THE YUMA DESALINIZATION PLANT

ARIZONA PERSPECTIVES

AUGUST 2002

APPENDICES

Arizona Department of Water Resources

THE YUMA DESALINIZATION PLANT
ARIZONA PERSPECTIVES
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Appendix A

Example Calculations for Coachella Canal Water Conservation Accounting

Example Calculations for Coachella Canal Water Conservation Accounting

Example calculations that illustrate the types of accounting that Reclamation should have included in the Compilation of Records in Accordance with Article V of the Decree of the Supreme Court of the United States in AZ v. CA Dated March 9, 1964 are illustrated below. The Coachella Canal lining theoretically conserved 132,000 acre-feet per year, but as shown in the two example years, the canal saving were sometimes insufficient to offset the actual amount of water that was bypassed to Mexico. These calculations show the importance of proper accounting to determine the correct water management actions necessary under law. In some years a water supply deficit should have been recorded, in other years, a surplus. Most importantly though, in 1990 the interim period that allowed the U.S. to use the canal savings should have been declared over since water uses in the lower basin exceeded 7.5 million acre-feet and California water users should have had their requests reduced. (see Table 1for compilation of consumptive use records)

Table A-1
Example Calculation for Coachella Canal Water Conservation
For years 1982 and 1990

	1982	1990
a) Normal Lower Basin Apportionment	7,500,000 AF	7,500,000 AF
b) Total LB Consumptive Uses	5,642,886 AF	7,657,840 AF
c) Difference a) – b)	1,857,114 AF	-157,840 AF
d) Coachella Canal Lining Conservation Savings Available to Offset Bypass (The difference between the LB Apportionment and Consumptives Uses (Line c), not to exceed 132,000 AF and >0AF)	132,000 AF	0 AF
e) Bypass Flow	149,689 AF	133,667 AF
f) Reduction in Reservoir Contents (Canal Conservation Savings (d)– Bypass Flow (e))	17,698 AF	133,667 AF

Explanation

1. If the lower basin water uses were 132,000 acre-feet less than the lower basin apportionment, then 132,000 AF of conserved water could be used to offset the bypass flow. (e.g. normal apportionment of 7.5 million acre-feet - 0.132 million acre-feet = 7.368)
2. If the bypass exceed 132,000 AF, then the difference between the bypass and 132,000 AF of conservation water is the over-delivery to Mexico.
3. If the lower basin water uses exceeded the lower basin apportionment minus the 132,000 AF, then part or all of the conserved water is not available to offset the bypass flow because the water was ordered and used by a lower basin water user. The difference between the actual water use and the lower basin apportionment is available for offset. (E.g. if the lower basin uses were 7.45 million acre-feet, only 50,000 AF of conservation savings are available for offset of the bypass.) Water bypassed in excess of the difference between the actual lower basin use and the lower basin apportionment is an over-delivery to Mexico and a reduction in reservoir contents.

Appendix B

Description of Assumptions Used for Colorado River Model Water Supply Projections

Description of Assumptions Used for Colorado River Model Water Supply Projections

The model used was the Colorado River System Simulation (CRSSez) model created by the Bureau of Reclamation.

The starting elevations for the system reservoirs used the projected January 1, 2003 elevations and reservoir contents.

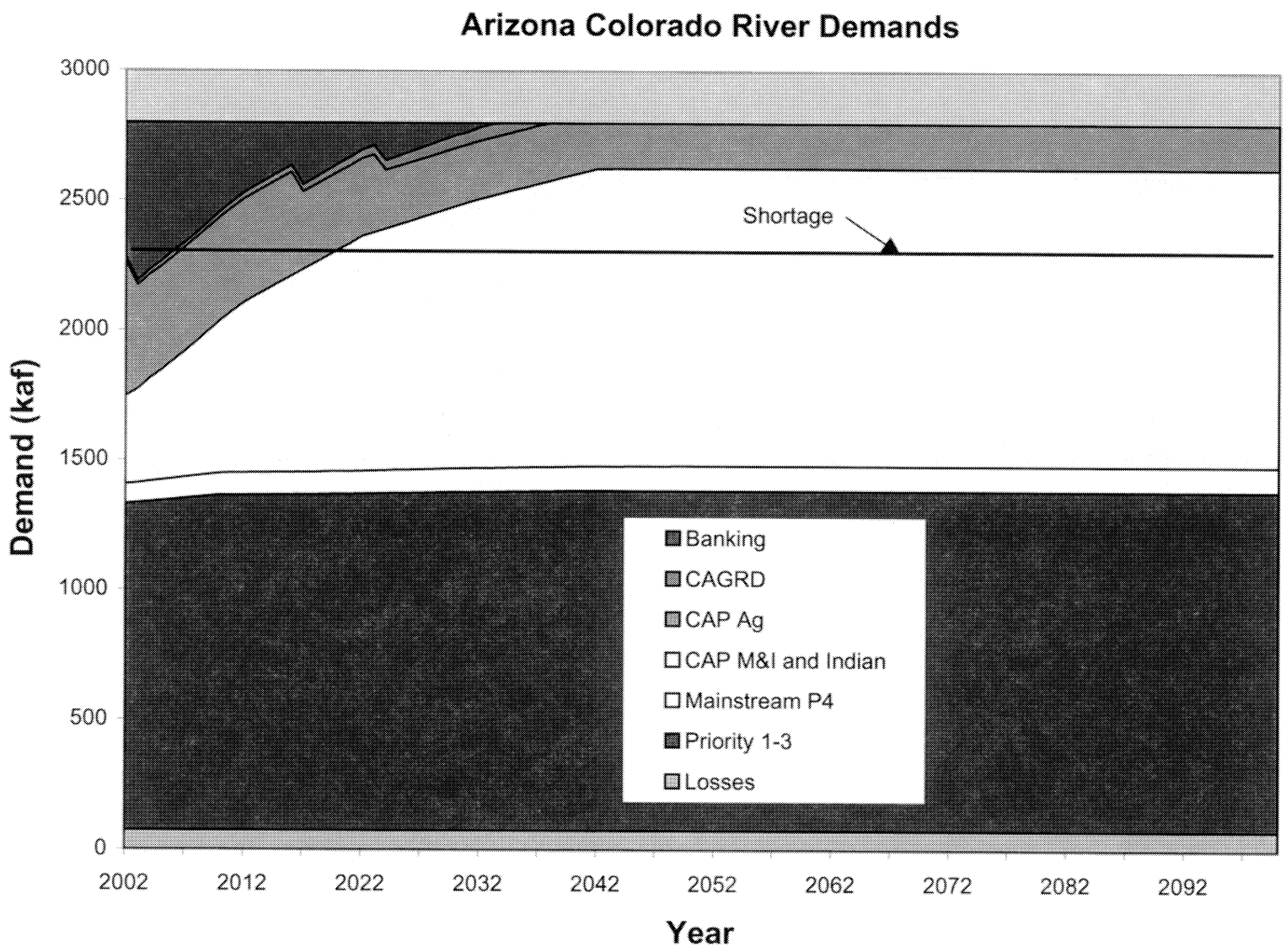
Powell elevation = 3627.37 fmsl
Mead elevation = 1153.49 fmsl
Other Upper Basin reservoirs content = 383 kaf
Fontenelle content = 170 kaf
Flaming Gorge = 2777 kaf
Taylor = 33 kaf
Blue Mesa = 232 kaf
Navajo = 893 kaf

The Interim Surplus Guidelines were used until the year 2017 to determine the surplus strategy. After 2017, both the 60R and 70R surplus methods were analyzed.

Two shortage strategies were analyzed. 80P1100 and 80P1000 were used for these river simulations.

The Upper Basin demands were consistent with Reclamation's projections with a final build-up to 5.2 Maf by 2060.

The model was used to simulate the Yuma Desalinization Plant being operated and not operated. When the desalter was operated, 108 kaf was salvaged to simulate the make-up of all Wellton-Mohawk bypass return flows.


Arizona Colorado River Demands
Demand (kaf)
3000
2500
2000
1500
1000
500
0
2002
2012
2022
2032
2042
2052
2062
2072
2082
2092
Year
Shortage
Banking
CAGRD
CAP Ag
CAP M&I and Indian
Mainstream P4
Priority 1-3
Losses

Appendix C

Description of Assumptions and Method of Calculating Estimated Damages Due to Increased Shortage to the Colorado River Water Supply

Appendix C

Description of Assumptions and Method of Calculating Estimated Damages Due to Increased Shortage to the Colorado River Water Supply

Table C-1
Estimated Damages to Arizona

Description of Cost	Agriculture Sector	Municipal Sector	Assumptions
M&I Damages Option 1-Banking		$171.00 /AF	AWBA Water Rates for 2002: $126/AF + Recharge Site use rate $45/AF =$171[1]
M&I Damages Option 2 – Agricultural Leasing Options		Option purchase $3,170 /AC $550 /AC Annual Cost	Assumed the same rates as the MWD – Palo Verde IID transfer agreement. See Tables C-5A&C-5B for calculation of total damages[2]
M&I Damages Option 3 Agriculture Retirement		$233.00 /AF	Assumed to be $233/AF/YR based on IID to SDWA Transfer
CAP Non-Indian Agricultural Damages	$103 to $148 / AF		Losses discounted to account for replacement water supplies[3]
Indian Agriculture	$295/AF		Assumed no replacement supplies[4]
Main stream priority 4 agricultural losses	$295/AF		No replacement water supplies[3]
Mainstream M&I		See options above for CAP M&I	

[1] Based on estimated costs for 2002 use rates for Vidler recharge site. Excess water rates from CAP would apply with energy costs up to $48/AF. Vidler facility charges are $45/AF.
[2] Assuming 4.5 AF/AC consumptive use, the holding cost is $704 per AF and the annual charge is $122 per AF
[3] Estimated damages include direct production losses, indirect loses, and induced losses to economy totaling $1330/AC or $295 per AF. Mike Hanrahan 2002, Paul Wilson 1992. The non-Indian agricultural districts are able to offset some CAP shortages with groundwater, but they expect to replace only 50% to 70%of the CAP water supply. Losses are therefore 50% to 30% of the CAP water in shortage year.
[4] See footnote 2 for estimated damages, but assume no replacement supplies.

Appendix C

Table C-2 Shortages and Surpluses Assuming Desalter On

Table C-2
Shortages and Surpluses Assuming Desalter On

Scenario	Shortage Assumption	Surplus Assumption	Shortage for 100-years (kaf)	Surplus for 100-years (kaf)	Short Next 20-years (kaf)	Average Probability Shortage (%)		Short 20-40 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	18,895	8,574	655	6.50		2,854	25.05	
2	80P1100	ISG/70R	23,733	8,752	2,285	22.80		3,923	38.65	
3	80P1000	ISG/60R	18,566	7,337	655	6.50		2,844	24.95	
4	80P1100	ISG/60R	23,334	7,487	2,274	22.70		3,869	38.05	
					Next 20 yr			20-40yr		
Shortage by Sector					Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1					394	86	175	1,061	872	921
2					1,343	188	754	1,447	1,042	1,434
3					394	86	175	1,058	869	916
4					1,336	188	750	1,426	1,028	1,415

Table C-2
Shortages and Surpluses Assuming Desalter On

Scenario	Shortage Assumption	Surplus Assumption	Short 40-60 years (kaf)	Average Probability Shortage (%)		Short 60-80 years (kaf)	Average Probability Shortage (%)		Short 80-100 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	4,685	41.80		5,165	46.45		5,535	48.20	
2	80P1100	ISG/70R	5,495	54.35		5,839	57.35		6,191	57.55	
3	80P1000	ISG/60R	4,615	41.20		5,070	45.55		5,381	46.80	
4	80P1100	ISG/60R	5,423	53.55		5,726	56.30		6,041	56.40	

		40-60yr			60-80 yr			80-100 yr		
Shortage by Sector		Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1		1,248	1,682	1,755	1,366	1,848	1,951	1,482	2,023	2,030
2		1,401	1,818	2,276	1,488	1,955	2,396	1,618	2,168	2,405
3		1,230	1,657	1,728	1,342	1,817	1,911	1,443	1,971	1,967
4		1,382	1,794	2,247	1,459	1,918	2,349	1,577	2,111	2,353

Table C-2
Shortages and Surpluses Assuming Desalter On

Scenario	Shortage Assumption	Surplus Assumption	Surplus Next 20 years (kaf)	Average Probability Surplus (%)	Surplus 20 40 years (kaf)	Average Probability Surplus (%)	Surplus 40 60 years (kaf)	Average Probability Surplus (%)	Surplus 60 80 years (kaf)	Average Probability Surplus (%)	Surplus 80 100 years (kaf)	Average Probability Surplus (%)
1	80P1000	ISG/70R	1,484	20.75	2,166	26.40	1,840	23.01	1,559	19.84	1,525	19.52
2	80P1100	ISG/70R	1,509	20.86	2,208	26.99	1,905	23.39	1,577	20.91	1,554	20.59
3	80P1000	ISG/60R	1,431	19.35	1,951	25.00	1,489	22.42	1,226	19.73	1,241	19.03
4	80P1100	ISG/60R	1,454	19.35	1,998	25.54	1,536	22.74	1,262	20.97	1,236	20.05

Shortage by Sector
1
2
3
4

Appendix C

Table C-3 Shortages and Surpluses Assuming Desalter Off

Table C-3
Shortages and Surpluses Assuming Desalter Off

Scenario	Shortage Assumption	Surplus Assumption	Shortage for 100-years (kaf)	Surplus for 100-years (kaf)	Short Next 20-years (kaf)	Average Probability Shortage (%)		Short 20-40 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	22,426	8,128	849	8.05		3,684	28.70	
2	80P1100	ISG/70R	26,891	8,477	2,584	25.75		4,626	42.65	
3	80P1000	ISG/60R	22,154	7,127	849	8.05		3,652	28.35	
4	80P1100	ISG/60R	26,552	7,351	2,557	25.45		4,572	42.20	
					Next 20 yr			20-40yr		
Shortage by Sector					Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1					504	123	223	1,363	1,259	1,062
2					1,519	213	852	1,714	1,337	1,575
3					504	123	223	1,355	1,250	1,047
4					1,503	209	845	1,694	1,323	1,556

Table C-3
Shortages and Surpluses Assuming Desalter Off

Scenario	Shortage Assumption	Surplus Assumption	Short 40-60 years (kaf)	Average Probability Shortage (%)		Short 60-80 years (kaf)	Average Probability Shortage (%)		Short 80-100 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	5,486	44.95		6,028	48.90		6,379	50.15	
2	80P1100	ISG/70R	6,094	56.00		6,560	58.30		7,028	58.55	
3	80P1000	ISG/60R	5,442	44.50		5,930	47.90		6,281	48.90	
4	80P1100	ISG/60R	6,047	55.55		6,446	57.35		6,930	57.80	

	40-60yr			60-80 yr			80-100 yr		
Shortage by Sector	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1	1,509	2,081	1,896	1,660	2,313	2,055	1,781	2,505	2,093
2	1,604	2,138	2,351	1,747	2,374	2,439	1,920	2,659	2,450
3	1,498	2,068	1,876	1,635	2,279	2,017	1,756	2,471	2,055
4	1,593	2,124	2,330	1,717	2,334	2,396	1,893	2,621	2,416

Table C-3
Shortages and Surpluses Assuming Desalter Off

Scenario	Shortage Assumption	Surplus Assumption	Surplus Next 20 years (kaf)	Average Probability Surplus (%)	Surplus 20 40 years (kaf)	Average Probability Surplus (%)	Surplus 40 60 years (kaf)	Average Probability Surplus (%)	Surplus 60 80 years (kaf)	Average Probability Surplus (%)	Surplus 80 100 years (kaf)	Average Probability Surplus (%)
1	80P1000	ISG/70R	1,461	20.32	2,129	25.70	1,735	21.83	1,426	19.03	1,378	19.14
2	80P1100	ISG/70R	1,495	20.59	2,176	26.18	1,803	22.90	1,522	20.59	1,482	20.48
3	80P1000	ISG/60R	1,409	18.98	1,942	24.09	1,485	20.86	1,169	17.63	1,122	17.26
4	80P1100	ISG/60R	1,445	19.14	1,985	24.62	1,532	21.88	1,205	19.73	1,184	19.52

Shortage by Sector
1
2
3
4

Appendix C

Table C-4 Shortages and Surpluses Comparison Between Desalter On and Off

Table C-4
Shortages and Surpluses Comparison Between Desalter On and Off
(Off - On)

Scenario	Shortage Assumption	Surplus Assumption	Shortage for 100-years (kaf)	Surplus for 100-years (kaf)	Short Next 20-years (kaf)	Average Probability Shortage (%)		Short 20-40 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	3,531	-446	194	1.55		830	3.65	
2	80P1100	ISG/70R	3,159	-275	299	2.95		703	4.00	
3	80P1000	ISG/60R	3,588	-211	194	1.55		808	3.40	
4	80P1100	ISG/60R	3,219	-136	283	2.75		703	4.15	

			Next 20 yr			20-40yr		
Shortage by Sector			Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1			110	36	47	302	387	141
2			176	25	98	267	295	141
3			110	36	47	296	381	131
4			167	21	95	267	295	140

Table C-4
Shortages and Surpluses Comparison Between Desalter On and Off
(Off - On)

Scenario	Shortage Assumption	Surplus Assumption	Short 40-60 years (kaf)	Average Probability Shortage (%)		Short 60-80 years (kaf)	Average Probability Shortage (%)		Short 80-100 years (kaf)	Average Probability Shortage (%)	
1	80P1000	ISG/70R	802	3.15		863	2.45		844	1.95	
2	80P1100	ISG/70R	598	1.65		721	0.95		837	1.00	
3	80P1000	ISG/60R	826	3.30		860	2.35		900	2.10	
4	80P1100	ISG/60R	624	2.00		720	1.05		889	1.40	
			40-60yr			60-80 yr			80-100 yr		
Shortage by Sector			Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed	Agricultural Shortage	M&I Shortage Firmed	M&I Shortage Not Firmed
1			261	399	141	294	465	103	299	482	63
2			203	320	75	259	419	43	302	490	45
3			268	410	148	293	462	106	313	500	88
4			210	330	84	257	416	47	316	510	63

Table C-4
Shortages and Surpluses Comparison Between Desalter On and Off
(Off - On)

Scenario	Shortage Assumption	Surplus Assumption	Surplus Next 20 years (kaf)	Average Probability Surplus (%)	Surplus 20 40 years (kaf)	Average Probability Surplus (%)	Surplus 40 60 years (kaf)	Average Probability Surplus (%)	Surplus 60 80 years (kaf)	Average Probability Surplus (%)	Surplus 80 100 years (kaf)	Average Probability Surplus (%)
1	80P1000	ISG/70R	-24	-0.43	-37	-0.70	-105	-1.18	-134	-0.81	-147	-0.38
2	80P1100	ISG/70R	-14	-0.27	-32	-0.81	-102	-0.48	-55	-0.32	-72	-0.11
3	80P1000	ISG/60R	-22	-0.38	-8	-0.91	-4	-1.56	-57	-2.10	-119	-1.77
4	80P1100	ISG/60R	-8	-0.22	-14	-0.91	-5	-0.86	-57	-1.24	-52	-0.54

Shortage by Sector
1
2
3
4

Appendix C

Table C-5 Municipal Damages Assuming MWD Water Transfer Costs Alt.# 2

Table C-5
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #2 (80P1100/ISG/70R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
1	0.00	0.00	0.00	$30,795,040	$30,795,040	$30,795,040	Option purchase price of $3,170 / acre. Estimate price based on 4.5 af/ ac. Option price = $704 / af. (Renewable every 35 years) Option purchase for 34.51kaf max. from Year 35. Includes investment of $6,000,000 in local community improvements and $500,000 for environmental documentation.
2	0.00	0.00	0.00	$100,000	$93,351	$87,344	Option price for water = $550/AC at 4.5 AF/AC = $122 / AF. Also include $100,000 per year for administrative costs.
3	0.00	0.00	0.00	$100,000	$90,194	$81,630	
4	1.00	0.75	0.25	$130,587	$113,799	$99,624	
5	1.57	1.40	0.17	$121,305	$102,136	$86,489	
6	1.64	1.55	0.09	$111,105	$90,384	$74,034	
7	2.27	1.90	0.38	$146,243	$114,945	$91,073	
8	2.66	2.36	0.30	$136,055	$103,322	$79,185	
9	2.82	2.62	0.20	$124,552	$91,388	$67,748	
10	2.87	2.77	0.10	$112,526	$79,772	$57,203	
11	3.04	2.72	0.31	$138,353	$94,764	$65,731	
12	3.10	2.78	0.32	$139,103	$92,056	$61,764	
13	3.27	2.94	0.33	$139,880	$89,440	$58,045	
14	3.77	3.00	0.78	$194,805	$120,347	$75,549	
15	12.63	11.18	1.44	$276,029	$164,759	$100,046	
16	22.06	17.65	4.41	$638,182	$368,043	$216,174	
17	28.73	27.83	0.90	$209,541	$116,757	$66,335	
18	34.48	29.26	5.22	$737,376	$396,975	$218,163	
19	41.66	38.09	3.57	$535,637	$278,615	$148,108	
20	46.34	40.27	6.07	$840,235	$422,274	$217,133	
21	49.32	41.85	7.47	$1,011,719	$491,261	$244,343	
22	59.82	49.40	10.42	$1,371,287	$643,340	$309,517	

Table C-5
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #2 (80P1100/ISG/70R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
23	59.59	53.97	5.62	$785,360	$355,992	$165,669	
24	71.64	58.33	13.31	$1,723,560	$754,845	$339,794	
25	78.31	69.75	8.57	$1,145,103	$484,547	$210,984	
26	81.75	74.21	7.54	$1,020,104	$417,057	$175,657	
27	96.99	79.23	17.76	$2,266,906	$895,455	$364,814	
28	105.81	86.80	19.00	$2,418,176	$922,907	$363,699	
29	115.69	90.85	24.83	$3,129,734	$1,154,084	$439,924	
30	126.88	95.13	31.75	$3,972,996	$1,415,493	$521,921	
31	131.35	103.34	28.01	$3,517,643	$1,210,879	$431,872	
32	138.12	117.37	20.75	$2,631,427	$875,186	$301,933	
33	146.32	118.75	27.57	$3,463,899	$1,113,099	$371,450	
34	148.84	126.76	22.08	$2,794,126	$867,509	$280,025	
35	168.96	134.45	34.51	$4,310,168	$1,292,951	$403,703	Max. shortage difference = 34,510 af
36	177.57	144.50	33.07	$28,429,573	$8,239,821	$2,488,596	Renew option to purchase
37	182.47	159.59	22.88	$2,891,699	$809,767	$236,567	
38	191.83	168.06	23.77	$2,999,973	$811,678	$229,368	
39	188.23	172.39	15.85	$2,033,618	$531,613	$145,312	
40	200.27	176.54	23.73	$2,995,479	$756,575	$200,039	
41	201.25	180.09	21.16	$2,681,005	$654,249	$167,326	
42	198.16	183.94	14.22	$1,835,268	$432,718	$107,049	
43	201.57	187.17	14.41	$1,857,533	$423,157	$101,259	
44	206.35	184.20	22.15	$2,802,628	$616,865	$142,784	
45	205.81	184.48	21.33	$2,702,825	$574,781	$128,691	
46	206.11	185.27	20.84	$2,642,250	$542,897	$117,576	
47	210.51	185.89	24.62	$3,104,036	$616,212	$129,089	
48	215.90	185.95	29.95	$3,753,708	$719,985	$145,895	
49	213.45	193.31	20.14	$2,557,048	$473,873	$92,882	
50	217.68	197.04	20.64	$2,618,392	$468,832	$88,889	
51	217.70	197.22	20.48	$2,598,762	$449,582	$82,451	
52	218.14	204.58	13.56	$1,753,823	$293,148	$52,003	

Table C-5
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #2 (80P1100/ISG/70R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
53	217.23	200.50	16.73	$2,141,531	$345,848	$59,345	
54	219.99	200.33	19.66	$2,498,976	$389,927	$64,720	
55	217.14	200.65	16.49	$2,111,268	$318,291	$51,102	
56	216.31	201.37	14.94	$1,922,330	$280,007	$43,485	
57	221.31	200.93	20.37	$2,585,675	$363,893	$54,664	
58	218.02	200.76	17.26	$2,205,328	$299,870	$43,573	
59	225.87	204.74	21.13	$2,677,282	$351,733	$49,437	
60	221.76	203.82	17.95	$2,289,574	$290,625	$39,512	
61	222.07	200.44	21.63	$2,739,443	$335,970	$44,183	
62	222.49	204.31	18.18	$2,317,383	$274,597	$34,930	
63	222.06	202.93	19.13	$2,433,526	$278,608	$34,281	
64	222.06	203.55	18.50	$2,357,460	$260,773	$31,037	
65	222.65	204.57	18.08	$2,305,932	$246,447	$28,373	
66	222.21	204.64	17.57	$2,242,952	$231,610	$25,792	
67	222.21	204.69	17.51	$2,236,409	$223,125	$24,035	
68	226.82	207.87	18.95	$2,411,443	$232,452	$24,220	
69	225.29	207.38	17.91	$2,284,649	$212,782	$21,446	
70	226.44	207.89	18.54	$2,362,351	$212,579	$20,724	
71	231.19	204.23	26.96	$27,683,907	$2,406,925	$226,976	Renew option to purchase
72	231.50	203.15	28.35	$3,558,993	$298,966	$27,271	
73	232.60	207.74	24.86	$3,132,843	$254,269	$22,435	
74	235.14	205.39	29.75	$3,729,120	$292,429	$24,958	
75	233.08	205.49	27.59	$3,465,734	$262,584	$21,678	
76	232.93	209.96	22.96	$2,901,357	$212,390	$16,960	
77	234.80	210.22	24.58	$3,099,292	$219,208	$16,932	
78	237.66	210.08	27.57	$3,464,082	$236,723	$17,687	
79	241.53	212.75	28.77	$3,610,505	$238,386	$17,229	
80	240.47	209.75	30.73	$3,848,518	$245,508	$17,163	
81	247.19	210.45	36.74	$4,582,221	$282,428	$19,098	
82	243.24	213.76	29.47	$3,695,568	$220,076	$14,395	

Table C-5
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #2 (80P1100/ISG/70R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
83	243.67	210.75	32.92	$4,115,993	$236,824	$14,984	
84	240.25	215.27	24.98	$3,147,549	$174,978	$10,709	
85	240.61	217.25	23.36	$2,949,614	$158,429	$9,379	
86	240.92	218.34	22.58	$2,854,735	$148,148	$8,483	
87	242.69	217.89	24.81	$3,126,283	$156,754	$8,682	
88	243.10	219.68	23.42	$2,956,975	$143,251	$7,675	
89	245.44	220.19	25.25	$3,180,282	$148,859	$7,715	
90	242.69	220.03	22.67	$2,865,368	$129,583	$6,496	
91	245.74	220.03	25.71	$3,236,718	$141,427	$6,858	
92	242.55	216.84	25.70	$3,235,900	$136,610	$6,407	
93	242.63	217.11	25.52	$3,212,999	$131,056	$5,946	
94	244.44	221.24	23.20	$2,930,801	$115,503	$5,069	
95	243.10	218.15	24.95	$3,144,294	$119,726	$5,082	
96	246.13	221.72	24.40	$3,077,225	$113,210	$4,649	
97	246.20	217.77	28.43	$3,567,990	$126,826	$5,037	
98	242.46	217.75	24.71	$3,114,849	$106,975	$4,110	
99	250.14	217.10	33.05	$4,131,550	$137,094	$5,095	
100	246.41	217.18	29.22	$3,665,322	$117,511	$4,224	
Totals			1,800.58	$308,956,486	$76,990,516	$43,591,736	

Appendix C

Table C-6 Municipal Damages Assuming MWD Water Transfer Costs Alt # 3

Table C-6
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #3 (80P1000/ISG/60R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
1	0.00	0.00	0.00	$36,863,520	$36,863,520	$36,863,520	Option purchase price of $3,170 / acre. Estimate price based on 4.5 af/ ac. Option price = $704 / af. (Renewable every 35 years) Option purchase for 43.13kaf max. from Year 35. Includes investment of $6,000,000 in local community improvements and $500,000 for environmental documentation.
2	0.00	0.00	0.00	$100,000	$93,351	$87,344	Option price for water = $550/AC at 4.5 AF/AC = $122 / AF. Also include $100,000 per year for administrative costs.
3	0.00	0.00	0.00	$100,000	$90,194	$81,630	
4	0.00	0.00	0.00	$100,000	$87,144	$76,290	
5	0.00	0.00	0.00	$100,000	$84,197	$71,299	
6	0.00	0.00	0.00	$100,000	$81,350	$66,634	
7	0.00	0.00	0.00	$100,000	$78,599	$62,275	
8	0.00	0.00	0.00	$100,000	$75,941	$58,201	
9	0.50	0.00	0.50	$161,381	$118,410	$87,780	
10	0.82	0.51	0.31	$137,578	$97,532	$69,938	
11	0.94	0.94	0.00	$100,000	$68,495	$47,509	
12	0.85	0.75	0.11	$113,034	$74,804	$50,189	
13	1.53	0.87	0.65	$179,760	$114,939	$74,594	
14	1.33	1.22	0.11	$113,544	$70,145	$44,034	
15	3.97	3.97	0.00	$100,000	$59,689	$36,245	
16	10.53	7.56	2.97	$462,484	$266,718	$156,659	
17	14.81	11.67	3.13	$482,190	$268,678	$152,649	
18	25.88	13.58	12.29	$1,599,871	$861,308	$473,344	
19	30.97	20.15	10.82	$1,420,133	$738,690	$392,679	
20	30.92	25.68	5.24	$738,981	$371,387	$190,967	
21	44.09	27.30	16.79	$2,148,663	$1,043,328	$518,930	
22	49.83	33.51	16.32	$2,090,983	$980,986	$471,962	

Table C-6
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #3 (80P1000/ISG/60R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
23	55.25	39.34	15.90	$2,039,899	$924,657	$430,310	
24	62.10	40.94	21.16	$2,681,102	$1,174,208	$528,570	
25	66.46	47.95	18.51	$2,358,356	$997,931	$434,525	
26	74.31	47.70	26.61	$3,345,873	$1,367,919	$576,144	
27	85.86	64.35	21.51	$2,724,715	$1,076,296	$438,489	
28	94.96	74.58	20.39	$2,587,165	$987,403	$389,115	
29	98.48	84.48	14.00	$1,807,424	$666,484	$254,057	
30	100.74	87.84	12.90	$1,673,462	$596,218	$219,838	
31	102.71	90.50	12.21	$1,589,421	$547,127	$195,138	
32	107.56	89.04	18.53	$2,360,112	$784,949	$270,802	
33	107.38	89.42	17.96	$2,290,992	$736,193	$245,674	
34	116.55	92.23	24.32	$3,066,805	$952,170	$307,353	
35	126.68	91.48	35.21	$4,395,261	$1,318,477	$411,673	
36	128.90	97.75	31.16	$34,264,452	$9,930,959	$2,999,354	Renew option to purchase
37	143.21	100.08	43.13	$5,361,524	$1,501,396	$438,620	Max. shortage difference = 43,130 af
38	153.23	111.87	41.36	$5,145,854	$1,392,272	$393,436	
39	157.10	116.19	40.91	$5,090,996	$1,330,850	$363,777	
40	164.76	131.57	33.19	$4,148,929	$1,047,905	$277,067	
41	171.74	138.35	33.40	$4,174,271	$1,018,653	$260,523	
42	181.19	147.96	33.23	$4,154,052	$979,439	$242,300	
43	181.66	150.39	31.26	$3,914,258	$891,691	$213,377	
44	183.41	153.82	29.59	$3,709,918	$816,562	$189,007	
45	179.27	156.54	22.73	$2,872,894	$610,947	$136,788	
46	180.75	151.65	29.10	$3,650,436	$750,047	$162,439	
47	184.95	159.86	25.09	$3,160,465	$627,415	$131,436	
48	186.03	159.27	26.76	$3,364,347	$645,303	$130,761	
49	184.75	168.23	16.53	$2,116,176	$392,170	$76,868	
50	185.82	158.57	27.25	$3,424,054	$613,088	$116,239	
51	191.51	159.25	32.25	$4,035,053	$698,058	$128,020	
52	191.41	167.26	24.15	$3,046,161	$509,160	$90,323	

Table C-6
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #3 (80P1000/ISG/60R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
53	195.21	161.96	33.25	$4,156,923	$671,326	$115,194	
54	195.22	169.41	25.81	$3,249,004	$506,957	$84,145	
55	198.30	167.53	30.77	$3,853,476	$580,943	$93,271	
56	194.53	165.74	28.79	$3,612,175	$526,149	$81,710	
57	198.48	171.95	26.53	$3,336,538	$469,565	$70,538	
58	195.22	172.42	22.79	$2,880,942	$391,737	$56,921	
59	195.17	172.04	23.12	$2,921,020	$383,755	$53,938	
60	194.08	171.93	22.15	$2,802,423	$355,724	$48,362	
61	193.78	168.46	25.32	$3,189,313	$391,143	$51,438	
62	197.52	168.42	29.10	$3,649,816	$432,483	$55,014	
63	201.83	175.85	25.98	$3,269,469	$374,313	$46,057	
64	197.30	179.15	18.16	$2,314,929	$256,068	$30,477	
65	198.44	175.08	23.36	$2,950,465	$315,332	$36,303	
66	200.67	178.33	22.34	$2,825,324	$291,746	$32,489	
67	201.73	178.68	23.05	$2,912,023	$290,530	$31,295	
68	203.63	170.45	33.18	$4,147,925	$399,841	$41,661	
69	205.28	173.72	31.56	$3,950,791	$367,959	$37,085	
70	209.43	177.80	31.63	$3,958,970	$356,252	$34,731	
71	204.03	181.25	22.77	$33,241,992	$2,890,162	$272,545	Renew option to purchase
72	205.07	178.17	26.90	$3,382,324	$284,125	$25,917	
73	204.26	178.62	25.64	$3,227,721	$261,969	$23,114	
74	207.59	178.86	28.73	$3,604,797	$282,680	$24,126	
75	212.62	174.63	37.99	$4,735,188	$358,766	$29,618	
76	209.04	179.93	29.10	$3,650,600	$267,238	$21,340	
77	210.82	180.85	29.97	$3,756,111	$265,663	$20,520	
78	215.30	184.10	31.20	$3,906,607	$266,964	$19,946	
79	212.10	184.93	27.17	$3,415,024	$225,479	$16,296	
80	216.45	181.91	34.53	$4,313,127	$275,147	$19,235	
81	215.89	184.67	31.22	$3,909,061	$240,937	$16,292	
82	212.48	185.65	26.83	$3,373,310	$200,885	$13,140	

Table C-6
Municipal Damages Assuming MWD Water Transfer Costs
Supply Alt. #3 (80P1000/ISG/60R)

Year from 2003	Average M&I Total Shortage Desalter Off (KAF)	Average M&I Total Shortage Desalter On (KAF)	Shortages Caused by Desalter Not Operating (KAF)	Damages at Discount Rates			Assumptions
				0%	3.50%	7%	
83	216.66	182.13	34.53	$4,312,309	$248,119	$15,698	
84	213.19	186.66	26.53	$3,336,504	$185,482	$11,352	
85	221.85	183.72	38.13	$4,751,546	$255,214	$15,108	
86	218.60	187.71	30.89	$3,868,983	$200,783	$11,497	
87	217.85	184.20	33.65	$4,205,163	$210,849	$11,679	
88	218.09	184.89	33.21	$4,151,180	$201,104	$10,775	
89	214.28	189.00	25.28	$3,183,554	$149,012	$7,722	
90	214.13	185.72	28.41	$3,566,355	$161,285	$8,085	
91	214.45	185.94	28.51	$3,577,805	$156,331	$7,580	
92	217.38	189.32	28.06	$3,523,005	$148,731	$6,976	
93	216.06	189.91	26.15	$3,290,701	$134,226	$6,090	
94	214.64	186.16	28.48	$3,574,534	$140,873	$6,182	
95	222.30	185.49	36.81	$4,591,235	$174,822	$7,421	
96	217.20	193.05	24.14	$3,045,326	$112,037	$4,600	
97	217.01	192.93	24.07	$3,037,147	$107,957	$4,288	
98	213.29	189.28	24.01	$3,028,968	$104,026	$3,997	
99	221.00	194.50	26.50	$3,333,249	$110,605	$4,110	
100	217.29	193.78	23.51	$2,968,442	$95,169	$3,421	
Totals			2199.34	$375,809,946	$94,553,820	$52,836,000	

Appendix C
Table C-7 Municipal Damages Assuming San Diego Water Transfer Costs Alt. # 2&3

Table C-7
Municipal Damages Assuming San Diego Water Transfer Costs
Supply Alt. #2 and #3

Year from 2003	Cost per Year for Transfer per AF	Shortages Caused by Desalter Not Operating - Alt #2 (80P1100/ISG/ 70R) (KAF)	Damages at Discount Rates				Shortages Caused by Desalter Not Operating - Alt #3 (80P1000/ISG /60R) (KAF)	Damages at Discount Rates		
			0%	3.50%	7%			0%	3.50%	7%
1	$248.63	0.00	$0	$0	$0		0.00	$0	$0	$0
2	$252.53	0.00	$0	$0	$0		0.00	$0	$0	$0
3	$256.43	0.00	$0	$0	$0		0.00	$0	$0	$0
4	$260.33	0.25	$65,266	$56,875	$49,791		0.00	$0	$0	$0
5	$264.23	0.17	$46,143	$38,851	$32,899		0.00	$0	$0	$0
6	$268.13	0.09	$24,407	$19,855	$16,263		0.00	$0	$0	$0
7	$272.03	0.38	$103,108	$81,042	$64,210		0.00	$0	$0	$0
8	$275.93	0.30	$81,545	$61,926	$47,460		0.00	$0	$0	$0
9	$279.83	0.20	$56,314	$41,320	$30,631		0.50	$140,786	$103,299	$76,578
10	$283.73	0.10	$29,131	$20,651	$14,809		0.31	$87,392	$61,954	$44,426
11	$287.63	0.31	$90,421	$61,933	$42,958		0.00	$0	$0	$0
12	$291.53	0.32	$93,440	$61,837	$41,488		0.11	$31,147	$20,612	$13,829
13	$295.43	0.33	$96,570	$61,747	$40,073		0.65	$193,140	$123,495	$80,146
14	$299.33	0.78	$232,603	$143,698	$90,207		0.11	$33,229	$20,528	$12,887
15	$303.23	1.44	$437,512	$261,147	$158,575		0.00	$0	$0	$0
16	$307.13	4.41	$1,354,829	$781,338	$458,927		2.97	$912,525	$526,259	$309,104
17	$311.03	0.90	$279,262	$155,606	$88,407		3.13	$974,350	$542,912	$308,454
18	$314.93	5.22	$1,645,293	$885,762	$486,783		12.29	$3,871,695	$2,084,370	$1,145,495
19	$314.93	3.57	$1,124,534	$584,933	$310,943		10.82	$3,407,730	$1,772,550	$942,266
20	$314.93	6.07	$1,910,808	$960,307	$493,789		5.24	$1,649,436	$828,950	$426,246
21	$314.93	7.47	$2,353,469	$1,142,776	$568,393		16.79	$5,288,321	$2,567,855	$1,277,199
22	$314.93	10.42	$3,281,639	$1,539,583	$740,709		16.32	$5,139,430	$2,411,167	$1,160,037
23	$314.93	5.62	$1,769,155	$801,933	$373,198		15.90	$5,007,564	$2,269,857	$1,056,330
24	$314.93	13.31	$4,190,980	$1,835,469	$826,237		21.16	$6,662,735	$2,917,992	$1,313,536
25	$314.93	8.57	$2,697,780	$1,141,557	$497,064		18.51	$5,829,614	$2,466,783	$1,074,101
26	$314.93	7.54	$2,375,112	$971,035	$408,984		26.61	$8,378,741	$3,425,545	$1,442,782
27	$314.93	17.76	$5,593,547	$2,209,520	$900,172		21.51	$6,775,315	$2,676,332	$1,090,354
28	$314.93	19.00	$5,984,030	$2,283,831	$900,011		20.39	$6,420,249	$2,450,316	$965,620

Table C-7
Municipal Damages Assuming San Diego Water Transfer Costs
Supply Alt. #2 and #3

Year from 2003	Cost per Year for Transfer per AF	Shortages Caused by Desalter Not Operating - Alt #2 (80P1100/ISG/ 70R) (KAF)	Damages at Discount Rates				Shortages Caused by Desalter Not Operating - Alt #3 (80P1000/ISG /60R) (KAF)	Damages at Discount Rates		
			0%	3.50%	7%			0%	3.50%	7%
29	$314.93	24.83	$7,820,812	$2,883,910	$1,099,315		14.00	$4,407,463	$1,625,244	$619,525
30	$314.93	31.75	$9,997,569	$3,561,918	$1,313,352		12.90	$4,061,659	$1,447,081	$533,568
31	$314.93	28.01	$8,822,140	$3,036,848	$1,083,121		12.21	$3,844,722	$1,323,470	$472,028
32	$314.93	20.75	$6,534,506	$2,173,309	$749,777		18.53	$5,834,146	$1,940,377	$669,416
33	$314.93	27.57	$8,683,408	$2,790,350	$931,163		17.96	$5,655,722	$1,817,425	$606,490
34	$314.93	22.08	$6,954,489	$2,159,202	$696,974		24.32	$7,658,370	$2,377,741	$767,517
35	$314.93	34.51	$10,867,929	$3,260,127	$1,017,922		35.21	$11,087,583	$3,326,018	$1,038,496
36	$314.93	33.07	$10,414,553	$3,018,478	$911,643		31.16	$9,811,545	$2,843,707	$858,858
37	$314.93	22.88	$7,206,360	$2,018,009	$589,544		43.13	$13,581,847	$3,803,347	$1,111,115
38	$314.93	23.77	$7,485,852	$2,025,387	$572,345		41.36	$13,025,129	$3,524,104	$995,860
39	$314.93	15.85	$4,991,349	$1,304,801	$356,657		40.91	$12,883,519	$3,367,913	$920,592
40	$314.93	23.73	$7,474,251	$1,887,790	$499,133		33.19	$10,451,713	$2,639,815	$697,969
41	$314.93	21.16	$6,662,485	$1,625,855	$415,816		33.40	$10,517,130	$2,566,510	$656,391
42	$314.93	14.22	$4,479,338	$1,056,134	$261,273		33.23	$10,464,937	$2,467,413	$610,405
43	$314.93	14.41	$4,536,813	$1,033,513	$247,314		31.26	$9,845,945	$2,242,964	$536,729
44	$314.93	22.15	$6,976,434	$1,535,529	$355,424		29.59	$9,318,471	$2,051,017	$474,743
45	$314.93	21.33	$6,718,808	$1,428,817	$319,906		22.73	$7,157,816	$1,522,176	$340,809
46	$314.93	20.84	$6,562,444	$1,348,371	$292,019		29.10	$9,164,926	$1,883,098	$407,826
47	$314.93	24.62	$7,754,475	$1,539,416	$322,489		25.09	$7,900,140	$1,568,333	$328,547
48	$314.93	29.95	$9,431,507	$1,809,024	$366,572		26.76	$8,426,429	$1,616,244	$327,508
49	$314.93	20.14	$6,342,508	$1,175,395	$230,386		16.53	$5,204,460	$964,492	$189,047
50	$314.93	20.64	$6,500,857	$1,164,000	$220,690		27.25	$8,580,556	$1,536,378	$291,291
51	$314.93	20.48	$6,450,185	$1,115,872	$204,644		32.25	$10,157,759	$1,757,276	$322,274
52	$314.93	13.56	$4,269,099	$713,572	$126,584		24.15	$7,605,080	$1,271,176	$225,500
53	$314.93	16.73	$5,269,911	$851,069	$146,037		33.25	$10,472,347	$1,691,241	$290,204
54	$314.93	19.66	$6,192,604	$966,261	$160,380		25.81	$8,128,689	$1,268,357	$210,522
55	$314.93	16.49	$5,191,792	$782,705	$125,664		30.77	$9,689,045	$1,460,702	$234,516
56	$314.93	14.94	$4,704,076	$685,196	$106,410		28.79	$9,066,161	$1,320,577	$205,084
57	$314.93	20.37	$6,416,404	$903,008	$135,649		26.53	$8,354,644	$1,175,785	$176,625

Table C-7
Municipal Damages Assuming San Diego Water Transfer Costs
Supply Alt. #2 and #3

Year from 2003	Cost per Year for Transfer per AF	Shortages Caused by Desalter Not Operating - Alt #2 (80P1100/ISG/ 70R) (KAF)	Damages at Discount Rates				Shortages Caused by Desalter Not Operating - Alt #3 (80P1000/ISG /60R) (KAF)	Damages at Discount Rates		
			0%	3.50%	7%			0%	3.50%	7%
58	$314.93	17.26	$5,434,595	$738,970	$107,376		22.79	$7,178,593	$976,111	$141,834
59	$314.93	21.13	$6,652,873	$874,034	$122,848		23.12	$7,282,048	$956,694	$134,465
60	$314.93	17.95	$5,652,061	$717,440	$97,539		22.15	$6,975,905	$885,482	$120,385
61	$314.93	21.63	$6,813,333	$835,600	$109,888		25.32	$7,974,606	$978,020	$128,617
62	$314.93	18.18	$5,723,846	$678,244	$86,277		29.10	$9,163,325	$1,085,804	$138,121
63	$314.93	19.13	$6,023,654	$689,633	$84,856		25.98	$8,181,516	$936,681	$115,254
64	$314.93	18.50	$5,827,301	$644,592	$76,719		18.16	$5,717,512	$632,448	$75,274
65	$314.93	18.08	$5,694,287	$608,579	$70,064		23.36	$7,358,055	$786,394	$90,535
66	$314.93	17.57	$5,531,715	$571,211	$63,611		22.34	$7,035,023	$726,444	$80,898
67	$314.93	17.51	$5,514,825	$550,210	$59,268		23.05	$7,258,823	$724,207	$78,011
68	$314.93	18.95	$5,966,648	$575,157	$59,929		33.18	$10,449,122	$1,007,247	$104,950
69	$314.93	17.91	$5,639,350	$525,224	$52,936		31.56	$9,940,249	$925,791	$93,308
70	$314.93	18.54	$5,839,925	$525,512	$51,232		31.63	$9,961,363	$896,384	$87,389
71	$314.93	26.96	$8,489,726	$738,123	$69,606		22.77	$7,172,215	$623,575	$58,804
72	$314.93	28.35	$8,928,881	$750,053	$68,417		26.90	$8,472,835	$711,744	$64,923
73	$314.93	24.86	$7,828,837	$635,407	$56,064		25.64	$8,073,751	$655,284	$57,818
74	$314.93	29.75	$9,368,037	$734,620	$62,697		28.73	$9,047,115	$709,454	$60,550
75	$314.93	27.59	$8,688,147	$658,265	$54,343		37.99	$11,965,054	$906,543	$74,840
76	$314.93	22.96	$7,231,289	$529,358	$42,272		29.10	$9,165,350	$670,938	$53,577
77	$314.93	24.58	$7,742,229	$547,595	$42,298		29.97	$9,437,711	$667,513	$51,560
78	$314.93	27.57	$8,683,880	$593,426	$44,338		31.20	$9,826,194	$671,488	$50,171
79	$314.93	28.77	$9,061,851	$598,314	$43,241		27.17	$8,557,244	$564,997	$40,833
80	$314.93	30.73	$9,676,247	$617,275	$43,152		34.53	$10,875,567	$693,783	$48,501
81	$314.93	36.74	$11,570,192	$713,136	$48,223		31.22	$9,832,528	$606,034	$40,981
82	$314.93	29.47	$9,281,429	$552,721	$36,153		26.83	$8,449,567	$503,183	$32,913
83	$314.93	32.92	$10,366,694	$596,474	$37,739		34.53	$10,873,455	$625,631	$39,583
84	$314.93	24.98	$7,866,798	$437,329	$26,765		26.53	$8,354,557	$464,445	$28,424
85	$314.93	23.36	$7,355,857	$395,097	$23,389		38.13	$12,007,280	$644,933	$38,179
86	$314.93	22.58	$7,110,943	$369,026	$21,131		30.89	$9,729,073	$504,895	$28,911

Table C-7
Municipal Damages Assuming San Diego Water Transfer Costs
Supply Alt. #2 and #3

Year from 2003	Cost per Year for Transfer per AF	Shortages Caused by Desalter Not Operating - Alt #2 (80P1100/ISG/ 70R) (KAF)	Damages at Discount Rates				Shortages Caused by Desalter Not Operating - Alt #3 (80P1000/ISG /60R) (KAF)	Damages at Discount Rates		
			0%	3.50%	7%			0%	3.50%	7%
87	$314.93	24.81	$7,811,903	$391,694	$21,695		33.65	$10,596,872	$531,334	$29,430
88	$314.93	23.42	$7,374,859	$357,275	$19,142		33.21	$10,457,524	$506,615	$27,143
89	$314.93	25.25	$7,951,294	$372,175	$19,288		25.28	$7,959,739	$372,570	$19,308
90	$314.93	22.67	$7,138,390	$322,826	$16,183		28.41	$8,947,883	$404,659	$20,285
91	$314.93	25.71	$8,096,976	$353,794	$17,155		28.51	$8,977,442	$392,266	$19,021
92	$314.93	25.70	$8,094,864	$341,741	$16,029		28.06	$8,835,983	$373,029	$17,496
93	$314.93	25.52	$8,035,747	$327,773	$14,871		26.15	$8,236,323	$335,955	$15,242
94	$314.93	23.20	$7,307,296	$287,981	$12,638		28.48	$8,968,996	$353,469	$15,512
95	$314.93	24.95	$7,858,396	$299,227	$12,702		36.81	$11,593,461	$441,448	$18,739
96	$314.93	24.40	$7,685,267	$282,739	$11,610		24.14	$7,602,925	$279,709	$11,485
97	$314.93	28.43	$8,952,106	$318,208	$12,639		24.07	$7,581,812	$269,500	$10,704
98	$314.93	24.71	$7,782,388	$267,275	$10,268		24.01	$7,560,699	$259,662	$9,976
99	$314.93	33.05	$10,406,852	$345,322	$12,833		26.50	$8,346,155	$276,944	$10,292
100	$314.93	29.22	$9,203,353	$295,061	$10,606		23.51	$7,404,461	$237,388	$8,533
Total		1,800.58	$566,894,993	$88,622,116	$23,511,213		2199.34	$692,547,263	$112,447,452	$30,251,619

Appendix C

Table C-8 Cumulative Municipal Damages Assuming Arizona Water Banking Authority Costs

Table C-8
Cumulative Municipal Damages Assuming Arizona Water Banking Authority Costs

Supply Alt. #2 (80P1100/ISG/70R)			
Recharge 1,800,580 AF over next 15 years = 120,039 AF/Year			
Year from 2003	Damages at Discount Rates		
	0%	3.5%	7%
1	$20,526,669	$19,832,530	$19,183,803
2	$41,053,338	$38,994,396	$37,112,590
3	$61,580,007	$57,508,275	$53,868,467
4	$82,106,676	$75,396,081	$69,528,164
5	$102,633,345	$92,678,986	$84,163,396
6	$123,160,014	$109,377,444	$97,841,182
7	$143,686,683	$125,511,220	$110,624,160
8	$164,213,352	$141,099,410	$122,570,868
9	$184,740,021	$156,160,463	$133,736,016
10	$205,266,690	$170,712,205	$144,170,733
11	$225,793,359	$184,771,859	$153,922,806
12	$246,320,028	$198,356,065	$163,036,893
13	$266,846,697	$211,480,903	$171,554,730
14	$287,373,366	$224,161,905	$179,515,327
15	$307,900,035	$236,414,081	$186,955,136

Supply Alt. #3 (80P1000/ISG/60R)			
Recharge 2,199,340 AF over next 15 years = 146,623 AF/Year			
Year from 2003	Damages at Discount Rates		
	0%	3.5%	7%
1	$25,072,533.00	$24,224,669.57	$23,432,273.83
2	$50,145,066.00	$47,630,147.41	$45,331,595.17
3	$75,217,599.00	$70,244,135.66	$65,798,250.63
4	$100,290,132.00	$92,093,399.67	$84,925,966.01
5	$125,362,665.00	$113,203,799.68	$102,802,335.52
6	$150,435,198.00	$133,600,321.43	$119,509,222.92
7	$175,507,731.00	$153,307,105.73	$135,123,136.37
8	$200,580,264.00	$172,347,477.03	$149,715,578.85
9	$225,652,797.00	$190,743,971.05	$163,353,375.56
10	$250,725,330.00	$208,518,361.40	$176,098,979.96
11	$275,797,863.00	$225,691,685.41	$188,010,759.78
12	$300,870,396.00	$242,284,268.99	$199,143,264.28
13	$325,942,929.00	$258,315,750.72	$209,547,474.09
14	$351,015,462.00	$273,805,105.04	$219,271,034.67
15	$376,087,995.00	$288,770,664.78	$228,358,474.45

Appendix C
Table C-9 Agricultural Damages Supply Alt. #2

Table C-9
Agricultural Damages
Supply Alt. #2 (80P1100/ISG/70R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
1	0.00	0.00	$0	$0	$0	$0	$0	$0
2	0.00	0.00	$0	$0	$0	$0	$0	$0
3	0.00	0.00	$0	$0	$0	$0	$0	$0
4	6.87	0.60	$1,318,099	$178,026	$1,148,647	$155,140	$1,005,571	$135,815
5	4.77	0.40	$915,979	$119,322	$771,230	$100,466	$653,081	$85,075
6	2.49	0.20	$478,904	$59,943	$389,589	$48,763	$319,114	$39,942
7	10.43	0.82	$2,002,293	$240,903	$1,573,784	$189,347	$1,246,928	$150,022
8	8.41	0.62	$1,614,300	$181,531	$1,225,918	$137,857	$939,537	$105,653
9	5.72	0.41	$1,097,310	$120,077	$805,130	$88,104	$596,864	$65,314
10	3.01	0.20	$577,068	$59,526	$409,094	$42,199	$293,352	$30,260
11	9.48	0.60	$1,820,007	$177,160	$1,246,606	$121,345	$864,672	$84,167
12	9.96	0.60	$1,912,230	$175,623	$1,265,482	$116,224	$849,053	$77,979
13	10.47	0.59	$2,010,763	$174,201	$1,285,690	$111,385	$834,395	$72,287
14	24.31	1.37	$4,667,392	$402,880	$2,883,430	$248,892	$1,810,095	$156,244
15	12.18	0.77	$2,338,991	$228,318	$1,396,122	$136,281	$847,758	$82,753
16	20.70	1.34	$3,974,753	$395,964	$2,292,263	$228,355	$1,346,386	$134,127
17	2.86	0.19	$548,487	$56,091	$305,619	$31,254	$173,637	$17,757
18	15.19	0.94	$2,916,673	$278,070	$1,570,223	$149,702	$862,938	$82,271
19	8.58	0.57	$1,648,203	$167,286	$857,322	$87,015	$455,742	$46,256
20	9.62	0.68	$1,846,149	$201,968	$927,812	$101,502	$477,080	$52,192
21	14.50	0.95	$2,783,411	$280,661	$1,351,544	$136,281	$672,230	$67,783
22	11.26	0.98	$2,162,499	$289,811	$1,014,538	$135,965	$488,104	$65,414
23	6.90	0.59	$1,324,053	$173,240	$600,174	$78,527	$279,305	$36,544
24	13.15	1.17	$2,524,323	$343,989	$1,105,545	$150,653	$497,662	$67,816
25	5.76	0.57	$1,105,114	$166,762	$467,626	$70,565	$203,616	$30,726
26	6.00	0.56	$1,151,611	$165,940	$470,822	$67,843	$198,302	$28,574
27	12.16	1.19	$2,335,400	$352,190	$922,512	$139,119	$375,837	$56,678
28	12.76	1.24	$2,450,747	$366,771	$935,338	$139,980	$368,598	$55,163

Table C-9
Agricultural Damages
Supply Alt. #2 (80P1100/ISG/70R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
29	15.48	1.56	$2,971,313	$460,674	$1,095,666	$169,873	$417,656	$64,754
30	19.64	2.01	$3,771,695	$591,936	$1,343,774	$210,894	$495,477	$77,761
31	16.50	1.73	$3,167,845	$510,262	$1,090,468	$175,648	$388,926	$62,646
32	11.72	1.26	$2,249,636	$371,975	$748,206	$123,715	$258,126	$42,681
33	14.83	1.66	$2,847,208	$489,090	$914,929	$157,165	$305,319	$52,447
34	11.23	1.30	$2,155,516	$383,496	$669,236	$119,066	$216,024	$38,434
35	16.18	1.98	$3,107,095	$585,298	$932,057	$175,576	$291,020	$54,821
36	14.81	1.86	$2,843,108	$549,386	$824,026	$159,230	$248,873	$48,091
37	10.37	1.28	$1,990,222	$377,560	$557,325	$105,729	$162,818	$30,888
38	10.34	1.31	$1,984,743	$386,573	$536,996	$104,592	$151,747	$29,556
39	7.78	0.90	$1,493,497	$265,207	$390,419	$69,328	$106,718	$18,950
40	10.29	1.31	$1,976,554	$385,651	$499,223	$97,405	$131,995	$25,754
41	9.77	1.18	$1,876,206	$348,769	$457,853	$85,110	$117,097	$21,767
42	7.77	0.83	$1,492,798	$244,691	$351,971	$57,693	$87,073	$14,272
43	7.87	0.84	$1,511,474	$247,803	$344,323	$56,451	$82,394	$13,508
44	10.29	1.24	$1,975,922	$365,596	$434,905	$80,469	$100,666	$18,626
45	9.84	1.19	$1,888,498	$351,419	$401,607	$74,733	$89,918	$16,732
46	9.56	1.16	$1,834,834	$342,775	$376,999	$70,429	$81,648	$15,253
47	10.70	1.36	$2,054,696	$399,943	$407,898	$79,397	$85,450	$16,633
48	11.77	1.61	$2,259,102	$475,667	$433,310	$91,236	$87,804	$18,488
49	9.16	1.12	$1,758,470	$330,558	$325,880	$61,259	$63,875	$12,007
50	9.43	1.15	$1,811,142	$339,202	$324,291	$60,735	$61,484	$11,515
51	9.35	1.14	$1,794,287	$336,436	$310,409	$58,203	$56,927	$10,674
52	7.40	0.79	$1,420,034	$233,050	$237,356	$38,954	$42,106	$6,910
53	8.22	0.95	$1,577,313	$279,845	$254,730	$45,194	$43,710	$7,755
54	8.90	1.09	$1,708,608	$322,375	$266,602	$50,302	$44,251	$8,349
55	8.08	0.93	$1,551,328	$275,580	$233,875	$41,546	$37,549	$6,670
56	7.23	0.84	$1,389,099	$248,956	$202,336	$36,263	$31,423	$5,632

Table C-9
Agricultural Damages
Supply Alt. #2 (80P1100/ISG/70R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
57	9.29	1.13	$1,783,050	$334,592	$250,936	$47,089	$37,695	$7,074
58	8.50	0.98	$1,632,092	$288,835	$221,924	$39,274	$32,247	$5,707
59	9.70	1.18	$1,861,707	$347,501	$244,586	$45,654	$34,377	$6,417
60	8.88	1.02	$1,704,428	$300,706	$216,350	$38,170	$29,414	$5,189
61	9.97	1.21	$1,915,081	$356,260	$234,869	$43,692	$30,887	$5,746
62	9.00	1.03	$1,728,306	$304,625	$204,795	$36,096	$26,051	$4,592
63	9.52	1.09	$1,828,031	$320,992	$209,287	$36,750	$25,752	$4,522
64	9.18	1.05	$1,762,718	$310,273	$194,985	$34,321	$23,207	$4,085
65	8.95	1.03	$1,718,474	$303,011	$183,662	$32,384	$21,144	$3,728
66	8.67	1.00	$1,664,397	$294,137	$171,868	$30,373	$19,139	$3,382
67	8.64	0.99	$1,658,779	$293,215	$165,495	$29,254	$17,827	$3,151
68	9.42	1.08	$1,809,069	$317,880	$174,386	$30,642	$18,170	$3,193
69	9.77	1.04	$1,875,821	$307,852	$174,706	$28,672	$17,608	$2,890
70	10.12	1.08	$1,942,539	$318,802	$174,802	$28,688	$17,041	$2,797
71	12.88	1.52	$2,472,701	$447,775	$214,984	$38,931	$20,273	$3,671
72	13.64	1.60	$2,618,778	$471,748	$219,985	$39,628	$20,066	$3,615
73	12.65	1.42	$2,428,491	$419,536	$197,102	$34,051	$17,391	$3,004
74	14.40	1.68	$2,764,854	$495,722	$216,814	$38,873	$18,504	$3,318
75	14.14	1.58	$2,714,324	$466,446	$205,653	$35,341	$16,978	$2,918
76	12.53	1.34	$2,405,349	$394,756	$176,081	$28,898	$14,061	$2,308
77	13.41	1.43	$2,575,304	$422,648	$182,147	$29,893	$14,069	$2,309
78	15.04	1.61	$2,888,526	$474,053	$197,392	$32,395	$14,748	$2,420
79	14.78	1.65	$2,838,629	$486,847	$187,422	$32,144	$13,545	$2,323
80	15.85	1.76	$3,042,996	$520,387	$194,121	$33,197	$13,571	$2,321
81	17.30	2.06	$3,321,738	$608,097	$204,737	$37,480	$13,845	$2,534
82	15.16	1.69	$2,911,668	$498,834	$173,394	$29,706	$11,342	$1,943
83	16.13	1.87	$3,097,038	$550,238	$178,196	$31,659	$11,274	$2,003
84	13.63	1.46	$2,616,739	$429,449	$145,469	$23,874	$8,903	$1,461

Table C-9
Agricultural Damages
Supply Alt. #2 (80P1100/ISG/70R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
85	12.74	1.36	$2,446,785	$401,556	$131,421	$21,568	$7,780	$1,277
86	12.32	1.32	$2,365,319	$388,187	$122,749	$20,145	$7,029	$1,154
87	13.53	1.45	$2,598,480	$426,452	$130,289	$21,383	$7,217	$1,184
88	12.78	1.36	$2,453,105	$402,594	$118,841	$19,504	$6,367	$1,045
89	12.86	1.44	$2,469,224	$426,221	$115,576	$19,950	$5,990	$1,034
90	12.37	1.32	$2,374,449	$389,685	$107,382	$17,623	$5,383	$883
91	13.11	1.47	$2,517,682	$434,174	$110,009	$18,971	$5,334	$920
92	13.11	1.47	$2,516,980	$434,059	$106,259	$18,325	$4,984	$859
93	13.01	1.46	$2,497,315	$430,832	$101,864	$17,573	$4,621	$797
94	12.66	1.35	$2,430,632	$398,905	$95,791	$15,721	$4,204	$690
95	12.70	1.43	$2,438,323	$421,150	$92,845	$16,036	$3,941	$681
96	12.40	1.40	$2,380,735	$411,699	$87,587	$15,146	$3,596	$622
97	13.68	1.60	$2,626,503	$473,016	$93,361	$16,814	$3,708	$668
98	12.57	1.41	$2,413,040	$417,001	$82,872	$14,321	$3,184	$550
99	15.29	1.85	$2,934,775	$544,591	$97,382	$18,071	$3,619	$672
100	14.11	1.65	$2,710,076	$486,731	$86,885	$15,605	$3,123	$561
			$209,742,050	$33,828,090	$49,385,992	$6,922,841	$21,587,141	$2,690,604
		Total Cost	$243,570,140		$56,308,833		$24,277,745	

Appendix C
Table C-10 Agricultural Damages Supply Alt. # 3

Table C-10
Agricultural Damages
Supply Alt. #3 (80P1000/ISG/60R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
1	0.00	0.00	$0	$0	$0	$0	$0	$0
2	0.00	0.00	$0	$0	$0	$0	$0	$0
3	0.00	0.00	$0	$0	$0	$0	$0	$0
4	0.00	0.00	$0	$0	$0	$0	$0	$0
5	0.00	0.00	$0	$0	$0	$0	$0	$0
6	0.00	0.00	$0	$0	$0	$0	$0	$0
7	0.00	0.00	$0	$0	$0	$0	$0	$0
8	0.00	0.00	$0	$0	$0	$0	$0	$0
9	14.29	1.02	$2,743,275	$300,191	$2,012,826	$220,260	$1,515,475	$163,284
10	9.02	0.61	$1,731,204	$178,579	$1,227,283	$126,598	$893,807	$90,780
11	0.00	0.00	$0	$0	$0	$0	$0	$0
12	3.32	0.20	$637,410	$58,541	$421,827	$38,741	$287,440	$25,993
13	20.95	1.18	$4,021,527	$348,402	$2,571,381	$222,770	$1,694,866	$144,574
14	3.47	0.20	$666,770	$57,554	$411,919	$35,556	$262,625	$22,321
15	0.00	0.00	$0	$0	$0	$0	$0	$0
16	6.67	0.47	$1,280,999	$140,058	$738,760	$80,772	$440,699	$47,443
17	6.45	0.46	$1,238,580	$134,617	$690,141	$75,009	$398,229	$42,616
18	19.09	1.34	$3,664,979	$395,638	$1,973,082	$212,996	$1,101,278	$117,055
19	16.99	1.22	$3,262,198	$359,999	$1,696,851	$187,255	$916,119	$99,543
20	2.88	0.30	$553,884	$87,613	$278,363	$44,031	$145,371	$22,641
21	15.47	1.27	$2,971,090	$374,963	$1,442,675	$182,071	$728,769	$90,558
22	13.13	1.22	$2,520,381	$360,546	$1,182,438	$169,150	$577,772	$81,380
23	11.28	1.09	$2,166,397	$320,827	$981,997	$145,426	$464,135	$67,677
24	13.96	1.38	$2,681,074	$405,740	$1,174,195	$177,697	$536,823	$79,990
25	12.27	1.21	$2,355,648	$356,942	$996,785	$151,039	$440,808	$65,766
26	18.32	1.79	$3,518,304	$528,272	$1,438,415	$215,978	$615,302	$90,966
27	15.03	1.47	$2,885,342	$432,514	$1,139,746	$170,848	$471,595	$69,605
28	13.52	1.32	$2,596,687	$390,534	$991,037	$149,049	$396,650	$58,737

Table C-10
Agricultural Damages
Supply Alt. #3 (80P1000/ISG/60R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
29	8.30	0.85	$1,592,667	$251,631	$587,293	$92,789	$227,368	$35,370
30	7.52	0.78	$1,443,886	$230,778	$514,426	$82,221	$192,643	$30,317
31	6.69	0.71	$1,285,300	$209,527	$442,439	$72,125	$160,266	$25,724
32	10.27	1.10	$1,971,749	$323,351	$655,783	$107,543	$229,776	$37,102
33	9.73	1.07	$1,868,054	$314,711	$600,286	$101,130	$203,450	$33,748
34	12.67	1.43	$2,432,530	$420,880	$755,242	$130,673	$247,596	$42,180
35	17.34	2.03	$3,329,658	$599,571	$998,820	$179,857	$316,738	$56,158
36	15.41	1.78	$2,958,770	$526,020	$857,548	$152,458	$263,044	$46,045
37	19.29	2.41	$3,703,117	$709,739	$1,036,990	$198,749	$307,681	$58,063
38	17.29	2.26	$3,319,943	$666,763	$898,250	$180,401	$257,799	$50,979
39	16.13	2.21	$3,097,074	$651,204	$809,614	$170,233	$224,759	$46,532
40	13.67	1.81	$2,625,517	$533,180	$663,133	$134,667	$178,073	$35,606
41	12.87	1.79	$2,471,510	$528,916	$603,126	$129,072	$156,661	$33,010
42	12.76	1.78	$2,450,268	$525,804	$577,722	$123,974	$145,154	$30,669
43	12.57	1.69	$2,413,545	$499,410	$549,820	$113,768	$133,625	$27,224
44	12.54	1.62	$2,408,347	$478,087	$530,083	$105,228	$124,614	$24,357
45	10.60	1.27	$2,034,664	$375,393	$432,690	$79,831	$98,391	$17,874
46	12.25	1.59	$2,351,628	$469,328	$483,184	$96,432	$106,279	$20,884
47	10.95	1.38	$2,103,164	$407,896	$417,520	$80,975	$88,832	$16,963
48	11.85	1.48	$2,276,025	$436,479	$436,556	$83,720	$89,844	$16,965
49	8.10	0.94	$1,555,542	$276,272	$288,273	$51,199	$57,387	$10,035
50	12.12	1.51	$2,327,292	$444,893	$416,710	$79,660	$80,241	$15,103
51	13.94	1.77	$2,676,297	$523,153	$462,995	$90,505	$86,237	$16,598
52	11.35	1.35	$2,178,441	$399,482	$364,123	$66,773	$65,603	$11,845
53	14.48	1.83	$2,780,939	$540,326	$449,110	$87,260	$78,268	$14,973
54	12.25	1.45	$2,352,609	$428,066	$367,089	$66,793	$61,881	$11,086
55	13.13	1.69	$2,520,388	$497,566	$379,969	$75,012	$61,957	$12,043
56	12.96	1.60	$2,488,819	$471,402	$362,522	$68,664	$57,179	$10,664

Table C-10
Agricultural Damages
Supply Alt. #3 (80P1000/ISG/60R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
57	11.73	1.47	$2,252,147	$432,561	$316,954	$60,876	$48,356	$9,145
58	10.61	1.28	$2,036,578	$376,200	$276,924	$51,154	$40,867	$7,433
59	10.79	1.29	$2,070,990	$381,847	$272,080	$50,166	$38,839	$7,051
60	10.26	1.24	$1,969,158	$365,135	$249,954	$46,348	$34,513	$6,301
61	11.07	1.40	$2,125,735	$411,814	$260,704	$50,506	$34,820	$6,642
62	12.22	1.59	$2,345,518	$468,867	$277,931	$55,558	$35,907	$7,067
63	11.43	1.43	$2,194,559	$423,109	$251,250	$48,441	$31,398	$5,960
64	8.99	1.03	$1,726,199	$304,279	$190,945	$33,658	$23,081	$4,006
65	10.92	1.31	$2,096,273	$385,997	$224,040	$41,253	$26,196	$4,749
66	10.36	1.25	$1,988,822	$368,362	$205,368	$38,038	$23,227	$4,236
67	10.75	1.29	$2,063,265	$380,580	$205,850	$37,970	$22,520	$4,090
68	14.44	1.83	$2,773,213	$539,058	$267,325	$51,963	$28,289	$5,414
69	14.48	1.76	$2,779,568	$519,119	$258,877	$48,348	$26,499	$4,873
70	14.51	1.76	$2,786,591	$520,271	$250,755	$46,817	$24,828	$4,564
71	11.51	1.30	$2,210,078	$383,691	$192,151	$33,359	$18,403	$3,146
72	12.85	1.51	$2,467,083	$446,852	$207,242	$37,537	$19,199	$3,424
73	13.07	1.47	$2,509,957	$432,906	$203,714	$35,136	$18,255	$3,100
74	13.84	1.62	$2,658,106	$478,202	$208,443	$37,500	$18,068	$3,200
75	17.07	2.11	$3,277,459	$621,813	$248,320	$47,112	$20,820	$3,889
76	14.05	1.64	$2,697,434	$484,657	$197,462	$35,479	$16,015	$2,833
77	14.52	1.69	$2,788,030	$499,525	$197,193	$35,331	$15,470	$2,729
78	15.19	1.77	$2,917,252	$520,732	$199,355	$35,585	$15,128	$2,659
79	13.91	1.56	$2,670,781	$459,300	$176,340	$30,326	$12,944	$2,192
80	16.10	1.93	$3,090,684	$570,178	$197,164	$36,373	$13,999	$2,543
81	15.20	1.77	$2,919,359	$521,078	$179,936	$32,117	$12,358	$2,172
82	13.72	1.54	$2,634,965	$453,422	$156,916	$27,002	$10,424	$1,766
83	16.09	1.93	$3,089,981	$570,062	$177,790	$32,800	$11,424	$2,075
84	13.56	1.52	$2,603,361	$448,236	$144,726	$24,918	$8,996	$1,525

Table C-10
Agricultural Damages
Supply Alt. #3 (80P1000/ISG/60R)

	Net Shortages (kAF)		Damages at Discount Rates					
			0% Discount Rate		3.5% Discount Rate		7% Discount Rate	
Year from 2003	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag	CAP Ag	On-River Ag
85	17.14	2.12	$3,291,505	$624,118	$176,793	$33,523	$10,629	$1,984
86	15.03	1.75	$2,884,946	$515,431	$149,716	$26,749	$8,707	$1,532
87	15.61	1.88	$2,997,981	$554,964	$150,321	$27,826	$8,456	$1,541
88	15.37	1.86	$2,951,630	$547,357	$142,992	$26,517	$7,781	$1,421
89	12.88	1.45	$2,472,033	$426,682	$115,708	$19,972	$6,090	$1,035
90	13.67	1.60	$2,625,098	$472,785	$118,717	$21,381	$6,044	$1,072
91	13.72	1.61	$2,634,930	$474,399	$115,132	$20,729	$5,670	$1,005
92	13.48	1.58	$2,587,877	$466,677	$109,253	$19,702	$5,204	$924
93	13.35	1.50	$2,564,033	$441,781	$104,585	$18,020	$4,819	$818
94	13.71	1.61	$2,632,121	$473,938	$103,732	$18,678	$4,623	$820
95	16.43	2.04	$3,153,856	$601,528	$120,090	$22,905	$5,177	$972
96	12.26	1.38	$2,353,346	$407,204	$86,579	$14,981	$3,611	$615
97	12.22	1.38	$2,346,323	$406,051	$83,401	$14,433	$3,364	$573
98	12.18	1.37	$2,339,300	$404,899	$80,340	$13,906	$3,135	$534
99	12.63	1.49	$2,424,945	$439,937	$80,465	$14,598	$3,037	$542
100	11.91	1.34	$2,287,330	$396,370	$73,332	$12,708	$2,677	$457
			$220,803,895	$38,393,330	$45,317,901	$7,075,254	$16,928,977	$2,303,679
		Total Cost	$259,197,225		$52,393,154		$19,232,656	

Appendix D

Assumptions Used for Comparison of Desalter Operational Costs to Alternative Actions
Table 3

Assumptions Used for Comparison of Desalter Operational Costs to Alternative Actions
Table 3

1. Conservation Assumptions to Offset Over-Delivery of Colorado River from Desalter Bypass

   Assume that 108,000 acre-feet per year are necessary from conservation savings to offset bypass to Mexico.

   Assume $249 per acre-foot indexed upwards over 17 years to $315 then held constant. This assumption is consistent with the IID – SDCWA acquisition of water through forbearance through land fallowing or conservation.

   Assume a second forbearance cost equal to the IID-SDCWA price to purchase forbearance option from the CAP.

2. Assumptions for Recharge Costs

   Assume that 108,000 acre-feet of water is necessary to offset bypass flows to Mexico.

   Assume a 10% loss to the bank occurs requiring 120,000 acre-feet to be banked to allow for the recovery of 108,000 acre-feet.

   Assume the water rates for recharge include a recharge facilities fee, CAP water rate and a wheeling charge. Assume the following costs:

Recharge facilities fee	$45 /AF
AWBA Interstate Recharge Water Rate	
M&I Capital Charges	$43 /AF
Fixed OM&R	$35 /AF
Pumping Energy Rate 3	$46 /AF
In-Lieu Tax	$20 /AF
Wheeling Rate (Assumed Fixed OM&R times 2)	$70 /AF
Total	$259 /AF

   Assume the water rates for recovery are $66/AF, the same as the M&I long term supply rate.