500	27,930	-1,820	35,560
Arizona Miscellaneous	11,320		11,320	0	52,040	0	85,000
Total	287,230	50,610	236,620	-10,880	1,919,980	-44,880	2,907,740
Nevada Users							
From Lake Mead	46,470	9,290	37,180	-2,180	159,630	-6,750	289,710
Mohave Steam Plant	40		40	-10	280	0	480
Total	46,510	9,290	37,220	-2,190	159,910	-6,750	290,190
Total Consumptive Use (Ariz., Cal., Nev.)	835,360	101,310	734,050	-65,950	4,896,960	-192,160	7,642,160

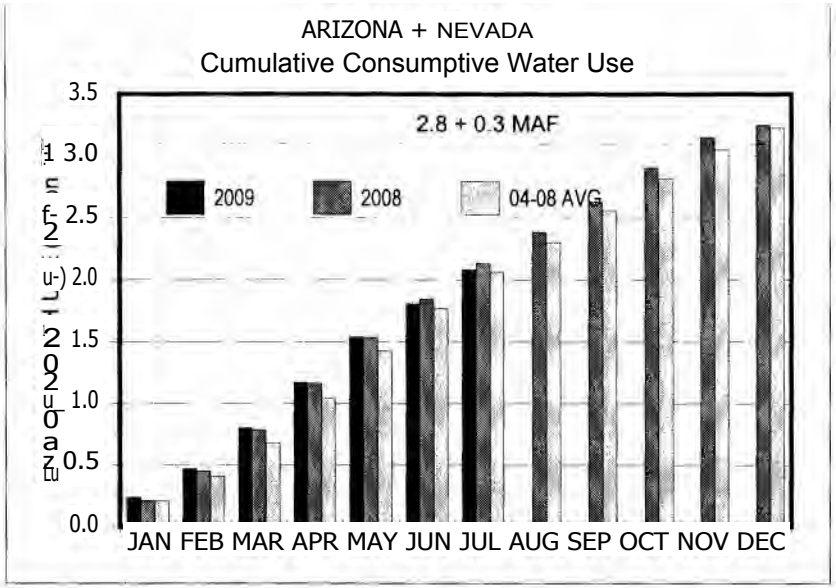
a. Based on measurements below Pilot Knob (assumed to be equal to USBR Article V data after credit is given for unmeasured California return flows between Imperial Dam and Pilot Knob). In addition, Salton Sea mitigation is not part of IID's use but is included in IID total diversion. IID diversions for April are not available

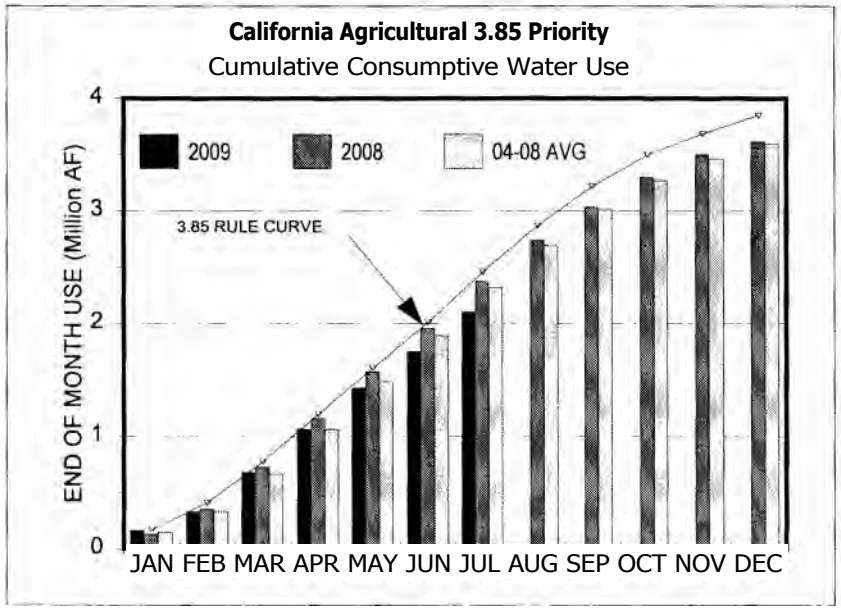
b. Return flow estimates based on averages of past returns as calculated by USBR for Article V data.

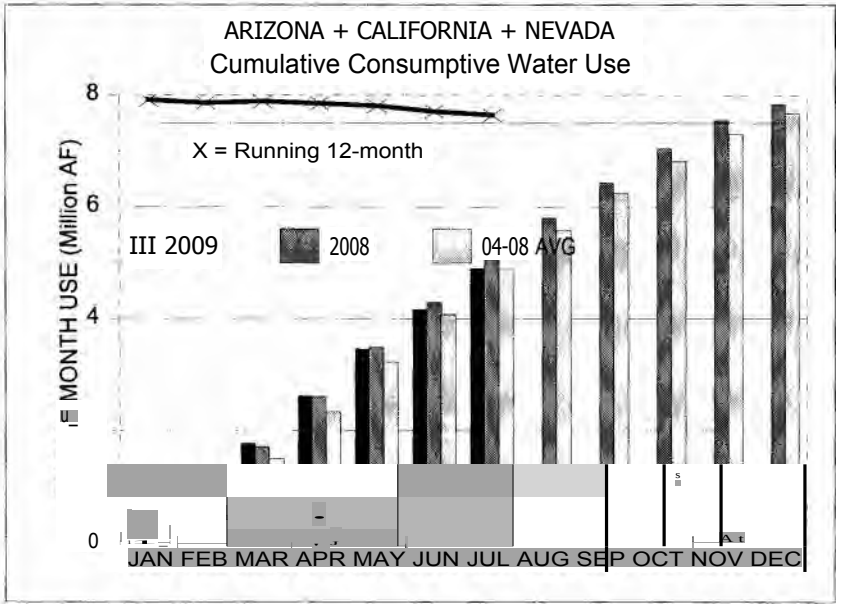
c. Assumed equal to August, 1983 use estimated by Fort Mojave Indian Tribe.

d. An estimated residual made by the Colorado River Board of California combining such items as small diversions along the river, unmeasured groundwater return flow, etc., which, when combined with other quantities listed to arrive at the State's total, presents an estimate of the State's Consumptive use of Lower Colorado River water.


CALIFORNIA
Cumulative Consumptive Water Use
END OF MONTH USE (Million AF)
2009
2008
04-08 AVG
0
1
2
3
4
5
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


ARIZONA + NEVADA
Cumulative Consumptive Water Use
2.8 + 0.3 MAF
2009
2008
04-08 AVG
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


California Agricultural 3.85 Priority
Cumulative Consumptive Water Use
END OF MONTH USE (Million AF)
2009
2008
04-08 AVG
3.85 RULE CURVE
0
1
2
3
4
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


ARIZONA + CALIFORNIA + NEVADA
Cumulative Consumptive Water Use
X = Running 12-month
III 2009
2008
04-08 AVG
0
4
6
8
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

August 17, 2009 Final Forecast of Colorado River Flow into Lake Powell (1) (Million Acre-feet)

	USBR and National Weather Service April-July 2009	Water Year 2009	Change From Last Month's Projected April-July 2009	Wat Yr 2009
Maximum (2)	7.864	11.274	0.051	0.226
Mean	7.814 *	10.974 '	0.001	-0.074
Minimum (2)	7.764	10.574	-0.049	-0.474

* This month's A-J observed is 99% of the 30-year A-J average shown below.
** This month's W-Y observed is 91% of the 30-year W-Y average shown below.

Comparison with past records of Colorado River inflow into Lake Powell fat Lee Ferry prior to 1962)

	April-July Flow	Water Year Flow
Long-Time Average (1922-2008)	7.741	11.519
30-yr. Average (1961-90)	7.735	11.724
10-yr. Average (1999-2008)	5.203	8.449
Max. of Record	15.404 (1984)	21.873 (1984)
Min. of Record	1.115 (2002)	3.058 (2002)
Year 2000	4.352	7.310
Year 2001	4.301	6.955
Year 2002	1.115	3.058
Year 2003	3.918	6.358
Year 2004	3.640	6.128
Year 2005	8.810	12.614
Year 2006	5.318	8.769
Year 2007	4.052	8.231
Year 2008	8.906	12.356
Total Years 2000 - 2004	17.326	29.809
5-Year Average (2000-2004)	3.465	5.962

(1) Under conditions of no other Upper Basin reservoirs.

(2) USBR and NWS forecasts indicate the probability of 95 percent of the time the actual flow will not exceed the maximum value, and will not be less than the minimum value.

VI. Scheduled Flows to Mexico - Arrivals and excess arrivals of Water for Calendar Year 2009

(Acre-feet)

	(1) Scheduled Flow	(2) Total Arrivals	(3) Excess Arrivals in accord with Minute 242	(4) Other Excess Arrivals	(5) Total Excess Arrivals	(6) Cumulative Excess Arrivals	(7) Flow Through NIB and Limitrophe	(8) Flow By-Pass Southerly International Boundary
Jan.	119,428	131,137	10,033	1,677	11,710	11,710	108,313	10,024
Feb.	152,979	171,990	9,433	9,578	19,011	30,721	151,373	9,433
March	208,455	219,177	10,164	558	10,722	41,443	195,714	10,164
April	199,629	215,258	9,702	5,927	15,629	57,072	192,856	9,702
May	112,754	132,812	10,422	9,631	20,053	77,125	110,896	10,422
June	112,353	123,213	9,645	1,215	10,860	87,985	102,298	9,645
July	118,342	129,556	9,525	1,689	11,214	99,199	108,508	9,525
August	92,284							
Sept.	89,307							
Oct.	73,828							
Nov.	102,966							
Dec.	117,676							
	1,500,001	1,123,143	68,924	30,275			969,958	68,915

Column (1). Flow schedule requested by Mexico. In surplus years as determined by the United States, Mexico can schedule up to 1.7 rather than 1.5 million acre-feet.

(2). Total Colorado River waters reaching Mexico. It is the sum of: 1) Colorado River water measured at the Northerly International Boundary, 2) drainage waters measured at the Southerly International Boundary near San Luis, Arizona, and 3) Wel!ton-Mohawk drainage waters measured at the Southerly International Boundary. It is the sum of Columns (1) + (5).

(3)- Arizona's Wellton-Mohawk Irritation and Drainage District drainage water. This water is discharged to the Santa Clara Slough in Mexico via a concrete-lined canal.

(4). Excess arrivals other than Wellton-Mohawk drainage. It is the sum of: 1) a delivery of about 5,000 a. f. per year to ensure that Mexico receives what is scheduled, 2) releases from Parker Dam which are not used due to unexpected rainfall in the Palo Verde, Coachella, Imperial, and and Yuma areas, 3) controlled flood releases on the Gila and Colorado River, and 4) local runoff.

(5) Sum of Columns (3) and (4).

(6). Cumulation of Column (5).

(7) Including Colorado River flow at the Northerly International Boundary plus flow from Cooper, 11-mile, and 21-mile spillways,

(8) Including flow at the Southerly International Boundary, from the East and West Main canals, Yuma Valley Main, 242 Lateral plus diversions from Lake Havasu for Tijuana.

WEIGHTED MONTHLY SALINITY AT
SELECTED COLORADO RIVER STATIONS
AND RUNNING 12-MONTH NIB-IMPERIAL FLOW-WEIGHTED SALINITY DIFFERENTIAL
(in parts per million)

	Below Hoover Dam			Below Parker Dam 3/			Palo Verde 31 Canal Near Blythe			At Imperial Dam			At Northerly International Boundary			Running 12-Month Flow-Wtd. Differential 31	
	5-Year avg..l[i]			5-Year avg.!'			5-Year avg.!'			5-Year avg.:11			5-Year avg.V				
Month	1974-78	2008	2009	1974-78	2008	2009	1974-78	2008	2009	1974-78	2008	2009	1974-78	2008	2009	2008	2009
Jan.	690	685	665	709	685		751	713		913	717	768	1,041	821	933	130.7	146.4
Feb.	675	692	655	706	678		732	682		835	675	745	998	822	862	135.9	145.5
March	684	674	649	699	668		727	686		805	717	703	925	803	804	139.4	147.0
April	680	659	636	700	675		714	697		801	699	710	892	805	798	144.9	144.6
May	677	676	646	698	681		709	696		822	725	727	962	914	907	141.4	144.0
June	678	648	637	695	671		712	686		812	718	717 41	956	896	889 '	137.1	143.4
July	682	655		688	683		709	701		797	720		909	865		137.3	
August	690	641		686	677		706	692		800	734		907	894		135.7	
Sept.	672	646		686	676		737	693		815	747		952	944		139.3	
Oct.	680	638		689	657		739	689		854	758		1,070	1,010		139.6	
Nov.	682	642		692	674		746	705		897	765		1,010	931		140.2	
Dec.	681	651		702	671		731	723		877	834		999	912		140.5	

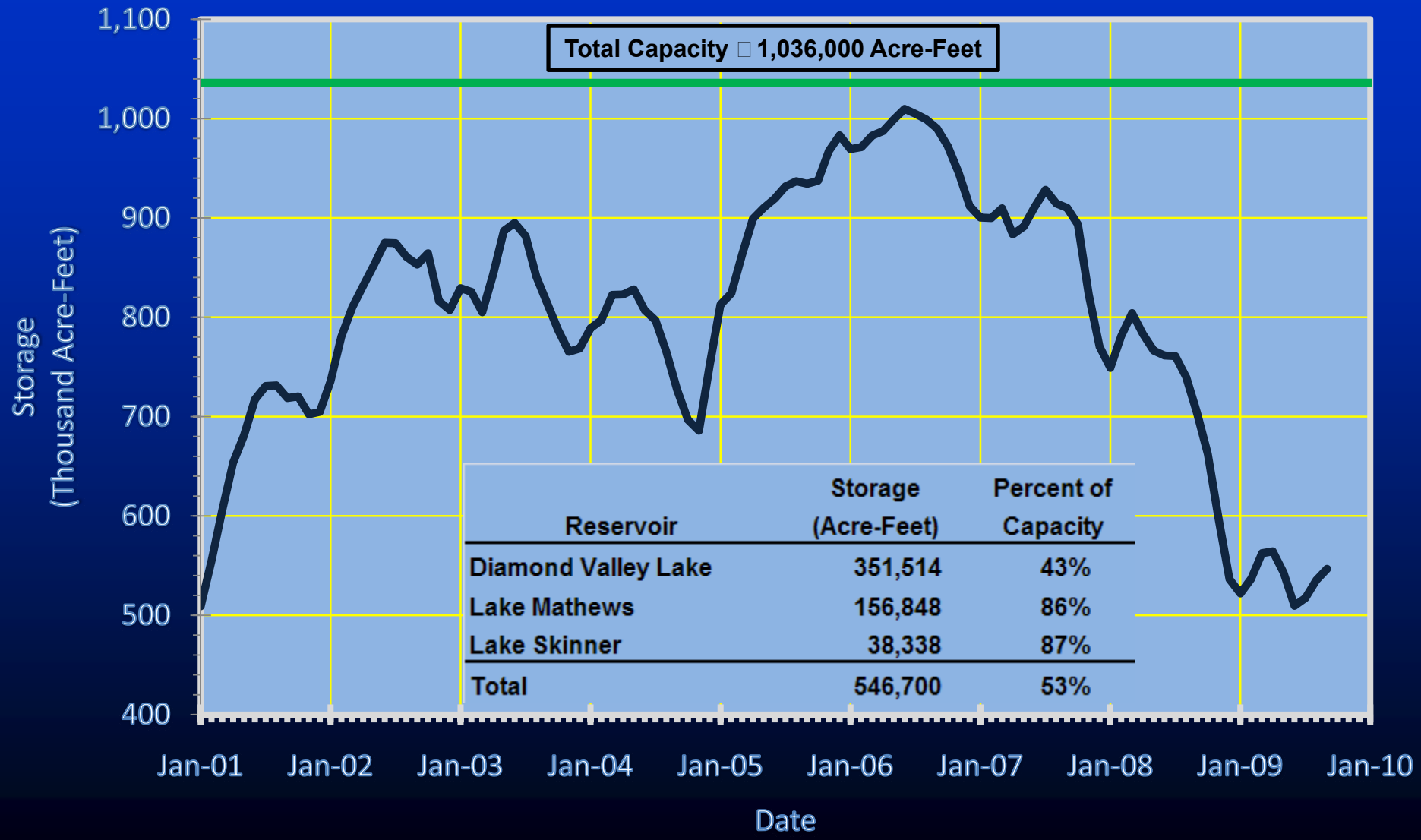
General Notes:

1/ 5-Year averages are arithmetical.
2/ 12-month flow-weighted differential between NIB and Imperial Dam through month shown in left column.
3/ Operational values only.
4/ Preliminary

5.b. - State and Local Water Reports

MWD's Combined Reservoir Storage as of September 1, 2009

Lake Skinner, Lake Mathews, and Diamond Valley Lake



Reservoir	Storage (Acre-Feet)	Percent of Capacity
Diamond Valley Lake	351,514	43%
Lake Mathews	156,848	86%
Lake Skinner	38,338	87%
Total	546,700	53%

5.c. - Colorado River Operations

RECLAMATION
Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

Agenda

Colorado River Annual Operating Plan (AOP) Consultation Meeting
Colorado River Management Work Group (CRMVVG)
August 26, 2009
10:00 a.m. (PDT)
Mezzanine Rooms 4 & 5
McCarran International Airport, Las Vegas, Nevada

I. Welcome and Introductions — Steve Hvinden / Dave Trueman

Upper Basin Hydrology and Operations -- Rick Clayton

III. Lower Basin Hydrology and Operations — Dan Bunk

IV. Review Draft 2010 AOP — CRMWG

V. Conclusion and Wrap-Up

Managing Water in the West

DRAFT Annual Operating Plan for Colorado River Reservoirs 2010

Colorado River Basin

Managing 14/ater in the West

YDP Pilot Run Draft FONSI and Final EA Now Available

The Bureau of Reclamation announces the release of the Final Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) for the proposed Yuma Desalting Plant Pilot Run. The documents are available on-line at: wwv,.usbrAlo\ 'lc yurna 'en \ ironmental_docs environ_docs.hunl, or a CD copy can be picked up between 7:30 a.m. and 4:30 p.m. at:

Bureau of Reclamation
Yuma Area Office
7301 Calle Ag,ua Salada
Yuma, AZ 85364

The draft FONSI and Final EA are available for public review and consideration for 30 calendar days from the date posted at the link referenced above. Questions should be directed to evirden(cr,usbr.go \ or to the address above, Attention: Ed Virden, Assistant Area Manager.

BUREAU OF RECLAMATION
Yuma Area Office
7301 Calle Aqua Salada

Colorado River Board of California
Attn: Gerald R. Zimmerman
770 Faiiinont Avenue, Suite 100
Glendale, California 91203-1068

News Release

RI CL AMATION

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Lower Colorado Region
Boulder City, NV

I Media Contacts: Ed Virden (928) 343-8109 evirden usbr.dov
Bob Walsh (702) 293-8421 rwalsh usbr.cov

Released On: August 26, 2009

Reclamation invites public review of draft Finding of No Significant Impact for the Yuma Desalting Plant pilot run

The Bureau of Reclamation, in accordance with the National Environmental Policy Act, has developed a draft Finding of No Significant Impact (FONSI) for a proposed pilot run of the Yuma Desalting Plant (YDP).

The proposed pilot run would commence in early 2010, and the plant would be run for 365 days at one-third capacity over a 12 to 18 month period. During this pilot run, the plant will produce an average of about 19.8 million gallons (61 acre-feet) of desalinated water per day. This water will be discharged to the Colorado River near the U.S. — Mexico international border for inclusion in Treaty-required water deliveries to Mexico.

Over the course of the pilot run, approximately 29,000 acre-feet of water (about 9.5 billion gallons) will be discharged to the river. This will consist of about 22,400 acre-feet of desalted water, and approximately 7,000 acre-feet of untreated irrigation drainage water. (There are 325,851 gallons of water in an acre-foot, which is enough to meet the annual needs of a family of four to six people.)

Reclamation invites public review and consideration on the draft FONSI. The public review period is open for 30 calendar days, until close of business on September 28. A copy of the final environmental assessment and draft FONS1 can be downloaded from Reclamation's Yuma Area Office website, at: http://www.usbr.gov/lc/yuma/environmental_docs/environ docs.html.

Questions should be directed to Mr. Ed Virden, Assistant Area Manager at the Yuma Area Office. Mr. Virden's contact information is: Yuma Area Office, 7301 Calle Agua Salada, Yuma, AZ 85364; email: evirdenausbr.go ; and Office fax: 928-343-8320. Comments must be submitted in writing via U.S. mail, e-mail, or fax, and must include personal identifying infoimation of the submitter.

# # #

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at http://www.usbr.gov/lc .

Draft
FINDING OF NO SIGNIFICANT IMPACT
Proposed Yuma Desalting Plant Pilot Run

U.S. Department of the Interior
Bureau of Reclamation
Yuma Area Office

Introduction

In accordance with the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190 as amended), the Bureau of Reclamation (Reclamation) has issued the attached Environmental Assessment (EA) to disclose the environmental impacts resulting from the proposed Yuma Desalting Plant Pilot Run. The EA provides details on the Proposed Action and an analysis of potential impacts; it should be used as the basis for this Finding of No Significant Impact (FONSI).

Proposed Action

The purpose of the Proposed Action is to operate the Yuma Desalting Plant (YDP) as designed at a sufficient flow and appropriate duration to gather benchmark performance and cost data which can only be obtained through actual plant operations; determine whether any additional corrective actions to plant design or equipment would be necessary for long-term operation of the plant; and test changes and corrections (such as the fully-automated distributed control system) which have already been implemented at the YDP as part of maintaining its ready reserve status. The need for the Proposed Action is to obtain information regarding actual plant operation which will test theoretical analyses and provide information about the plant's operating capability to reliably produce product water which could be used for multiple end uses; as well as to verify the suitability of treatment processes and associated facilities during actual plant performance, determine baseline operating costs, test the effectiveness of completed plant improvements, and assess how plant equipment will respond to daily operation; and provide process related effluent and emissions data for a sufficient period of time to provide a basis to analyze, in a separate, future decision, potential environmental consequences of long-term YDP operation.

Resource Analysis

The EA focused on those resource areas identified as potentially impacted by the alternatives considered, including the No Action Alternative. Based on the location and nature of the Proposed Action, there would be no effects to aesthetics, cultural resources, geology and soils, and land use. Potential negative effects of the Proposed Action were identified for air quality, biological resources, water resources, hazardous materials, Indian trust assets, environmental justice, noise, and climate change:

1. Air quality will be affected by the Proposed Action through increased particulate matter that is 10 microns in diameter or less (PM_{10})emissions and ozone as a result of a slight

increase in traffic to the YDP. However, the analysis in the EA indicates effects to PK° and ozone will be negligible and not significant.

2. Biological resources may be impacted from the Proposed Action due to the conveyance of drainage water into the Colorado River from the MODE 1 Diversion/Return Facility. However, because this type of conveyance is a routine operational practice which occurs regularly, and because the additional water will not result in any significant changes in salinity and river level, no effects to fish and wildlife, including endangered species in the U.S., will occur (U.S. Fish and Wildlife Service letter dated July 13, 2009). Reclamation will obtain a National Pollutant Discharge Elimination System permit for the discharge of product water from the YDP prior to initiating the Proposed Action. This discharge will not result in any significant impacts.

3. Potential impacts to water resources include the disposal of biosolids (a byproduct of the YDP) to the A-22 evaporative ponds. These biosolids, if not disposed of properly, could affect groundwater in the Yuma area. However, the A-22 ponds (evaporative cells) are lined, which will prevent biosolids from reaching the groundwater and adversely affecting groundwater. As appropriate, Reclamation will notify the Arizona Department of Environmental Quality of the proposed quantity change discharged to the A-22 cells for the Proposed Action. In addition, during operation of the YDP about 21,700 acre feet (AF) of desalinated product water and 7,300 AF of MODE flow will be conveyed to the Colorado River. As a result, depending upon the delivery of Intentionally Created Surplus (ICS) credits, temporary reduced releases from Hoover Dam may occur, thus producing slightly lowered water elevations along the river between Hoover and Imperial Dams. However, effects resulting from the lower elevation levels would be so small as to be immeasurable, and the change in water releases would not conflict with water delivery obligations, cause significant groundwater depletion, or alter existing drainage. There will not be any significant impacts on water resources.

4. Hazardous materials to be used on-site during the proposed YDP Pilot Run will increase. Hazardous materials will continue to be managed in accordance with Environmental Protection Agency and Occupational Safety and Health Administration requirements. The existing Risk Management Plan/Process Safety Management Plan (RMP/PSMP) documents which outline preventative actions to avoid an accidental release will be revised before the Proposed Action is initiated in order to continue to ensure employee, public, and environmental safety due to the greater amounts of chemicals necessitated by the YDP Pilot Run. In addition, hazardous waste generated from the Proposed Action would continue to be transported to an off-site hazardous waste facility for treatment or disposal in accordance with state regulations. There will be no significant impact resulting from hazardous materials.

5. The Proposed Action will not affect Indian trust assets (ITA). Reclamation will continue to coordinate with the Quechan and Cocopah tribes to ensure ITA's remain unaffected.

6. The Proposed Action will not affect environmental justice considerations. It will not result in any disproportionately high and adverse human health or environmental effects on minority or low-income populations in the U.S.

7. A slight increase in ambient noise levels is anticipated as a result of the Proposed Action. However, because sensitive noise receptors are in locations which are sufficiently distant from the YDP, and existing mechanisms to minimize noise are in place, impacts will not be significant.

8. Based on the Pilot Run's short term duration, the Proposed Action will not be affected by global climate change. The Proposed Action will not cause any significant contribution of hydrocarbons to the environment; therefore, no significant climate change impact will result.

Connected Actions

The potential environmental impacts of two connected actions were also analyzed in the EA: (1) the potential approval of ICS credits associated with the proposed YDP Pilot Run; and (2) Reclamation actions within the U.S. that are documented in the "Joint Report Of The Principal Engineers Concerning U.S.-Mexico Joint Cooperative Actions Related To The Yuma Desalting Plant (YDP) Pilot Run And The Santa Clara Wetland" (Joint Report). Neither of these actions were determined to result in significant environmental impacts for the reasons identified in the EA.

NEPA Finding

Based on the analysis of the environmental impacts and mitigation measures as presented in the EA, Reclamation has determined that implementation of the Proposed Action of conducting a Pilot Run of the Yuma Desalting Plant would not significantly impact the human environment and that preparation of an environmental impact statement is not warranted. The Proposed Action does not exceed any of the significance criteria outlined in the NEPA implementing regulations at 40 CFR Section 1508.27. In addition, Reclamation has determined the implementation of the two connected actions addressed in the EA would not significantly affect the human environment.

International Considerations

Under the proposed Pilot Run, flows in the Bypass Drain would be reduced by approximately 29,000 AF, while salinity levels would be increased by about 540 parts per million (expressed as total dissolved solids). A number of public comments on the EA focused on this potential impact of the proposed Pilot Run on the environmental resources of the Cienega de Santa Clara (Cienega). As noted in Section 1.6 of the EA, the statutory provisions of NEPA and the CEQ implementing regulations do not require assessment of environmental impacts in the sovereign territory of a foreign nation. However, in the spirit of bi-national cooperation, with regard to the ecology of the Colorado River's Limitrophe Division and its Delta as established in Minute No. 306,

Reclamation, through the International Boundary and Water Commission, initiated consultation with Mexico regarding the proposed YDP Pilot Run.
The outcome of this consultation is Joint Report, dated July 17, 2009. The United States, Mexico, and a partnership of non-governmental organizations, as stated in commitment letters from each party and further outlined in the Joint Report, will each arrange for 10,000 AF of water (for a total of 30,000 AF) in connection with the reduction in flow and increase in salinity level. Furthermore, the United States, Mexico, and a partnership of non-governmental organizations committed to working through the Colorado River Joint Cooperative Process, pursuant to Minute 306, to continue to address long-term approaches to maintain the environmental values of the Cienega. The Joint Report and other related documents are included in the EA for informational purposes as Appendix C.

Decision

In light of the foregoing, I hereby approve:

1) implementation of the Proposed Action to initiate a Pilot Run of the YDP; and
2) implementation of the Reclamation actions outlined in the Joint Report.

_____ _____

Jennifer McCloskey, Area Manager Date
Yuma Area Office

NICK J. RAHALL II, WV
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NEIL. ABERCROMBIE,
FRANK PAM,ONE. JR., Ni
GRACE E. NAPOLI TANO. CA
RUSH D.11011, NJ
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MAURICE D. HINCHEY, NY
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JAY INBLEE, WA
JOE BACA, CA
STEEHANIE HERf.-:ETH SA NDI. IN, E.,D
JOHN P. SARBANE S. MO
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August 28, 2009

Mr. Kenneth Salazar
Secretary of the Interior
U.S. Department of the Interior
1849 C Street NW
Washington, D.C. 20240

Dear Mr, Secretary.

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As chair of the Subcommittee on Water and Power, I have grave concerns I felt I must share with you. Please forgive the lengthy explanation; I felt it must be given.

Drought in California is polarizing the state, taking up valuable time and resources resulting in considerable debate and finger-pointing as to who/what to blame. Thank you for recognizing that the issue is big enough and requires you dedicating high level staff to addressing the problem.

The quandary we face is to both reduce demand and increase supply. Historically, water developers have focused on increasing the size of the water pie. Developing new water supply takes years to accomplish (fifteen years by the Governors own estimate), costs billions of dollars, presently lacks public consensus, public and political will, and united support. Addressing the water equation by reducing demand has already resulted in extensive efforts in Southern California to reduce water consumption (local regulations), improving conservation efforts (low flow toilets and shower heads) and educating the public (PSA's and notices in water bills). This has lessened impacts, but as the population continues to grow and the drought continues, the demand will increase beyond what conservation alone can provide.

The California Congressional delegation is a diverse group. One thing that we all agree on is that the water crisis in California is significant, requires leadership and development of a

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solutions portfolio that builds upon our abilities to confront problems, and uses our innovation and ideas to mobilize the resources necessary to addresses the issues. Some of us have been giving the California water issue serious review and determined that the Subcommittee needed to explore options.

What Does a Water Solution Look Like?

Over the past two months I have had the Water and Power Subcommittee staff director, Dave Wegner, researching the issue and our potential roles. I have been briefed on initial findings and we will be briefing the subcommittee upon our return in September. We are offering our full assistance to address the long, mid and short-term actions that can be taken to develop water solutions for California and, by learning from these efforts, provide opportunities for the rest of the Western United States. Our concern is that the drought of the last three years may continue into 2010, possibly further. We need to implement actions now that will provide the ability to let the Department focus on the long-term solutions.

Solutions to the California water crisis must be based on a diversified and dynamic approach, allow for appropriate planning and permitting that will ultimately allow delivery of water in a timely and cost effective manner. There is no one single "silver bullet" that will solve the water crisis. The challenge we face is to develop a cooperative approach that cumulatively will yield a diversified portfolio and strategy that will result in increased supply, reduced risk, and improved water security, sooner rather than later.

It is indisputable and imperative that discussions and efforts directed at long-term solutions continue. At the same time, we must recognize that when creating new water from large water projects, all parties and all interests are defined by an immutable rule: the last dollar must be spent to get the first drop of water. The bottom line is that until we spend the last construction dollar, no one gets the first drop of water from any of these proposed projects.

In the course of our research, we have asked state water leaders when new water supplies could be brought on-line, addressing the question, when does California achieve that "first drop?" The answers range from 2020 to 2030, depending on a plethora of unknown factors. In reality the year doesn't really matter. The point is there is no immediate construction action that can be taken to create new water.

Creating solutions to water demands must incorporate a range of ideas and approaches. Water managers must continue to explore, and analyze long-term solutions associated with the Delta, evaluating new water sources, including storage and conveyance. At the same time, it is equally imperative that a plan be adopted to address our immediate challenges.

The Goal: Creating 1 MAF of Water for California in the Near Term

Let me reiterate again Mr. Secretary, we want and are anxious to work with the Department on a portfolio of solutions for the water crisis in California. We want to look for solutions and approaches where Congress and the Administration can work collaboratively on solutions. As Chairwoman of the Subcommittee on Water and Power, I submit the following recommendations

for immediate actions on your part, to address challenges to the California water crisis. Each is based on the concept of stretching existing water supplies in order to increase the amount of available water and does not require new legislation, only strong and decisive leadership.

Bureau of Reclamation to establish a 1 Million Acre Foot new water program

- Grow new water in the State — throughout the State
- Create, in the next 48-60 months, 1 MAF of new water annually
- Develop this new water without regional water user or environmental conflict Accomplish this objective utilizing the Bureau's Title XVI program, identified by the Commissioner on July 21, 2009, as part of Reclamation's core mission. (We agree with the Commissioner's statement made before the Subcommittee and believe that by working with OMB we can develop support for funding.)

(2) **Bureau of Reclamation to establish a "Farmer Helping Farmer" Irrigation Efficiency Initiative**

- Make funds available to water districts, water agencies and individual irrigators to invest in on-farm irrigation efficiencies to stretch our existing available irrigation water. These funds could come from the Reclamation Rural Water Program and other funding vehicles identified in previous legislation.
- Consistent with CVPIA and Reclamation law, allow districts or irrigators to sell, rent or lease water savings to other irrigators.
- Implement improved and less bureaucratically cumbersome transfer incentives for farmers and water districts to allow the efficient and timely movement of water from and through existing facilities.

(3) **Bureau of Reclamation to establish a "Water Conservation" Initiative for urban and rural water districts.**

- Make funds available to water districts, water agencies and others as appropriate to invest in conservation efforts (i.e. irrigation methods, scheduling, land leveling, etc.) that stretch existing water supplies. These funds could come from the Reclamation Rural Water Program and other funding vehicles identified in previous legislation.
- Consistent with CVPIA and Reclamation law, allow districts and/or irrigators to sell, rent or lease water saved to others.

The objective of these recommendations is to stretch the water supplies we have. In the short term, we have adequate water supply to meet the needs of the State of California. What is lacking is the bureaucratic ability to efficiently move water, incentives for water right holders to allow for the efficient use of water, and leadership to address how to get it done.

We can implement programs here and now to create 1 MAF of new water annually through Title XVI, and supplement that initiative with projects to stretch existing supplies throughout the State — from our cities to our farms.

Recommendations reouiring action:

- **The Interior Department and Bureau of Reclamation submit, urgently, a $250 million budget amendment to the Bureau of Reclamation's budget for FY 2010 adding funds in the following amounts:**

Title XVI	200 million
Water Efficiency (Farmer-to-Farmer)	25 million
Water Conservation Initiative	25 million

- **OMB, Interior, the Administration, and others as appropriate and necessary, work with the 1-louse Budget Committee, Appropriations Committee, Energy and Water Appropriations Subcommittee, Natural Resources Committee, and the Water and Power Subcommittee to implement this prior to when the Energy and Water Appropriations bill for FY 2010 is finalized in conference.** Concurrently, coordinate with the appropriate Senate committees and subcommittees.
- **The Title XVI funds should go to develop a new generation of projects — throughout the State. The objective is to (a) fund projects not funded by the Stimulus Program; and (b) underwrite at least 40 congressionally approved new recycling projects.** Today, projects throughout Southern California — in LA, San Diego, Riverside, Orange and San Bernadino Counties are on track to develop approximately 500,000 acre-feet of new water annually. This program will double that — to produce 1 MAF of new water annually and do so within 48-60 months.

While California puts I MAF water into service and on-line, long-term plans can proceed with the efforts of the Department of the Interior leading towards actions. California can manage our way through this challenge rather than be overwhelmed by it. When the day arrives where California runs short of' water, the direct and indirect costs will be measured in billions and the bureaucratic stress will increase exponentially. **We need to act now and act in a concerted, strategic approach.**

What can be done immediately?

Congress has provided tools so we can begin work now to resolve the water crisis. First, the Title XVI water recycling and water reclamation program can be the centerpiece of a constructive solution. As a result of investment in it, **new wet, not paper,** water can be created and placed in service throughout the State. Recycled water developed throughout California relieves pressure on the Delta, and, in turn, helps water districts and water users in the San Joaquin Valley, particularly those on the West Side, who have junior water rights and water entitlements.

A $200 million investment in Title XVI automatically leverages an additional $600 million from the water districts and financial lenders. By law and policy, water districts are eligible for a 25% cost-share, not to exceed $20 million. This is the most cost-shared water resources program in the Federal Government. This investment **stimulates new business, puts people to work, develops green jobs, produces 1 MAF of new water annually** and helps the State manage its way through this water crisis.

The bottom line to the Water and Power Subcommittee is that we believe that Congress has given the Department tools to address the California water crisis. We believe that solutions must include near, mid and long-term actions. And finally, we believe that cooperatively we can work with the Department to strategically plan for and implement actions that will result in water in the faucet, will work with local water districts, will put people to work, and will provide leadership in addressing long-term water planning and production.

What we would like to Suggest.

We respectfully request a sit down meeting to discuss these ideas with you, identifying what we can do to work with the Department in meeting the water needs of California, and doing so in a cost effective and environmentally sensitive manner. We look forward to your favorable reply and meeting with you in September. Please contact the Water and Power Subcommittee or myself to set up the meeting.

Warm Regards,

Grace Napolitano

Grace F. Napolitano
Chairwoman
Water and Power Subcommittee

cc: Nick Joe Rahall, Chairman, Committee on Natural Resources
Doc Hastings, Ranking Minority Member, Committee on Natural Resources
Torn McClintock, Ranking Minority Member, Subcommittee on Water and Power
Members, Subcommittee on Water and Power
Members, California Congressional Delegation
Senator Feinstein
Senator Boxer
Phil Isenberg
John Garamendi
Darrell Steinberg, President Pro Tempore, California State Senate
Karen Bass, Speaker, California State Assembly
Governor Arnold Schwarzenegger

Supporting Justification for Proposal Suggestions

This request is consistent with:

- Bureau of Reclamation Feasibility Study on Water Recycling in Southern California
- Bureau of Reclamation Feasibility Study on Water Recycling in the Bay Area.
- State of California Task Force on Water Recycling
- DWR's Bulletin 160
- MWD and SAWPA approved programs
- Other?

- Water Recycling Benefits
  - Consistent with stimulus objectives
  - Creates green jobs
  - Provides for continuity of construction jobs in counties most impacted by the recession
  - Relieves pressure on the Delta, short-term and long-term
    Consistent with reduced energy and lower carbon objectives
  - Provides drought relief
  - * Consistent with climate change policy objectives
  - Develops new water supplies (and does so without generating political conflicts)
  - * Projects can be designed, approved, funded, constructed and operated within a short time.
  - No other alternative can produce 1 MAF as quickly or efficiently.

- Farmer to Farmer Initiative Benefits
  - Allows farmers to develop and implement solutions locally
  - Can be accomplished with days, weeks and months....all short term
  - Proven technologies can be applied to modernize and improve water management locally
  - Maximizes flexibility to local districts and irrigators within their immediate regions

- Conservation Initiative Benefits
  - Fastest and least expensive way to "create" new water
  - Urban water agencies have a demonstrated capacity

United States Department of the Interior

BUREAU OF RECLAMATION
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

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IN REPLY REFER TO:

BC00-4222
WTR-4.03

CERTIFIED - RETURN RECEIPT REQUESTED

Mr. Brian J. Brady
General Manager
Imperial Irrigation District
P.O. Box 937
Imperial, CA 92251-0937

Subject: Approval of the Imperial Irrigation District's (1ID) Plan for the Creation of Extraordinary Conservation Intentionally Created Surplus (ICS) for Calendar Year 2009

Dear Mr. Brady:

The Secretary of the Interior issued a Record of Decision (ROD) on December 13, 2007, for Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (Interim Guidelines). Among other things, the Interim Guidelines establish criteria for the development and delivery of ICS. Prior to creating ICS, the Interim Guidelines require a contract holder to enter into a Delivery Agreement with the Secretary of the Interior and a Forbearance Agreement with Arizona, Nevada, and certain California contract holders. On December 13, 2007, IID entered into the necessary delivery and forbearance agreements.

Also, on December 13, 2007, the Palo Verde Irrigation District, 11D, Coachella Valley Water District, The Metropolitan Water District of Southern California, and the City of Needles entered into the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus (California ICS Agreement). The California ICS Agreement discusses the amount of ICS that IlD can create in a given year and in total. Although the Bureau of Reclamation is not a party to the California ICS Agreement, Reclamation verified that the ICS Plan submitted by IID does not exceed the limits set forth in the California ICS Agreement.

Section 3.B.1 of the Interim Guidelines requires the submission of a plan to the Secretary for the creation of ICS that demonstrates how the requirements of the Interim Guidelines will be met. IID submitted its ICS plan to Reclamation by its letter dated December 8, 2008.

Pursuant to Section 7.B.5. of the Interim Guidelines, Reclamation conducted appropriate consultation with the Basin States regarding HD's proposed ICS plan. As part of the consultation process, IID hosted several tours of its fallowing program and seepage recovery

facilities for Reclamation staff and representatives of the Basin States. Reclamation appreciates that effort.

Based on our review of IlD's proposed ICS plan and completion of the consultation process, Reclamation hereby approves IlD's plan for the creation of up to 25,000 acre-feet of ICS for 2009.

The Interim Guidelines provide that a Contractor may modify its approved plan during the year of creation of ICS, subject to approval by Reclamation. In addition, Section 3.D.1 of the Interim Guidelines requires a Contractor to submit a Certification Report to the Regional Director demonstrating the amount of ICS created and that the method of creation was consistent with the approved ICS plan.

If you have questions, please contact Mr. Paul Matuska at 702-293-8164.

Sincerely,

LORRI GRAY-LEE

Lorri Gray-Lee
Regional Director

cc: Mr. Gerald Zimmerman
Executive Director
Colorado River Board of California
770 Fairmont Avenue, Suite 100
Glendale, CA 91203-1035

Mr. Herb R. Guenther
Director
Arizona Department of Water Resources
3550 North Central Avenue
Phoenix, AZ 85012-2105

Mr. George M. Caan
Executive Director
Colorado River Commission of Nevada
555 East Washington Avenue, Suite 3100
Las Vegas, NV 89101-1065

Mr. William Hasencamp
Manager, Colorado River Resources
The Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

Mr. Dennis Strong
Director
Utah Division of Water Resources
P.O. Box 146201
Salt Lake City, UT 84114-6201

Mr. Don Ostler
Executive Director
Upper Colorado River Commission
355 South 400 East Street
Salt Lake City, UT 84111

Continued on next page.

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Mr. John D'Antonio
State Engineer
Office of the State Engineer
P.O. Box 25102
P.O. Box 25102
Santa Fe, NM 87504-5102

Mr. Patrick T. Tyrrell
State Engineer
State of Wyoming
Herschler Building, 4th Floor East
Cheyenne, WY 82002-0370

Ms. Jennifer Gimbel
Director
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80123

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WASHNGTON DC 20510

August 11. 2009

The Honorable Daniel Inouye
Chairman
U.S. Senate Committee on Appropriations
The Capitol, S-128
Washington, D.C. 20510

The Honorable Thad Cochran
Ranking Member
U.S. Senate Committee on Appropriations
The Capitol, S-128
Washington, D.C. 20510

The Honorable Byron Dorgan
Chairman
Subcommittee on Energy and
Water Development
Dirksen Senate Office Building Rm 184
Washington, D.C. 20510

The Honorable Robert Bennett
Ranking Member
Subcommittee on Energy and
Water Development
Dirksen Senate Office Building Rm 188
Washinoon. D.C. 20510

Dear Senators Inouye, Cochran. Donlan, and Bennett:

We are writing to make you aware of our concern about language recently included in the committee report on the House-passed Energy and Water Development Appropriations Bill, H.R. 3183, which could adversely affect the efficient management of the waters of the Colorado River system.

The House committee report contains language criticizing the Department of the Interior's management of the Colorado River system and encourages the Bureau of Reclamation, with the concurrence of the National Park Service, to revisit the Operating Criteria for Glen Canyon Dam. We are concerned that this language may not be consistent with the existing law of the Colorado River and could interfere with the delicate balance of Colorado River operations that have been agreed to among the Colorado River Basin states and the Department of the Interior.

We understand and support the recreation and natural resources interests associated with the Grand Canyon National Park, and we also support the ongoing activities of the Glen Canyon Dam Adaptive Management Program. At the same time, we recognize that Lakes Powell and Mead store and release water for municipal, industrial, and agricultural purposes consistent with the obligations set forth in the fundamental allocations of the Colorado River Compact, Boulder Canyon Project Act. the Decree in *Arizona* v. *Califivnia,* and the 1944 Treaty with Mexico. We also recognize that, in 2007, after more than two years of negotiation among the Colorado River Basin states and with the express involvement of several agencies within the Department of the Interior, including the National Park Service, the Secretary adopted Interim Guidelines for the operation of Lakes Powell and Mead. In addition, programs such as the Glen Canyon Adaptive Management Program, which arose out of the Grand Canyon Protection Act of 1992. involve a wide array of Stakeholders who are all involved in the decision-making process for the program.

We believe that the House committee report language appears inconsistent with the Colorado River Basin Project Act and will lead to confusion regarding implementation of that act and operation of the system. To address our concern, we recommend that you include the following language in the final conference report on the Energy and Water bill:

> The conferees continue to support the balance called for in the Grand Canyon Protection Act and the resulting duties placed upon the Secretary of the Interior. The conferees encourage the Secretary of the Interior to fully support the ongoing work of the Glen Canyon Darn Adaptive Management Program. The conferees view changes in the operation of the Colorado River system, as suggested in the House Report language. to be unnecessary and are omitting that section from this report.

The long-term sustainability of our states is directly tied to the proper management of the Colorado River system. We appreciate your attention to this critical issue.

Sincerely,

'ohn Ensign
United States Senat4F-'

Harry R 'd
Unite tates Senator

Jon Kyl
United States Senator

Jeff Bingaman
U d Sta les S nator

Michael Enzi
United States Senator

Dianne Feinstein
United States Senator

John Barrasso
Unit ..d lates senator

Barbara Boxer
United States Senator

Mark Udall
United States Senator

Michael Bennet
United States Senator

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WATE EUSE

August 21, 2009

The Honorable Ken Salazar
Secretary
U.S. Department of the Interior
1849 C Street, N.W.
Washington. DC 20240

Dear Secretary Salazar;

On behalf of the undersigned organizations, we are writing to urge that you request at least $1.2 billion in the FY 2011 Presidential budget request for the U.S. Bureau of Reclamation's Water and Related Resources account. As part of the 2011 Presidential request, we also urge your support of at least $100 million for Reclamation's Title XVI Water Recycling program as well as significant funds to address the serious issues of aging water infrastructure and rural water needs throughout the West.

Drought and recession affect all parts of our country, but bring particular hardship for the people of western states. Today, national unemployment rate is 9.3 %, but higher in many drought-stricken states such as California which is currently 11.9 %.

According to a recently released economic impact study prepared, for the Clean Water Council, a $1 billion investment in water and wastewater infrastructure results in the creation of —27,000 jobs and a tripling in demand for goods and services. These projects also represent an environmentally sustainable approach to ensure a safe and reliable water supply as communities across the west seek to develop effective responses to climate change effects.

As noted by Reclamation's Commissioner Mike Connor in his July 21, 2009 testimony to the House of Representatives Natural Resources Subcommittee on Water and Power, there is a $600 million unfunded backlog of authorized Title XVI projects. Funding to eliminate this backlog represents a unique opportunity for the Administration to create jobs and provide a near-term solution to water supply challenges facing many Western states.

The infusion of funding that was provided by the American Recovery and Reinvestment Act for the Reclamation program is a valuable step in addressing this backlog, however there is an abundance of remaining water supply and infrastructure needs that can be met in a timely manner by providing adequate FY 2011 funding necessary to address these issues.

In conclusion, we again request your support for at least $1.2 billion in the U.S. Bureau of Reclamation's Water and Related Resources FY 2011 budget to help address western water infrastructure needs. including a $100 million request for the Title XVI prow-am. We thank you for recognizing that water is the essential resource for our western economy and environment.

Sincerely,

Timothy Quinn
Executive Director
ACWA

Hamlet J. "Chips" Barry, III
Chairman
WESTERN URBAN WATER COALITION

/

G. Wade Miller
Executive Director
WATEREUSE ASSOCIATION

Leroy Goodson
General Manager
TWCA

Peter Carlson
Vice Chair of Western Water Programs
WATER RESOURCES COALITION

Charles Nylander
President
WESTCAS

Tom Donnelly
Executive Director
NW' **RA**

Doug Kemper
Executive Director
Colorado Water Congress

cc: Hon. Michael Connor, Commissioner

5.d. - Basin States Discussions

STATE OF CALIFORNIA - THE NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

COLORADO RIVER BOARD OF CALIFORNIA
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1035
(818) 500-1625
(818) 543-4685 FAX

August 21, 2009

Mr. Bill Ruth
Commissioner
International Boundary and Water Commission
4171 North Mesa Street
El Paso, TX 79902-1441

Dear Commissioner Ruth:

The Principal Engineers of the International Boundary and Water Commission (IBWC), United States and Mexico signed a Joint Report on August 19, 2009 regarding the Transboundary Aquifer Program. The Joint Report makes recommendations regarding the Joint Cooperative Process between the United States and Mexico to implement an assessment program for the transboundary aquifers shared by the two countries.

The Joint Report indicates that the recommendations are within the framework of the United States-Mexico Transboundary Aquifer Assessment Act (Act) of 2006 (P.L. 109-448). The purpose of this letter is to remind you that the Act specifically excludes aquifers shared by California and Mexico from the program. As such, the Joint Report recommendations should apply only to the legislative authority of the P.L. 109-448.

Should you have any questions, please do not hesitate to call me at (818) 500-1625.

Sincerely,

Gerald R. Zimi nnan
Ex irector

BENEFITS OF A UTAH/NEVADA AGREEMENT ON THE ALLOCATION AND MANAGEMENT OF THE SNAKE VALLEY AQUIFER

I. INTRODUCTION

Snake Valley includes a large area in southwestern Utah and southeastern Nevada. Water use in the Snake Valley aquifer has developed slowly in both States. In 1989, however, the Southern Nevada Water Authority (SNWA) filed applications with the Nevada State Engineer to appropriate approximately 50,000 acre-feet of water from Snake Valley in Nevada to be piped to Clark County (Las Vegas) as part of a system of pipelines in central and eastern Nevada intended to transport rural groundwater to municipal uses.

There is little doubt that some unappropriated water exists in Snake Valley. One issue is how much water is available and how that unappropriated water should be divided between the two States. Some water "belongs" to Nevada and some "belongs" to Utah. Another issue is how to ensure, as much as possible, that the additional withdrawals in Nevada do not unreasonably impact existing rights and sensitive ecosystems in Utah. A third issue is how generally the two States should manage this interstate aquifer.

A federal statute creating easements for the SNWA project pipelines requires the States to settle these issues before SNWA pumps Snake Valley water. Thus, Utah and Nevada officials have for the last three years actively negotiated an agreement for the allocation and management of the aquifer. A draft of that Agreement is now ready for public review and comment.

This document outlines the Utah/Nevada Snake Valley Water Agreement ("Agreement") and describes the legal and practical consequences if no agreement is executed or implemented.

IL NATURE OF THE PROBLEM

A. Allocating the Snake Valley aquifer requires dividing a natural resource shared between two sovereign States: It is not the same as a traditional water dispute between private parties and is governed by different considerations. including these:

1. The "equal footing doctrine," which provides that as a matter of federal constitutional law all States admitted to the Union stand on the same footing as the original States.

2. Each State therefore owns and regulates its own water resources and cannot dictate to another how to manage its resources. Further, the jurisdiction of the Utah State Engineer and Utah's courts do not extend into Nevada, and *vice versa.*

3. Where a groundwater aquifer is located in two States, each receives an equitable share so long as the right of the other to its share is not unduly infringed. When one State takes what it believes is its share and a controversy arises, three possible solutions arise: (1) a negotiated settlement; (2) an interstate compact; or (3) an original action in the U.S. Supreme Court seeking equitable apportionment of the joint resource.

4. Priorities of existing water rights and the areas of water origin are key elements in an equitable apportionment analysis, although the U.S. Supreme Court may consider many other things. In the Snake Valley Aquifer, the majority of the recharge occurs in Nevada and flows down gradient into Utah, while the majority of historic discharge (use) has occurred in Utah.

Some have argued that any water SNWA takes "steals" Utah's water. This is incorrect, since Nevada is legally entitled to an equitable portion of the Snake Valley water.

5. A recent Act of Congress, Public Law 108-424, authorizing pipeline rights-of-way for the SNWA Project, provides that, prior to SNWA pumping Snake Valley water, Utah and Nevada must divide the Snake Valley groundwater. The Act further requires that the Agreement allow for maximum sustainable beneficial use of the water resource and protection for existing water rights. This is the Agreement Utah and Nevada have negotiated.

6. Utah and Nevada have some disagreement over the aquifer's long-term safe yield, because studies differ as to the amount of water available. The aquifer has unique characteristics, and the use has been relatively small. The most recent USGS "BARCASS" Study finds the aquifer discharges more water than did prior studies. Utah has not been comfortable with the BARCASS figures and has urged the use of more conservative estimates.

7. The concept of "sustainable beneficial use" is common to Utah and Nevada law, meaning that aquifer diversions cannot exceed long-term recharge.

8. Some Utah water legal concepts, such as "reasonable use," described below, which governs Utah groundwater along with the prior appropriation doctrine, are relevant.

III. COMPONENTS OF THE AGREEMENT

One benefit of the Agreement is that it allows the States rather than the U.S. Supreme Court[2] to divide the water in the aquifer. While neither party gets everything it wants, the parties have control over and flexibility regarding their respective interests and how to protect them.

[2] The only forum in which one state may sue another in the U.S. Supreme Court.

The Agreement protects the interests of Utah and its water users, provides mitigation if harm occurs, and creates a system for the protection of sensitive ecosystems and species.

1. Allocation of the Long-Term Safe Yield

The Agreement allocates the Snake Valley water resources using three categories of water which, in total, give each State half of the water in the Snake Valley aquifer. This concept protects water rights in place prior to 1989, allocates additional water to Utah and Nevada, and relies on conservative water estimates.

CATEGORY 1
ALLOCATED WATER: Totals 67,000 acre-feet and protects all existing Utah and Nevada water rights with a priority date prior to October 17, 1989. Utah is allocated 55,000 acre-feet and Nevada 12,000 acre-feet in this category

CATEGORY 2
UNALLOCATED WATER: Totals 41,000 acre-feet of unappropriated water which, when added to Category 1, totals 108,000 acre-feet. This is a more conservative amount than identified in the BARCASS study as potentially available for use in Snake Valley. In Category 2, Utah is allocated 5,000 acre-feet and Nevada 36,000 acre-feet. This means that any approval of SNWA applications by the Nevada State Engineer must be limited as a consequence of the

Agreement to no more than 36,000 acre-feet—rather than the 50,000 acre-feet SNWA applied for.3

CATEGORY 3 RESERVED WATER: Totals 24,000 acre-feet of water which may eventually be available for appropriation without exceeding the long-term safe yield of the aquifer, depending on the impact of Categories 1 and 2 development. Utah is allocated 6,000 feet of the Reserved Water and Nevada 18,000 acre-feet. The Agreement provides that neither State Engineer may allow appropriations of Reserved water unless both agree that data demonstrate the water can be sustainably withdrawn without impacting uses under Categories 1 and 2 and/or over-drafting the aquifer. Further testing and data-gathering must take place before any Reserved water can be diverted. The total of all three Categories is the amount of ground water BARCASS estimates is consumed annually through evapotranspiration in Snake Valley.

2. Monitoring and Data Gathering.

The Agreement requires the States to jointly identify on-going areas of concern, including available groundwater supplies, groundwater levels, and effects of additional pumping

[3] Further, under Nevada law, when water is exported out of the basin of origin, a reasonable amount of unappropriated water must be left in the basin of origin — 10% was left when the Nevada State Engineer approved SNWA's Spring Valley application.

on existing water rights, wetlands, springs and riparian areas. All such data will be shared and publicly available. Further, the States agree that the sustainable groundwater supply includes a prohibition on "groundwater mining" (use that exceeds long-term recharge), degradation of water quality, and harm to the physical integrity of the Snake Valley groundwater basin.

A critical provision of the Agreement provides that the Nevada State Engineer will hold SNWA's Snake Valley Applications in abeyance for ten years to allow both states and the USGS to conduct further studies and data gathering in an effort to obtain more information on the Snake Valley aquifer and the quantity of water available for appropriation without causing unreasonable adverse impacts to the aquifer, including effects on current water rights and environmental concerns. This means that SNWA will not have any Snake Valley water rights and therefore will not pump any Snake Valley water until at least 2019. If when the SNWA applications come before the Nevada State Engineer for consideration, all data gathered during the ten year abeyance period may be submitted to and considered by the Nevada State Engineer. Without this ten year abeyance period, the SNWA applications are currently scheduled to be heard in the fall of 2011.

3. <u>Identification and Mitigation of Adverse Impacts</u>

Under Utah law, the rule of reasonableness requires that a prior groundwater user cannot demand that groundwater levels remain the same as when he first made his appropriation. But, any drop in groundwater levels must be "reasonable." It is contrary to public interest to keep the aquifer completely full just to support existing water levels. Impaii went issues are typically addressed through costly litigation, and the issues are more problematic when diversions are in an adjoining State.

As a special protection for Utah water users, the Agreement provides a process to identify and mitigate adverse impacts from SNWA pumping on existing water rights. SNWA must respond within ten days to any written complaint by a water user that SNWA's pumping impairs his rights. If acceptable mitigation cannot be agreed upon, the matter is referred to an interstate panel comprised of both State Engineers. As long as SNWA pumps from Snake Valley it must maintain a S3 million mitigation fund, which may be used to deepen wells, reimburse pumping costs or provide other mitigation measures. This process will be simpler and less costly than litigating an impaiii_lent case with SNWA in Nevada courts, although such litigation by an affected water user is not precluded. The Agreement's monitoring and mitigation provisions protect Utahns in Snake Valley more than water users in any other part of Utah.

4. ENVIRONMENTAL MONITORING AND MITIGATION

The Agreement requires extensive monitoring and mitigation to address environmental concerns, including potential impacts on sensitive species and damage to wetlands and air quality. The details of this process is set forth in a separate agreement between Utah and SNWA which will be attached to the primary Agreement. A significant focus of providing for environmental mitigation is that it intends to prevent the listing of certain species under the Endangered Species Act, which could cause the U.S. Fish and Wildlife Service to exert control over Snake Valley water to protect critical habitats.

In summary, among other things the Agreement:

- fairly apportions Snake Valley water 50/50 to each State;
- places outside limits on how much water SNWA can pump;

- provides for a ten year delay on the consideration of the SNWA Snake Valley Applications to allow for further data-gathering and the strict monitoring of the potential effects of SNWA pumping;
- protects all existing Utah and Nevada water rights;
- provides several measures to mitigate adverse impacts to Utah water users without litigation and establishes a mitigation fund;
- addresses many of environmental concerns; and
- gives Utah and Nevada joint management authority over the Snake Valley aquifer rather than relying on uncoordinated actions in each state.

IV. IS THE AGREEMENT BETTER THAN NO AGREEMENT?

For political, environmental, and even cultural reasons, the Snake Valley component of the SNWA project has generated tremendous opposition throughout Utah. The intensity of these feelings leads some observers to believe Utah simply cannot reach an acceptable agreement with Nevada dividing the Snake Valley aquifer — in other words, no Agreement would be better than the Agreement outlined here. That view is misguided.[4]

[4] Utah and Nevada officials have been in negotiations concerning the Agreement for three years. During that time, confidentiality restrictions have prevented Utah officials from responding to the consistent negative reports concerning Snake Valley issues. Now that it is possible to provide a response, Utah officials hope that interested parties will consider the Agreement, and the reasoning behind it, objectively and impassionately.

Similarly, some observers believe that P.L. 108-424 gives Utah a "veto" over the project, and Utah should use that veto. But this view is incorrect because the statute specifies no such veto. Utah must, at the least, negotiate in good faith toward an agreement. Failure to do so could mean BLM looks for alternative ways to interpret the law or, more likely, Congress repeals it.5

Without an Agreement, Utah's only legal remedy if Nevada's development of Snake Valley water harms Utah interests is an original action in the U.S. Supreme Court seeking a decree apportioning the aquifer. Bringing such an action is fraught with challenges and uncertainty, in addition to the cost of the litigation (which could be very high). For example, a plaintiff in an original action must have permission from the Supreme Court to file the lawsuit based on the showing of actual, present harm. The size of SNWA's project means certain areas can be pumped while others rest. In the future, when and if SNWA's Snake Valley pumping appears to create the haiiii necessary for Utah to get the Supreme Court's pelinission for a lawsuit, Nevada could cease pumping from Snake Valley for a time and, depending on many factors, Utah may or may not be able to proceed. Further, the equitable apportionment doctrine is so complex and unpredictable that it is impossible to predict Utah's odds of prevailing in such a lawsuit. Another example: even if Utah were to prevail in an equitable apportionment suit, there is no guarantee the U.S. Supreme Court would address adverse impacts on specific water rights or provide "mitigation" for such impacts or the environmental harm SNWA pumping could cause. This consideration is especially important because the mitigation the Agreement

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[5] Absent the unusual P.L. 108-424 provisions, Utah would have no say in Nevada's use of Snake Valley water. Utah could do nothing to prevent that use until impairment occurs to Utah water rights, likely years from now.

provides to holders of Utah water rights in Snake Valley is more protection than Utah law requires. Such protection could be lost in a lawsuit.

In short, Utah's top water officials have, in conjunction with their lawyers, considered the related facts, issues, and law and determined that a negotiated agreement is preferable to pursuing long and costly litigation at some future time. The proposed Agreement is a better way to address and mitigate potential adverse effects of the SNWA project in Snake Valley than a lawsuit would be. And it is much better than no agreement or having Utah try to "veto" the Nevada project when Utah has no authority to exercise such a veto. This point is critical in a broader sense, because Utah officials would resist the involvement of Nevada officials in Utah water policy decisions. And, indeed, there may be Utah projects for which Nevada's support would be helpful. Further, failure to reach an agreement could increase tensions related to other water issues, such as management of the Colorado River. Finally, the Agreement gives Utah an important opportunity, mandated by Federal law, to address the numerous and complex issues involved with the development and future management of Snake Valley water resources. Utah should respond wisely and take full advantage of that opportunity. In this regard, the Agreement fairly divides the Snake Valley aquifer whether or not the SNWA project is built.

AGREEMENT FOR MANAGEMENT
OF THE SNAKE VALLEY GROUNDWATER SYSTEM

This State-to-State Agreement concerns the establishment of a cooperative relationship between the States of Utah and Nevada regarding the mana gement of interstate groundwater resources. The Southern Nevada Water Authority is signatory to this Agreement for the limited purposes outlined in Sections 6.1 through 6.6. inclusive, and 7.2 of this ALTreement.

In 2004, the United States Congress passed Pub. L. 108-424 (Appendix A) establishing, among other things, the requirement that the States of Utah and Nevada reach an agreement regarding the division of water resources, protection of existing water rights and the maximum sustainable use of the waters prior to any interbasin transfer from groundwater basins located within both States. It is the express intention of Utah and Nevada to satisfy the requirements of Pub. L. 108-424 with respect to the Snake Valley Groundwater Basin by executing this Agreement.

This Agreement is intended to define the water resource management responsibilities of the States of Nevada and Utah regarding the Snake Valley Groundwater Basin (Appendix B) and define a framework for cooperation between the states on natural resource issues of mutual interest. This Agreement is not intended to be an interstate compact, entered pursuant to the Compact Clause of the U.S. Constitution, Art. I, Section 10, Cl. 3. This Agreement is entered into between the States with the intention of avoiding an equitable apportionment action regarding the Snake Valley Groundwater Basin in the United States Supreme Court.

In consideration of the mutual covenants, terms and conditions herein contained, the States of Utah and Nevada hereto do agree as follows:

1.0 <u>Definitions</u>

As used in this Agreement:

1.1 "Adverse Impact to an Existing Permitted Use" or "Adverse Impact" means:

a. In the case of an Existing Permitted Use of Groundwater, a lowering of the water level that is caused by withdrawals of Groundwater by a junior, permitted Groundwater right, and that can be demonstrated to negatively affect that well's ability to produce Groundwater in a manner substantially similar to the well's historical production; or
b. In the case of Existing Permitted Uses for which the point of diversion is a spring, a reduction in spring flow to an amount less than the Existing Permitted Use, and that can be demonstrated to be less than the spring's historical supply.

1.2 "afy" means acre-feet per year

1.3 "Available Groundwater Supply" means that total amount of Groundwater available for appropriation and use on an annual basis from the Snake Valley

Groundwater Basin as deteimined by this Agreement or subsequently through further study and agreement of the State Engineers of Utah and Nevada.

1.4 "Beneficial Use" means the use of water for one or more recognized purposes including, but not limited to, municipal, domestic, irrigation, hydropower generation, industrial, commercial, recreation, fish and waterfowl propagation, and stock-watering; it is the basis, measure and limit of a water right.

1.5 "Consumptive Use" means the amount of water permanently removed from the Snake Valley Groundwater Basin for the permitted Beneficial Use. Consumptive Use is equivalent to depletion.

1.6 "Existing Permitted Uses" means Consumptive Use of Groundwater in the Snake Valley Groundwater Basin pursuant to water rights granted or recognized by the State Engineers of Utah and Nevada as of the date of this Agreement, and Utah water right numbers 18-51, 18-59, 18-66, 18-215, and 18-331 for water rights at the Fish Springs National Wildlife Refuge.

1.7 "Groundwater" means water underlying the surface of Snake Valley including water percolating therefrom via artesian springs rising from underground waters.

1.8 "Nevada" means the State of Nevada.

1.9 "Snake Valley" or "Snake Valley Groundwater Basin" means the hydrologic and geographical area subject to this Agreement. It is delineated by the surface water drainage divide, except on the north, as shown on the map in Appendix B, appended hereto and incorporated herein by this reference.

1.10 "SNWA" means the Southern Nevada Water Authority.

1.11 "States" means the State of Nevada and the State of Utah.

1.12 "State Engineers" means the State Engineer of Nevada and the State Engineer of Utah.

1.13 "Utah" means the State of Utah.

2.0 <u>Findings</u>

2.1. The States have a long history of resolving issues of concern to each state's citizens in a cooperative and mutually beneficial manner.

2.2 The States share a common border that divides several surface and subsurface watersheds.

2.3 Snake Valley Groundwater Basin is divided by the border between the States.

2.4 Although a substantial amount of information exists regarding the aquifer system that underlies Snake Valley in the form of reports and studies compiled by the United States Geological Survey ("USGS"), the States and other parties. the States acknowledge that such information is insufficient to determine with precision the Available Groundwater Supply.

Evaluating the Available Groundwater Supply within the Snake Valley Groundwater Basin with certainty depends upon the evolving trends in data collection regarding precipitation and recharge, characterization of the underground physical environment, and the sophistication of hydrologic estimation.

2.6 Recharge of the Groundwater supply in the Snake Valley Groundwater Basin occurs primarily within Nevada. Groundwater discharge and Consumptive Use has historically occurred primarily in Utah.

2.7 The States desire to incorporate both presently available, ongoing and future studies and other information into the process for administering and managing Groundwater development in Snake Valley.

2.8 Utah acknowledges that the safe yield doctrine that governs Groundwater appropriation in Utah generally allows for the appropriation of Groundwater in a manner that is sustainable and results in a reasonable amount of drawdown in the Groundwater aquifer. Such appropriations necessarily impact the existing hydrologic system and captures discharge available to phreatophytes, streams and natural lakes.

2.9 Nevada acknowledges that the perennial yield doctrine that governs Groundwater appropriation in Nevada generally allows for the appropriation of Groundwater that is discharged through natural evapotranspiration processes and/or some portion of the subsurface flow to adjacent basins. The majority of Groundwater appropriation within Nevada throughout the state's history has been premised upon the capture of Groundwater naturally discharged as phreatophytic evapotranspiration.

2.10 The States desire to allow for the development of the maximum sustainable Beneficial Use of water resources within each state through the establishment of procedures to administer the development of shared interstate water resources in a cooperative and equitable manner.

2.11 The States desire to incorporate monitoring data from measured Groundwater withdrawals into a publicly available database, which will assist the State Engineers in managing the Available Groundwater Supply.

2.12 SNWA has filed Application Nos. 54022 through 54030, inclusive, (hereinafter "SNWA Applications") with the Nevada State Engineer to appropriate Groundwater in Snake Valley with points of diversion within the State of Nevada.

3.0 Available Groundwater Supply

3.1 The States recognize that, in addition to ongoing studies and data collection activities, the USGS has completed what is generally known as the Basin and Range Carbonate Aquifer System Study ("BARCASS") as required by Section 301(e)(1) of Pub. L. 108-424. SNWA is working to collect and compile additional water level, spring flow, evapotranspiration and other hydrologic and biologic data. The States agree that BARCASS and other scientifically reliable reports, studies, or data collection efforts are valuable tools in determining the Available Groundwater Supply of Snake Valley and further agree that such additional information shall be examined in conjunction with actual monitoring data as part of the process of revising estimates of the Available Groundwater Supply of Snake Valley. All data used or proposed to be used to revise estimates shall be shared between the States and be publically available for review.

3.2 Based on the best currently available data, the States agree that the Available Groundwater Supply as of the date of this Agreement is 132,000 afy.

4.0 Allocation and Management of Available Groundwater Supply

4.1 The State Engineer of Utah shall exercise exclusive jurisdiction over that portion of the Available Groundwater Supply listed in Table 1 as available to Utah.

4.2 The State Engineer of Nevada shall exercise exclusive jurisdiction over that portion of the Available Groundwater Supply listed in Table 1 as available to Nevada.

Table 1 — Allowed Amounts of Consumptive Use of Groundwater

Allocated	Utah: Nevada:	55,000 afy 12,000 afy
Unallocated	Utah: Nevada:	5,000 afy 36,000 afv
Reserved	Utah: Nevada:	6,000 afy 18,000 afy

4.3 The States agree that, except as otherwise provided herein, the State Engineers are vested with the exclusive jurisdiction to administer the terms of this Agreement. The State Engineers shall make and enforce such regulations within their respective State as may be necessary to enable compliance with this Agreement.

4.4 The States agree to jointly identify areas of concern including, but not limited to, Available Groundwater Supply, points of diversion of existing water rights, wetlands, springs and other riparian dependant resources that could be affected by the Consumptive Use of Groundwater in Snake Valley.

4.5 The States agree that it is critical to incorporate monitoring data from measured Groundwater withdrawals into a database from which Available Groundwater Supply is determined. Both States agree to cooperate on data gathering and data sharing to better understand the geology and hydrogeology and the Available Groundwater Supply of Snake Valley. The States agree that all monitoring data collected will be shared and made available to the public.

4.6 The State Engineers shall cooperate to ascertain and make public the annual Groundwater withdrawal and actual Consumptive Use occurring under water rights of record in Snake Valley and any other information upon which they may mutually agree from time to time. The State Engineers shall either arrange for the annual publication of, or make public on a publicly available website, a report giving the diversions and depletions from the water resource under the water rights and the changes in aquifer water levels in the respective States during the preceding calendar year. The State Engineers shall meet as needed to review and assess the collected data, evaluate compliance with this Agreement, and determine the necessity of additional data gathering. The State Engineers may elect to also hold a joint annual public meeting with Nevada and Utah water users in the Snake Valley area to receive public input as to use and management of the water resource.

4.7 The State Engineers shall meter, or cause to be metered, the withdrawal of Groundwater pursuant to any water right with a duty or diversion quantity that exceeds 100 (one hundred) acre-feet per year and report said diversions on a calendar year basis.

4.8 The States agree to work cooperatively to (a) resolve present or future controversies over the Snake Valley Groundwater Basin; (b) assure the quantity and quality of the Available Groundwater Supply, (c) minimize the injury to Existing Permitted Uses; (d) minimize environmental impacts and prevent the need for listing additional species under the Endangered Species Act, (e) maximize the water available for Beneficial Use in each State, and (f) manage the hydrologic basin as a whole.

5.0 <u>Categories of Available Groundwater Supply</u>

5.1 Allocated - Allocated Groundwater is solely for satisfaction of water rights in Snake Valley and at Fish Springs National Wildlife Refuge with a priority date prior to October 17, 1989. Recognition of unrecorded diligence claims shall be accounted for as Allocated. Change applications which seek to move existing spring or surface water rights to Groundwater may be allowed for under the Allocated category, but no new appropriations will be allowed.

5.2 Unallocated - The State Engineers shall grant permits to withdraw, appropriate, or otherwise permit the use of, Groundwater from Unallocated Groundwater pursuant to the law of their respective States. Those rights with a priority date on or after October 17, 1989 shall be accounted for in this category. The State Engineers shall condition permits to appropriate Unallocated Groundwater issued after the date of this Agreement so as to:

a. For appropriation approvals in excess of 1,000 at', require a Hydrologic Monitoring and Management Plan be developed.

b. Require that all wells be equipped with access ports of sufficient diameter to allow the measurement of the water levels therein.

5.3 Reserved - The State Engineers shall not grant any Groundwater withdrawal permits to extract Reserved Groundwater until the State Engineers agree information reasonably demonstrates that additional Groundwater can be safely and sustainably withdrawn from Snake Valley and that Allocated and Unallocated uses will not be unreasonably affected.

5.4 The States agree that "maximization of sustainable Beneficial Use of the water resources while protecting existing rights," as intended by Public Law 108-424, requires that Consumptive Use from the Snake Valley Groundwater Basin be reasonably related to the Available Groundwater Supply within the Snake Valley Groundwater Basin, and as such, prohibits 1) the mining (or overdrafting) of Groundwater; 2) the degradation of water quality; and 3) the diminishment of the physical integrity of the Groundwater basin. The States agree to re-consult, at the request of either of them, regarding the Available Groundwater Supply, and adopt such measures as may later be agreed upon to redetermine the Available Groundwater Supply or otherwise maintain the maximum sustainable Beneficial Use of the water resources of the Snake Valley Groundwater Basin. In the event these consultations conclude that withdrawals exceed the redetermined Available Groundwater Supply, the State Engineers are to take action to reduce withdrawals by priority such that Consumptive Use in each state is limited to the redetermined Available Groundwater Supply.

6.0 Identification and Mitigation of Adverse Impacts to Existing Permitted Uses

6.1 In the event SNWA is granted any permits pursuant to the SNWA Applications, SN WA agrees to provide public notice, at least one year prior to the export of Groundwater from Snake Valley and at least once each quarter following the commencement of such export, that any owner of an Existing Permitted Use may notify SNWA of a claim to an Adverse Impact to its water right due to Groundwater withdrawals by SNWA. Such public notice shall be published in any newspapers of general circulation in Snake Valley, SNWA's website and such other reasonable means of publication as may be requested by the State Engineers.

6.2 Any owner of an Existing Permitted Use who believes that development or withdrawal of Groundwater by SNWA has caused an Adverse Impact to its Existing Permitted Use may notify SNWA that the permit owner claims an Adverse Impact and shall provide any pertinent information that supports their claim of Adverse Impact. Whenever such notification is made, SNWA shall assess the claimed Adverse Impact, verify that an Adverse Impact has occurred or is likely to occur, and propose options to mitigate any verified Adverse Impact. Upon receipt of notice of a claimed Adverse Impact, SNWA shall:

a. Within I 0 business days of receipt of notice, provide qualified staff to meet in person with the permit owner if the well(s) or spring(s) that are the point of diversion of the Existing Permitted Use are not currently producing sufficient water to meet the immediate needs of the permit owner. The location of such meeting shall be the point of diversion of the Existing Permitted Use unless otherwise agreed by both parties. If an Adverse Impact is determined by SNWA to have occurred or be likely to occur, SNWA shall make an offer, binding on SNVv'A, to the owner of an Existing Permitted Use to mitigate the Adverse Impact; or

b. If the well(s) or spring(s) that are the point of diversion of the Existing Permitted Use are currently producing sufficient water to meet the immediate needs of the permit owner, within 30 days of receipt of notice SNWA shall determine whether either an Adverse Impact has occurred based upon information provided by the permit owner or whether a site visit or other additional information is necessary to make such a determination. If an Adverse Impact is determined by SNWA to have occurred or be likely to occur, it shall make an offer, binding on SNWA, to the owner of the Existing Permitted Use to mitigate the Adverse Impact.

Mitigation options that may be offered shall include, but shall not be limited to:

1. Redistributing Groundwater withdrawals geographically;
2. Reducing or ceasing Groundwater withdrawals at specific points of diversion;
3. Deepening of well(s), repairing or replacing pumps and other infrastructure, and reimbursing for increased pumping costs;
4. Providing alternate water supplies;
5. Augmenting water supply for senior rights and resources using surface and Groundwater sources; and
6. Other measures as agreed to by SNWA and the owner of the Existing Permitted Use.

c. Within 10 business days from either: 1) a determination that no Adverse Impact has occurred or will occur; or 2) a rejection by any owner of an Existing Permitted Use of SNWA's final offer to mitigate any claimed Adverse Impact, SNWA shall notify both State Engineers of such determination or rejection and shall provide all pertinent details in writing.

6.3 The States agree to establish an Interstate Panel composed of the State Engineers or their designees and such members of each State Engineer's staff as they deem appropriate to hear disputes arising between an owner of an Existing Permitted Use in Utah and SNWA. Whenever the owner of the Existing Permitted Use and SNWA, cannot agree regarding the occurrence of an Adverse Impact or upon the appropriate mitigation for an Adverse Impact, the Interstate Panel shall consider the matters in dispute. The Interstate Panel shall not consider and shall have no jurisdiction over claims of Adverse

Impacts from SNWA's Groundwater development and withdrawal in Snake Valley for an Existing Permitted Use in Nevada. Any issues regarding claims of Adverse Impacts to Nevada water rights shall continue to be overseen by the Nevada State Engineer pursuant to the laws of Nevada.

a. When considering whether pumping from a SNWA Groundwater well is having an Adverse Impact upon a water right in Utah, the Interstate Panel may consider the following:

1. The construction of respective wells, including:
   a. Depth of the well
   b. Diameter of the well
   c. Screen intervals
   d. Slot size
   e. Age of the well
   f. Location of saturated strata
   g. Pump location
   h. Maintenance history
2. The distance between the respective wells
3. Priority dates of the respective water rights
4. Baseline data for the respective wells, including
   a. Pumping history
   b. Water level history
5. Baseline data for the area, including:
   a. Pumping history and distribution
   b. Water levels and water level variability
6. Groundwater gradient
7. Water quality
8. Locations of other wells in the area and their associated amounts and frequency of pumping
9. Climatic conditions, e.g. drought year
10. Geology
11. Likelihood of hydrologic connectivity between the respective wells
12. Occurrence of impact to or from other wells in the area
13. Recent seismic activity
14. Any other information determined relevant to the situation

b. When considering whether pumping from a SNWA Groundwater well is having an Adverse Impact on the spring supply of a water right in Utah, the Interstate Panel may consider the following:

1. Distance between the well and the spring
2. Geology
3. Likelihood of hydrologic connectivity between the well and the spring
4. Baseline flow rates
5. Groundwater gradient

6. Water quality
7. Recent seismic activity
8. Recent manmade activity
9. Locations of other wells in the area and their associated amounts and frequency of pumping
10. Occurrence of impact to or from other wells in the area
11. Climatic conditions
12. Any other information determined relevant to the situation.

6.4 In the event that any permits are issued to SNWA pursuant to the SNWA Applications, SNWA shall establish a mitigation fund sufficient to accomplish the mitigation of any reasonably anticipatable Adverse Impact, which shall be maintained throughout the tenure of the permit. In no event will the balance of the mitigation fund be reduced below $3,000,000 while SNWA maintains Groundwater development and withdrawal facilities in Snake Valley.

6.5 The Interstate Panel shall determine whether an Adverse Impact has occurred. In the case of the occurrence of an Adverse Impact, the Interstate Panel shall determine the appropriate mitigation. The determination of the Interstate Panel shall be administered by the Nevada State Engineer. The process for any challenge or review of an order of the Nevada State Engineer shall be determined by the laws of Nevada.

6.6 The processes described in subsections 6.2 to 6.5 of this section may be exercised at the election of the owner of an Existing Permitted Use and shall not preclude such person's right to pursue any and all other remedies available to any party in law or in equity.

6.7 Nevada agrees to hold the SNWA Applications in abeyance through September 1, 2019, to allow additional hydrologic, biologic, and other data to be collected in Snake Valley for use by the Nevada State Engineer and for use in other processes. Prior to September 1, 2019, the Nevada State Engineer will not hold a hearing or grant a permit pursuant to the SNWA Applications.

6.8 At least nine months prior to any hearing conducted by the Nevada State Engineer in regard to the SNWA Applications, Utah and Nevada will confer regarding which employees of the State of Utah have knowledge and expertise regarding the hydrologic and biologic resources of Snake Valley. Any employees of the State of Utah that the States agree have relevant infoimation regarding the hydrologic and biologic resources of Snake Valley will be invited by Nevada to present such information during the hearing on the SNWA Applications.

7.0 <u>Environmental Programs</u>

7.1 The Director of the Nevada Department of Conservation and Natural Resources shall designate a representative to participate in the Columbia Spotted Frog Conservation Team as created by Article VI of the Conservation Agreement and Strategy for Columbia

Spotted Frog *(Rana Luteiventris)* in the State of Utah, Utah Department of Natural Resources, Division of Wildlife Resources—Native Aquatic Species, Publication Number 06-01, and the Least Chub Conservation Team, as created by Article VII of the Conservation Agreement and Strategy for Least Chub *(Iotichthys Phlegethontis)* in the State of Utah, Utah Department of Natural Resources, Division of Wildlife Resources—Native Aquatic Species, Publication Number 05-24.

7.2 Concurrently with the execution of this Agreement, Utah and SNWA have entered into an agreement entitled the *Snake Valley Environmental Monitoring and Management Agreement* ("Environmental Agreement") attached hereto as Appendix C. The Parties agree to work together to coordinate management activities conducted pursuant to this Agreement and monitoring and management activities conducted pursuant to the Environmental Agreement in order to make informed determinations as to whether Groundwater withdrawals have caused an Adverse Impact to an Existing Permitted Use.

8.0 General Provisions

8.1 Nothing in this Agreement shall be deemed to alter, amend or supersede the respective statutory or administrative authority of the State Engineers in administering the waters of the Snake Valley Groundwater Basin in their respective States.

8.2 Should any claim or controversy arise between the States; (a) with respect to any water resource not specifically addressed by the terms of this Agreement; (b) over the meaning or performance of any of the terms of this Agreement; (c) as to the allocation of the burdens incident to the performance of any provision of this Agreement; or (d) regarding the delivery of waters herein provided; the signatories of this Agreement, or their successors, upon the request of one of them, shall forthwith instruct the State Engineers, to consider, resolve and adjust such claims or controversy. If the State Engineers fail to resolve said dispute, the signatories shall select a neutral mediator agreeable to both States who shall mediate the dispute. The States shall share the cost of the mediator equally.

8.3 This Agreement shall become effective immediately upon execution by the States.

8.4 Nothing in the Agreement is intended to provide any contract for the benefit of third parties, and no such persons or entities shall have any cause of action as against the States arising from this Agreement, nor shall such third parties have any cause of action to enforce any provisions of this Agreement.

8.5 Any modification, amendment, or termination of this Agreement shall be binding only if evidenced in writing and signed by each State.

8.6 Each individual executing this Agreement hereby represents that he is duly authorized to sign the Agreement in the capacity set forth.

8.7 Any notice concerning this Agreement shall be given by sending such notice via U.S. Mail to the State Engineers.

IN WITNESS WHEREOF, Utah and Nevada have fully executed this Agreement on this _____ day of _____, 2009.

_____
Utah Department of Natural Resources
Michael R. Styler
Executive Director

_____
Nevada Department of Conservation and Natural Resources
Allen Biaggi
Director

For the purposes of Sections 6.1 through 6.6, inclusive, and 7.2 only of this agreement:

_____
Southern Nevada Water Authority
Patricia Mulroy
General Manager

APPENDIX A

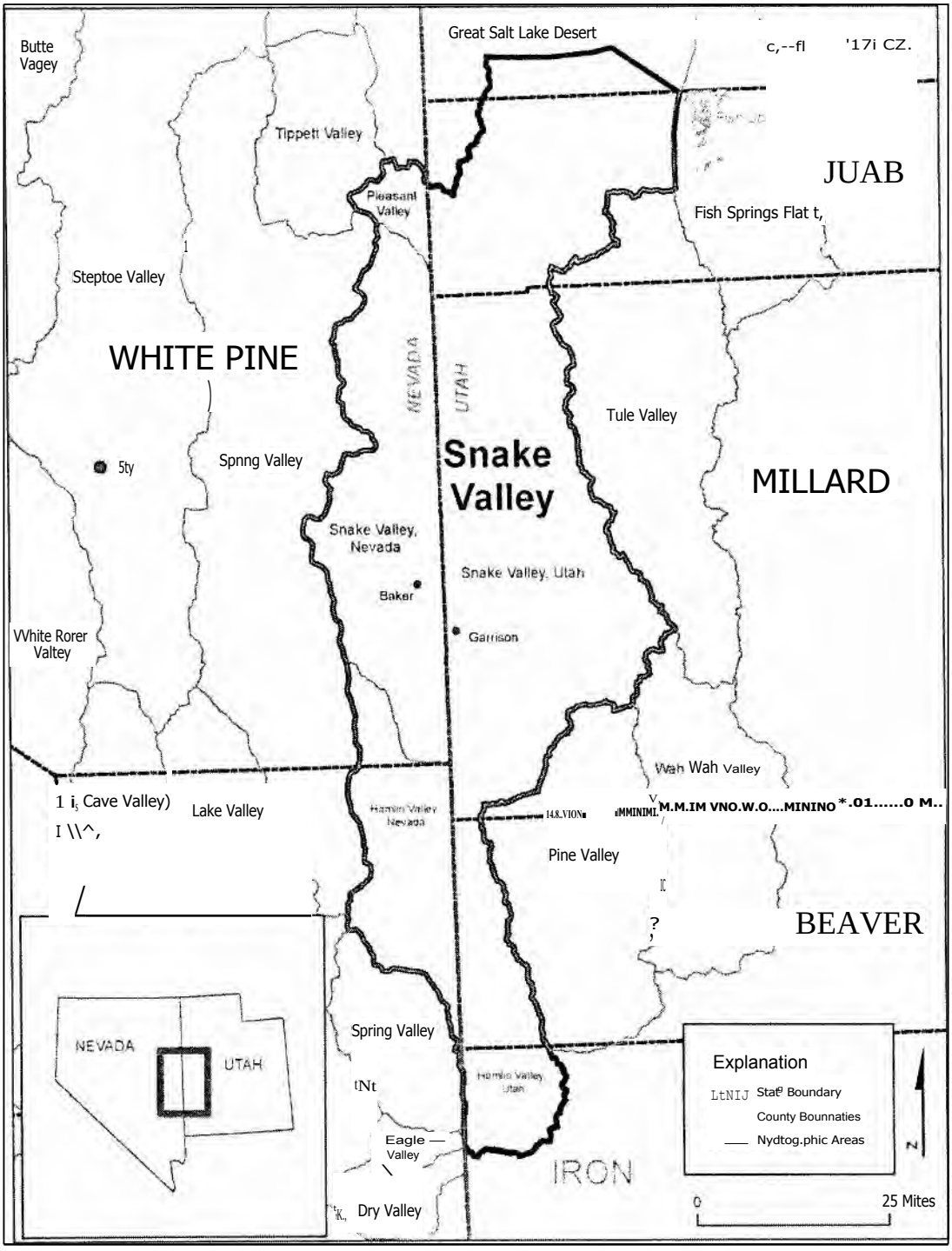
PUBLIC LAW 108-424

Section 301 (e) (3)

Prior to any transbasin diversion from ground-water basins located within both the State of Nevada and the State of Utah, the State of Nevada and the State of Utah shall reach an agreement regarding the division of water resources of those interstate ground-water flow system(s)from which water will be diverted and used by the project. The agreement shall allow for the maximum sustainable beneficial use of the water resources and protect existing water rights.

APPENDIX B

APPENDIX a SNAKE VALLEY GROUND TER *BASIN, NEVADA a*nd UTAH



APPENDIX C

Snake Valley Environmental Monitoring and Management Agreement

SNAKE VALLEY ENVIRONMENTAL MONITORING AND MANAGEMENT AGREEMENT

This Snake Valley Environmental Monitoring and Management Agreement (Agreement) is made and entered into between the State of Utah (Utah) and the Southern Nevada Water Authority (SNWA), a political subdivision of the State of Nevada. For convenience, at times herein Utah and SNWA are referred to individually as Party and collectively as Parties.

RECITALS

A. In October 1989, the Las Vegas Valley Water District (SNWA's predecessor-in-interest) filed Applications 54022 through 54030, inclusive, (hereinafter referred to as the "SNWA Applications") to appropriate the public groundwater of the State of Nevada in the Snake Valley hydrographic basin with points of diversion within the State of Nevada. S.NWA proposes to develop and utilize these groundwater resources for municipal purposes outside of the Snake Valley hydrographic basin.

B. The Snake Valley hydrographic basin (Snake Valley or Snake Valley HB) lies within the boundaries of both the State of Utah and the State of Nevada.

C. In 2004, the United States Congress passed Pub. L. 108-424 establishing, among other things, the requirement that the States of Utah and Nevada reach an agreement regarding the division of water resources prior to any interbasin transfer from groundwater basins located within both States.

D. Concurrent with the execution of this Agreement, the States of Utah and Nevada have entered into an Agreement for Management of the Snake Valley Groundwater System (Utah-Nevada Agreement) in satisfaction of the requirements of Pub. L. 108-424 with respect to Snake Valley. The Utah-Nevada Agreement defines the water resource management responsibilities of the States of Nevada and Utah regarding the Snake Valley HB, and defines a framework for cooperation between the states on natural resource issues of mutual interest.

E. Prior to the execution of this Agreement, SNWA became a signatory party to the Conservation Agreement and Strategy for Least Chub (Bailey et al 2005) and the Conservation Agreement and Strategy for Columbia Spotted Frog (Bailey et al 2006) attached hereto as Appendixes 4 and 5, respectively.

F. By entering into this Agreement, Utah and SNWA intend to define certain monitoring and management obligations that are complimentary to the obligations of the States of Utah and Nevada as set forth in the Utah-Nevada Agreement.

G. The Parties desire to establish a consultative process by which to manage the development of groundwater by SNWA within Snake Valley which the Parties agree will result in changes to the existing hydrologic and biologic conditions and may potentially effect the air resources of Snake Valley and the defined Area of Interest, and that the consultative process envisioned and established by this Agreement will provide for monitoring the effects of any

development by SNWA on the hydrologic, biologic and air resources, detellnining early warning indicators for decisions concerning potential management response actions, instituting a measured management response action, if necessary, and monitoring the effects of the response action to determine its efficacy and sufficiency or the need for further response actions.

H. Utah acknowledged at section 2.8 of the Utah-Nevada Agreement that the safe yield doctrine that governs groundwater appropriation in Utah generally allows for the appropriation of groundwater in a manner that is sustainable and results in a reasonable amount of drawdown in the groundwater aquifer. Such appropriations necessarily impact the existing hydrologic system and captures discharge available to phreatophytes, streams and natural lakes.

I. Nevada acknowledged at section 2.9 of the Utah-Nevada Agreement that the perennial yield doctrine that governs groundwater appropriation in Nevada generally allows for the appropriation of groundwater that is naturally discharged as phreatophytic evapotranspiration and/or some portion of the subsurface discharge. The majority of groundwater appropriation within Nevada throughout the state's history has been premised upon the capture of groundwater naturally discharged as phreatophytic evapotranspiration.

J. The Parties acknowledge that not all effects caused by the development of groundwater in Snake Valley are unreasonable, and that the process identified in this Agreement will evaluate the severity and relative importance of the identified effect in the consideration of the appropriate management response action, if any. The Parties also recognize that management actions will need to be coordinated with determinations made under the Utah-Nevada Agreement, though determinations made under each Agreement may have independent validity and effect.

K. The Parties intend, through the Management Committee and the Technical Working Group established herein, to collaborate on data collection and technical analysis, and shall rely on the best scientific infoiniation available in making determinations and recommendations required by, and necessary for, the implementation of this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants, terms and conditions herein contained, Utah and SNWA do agree as follows:

1. Statement of Intent.

In order to accomplish the purposes of this Agreement, the Parties agree, as more specifically set forth in this Agreement, to 1) establish monitoring plans to detennine the hydrologic, biologic and air resources of the state of Utah which may be affected by SNWA's development of Nevada state groundwater rights within the Snake Valley HB, 2) set out a process to define, subsequently review and, if necessary revise, early warning indicators of sufficient scope and diversity to indicate effects to the hydrologic, biologic and air resources caused by SNWA's groundwater development in Snake Valley, and to 3) establish reasoned and effective management response mechanisms to counter the effects through, initially, avoiding the actions leading to the effect, secondly, minimizing the effect, or thirdly, mitigating the effect. In order to accomplish these tasks the Parties agree to utilize the following tools:

1. Hydrologic Monitoring
2. Groundwater Chemical Monitoring
3. Regional Groundwater Flow Numerical Modeling
4. Ecological Modeling
5. Biological Monitoring Plan
6. Management Response and Operation Plan
7. Air Quality Protection Plan

2. Definitions. As utilized in this Agreement the following terms shall have the followinL, meanin(2:

2.1. Initial Period. "Initial Period" shall mean the time period from the Effective Date of this Agreement through the first day of the Baseline Period, as defined herein.

2.2. Baseline Period. "Baseline Period" shall mean a time period of not less than five years immediately preceding the export of any groundwater by SNWA from Snake Valley. The Baseline Period will begin when SNWA provides notice to Utah.

2.3. Operational Period. "Operational Period" shall mean the time period beginning immediately following the export of any groundwater by SNWA from Snake Valley and lasting for so long as SNWA holds Nevada state groundwater rights with a point of diversion within Snake Valley.

2.4. Effective Date. "Effective Date" means the date that this Agreement is executed by and binding upon each of the Parties hereto.

3. Management Requirements.

3.1. Management Committee.

3.1.1 Creation and Purpose. The Parties shall create a Management Committee, to include two executive level principals from each of the Parties, within 30 days of the beginning of the Initial Period. The first purpose of the Management Committee is to review and approve, disapprove or modify recommendations from the Technical Working Group (TWG) constituted pursuant to section 3.2 of this Agreement. The Management Committee will convene as necessary upon the request of any member of the Management Committee. The second purpose is to negotiate a resolution in the event that the TWG cannot reach consensus on a recommendation concerning monitoring requirements, resource or other research needs, technical aspects of study design, interpretation of results, or appropriate management response actions.

The Utah representatives to the Management Committee shall coordinate efforts with the Snake Valley Aquifer Research Team established pursuant to Section 63C-12-101, *et seq.* of the Utah Code.

3.1.2 Operation. The Management Committee shall meet within 21 calendar days of notification from the TWG of a need for action, or notification from any member of the Committee, and shall reach a decision within 60 calendar days of TWG notification. If the

3.2. Technical Working Group

3.2.1 Creation and Purpose. The Parties shall create and convene a multi-disciplinary Technical Working Group (TWG) within 60 days of the beginning of the Initial Period. The purpose of the TWG is to carry out the functions required of it under this Agreement, including reviewing, analyzing, and interpreting information collected under this Agreement, evaluating the results of related analyses, and making recommendations for management response actions and other items to the Management Committee. Membership of the TWG shall include two representatives from SNWA (Groundwater Resources Division, Environmental Resources Division) and three representatives from the State of Utah (Utah Geological Survey, Utah Division of Air Quality, Utah Division of Wildlife Resources). Each Party, at its sole discretion and cost, may invite such additional staff or consultants to attend, as each deems necessary. To assist the TWG, the Parties may mutually agree to invite a representative of the Nevada and Utah State Engineer's Office to participate in the TWG. Furthermore, the Parties may mutually agree to invite other non-Party entities to assist and participate in the TWG as deemed necessary or appropriate.

3.2.2 Operation. The TWG shall meet as needed to carry out the tasks set forth for completion in this Agreement or as otherwise requested by any member of the TWG or as directed by the Management Committee.

The TWG shall strive for consensus in all determinations and recommendations. Specific tasks assigned to the TWG pursuant to this Agreement include:

1. Implementation and modification, as deemed necessary, of the biologic, hydrologic and air quality monitoring plans set forth in Appendixes 1, 2 and 3, respectively;

2. Make recommendations to the Management Committee regarding the formulation, implementation and modification of the Management Response and Operation Plan set forth in section 5 of this Agreement;

3. Review data collection and quality assurance procedures, disseminate data and provide a scientific and technical forum to evaluate data and analyses, including hydrologic and ecologic parameters of the appropriate models and the results of model analysis;

4. Identify needs for additional data collection and scientific investigations;

5. Consider, as necessary, whether the modification of the initial boundaries of the monitoring areas is warranted as new data become available;

6. During the Operation Period, review SNWA proposed or ongoing pumping schedules in Snake Valley for both testing and production purposes;

7. Provide a forum for discussion to help develop agreement for prescribed courses of action on technical issues and make recommendations to the Management Committee;

Develop recommendations about monitoring, modeling, groundwater mana ᵍement, and mitigation, including but not limited to the addition, deletion, or replacement of monitoring wells, the frequency of data collection, and the types of monitorinᵍ, sampling, and testing to be conducted;

9. If appropriate, oversee development and use of a regional ecological model to track biotic community response to SNWA's ᵍroundwater withdrawal from Snake Valley; and

10. Other responsibilities as delegated by the Management Committee.

4. Monitoring Objectives.

The objectives of the monitoring program are to assemble, collect and analyze biological, hydrologic and air-quality data that improve the current understanding of baseline conditions and natural variation, and provide early detection of effects from SNWA and Existing Permitted User (EPU) groundwater withdrawals in Snake Valley. Data collected by this program will: 1) support assessments of groundwater-influenced ecosystems inhabited by sensitive or special-status species; 2) include measurements of groundwater-levels and spring discharges where effects may be attributed to groundwater development within Snake Valley; 3) include certain water quality parameters that may be affected by groundwater development within Snake Valley; and. 4) include certain air quality parameters that may be affected by groundwater development within Snake Valley.

4.1. Monitoring Area Description.

The monitoring areas associated with this Agreement occur within a larger Area of Interest that includes the Upper Great Salt Lake Desert Flow System (GSLDFS). Within this Area of Interest, two specific areas have been delineated in which biological, hydrologic, and air-quality monitoring will be conducted. These areas are named "Tier I" and "Tier II" Monitoring Areas, respectively, and are depicted on Figure 1. Within the Tier I and Tier II Monitoring Areas are Key Areas of Biological Concern (KABCs), also depicted on Figure 1. These KABCs were identified to focus the monitoring approach, and were based on the presence of groundwater-influenced ecosystems inhabited by Species of Greatest Conservation Need identified in the Utah Comprehensive Wildlife Conservation Strategy (CWCS 2005) or contain phreatoplaytic vegetation susceptible to effects resulting from groundwater development.

4.1.1 The Tier I Monitoring Area includes a large part of the Snake Valley hydrographic area, extending from Miller Spring at the northern end of Snake Valley to the southern boundary of the Snake Valley hydrographic area. The Tier I Monitoring Area includes parts of Nevada and Utah adjacent to the SNWA proposed points of diversion, areas of current agricultural use, and KABCs. The Parties anticipate that effects to groundwater levels and groundwater-influenced ecosystems that may result from groundwater pumping by SNWA will first occur within the Tier I Monitorinᵍ Area. Therefore. monitoring efforts will be greatest in the Tier I Monitoring Area and will include a higher density of monitoring sites, and greater scope

and frequency of data collection to ensure early detection of effects resulting from SNWA groundwater withdrawals in Snake Valley.

Biologic, hydrologic, and air-quality monitoring requirements for the Tier I Monitoring Area are specified in this Appendixes 1, 2 and 3. Specific biologic, hydrologic, and air-quality parameters were selected for monitoring based on their susceptibility to be influenced by changing groundwater conditions.

4.1.2 The Tier II Monitoring Area extends to the east, north and south from the Tier I Monitoring Area, to adjacent areas including the northern part of Snake Valley (north of Miller Spring) and the hydrographic areas of Fish Springs Flat, Tule Valley, Pine Valley, and Wah Wah Valley. Because virtually no groundwater development has occurred in these areas and they are distant from the proposed SNWA points of diversion, monitoring in the Tier II Monitoring Area will be less intense with respect to the frequency of data collection and the density of monitoring sites. Tier II monitoring will be focused on Fish Springs Flat and Tule Valley which are thought to be hydraulically connected and potentially down-gradient from Snake Valley, where the proposed SNWA and current/future EPU pumping centers are located. Because these areas contain KABCs, biological monitoring will be included here, albeit at a lower level of intensity than in the Tier I Monitoring Area. Hydrologic monitoring efforts in these areas and in northern Snake Valley, Pine Valley, and Wah W, Tah Valley will be perfoinied to establish background hydrologic conditions within the Upper GSLDFS.

Biologic, hydrologic, and air-quality monitoring requirements for the Tier II Monitoring Area are specified in Appendixes 1, 2 and 3.

4.2. General Monitoring Requirements.

The TWG is responsible for developing and implementing the monitoring plan. The Parties agree to work cooperatively in designing the specific biological, hydrologic, and air-quality monitoring networks set forth in Appendixes 1, 2 and 3 needed to achieve the Statement of Intent and complete the tasks set forth in section 3.2.2 of this Agreement.

5. Management Response and Operation Plan.

5.1 Creation of Operation Plan. Prior to the beginning of the Operational Period, the Management Committee, upon the recommendation and advice of the TWG, shall approve an initial written Management Response and Operation Plan ("Operation Plan"). The Parties recognize that the scope, terms and conditions of the initial Operation Plan will necessarily be based upon the data available at the beginning of the Operational Period. In particular, the Parties recognize that the predictive capabilities of any groundwater or ecological models will improve as data and information is obtained through the development of groundwater over a period of years, and that early warning indicators may need to be refined or amended as this data becomes available. The Parties agree that the Operation Plan shall contain a defined process for the Management Committee to approve, as appropriate, updates to the Operation Plan as necessary to ensure the early warning indicators and management response actions are consistent with the Recitals and Statement of Intent set forth above, and reflect the most current data and analysis available.

5.1.1 The Operation Plan shall include:

1. Identification and definition of early warning indicators for effects to hydrologic, biologic and air resources in the Area of Interest;

   A defined range of specific management response actions designed to avoid the indicated effects;

3. A defined range of specific management response actions designed to minimize the indicated effects;

4. A defined range of specific management response actions designed to mitigate the indicated effects;

5. A process for the TWG and Management Committee to review the early warning indicators when observed, review the criteria, and determine the appropriate management response action; and

6. A defined process to evaluate and monitor the success of all management response actions.

5.1.2 Early warning indicators and the range of specific avoidance, minimization and mitigation management response actions identified in the Operation Plan will be based on all relevant and available data.

5.1.3 Notwithstanding anything to the contrary contained in this Agreement, nothing contained in the Operation Plan shall mandate or otherwise require that any specific management response action be implemented based upon an early warning indicator or otherwise. The task of initiating any and all management response actions shall be within the sole discretion of the Management Committee.

5.1.4 The Parties agree that if, during the Term of this Agreement, the State of Utah permits any Utah water rights with a point of diversion in Snake Valley to be exported and placed to beneficial use outside of the hydrographic basin boundaries of Snake Valley, then Utah will require the holder of the export permit(s) to comply with an operation plan that is substantially similar to the Operation Plan agreed to by the Parties to this Agreement. If Utah permits an interbasin transfer of Utah water rights from Snake Valley without enforcement of this section 5.1.4, then this entire Agreement shall be subject to termination for breach of a material term. If at any time while this Agreement remains in effect SNWA believes that Utah has permitted an interbasin transfer of Utah water ri ghts from Snake Valley without enforcement of this section 5.1.4, the following process will be followed:

a. SNWA shall provide notice to Utah of all infoli iation in the possession of SNWA that forins the basis of SNWA's belief that a breach of section 5.1.4 has occurred;

b. Utah shall reply in writing to SNWA within 90 days of the receipt of notice and state whether Utah agrees or disagrees with SNW,A's belief that a breach of section 5.1.4 has occurred:

c. If Utah agrees that a breach of section 5.1.4 has occurred then Utah will have 120 days from the mailing of the notice to SNWA under section 5.1.4(b) to cure the breach;

d. If Utah disagrees that a breach of section 5.1.4 has occurred or if for any reason SNWA is not satisfied with any cure instituted by Utah under section 5.1.4(c), then the Parties shall proceed to the Dispute Resolution Process outlined in section 13 of this Agreement and thereafter to any remedy available in law or in equity available to either Party;

e. Non-enforcement by SNWA of the provisions of this section 5.1.4 for any period of years while this Agreement remains in effect shall not be deemed to waive SNWA's right to enforce this provision; and

f. Nothing in this section 5.1.4 shall effect any valid contractual rights or obligations of the Parties set forth outside of this Agreement.

5.2 Initiation of Management Response Actions Pursuant to the Operation Plan. During the Operational Period, the Management Committee shall utilize the Operation Plan to determine management response actions that are a measured and reasonable response to the scope, magnitude and extent of the identified effect caused by pumping from SNWA's groundwater production wells upon the hydrologic, biologic and air resources within or as a result of atmospheric transport from the Area of Interest.

Based upon the Parties understanding that development of groundwater by SNWA in the Snake Valley HB will result in changes to the existing hydrologic and biologic conditions and may potentially effect the air resources within or as a result of atmospheric transport from the defined Area of Interest, but that not all such changes are unreasonable, the Management Committee shall detellnine and execute management response actions that are a measured and reasonable response to the scope, magnitude and extent, large or small, of the identified effect. As part of the determination, the Management Committee shall take all necessary steps to ensure that management response actions are: 1) scientifically sound; 2) can be engineered and implemented in a reasonable manner; 3) are implemented in a timely manner.

However, the Parties agree that no management response action may be selected which has 1) the effect of violating the letter or the spirit of the Conservation Agreements and Strategies for the Least Chub and Columbia Spotted Frog, or any successor agreement, or 2) otherwise causes the existing viable population of a species to decline to an extent which necessitates the species come under the purview of the Endangered Species Act, (16 U.S.C. 1531, et. seq.) including Candidate Species provisions, or 3) causes or contributes significantly to a violation of an applicable National Ambient Air Quality Standard (NAAQS) standard or Prevention of Significant Deterioration (P SD) increment.

Available management response actions include, but are not limited to, the following:

- Geographic redistribution of groundwater withdrawals;
- Reduction or cessation in groundwater withdrawals;

- Provision of consumptive water supply requirements using surface andlor groundwater sources;
- Acquisition of real property and/or water rights dedicated to the recovery of the Special Status Species within the current and historic habitat range within the Tier I and/or Tier II Monitoring Areas;
- Augmentation of water supply and/or acquisition of water rights for using surface and groundwater sources: and
- Other measures as agreed to by the Management Committee, or required by the Nevada State Engineer.

5.3 Good Faith Effort to Finalize Operation Plan. SNWA and Utah shall in good faith pursue the creation the Operation Plan as set forth in section 5.1 of this Agreement within one year of the beginning of the Baseline Period. If the TWG is unable to recommend a consensus Operation Plan within this timeframe, then the TWG shall submit to the Management Committee any alternative versions of the Operation Plan developed by members of the TWG. If the Management Committee cannot agree by consensus to one alternative or a combination of alternatives recommended by the TWG within 90 days, then the Parties agree that each of the alternatives submitted to the Management Committee by the TWG shall be submitted to a mutually-agreeable third party, who shall have up to one year for final selection among the submitted alternatives or a combination thereof. The alternatives selected by the third party shall be binding on the Parties. Final payment to the third party shall be conditional upon completion within the allotted year. The provisions of this section 5.3 shall apply only to the first version of the Operation Plan and shall not apply to any subsequent revision, modification or amendment of the Operation Plan. If for any reason mutually agreed upon third party does not produce a final version of the Operation Plan within one year of the submission of the alternatives by the Parties, then either Party can invoke the provisions of section 13 of this A greement for resolution of the matter. The resolution of any dispute or disagreement concerning the revision, modification or amendment of the Operation Plan shall be governed by section 13 of this Agreement.

6. Data-Quality Requirements.

Data quality shall conform to applicable industry and scientific standard methods and protocols, unless otherwise agreed upon or defined by the TWG. All data will undergo Quality Assurance/Quality Control.

The TWG shall ensure that all measurement and data collection associated with the hydrologic monitoring networks is performed according to USGS established protocols, unless otherwise agreed-upon.

All air quality instrumentation shall be installed, calibrated and operated according to EPA established monitoring protocols (Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. I, EPA-600/R-94/038a and Vol. II, EPA-454/13-08-003), unless otherwise agreed upon by the TWG. The collected air quality and meteorological data shall be reviewed and validated on a quarterly basis. Records of the audits. data quality and data completeness shall be maintained and available to the TWG.

7. Data Reporting Requirements.

All data collected pursuant to this Agreement shall be fully and cooperatively shared among the Parties. SNWA shall develop and maintain a shared-data repository for the storage and retrieval of data and information collected pursuant to this Agreement. The monitoring reports specified in section 7.1, 7.2 and 7.3 will be posted on SNWA's website within one week of their annual transmission to the Nevada and Utah State Engineers' Office.

7.1 Biologic Data Reporting.

SNWA shall report the results of all monitoring and sampling pursuant to this Agreement in an annual monitoring report that shall be submitted to the Parties and the Nevada and Utah State Engineers' Office by no later than March 31 of each year that this Agreement is in effect.

7.2 Hydrologic Data Reporting.

Using data derived from groundwater-level measurements of all production, exploratory, and monitor wells identified in this Agreement, SNWA shall produce groundwater contour maps and water-level change maps for both the basin-fill and carbonate-rock aquifers at the end of baseline data collection, and annually thereafter at the end of each year of groundwater withdrawals by SNWA, or at a lesser frequency agreed-upon by the Parties.

Groundwater-level and water-production data shall be made available to the other Party within 90 calendar days of collection using the shared data-repository website administered by SNWA. Water-quality laboratory reports shall be made available to the other Party within 90 calendar days of receipt using the shared data-repository website administered by SNWA.

SNWA shall report the results of all monitoring and sampling pursuant to this Agreement in an annual monitoring report that shall be submitted to the Parties and the Nevada and Utah State Engineers' Office by no later than March 31 of each year that this Agreement is in effect. SNWA shall submit as part of its annual report a proposed schedule of groundwater withdrawals (testing and production) for the immediately succeeding two calendar years. Final monitoring and sampling data will be made available over the Internet via the USGS NWIS or other appropriate website throughout the duration of this Agreement.

7.3 Air-Quality Data Reporting.

Air quality and coincident meteorological parameters shall be sampled and reported continuously on an hourly average basis. The data collected shall be submitted hourly to Utah Division of Air Quality (UDAQ) and other interested Parties as deteimined by the TWG via cellular modern, satellite modem, radio or other electronic telemetry. Such data will be available on the UDAQ website in accordance with UDAQ's standard processes and procedures.

Quarterly reports of the quality assured air quality and meteorological data shall be submitted to the UDAQ. These reports shall include full electronic data sets of the quality assured air quality and meteorological data in a foiniat prescribed by the TWG. These reports shall also include summary tables and charts of: averaged air quality data comparable to the NAAQS, maximum

data. mean data, data quality and completeness, and other information deemed important by the TWG.

8. Analytical Models.

8.1 Regional Groundwater Flow Numerical Modeling.

The Parties agree that groundwater flow system numerical modeling is a useful tool in the prudent management of basin-fill and regional carbonate-rock aquifer systems. Therefore, the Parties agree that this Agreement must include a suitable groundwater flow system numerical model(s). The Parties acknowledge that model results must be qualified based on a comparison of the accuracy of the model(s) and the capability of the model(s) to predict actual conditions. As the effects of groundwater withdrawals in Snake Valley on groundwater levels and spring flows are measured, refinement of the model(s) may be necessary to achieve better agreement with actual field measurements. Furthei more, the collection of additional hydrologic, geologic, geophysical, and geochemical data may indicate that modification of the conceptual and numerical model(s) of the regional groundwater flow system is warranted.

The Parties shall share all geologic, geophysical, hydrologic, and geochemical information collected in the Tier I and Tier II Monitoring Areas. These data shall be evaluated by the TWG for inclusion into the regional groundwater flow system numerical model(s).

SNWA shall maintain, update, and operate an agreed-upon groundwater flow system numerical model(s), in cooperation with the TWG. SNWA may subcontract this obligation to a third party. The cost of all modeling described herein shall be borne by SNWA.

Beginning at least one year prior to the end of the Baseline Period, SNWA shall provide model output in cooperation with the TWG for evaluation by the TWG in the form of input files, output files, drawdown maps, tabular data summaries, and plots of simulated water levels through time for the aquifer system, unless otherwise recommended by the TWG.

8.2 Ecological Model.

The Parties agree that regional ecological model may be a useful tool in evaluating and predicting effects of SNWA groundwater development when coupled with a sufficiently resolved hydrologic model. Based upon the success of the ecological modeling effort being conducted by SNWA in Spring Valley, the TWG will evaluate the utility of an ecological model within Snake Valley during the Initial Period. If the TWG recommends and the Management Committee approves proceeding with an ecological modeling effort, the ecological model will be created in years one and two of the Baseline Period. During the remainder of the Baseline Period and throughout the Operational Period SNWA will maintain, update and operate an agreed-upon model in cooperation with the TWG.

Notwithstanding anything to the contrary contained in this Agreement, SNWA's contributed funding of the ecological model during the Baseline Period shall be limited to $500,000. Any funding commitment for ecological modeling during the Operational Period is subject to appropriation approval by SNWA's Board of Directors.

9. Change Applications.

In the future, SNWA may seek to change the points of diversion and rates of withdrawal within the Snake Valley HB for any quantities of groundwater permitted pursuant to the SNWA Applications. Prior to filing such change applications, SNWA shall consult with the TWG about the potential effects of any proposed changes.

10. Nevada State Engineer Proceedings.

The Parties agree that a copy of this Agreement shall be submitted by SNWA to the Nevada State Engineer at the commencement of any administrative proceedings regarding the SNWA Applications. At that time, SNWA shall request on the record that the State Engineer include the terms of this Agreement as part of the peilnit terms and conditions in the event that the Nevada State Engineer grants any of the SNWA Applications in total or in part.

11. Submission to Bureau of Land Management.

SNWA shall submit a copy of this Agreement to the Bureau of Land Management and request that it be included in any Environmental Impact Statement prepared for the "Clark/Lincoln/White Pine Counties Groundwater Development Project," or any other project related to the development of the SNWA Applications.

12. Funding.

Except as otherwise specifically set forth in this Agreement, any commitment of funding by Utah or SNWA in this Agreement, including specifically any monitoring or management response actions are subject to appropriations by the Utah Legislature or the governing body of the SNWA, as appropriate.

13. Dispute Resolution Process.

In the event the Management Committee cannot agree on a mutually acceptable course of action upon request from the TWG, a Disputes Review Board (Board) will be established within thirty (30) days notice by either Party to review that disagreement. The Board shall be comprised of one member selected by Utah, one member selected by SNWA, and a third member selected by the first two members. The Board members shall show no partiality to either Utah or SNWA; or have any conflict of interest.

For any dispute that is brought before the Board, the Board shall provide a list of written recommendations to Utah and SNWA to assist in the resolution of the disagreement within thirty (30) days of the initial meeting of the Board. Although the recommendations of the Board should carry great weight for both Utah and SNWA, they are not binding on either party. However, the written recommendations shall be admissible as evidence to the extent permitted by law in any subsequent legal proceeding arising under this Agreement, including any administrative hearing before the Nevada State Engineer. Notwithstanding the foregoing or any contrary provision contained herein, either Party may bring an action in a court of competent jurisdiction to assert any claim arising out of this Agreement or otherwise. SNWA specifically agrees that SNWA will not assert that Utah lacks standing to bring any action related to the

enforcement of this Agreement before the Nevada State Engineer, or in any court of competent jurisdiction in the State of Nevada.

14. Notices.

If notice is required to be sent by the Parties, the addresses are as follows:

If to Utah:
Executive Director
Utah Department of Natural Resources
594 West North Temple
PO Box 146300
Salt Lake City, UT 84114-6300

If to SNWA:
General Manager
Southern Nevada Water Authority
1001 S. Valley View Blvd.
Las Vegas, NV 89153

15. Modification of the Agreement.

The Parties may modify this Agreement by mutual written agreement.

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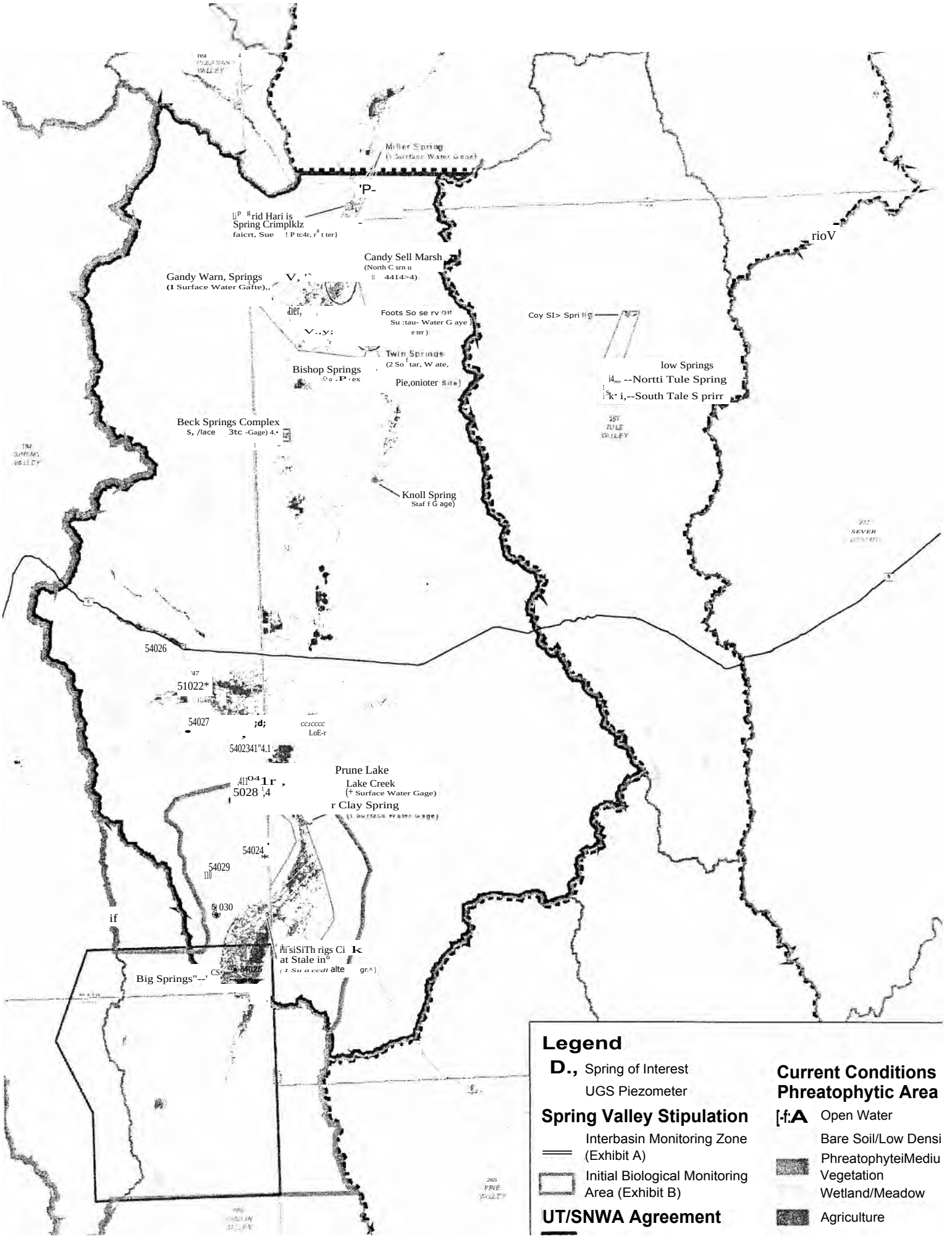
IN WITNESS WHEREOF, Utah and SNWA have fully executed this Agreement on this _____ day of _____, 2009.

_____
Utah Department of Natural Resources
Michael R. Styler
Executive Director

_____
Southern Nevada Water Authority
Patricia Mulroy
General Manager

Approved as to Form:

_____
John J. Entsminger
SNWA Deputy General Counsel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UGS Piezometer
Spring Valley Stipulation
Interbasin Monitoring Zone (Exhibit A)
Initial Biological Monitoring Area (Exhibit B)
UT/SNWA Agreement
Current Conditions
Phreatophytic Area
Open Water
Bare Soil/Low Densi
PhreatophyteiMediu
Vegetation
Wetland/Meadow
Agriculture

Appendix 1: Biological Monitoring

1.1. Biological Monitoring

The intent of the biological monitoring considered here, is to collect a suite of ecologically informative data, at Key Areas of Biological Concern (KABCs), for the purpose of providing an early-warning indication as to whether, in combination with the hydrologic monitoring component, SNWA groundwater development in Snake Valley is causing adverse effects. A detailed biological monitoring plan will be developed during the Initial Period and implemented and modified as appropriate throughout the Baseline Period and Operational Period. This plan will differentiate monitoring efforts in the Tier I and II monitoring areas, and identify data types and collection methods that: 1) contribute to the characterization of the current ("baseline") condition of groundwater-influenced ecosystems within the KABCs; 2) establish the range of variability for monitored parameters in the KABCs prior to groundwater withdrawal by SNWA; 3) assess the response of groundwater-influenced ecosystems in the KABCs to groundwater withdrawal by SNWA; 4) give early warning prior to adverse effects to groundwater-influenced ecosystems in the KABCs due to groundwater withdrawal by SNWA; 5) identify research needs; 6) develop criteria and make recommendations to the Management Committee (MC) when a course of action shall be taken to avoid adverse effects; and 7) prior to the end of the baseline data collection period, develop and recommend to the MC a refined biological monitoring plan.

SNWA and Utah Division of Wildlife Resources (UDWR) will work cooperatively to implement this plan in a cost effective and efficient manner. Collection of monitoring data shall be performed by UDWR, SNWA, or a mutually agreed to third party. Utah commits to fund monitoring of Columbia spotted frog and least chub in the Tier I and Tier II monitoring areas as is currently being conducted. It is the intent of the Parties that the capital and operating costs of implementing biological monitoring plan components beyond the current UDWR effort will be primarily borne by SNWA.

1.1.1 Biological Monitoring Plan Development

The TWG intends to use The Nature Conservancy's Conservation Action Planning (CAP) process, or a similar process, to develop a detailed biological monitoring plan. The CAP process was successfully utilized to develop the Spring Valley Stipulation Biological Monitoring Plan, and it is expected to be advantageous here. Specifically, this process will help the TWG to: 1) identify key ecological attributes (KEAs) essential to the long-term viability of the groundwater-influenced ecosystems within the KABCs; 2) identify indicators to assess each KEA, including those that may be used to predict potential adverse effects and/or show early warning of effects from SNWA's groundwater development; 3) integrate the existing UDWR monitoring into this plan; and 4) develop conceptual models of the groundwater-influenced ecosystems as necessary and appropriate.

1.1.2 Existing UDWR Monitoring

UDWR currently conducts annual monitoring for Columbia spotted frog and least chub in the Tier I and Tier II monitoring areas. Columbia spotted frog monitoring consists of Visual Encounter Surveys targeting egg masses to determine the breeding population size (number of

adults contributing to reproduction). Least chub monitoring consists of monitoring size class frequency within each population to assess health of population and determine success of recruitment of new individuals into the population. Northern leopard frog, sub-globose snake pyrg, and longitudinal gland pyrg are not currently monitored. California floater, longitudinal gland pyrg, and the five native fish species in the Big Spring complex will be monitored as part of the Spring Valley biological monitoring plan.

1.2. Tier I Biological Monitoring

The main objectives of biological monitoring in the Tier I monitoring area are to provide early warning of adverse effects to groundwater-influenced ecosystems and to track ecosystem response as management response actions are implemented. As stated above. KABCs were identified to focus the monitoring approach and were based on the presence of groundwater-influenced ecosystems, which support Species of Greatest Conservation Need (Utah Comprehensive Wildlife Conservation Strategy 2006) and/or contain phreatophytic vegetation having some potential to degrade air quality if significantly affected by groundwater development. Specific KABCs in the Tier I Monitoring Area, and their associated sensitive species, are identified in Table 1.1. Biological monitoring will augment existing UDWR efforts and will include population level monitoring of these sensitive species (Conservation Targets), or their surrogates, at representative locations within the KABCs. Monitoring of selected KEAs will coincide with the population level monitoring to track habitat condition relative to SNWA groundwater development. In the phreatophytic plant community south of Gandy Salt Marsh, a sufficient number of permanent transects will be established and annually sampled to track composition and cover at the alliance level. Monitoring sites or different species to track may be added or deleted based upon compelling scientific evidence regarding the ecosystem's response to SNWA groundwater development.

Table 1.1. Key areas of Biological Concern within the Tier I monitoring area and associated Species of Greatest Conservation Need.

Spring / Stream Name	**Columbia spotted** frog'	**Least chub'**	**Northern leopard frog'**	**California floater**	**Sub-globose snake** pyrg	**Longitudinal gland** pyrg	Five native **fishes: Spring Valley Mon. Plan**
Miller Spring	X	X					
Leland Harris Spring Complex	X	X					
Gandy Salt Marsh	X	X					
Bishop Springs Complex							
Foote Reservoir	X	X	X				
Twin Springs	X	X					
Central Springs	X	X					
Warm Springs at Gandy			X		X		
Beck Springs	X						

Spring / Stream Name	Columbia spotted frog'	Least chub'	Northern leopard frog'	California floater!' [3]	Sub-globose snake pyrgi	Longitudinal gland pyrg[1,2]	Five native fishes: Spring Valley Mon. Plan2
Lake Creek						X	X
Cla S rill!						X	X
Pruess Lake				X			
Phreatophytic Vegetation South of Gandy Salt Marsh4							

SGCN = Species of Greatest Conservation Need, Utah Comprehensive Wildlife Conservation Strategy. [2] Five native Bonneville Basin fish species and springsnail found in Big Spring complex and being monitored as part of the Spring Valley Biological Monitoring Plan. [3] California floater at Pruess Lake (terminus of Big Spring complex) being monitored as part of the Spring Valley Biological Monitoring Plan. This vegetation will be monitored to address air quality concerns.

1.3. Tier II Biologic Monitoring

The KABCs listed in Table 1.2 have been identified for monitoring based on the presence of Species of Greatest Conservation Need (Utah Comprehensive Wildlife Conservation Strategy 2006) (Table 1.2). UDWR currently conducts annual monitoring for Columbia spotted frog and least chub populations, where present, in KABCs in the Tier II monitoring area. Current monitoring methods for these species are consistent with those used in the Tier I monitoring area. Monitoring sites and different species may be added or deleted, and monitoring effort may be adjusted based upon compelling scientific evidence regarding the effects of SNWA groundwater development.

Table 1.2. Key Areas of Biological Concern within the Tier II Monitoring Area and associated Species of Greatest Conservation Need.

Spring / Stream Name	Columbia spotted frog]	Least chub'	Northern frog'	California floater'	Utah chub'
Fish Springs		X	X		X
Tule Valley					
Coyote	X				
Willow	X				
North Tule	X				
South Tule	X				
Redden Spring				X	X

Species of Greatest Conservation Need, Utah Comprehensive Wildlife Conservation Strategy.

Appendix 2: Hydrologic Monitoring

1.1. Hydrologic Monitoring

The hydrologic monitoring network shall be comprised of the monitoring sites in Table 1.1 and others to be selected by the TWG. Hydrologic data collection at these sites shall include measurements of groundwater production, depth-to-groundwater, spring discharge, stream flow, and water quality as applicable, or as otherwise agreed to and specified by the TWG.

The capital costs of establishing the hydrologic monitoring network shall be shared as stated in Sections 1.1.1 and Table 1.1. Maintenance and operation of these sites shall be performed by the Utah Geological Survey (UGS), SNWA, or a mutually agreed to third party. SNWA and UGS agree to work cooperatively to ensure data is reported in an electronic format agreed to by the TWG.

1.1.1. Tier I Hydrologic Monitoring

The objectives of the hydrologic monitoring program are to detect the potential effects of SNWA and EPU groundwater withdrawals in Snake Valley, and include collecting hydrologic data to 1) support assessments of groundwater-influenced ecosystems supporting sensitive/special-status species, 2) define the natural variation of groundwater parameters (groundwater levels, spring discharge), 3) detect declines in groundwater-levels and spring discharges attributable to groundwater development within Snake Valley, and 4) detect changes in water quality attributable to groundwater development within Snake Valley that may affect EPUs in Nevada and Utah.

The Parties recognize that some of these sites have already been established as part of existing programs, but that data collection at these sites will be incorporated as a component of this Agreement. SNWA shall fund the UGS, or a mutually agreed to third party, to perform data collection and processing at the sites for which UGS is responsible. SNWA shall perform, or fund a mutually agreed to third party to perform, data collection and processing at sites for which SNWA is responsible.

1.1.1.1. SNWA Exploratory and Production Wells

SNWA shall continuously record production data and water levels on all SNWA production wells in Snake Valley. SNWA shall measure depth-to-water in all SNWA exploratory wells in Snake Valley on a quarterly basis.

1.1.1.2. Existing Monitor Wells

Groundwater levels shall be monitored at a total of twenty-nine (29) monitor-well sites in Snake Valley, within both Nevada and Utah, including continuous monitoring at up to fourteen (14) existing UGS sites and quarterly monitoring at up to fifteen (15) other existing sites selected by the TWG. Each of the fourteen existing UGS sites scheduled for continuous monitoring includes one to three piezometers (2- or 2.5-inch-diamter PVC wells). All of these piezorneters are scheduled for continuous monitoring, unless otherwise agreed to and specified by the TWG. Currently, there are thirty-three (33) piezometers installed in the fourteen (14) existing UGS well

sites, all of which have been equipped with pressure transducers to record water levels twice daily. Downloading of the data loggers attached to these transducers shall be performed quarterly or at intervals deteimined by the TWG. The wells scheduled for quarterly monitoring are single-completion wells and will not be equipped with transducers.

The TWG, in its review of the existing monitor wells, shall strive to optimize the network to achieve the goals and objectives of the Agreement by eliminating redundant monitoring sites and/or increasing the spatial coverage as needed.

1.1.1.3. New Monitor Wells

SNWA shall install up to three (3) new monitor wells should the TWG determine that the "existing" monitoring network outlined in section 1.1.1.2 is insufficient for meeting the goals and objectives of this Agreement. If the TWG determines that new monitor wells are needed, the location of the wells shall be restricted to the Tier I Monitoring Area, and shall be selected by the TWG. The costs of well installation and subsequent monitoring shall be borne by SNWA.

1.1.1.4. Groundwater Production

As stated in Section 1.1.1.1, SNWA shall continuously record groundwater production rates and volumes in all SNWA production wells. The State of Utah, through the Utah Division of Water Rights (UDWRI), shall record all groundwater production data on groundwater production wells in Snake Valley, Utah used for irrigation, mining, and municipal and industrial purposes. At a minimum, these records shall report monthly production totals and the duration of pumping during the reporting period.

1.1.1.5. Springs and Surface Water

Nested piezometers at selected springs and regional discharge areas within the Tier I Monitoring Area shall be installed to monitor groundwater levels with the objective of measuring the hydraulic head potential contributing to the spring and/or diffuse groundwater discharge. The Parties recognize that the measured groundwater levels in these piezometers may or may not reflect the actual hydraulic head at the spring orifice, but that the measurements may be used as a surrogate to approximate hydraulic changes due to climate variability or pumping effects. At appropriate sites, these piezometers will be coupled with surface-water gages that shall be installed to measure spring discharge.

SNWA and UGS shall work cooperatively to establish monitoring sites at the selected springs and diffuse groundwater discharge areas listed in Table 1.1. The Parties shall share in the capital costs of establishing these monitoring sites as provided for in Table 1.1.

Table 1.1. Tier 1 Spring and Stream Monitoring Sites

Spring / Stream Name	Piezometer Sites	Surface-Water Gages	Agency Responsible for Installation	Agency Responsible for Monitoring
Miller Spring		1	UGS	UGS
Leland Harris Spring Complex				
North Complex	1	--	UGS	UGS
Gandy Salt Marsh				
North Complex	1	--	UGS	UGS
Bishop Springs Complex				
Foote Reservoir	--	2	UGS	UGS
Twin Springs			UGS	UGS
Warm Springs at Gandy			SNWA	SNWA
Beck Springs		1	UGS	UGS
Knoll Spring			SNWA	SNWA
Clay Springs			UGS	UGS
Lake Creek			SNWA	SNWA
Big Springs Creek (at Stateline)			UGS	UGS
Bi S rin s			SNWA	SNWA
TOTAL				

The Parties agree to cooperate in the data collection and record maintenance for the surface-water sites, including providing access to the measurement sections and gages, and sharing miscellaneous discharge measurements made at each respective site. The TWG will determine the appropriate measurement section at each site and determine the specific flow-measuring device to be installed after field reconnaissance has been performed to determine the optimal arrangement. The responsible monitoring agency will develop rating curves for the gaging stations listed in Table 1.1 using the miscellaneous discharge measurements collected at each site. The TWG will review and approve the rating curves used to compute the discharge records for the respective stations.

1.1.1.6. Precipitation Gages

The coverage of existing precipitation stations within the Tier I Monitoring Area shall be reviewed by the TWG and, if necessary, the TWG may recommend that additional precipitation stations be established. SNWA shall fund the construction, operation, and maintenance of any such additional stations.

1.1.1.7. Water Chemistry

The TWG shall compile all available water-chemistry data for the Tier I and Tier II Monitoring Areas. SNWA shall develop a database accessible to the TWG for storage and retrieval of these data. The TWG shall evaluate the dataset to determine if additional groundwater samples are needed to characterize the baseline condition for the specific water-quality parameters of concern that might be affected by groundwater pumping associated with SNWA and EPU production wells. The specific water-quality parameters of concern (e.g. salinity) and associated analytical

suite shall be defined by the TWG. Sample collection shall be limited to existing pumping wells or springs within the Tier I and Tier II Monitoring Areas, and shall be performed by SNWA for sample sites located in Nevada and by UGS for sample sites located in Utah.

Routine sample collection and analysis for the water-quality parameters of concern shall be perfoimed at up to four (4) representative existin g wells identified by the TWG. The selected wells shall be existing production wells within the Tier I Monitoring Area. The routine sample collection shall be performed annually, or as otherwise mutually agreed to by the TWG. SNWA shall perform the routine sampling at the selected wells in Nevada and fund the UGS, or a mutually agreed to third party, to perform the routine sampling at the selected wells in Utah.

1.1.2. Tier II Hydrologic Monitoring

The Parties agree that monitoring precipitation and groundwater levels within the undeveloped areas of the Tier II Monitoring Area is important for describing the natural variation of the underlying groundwater system(s) to discern the cause of changing groundwater levels, and whether the changes are attributable to natural variation or pumping effects.

1.1.2.1. Monitor Wells

Existing monitor wells within the Tier II Monitoring Area that are part of existing groundwater monitoring networks shall be evaluated by the TWG, and up to three (3) wells or well sites in each of the Tier II hydrographic areas will be selected for quarterly depth-to-water measurements. SNWA shall fund the USGS, or another mutually agreed to third party to perfoini these measurements and report the data to SNWA and the TWG.

1.1.2.2. Precipitation Gages

The covera ge of existing precipitation stations within the Tier II Monitoring Area shall be reviewed by the TWG and, if necessary, the TWG may recommend that additional precipitation stations be established.

Appendix 3: Air Quality Monitoring

1.1 Air-Quality Monitoring

The purpose of air-quality monitoring pursuant to this Agreement is to maintain compliance with the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increment ceilings established under Section 109 and Section 163 respectively, of the Clean Air Act. The Parties agree that the preferred approach for achieving this goal is through the implementation of appropriate monitoring and management response actions in conjunction with SNWA's groundwater development.

An air quality monitoring station shall be located within the Utah portion of the Tier I Monitoring Area at a site deemed representative of the Snake Valley airshed. Data from this station will be used to substantiate potential air quality impacts local to proposed groundwater withdrawals. In addition, the data from this monitor will be used, in conjunction with data collected from existing air quality stations along the Wasatch Front, to substantiate potential regional transport of pollutants generated local to proposed groundwater withdrawals.

The air quality monitoring equipment deployed at the site should be capable of sampling particulate matter smaller than 10 micrometers in aerodynamic diameter (PM10) and verifying compliance with the NAAQS and PSD increment ceilings for this air pollutant. Meteorological monitoring equipment will also be deployed at the site to provide data to support the air quality measurements. The monitoring equipment will collect air quality and meteorological data on a continuous basis.

The cost of equipment and installation, in addition to the on-going maintenance, data collection and reporting, shall be borne by the SNWA. SNWA shall perform. or fund a mutually agreed upon third party to perform, the installation, maintenance and reporting. The Utah Division of Air Quality (UDAQ) will be able to provide monitoring recommendations and expertise to support data collection and interpretation.

1.1.1. Tier 1 Air-Quality NIonitoring

SNWA, in consultation with the TWG, shall locate, construct and instrument a monitoring station for air quality and meteorological data within one year of the beginning of the Initial Period. This station shall be located in Utah at a site representative of the Snake Valley airshed and operated continuously for at least 5 years prior to and for the duration of the SNWA groundwater withdrawal. Air quality measurements shall consist of particulate matter smaller than 10 micrometers in aerodynamic diameter (PM10) using a continuous monitor. The meteorological parameters measured will include wind direction, wind speed, precipitation, temperature, relative humidity and solar radiation using a 10-meter tower.

The Parties, through the TWG, shall work together on the design and location of the site to be constructed to monitor potential changes in atmospheric concentrations of PM10 in the Tier 1 Monitoring Area. The site shall be located, designed, and constructed to achieve the monitoring goals and requirements of this Agreement.

1.1.2. Tier II Air-Quality NIonitoring

No Tier II air quality monitoring is currently planned but could be implemented if deemed necessary by the TWG in the future.

5.e. - Colorado River Environmental Issues

THE SECRETARY OF THE INTERIOR

WASHINGTON

AUG 07 2009

Memorandum

To: Members and Alternates
Glen Canyon Dam Adaptive Management Work Group

From: Secretary

Subject: Secretarial Designee - Glen Canyon Da daptive Management Work Group

President Obama and I have repeatedly stressed the importance of ensuring that sound science is used to inform the important policy decisions facing our Government and our Nation. This principle is fundamental to the Department's continued efforts to implement and balance the complex provisions of Federal law that apply to the Glen Canyon Dam Adaptive Management Program. In fact, the Department's 1996 decision to implement an adaptive management-based program with respect to Glen Canyon Dam operations focused on just this foundational principle - "that resource management rely on good science to monitor, and respond to possible adverse effects resulting from changes in dam operations."

In recognition of the need for the use of sound science and because of the fbcus on the role of water flows in the considerations of the .AMWG, the Assistant Secretary for Water and Science has been the Secretary's designee to the AMWG. As the Department considers the various and important issues .facing the AMP. I will continue with that designation and rely on Ms. Anne Castle, our Assistant Secretary for Water and Science. to provide the key Departmental leadership for this program. Anne's role overseeing the effbrts of the U.S. Geological Survey is particularly important, as the USGS will be called on to continue to provide objective, unbiased, science-based research and analysis to ftwin the basis of our policy decisions. As my Designee for the AMWG. Anne will serve as a key conduit for consultation with the members of the AMWG and will work to improve the effectiveness of this program within the Department.

Anne is particularly well suited to this task by her professional experience, her position as Assistant Secretary, and by the personal qualities that she brings to our Interior leadership team.
In her confirmation statement to the Senate Committee on Energy & Natural Resources, Anne identified a number of key elements needed to address and resolve challenging resource issues: building consensus, reconciling disparate interests, fostering a willingness to recognize the validity of other's claims, and compromising to achieve a greater good. I share these views which describe precisely the approach that I ask Anne to utilize as she works with each of you as my Designated Federal Official fur the AMWG.

Consistent with § 10 of the Federal Advisory Committee Act, and the duties of the Designated Federal Official, it is my intention that the daily responsibilities for carrying out the primary administrative and routine functions identified above will continue to be carried out by Upper Colorado Regional Office of the Bureau of Reclamation. Th.ese duties include:

scheduling meetings. preparing meeting agendas;
ensuring public participation;
attending meetings of the AMWG, chairing the meetings, and adjourning the meeting when it is in the public interest;
maintaining the records, reports, transcripts, minutes, appendices, working papers, drafts, studies, agendas, or other documents which are made available fir public inspection and copying at a single location in the agency until the Advisory Committee ceases to exist;
maintaining detailed minutes;
maintaining records of costs;
and tracking Committee recommendations and obtaining agency responses, including coordination with the Glen Canyon Dam. Adaptive Management Policy Group, which includes senior Departmental leadership of the participating Interior agencies.

cc: Glen Canyon Dam Adaptive Management Work Group - Members and Alternates
Deputy Secretary
Assistant Secretary - Fish, Wildlife & Parks
Assistant Secretary - Indian Affairs
Assistant Secretary for Policy. Management and Budget
Commissioner, U.S. Bureau of Reclamation.
Director, U.S. Geological Survey
Director, U.S. Fish and Wildlife Service
Director. National Park Service

6.a. - Colorado River Basin Salinity Control

U.S. Department of the Interior
Office of the Secretary
Office of Communications
1849 C Street NW 202-208-6416 phone
Washington DC 20240 202-208-5133 thx

Inter or Recovery News Release

FOR IMMEDIATE RELEASE
Date: Aug. 19, 2009
Contact: Kendra Barkoff
(202) 208-6416
Doug Hendrix
(801) 524-3837

Secretary Salazar Announces $11.1 Million in Grants through the Colorado River Basinwide Salinity Control Program

Washington, DC — Interior Secretary Ken Salazar announced today that the Bureau of Reclamation will award grants totaling more than $11.1 million to irrigation companies in Colorado, Utah and Wyoming to fund salinity control projects within the Upper Colorado River Basin under the American Recovery and Reinvestment Act of 2009 (ARRA).

These Recovery Act grants will leverage an additional $4.8 million cost-share from the Upper and Lower Colorado River Basin Funds (funds from area water district's revenues from sale of water and power), to help control nearly 12,000 tons of salt loading from occurring that would otherwise enter the Colorado River system.

"These grants, and the cost sharing funds, mean controlling salt at its source to prevent it from entering the Colorado River system," said Secretary Salazar. "This is a major step forward in reversing the significant damages salinity causes each year to agricultural and municipal water delivery and conveyance systems in the Lower Colorado River Basin states of Arizona, California and Nevada."

"Through the Recovery Act funding, area residents are on the job tackling a major challenge for the river basin. Today's investments will help to make a lasting improvement for the region," Secretary Salazar said.

Historically, there has been approximately 9 million tons of salt loading to the Colorado River annually. About one half of the present salt load can be attributed to natural sources such as erosion of lands and saline springs. The remainder of the salt load is human-induced, originating from irrigation practices and municipal and industrial sources.

These projects will benefit water users by constructing pipelines and related infrastructure providing a more efficient water supply. The increased efficiency of water delivery and use also reduces salinity contributions from agricultural return flows.

Grants were awarded to:

- Huntington Cleveland Irrigation Company, Emery County, Utah, $2,068,718.
- Eden Valley Irrigation and Drainage District, Eden/Parson Wyoming, $381,584.
- Red Cap Lake Fork Irrigation Company, Duchesne, Utah, $1,780,980.
- Peoples Canal Company, Manila, Utah, $5,012,364.
- Montezuma Valley Irrigation Company, Cortez, Colo., $1,521,288.

Additionally, the Bureau of Reclamation will utilize about $350,000 for administration of the projects and to ensure the projects' compliance with federal regulations and statutes as well as adherence to the Recovery Act goals.

Reclamation's Upper Colorado Region solicited applications for reducing salinity contributions to the Colorado River through a Funding Opportunity Announcement announced on March 31, 2009 and closed on May 14, 2009. Applications were evaluated and ranked by an Application Review Committee with representatives from the Colorado River Basin States and Reclamation.

Congress enacted the Colorado River Basin Salinity Control Act, Public Law 93-320 (Act), in June 1974, which directed the Secretary of the Interior to proceed with a program to enhance and protect the quality of water available in the Colorado River for use in the United States and Republic of Mexico. Public Law 104-20 of July 28, 1995, amended the Act and authorized the Secretary, acting through Reclamation, to implement a basinwide salinity control program.

Since the program's inception, Reclamation, through the Basinwide Program, has funded more than 40 salinity control projects. Most of these projects consist of placing off-farm irrigation canals and laterals in pressure pipelines, generally utilizing either PVC or a high-density polyethylene pipeline that eliminate canal and lateral seepage that carries salt into the river system. All salinity control projects are required to replace incidental wildlife habitat losses concurrent with construction of salinity control features.

The purposes of the ARRA are, among others, to quickly and prudently commence activities that preserve and create jobs promoting economic recovery and to invest in infrastructure providing long-term economic benefits. ARRA funding must be obligated by Sept. 30, 2010, and the identified projects must meet specific milestones and timetables or their funding could be reconsidered. Before implementation, the projects must also meet specific requirements such as demonstrating compliance with the National Environmental Policy Act and other environmental laws.

Secretary Salazar has pledged unprecedented levels of transparency and accountability in the implementation of the Department of the Interior's economic recovery projects. The public will be able to follow the progress of each project on www.recovery.gov and on www.interior.gov/recovery. Secretary Salazar has appointed a Senior Advisor for Economic Recovery, Chris Henderson, and an Interior Economic Recovery Task Force. Henderson and the Task Force will work closely with the Department of the Interior's Inspector General to ensure that the recovery program is meeting the high standards for accountability, responsibility and transparency that President Obama has set.

Bureau of Reclamation's ARRA Basinwide Salinity Program — Project Summaries

Huntington Cleveland Irrigation Company
Huntington Cleveland Salinity Reduction Project
Emery County, UT 84528
Reclamation ARRA Funding: $2,068,718
Local Contact: Sherrel Ward, President — (435) 687-2505
Project consists of abandoning 9.1 miles of canal and providing an alternate means to deliver winter livestock water in an additional 20.1 miles of canal by constructing 5.1 miles of 30" and 60" pipe, 3 pressure reducing stations, and 2 connections to existing regulating ponds.

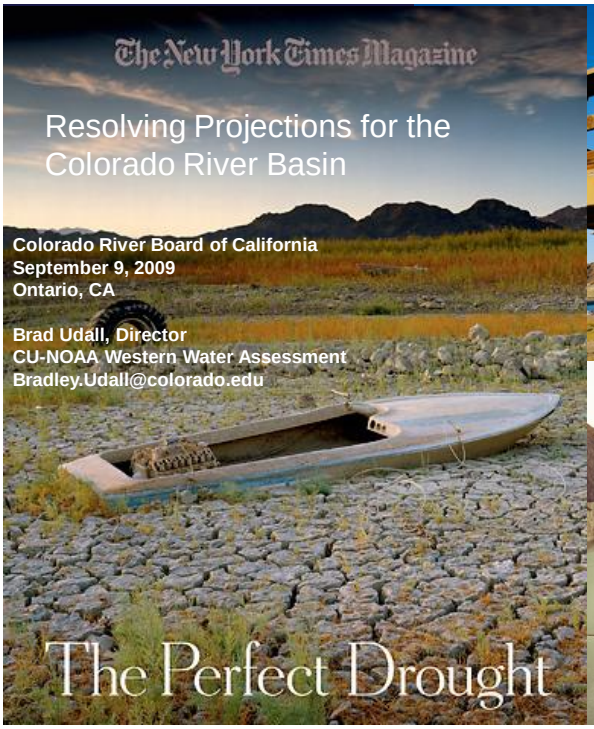
Eden Valley Irrigation and Drainage District
Farson/Eden Pipeline Project Phase Ill M-1 & **M-1B Laterals**
Eden/Farson, WY 82932
Reclamation ARRA Funding: $381,584
Local Contact: Ed Burton, President — (307) 273-9566
Project consists of replacing existing earth lined laterals with pipe in a pressurized pipeline network system. Approximately 8,324 feet of canal will be replaced with 8"-18" HDPE DR 32.5 pipe. 2,450 feet of an existing earth lined lateral will be converted to a drainage lateral to drain the system in the fall.

Red Cap Lake Fork Irrigation Company
Red Cap Canal and Laterals Project
Duchesne, UT 84021
Reclamation ARRA Funding: $1,780,980
Local Contact: Charlie Hansen, President — (435) 823-3348
Project replaces 3.87 miles of the Red Cap Canal and 6.87 miles of laterals with a 10.16 miles pipeline conveyance system.

Peoples Canal Company
Peoples Canal Project
Manila, UT 84046
Reclamation ARRA Funding: $5,012,364
Local Contact: Jim Wilson, President — (435) 784-3723
The project will consist of constructing two settling basins; and a screening structure where the canal begins at its point of diversion on the Henry's Fork River. The project will replace the canal from the settling basin to the last user - 9.1 miles down the existing canal right of way.

Montezuma Valley Irrigation Company
Lone Pine Canal Piping Project
Cortez, CO 81321
Reclamation ARRA Funding: $1,521,288
Local Contact: Jim Siscoe, General Manager — (970) 565-3332
Project will pipe approximately 25,512 linear feet of the lower reaches of the Lone Pine Canal with pipe ranging in size from 26" to 36" HDPE pipe. The head pressure developed in this gravity pipe will also be utilized for existing and future on-farm sprinkler improvements.

7. - Mr. Brad Udall's Presentation on Climate Change and Global Warming



Resolving Projections for the Colorado River Basin

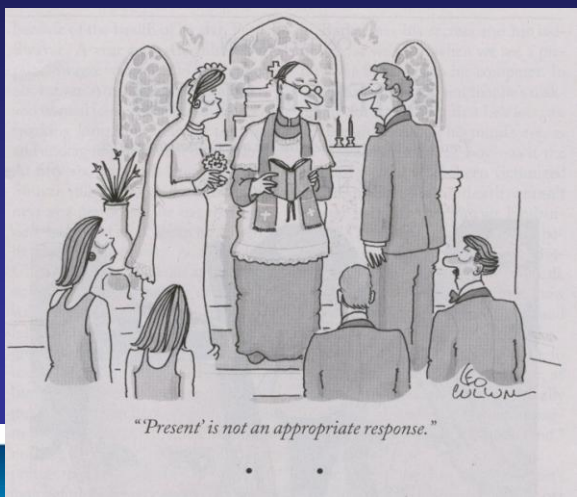
Colorado River Board of California
September 9, 2009
Ontario, CA

Brad Udall, Director
CU-NOAA Western Water Assessment
Bradley.Udall@colorado.edu

New York Times Sunday Magazine, October 21, 2007

Outline

- History of Colorado River Climate Change Studies
- Reconciling Disparate Projections
- Implications for the Basin



Western Water Assessment

Colorado River Climate Change Studies over the Years

- Early Studies – Scenarios, About 1980
  - Stockton and Boggess, 1979
  - Revelle and Waggoner, 1983*
- Mid Studies, First Global Climate Model Use, 1990s
  - Nash and Gleick, 1991, 1993
  - McCabe and Wolock, 1999 (NAST)
  - IPCC, 2001
- More Recent Studies, Since 2004 – RANGE -5% to -45% BY 2050
  - Milly et al.,2005, "Global Patterns of trends in runoff"
  - Christensen and Lettenmaier, 2004, 2006
  - Hoerling and Eischeid, 2006, "Past Peak Water?"
  - Seager et al, 2007, "Imminent Transition to more arid climate state.."
  - IPCC, 2007 (Regional Assessments)
  - Barnett and Pierce, 2008, "When will Lake Mead Go Dry?"
  - McCabe and Wolock, 2008
- National Research Council Colorado River Report, 2007

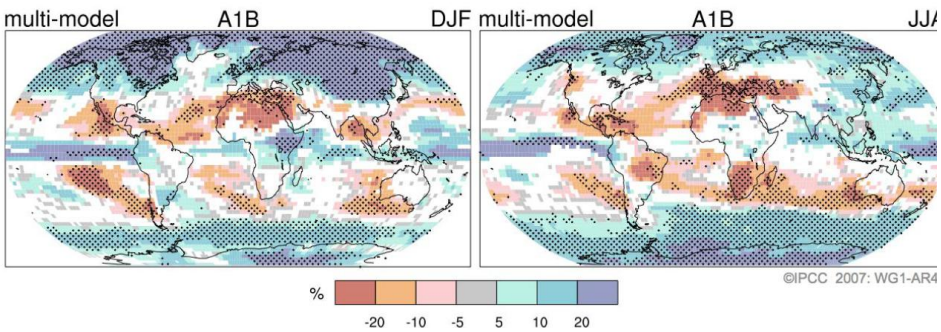
Western Water Assessment

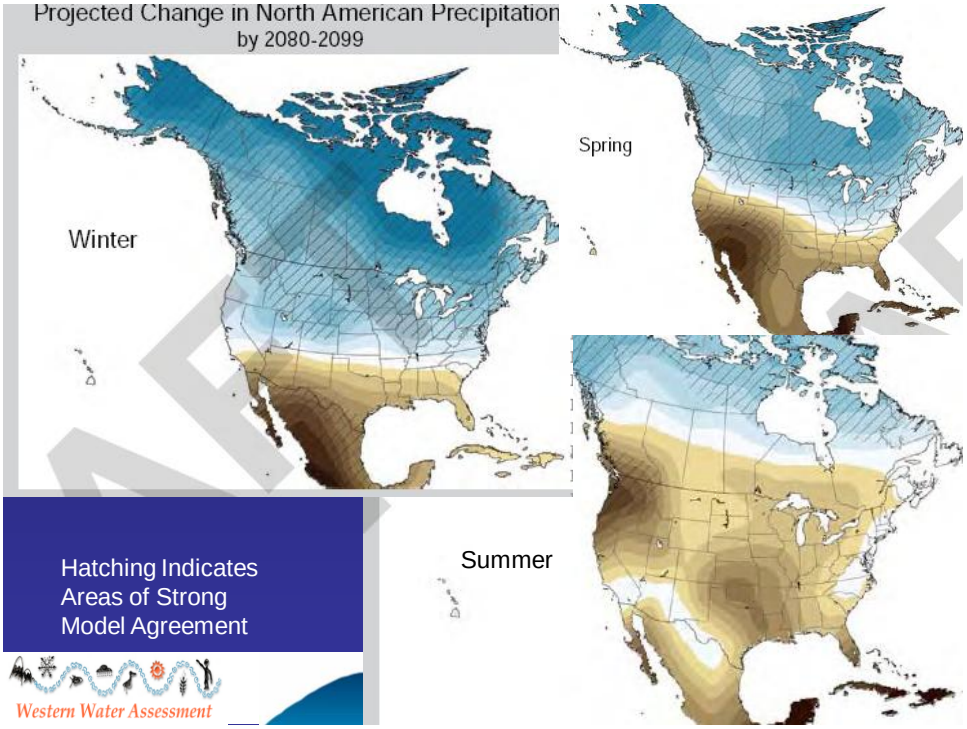
Colorado
University of Colorado at Boulder

IPCC 2007 AR4 Projections

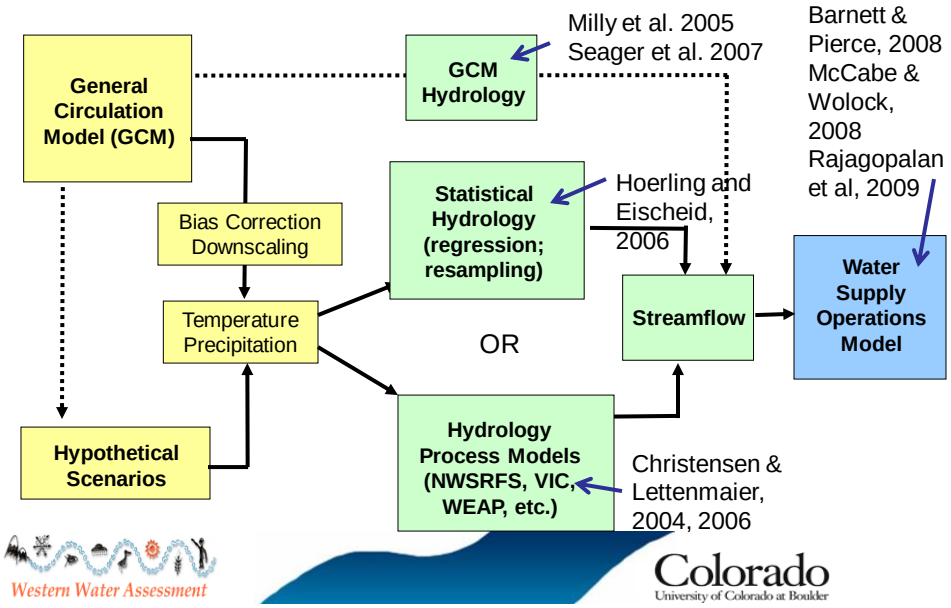
- Wet get wetter and dry get drier…
  - Part Increased Evaporation, Part Less Precipitation Due to Changes in Weather Patterns
- Southwest Likely to get drier – IPCC Findings

Projected Patterns of Precipitation Changes





Progression of Data and Models in studies about the influence of climate change on streamflows in the Colorado River Basin



Christensen & Lettenmaier, 2006
Colorado River Projections - Mean Results

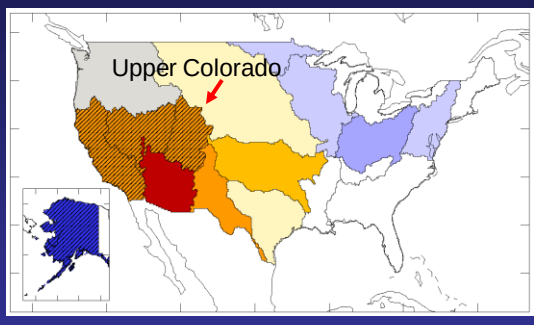
- 11AR 4 Models, 2 Scenarios B1(Low) & A2 (High)
- Different results from C&L, 2004
- Increased Winter Precipitation important
- Caveats: Does hydrology model understate summer drying?

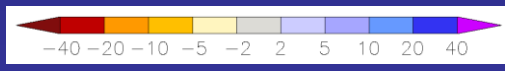
	P1 = 2010-2039		P2 = 2040-2069		P3 = 2070-2099		
	B1	A2	B1	A2	B1	A2	Comments
Temperatures	1.28	1.23	2.05	2.56	2.74	4.35	in C
Precipitation	-1%	-1%	-1%	-2%	-1%	-2%	Relative to Historic Run
SWE	-15%	-13%	-25%	-21%	-29%	-28%	Relative to Historic Run
Runoff	0%	0%	-7%	-6%	-8%	-11%	Relative to Historic Run

Milly's Results – Nature 2005

"Global pattern of trends in streamflow and water availability in a changing climate"

- 10 to 20% Less Upper Basin Runoff in 2041-2060 relative to 1900-1970 baseline.
- > 90% of Models Agree
- Decreases in runoff due to temperature increases, perhaps small precipitation declines
- Dryness consistent with world-wide poleward movement of deserts from ~30 N/S Latitude
- Warning: GCMs have relatively crude hydrologic cycle



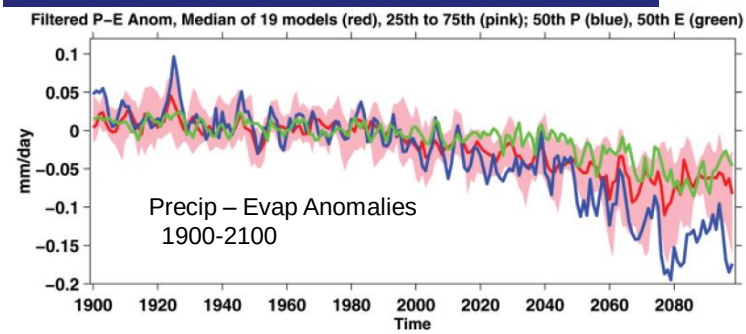


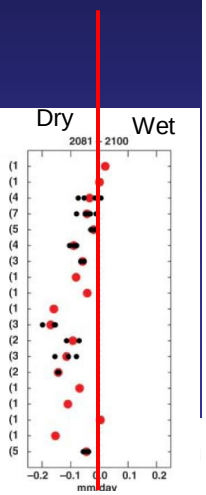
(After Milly, P.C.D., K.A. Dunne, A.V. Vecchia, Global pattern of trends in streamflow and water availability in a changing climate, *Nature*, **438**, 347-350, 2005.)

Seager's Results – Science 2007

"Model projections of an Imminent Transition to a more arid climate in Southwestern North America" – Science, 2007

- Climate models project drying in SW US
- Likely that this is already occurring
- Recent drought may become normal
- Only 1/19 Models Have Wet Trend
- -16 % Reduction by 2050 (??)
- Caveats: Large scale models, crude 'runoff' "SW" is huge



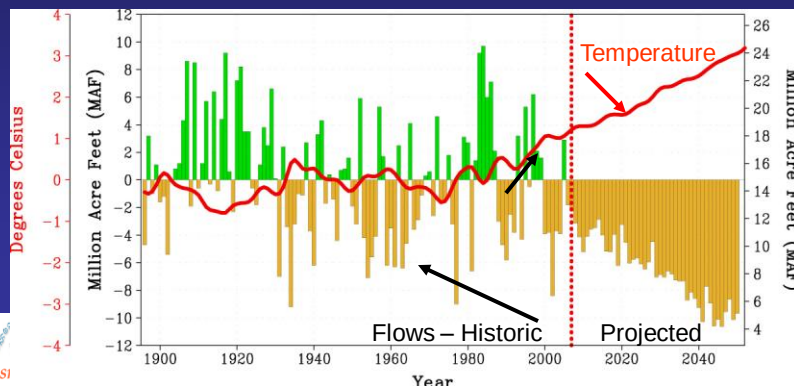


Historical and Projected Lee Ferry Flows: Hoerling and Eischeid, 2006

Bottom Line: -45% Reduction by 2050

Caveats: A very simple 'hydrology model' using a scale too big to effectively model the mountains in the basin

Hoerling now believes this overstates the future losses



Western Water Assess

Climate Change in Colorado:
A Synthesis to Support Water Resources Management and Adaptation

Lead Authors

Andrea J. Ray[1, 2], Joseph J. Barsugli [3], Kristen B. Averyt [2]

Authors

Klaus Wolter [3], Martin Hoerling[1], Nolan Doesken[4], Bradley Udall[2], Robert S. Webb[1]

[1]NOAA, Earth Systems Research Laboratory
[2]University of Colorado at Boulder, Western Water Assessment
[3]University of Colorado at Boulder, Climate Diagnostics Center
[4]Colorado State University

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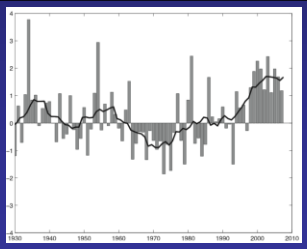
University of Colorado at Boulder

Western Water Assessment

Earth System Research Laboratory
Science, Service & Stewardship

State of the science regarding the physical aspects of climate change that are important for evaluating impacts on Colorado's water resources, and developing adaptation strategies out to the mid-21st century

Multiple independent measurements confirm widespread warming in the Western U.S.; in Colorado, temperatures have increased by approximately 2°F from 1977–2006. No consistent long-term trends in annual precipitation have been detected.



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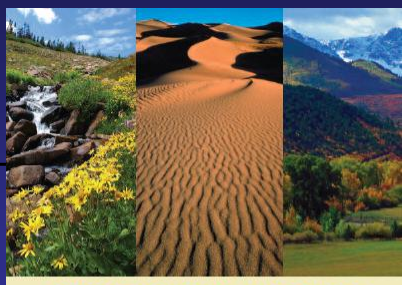


Climate Change in Colorado

A Synthesis to Support Water Resources Management and Adaptation

A REPORT FOR THE COLORADO WATER CONSERVATION BOARD

Colorado
University of Colorado at Boulder

Recent Colorado River Studies Table

Source: Climate Change in Colorado, 2008

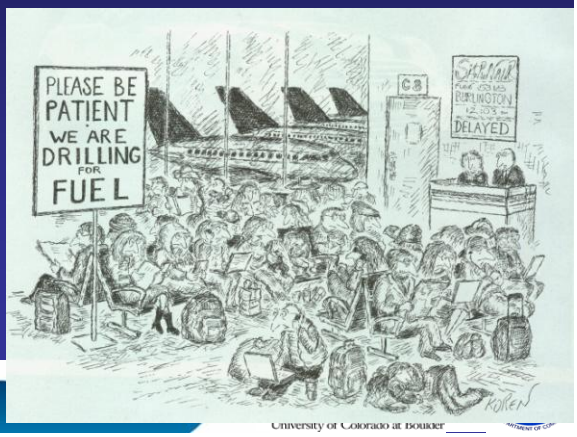
TABLE 5-1. Projected Changes in Colorado River Basin Runoff or Streamflow in the Mid-21st Century from Recent Studies

Study	*GCMs (runs)*	*Spatial Scale*	*Temperature*	*Precipitation*	*Year*	*Runoff (Flow)*	*Risk Estimate*
Christensen et al. 2004	1 (3)	VIC model grid (~8 mi)	+3.1°F	-6%	2040–69	-18%	Yes
Milly 2005, replotted by P.C.D. Milly	12 (24) (~100–300 mi)	GCM grids —	—		2041–60	-10 to -20% 96% model agreement	No
Hoerling and Eischeid 2006	18 (42)	NCDC Climate Division	+5.0°F	~0%	2035–60	-45%	No
Christensen and Lettenmaier 2007	11 (22)	VIC model grid (~8 mi)	+4.5°F (+1.8 to +5.0)	-1% (-21% to +13%)	2040–69	-6% (-40% to +18%)	Yes
Seager et al. 2007*	19 (49)	GCM grids (~100–300 mi)	—	—	2050	-16% (-8% to -25%)	No
McCabe and Wolock 2008	—	USGS HUC8 units (~25–65 mi)	Assumed +3.6°F	0%	—	-17 %	Yes
Barnett and Pierce 2008*	—	—	—	—	2057	Assumed -10% to -30%	Yes

Values and ranges (where available) were extracted from the text and figures of the references shown. Columns provide the number of climate models and individual model runs used to drive the hydrology models, the spatial scale of the hydrology, the temperature and precipitation changes that drive the runoff projections, and whether or not the study quantified the risk these changes pose to water supply (e.g., the risk of a compact call or of significantly depleting reservoir storage).

Outline

- History of Colorado River Climate Change Studies
- Reconciling Disparate Projections
- Implications for the Basin



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Reconciling Colorado River Projections

- -6% to -45% Modeled Reduction in C. River Flow
- NOAA Funded Study now in 2nd Year
- Scripps, NOAA (Boulder, CBRFC), UW, UA, CU, Reclamation
- 1st Step: Historical Hydrology Model "Bake-off"
- 2nd Step: Drive Hydrology Model w/Climate Models
- Many Hydrology Models: VIC, CBRFC SAC-Snow17, NOAH, Hoerling 'Bucket' Model
- Note: SNWA Hosted Meeting Nov 14 to Discuss
  - 50 Participants from around the Basin

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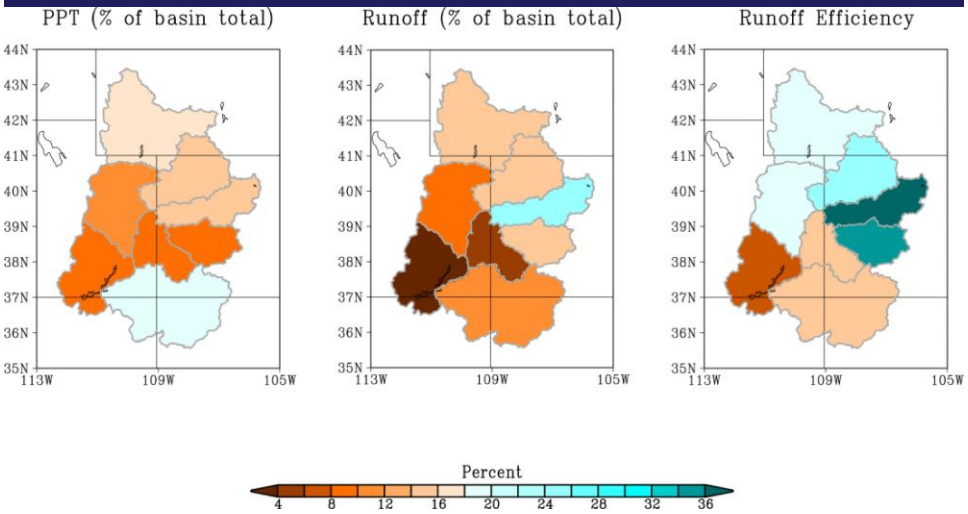
Reconciling Year 1 – Scale Matters

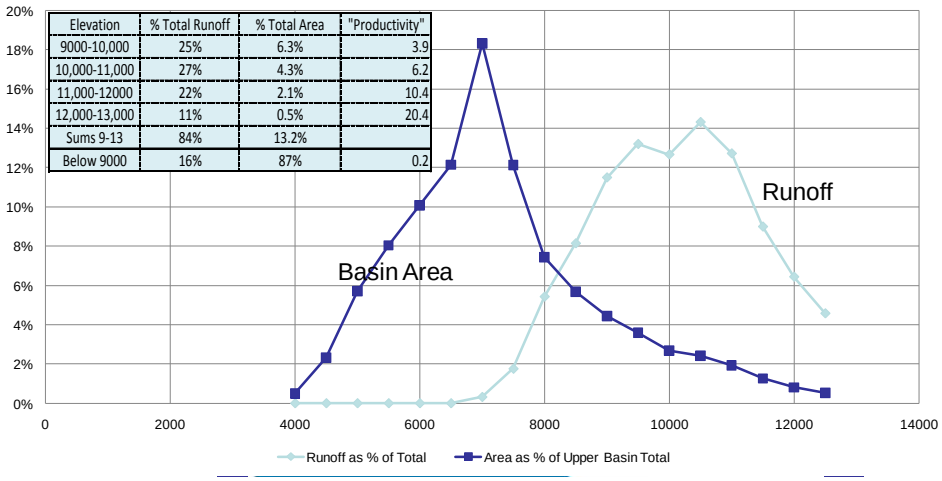
- More Precipitation Does not necessarily lead to more runoff…



Reconciling Year 1- Scale Matters

- Most runoff comes from small part of the basin > 9000 feet
  - Very Little of the Runoff Comes from Below 9000' (16% Runoff, 87% of Area)
  - 84% of Total Runoff Comes from 13% of the Basin Area – all above 9000'

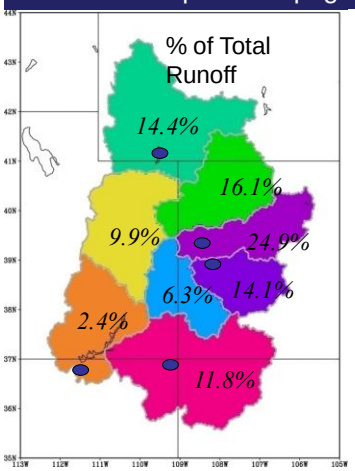
Basin Area and Runoff By Elevation

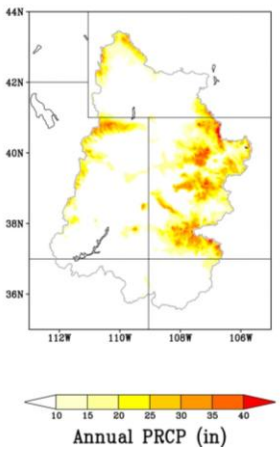


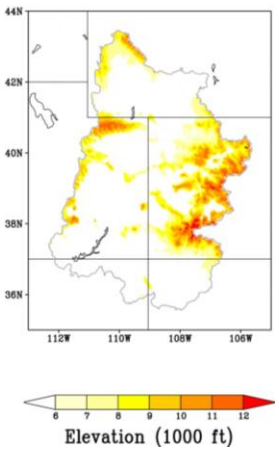
Elevation	% Total Runoff	% Total Area	"Productivity"
9000-10,000	25%	6.3%	3.9
10,000-11,000	27%	4.3%	6.2
11,000-12000	22%	2.1%	10.4
12,000-13,000	11%	0.5%	20.4
Sums 9-13	84%	13.2%	
Below 9000	16%	87%	0.2

Reconciling Year 1- Scale Matters

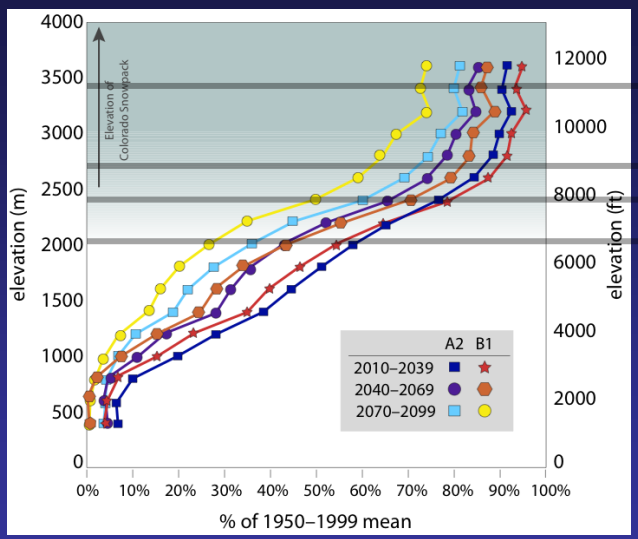
- Runoff Efficiency (How much Precip actually runs off) Varies Greatly from ~5% (Dirty Devil) to > 40% (Upper Mainstem)
- You can't model the basin at large scales and expect accurate results
  - GCMs (e.g. Milly, Seager) and H&E 2006 may get the right answer, but miss important topographical effects







Projections: Colorado River Basin Snowpack



Berthoud Pass, CO

Keystone, CO

Aspen, CO

Tahoe, CA

Projected declines in Colorado River snowpack are not as severe as elsewhere in the West at lower elevations.

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Reconciling Year 1- Runoff "Elasticity"

- How Do Hydrology Models Perform During Historical Period?
  - If you only modify Temperature by 1°C?
    - +1C = -2% to -9% runoff
    - Results very model dependent
  - If you only modify Precipitation by -10% / + 10%
    - -10% precipitation = -20% runoff
    - +10% precipitation = +20% runoff
    - Results Independent of the hydrology model
  - +1C Warming Equivalent to -1% to -5% Precipitation
  - At 2050 with 2C Warming, -4% to -18% Runoff w/ No Changes in Precipitation

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Current and Future Work

- Current Funding
  - Evaluate all IPCC Climate Models for CRB
  - Downscale Climate Model Data using Alternative Methodologies
  - Investigate Runoff 'Elasticity' Using Hydrology Models
  - Investigate High Elevation Impacts on Runoff
  - Stakeholder Workshop (held November 2008)
  - Evaluate Project Effectiveness for Policy
  - Communicate Findings
- Proposed New Work
  - Evaluate Alternative Datasets
  - Diagnose Reasons for Different Temperature Sensitivities
  - Understand Difference Between Seager and Milly
  - Evaluate Runoff Sensitivities using NARCCAP Data
  - Continue to Investigate High Elevation Runoff Physics
  - Track AR5 Model Results as they become available
  - Stakeholder Meeting & Prepare Papers

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Outline

- History of Colorado River Climate Change Studies
- Reconciling Disparate Projections
- Implications for the Basin

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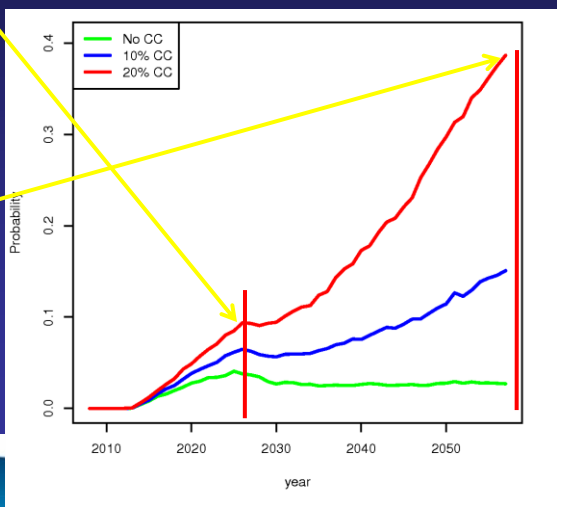
Risk of Reservoir Drying at 2026 and 2050

Rajagopalan, et al., 2009 Water Resources Research

Risk of Empty Reservoirs in at 2026…
Low = 5-10% For All Flows

at 2058….
No Flow Change = 3%
-10% Flows = 10%
-20% Flows = 40%

Key Lesson: Large Non-linear increase in risk with 20% CC – Understanding -10% vs -20% is Important!



Western Water Assessment

Last minute item – not on Agenda

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

Ciudad Juarez, Chihuahua
July 17, 2009

JOINT REPORT OF THE PRINCIPAL ENGINEERS CONCERNING U.S.-MEXICO JOINT COOPERATIVE ACTIONS RELATED TO THE YUMA DESALTING PLANT (YDP) PILOT RUN AND THE SANTA CLARA WETLAND

To the Honorable Commissioners
International Boundary and Water Commission
United States and Mexico
El Paso, Texas-Ciudad Juarez, Chihuahua.

Sirs:

In accordance with your instructions, we respectfully submit this Joint Report concerning U.S.-Mexico joint cooperative actions related to the proposed Yuma Desalting Plant (YDP) Pilot Run. The purpose of this report is to identify actions that could be carried out by each country related to the proposed YDP Pilot Run and to identify other efforts related to the Santa Clara Wetland in Mexico.

To continue with the binational spirit of cooperation with regard to the Colorado River limitrophe section and the Santa Clara Wetland as established in Commission Minute No. 306 entitled, "Conceptual Framework for United States-Mexico Studies for Future Recommendations Concerning the Riparian and Estuarine Ecology of the Limitrophe Section of the Colorado River and its associated Delta," signed on December 12, 2000, and in accordance with the resolutions in Minute No. 242, "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River," signed on August 30, 1973, in November 2008, the U.S. and Mexico, through the International Boundary and Water Commission, initiated binational consultations regarding the proposed Pilot Run to operate the YDP.

Proposed Pilot Run of the YDP and Alteration of Flow to the Santa Clara Wetland.

The United States passed the *Colorado River Basin Salinity Control Act of 1974* (Salinity Control Act), which authorized the construction, operation, and maintenance of certain works in the Colorado River Basin to control the salinity of water that is delivered to Mexico in accordance with the 1944 Water Treaty. Title I of the Salinity Control Act provides the legal basis for programs to comply with the provisions of Minute No. 242 downstream from Imperial Dam. To implement provisions of Title I of the Salinity Control Act, construction of the YDP in Yuma, Arizona was largely completed in 1992. Shortly thereafter, it operated at one-third capacity for a brief trial period. With above average flow on the Colorado River and other considerations, operation of the YDP was then suspended and has not operated since, with the exception of a 90-day demonstration run at 10% of its capacity in 2007.

The Metropolitan Water District of Southern California (MWD), Southern Nevada Water Authority (SNWA), and Central Arizona Water Conservation District (CAWCD) have requested that the U.S. Bureau of Reclamation (Reclamation) conduct a Pilot Run of the YDP and are considering providing some funds needed for operation. These parties, as well as other U.S. entities, are interested in gaining additional information under low water conditions in the Colorado River Basin that can be used when considering long term, sustained operation of the YDP as a tool to extend water supplies. Such consideration requires gathering information that can only be obtained through actual operation of the YDP. This includes collecting performance and cost data, identifying any remaining improvements to equipment, and testing changes already performed on the plant. Reclamation has developed a plan for the proposed Pilot Run, in which the plant would operate for 365 days within a period of up to 18 months at one-third capacity to gather such information. The proposed Pilot Run would produce approximately 29,000 acre-feet (35.8 million cubic meters (mcm)) of water for use within the United States. Reclamation, as the owner and operator, will comply with all the applicable requirements of federal law prior to determining whether to commence the Pilot Run.

Under current conditions, saline flows are bypassed to Mexico via the Wellton-Mohawk Bypass Drain and eventually flow into the Santa Clara Wetland. We observe that the Santa Clara Wetland is part of the Upper Gulf of California and Colorado River Delta Biosphere Reserve, the highest category of protection that Mexico assigns to a wetland, in addition to being declared a protected wetland under the RAMSAR Wetlands Convention. This area provides wetland habitat for migratory birds on the Pacific Flyway and for various species including threatened and endangered species. When the YDP is not operating, flows to the Santa Clara Wetland from the Wellton-Mohawk Bypass Drain between 2004 and 2008 averaged an estimated 107,000 acre-feet (132.0594 mcm) annually with a salinity of approximately 2,664 parts per million. Under the proposed Pilot Run, absent any joint cooperative actions, flows that reach the Santa Clara Wetland from the Wellton-Mohawk Bypass Drain would be reduced to approximately 77,000 acre-feet (95.0334 mcm), while salinity would increase to approximately 3,204 parts per million.

We observed that both countries are interested in preserving the environmental value of the Santa Clara Wetland during the proposed YDP Pilot Run, and we also observe that Mexico, the United States and the potential YDP funding partners, in the interest of binational cooperation, are willing to undertake joint cooperative actions that are responsive to address the Santa Clara Wetland and the U.S. interest in conducting the proposed YDP Pilot Run.

U.S.-Mexico Discussions Concerninz the 'YDP Pilot Run and the Santa Clara Wetland

We observed that Resolution 4 of Minute No. 242 states that Mexico shall permit the United States to discharge to the Santa Clara Slough "the volumes of brine from such desalting operations in the United States as are carried out to implement the Resolution of this Minute, and any other volumes of brine which Mexico may agree to accept" and Resolution 6 stipulates that "With the objective of avoiding future problems, the United States and Mexico shall consult with each other prior to undertaking any new development of either the surface or the groundwater resources, or undertaking substantial modifications of present developments, in its own territory in the border area that might adversely affect the other country."

We also observed that Minute No. 306 provides, "That in recognition of their respective governments' interest in the preservation of the riparian and estuarine ecology of the Colorado River in its limitrophe section and its associated delta, the Commission shall establish a framework for cooperation by the United States and Mexico through the development of joint studies that include possible approaches to ensure use of water for ecological purposes in this reach and formulation of recommendations for cooperative projects, based on the principle of an equitable distribution of resources."

In November 2008, in order to further both the consultation process established under Minute No. 242 and the spirit of binational cooperation with regard to the ecology of the Colorado River limitrophe and its delta as established in Minute No. 306, the U.S. and Mexico, through the International Boundary and Water Commission, initiated consultations regarding the proposed YDP Pilot Run.

The binational consultation consisted of a series of meetings held over a period of five months where the details of the Pilot Run were presented and expert stakeholders from both countries had an opportunity to discuss the proposed action. The following were the primary items of discussion:

- Whether or not current average annual flows reaching the Santa Clara Wetland would be reduced and if so, what the impact would be that reduced volumes and increased salinity could have on the biodiversity and the ecosystem,
- Need for a comprehensive binational monitoring program of the Santa Clara Wetland,
- Importance of the YDP Pilot Run in order to gather data required for future decision making,
- Ensuring that all agreements with regards to this YDP consultation are limited to the proposed YDP Pilot Run and its duration,
- Addressing the importance of understanding the requirements for long term sustainability of the Santa Clara Wetland based on specific habitat requirements instead of historical flows reaching the Santa Clara Wetland, and
- Importance of maintaining existing infrastructure such as the Wellton-Mohawk Bypass Drain and the Santa Clara drain to ensure flows reach the intended locations within the Santa Clara Wetland.

Proposed Joint Cooperative Actions

Based on the binational discussions regarding the YDP Pilot Run discussed during the preceding five months, a program of joint cooperative actions was developed and proposed to address the interests of both countries in the event Reclamation determines to commence the Pilot Run. The suggested joint cooperative actions discussed to date regarding the proposed YDP Pilot Run are described below.

1) If, the proposed 365 day YDP Pilot Run, is approved by the appropriate U.S. agency, it is recommended that the Joint Cooperative Actions described in this document be carried out.
2) During the YDP Pilot Run, each one of the parties, the U.S., Mexico and Non-Governmental Organizations (NG0s) each intend to arrange for 10,000 acre-feet (12.3 mcm) of water for a

total of 30,000 acre-feet (37.0 mcm) pursuant to the letters of commitment that have been received from the respective participants.

3) All actions undertaken pursuant to this agreement will be carried out in such a way as not to interfere with deliveries of water to Mexico either at Morelos Dam or the Southerly International Boundary (SIB) nor interfere with the rights of the United States or Mexico in accordance with the 1944 Water Treaty.
4) The non-federal U.S. parties **(MWD, SNWA** and CAWCD) intend to contribute a total of $250,000 toward a comprehensive binational monitoring program for the Santa Clara Wetland.
5) Mexico is willing to allocate resources to perform the necessary dredging work in order to allow Santa Clara drain flows to reach the Santa Clara Wetland.
6) If deemed necessary, the U.S. is willing to allow for the use of the amphibious excavator to excavate the Santa Clara Drain, and Mexico will provide funds for the operation, maintenance and, if necessary, repair of the equipment.
7) The U.S. Bureau of Reclamation will provide a one-time contribution of $100,000 for additional maintenance activities related to the Wellton-Mohawk Bypass Drain.
8) Upon request of Mexico and pursuant to further arrangements and in a manner that poses no conflicts with the provisions of the 1944 Water Treaty, the U.S. is willing to arrange for the use of the Wellton-Mohawk Bypass Drain for the conveyance of water that Mexico and the non-governmental organizations intend to contribute to the Santa Clara Wetland through said drain.
9) Both countries are willing to continuing work, under the auspices of Minute No. 306, and to include this topic in the Colorado River Joint Cooperative Process discussions, to specifically identify the true requirements for long term sustainability of the Santa Clara Wetland based on specific habitat requirements instead of historical flows reaching the Santa Clara Wetland.

Specific Details of the Proposed Joint Cooperative Actions

1. The proposed YDP Pilot Run consists of the operation of the YDP at one-third capacity for 365 days during a period of up to eighteen months. The implementation of this pilot run is subject to the conclusion of the Environmental Assessment (EA) and subject to a decision by Reclamation to proceed. In order to carry out the proposed Pilot Run, 37,980 acre-feet (46.8 mcm) of water from the Wellton-Mohawk Bypass Drain will be treated at the plant, resulting in about 21,700 acre-feet (26.8 mcm) of treated and desalinated product water. This treated and desalinated product water will be discharged along with an estimated 7,300 acre-feet (9 mcm) of untreated water from the Wellton-Mohawk Bypass Drain, resulting in discharge to the Colorado River of approximately 29,000 acre-feet (35.8 mcm) of water with salinity substantially similar to current river salinity. The saline concentrate that is a byproduct of the treatment process will be discharged to the Wellton-Mohawk Bypass Drain, which would increase the salinity to an estimated salinity of 3,204 ppm.

   The United States, Mexico, and a partnership of non-governmental organizations intend to each arrange for 10,000 acre-feet (12.3 mcm) of water, for a total of 30,000 acre-feet (37 mcm), in connection with the reduction in flow to the Santa Clara Wetland and the increase in salinity that would occur during the proposed '{DP Pilot Run in the absence

of the Joint Cooperative Actions identified in this agreement. These volumes shall be conveyed during the YDP Pilot Run period, however each party may initiate conveyance of their respective volumes starting on the date a decision is made by the appropriate U.S. agency to proceed with the proposed YDP Pilot Run until the conclusion of the proposed YDP Pilot Run.

(a) As a matter of binational cooperation, the U.S. intends to convey through the Wellton-Mohawk Drain to the Santa Clara Wetland 10,000 acre-feet (12.3 mcm) of non-storable Colorado River flows, which arrive in Mexico due to limitations in U.S. system operations and are not part of its Colorado River allocation.

(b) Mexico intends to provide 10,000 acre-feet (12.3 mcm) of water to the Santa Clara Wetland. To do so, Mexico is making the necessary arrangements and investments to send water to the Santa Clara Wetland.

(c) U.S. and Mexican non-governmental organizations intend to use existing water rights that are property of the NGOs trust and lease sufficient water rights from the Mexicali Valley Irrigation District to provide 10,000 acre-feet (12.3 mcm) of water for delivery to the Santa Clara Wetland. This responsibility is limited to the NGOs without responsibility to the U.S. or Mexican government. It is recommended that Mexico and the U.S. work with the NGOs to document through the Commission this agreement and deliver this water through the Wellton-Mohawk Bypass Drain.

3. The U.S. is willing to operate its systems in a manner that allows conveyance of the contribution stated in point 2 (a) above, 10,000 acre-feet (12,3 mcm) of water, directly into the Wellton-Mohawk Bypass Drain. The U.S. conveyance of 10,000 acre-feet (12.3 mcm) of non-storable Colorado River water identified in point 2 (a) above should not be considered part of Mexico's Colorado River water allocation as provided for under the 1944 Water Treaty, nor impact the delivery of said waters, including monthly allocations and delivery schedules.

4. It is recommended that the U.S. and Mexico coordinate regarding system operations to ensure conveyance of the water volumes described in 2 (b) and 2 (c) above to the Santa Clara Wetland, including consideration of the feasibility of delivering Mexican water to the Santa Clara Wetland through the Wellton-Mohawk Bypass Drain or by means of other infrastructure owned or operated by the United States. It is recommended that the Commission develop a new Minute to facilitate the conveyance of said water using the Wellton-Mohawk Bypass Drain.

5. The volume of 10,000 acre-feet (12.3 mcm) conveyance stated in point 2 (a) above during the YDP Pilot Run will not be accounted in favor of Mexico as part of its Colorado River water allocation provided for under the 1944 Water Treaty.

6. For the contribution stated in point 2 (b) above, Mexico intends to, using Mexican resources and infrastructure, perform the necessary maintenance work on the Santa Clara Drain, including removal of sediment, to ensure that Santa Clara Drain flows reach the Santa Clara Wetland, and if appropriate, any other actions to guarantee its commitment as required.

7. Reclamation's non-federal funding partners for the YDP Pilot Run intend to contribute a total of $250,000 for a comprehensive binational monitoring program of the Santa Clara Wetland and related activities. It is recommended that a binational group be established by the Commission to make recotrunendations to the Commission for the program's terms of reference, scope, and duration. The terms of reference should outline what agencies will be participating, how the information will be exchanged, and how the final product will be published.

8. As may be requested by the Mexican Section, the U.S. Section is willing to authorize the Mexican Section to use the U.S. Section's amphibious excavator, two 19-foot aluminum boats, and the air boat and trailer, currently loaned to the Mexican Section for Wellton-Mohawk Bypass Drain maintenance, for maintenance of the Santa Clara Drain, using Mexican funds for the operation, maintenance and, if necessary, repairs to the equipment. The use of the equipment for the Santa Clara Drain shall be consistent with the conditions established for this purpose. Use of the equipment and the conditions for its use will be coordinated between the two Sections of the Commission.

9. Reclamation, through the U. S. Section, is willing to provide a one-time contribution to the Mexican Section of $100,000 dollars for extraordinary maintenance of the Wellton-Mohawk Bypass Drain. Performing extraordinary maintenance on the Wellton-Mohawk Bypass Drain will assure reliable flows to the Santa Clara Wetland by effectively improving the conveyance capacity to transport sediment through the canal and avoid sediment build-up at the terminus of the canal that could disrupt flow to the wetland. The Mexican Section intends to provide to the U.S. Section a detailed list of the actions to be performed for review and concurrence.

10. It is recommended that Colorado River Joint Cooperative Process' Work Groups and Core Group address the future needs of the Santa Clara Wetland. Consistent with Minute No. 306, the Colorado River Joint Cooperative Process intends to address long-term approaches to maintain the environmental values of the Santa Clara Wetland. Such approaches should focus on identifying and quantifying the habitat values to be preserved then identifying the amount, timing, quality and source of water associated with preservation of those values.

Recommendations

Based on the foregoing and that the U.S. and Mexico participants involved in the consultation process have provided their concurrence with the implementation of the proposed Joint Cooperative Actions Program, we respectfully recommend that the Commissioners approve the aforementioned program of joint cooperative actions.

After the approval of this report by the Commissioners and in the event that any of the recommended joint cooperative actions described in this report are not implemented due to unforeseen conditions, it is recommended that under the auspices of the Commission and in the interest of binational cooperation, all parties involved in the process reinitiate discussions, in good faith, to expeditiously resolve any unforeseen issues related to the proposed YDP Pilot Run.

Respectfully submitted for your consideration,

Alfredo J. Riera
Principal Engineer
United States Section

Luis Antonio Rascon Mendoza
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