Lake Powell Pipeline Project
FERC Additional Information Request Schedule B – Item 29

Exhibit E
Socioeconomics

29. Final Study Report 10, *Socioeconomics and Water Resources Economics*, summarizes your life-cycle economic analysis, including national economic development (NED) and FERC developmental approaches. For us to better understand the details of your analysis, please provide copies of the output from the models used to make the NED analysis shown in tables 5-1 through 5-4 and the FERC developmental analysis shown in tables 6-1 and 6-2. If spreadsheet models were used, please provide electronic copies of the spreadsheet files.

UBWR Response:

Following is a PDF file consisting of the schematics and model output files used to prepare the NED analysis shown in Tables 5-1 through 5-4 and the FERC developmental analysis shown in Tables 6-1 and 6-2.

Attachments

NED Analyses and FERC Out-Put Files

Water Supply Project

Real and Social Time Preference

Discount Rates

State (NED) Benefit-Cost Methodology for Lake Powell Pipeline Project
Baseline State Assumptions

Benefits

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

Municipal Water Supply:

Marginal Value-Alternative Cost of Municipal Water from LPP--Based on Water Reuse-RO ($3,675/Acre-ft.).

Water Delivery Start in 2024. Full Water Delivery (86,249 acre-ft.) in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power Production: 1) Pipeline and 2) Peaking Operations:

Marginal Value of Power--Market-Based on 2013-2015 Daily Peak Power Cost Average ($37/MWh).

Power Production Start in 2024. Full Power Operations in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

All Benefits Displayed As:

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

2010 2015 2020 2030 2040 2050 2060 2070

Costs

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

Construction:

* Field Costs (with 16% Contingency).
* Non-Construction Contract Costs: Environmental Analyses, Engineering, Administration (16% of Field Costs).
* Interest During Construction (Not Included as Separate Cost Per State Designation).

Construction Period 2020-2023.

Annual Escalation after 2015 at 2.0% (in real value terms).

Construction,Operation & Maintenance, Replacement:

O&MR Start in 2024 Running Through 2070.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Reservoir System Foregone Power Production

Marginal Value of Power--Market-Based on 2013-2015 Daily Off Peak Power Cost Average ($32/MWh).

Reservoir Water Diversions Start in 2024. Full Diversions 2048-2070

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Pipeline Water Pumping

Marginal Value of Power--Based on NPPC Subregional Model/Market-Based Estimates ($32/MWh)..

Pipeline Water Pumping Start in 2024. Full Pumping 2048-2070

Annual Escalation after 2015 at 2.0% (in real value terms).

All Costs Displayed As:

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

Lake Powell Pipeline

Benefit-Cost Analysis-State Water Supply Project

Real Discount Rate and Escalation Rate

Benefits:	PV (2015$)	Annual. PV	Discount Rate	Escalation Rate	Water $/Acre-ft.
M&I Water	$3,851,762,287	$207,735,605	4.9%	2.0%	$3,675
Power-Inline	$21,282,047	$1,147,796	4.9%	2.0%	
Power-Peaking & Sand H.	$46,924,812	$2,530,778	4.9%	2.0%	
Total Benefits:	$3,919,969,146	$211,414,179			
Costs:	**PV**	**Annual. PV**			
Capital Contruc. (w-Hydro)	$1,177,469,491	$63,504,007	4.9%	2.0%	
OM&R	$86,240,174	$4,651,158	4.9%	2.0%	
Power Pumping Opers.	$79,612,272	$4,293,698	4.9%	2.0%	
Foregone Power	$13,254,134	$714,830	4.9%	2.0%	
Total Costs:	$1,356,576,070	$73,163,692			
NED B/C:	2.89	2.89			

NOTE:

Estimated Cost Per Delivered M&I Water in $/Acre-Ft.: Expressed in Constant Annualized $/Acre-Ft.*	$1,161
Expressed in $/1,000 gal.:	$3.56
* For Average Annual Acre-Ft. Delivery 2024-2070:	62,996

Annualized PV value is for 50-year period.

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Water Supply Benefits:

NOTE: Yellow Cells Are Interactive:

Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Benefits:**	
Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Estimated PV:**	3,851,762,287
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	207,735,605
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	Delivered Water Acre-Ft.	Escalation Rate Factor	Water Value $/Acre-ft.	PV Discount Rate Factor	PV Water Value $/Acre-ft.	Annual Delivered Water Value $
2015	0	0.00	$3,675	1.00	$3,675	$0
2016	0	1.020	$3,749	0.95	$3,749	$0
2017	0	1.020	$3,823	0.90	$3,458	$0
2018	0	1.020	$3,900	0.86	$3,354	$0
2019	0	1.020	$3,978	0.82	$3,254	$0
2020	0	1.020	$4,057	0.78	$3,156	$0
2021	0	1.020	$4,139	0.74	$3,062	$0
2022	0	1.020	$4,221	0.70	$2,970	$0
2023	0	1.020	$4,306	0.67	$2,881	$0
2024	15,468	1.020	$4,392	0.64	$2,794	$67,934,918
2025	16,644	1.020	$4,480	0.61	$2,711	$74,559,931
2026	17,908	1.020	$4,569	0.58	$2,629	$81,831,015
2027	19,270	1.020	$4,661	0.55	$2,551	$89,811,176
2028	20,734	1.020	$4,754	0.52	$2,474	$51,296,714
2029	22,310	1.020	$4,849	0.49	$2,400	$53,540,510
2030	24,005	1.020	$4,946	0.47	$2,328	$55,882,453
2031	25,830	1.020	$5,045	0.45	$2,258	$58,326,837
2032	27,793	1.020	$5,146	0.43	$2,190	$60,878,141
2033	29,905	1.020	$5,249	0.40	$2,125	$63,541,044
2034	32,178	1.020	$5,354	0.38	$2,061	$66,320,426
2035	34,623	1.020	$5,461	0.37	$1,999	$69,221,382
2036	37,255	1.020	$5,570	0.35	$1,939	$72,249,230
2037	40,086	1.020	$5,681	0.33	$1,881	$75,409,522
2038	43,133	1.020	$5,795	0.31	$1,825	$78,708,049
2039	46,411	1.020	$5,911	0.30	$1,770	$82,150,858
2040	49,938	1.020	$6,029	0.28	$1,717	$85,744,262
2041	53,733	1.020	$6,150	0.27	$1,666	$89,494,846
2042	57,817	1.020	$6,273	0.26	$1,616	$93,409,487
2043	62,211	1.020	$6,398	0.24	$1,567	$97,495,360
2044	66,939	1.020	$6,526	0.23	$1,520	$101,759,955
2045	72,026	1.020	$6,657	0.22	$1,475	$106,211,090
2046	77,500	1.020	$6,790	0.21	$1,430	$110,856,924
2047	83,390	1.020	$6,926	0.20	$1,388	$115,705,975
2048	86,249	1.020	$7,064	0.19	$1,346	$116,084,474
2049	86,249	1.020	$7,205	0.18	$1,306	$112,604,262
2050	86,249	1.020	$7,350	0.17	$1,266	$109,228,386
2051	86,249	1.020	$7,497	0.16	$1,228	$105,953,719
2052	86,249	1.020	$7,647	0.16	$1,192	$102,777,226
2053	86,249	1.020	$7,799	0.15	$1,156	$99,695,965
2054	86,249	1.020	$7,955	0.14	$1,121	$96,707,080
2055	86,249	1.020	$8,115	0.13	$1,088	$93,807,802
2056	86,249	1.020	$8,277	0.13	$1,055	$90,995,444
2057	86,249	1.020	$8,442	0.12	$1,023	$88,267,401
2058	86,249	1.020	$8,611	0.12	$993	$85,621,144
2059	86,249	1.020	$8,783	0.11	$963	$83,054,222
2060	86,249	1.020	$8,959	0.10	$934	$80,564,256
2061	86,249	1.020	$9,138	0.10	$906	$78,148,940
2062	86,249	1.020	$9,321	0.09	$879	$75,806,035
2063	86,249	1.020	$9,507	0.09	$853	$73,533,370
2064	86,249	1.020	$9,698	0.09	$827	$71,328,839
2065	86,249	1.020	$9,892	0.08	$802	$69,190,401
2066	86,249	1.020	$10,089	0.08	$778	$67,116,073
2067	86,249	1.020	$10,291	0.07	$755	$65,103,933
2068	86,249	1.020	$10,497	0.07	$732	$63,152,117
2069	86,249	1.020	$10,707	0.07	$710	$61,258,816
2070	86,249	1.020	$10,921	0.06	$689	$59,422,277
2024-2070						
Ave. =	62,996				PV Sum =	$3,851,762,287
					Annualized PV Sum =	207,735,605
				Ave. An. Water	Delivery 2021-207	62,996

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--In-Line Power Generation

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$21,282,047
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,147,796
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-70):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.95	$36	$0
2017	0	1.02	$38	0.90	$35	$0
2018	0	1.02	$39	0.86	$34	$0
2019	0	1.02	$40	0.82	$33	$0
2020	0	1.02	$41	0.78	$32	$0
2021	0	1.02	$42	0.74	$31	$0
2022	0	1.02	$43	0.70	$30	$0
2023	0	1.02	$43	0.67	$29	$0
2024	10,805	1.02	$44	0.64	$28	$303,985
2025	10,805	1.02	$45	0.61	$27	$294,872
2026	10,805	1.02	$46	0.58	$26	$286,032
2027	10,805	1.02	$47	0.55	$26	$277,456
2028	10,805	1.02	$48	0.52	$25	$269,138
2029	11,847	1.02	$49	0.49	$24	$286,246
2030	13,908	1.02	$50	0.47	$23	$325,969
2031	16,115	1.02	$51	0.45	$23	$366,373
2032	18,269	1.02	$52	0.43	$22	$402,892
2033	20,356	1.02	$53	0.40	$21	$435,458
2034	22,391	1.02	$54	0.38	$21	$464,631
2035	24,346	1.02	$55	0.37	$20	$490,053
2036	26,220	1.02	$56	0.35	$20	$511,952
2037	29,873	1.02	$57	0.33	$19	$565,791
2038	31,676	1.02	$58	0.31	$18	$581,953
2039	33,370	1.02	$60	0.30	$18	$594,695
2040	34,948	1.02	$61	0.28	$17	$604,145
2041	36,546	1.02	$62	0.27	$17	$612,829
2042	37,981	1.02	$63	0.26	$16	$617,798
2043	40,221	1.02	$64	0.24	$16	$634,620
2044	41,323	1.02	$66	0.23	$15	$632,461
2045	42,224	1.02	$67	0.22	$15	$626,876
2046	42,914	1.02	$68	0.21	$14	$618,019
2047	43,381	1.02	$70	0.20	$14	$606,015
2048	43,381	1.02	$71	0.19	$14	$587,847
2049	43,381	1.02	$73	0.18	$13	$570,223
2050	43,381	1.02	$74	0.17	$13	$553,128
2051	43,381	1.02	$75	0.16	$12	$536,545
2052	43,381	1.02	$77	0.16	$12	$520,459
2053	43,381	1.02	$79	0.15	$12	$504,856
2054	43,381	1.02	$80	0.14	$11	$489,720
2055	43,381	1.02	$82	0.13	$11	$475,039
2056	43,381	1.02	$83	0.13	$11	$460,797
2057	43,381	1.02	$85	0.12	$10	$446,982
2058	43,381	1.02	$87	0.12	$10	$433,582
2059	43,381	1.02	$88	0.11	$10	$420,583
2060	43,381	1.02	$90	0.10	$9	$407,974
2061	43,381	1.02	$92	0.10	$9	$395,743
2062	43,381	1.02	$94	0.09	$9	$383,878
2063	43,381	1.02	$96	0.09	$9	$372,370
2064	43,381	1.02	$98	0.09	$8	$361,206
2065	43,381	1.02	$100	0.08	$8	$350,377
2066	43,381	1.02	$102	0.08	$8	$339,873
2067	43,381	1.02	$104	0.07	$8	$329,683
2068	43,381	1.02	$106	0.07	$7	$319,800
2069	43,381	1.02	$108	0.07	$7	$310,212
2070	43,381	1.02	$110	0.06	$7	$300,912
					PV Sum =	$21,282,047
					Annualized PV Sum =	$1,147,796

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--Peaking Power Generation and Sand Hollow

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$46,924,812
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$2,530,778
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.95	$36	$0
2017	0	1.02	$38	0.90	$35	$0
2018	0	1.02	$39	0.86	$34	$0
2019	0	1.02	$40	0.82	$33	$0
2020	0	1.02	$41	0.78	$32	$0
2021	0	1.02	$42	0.74	$31	$0
2022	0	1.02	$43	0.70	$30	$0
2023	0	1.02	$43	0.67	$29	$0
2024	20,053	1.02	$44	0.64	$28	$564,166
2025	20,053	1.02	$45	0.61	$27	$547,253
2026	20,053	1.02	$46	0.58	$26	$530,846
2027	20,053	1.02	$47	0.55	$26	$514,931
2028	20,053	1.02	$48	0.52	$25	$499,494
2029	22,039	1.02	$49	0.49	$24	$532,504
2030	26,007	1.02	$50	0.47	$23	$609,540
2031	30,335	1.02	$51	0.45	$23	$689,663
2032	34,660	1.02	$52	0.43	$22	$764,367
2033	38,977	1.02	$53	0.40	$21	$833,801
2034	43,293	1.02	$54	0.38	$21	$898,364
2035	47,605	1.02	$55	0.37	$20	$958,226
2036	51,912	1.02	$56	0.35	$20	$1,013,594
2037	57,185	1.02	$57	0.33	$19	$1,083,076
2038	61,555	1.02	$58	0.31	$18	$1,130,891
2039	65,920	1.02	$60	0.30	$18	$1,174,777
2040	70,278	1.02	$61	0.28	$17	$1,214,894
2041	75,095	1.02	$62	0.27	$17	$1,259,246
2042	79,902	1.02	$63	0.26	$16	$1,299,685
2043	85,271	1.02	$64	0.24	$16	$1,345,434
2044	90,090	1.02	$66	0.23	$15	$1,378,854
2045	94,901	1.02	$67	0.22	$15	$1,408,942
2046	99,698	1.02	$68	0.21	$14	$1,435,785
2047	104,486	1.02	$70	0.20	$14	$1,459,627
2048	104,486	1.02	$71	0.19	$14	$1,415,867
2049	104,486	1.02	$73	0.18	$13	$1,373,420
2050	104,486	1.02	$74	0.17	$13	$1,332,244
2051	104,486	1.02	$75	0.16	$12	$1,292,304
2052	104,486	1.02	$77	0.16	$12	$1,253,561
2053	104,486	1.02	$79	0.15	$12	$1,215,979
2054	104,486	1.02	$80	0.14	$11	$1,179,524
2055	104,486	1.02	$82	0.13	$11	$1,144,162
2056	104,486	1.02	$83	0.13	$11	$1,109,860
2057	104,486	1.02	$85	0.12	$10	$1,076,586
2058	104,486	1.02	$87	0.12	$10	$1,044,310
2059	104,486	1.02	$88	0.11	$10	$1,013,002
2060	104,486	1.02	$90	0.10	$9	$982,632
2061	104,486	1.02	$92	0.10	$9	$953,173
2062	104,486	1.02	$94	0.09	$9	$924,596
2063	104,486	1.02	$96	0.09	$9	$896,877
2064	104,486	1.02	$98	0.09	$8	$869,989
2065	104,486	1.02	$100	0.08	$8	$843,906
2066	104,486	1.02	$102	0.08	$8	$818,606
2067	104,486	1.02	$104	0.07	$8	$794,064
2068	104,486	1.02	$106	0.07	$7	$770,258
2069	104,486	1.02	$108	0.07	$7	$747,166
2070	104,486	1.02	$110	0.06	$7	$724,766
					PV Sum =	$46,924,812
					Annualized PV Sum =	$2,530,778

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Construction Capital Costs (Field and Non-Contract)

NOTE: Yellow Cells Are Interactive:

Capital Construction (Field-2015$):	$1,232,000,000	**Costs:**			
Ave. An. Capital Outlays-with Contingencies (2020-2023):	$308,000,000	**Estimated PV:**	$1,177,469,491		
Capital Constriction Non-Contract with Contin. (Env./Eng./Adm):	$185,000,000	**Annualized PV:**	$63,504,007		
Ave. An. Capital Non Contracts Outlays (2016-2019) @18% An	$33,300,000				
Ave. An. Capital Non-Contract Outlays (2020-2023) @7% An. $	$12,950,000			$46,250,000	$185,000,000
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%				
PV Period Annaul Escalation Rate% (Real Rate):	2.0%				
Real Discount Rate (PV Period 2015-2070):	4.9%				
Annual PV Rate Factor:	0.951		$185,000,000		

Year	Annual Cap. Construction Costs-2015$	Escalation Rate Factor	Annual Cap. Construction Escalated	Annual Cap. on-Contract Const. Costs-2015$	Escalation Rate Factor	Annual Cap. Non-Contract Const. Escalated	Annual Total Const. Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	$0	1.00	$0	$0	1.00	$0
2016	$0	1.020	$0	$33,300,000	1.02	$33,966,000	$33,966,000	0.95	$32,301,666
2017	$0	1.040	$0	$33,300,000	1.04	$34,645,320	$34,645,320	0.90	$31,333,262
2018	$0	1.061	$0	$33,300,000	1.06	$35,338,226	$35,338,226	0.86	$30,393,891
2019	$0	1.082	$0	$33,300,000	1.08	$36,044,991	$36,044,991	0.82	$29,482,682
2020	$308,000,000	1.104	$340,056,887	$12,950,000	1.10	$14,297,846	$354,354,734	0.78	$275,639,100
2021	$308,000,000	1.126	$346,858,025	$12,950,000	1.13	$14,583,803	$361,441,828	0.74	$267,375,440
2022	$308,000,000	1.149	$353,795,186	$12,950,000	1.15	$14,875,479	$368,670,665	0.70	$259,359,524
2023	$308,000,000	1.172	$360,871,089	$12,950,000	1.17	$15,172,989	$376,044,078	0.67	$251,583,926
2024	$0	1.195	$0	$0	1.20	$0	$0	0.00	$0
2025	$0	1.219	$0	$0	1.22	$0	$0	0.00	$0
2026	$0	1.243	$0	$0	1.24	$0	$0	0.00	$0
2027	$0	0.000	$0	$0	1.27	$0	$0	0.00	$0
2028	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2029	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2030	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2031	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2032	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2033	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2034	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2035	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2036	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2037	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2038	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2039	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2040	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2041	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2042	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2043	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2044	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2045	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2046	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2047	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2048	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2049	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2050	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2051	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2052	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2053	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2054	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2055	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2056	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2057	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2058	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2059	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2060	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2061	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2062	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2063	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2064	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2065	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2066	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2067	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2068	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2069	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2070	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
Sum Col. =	$1,232,000,000		Sum Col. =	$185,000,000				PV =	$1,177,469,491
								Annualized PV =	$63,504,007
Constr. =	$1,232,000,000		Constr. =	$185,000,000					

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Project Annual OM&R Capital Costs (without Power)

NOTE: Yellow Cells Are Interactive:

Project Annual OM&R Costs (2015$):	$4,469,129	**Costs:**	
Ave. An. OM&R Outlays (2015$) @__% Capital Constructio	$4,469,129	**Estimated PV:**	$86,240,174
% Capital Construction (An. Factor Adj.)	0.003628	**Annualized PV:**	$4,651,158
Project Annual OM&R Costs (2015$):	$4,469,129		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
Annual PV Rate Factor:	0.951		

Year	Annual OM&R Costs-2015$	Escalation Rate Factor	Annual OM&R Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	1.00	$0
2016	$0	1.020	$0	0.95	$0
2017	$0	1.040	$0	0.90	$0
2018	$0	1.061	$0	0.86	$0
2019	$0	1.082	$0	0.82	$0
2020	$0	1.104	$0	0.78	$0
2021	$0	1.126	$0	0.74	$0
2022	$0	1.149	$0	0.70	$0
2023	$0	1.172	$0	0.67	$0
2024	$4,469,129	1.195	$5,341,023	0.64	$3,398,201
2025	$4,469,129	1.219	$5,447,844	0.61	$3,296,323
2026	$4,469,129	1.243	$5,556,801	0.58	$3,197,500
2027	$4,469,129	1.268	$5,667,937	0.55	$3,101,639
2028	$4,469,129	1.294	$5,781,295	0.52	$3,008,651
2029	$4,469,129	1.319	$5,896,921	0.49	$2,918,452
2030	$4,469,129	1.346	$6,014,860	0.47	$2,830,957
2031	$4,469,129	1.373	$6,135,157	0.45	$2,746,085
2032	$4,469,129	1.400	$6,257,860	0.43	$2,663,757
2033	$4,469,129	1.428	$6,383,017	0.40	$2,583,898
2034	$4,469,129	1.457	$6,510,677	0.38	$2,506,432
2035	$4,469,129	1.486	$6,640,891	0.37	$2,431,290
2036	$4,469,129	1.516	$6,773,709	0.35	$2,358,400
2037	$4,469,129	1.546	$6,909,183	0.33	$2,287,695
2038	$4,469,129	1.577	$7,047,367	0.31	$2,219,110
2039	$4,469,129	1.608	$7,188,314	0.30	$2,152,581
2040	$4,469,129	1.641	$7,332,080	0.28	$2,088,046
2041	$4,469,129	1.673	$7,478,722	0.27	$2,025,447
2042	$4,469,129	1.707	$7,628,296	0.26	$1,964,724
2043	$4,469,129	1.741	$7,780,862	0.24	$1,905,821
2044	$4,469,129	1.776	$7,936,480	0.23	$1,848,685
2045	$4,469,129	1.811	$8,095,209	0.22	$1,793,261
2046	$4,469,129	1.848	$8,257,113	0.21	$1,739,499
2047	$4,469,129	1.885	$8,422,256	0.20	$1,687,349
2048	$4,469,129	1.922	$8,590,701	0.19	$1,636,762
2049	$4,469,129	1.961	$8,762,515	0.18	$1,587,692
2050	$4,469,129	2.000	$8,937,765	0.17	$1,540,093
2051	$4,469,129	2.040	$9,116,520	0.16	$1,493,921
2052	$4,469,129	2.081	$9,298,851	0.16	$1,449,134
2053	$4,469,129	2.122	$9,484,828	0.15	$1,405,688
2054	$4,469,129	2.165	$9,674,524	0.14	$1,363,546
2055	$4,469,129	2.208	$9,868,015	0.13	$1,322,667
2056	$4,469,129	2.252	$10,065,375	0.13	$1,283,013
2057	$4,469,129	2.297	$10,266,683	0.12	$1,244,549
2058	$4,469,129	2.343	$10,472,016	0.12	$1,207,237
2059	$4,469,129	2.390	$10,681,456	0.11	$1,171,044
2060	$4,469,129	2.438	$10,895,086	0.10	$1,135,936
2061	$4,469,129	2.487	$11,112,987	0.10	$1,101,881
2062	$4,469,129	2.536	$11,335,247	0.09	$1,068,846
2063	$4,469,129	2.587	$11,561,952	0.09	$1,036,802
2064	$4,469,129	2.639	$11,793,191	0.09	$1,005,719
2065	$4,469,129	2.692	$12,029,055	0.08	$975,568
2066	$4,469,129	2.745	$12,269,636	0.08	$946,320
2067	$4,469,129	2.800	$12,515,029	0.07	$917,949
2068	$4,469,129	2.856	$12,765,329	0.07	$890,429
2069	$4,469,129	2.913	$13,020,636	0.07	$863,734
2070	$4,469,129	2.972	$13,281,049	0.06	$837,839
				PV =	$86,240,174
				Annualized PV =	$4,651,158

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Reservoir and Pipeline Power Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32
Annual Power Value $/MWh (2015$):	$32
Pre-PV Period Escalation Annaul Rate% (with Inflatio	2.0%
PV Period Annaul Escalation Rate% (Real Rate):	2.0%
Real Discount Rate (PV Period 2015-2070):	4.9%
PV Annual Rate Factor:	0.951

Costs:	
Estimated PV:	$79,612,272
Annualized PV:	$4,293,698

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.02	$32	1.00	$32	$0
2016	0	1.02	$33	0.95	$31	$0
2017	0	1.02	$33	0.90	$30	$0
2018	0	1.02	$34	0.86	$29	$0
2019	0	1.02	$35	0.82	$28	$0
2020	0	1.02	$35	0.78	$27	$0
2021	0	1.02	$36	0.74	$27	$0
2022	0	1.02	$37	0.70	$26	$0
2023	0	1.02	$37	0.67	$25	$0
2024	7,075	1.02	$38	0.64	$24	$172,148
2025	8,249	1.02	$39	0.61	$24	$194,705
2026	9,619	1.02	$40	0.58	$23	$220,217
2027	11,215	1.02	$41	0.55	$22	$249,071
2028	13,077	1.02	$41	0.52	$22	$281,707
2029	15,247	1.02	$42	0.49	$21	$318,618
2030	17,778	1.02	$43	0.47	$20	$360,367
2031	20,729	1.02	$44	0.45	$20	$407,585
2032	24,170	1.02	$45	0.43	$19	$460,990
2033	28,181	1.02	$46	0.40	$19	$521,393
2034	32,859	1.02	$47	0.38	$18	$589,711
2035	38,313	1.02	$48	0.37	$17	$666,980
2036	44,673	1.02	$49	0.35	$17	$754,374
2037	52,088	1.02	$49	0.33	$16	$853,218
2038	60,733	1.02	$50	0.31	$16	$965,014
2039	70,814	1.02	$51	0.30	$15	$1,091,459
2040	82,568	1.02	$52	0.28	$15	$1,234,471
2041	96,274	1.02	$54	0.27	$15	$1,396,223
2042	112,253	1.02	$55	0.26	$14	$1,579,168
2043	130,886	1.02	$56	0.24	$14	$1,786,085
2044	152,611	1.02	$57	0.23	$13	$2,020,113
2045	177,942	1.02	$58	0.22	$13	$2,284,806
2046	207,478	1.02	$59	0.21	$12	$2,584,181
2047	241,916	1.02	$60	0.20	$12	$2,922,783
2048	283,000	1.02	$62	0.19	$12	$3,316,646
2049	283,000	1.02	$63	0.18	$11	$3,217,213
2050	283,000	1.02	$64	0.17	$11	$3,120,761
2051	283,000	1.02	$65	0.16	$11	$3,027,201
2052	283,000	1.02	$67	0.16	$10	$2,936,445
2053	283,000	1.02	$68	0.15	$10	$2,848,411
2054	283,000	1.02	$69	0.14	$10	$2,763,015
2055	283,000	1.02	$71	0.13	$9	$2,680,180
2056	283,000	1.02	$72	0.13	$9	$2,599,828
2057	283,000	1.02	$74	0.12	$9	$2,521,885
2058	283,000	1.02	$75	0.12	$9	$2,446,279
2059	283,000	1.02	$76	0.11	$8	$2,372,940
2060	283,000	1.02	$78	0.10	$8	$2,301,799
2061	283,000	1.02	$80	0.10	$8	$2,232,791
2062	283,000	1.02	$81	0.09	$8	$2,165,852
2063	283,000	1.02	$83	0.09	$7	$2,100,920
2064	283,000	1.02	$84	0.09	$7	$2,037,934
2065	283,000	1.02	$86	0.08	$7	$1,976,837
2066	283,000	1.02	$88	0.08	$7	$1,917,571
2067	283,000	1.02	$90	0.07	$7	$1,860,083
2068	283,000	1.02	$91	0.07	$6	$1,804,317
2069	283,000	1.02	$93	0.07	$6	$1,750,224
2070	283,000	1.02	$95	0.06	$6	$1,697,752
					PV Sum =	$79,612,272
					Annualized PV Sum =	$4,293,698

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Foregone Power at Main Project Reservoir

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32.0	**Costs:**	
Annual Power Value $/MWh (2015$):	$32.0	**Estimated PV:**	$13,254,134
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$714,830
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2010-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Foregone MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual "Lost" Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.95	$31	$0
2017	0	1.02	$33	0.90	$30	$0
2018	0	1.02	$34	0.86	$29	$0
2019	0	1.02	$35	0.82	$28	$0
2020	0	1.02	$35	0.78	$27	$0
2021	0	1.02	$36	0.74	$27	$0
2022	0	1.02	$37	0.70	$26	$0
2023	0	1.02	$37	0.67	$25	$0
2024	6,451	1.02	$38	0.64	$24	$156,965
2025	6,922	1.02	$39	0.61	$24	$163,374
2026	7,427	1.02	$40	0.58	$23	$170,045
2027	7,969	1.02	$41	0.55	$22	$176,988
2028	8,551	1.02	$41	0.52	$22	$184,215
2029	9,175	1.02	$42	0.49	$21	$191,737
2030	9,845	1.02	$43	0.47	$20	$199,566
2031	10,564	1.02	$44	0.45	$20	$207,714
2032	11,335	1.02	$45	0.43	$19	$216,195
2033	12,163	1.02	$46	0.40	$19	$225,023
2034	13,050	1.02	$47	0.38	$18	$234,211
2035	14,003	1.02	$48	0.37	$17	$243,774
2036	15,025	1.02	$49	0.35	$17	$253,728
2037	16,122	1.02	$49	0.33	$16	$264,088
2038	17,299	1.02	$50	0.31	$16	$274,871
2039	18,562	1.02	$51	0.30	$15	$286,094
2040	19,917	1.02	$52	0.28	$15	$297,776
2041	21,371	1.02	$54	0.27	$15	$309,935
2042	22,931	1.02	$55	0.26	$14	$322,590
2043	24,605	1.02	$56	0.24	$14	$335,762
2044	26,401	1.02	$57	0.23	$13	$349,471
2045	28,328	1.02	$58	0.22	$13	$363,741
2046	30,396	1.02	$59	0.21	$12	$378,593
2047	32,615	1.02	$60	0.20	$12	$394,051
2048	35,840	1.02	$62	0.19	$12	$420,030
2049	35,840	1.02	$63	0.18	$11	$407,438
2050	35,840	1.02	$64	0.17	$11	$395,223
2051	35,840	1.02	$65	0.16	$11	$383,374
2052	35,840	1.02	$67	0.16	$10	$371,881
2053	35,840	1.02	$68	0.15	$10	$360,732
2054	35,840	1.02	$69	0.14	$10	$349,917
2055	35,840	1.02	$71	0.13	$9	$339,426
2056	35,840	1.02	$72	0.13	$9	$329,250
2057	35,840	1.02	$74	0.12	$9	$319,379
2058	35,840	1.02	$75	0.12	$9	$309,804
2059	35,840	1.02	$76	0.11	$8	$300,516
2060	35,840	1.02	$78	0.10	$8	$291,507
2061	35,840	1.02	$80	0.10	$8	$282,768
2062	35,840	1.02	$81	0.09	$8	$274,290
2063	35,840	1.02	$83	0.09	$7	$266,067
2064	35,840	1.02	$84	0.09	$7	$258,090
2065	35,840	1.02	$86	0.08	$7	$250,353
2066	35,840	1.02	$88	0.08	$7	$242,847
2067	35,840	1.02	$90	0.07	$7	$235,567
2068	35,840	1.02	$91	0.07	$6	$228,504
2069	35,840	1.02	$93	0.07	$6	$221,654
2070	35,840	1.02	$95	0.06	$6	$215,009
					PV Sum =	$13,254,134
					Annualized PV Sum =	$714,830

State (NED) Benefit-Cost Methodology for Lake Powell Pipeline Project
Baseline State Assumptions with Social Time Preference Discount Rate

Benefits

PV At 2015$, 3.0% Discount Rate (2020-2070 Project Development/Operations).

Municipal Water Supply:

Marginal Value-Alternative Cost of Municipal Water from LPP--Based on Water Reuse-RO ($3,300/Acre-ft.).

Water Delivery Start in 2024. Full Water Delivery (86,249 acre-ft.) in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power Production: 1) Pipeline and 2) Peaking Operations:

Marginal Value of Power--Market-Based on 2013-2015 Daily Peak Power Cost Average ($37/MWh).

Power Production Start in 2024. Full Power Operations in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

All Benefits Displayed As:

PV At 2015$, 3.0% Discount Rate (2020-2070 Project Development/Operations).

2010 2015 2020 2030 2040 2050 2060 2070

Costs

PV At 2015$, 3.0% Discount Rate (2020-2070 Project Development/Operations).

Construction:

* Field Costs (with 16% Contingency).
* Non-Construction Contract Costs: Environmental Analyses, Engineering, Administration (16% of Field Costs).
* Interest During Construction (Not Included as Separate Cost Per State Designation).

Construction Period 2020-2023.

Annual Escalation after 2015 at 2.0% (in real value terms).

Construction,Operation & Maintenance, Replacement:

O&MR Start in 2024 Running Through 2070.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Reservoir System Foregone Power Production

Marginal Value of Power--Market-Based on 2013-2015 Daily Off Peak Power Cost Average ($32/MWh).

Reservoir Water Diversions Start in 2024. Full Diversions 2048-2070

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Pipeline Water Pumping

Marginal Value of Power--Based on NPPC Subregional Model/Market-Based Estimates ($32/MWh)..

Pipeline Water Pumping Start in 2024. Full Pumping 2048-2070

Annual Escalation after 2015 at 2.0% (in real value terms).

All Costs Displayed As:

PV At 2015$, 3.0% Discount Rate (2020-2070 Project Development/Operations).

Lake Powell Pipeline

Benefit-Cost Analysis-State Water Supply Project

Real Discount Rate and Escalation Rate

Benefits:	PV (2015$)	Annual. PV	Discount Rate	Escalation Rate	Water $/Acre-ft.
M&I Water	$7,451,372,295	$289,601,269	3.0%	2.0%	$3,675
Power-Inline	$41,080,596	$1,596,618	3.0%	2.0%	
Power-Peaking & Sand H.	$92,469,725	$3,593,882	3.0%	2.0%	
Total Benefits:	$7,584,922,617	$294,791,768			
Costs:	**PV**	**Annual. PV**			
Capital Contruc. (w-Hydro)	$1,327,676,432	$51,600,801	3.0%	2.0%	
OM&R	$86,240,165	$3,351,767	3.0%	2.0%	
Power Pumping Opers.	$170,646,930	$6,632,277	3.0%	2.0%	
Foregone Power	$26,286,972	$1,021,656	3.0%	2.0%	
Total Costs:	$1,610,850,499	$62,606,501			
NED B/C:	4.71	4.71			

NOTE:

Estimated Cost Per Delivered M&I Water in $/Acre-Ft.: Expressed in Constant Annualized $/Acre-Ft.*	$994
Expressed in $/1,000 gal.:	$3.05
* For Average Annual Acre-Ft. Delivery 2024-2070:	62,996

Annualized PV value is for 50-year period.

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Water Supply Benefits:

NOTE: Yellow Cells Are Interactive:

Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Benefits:**	
Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Estimated PV:**	7,451,372,295
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	289,601,269
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	Delivered Water Acre-Ft.	Escalation Rate Factor	Water Value $/Acre-ft.	PV Discount Rate Factor	PV Water Value $/Acre-ft.	Annual Delivered Water Value $
2015	0	0.00	$3,675	1.00	$3,675	$0
2016	0	1.020	$3,749	0.97	$3,749	$0
2017	0	1.020	$3,823	0.94	$3,598	$0
2018	0	1.020	$3,900	0.91	$3,559	$0
2019	0	1.020	$3,978	0.89	$3,522	$0
2020	0	1.020	$4,057	0.86	$3,484	$0
2021	0	1.020	$4,139	0.83	$3,447	$0
2022	0	1.020	$4,221	0.81	$3,411	$0
2023	0	1.020	$4,306	0.78	$3,375	$0
2024	15,468	1.020	$4,392	0.76	$3,339	$67,934,918
2025	16,644	1.020	$4,480	0.74	$3,304	$74,559,931
2026	17,908	1.020	$4,569	0.72	$3,268	$81,831,015
2027	19,270	1.020	$4,661	0.69	$3,234	$89,811,176
2028	20,734	1.020	$4,754	0.67	$3,200	$66,339,985
2029	22,310	1.020	$4,849	0.65	$3,166	$70,625,177
2030	24,005	1.020	$4,946	0.63	$3,132	$75,187,168
2031	25,830	1.020	$5,045	0.61	$3,099	$80,043,838
2032	27,793	1.020	$5,146	0.60	$3,066	$85,214,221
2033	29,905	1.020	$5,249	0.58	$3,034	$90,718,583
2034	32,178	1.020	$5,354	0.56	$3,001	$96,578,495
2035	34,623	1.020	$5,461	0.54	$2,970	$102,816,925
2036	37,255	1.020	$5,570	0.53	$2,938	$109,458,323
2037	40,086	1.020	$5,681	0.51	$2,907	$116,528,718
2038	43,133	1.020	$5,795	0.50	$2,876	$124,055,820
2039	46,411	1.020	$5,911	0.48	$2,846	$132,069,131
2040	49,938	1.020	$6,029	0.47	$2,815	$140,600,058
2041	53,733	1.020	$6,150	0.45	$2,786	$149,682,034
2042	57,817	1.020	$6,273	0.44	$2,756	$159,350,655
2043	62,211	1.020	$6,398	0.43	$2,727	$169,643,815
2044	66,939	1.020	$6,526	0.41	$2,698	$180,601,856
2045	72,026	1.020	$6,657	0.40	$2,669	$192,267,724
2046	77,500	1.020	$6,790	0.39	$2,641	$204,687,142
2047	83,390	1.020	$6,926	0.38	$2,613	$217,908,786
2048	86,249	1.020	$7,064	0.37	$2,585	$222,989,447
2049	86,249	1.020	$7,205	0.36	$2,558	$220,625,759
2050	86,249	1.020	$7,350	0.34	$2,531	$218,287,126
2051	86,249	1.020	$7,497	0.33	$2,504	$215,973,282
2052	86,249	1.020	$7,647	0.32	$2,478	$213,683,966
2053	86,249	1.020	$7,799	0.31	$2,451	$211,418,916
2054	86,249	1.020	$7,955	0.30	$2,425	$209,177,875
2055	86,249	1.020	$8,115	0.30	$2,400	$206,960,590
2056	86,249	1.020	$8,277	0.29	$2,374	$204,766,807
2057	86,249	1.020	$8,442	0.28	$2,349	$202,596,279
2058	86,249	1.020	$8,611	0.27	$2,324	$200,448,759
2059	86,249	1.020	$8,783	0.26	$2,299	$198,324,002
2060	86,249	1.020	$8,959	0.25	$2,275	$196,221,767
2061	86,249	1.020	$9,138	0.25	$2,251	$194,141,817
2062	86,249	1.020	$9,321	0.24	$2,227	$192,083,913
2063	86,249	1.020	$9,507	0.23	$2,203	$190,047,824
2064	86,249	1.020	$9,698	0.22	$2,180	$188,033,317
2065	86,249	1.020	$9,892	0.22	$2,157	$186,040,164
2066	86,249	1.020	$10,089	0.21	$2,134	$184,068,138
2067	86,249	1.020	$10,291	0.21	$2,112	$182,117,016
2068	86,249	1.020	$10,497	0.20	$2,089	$180,186,575
2069	86,249	1.020	$10,707	0.19	$2,067	$178,276,598
2070	86,249	1.020	$10,921	0.19	$2,045	$176,386,866
2024-2070						
Ave. =	62,996				PV Sum =	$7,451,372,295
					Annualized PV Sum =	289,601,269
					Ave. An. Water Delivery 2021-207	62,996

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--In-Line Power Generation

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$41,080,596
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,596,618
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-70):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.97	$37	$0
2017	0	1.02	$38	0.94	$36	$0
2018	0	1.02	$39	0.91	$36	$0
2019	0	1.02	$40	0.89	$35	$0
2020	0	1.02	$41	0.86	$35	$0
2021	0	1.02	$42	0.83	$35	$0
2022	0	1.02	$43	0.81	$34	$0
2023	0	1.02	$43	0.78	$34	$0
2024	10,805	1.02	$44	0.76	$34	$363,223
2025	10,805	1.02	$45	0.74	$33	$359,373
2026	10,805	1.02	$46	0.72	$33	$355,564
2027	10,805	1.02	$47	0.69	$33	$351,795
2028	10,805	1.02	$48	0.67	$32	$348,066
2029	11,847	1.02	$49	0.65	$32	$377,587
2030	13,908	1.02	$50	0.63	$32	$438,576
2031	16,115	1.02	$51	0.61	$31	$502,785
2032	18,269	1.02	$52	0.60	$31	$563,948
2033	20,356	1.02	$53	0.58	$31	$621,711
2034	22,391	1.02	$54	0.56	$30	$676,615
2035	24,346	1.02	$55	0.54	$30	$727,893
2036	26,220	1.02	$56	0.53	$30	$775,612
2037	29,873	1.02	$57	0.51	$29	$874,304
2038	31,676	1.02	$58	0.50	$29	$917,246
2039	33,370	1.02	$60	0.48	$29	$956,057
2040	34,948	1.02	$61	0.47	$28	$990,653
2041	36,546	1.02	$62	0.45	$28	$1,024,970
2042	37,981	1.02	$63	0.44	$28	$1,053,925
2043	40,221	1.02	$64	0.43	$27	$1,104,251
2044	41,323	1.02	$66	0.41	$27	$1,122,481
2045	42,224	1.02	$67	0.40	$27	$1,134,797
2046	42,914	1.02	$68	0.39	$27	$1,141,116
2047	43,381	1.02	$70	0.38	$26	$1,141,306
2048	43,381	1.02	$71	0.37	$26	$1,129,209
2049	43,381	1.02	$73	0.36	$26	$1,117,239
2050	43,381	1.02	$74	0.34	$25	$1,105,396
2051	43,381	1.02	$75	0.33	$25	$1,093,679
2052	43,381	1.02	$77	0.32	$25	$1,082,086
2053	43,381	1.02	$79	0.31	$25	$1,070,616
2054	43,381	1.02	$80	0.30	$24	$1,059,267
2055	43,381	1.02	$82	0.30	$24	$1,048,039
2056	43,381	1.02	$83	0.29	$24	$1,036,930
2057	43,381	1.02	$85	0.28	$24	$1,025,939
2058	43,381	1.02	$87	0.27	$23	$1,015,064
2059	43,381	1.02	$88	0.26	$23	$1,004,304
2060	43,381	1.02	$90	0.25	$23	$993,658
2061	43,381	1.02	$92	0.25	$23	$983,125
2062	43,381	1.02	$94	0.24	$22	$972,704
2063	43,381	1.02	$96	0.23	$22	$962,394
2064	43,381	1.02	$98	0.22	$22	$952,192
2065	43,381	1.02	$100	0.22	$22	$942,099
2066	43,381	1.02	$102	0.21	$21	$932,113
2067	43,381	1.02	$104	0.21	$21	$922,232
2068	43,381	1.02	$106	0.20	$21	$912,457
2069	43,381	1.02	$108	0.19	$21	$902,785
2070	43,381	1.02	$110	0.19	$21	$893,215
					PV Sum =	$41,080,596
					Annualized PV Sum =	$1,596,618

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--Peaking Power Generation and Sand Hollow

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$92,469,725
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$3,593,882
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.97	$37	$0
2017	0	1.02	$38	0.94	$36	$0
2018	0	1.02	$39	0.91	$36	$0
2019	0	1.02	$40	0.89	$35	$0
2020	0	1.02	$41	0.86	$35	$0
2021	0	1.02	$42	0.83	$35	$0
2022	0	1.02	$43	0.81	$34	$0
2023	0	1.02	$43	0.78	$34	$0
2024	20,053	1.02	$44	0.76	$34	$674,106
2025	20,053	1.02	$45	0.74	$33	$666,961
2026	20,053	1.02	$46	0.72	$33	$659,891
2027	20,053	1.02	$47	0.69	$33	$652,896
2028	20,053	1.02	$48	0.67	$32	$645,975
2029	22,039	1.02	$49	0.65	$32	$702,426
2030	26,007	1.02	$50	0.63	$32	$820,107
2031	30,335	1.02	$51	0.61	$31	$946,447
2032	34,660	1.02	$52	0.60	$31	$1,069,923
2033	38,977	1.02	$53	0.58	$31	$1,190,432
2034	43,293	1.02	$54	0.56	$30	$1,308,235
2035	47,605	1.02	$55	0.54	$30	$1,423,287
2036	51,912	1.02	$56	0.53	$30	$1,535,605
2037	57,185	1.02	$57	0.51	$29	$1,673,654
2038	61,555	1.02	$58	0.50	$29	$1,782,456
2039	65,920	1.02	$60	0.48	$29	$1,888,620
2040	70,278	1.02	$61	0.47	$28	$1,992,135
2041	75,095	1.02	$62	0.45	$28	$2,106,116
2042	79,902	1.02	$63	0.44	$28	$2,217,179
2043	85,271	1.02	$64	0.43	$27	$2,341,081
2044	90,090	1.02	$66	0.41	$27	$2,447,167
2045	94,901	1.02	$67	0.40	$27	$2,550,526
2046	99,698	1.02	$68	0.39	$27	$2,651,046
2047	104,486	1.02	$70	0.38	$26	$2,748,912
2048	104,486	1.02	$71	0.37	$26	$2,719,773
2049	104,486	1.02	$73	0.36	$26	$2,690,944
2050	104,486	1.02	$74	0.34	$25	$2,662,420
2051	104,486	1.02	$75	0.33	$25	$2,634,198
2052	104,486	1.02	$77	0.32	$25	$2,606,276
2053	104,486	1.02	$79	0.31	$25	$2,578,649
2054	104,486	1.02	$80	0.30	$24	$2,551,315
2055	104,486	1.02	$82	0.30	$24	$2,524,272
2056	104,486	1.02	$83	0.29	$24	$2,497,514
2057	104,486	1.02	$85	0.28	$24	$2,471,041
2058	104,486	1.02	$87	0.27	$23	$2,444,848
2059	104,486	1.02	$88	0.26	$23	$2,418,932
2060	104,486	1.02	$90	0.25	$23	$2,393,292
2061	104,486	1.02	$92	0.25	$23	$2,367,923
2062	104,486	1.02	$94	0.24	$22	$2,342,823
2063	104,486	1.02	$96	0.23	$22	$2,317,989
2064	104,486	1.02	$98	0.22	$22	$2,293,418
2065	104,486	1.02	$100	0.22	$22	$2,269,108
2066	104,486	1.02	$102	0.21	$21	$2,245,055
2067	104,486	1.02	$104	0.21	$21	$2,221,258
2068	104,486	1.02	$106	0.20	$21	$2,197,712
2069	104,486	1.02	$108	0.19	$21	$2,174,417
2070	104,486	1.02	$110	0.19	$21	$2,151,368
					PV Sum =	$92,469,725
					Annualized PV Sum =	$3,593,882

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Construction Capital Costs (Field and Non-Contract)

NOTE: Yellow Cells Are Interactive:

Capital Construction (Field-2015$):	$1,232,000,000	**Costs:**	
Ave. An. Capital Outlays-with Contingencies (2020-2023):	$308,000,000	**Estimated PV:**	$1,327,676,432
Capital Constriction Non-Contract with Contin. (Env./Eng./Adm):	$185,000,000	**Annualized PV:**	$51,600,801
Ave. An. Capital Non Contracts Outlays (2016-2019) @18% An	$33,300,000		
Ave. An. Capital Non-Contract Outlays (2020-2023) @7% An. $	$12,950,000		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
Annual PV Rate Factor:	0.970		

Year	Annual Cap. Construction Costs-2015$	Escalation Rate Factor	Annual Cap. Construction Escalated	Annual Cap. on-Contract Const. Costs-2015$	Escalation Rate Factor	Annual Cap. Non-Contract Const. Escalated	Annual Total Const. Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	$0	1.00	$0	$0	1.00	$0
2016	$0	1.020	$0	$33,300,000	1.02	$33,966,000	$33,966,000	0.97	$32,947,020
2017	$0	1.040	$0	$33,300,000	1.04	$34,645,320	$34,645,320	0.94	$32,597,782
2018	$0	1.061	$0	$33,300,000	1.06	$35,338,226	$35,338,226	0.91	$32,252,245
2019	$0	1.082	$0	$33,300,000	1.08	$36,044,991	$36,044,991	0.89	$31,910,371
2020	$308,000,000	1.104	$340,056,887	$12,950,000	1.10	$14,297,846	$354,354,734	0.86	$304,296,467
2021	$308,000,000	1.126	$346,858,025	$12,950,000	1.13	$14,583,803	$361,441,828	0.83	$301,070,925
2022	$308,000,000	1.149	$353,795,186	$12,950,000	1.15	$14,875,479	$368,670,665	0.81	$297,879,573
2023	$308,000,000	1.172	$360,871,089	$12,950,000	1.17	$15,172,989	$376,044,078	0.78	$294,722,049
2024	$0	1.195	$0	$0	1.20	$0	$0	0.00	$0
2025	$0	1.219	$0	$0	1.22	$0	$0	0.00	$0
2026	$0	1.243	$0	$0	1.24	$0	$0	0.00	$0
2027	$0	0.000	$0	$0	1.27	$0	$0	0.00	$0
2028	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2029	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2030	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2031	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2032	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2033	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2034	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2035	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2036	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2037	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2038	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2039	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2040	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2041	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2042	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2043	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2044	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2045	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2046	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2047	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2048	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2049	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2050	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2051	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2052	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2053	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2054	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2055	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2056	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2057	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2058	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2059	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2060	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2061	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2062	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2063	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2064	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2065	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2066	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2067	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2068	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2069	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2070	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
Sum Col. =	$1,232,000,000		Sum Col. =	$185,000,000				PV =	$1,327,676,432
								Annualized PV =	$51,600,801

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Project Annual OM&R Capital Costs (without Power)

NOTE: Yellow Cells Are Interactive:

Project Annual OM&R Costs (2015$):	$2,553,776	**Costs:**	
Ave. An. OM&R Outlays (2015$) @__% Capital Constructio	$2,553,776	**Estimated PV:**	$86,240,165
% Capital Construction (An. Factor Adj.)	0.002073	**Annualized PV:**	$3,351,767
Project Annual OM&R Costs (2015$):	$2,553,776		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
Annual PV Rate Factor:	0.970		

Year	Annual OM&R Costs-2015$	Escalation Rate Factor	Annual OM&R Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	1.00	$0
2016	$0	1.020	$0	0.97	$0
2017	$0	1.040	$0	0.94	$0
2018	$0	1.061	$0	0.91	$0
2019	$0	1.082	$0	0.89	$0
2020	$0	1.104	$0	0.86	$0
2021	$0	1.126	$0	0.83	$0
2022	$0	1.149	$0	0.81	$0
2023	$0	1.172	$0	0.78	$0
2024	$2,553,776	1.195	$3,051,999	0.76	$2,320,224
2025	$2,553,776	1.219	$3,113,038	0.74	$2,295,630
2026	$2,553,776	1.243	$3,175,299	0.72	$2,271,296
2027	$2,553,776	1.268	$3,238,805	0.69	$2,247,220
2028	$2,553,776	1.294	$3,303,581	0.67	$2,223,400
2029	$2,553,776	1.319	$3,369,653	0.65	$2,199,832
2030	$2,553,776	1.346	$3,437,046	0.63	$2,176,513
2031	$2,553,776	1.373	$3,505,787	0.61	$2,153,442
2032	$2,553,776	1.400	$3,575,903	0.60	$2,130,616
2033	$2,553,776	1.428	$3,647,421	0.58	$2,108,031
2034	$2,553,776	1.457	$3,720,369	0.56	$2,085,686
2035	$2,553,776	1.486	$3,794,777	0.54	$2,063,578
2036	$2,553,776	1.516	$3,870,672	0.53	$2,041,704
2037	$2,553,776	1.546	$3,948,086	0.51	$2,020,062
2038	$2,553,776	1.577	$4,027,047	0.50	$1,998,649
2039	$2,553,776	1.608	$4,107,588	0.48	$1,977,464
2040	$2,553,776	1.641	$4,189,740	0.47	$1,956,503
2041	$2,553,776	1.673	$4,273,535	0.45	$1,935,764
2042	$2,553,776	1.707	$4,359,005	0.44	$1,915,245
2043	$2,553,776	1.741	$4,446,186	0.43	$1,894,943
2044	$2,553,776	1.776	$4,535,109	0.41	$1,874,857
2045	$2,553,776	1.811	$4,625,811	0.40	$1,854,983
2046	$2,553,776	1.848	$4,718,328	0.39	$1,835,320
2047	$2,553,776	1.885	$4,812,694	0.38	$1,815,866
2048	$2,553,776	1.922	$4,908,948	0.37	$1,796,618
2049	$2,553,776	1.961	$5,007,127	0.36	$1,777,574
2050	$2,553,776	2.000	$5,107,270	0.34	$1,758,731
2051	$2,553,776	2.040	$5,209,415	0.33	$1,740,089
2052	$2,553,776	2.081	$5,313,603	0.32	$1,721,644
2053	$2,553,776	2.122	$5,419,875	0.31	$1,703,394
2054	$2,553,776	2.165	$5,528,273	0.30	$1,685,338
2055	$2,553,776	2.208	$5,638,838	0.30	$1,667,474
2056	$2,553,776	2.252	$5,751,615	0.29	$1,649,799
2057	$2,553,776	2.297	$5,866,647	0.28	$1,632,311
2058	$2,553,776	2.343	$5,983,980	0.27	$1,615,008
2059	$2,553,776	2.390	$6,103,660	0.26	$1,597,889
2060	$2,553,776	2.438	$6,225,733	0.25	$1,580,951
2061	$2,553,776	2.487	$6,350,248	0.25	$1,564,193
2062	$2,553,776	2.536	$6,477,253	0.24	$1,547,613
2063	$2,553,776	2.587	$6,606,798	0.23	$1,531,208
2064	$2,553,776	2.639	$6,738,934	0.22	$1,514,977
2065	$2,553,776	2.692	$6,873,712	0.22	$1,498,919
2066	$2,553,776	2.745	$7,011,187	0.21	$1,483,030
2067	$2,553,776	2.800	$7,151,410	0.21	$1,467,310
2068	$2,553,776	2.856	$7,294,439	0.20	$1,451,757
2069	$2,553,776	2.913	$7,440,327	0.19	$1,436,368
2070	$2,553,776	2.972	$7,589,134	0.19	$1,421,142
				PV =	$86,240,165
				Annualized PV =	$3,351,767

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Reservoir and Pipeline Power Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32	**Costs:**	
Annual Power Value $/MWh (2015$):	$32	**Estimated PV:**	$170,646,930
Pre-PV Period Escalation Annaul Rate% (with Inflatio	2.0%	**Annualized PV:**	$6,632,277
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.02	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	7,075	1.02	$38	0.76	$29	$205,695
2025	8,249	1.02	$39	0.74	$29	$237,295
2026	9,619	1.02	$40	0.72	$28	$273,749
2027	11,215	1.02	$41	0.69	$28	$315,804
2028	13,077	1.02	$41	0.67	$28	$364,320
2029	15,247	1.02	$42	0.65	$28	$420,289
2030	17,778	1.02	$43	0.63	$27	$484,856
2031	20,729	1.02	$44	0.61	$27	$559,342
2032	24,170	1.02	$45	0.60	$27	$645,272
2033	28,181	1.02	$46	0.58	$26	$744,402
2034	32,859	1.02	$47	0.56	$26	$858,761
2035	38,313	1.02	$48	0.54	$26	$990,689
2036	44,673	1.02	$49	0.53	$26	$1,142,884
2037	52,088	1.02	$49	0.51	$25	$1,318,460
2038	60,733	1.02	$50	0.50	$25	$1,521,009
2039	70,814	1.02	$51	0.48	$25	$1,754,675
2040	82,568	1.02	$52	0.47	$25	$2,024,238
2041	96,274	1.02	$54	0.45	$24	$2,335,212
2042	112,253	1.02	$55	0.44	$24	$2,693,961
2043	130,886	1.02	$56	0.43	$24	$3,107,822
2044	152,611	1.02	$57	0.41	$23	$3,585,263
2045	177,942	1.02	$58	0.40	$23	$4,136,051
2046	207,478	1.02	$59	0.39	$23	$4,771,454
2047	241,916	1.02	$60	0.38	$23	$5,504,471
2048	283,000	1.02	$62	0.37	$23	$6,371,025
2049	283,000	1.02	$63	0.36	$22	$6,303,492
2050	283,000	1.02	$64	0.34	$22	$6,236,675
2051	283,000	1.02	$65	0.33	$22	$6,170,566
2052	283,000	1.02	$67	0.32	$22	$6,105,158
2053	283,000	1.02	$68	0.31	$21	$6,040,444
2054	283,000	1.02	$69	0.30	$21	$5,976,415
2055	283,000	1.02	$71	0.30	$21	$5,913,065
2056	283,000	1.02	$72	0.29	$21	$5,850,387
2057	283,000	1.02	$74	0.28	$20	$5,788,372
2058	283,000	1.02	$75	0.27	$20	$5,727,016
2059	283,000	1.02	$76	0.26	$20	$5,666,309
2060	283,000	1.02	$78	0.25	$20	$5,606,246
2061	283,000	1.02	$80	0.25	$20	$5,546,820
2062	283,000	1.02	$81	0.24	$19	$5,488,024
2063	283,000	1.02	$83	0.23	$19	$5,429,851
2064	283,000	1.02	$84	0.22	$19	$5,372,294
2065	283,000	1.02	$86	0.22	$19	$5,315,348
2066	283,000	1.02	$88	0.21	$19	$5,259,005
2067	283,000	1.02	$90	0.21	$18	$5,203,260
2068	283,000	1.02	$91	0.20	$18	$5,148,105
2069	283,000	1.02	$93	0.19	$18	$5,093,536
2070	283,000	1.02	$95	0.19	$18	$5,039,544
					PV Sum =	$170,646,930
					Annualized PV Sum =	$6,632,277

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Reservoir and Pipeline Power Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32
Annual Power Value $/MWh (2015$):	$32
Pre-PV Period Escalation Annaul Rate% (with Inflatio	2.0%
PV Period Annaul Escalation Rate% (Real Rate):	2.0%
Real Discount Rate (PV Period 2015-2070):	3.0%
PV Annual Rate Factor:	0.970

Costs:	
Estimated PV:	$170,646,930
Annualized PV:	$6,632,277

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.02	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	7,075	1.02	$38	0.76	$29	$205,695
2025	8,249	1.02	$39	0.74	$29	$237,295
2026	9,619	1.02	$40	0.72	$28	$273,749
2027	11,215	1.02	$41	0.69	$28	$315,804
2028	13,077	1.02	$41	0.67	$28	$364,320
2029	15,247	1.02	$42	0.65	$28	$420,289
2030	17,778	1.02	$43	0.63	$27	$484,856
2031	20,729	1.02	$44	0.61	$27	$559,342
2032	24,170	1.02	$45	0.60	$27	$645,272
2033	28,181	1.02	$46	0.58	$26	$744,402
2034	32,859	1.02	$47	0.56	$26	$858,761
2035	38,313	1.02	$48	0.54	$26	$990,689
2036	44,673	1.02	$49	0.53	$26	$1,142,884
2037	52,088	1.02	$49	0.51	$25	$1,318,460
2038	60,733	1.02	$50	0.50	$25	$1,521,009
2039	70,814	1.02	$51	0.48	$25	$1,754,675
2040	82,568	1.02	$52	0.47	$25	$2,024,238
2041	96,274	1.02	$54	0.45	$24	$2,335,212
2042	112,253	1.02	$55	0.44	$24	$2,693,961
2043	130,886	1.02	$56	0.43	$24	$3,107,822
2044	152,611	1.02	$57	0.41	$23	$3,585,263
2045	177,942	1.02	$58	0.40	$23	$4,136,051
2046	207,478	1.02	$59	0.39	$23	$4,771,454
2047	241,916	1.02	$60	0.38	$23	$5,504,471
2048	283,000	1.02	$62	0.37	$23	$6,371,025
2049	283,000	1.02	$63	0.36	$22	$6,303,492
2050	283,000	1.02	$64	0.34	$22	$6,236,675
2051	283,000	1.02	$65	0.33	$22	$6,170,566
2052	283,000	1.02	$67	0.32	$22	$6,105,158
2053	283,000	1.02	$68	0.31	$21	$6,040,444
2054	283,000	1.02	$69	0.30	$21	$5,976,415
2055	283,000	1.02	$71	0.30	$21	$5,913,065
2056	283,000	1.02	$72	0.29	$21	$5,850,387
2057	283,000	1.02	$74	0.28	$20	$5,788,372
2058	283,000	1.02	$75	0.27	$20	$5,727,016
2059	283,000	1.02	$76	0.26	$20	$5,666,309
2060	283,000	1.02	$78	0.25	$20	$5,606,246
2061	283,000	1.02	$80	0.25	$20	$5,546,820
2062	283,000	1.02	$81	0.24	$19	$5,488,024
2063	283,000	1.02	$83	0.23	$19	$5,429,851
2064	283,000	1.02	$84	0.22	$19	$5,372,294
2065	283,000	1.02	$86	0.22	$19	$5,315,348
2066	283,000	1.02	$88	0.21	$19	$5,259,005
2067	283,000	1.02	$90	0.21	$18	$5,203,260
2068	283,000	1.02	$91	0.20	$18	$5,148,105
2069	283,000	1.02	$93	0.19	$18	$5,093,536
2070	283,000	1.02	$95	0.19	$18	$5,039,544
					PV Sum =	$170,646,930
					Annualized PV Sum =	$6,632,277

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Foregone Power at Main Project Reservoir

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32.0	**Costs:**	
Annual Power Value $/MWh (2015$):	$32.0	**Estimated PV:**	$26,286,972
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,021,656
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2010-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Foregone MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual "Lost" Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	6,451	1.02	$38	0.76	$29	$187,553
2025	6,922	1.02	$39	0.74	$29	$199,111
2026	7,427	1.02	$40	0.72	$28	$211,382
2027	7,969	1.02	$41	0.69	$28	$224,408
2028	8,551	1.02	$41	0.67	$28	$238,238
2029	9,175	1.02	$42	0.65	$28	$252,919
2030	9,845	1.02	$43	0.63	$27	$268,506
2031	10,564	1.02	$44	0.61	$27	$285,053
2032	11,335	1.02	$45	0.60	$27	$302,620
2033	12,163	1.02	$46	0.58	$26	$321,269
2034	13,050	1.02	$47	0.56	$26	$341,068
2035	14,003	1.02	$48	0.54	$26	$362,086
2036	15,025	1.02	$49	0.53	$26	$384,400
2037	16,122	1.02	$49	0.51	$25	$408,089
2038	17,299	1.02	$50	0.50	$25	$433,238
2039	18,562	1.02	$51	0.48	$25	$459,937
2040	19,917	1.02	$52	0.47	$25	$488,281
2041	21,371	1.02	$54	0.45	$24	$518,372
2042	22,931	1.02	$55	0.44	$24	$550,318
2043	24,605	1.02	$56	0.43	$24	$584,232
2044	26,401	1.02	$57	0.41	$23	$620,236
2045	28,328	1.02	$58	0.40	$23	$658,458
2046	30,396	1.02	$59	0.39	$23	$699,037
2047	32,615	1.02	$60	0.38	$23	$742,116
2048	35,840	1.02	$62	0.37	$23	$806,846
2049	35,840	1.02	$63	0.36	$22	$798,294
2050	35,840	1.02	$64	0.34	$22	$789,832
2051	35,840	1.02	$65	0.33	$22	$781,460
2052	35,840	1.02	$67	0.32	$22	$773,176
2053	35,840	1.02	$68	0.31	$21	$764,981
2054	35,840	1.02	$69	0.30	$21	$756,872
2055	35,840	1.02	$71	0.30	$21	$748,849
2056	35,840	1.02	$72	0.29	$21	$740,911
2057	35,840	1.02	$74	0.28	$20	$733,057
2058	35,840	1.02	$75	0.27	$20	$725,287
2059	35,840	1.02	$76	0.26	$20	$717,599
2060	35,840	1.02	$78	0.25	$20	$709,992
2061	35,840	1.02	$80	0.25	$20	$702,467
2062	35,840	1.02	$81	0.24	$19	$695,020
2063	35,840	1.02	$83	0.23	$19	$687,653
2064	35,840	1.02	$84	0.22	$19	$680,364
2065	35,840	1.02	$86	0.22	$19	$673,152
2066	35,840	1.02	$88	0.21	$19	$666,017
2067	35,840	1.02	$90	0.21	$18	$658,957
2068	35,840	1.02	$91	0.20	$18	$651,972
2069	35,840	1.02	$93	0.19	$18	$645,061
2070	35,840	1.02	$95	0.19	$18	$638,224
					PV Sum =	$26,286,972
					Annualized PV Sum =	$1,021,656

Water Supply Project

and Pump Storage

Real and Social Time Preference

Discount Rates

State (NED) Benefit-Cost Methodology for Lake Powell Pipeline Water Supply Project with Pump Storage Project

Benefits

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

Municipal Water Supply:

Marginal Value-Alternative Cost of Municipal Water from LPP--Based on Water Reuse-RO ($3,300/Acre-ft.).

Water Delivery Start in 2024. Full Water Delivery (86,249 acre-ft.) in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power Production: 1) Pipeline-Peaking and 2) Pump Storage:

Marginal Value of Power--Market-Based on 2013-2015 Daily Peak Power Cost Average ($37/MWh).

Power Production Start in 2024.
Pump Storage at Full Operations. All Systems Full Power Operations in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

All Benefits Displayed As:

PV At 2015$, 4.9% Real Discount Rate (2020-2070 Project Development/Operations).

2010 2015 2020 2030 2040 2050 2060 2070

Costs

PV At 2015$, 4.9% Discount Rate (2020-2070 Project Development/Operations).

Construction:

* Field Costs (with 16% Contingency).
* Non-Construction Contract Costs: Environmental Analyses, Engineering, Administration (16% of Field Costs).
* Interest During Construction (Not Included as Separate Cost Per State Designation).

Construction Period 2020-2023.

Annual Escalation after 2015 at 2.0% (in real value terms).

Construction,Operation & Maintenance, Replacement:

O&MR Start in 2024 Running Through 2070.

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Reservoir System Foregone Power Production:

Marginal Value of Power--Market-Based on 2013-2015 Daily Off-Peak Power Cost Average ($32/MWh).

Reservoir Water Diversions Start in 2024. Full Diversions 2048-2070

Annual Escalation after 2015 at 2.0% (in real value terms).

Power-Pipeline Water Pumping and Pump Storage Pumping:

Marginal Value of Power--Market-Based on 2013-2015 Daily Off-Peak Power Cost Average ($32/MWh).

Pipeline Water Pumping Start in 2024.
Pump Storage Water Pumping Start in 2024. All Systems Full Pumping Operations in 2048.

Annual Escalation after 2015 at 2.0% (in real value terms).

All Costs Displayed As:

PV At 2015$, 4.9% Real Discount Rate (2020-2070 Project Development/Operations).

Lake Powell Pipeline

Benefit-Cost Analysis-State Water Supply Project with Pump Storage

Real Discount Rate and Escalation Rate

Benefits:	PV (2015$)	Annual. PV	Discount Rate	Escalation Rate	Water $/Acre-ft.
M&I Water	$3,851,762,287	$207,735,605	4.9%	2.0%	$3,675
Power-Inline	$21,282,047	$1,147,796	4.9%	2.0%	
PS & Sand H.	$421,766,368	$22,746,962	4.9%	2.0%	
Total Benefits:	$4,294,810,703	$231,630,364			
Costs:	**PV**	**Annual. PV**			
Capital Contruc. (w-Hydro)	$1,588,991,400	$85,698,458	4.9%	2.0%	
OM&R	$116,186,010	$6,266,215	4.9%	2.0%	
Power Pumping Opers.	$79,612,272	$4,293,698	4.9%	2.0%	
Power PS Opers.	$337,154,783	$18,183,638	4.9%	2.0%	
Foregone Power	$13,254,134	$714,830	4.9%	2.0%	
Total Costs:	$2,135,198,599	$115,156,840			
NED B/C:	2.01	2.01			

NOTE:

Estimated Cost Per Delivered M&I Water in $/Acre-Ft.: Expressed in Constant Annualized $/Acre-Ft.*	$1,828
Expressed in $/1,000 gal.:	$5.61
* For Average Annual Acre-Ft. Delivery 2024-2070:	62,996

Annualized PV value is for 50-year period.

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Water Supply Benefits:

NOTE: Yellow Cells Are Interactive:

Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Benefits:**	
Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Estimated PV:**	3,851,762,287
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	207,735,605
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	Delivered Water Acre-Ft.	Escalation Rate Factor	Water Value $/Acre-ft.	PV Discount Rate Factor	PV Water Value $/Acre-ft.	Annual Delivered Water Value $
2015	0	0.00	$3,675	1.00	3,675	$0
2016	0	1.020	$3,749	0.95	3,749	$0
2017	0	1.020	$3,823	0.90	$3,458	$0
2018	0	1.020	$3,900	0.86	$3,354	$0
2019	0	1.020	$3,978	0.82	$3,254	$0
2020	0	1.020	$4,057	0.78	$3,156	$0
2021	0	1.020	$4,139	0.74	$3,062	$0
2022	0	1.020	$4,221	0.70	$2,970	$0
2023	0	1.020	$4,306	0.67	$2,881	$0
2024	15,468	1.020	$4,392	0.64	$2,794	$67,934,918
2025	16,644	1.020	$4,480	0.61	$2,711	$74,559,931
2026	17,908	1.020	$4,569	0.58	$2,629	$81,831,015
2027	19,270	1.020	$4,661	0.55	$2,551	$89,811,176
2028	20,734	1.020	$4,754	0.52	$2,474	$51,296,714
2029	22,310	1.020	$4,849	0.49	$2,400	$53,540,510
2030	24,005	1.020	$4,946	0.47	$2,328	$55,882,453
2031	25,830	1.020	$5,045	0.45	$2,258	$58,326,837
2032	27,793	1.020	$5,146	0.43	$2,190	$60,878,141
2033	29,905	1.020	$5,249	0.40	$2,125	$63,541,044
2034	32,178	1.020	$5,354	0.38	$2,061	$66,320,426
2035	34,623	1.020	$5,461	0.37	$1,999	$69,221,382
2036	37,255	1.020	$5,570	0.35	$1,939	$72,249,230
2037	40,086	1.020	$5,681	0.33	$1,881	$75,409,522
2038	43,133	1.020	$5,795	0.31	$1,825	$78,708,049
2039	46,411	1.020	$5,911	0.30	$1,770	$82,150,858
2040	49,938	1.020	$6,029	0.28	$1,717	$85,744,262
2041	53,733	1.020	$6,150	0.27	$1,666	$89,494,846
2042	57,817	1.020	$6,273	0.26	$1,616	$93,409,487
2043	62,211	1.020	$6,398	0.24	$1,567	$97,495,360
2044	66,939	1.020	$6,526	0.23	$1,520	$101,759,955
2045	72,026	1.020	$6,657	0.22	$1,475	$106,211,090
2046	77,500	1.020	$6,790	0.21	$1,430	$110,856,924
2047	83,390	1.020	$6,926	0.20	$1,388	$115,705,975
2048	86,249	1.020	$7,064	0.19	$1,346	$116,084,474
2049	86,249	1.020	$7,205	0.18	$1,306	$112,604,262
2050	86,249	1.020	$7,350	0.17	$1,266	$109,228,386
2051	86,249	1.020	$7,497	0.16	$1,228	$105,953,719
2052	86,249	1.020	$7,647	0.16	$1,192	$102,777,226
2053	86,249	1.020	$7,799	0.15	$1,156	$99,695,965
2054	86,249	1.020	$7,955	0.14	$1,121	$96,707,080
2055	86,249	1.020	$8,115	0.13	$1,088	$93,807,802
2056	86,249	1.020	$8,277	0.13	$1,055	$90,995,444
2057	86,249	1.020	$8,442	0.12	$1,023	$88,267,401
2058	86,249	1.020	$8,611	0.12	$993	$85,621,144
2059	86,249	1.020	$8,783	0.11	$963	$83,054,222
2060	86,249	1.020	$8,959	0.10	$934	$80,564,256
2061	86,249	1.020	$9,138	0.10	$906	$78,148,940
2062	86,249	1.020	$9,321	0.09	$879	$75,806,035
2063	86,249	1.020	$9,507	0.09	$853	$73,533,370
2064	86,249	1.020	$9,698	0.09	$827	$71,328,839
2065	86,249	1.020	$9,892	0.08	$802	$69,190,401
2066	86,249	1.020	$10,089	0.08	$778	$67,116,073
2067	86,249	1.020	$10,291	0.07	$755	$65,103,933
2068	86,249	1.020	$10,497	0.07	$732	$63,152,117
2069	86,249	1.020	$10,707	0.07	$710	$61,258,816
2070	86,249	1.020	$10,921	0.06	$689	$59,422,277
2024-2070						
Ave. =	62,996				PV Sum =	$3,851,762,287
					Annualized PV Sum =	207,735,605
				Ave. An. Water	Delivery 2021-206	62,996

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--In-Line Power Generation

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$21,282,047
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,147,796
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-70):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.95	$36	$0
2017	0	1.02	$38	0.90	$35	$0
2018	0	1.02	$39	0.86	$34	$0
2019	0	1.02	$40	0.82	$33	$0
2020	0	1.02	$41	0.78	$32	$0
2021	0	1.02	$42	0.74	$31	$0
2022	0	1.02	$43	0.70	$30	$0
2023	0	1.02	$43	0.67	$29	$0
2024	10,805	1.02	$44	0.64	$28	$303,985
2025	10,805	1.02	$45	0.61	$27	$294,872
2026	10,805	1.02	$46	0.58	$26	$286,032
2027	10,805	1.02	$47	0.55	$26	$277,456
2028	10,805	1.02	$48	0.52	$25	$269,138
2029	11,847	1.02	$49	0.49	$24	$286,246
2030	13,908	1.02	$50	0.47	$23	$325,969
2031	16,115	1.02	$51	0.45	$23	$366,373
2032	18,269	1.02	$52	0.43	$22	$402,892
2033	20,356	1.02	$53	0.40	$21	$435,458
2034	22,391	1.02	$54	0.38	$21	$464,631
2035	24,346	1.02	$55	0.37	$20	$490,053
2036	26,220	1.02	$56	0.35	$20	$511,952
2037	29,873	1.02	$57	0.33	$19	$565,791
2038	31,676	1.02	$58	0.31	$18	$581,953
2039	33,370	1.02	$60	0.30	$18	$594,695
2040	34,948	1.02	$61	0.28	$17	$604,145
2041	36,546	1.02	$62	0.27	$17	$612,829
2042	37,981	1.02	$63	0.26	$16	$617,798
2043	40,221	1.02	$64	0.24	$16	$634,620
2044	41,323	1.02	$66	0.23	$15	$632,461
2045	42,224	1.02	$67	0.22	$15	$626,876
2046	42,914	1.02	$68	0.21	$14	$618,019
2047	43,381	1.02	$70	0.20	$14	$606,015
2048	43,381	1.02	$71	0.19	$14	$587,847
2049	43,381	1.02	$73	0.18	$13	$570,223
2050	43,381	1.02	$74	0.17	$13	$553,128
2051	43,381	1.02	$75	0.16	$12	$536,545
2052	43,381	1.02	$77	0.16	$12	$520,459
2053	43,381	1.02	$79	0.15	$12	$504,856
2054	43,381	1.02	$80	0.14	$11	$489,720
2055	43,381	1.02	$82	0.13	$11	$475,039
2056	43,381	1.02	$83	0.13	$11	$460,797
2057	43,381	1.02	$85	0.12	$10	$446,982
2058	43,381	1.02	$87	0.12	$10	$433,582
2059	43,381	1.02	$88	0.11	$10	$420,583
2060	43,381	1.02	$90	0.10	$9	$407,974
2061	43,381	1.02	$92	0.10	$9	$395,743
2062	43,381	1.02	$94	0.09	$9	$383,878
2063	43,381	1.02	$96	0.09	$9	$372,370
2064	43,381	1.02	$98	0.09	$8	$361,206
2065	43,381	1.02	$100	0.08	$8	$350,377
2066	43,381	1.02	$102	0.08	$8	$339,873
2067	43,381	1.02	$104	0.07	$8	$329,683
2068	43,381	1.02	$106	0.07	$7	$319,800
2069	43,381	1.02	$108	0.07	$7	$310,212
2070	43,381	1.02	$110	0.06	$7	$300,912
					PV Sum =	$21,282,047
					Annualized PV Sum =	$1,147,796

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--Pump Storage and PK-Sand Hollow

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$421,766,368
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$22,746,962
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.95	$36	$0
2017	0	1.02	$38	0.90	$35	$0
2018	0	1.02	$39	0.86	$34	$0
2019	0	1.02	$40	0.82	$33	$0
2020	0	1.02	$41	0.78	$32	$0
2021	0	1.02	$42	0.74	$31	$0
2022	0	1.02	$43	0.70	$30	$0
2023	0	1.02	$43	0.67	$29	$0
2024	545,053	1.02	$44	0.64	$28	$15,334,395
2025	545,053	1.02	$45	0.61	$27	$14,874,670
2026	545,053	1.02	$46	0.58	$26	$14,428,728
2027	545,053	1.02	$47	0.55	$26	$13,996,154
2028	545,053	1.02	$48	0.52	$25	$13,576,550
2029	547,039	1.02	$49	0.49	$24	$13,217,510
2030	551,007	1.02	$50	0.47	$23	$12,914,249
2031	555,335	1.02	$51	0.45	$23	$12,625,477
2032	559,660	1.02	$52	0.43	$22	$12,342,346
2033	563,977	1.02	$53	0.40	$21	$12,064,672
2034	568,293	1.02	$54	0.38	$21	$11,792,533
2035	572,605	1.02	$55	0.37	$20	$11,525,788
2036	576,912	1.02	$56	0.35	$20	$11,264,340
2037	582,185	1.02	$57	0.33	$19	$11,026,505
2038	586,555	1.02	$58	0.31	$18	$10,776,216
2039	590,920	1.02	$60	0.30	$18	$10,530,935
2040	595,278	1.02	$61	0.28	$17	$10,290,554
2041	600,095	1.02	$62	0.27	$17	$10,062,818
2042	604,902	1.02	$63	0.26	$16	$9,839,326
2043	610,271	1.02	$64	0.24	$16	$9,629,057
2044	615,090	1.02	$66	0.23	$15	$9,414,134
2045	619,901	1.02	$67	0.22	$15	$9,203,324
2046	624,698	1.02	$68	0.21	$14	$8,996,492
2047	629,486	1.02	$70	0.20	$14	$8,793,663
2048	629,486	1.02	$71	0.19	$14	$8,530,029
2049	629,486	1.02	$73	0.18	$13	$8,274,299
2050	629,486	1.02	$74	0.17	$13	$8,026,236
2051	629,486	1.02	$75	0.16	$12	$7,785,609
2052	629,486	1.02	$77	0.16	$12	$7,552,197
2053	629,486	1.02	$79	0.15	$12	$7,325,782
2054	629,486	1.02	$80	0.14	$11	$7,106,155
2055	629,486	1.02	$82	0.13	$11	$6,893,112
2056	629,486	1.02	$83	0.13	$11	$6,686,457
2057	629,486	1.02	$85	0.12	$10	$6,485,997
2058	629,486	1.02	$87	0.12	$10	$6,291,547
2059	629,486	1.02	$88	0.11	$10	$6,102,926
2060	629,486	1.02	$90	0.10	$9	$5,919,960
2061	629,486	1.02	$92	0.10	$9	$5,742,480
2062	629,486	1.02	$94	0.09	$9	$5,570,320
2063	629,486	1.02	$96	0.09	$9	$5,403,322
2064	629,486	1.02	$98	0.09	$8	$5,241,331
2065	629,486	1.02	$100	0.08	$8	$5,084,195
2066	629,486	1.02	$102	0.08	$8	$4,931,771
2067	629,486	1.02	$104	0.07	$8	$4,783,917
2068	629,486	1.02	$106	0.07	$7	$4,640,495
2069	629,486	1.02	$108	0.07	$7	$4,501,373
2070	629,486	1.02	$110	0.06	$7	$4,366,422
					PV Sum =	$421,766,368
					Annualized PV Sum =	$22,746,962

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Construction Capital Costs (Field and Non-Contract)

NOTE: Yellow Cells Are Interactive:

Capital Construction (Field-2015$):	**$1,659,800,000**
Ave. An. Capital Outlays-with Contingencies (2020-2023):	**$414,950,000**
Capital Constriction Non-Contract with Contin. (Env./Eng./Adm):	**$252,200,000**
Ave. An. Capital Non Contracts Outlays (2016-2019) @18% An	**$45,396,000**
Ave. An. Capital Non-Contract Outlays (2020-2023) @7% An. $	**$17,654,000**
Pre-PV Escalation Annaul Rate% (with Inflation):	**2.0%**
PV Period Annaul Escalation Rate% (Real Rate):	**2.0%**
Real Discount Rate (PV Period 2010-60):	**4.9%**
Annual PV Rate Factor:	**0.951**

Costs:	
Estimated PV:	**$1,588,991,400**
Annualized PV:	**$85,698,458**

Year	Annual Cap. Construction Costs-2015$	Escalation Rate Factor	Annual Cap. Construction Escalated	Annual Cap. on-Contract Const. Costs-2015$	Escalation Rate Factor	Annual Cap. Non-Contract Const. Escalated	Annual Total Const. Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	$0	1.00	$0	$0	1.00	$0
2016	$0	1.020	$0	$45,396,000	1.02	$46,303,920	$46,303,920	0.95	$44,035,028
2017	$0	1.040	$0	$45,396,000	1.04	$47,229,998	$47,229,998	0.90	$42,714,858
2018	$0	1.061	$0	$45,396,000	1.06	$48,174,598	$48,174,598	0.86	$41,434,266
2019	$0	1.082	$0	$45,396,000	1.08	$49,138,090	$49,138,090	0.82	$40,192,067
2020	$414,950,000	1.104	$458,138,329	$17,654,000	1.10	$19,491,442	$477,629,772	0.78	$371,530,074
2021	$414,950,000	1.126	$467,301,096	$17,654,000	1.13	$19,881,271	$487,182,367	0.74	$360,391,603
2022	$414,950,000	1.149	$476,647,118	$17,654,000	1.15	$20,278,897	$496,926,015	0.70	$349,587,062
2023	$414,950,000	1.172	$486,180,060	$17,654,000	1.17	$20,684,475	$506,864,535	0.67	$339,106,442
2024	$0	1.195	$0	$0	1.20	$0	$0	0.00	$0
2025	$0	1.219	$0	$0	1.22	$0	$0	0.00	$0
2026	$0	1.243	$0	$0	1.24	$0	$0	0.00	$0
2027	$0	0.000	$0	$0	1.27	$0	$0	0.00	$0
2028	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2029	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2030	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2031	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2032	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2033	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2034	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2035	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2036	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2037	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2038	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2039	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2040	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2041	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2042	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2043	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2044	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2045	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2046	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2047	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2048	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2049	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2050	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2051	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2052	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2053	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2054	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2055	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2056	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2057	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2058	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2059	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2060	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2061	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2062	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2063	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2064	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2065	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2066	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2067	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2068	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2069	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2070	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
Sum Col. =	$1,659,800,000		Sum Col. =	$252,200,000				PV =	$1,588,991,400
								Annualized PV =	$85,698,458

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Project Annual OM&R Capital Costs (without Power)

NOTE: Yellow Cells Are Interactive:

Project Annual OM&R Costs (2015$):	$6,020,979	**Costs:**	
Ave. An. OM&R Outlays (2015$) @__% Capital Constructio	$6,020,979	**Estimated PV:**	$116,186,010
% Capital Construction (Annual. Factor Adj.):	0.003628	**Annualized PV:**	$6,266,215
Project Annual OM&R Costs (2015$):	$6,020,979		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
Annual PV Rate Factor:	0.951		

Year	Annual OM&R Costs-2015$	Escalation Rate Factor	Annual OM&R Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	1.00	$0
2016	$0	1.020	$0	0.95	$0
2017	$0	1.040	$0	0.90	$0
2018	$0	1.061	$0	0.86	$0
2019	$0	1.082	$0	0.82	$0
2020	$0	1.104	$0	0.78	$0
2021	$0	1.126	$0	0.74	$0
2022	$0	1.149	$0	0.70	$0
2023	$0	1.172	$0	0.67	$0
2024	$6,020,979	1.195	$7,195,628	0.64	$4,578,185
2025	$6,020,979	1.219	$7,339,540	0.61	$4,440,931
2026	$6,020,979	1.243	$7,486,331	0.58	$4,307,792
2027	$6,020,979	1.268	$7,636,058	0.55	$4,178,644
2028	$6,020,979	1.294	$7,788,779	0.52	$4,053,368
2029	$6,020,979	1.319	$7,944,554	0.49	$3,931,848
2030	$6,020,979	1.346	$8,103,445	0.47	$3,813,972
2031	$6,020,979	1.373	$8,265,514	0.45	$3,699,629
2032	$6,020,979	1.400	$8,430,825	0.43	$3,588,714
2033	$6,020,979	1.428	$8,599,441	0.40	$3,481,124
2034	$6,020,979	1.457	$8,771,430	0.38	$3,376,760
2035	$6,020,979	1.486	$8,946,858	0.37	$3,275,525
2036	$6,020,979	1.516	$9,125,796	0.35	$3,177,325
2037	$6,020,979	1.546	$9,308,312	0.33	$3,082,068
2038	$6,020,979	1.577	$9,494,478	0.31	$2,989,668
2039	$6,020,979	1.608	$9,684,367	0.30	$2,900,038
2040	$6,020,979	1.641	$9,878,055	0.28	$2,813,095
2041	$6,020,979	1.673	$10,075,616	0.27	$2,728,758
2042	$6,020,979	1.707	$10,277,128	0.26	$2,646,950
2043	$6,020,979	1.741	$10,482,671	0.24	$2,567,594
2044	$6,020,979	1.776	$10,692,324	0.23	$2,490,618
2045	$6,020,979	1.811	$10,906,171	0.22	$2,415,949
2046	$6,020,979	1.848	$11,124,294	0.21	$2,343,519
2047	$6,020,979	1.885	$11,346,780	0.20	$2,273,260
2048	$6,020,979	1.922	$11,573,715	0.19	$2,205,108
2049	$6,020,979	1.961	$11,805,190	0.18	$2,138,999
2050	$6,020,979	2.000	$12,041,294	0.17	$2,074,872
2051	$6,020,979	2.040	$12,282,119	0.16	$2,012,667
2052	$6,020,979	2.081	$12,527,762	0.16	$1,952,327
2053	$6,020,979	2.122	$12,778,317	0.15	$1,893,796
2054	$6,020,979	2.165	$13,033,883	0.14	$1,837,020
2055	$6,020,979	2.208	$13,294,561	0.13	$1,781,947
2056	$6,020,979	2.252	$13,560,452	0.13	$1,728,524
2057	$6,020,979	2.297	$13,831,661	0.12	$1,676,703
2058	$6,020,979	2.343	$14,108,295	0.12	$1,626,435
2059	$6,020,979	2.390	$14,390,460	0.11	$1,577,675
2060	$6,020,979	2.438	$14,678,270	0.10	$1,530,376
2061	$6,020,979	2.487	$14,971,835	0.10	$1,484,495
2062	$6,020,979	2.536	$15,271,272	0.09	$1,439,990
2063	$6,020,979	2.587	$15,576,697	0.09	$1,396,819
2064	$6,020,979	2.639	$15,888,231	0.09	$1,354,943
2065	$6,020,979	2.692	$16,205,996	0.08	$1,314,321
2066	$6,020,979	2.745	$16,530,116	0.08	$1,274,918
2067	$6,020,979	2.800	$16,860,718	0.07	$1,236,696
2068	$6,020,979	2.856	$17,197,932	0.07	$1,199,620
2069	$6,020,979	2.913	$17,541,891	0.07	$1,163,655
2070	$6,020,979	2.972	$17,892,729	0.06	$1,128,769
				PV =	$116,186,010
				Annualized PV =	$6,266,215

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Pipeline Power Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32	**Costs:**	
Annual Power Value $/MWh (2015$):	$32	**Estimated PV:**	$79,612,272
Pre-PV Period Escalation Annaul Rate% (with Inflatic	2.0%	**Annualized PV:**	$4,293,698
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.02	$32	1.00	$32	$0
2016	0	1.02	$33	0.95	$31	$0
2017	0	1.02	$33	0.90	$30	$0
2018	0	1.02	$34	0.86	$29	$0
2019	0	1.02	$35	0.82	$28	$0
2020	0	1.02	$35	0.78	$27	$0
2021	0	1.02	$36	0.74	$27	$0
2022	0	1.02	$37	0.70	$26	$0
2023	0	1.02	$37	0.67	$25	$0
2024	7,075	1.02	$38	0.64	$24	$172,148
2025	8,249	1.02	$39	0.61	$24	$194,705
2026	9,619	1.02	$40	0.58	$23	$220,217
2027	11,215	1.02	$41	0.55	$22	$249,071
2028	13,077	1.02	$41	0.52	$22	$281,707
2029	15,247	1.02	$42	0.49	$21	$318,618
2030	17,778	1.02	$43	0.47	$20	$360,367
2031	20,729	1.02	$44	0.45	$20	$407,585
2032	24,170	1.02	$45	0.43	$19	$460,990
2033	28,181	1.02	$46	0.40	$19	$521,393
2034	32,859	1.02	$47	0.38	$18	$589,711
2035	38,313	1.02	$48	0.37	$17	$666,980
2036	44,673	1.02	$49	0.35	$17	$754,374
2037	52,088	1.02	$49	0.33	$16	$853,218
2038	60,733	1.02	$50	0.31	$16	$965,014
2039	70,814	1.02	$51	0.30	$15	$1,091,459
2040	82,568	1.02	$52	0.28	$15	$1,234,471
2041	96,274	1.02	$54	0.27	$15	$1,396,223
2042	112,253	1.02	$55	0.26	$14	$1,579,168
2043	130,886	1.02	$56	0.24	$14	$1,786,085
2044	152,611	1.02	$57	0.23	$13	$2,020,113
2045	177,942	1.02	$58	0.22	$13	$2,284,806
2046	207,478	1.02	$59	0.21	$12	$2,584,181
2047	241,916	1.02	$60	0.20	$12	$2,922,783
2048	283,000	1.02	$62	0.19	$12	$3,316,646
2049	283,000	1.02	$63	0.18	$11	$3,217,213
2050	283,000	1.02	$64	0.17	$11	$3,120,761
2051	283,000	1.02	$65	0.16	$11	$3,027,201
2052	283,000	1.02	$67	0.16	$10	$2,936,445
2053	283,000	1.02	$68	0.15	$10	$2,848,411
2054	283,000	1.02	$69	0.14	$10	$2,763,015
2055	283,000	1.02	$71	0.13	$9	$2,680,180
2056	283,000	1.02	$72	0.13	$9	$2,599,828
2057	283,000	1.02	$74	0.12	$9	$2,521,885
2058	283,000	1.02	$75	0.12	$9	$2,446,279
2059	283,000	1.02	$76	0.11	$8	$2,372,940
2060	283,000	1.02	$78	0.10	$8	$2,301,799
2061	283,000	1.02	$80	0.10	$8	$2,232,791
2062	283,000	1.02	$81	0.09	$8	$2,165,852
2063	283,000	1.02	$83	0.09	$7	$2,100,920
2064	283,000	1.02	$84	0.09	$7	$2,037,934
2065	283,000	1.02	$86	0.08	$7	$1,976,837
2066	283,000	1.02	$88	0.08	$7	$1,917,571
2067	283,000	1.02	$90	0.07	$7	$1,860,083
2068	283,000	1.02	$91	0.07	$6	$1,804,317
2069	283,000	1.02	$93	0.07	$6	$1,750,224
2070	283,000	1.02	$95	0.06	$6	$1,697,752
					PV Sum =	$79,612,272
					Annualized PV Sum =	$4,293,698

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Pump Storage Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32	**Costs:**	
Annual Power Value $/MWh (2015$):	$32	**Estimated PV:**	$337,154,783
Pre-PV Period Escalation Annaul Rate% (with Inflatic	2.0%	**Annualized PV:**	$18,183,638
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.95	$31	$0
2017	0	1.02	$33	0.90	$30	$0
2018	0	1.02	$34	0.86	$29	$0
2019	0	1.02	$35	0.82	$28	$0
2020	0	1.02	$35	0.78	$27	$0
2021	0	1.02	$36	0.74	$27	$0
2022	0	1.02	$37	0.70	$26	$0
2023	0	1.02	$37	0.67	$25	$0
2024	546,000	1.02	$38	0.64	$24	$13,285,222
2025	546,000	1.02	$39	0.61	$24	$12,886,931
2026	546,000	1.02	$40	0.58	$23	$12,500,581
2027	546,000	1.02	$41	0.55	$22	$12,125,814
2028	546,000	1.02	$41	0.52	$22	$11,762,282
2029	546,000	1.02	$42	0.49	$21	$11,409,648
2030	546,000	1.02	$43	0.47	$20	$11,067,587
2031	546,000	1.02	$44	0.45	$20	$10,735,781
2032	546,000	1.02	$45	0.43	$19	$10,413,922
2033	546,000	1.02	$46	0.40	$19	$10,101,713
2034	546,000	1.02	$47	0.38	$18	$9,798,863
2035	546,000	1.02	$48	0.37	$17	$9,505,094
2036	546,000	1.02	$49	0.35	$17	$9,220,131
2037	546,000	1.02	$49	0.33	$16	$8,943,711
2038	546,000	1.02	$50	0.31	$16	$8,675,579
2039	546,000	1.02	$51	0.30	$15	$8,415,485
2040	546,000	1.02	$52	0.28	$15	$8,163,189
2041	546,000	1.02	$54	0.27	$15	$7,918,456
2042	546,000	1.02	$55	0.26	$14	$7,681,061
2043	546,000	1.02	$56	0.24	$14	$7,450,783
2044	546,000	1.02	$57	0.23	$13	$7,227,408
2045	546,000	1.02	$58	0.22	$13	$7,010,731
2046	546,000	1.02	$59	0.21	$12	$6,800,549
2047	546,000	1.02	$60	0.20	$12	$6,596,668
2048	546,000	1.02	$62	0.19	$12	$6,398,900
2049	546,000	1.02	$63	0.18	$11	$6,207,061
2050	546,000	1.02	$64	0.17	$11	$6,020,974
2051	546,000	1.02	$65	0.16	$11	$5,840,465
2052	546,000	1.02	$67	0.16	$10	$5,665,368
2053	546,000	1.02	$68	0.15	$10	$5,495,520
2054	546,000	1.02	$69	0.14	$10	$5,330,764
2055	546,000	1.02	$71	0.13	$9	$5,170,948
2056	546,000	1.02	$72	0.13	$9	$5,015,923
2057	546,000	1.02	$74	0.12	$9	$4,865,546
2058	546,000	1.02	$75	0.12	$9	$4,719,677
2059	546,000	1.02	$76	0.11	$8	$4,578,181
2060	546,000	1.02	$78	0.10	$8	$4,440,927
2061	546,000	1.02	$80	0.10	$8	$4,307,788
2062	546,000	1.02	$81	0.09	$8	$4,178,640
2063	546,000	1.02	$83	0.09	$7	$4,053,365
2064	546,000	1.02	$84	0.09	$7	$3,931,845
2065	546,000	1.02	$86	0.08	$7	$3,813,968
2066	546,000	1.02	$88	0.08	$7	$3,699,625
2067	546,000	1.02	$90	0.07	$7	$3,588,711
2068	546,000	1.02	$91	0.07	$6	$3,481,121
2069	546,000	1.02	$93	0.07	$6	$3,376,757
2070	546,000	1.02	$95	0.06	$6	$3,275,522
					PV Sum =	$337,154,783
					Annualized PV Sum =	$18,183,638

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Foregone Power at Main Project Reservoir

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32.0	**Costs:**	
Annual Power Value $/MWh (2015$):	$32.0	**Estimated PV:**	$13,254,134
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$714,830
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	4.9%		
PV Annual Rate Factor:	0.951		

Year	System Foregone MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual "Lost" Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.95	$31	$0
2017	0	1.02	$33	0.90	$30	$0
2018	0	1.02	$34	0.86	$29	$0
2019	0	1.02	$35	0.82	$28	$0
2020	0	1.02	$35	0.78	$27	$0
2021	0	1.02	$36	0.74	$27	$0
2022	0	1.02	$37	0.70	$26	$0
2023	0	1.02	$37	0.67	$25	$0
2024	6,451	1.02	$38	0.64	$24	$156,965
2025	6,922	1.02	$39	0.61	$24	$163,374
2026	7,427	1.02	$40	0.58	$23	$170,045
2027	7,969	1.02	$41	0.55	$22	$176,988
2028	8,551	1.02	$41	0.52	$22	$184,215
2029	9,175	1.02	$42	0.49	$21	$191,737
2030	9,845	1.02	$43	0.47	$20	$199,566
2031	10,564	1.02	$44	0.45	$20	$207,714
2032	11,335	1.02	$45	0.43	$19	$216,195
2033	12,163	1.02	$46	0.40	$19	$225,023
2034	13,050	1.02	$47	0.38	$18	$234,211
2035	14,003	1.02	$48	0.37	$17	$243,774
2036	15,025	1.02	$49	0.35	$17	$253,728
2037	16,122	1.02	$49	0.33	$16	$264,088
2038	17,299	1.02	$50	0.31	$16	$274,871
2039	18,562	1.02	$51	0.30	$15	$286,094
2040	19,917	1.02	$52	0.28	$15	$297,776
2041	21,371	1.02	$54	0.27	$15	$309,935
2042	22,931	1.02	$55	0.26	$14	$322,590
2043	24,605	1.02	$56	0.24	$14	$335,762
2044	26,401	1.02	$57	0.23	$13	$349,471
2045	28,328	1.02	$58	0.22	$13	$363,741
2046	30,396	1.02	$59	0.21	$12	$378,593
2047	32,615	1.02	$60	0.20	$12	$394,051
2048	35,840	1.02	$62	0.19	$12	$420,030
2049	35,840	1.02	$63	0.18	$11	$407,438
2050	35,840	1.02	$64	0.17	$11	$395,223
2051	35,840	1.02	$65	0.16	$11	$383,374
2052	35,840	1.02	$67	0.16	$10	$371,881
2053	35,840	1.02	$68	0.15	$10	$360,732
2054	35,840	1.02	$69	0.14	$10	$349,917
2055	35,840	1.02	$71	0.13	$9	$339,426
2056	35,840	1.02	$72	0.13	$9	$329,250
2057	35,840	1.02	$74	0.12	$9	$319,379
2058	35,840	1.02	$75	0.12	$9	$309,804
2059	35,840	1.02	$76	0.11	$8	$300,516
2060	35,840	1.02	$78	0.10	$8	$291,507
2061	35,840	1.02	$80	0.10	$8	$282,768
2062	35,840	1.02	$81	0.09	$8	$274,290
2063	35,840	1.02	$83	0.09	$7	$266,067
2064	35,840	1.02	$84	0.09	$7	$258,090
2065	35,840	1.02	$86	0.08	$7	$250,353
2066	35,840	1.02	$88	0.08	$7	$242,847
2067	35,840	1.02	$90	0.07	$7	$235,567
2068	35,840	1.02	$91	0.07	$6	$228,504
2069	35,840	1.02	$93	0.07	$6	$221,654
2070	35,840	1.02	$95	0.06	$6	$215,009
					PV Sum =	$13,254,134
					Annualized PV Sum =	$714,830

Lake Powell Pipeline

Benefit-Cost Analysis-State Water Supply Project with Pump Storage

Real Discount Rate and Escalation Rate

Benefits:	PV (2015$)	Annual. PV	Discount Rate	Escalation Rate	Water $/Acre-ft.
M&I Water	$7,451,372,295	$289,601,269	3.0%	2.0%	$3,675
Power-Inline	$41,080,596	$1,596,618	3.0%	2.0%	
PS & Sand H.	$748,445,550	$29,088,706	3.0%	2.0%	
Total Benefits:	$8,240,898,442	$320,286,593			
Costs:	**PV**	**Annual. PV**			
Capital Contruc. (w-Hydro)	$1,791,548,379	$69,629,414	3.0%	2.0%	
OM&R	$116,186,055	$4,515,628	3.0%	2.0%	
Power Pumping Opers.	$170,646,930	$6,632,277	3.0%	2.0%	
Power PS Opers.	$590,023,661	$22,931,561	3.0%	2.0%	
Foregone Power	$26,286,972	$1,021,656	3.0%	2.0%	
Total Costs:	$2,694,691,997	$104,730,537			
NED B/C:	3.06	3.06			

NOTE:

Estimated Cost Per Delivered M&I Water in $/Acre-Ft.: Expressed in Constant Annualized $/Acre-Ft.*	$1,662
Expressed in $/1,000 gal.:	$5.10
* For Average Annual Acre-Ft. Delivery 2024-2070:	62,996

Annualized PV value is for 50-year period.

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Water Supply Benefits:

NOTE: Yellow Cells Are Interactive:

Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Benefits:**	
Annual Water Value $/Acre-Ft. (2015$):	$3,675	**Estimated PV:**	7,451,372,295
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	289,601,269
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	Delivered Water Acre-Ft.	Escalation Rate Factor	Water Value $/Acre-ft.	PV Discount Rate Factor	PV Water Value $/Acre-ft.	Annual Delivered Water Value $
2015	0	0.00	$3,675	1.00	3,675	$0
2016	0	1.020	$3,749	0.97	3,749	$0
2017	0	1.020	$3,823	0.94	$3,598	$0
2018	0	1.020	$3,900	0.91	$3,559	$0
2019	0	1.020	$3,978	0.89	$3,522	$0
2020	0	1.020	$4,057	0.86	$3,484	$0
2021	0	1.020	$4,139	0.83	$3,447	$0
2022	0	1.020	$4,221	0.81	$3,411	$0
2023	0	1.020	$4,306	0.78	$3,375	$0
2024	15,468	1.020	$4,392	0.76	$3,339	$67,934,918
2025	16,644	1.020	$4,480	0.74	$3,304	$74,559,931
2026	17,908	1.020	$4,569	0.72	$3,268	$81,831,015
2027	19,270	1.020	$4,661	0.69	$3,234	$89,811,176
2028	20,734	1.020	$4,754	0.67	$3,200	$66,339,985
2029	22,310	1.020	$4,849	0.65	$3,166	$70,625,177
2030	24,005	1.020	$4,946	0.63	$3,132	$75,187,168
2031	25,830	1.020	$5,045	0.61	$3,099	$80,043,838
2032	27,793	1.020	$5,146	0.60	$3,066	$85,214,221
2033	29,905	1.020	$5,249	0.58	$3,034	$90,718,583
2034	32,178	1.020	$5,354	0.56	$3,001	$96,578,495
2035	34,623	1.020	$5,461	0.54	$2,970	$102,816,925
2036	37,255	1.020	$5,570	0.53	$2,938	$109,458,323
2037	40,086	1.020	$5,681	0.51	$2,907	$116,528,718
2038	43,133	1.020	$5,795	0.50	$2,876	$124,055,820
2039	46,411	1.020	$5,911	0.48	$2,846	$132,069,131
2040	49,938	1.020	$6,029	0.47	$2,815	$140,600,058
2041	53,733	1.020	$6,150	0.45	$2,786	$149,682,034
2042	57,817	1.020	$6,273	0.44	$2,756	$159,350,655
2043	62,211	1.020	$6,398	0.43	$2,727	$169,643,815
2044	66,939	1.020	$6,526	0.41	$2,698	$180,601,856
2045	72,026	1.020	$6,657	0.40	$2,669	$192,267,724
2046	77,500	1.020	$6,790	0.39	$2,641	$204,687,142
2047	83,390	1.020	$6,926	0.38	$2,613	$217,908,786
2048	86,249	1.020	$7,064	0.37	$2,585	$222,989,447
2049	86,249	1.020	$7,205	0.36	$2,558	$220,625,759
2050	86,249	1.020	$7,350	0.34	$2,531	$218,287,126
2051	86,249	1.020	$7,497	0.33	$2,504	$215,973,282
2052	86,249	1.020	$7,647	0.32	$2,478	$213,683,966
2053	86,249	1.020	$7,799	0.31	$2,451	$211,418,916
2054	86,249	1.020	$7,955	0.30	$2,425	$209,177,875
2055	86,249	1.020	$8,115	0.30	$2,400	$206,960,590
2056	86,249	1.020	$8,277	0.29	$2,374	$204,766,807
2057	86,249	1.020	$8,442	0.28	$2,349	$202,596,279
2058	86,249	1.020	$8,611	0.27	$2,324	$200,448,759
2059	86,249	1.020	$8,783	0.26	$2,299	$198,324,002
2060	86,249	1.020	$8,959	0.25	$2,275	$196,221,767
2061	86,249	1.020	$9,138	0.25	$2,251	$194,141,817
2062	86,249	1.020	$9,321	0.24	$2,227	$192,083,913
2063	86,249	1.020	$9,507	0.23	$2,203	$190,047,824
2064	86,249	1.020	$9,698	0.22	$2,180	$188,033,317
2065	86,249	1.020	$9,892	0.22	$2,157	$186,040,164
2066	86,249	1.020	$10,089	0.21	$2,134	$184,068,138
2067	86,249	1.020	$10,291	0.21	$2,112	$182,117,016
2068	86,249	1.020	$10,497	0.20	$2,089	$180,186,575
2069	86,249	1.020	$10,707	0.19	$2,067	$178,276,598
2070	86,249	1.020	$10,921	0.19	$2,045	$176,386,866
2024-2070						
Ave. =	62,996				PV Sum =	$7,451,372,295
					Annualized PV Sum =	289,601,269
					Ave. An. Water Delivery 2021-206	62,996

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--In-Line Power Generation

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$41,080,596
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,596,618
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-70):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.97	$37	$0
2017	0	1.02	$38	0.94	$36	$0
2018	0	1.02	$39	0.91	$36	$0
2019	0	1.02	$40	0.89	$35	$0
2020	0	1.02	$41	0.86	$35	$0
2021	0	1.02	$42	0.83	$35	$0
2022	0	1.02	$43	0.81	$34	$0
2023	0	1.02	$43	0.78	$34	$0
2024	10,805	1.02	$44	0.76	$34	$363,223
2025	10,805	1.02	$45	0.74	$33	$359,373
2026	10,805	1.02	$46	0.72	$33	$355,564
2027	10,805	1.02	$47	0.69	$33	$351,795
2028	10,805	1.02	$48	0.67	$32	$348,066
2029	11,847	1.02	$49	0.65	$32	$377,587
2030	13,908	1.02	$50	0.63	$32	$438,576
2031	16,115	1.02	$51	0.61	$31	$502,785
2032	18,269	1.02	$52	0.60	$31	$563,948
2033	20,356	1.02	$53	0.58	$31	$621,711
2034	22,391	1.02	$54	0.56	$30	$676,615
2035	24,346	1.02	$55	0.54	$30	$727,893
2036	26,220	1.02	$56	0.53	$30	$775,612
2037	29,873	1.02	$57	0.51	$29	$874,304
2038	31,676	1.02	$58	0.50	$29	$917,246
2039	33,370	1.02	$60	0.48	$29	$956,057
2040	34,948	1.02	$61	0.47	$28	$990,653
2041	36,546	1.02	$62	0.45	$28	$1,024,970
2042	37,981	1.02	$63	0.44	$28	$1,053,925
2043	40,221	1.02	$64	0.43	$27	$1,104,251
2044	41,323	1.02	$66	0.41	$27	$1,122,481
2045	42,224	1.02	$67	0.40	$27	$1,134,797
2046	42,914	1.02	$68	0.39	$27	$1,141,116
2047	43,381	1.02	$70	0.38	$26	$1,141,306
2048	43,381	1.02	$71	0.37	$26	$1,129,209
2049	43,381	1.02	$73	0.36	$26	$1,117,239
2050	43,381	1.02	$74	0.34	$25	$1,105,396
2051	43,381	1.02	$75	0.33	$25	$1,093,679
2052	43,381	1.02	$77	0.32	$25	$1,082,086
2053	43,381	1.02	$79	0.31	$25	$1,070,616
2054	43,381	1.02	$80	0.30	$24	$1,059,267
2055	43,381	1.02	$82	0.30	$24	$1,048,039
2056	43,381	1.02	$83	0.29	$24	$1,036,930
2057	43,381	1.02	$85	0.28	$24	$1,025,939
2058	43,381	1.02	$87	0.27	$23	$1,015,064
2059	43,381	1.02	$88	0.26	$23	$1,004,304
2060	43,381	1.02	$90	0.25	$23	$993,658
2061	43,381	1.02	$92	0.25	$23	$983,125
2062	43,381	1.02	$94	0.24	$22	$972,704
2063	43,381	1.02	$96	0.23	$22	$962,394
2064	43,381	1.02	$98	0.22	$22	$952,192
2065	43,381	1.02	$100	0.22	$22	$942,099
2066	43,381	1.02	$102	0.21	$21	$932,113
2067	43,381	1.02	$104	0.21	$21	$922,232
2068	43,381	1.02	$106	0.20	$21	$912,457
2069	43,381	1.02	$108	0.19	$21	$902,785
2070	43,381	1.02	$110	0.19	$21	$893,215
					PV Sum =	$41,080,596
					Annualized PV Sum =	$1,596,618

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Benefits--Pump Storage and PK-Sand Hollow

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$37	**Benefits:**	
Annual Power Value $/MWh (2015$):	$37	**Estimated PV:**	$748,445,550
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$29,088,706
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Production MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Delivered Power Value $
2015	0	0.00	$37	1.00	$37	$0
2016	0	1.02	$38	0.97	$37	$0
2017	0	1.02	$38	0.94	$36	$0
2018	0	1.02	$39	0.91	$36	$0
2019	0	1.02	$40	0.89	$35	$0
2020	0	1.02	$41	0.86	$35	$0
2021	0	1.02	$42	0.83	$35	$0
2022	0	1.02	$43	0.81	$34	$0
2023	0	1.02	$43	0.78	$34	$0
2024	545,053	1.02	$44	0.76	$34	$18,322,622
2025	545,053	1.02	$45	0.74	$33	$18,128,402
2026	545,053	1.02	$46	0.72	$33	$17,936,241
2027	545,053	1.02	$47	0.69	$33	$17,746,117
2028	545,053	1.02	$48	0.67	$32	$17,558,008
2029	547,039	1.02	$49	0.65	$32	$17,435,191
2030	551,007	1.02	$50	0.63	$32	$17,375,505
2031	555,335	1.02	$51	0.61	$31	$17,326,357
2032	559,660	1.02	$52	0.60	$31	$17,276,207
2033	563,977	1.02	$53	0.58	$31	$17,224,928
2034	568,293	1.02	$54	0.56	$30	$17,172,766
2035	572,605	1.02	$55	0.54	$30	$17,119,654
2036	576,912	1.02	$56	0.53	$30	$17,065,591
2037	582,185	1.02	$57	0.51	$29	$17,039,022
2038	586,555	1.02	$58	0.50	$29	$16,984,951
2039	590,920	1.02	$60	0.48	$29	$16,929,969
2040	595,278	1.02	$61	0.47	$28	$16,874,045
2041	600,095	1.02	$62	0.45	$28	$16,830,278
2042	604,902	1.02	$63	0.44	$28	$16,785,265
2043	610,271	1.02	$64	0.43	$27	$16,754,745
2044	615,090	1.02	$66	0.41	$27	$16,708,046
2045	619,901	1.02	$67	0.40	$27	$16,660,240
2046	624,698	1.02	$68	0.39	$27	$16,611,197
2047	629,486	1.02	$70	0.38	$26	$16,561,085
2048	629,486	1.02	$71	0.37	$26	$16,385,538
2049	629,486	1.02	$73	0.36	$26	$16,211,851
2050	629,486	1.02	$74	0.34	$25	$16,040,005
2051	629,486	1.02	$75	0.33	$25	$15,869,981
2052	629,486	1.02	$77	0.32	$25	$15,701,760
2053	629,486	1.02	$79	0.31	$25	$15,535,321
2054	629,486	1.02	$80	0.30	$24	$15,370,647
2055	629,486	1.02	$82	0.30	$24	$15,207,718
2056	629,486	1.02	$83	0.29	$24	$15,046,516
2057	629,486	1.02	$85	0.28	$24	$14,887,023
2058	629,486	1.02	$87	0.27	$23	$14,729,220
2059	629,486	1.02	$88	0.26	$23	$14,573,091
2060	629,486	1.02	$90	0.25	$23	$14,418,616
2061	629,486	1.02	$92	0.25	$23	$14,265,779
2062	629,486	1.02	$94	0.24	$22	$14,114,561
2063	629,486	1.02	$96	0.23	$22	$13,964,947
2064	629,486	1.02	$98	0.22	$22	$13,816,918
2065	629,486	1.02	$100	0.22	$22	$13,670,459
2066	629,486	1.02	$102	0.21	$21	$13,525,552
2067	629,486	1.02	$104	0.21	$21	$13,382,181
2068	629,486	1.02	$106	0.20	$21	$13,240,330
2069	629,486	1.02	$108	0.19	$21	$13,099,983
2070	629,486	1.02	$110	0.19	$21	$12,961,123
					PV Sum =	$748,445,550
					Annualized PV Sum =	$29,088,706

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Construction Capital Costs (Field and Non-Contract)

NOTE: Yellow Cells Are Interactive:

Capital Construction (Field-2015$):	$1,659,800,000	**Costs:**	
Ave. An. Capital Outlays-with Contingencies (2020-2023):	$414,950,000	**Estimated PV:**	$1,791,548,379
Capital Constriction Non-Contract with Contin. (Env./Eng./Adm):	$252,200,000	**Annualized PV:**	$69,629,414
Ave. An. Capital Non Contracts Outlays (2016-2019) @18% An	$45,396,000		
Ave. An. Capital Non-Contract Outlays (2020-2023) @7% An. $	$17,654,000		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2010-60):	3.0%		
Annual PV Rate Factor:	0.970		

Year	Annual Cap. Construction Costs-2015$	Escalation Rate Factor	Annual Cap. Construction Escalated	Annual Cap. on-Contract Const. Costs-2015$	Escalation Rate Factor	Annual Cap. Non-Contract Const. Escalated	Annual Total Const. Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	$0	1.00	$0	$0	1.00	$0
2016	$0	1.020	$0	$45,396,000	1.02	$46,303,920	$46,303,920	0.97	$44,914,802
2017	$0	1.040	$0	$45,396,000	1.04	$47,229,998	$47,229,998	0.94	$44,438,705
2018	$0	1.061	$0	$45,396,000	1.06	$48,174,598	$48,174,598	0.91	$43,967,655
2019	$0	1.082	$0	$45,396,000	1.08	$49,138,090	$49,138,090	0.89	$43,501,598
2020	$414,950,000	1.104	$458,138,329	$17,654,000	1.10	$19,491,442	$477,629,772	0.86	$410,156,937
2021	$414,950,000	1.126	$467,301,096	$17,654,000	1.13	$19,881,271	$487,182,367	0.83	$405,809,273
2022	$414,950,000	1.149	$476,647,118	$17,654,000	1.15	$20,278,897	$496,926,015	0.81	$401,507,695
2023	$414,950,000	1.172	$486,180,060	$17,654,000	1.17	$20,684,475	$506,864,535	0.78	$397,251,713
2024	$0	1.195	$0	$0	1.20	$0	$0	0.00	$0
2025	$0	1.219	$0	$0	1.22	$0	$0	0.00	$0
2026	$0	1.243	$0	$0	1.24	$0	$0	0.00	$0
2027	$0	0.000	$0	$0	1.27	$0	$0	0.00	$0
2028	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2029	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2030	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2031	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2032	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2033	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2034	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2035	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2036	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2037	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2038	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2039	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2040	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2041	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2042	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2043	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2044	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2045	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2046	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2047	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2048	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2049	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2050	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2051	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2052	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2053	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2054	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2055	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2056	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2057	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2058	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2059	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2060	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2061	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2062	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2063	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2064	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2065	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2066	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2067	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2068	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2069	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
2070	$0	0.000	$0	$0	0.00	$0	$0	0.00	$0
Sum Col. =	$1,659,800,000		Sum Col. =	$252,200,000				PV =	$1,791,548,379
								Annualized PV =	$69,629,414

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Project Annual OM&R Capital Costs (without Power)

NOTE: Yellow Cells Are Interactive:

Project Annual OM&R Costs (2015$):	$3,440,545	**Costs:**	
Ave. An. OM&R Outlays (2015$) @__% Capital Constructio	$3,440,545	**Estimated PV:**	$116,186,055
% Capital Construction (Annual. Factor Adj.):	0.002073	**Annualized PV:**	$4,515,628
Project Annual OM&R Costs (2015$):	$3,440,545		
Pre-PV Escalation Annaul Rate% (with Inflation):	2.0%		
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
Annual PV Rate Factor:	0.970		

Year	Annual OM&R Costs-2015$	Escalation Rate Factor	Annual OM&R Costs Escalated	PV Discount Rate Factor	PV Annual Cap. Construction $
2015	$0	1.000	$0	1.00	$0
2016	$0	1.020	$0	0.97	$0
2017	$0	1.040	$0	0.94	$0
2018	$0	1.061	$0	0.91	$0
2019	$0	1.082	$0	0.89	$0
2020	$0	1.104	$0	0.86	$0
2021	$0	1.126	$0	0.83	$0
2022	$0	1.149	$0	0.81	$0
2023	$0	1.172	$0	0.78	$0
2024	$3,440,545	1.195	$4,111,769	0.76	$3,125,895
2025	$3,440,545	1.219	$4,194,005	0.74	$3,092,760
2026	$3,440,545	1.243	$4,277,885	0.72	$3,059,977
2027	$3,440,545	1.268	$4,363,443	0.69	$3,027,541
2028	$3,440,545	1.294	$4,450,711	0.67	$2,995,449
2029	$3,440,545	1.319	$4,539,726	0.65	$2,963,698
2030	$3,440,545	1.346	$4,630,520	0.63	$2,932,282
2031	$3,440,545	1.373	$4,723,131	0.61	$2,901,200
2032	$3,440,545	1.400	$4,817,593	0.60	$2,870,447
2033	$3,440,545	1.428	$4,913,945	0.58	$2,840,021
2034	$3,440,545	1.457	$5,012,224	0.56	$2,809,916
2035	$3,440,545	1.486	$5,112,468	0.54	$2,780,131
2036	$3,440,545	1.516	$5,214,718	0.53	$2,750,662
2037	$3,440,545	1.546	$5,319,012	0.51	$2,721,505
2038	$3,440,545	1.577	$5,425,392	0.50	$2,692,657
2039	$3,440,545	1.608	$5,533,900	0.48	$2,664,115
2040	$3,440,545	1.641	$5,644,578	0.47	$2,635,875
2041	$3,440,545	1.673	$5,757,470	0.45	$2,607,935
2042	$3,440,545	1.707	$5,872,619	0.44	$2,580,291
2043	$3,440,545	1.741	$5,990,072	0.43	$2,552,940
2044	$3,440,545	1.776	$6,109,873	0.41	$2,525,879
2045	$3,440,545	1.811	$6,232,070	0.40	$2,499,104
2046	$3,440,545	1.848	$6,356,712	0.39	$2,472,614
2047	$3,440,545	1.885	$6,483,846	0.38	$2,446,404
2048	$3,440,545	1.922	$6,613,523	0.37	$2,420,472
2049	$3,440,545	1.961	$6,745,793	0.36	$2,394,815
2050	$3,440,545	2.000	$6,880,709	0.34	$2,369,430
2051	$3,440,545	2.040	$7,018,323	0.33	$2,344,314
2052	$3,440,545	2.081	$7,158,690	0.32	$2,319,464
2053	$3,440,545	2.122	$7,301,864	0.31	$2,294,878
2054	$3,440,545	2.165	$7,447,901	0.30	$2,270,552
2055	$3,440,545	2.208	$7,596,859	0.30	$2,246,485
2056	$3,440,545	2.252	$7,748,796	0.29	$2,222,672
2057	$3,440,545	2.297	$7,903,772	0.28	$2,199,112
2058	$3,440,545	2.343	$8,061,848	0.27	$2,175,801
2059	$3,440,545	2.390	$8,223,085	0.26	$2,152,737
2060	$3,440,545	2.438	$8,387,546	0.25	$2,129,918
2061	$3,440,545	2.487	$8,555,297	0.25	$2,107,341
2062	$3,440,545	2.536	$8,726,403	0.24	$2,085,003
2063	$3,440,545	2.587	$8,900,931	0.23	$2,062,902
2064	$3,440,545	2.639	$9,078,950	0.22	$2,041,036
2065	$3,440,545	2.692	$9,260,529	0.22	$2,019,401
2066	$3,440,545	2.745	$9,445,739	0.21	$1,997,995
2067	$3,440,545	2.800	$9,634,654	0.21	$1,976,816
2068	$3,440,545	2.856	$9,827,347	0.20	$1,955,862
2069	$3,440,545	2.913	$10,023,894	0.19	$1,935,130
2070	$3,440,545	2.972	$10,224,372	0.19	$1,914,618
				PV =	$116,186,055
				Annualized PV =	$4,515,628

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Pipeline Power Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32	**Costs:**	
Annual Power Value $/MWh (2015$):	$32	**Estimated PV:**	$170,646,930
Pre-PV Period Escalation Annaul Rate% (with Inflatio	2.0%	**Annualized PV:**	$6,632,277
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Use MWh	Escalation Rate Factor	ower Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.02	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	7,075	1.02	$38	0.76	$29	$205,695
2025	8,249	1.02	$39	0.74	$29	$237,295
2026	9,619	1.02	$40	0.72	$28	$273,749
2027	11,215	1.02	$41	0.69	$28	$315,804
2028	13,077	1.02	$41	0.67	$28	$364,320
2029	15,247	1.02	$42	0.65	$28	$420,289
2030	17,778	1.02	$43	0.63	$27	$484,856
2031	20,729	1.02	$44	0.61	$27	$559,342
2032	24,170	1.02	$45	0.60	$27	$645,272
2033	28,181	1.02	$46	0.58	$26	$744,402
2034	32,859	1.02	$47	0.56	$26	$858,761
2035	38,313	1.02	$48	0.54	$26	$990,689
2036	44,673	1.02	$49	0.53	$26	$1,142,884
2037	52,088	1.02	$49	0.51	$25	$1,318,460
2038	60,733	1.02	$50	0.50	$25	$1,521,009
2039	70,814	1.02	$51	0.48	$25	$1,754,675
2040	82,568	1.02	$52	0.47	$25	$2,024,238
2041	96,274	1.02	$54	0.45	$24	$2,335,212
2042	112,253	1.02	$55	0.44	$24	$2,693,961
2043	130,886	1.02	$56	0.43	$24	$3,107,822
2044	152,611	1.02	$57	0.41	$23	$3,585,263
2045	177,942	1.02	$58	0.40	$23	$4,136,051
2046	207,478	1.02	$59	0.39	$23	$4,771,454
2047	241,916	1.02	$60	0.38	$23	$5,504,471
2048	283,000	1.02	$62	0.37	$23	$6,371,025
2049	283,000	1.02	$63	0.36	$22	$6,303,492
2050	283,000	1.02	$64	0.34	$22	$6,236,675
2051	283,000	1.02	$65	0.33	$22	$6,170,566
2052	283,000	1.02	$67	0.32	$22	$6,105,158
2053	283,000	1.02	$68	0.31	$21	$6,040,444
2054	283,000	1.02	$69	0.30	$21	$5,976,415
2055	283,000	1.02	$71	0.30	$21	$5,913,065
2056	283,000	1.02	$72	0.29	$21	$5,850,387
2057	283,000	1.02	$74	0.28	$20	$5,788,372
2058	283,000	1.02	$75	0.27	$20	$5,727,016
2059	283,000	1.02	$76	0.26	$20	$5,666,309
2060	283,000	1.02	$78	0.25	$20	$5,606,246
2061	283,000	1.02	$80	0.25	$20	$5,546,820
2062	283,000	1.02	$81	0.24	$19	$5,488,024
2063	283,000	1.02	$83	0.23	$19	$5,429,851
2064	283,000	1.02	$84	0.22	$19	$5,372,294
2065	283,000	1.02	$86	0.22	$19	$5,315,348
2066	283,000	1.02	$88	0.21	$19	$5,259,005
2067	283,000	1.02	$90	0.21	$18	$5,203,260
2068	283,000	1.02	$91	0.20	$18	$5,148,105
2069	283,000	1.02	$93	0.19	$18	$5,093,536
2070	283,000	1.02	$95	0.19	$18	$5,039,544
					PV Sum =	$170,646,930
					Annualized PV Sum =	$6,632,277

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Pump Storage Pumping

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32	**Costs:**	
Annual Power Value $/MWh (2015$):	$32	**Estimated PV:**	$590,023,661
Pre-PV Period Escalation Annaul Rate% (with Inflatic	2.0%	**Annualized PV:**	$22,931,561
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Use MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual Produced Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	546,000	1.02	$38	0.76	$29	$15,874,124
2025	546,000	1.02	$39	0.74	$29	$15,705,859
2026	546,000	1.02	$40	0.72	$28	$15,539,376
2027	546,000	1.02	$41	0.69	$28	$15,374,659
2028	546,000	1.02	$41	0.67	$28	$15,211,688
2029	546,000	1.02	$42	0.65	$28	$15,050,444
2030	546,000	1.02	$43	0.63	$27	$14,890,909
2031	546,000	1.02	$44	0.61	$27	$14,733,065
2032	546,000	1.02	$45	0.60	$27	$14,576,895
2033	546,000	1.02	$46	0.58	$26	$14,422,380
2034	546,000	1.02	$47	0.56	$26	$14,269,503
2035	546,000	1.02	$48	0.54	$26	$14,118,246
2036	546,000	1.02	$49	0.53	$26	$13,968,592
2037	546,000	1.02	$49	0.51	$25	$13,820,525
2038	546,000	1.02	$50	0.50	$25	$13,674,028
2039	546,000	1.02	$51	0.48	$25	$13,529,083
2040	546,000	1.02	$52	0.47	$25	$13,385,675
2041	546,000	1.02	$54	0.45	$24	$13,243,787
2042	546,000	1.02	$55	0.44	$24	$13,103,403
2043	546,000	1.02	$56	0.43	$24	$12,964,507
2044	546,000	1.02	$57	0.41	$23	$12,827,083
2045	546,000	1.02	$58	0.40	$23	$12,691,116
2046	546,000	1.02	$59	0.39	$23	$12,556,590
2047	546,000	1.02	$60	0.38	$23	$12,423,490
2048	546,000	1.02	$62	0.37	$23	$12,291,801
2049	546,000	1.02	$63	0.36	$22	$12,161,508
2050	546,000	1.02	$64	0.34	$22	$12,032,596
2051	546,000	1.02	$65	0.33	$22	$11,905,050
2052	546,000	1.02	$67	0.32	$22	$11,778,857
2053	546,000	1.02	$68	0.31	$21	$11,654,001
2054	546,000	1.02	$69	0.30	$21	$11,530,469
2055	546,000	1.02	$71	0.30	$21	$11,408,246
2056	546,000	1.02	$72	0.29	$21	$11,287,318
2057	546,000	1.02	$74	0.28	$20	$11,167,673
2058	546,000	1.02	$75	0.27	$20	$11,049,295
2059	546,000	1.02	$76	0.26	$20	$10,932,173
2060	546,000	1.02	$78	0.25	$20	$10,816,292
2061	546,000	1.02	$80	0.25	$20	$10,701,639
2062	546,000	1.02	$81	0.24	$19	$10,588,202
2063	546,000	1.02	$83	0.23	$19	$10,475,967
2064	546,000	1.02	$84	0.22	$19	$10,364,921
2065	546,000	1.02	$86	0.22	$19	$10,255,053
2066	546,000	1.02	$88	0.21	$19	$10,146,350
2067	546,000	1.02	$90	0.21	$18	$10,038,798
2068	546,000	1.02	$91	0.20	$18	$9,932,387
2069	546,000	1.02	$93	0.19	$18	$9,827,104
2070	546,000	1.02	$95	0.19	$18	$9,722,937
					PV Sum =	$590,023,661
					Annualized PV Sum =	$22,931,561

Lake Powell Pipeline Benefit-Cost Analysis Version-1

Real Discount Rate and Escalation Rate

Power Supply Costs--Foregone Power at Main Project Reservoir

NOTE: Yellow Cells Are Interactive:

Annual Power Value $/MWh (2015$):	$32.0	**Costs:**	
Annual Power Value $/MWh (2015$):	$32.0	**Estimated PV:**	$26,286,972
Pre-PV Period Escalation Annaul Rate% (with Inflation):	2.0%	**Annualized PV:**	$1,021,656
PV Period Annaul Escalation Rate% (Real Rate):	2.0%		
Real Discount Rate (PV Period 2015-2070):	3.0%		
PV Annual Rate Factor:	0.970		

Year	System Foregone MWh	Escalation Rate Factor	Power Value $/MWh	PV Discount Rate Factor	PV Power Value $/MWh	Annual "Lost" Power Value $
2015	0	1.00	$32	1.00	$32	$0
2016	0	1.02	$33	0.97	$32	$0
2017	0	1.02	$33	0.94	$31	$0
2018	0	1.02	$34	0.91	$31	$0
2019	0	1.02	$35	0.89	$31	$0
2020	0	1.02	$35	0.86	$30	$0
2021	0	1.02	$36	0.83	$30	$0
2022	0	1.02	$37	0.81	$30	$0
2023	0	1.02	$37	0.78	$29	$0
2024	6,451	1.02	$38	0.76	$29	$187,553
2025	6,922	1.02	$39	0.74	$29	$199,111
2026	7,427	1.02	$40	0.72	$28	$211,382
2027	7,969	1.02	$41	0.69	$28	$224,408
2028	8,551	1.02	$41	0.67	$28	$238,238
2029	9,175	1.02	$42	0.65	$28	$252,919
2030	9,845	1.02	$43	0.63	$27	$268,506
2031	10,564	1.02	$44	0.61	$27	$285,053
2032	11,335	1.02	$45	0.60	$27	$302,620
2033	12,163	1.02	$46	0.58	$26	$321,269
2034	13,050	1.02	$47	0.56	$26	$341,068
2035	14,003	1.02	$48	0.54	$26	$362,086
2036	15,025	1.02	$49	0.53	$26	$384,400
2037	16,122	1.02	$49	0.51	$25	$408,089
2038	17,299	1.02	$50	0.50	$25	$433,238
2039	18,562	1.02	$51	0.48	$25	$459,937
2040	19,917	1.02	$52	0.47	$25	$488,281
2041	21,371	1.02	$54	0.45	$24	$518,372
2042	22,931	1.02	$55	0.44	$24	$550,318
2043	24,605	1.02	$56	0.43	$24	$584,232
2044	26,401	1.02	$57	0.41	$23	$620,236
2045	28,328	1.02	$58	0.40	$23	$658,458
2046	30,396	1.02	$59	0.39	$23	$699,037
2047	32,615	1.02	$60	0.38	$23	$742,116
2048	35,840	1.02	$62	0.37	$23	$806,846
2049	35,840	1.02	$63	0.36	$22	$798,294
2050	35,840	1.02	$64	0.34	$22	$789,832
2051	35,840	1.02	$65	0.33	$22	$781,460
2052	35,840	1.02	$67	0.32	$22	$773,176
2053	35,840	1.02	$68	0.31	$21	$764,981
2054	35,840	1.02	$69	0.30	$21	$756,872
2055	35,840	1.02	$71	0.30	$21	$748,849
2056	35,840	1.02	$72	0.29	$21	$740,911
2057	35,840	1.02	$74	0.28	$20	$733,057
2058	35,840	1.02	$75	0.27	$20	$725,287
2059	35,840	1.02	$76	0.26	$20	$717,599
2060	35,840	1.02	$78	0.25	$20	$709,992
2061	35,840	1.02	$80	0.25	$20	$702,467
2062	35,840	1.02	$81	0.24	$19	$695,020
2063	35,840	1.02	$83	0.23	$19	$687,653
2064	35,840	1.02	$84	0.22	$19	$680,364
2065	35,840	1.02	$86	0.22	$19	$673,152
2066	35,840	1.02	$88	0.21	$19	$666,017
2067	35,840	1.02	$90	0.21	$18	$658,957
2068	35,840	1.02	$91	0.20	$18	$651,972
2069	35,840	1.02	$93	0.19	$18	$645,061
2070	35,840	1.02	$95	0.19	$18	$638,224
					PV Sum =	$26,286,972
					Annualized PV Sum =	$1,021,656

FERC Avoided/Marginal Cost Analyses

Master Computation Tables

Lake Powell Pipeline FERC-1 Economic Analysis (Water Project)
Hydro System Added (Marginal) Costs to Water Supply Project
Discount/Annualized Rate at 5.4%, All Values in 2015$

Power Production Benefits:	Annual MWh	Annual Value at $37/MWh	Annual Value at $40/MWh*
Power-Inline (2048-2070 Annual Ave. MWh)	43,380	$1,605,060	$1,735,200
Power-PK & SH (2048-2070 Annual Ave. MWh)	104,500	$3,866,500	$4,180,000
Total:	147,880	$5,471,560	$5,915,200
Power-Inline (2024-2070 Annual Ave. MWh)	34,460	$1,275,020	$1,378,400
Power-PK & SH (2024-2070 Annual Ave. MWh)	78,350	$2,898,950	$3,134,000
Total:	112,810	$4,173,970	$4,512,400

Estimated Power Production Costs:	PV or 2015$	Annual. PV
Capital Construction (Over-Night 2015$)		
Direct Costs:		
HS-1 Inline Power Station	$10,407,800	------
Transmission & Substation	$2,192,200	------
Main Transmission Upgrade	$41,800	------
HS-2 Inline Power Station	$9,902,000	------
Transmission & Substation	$1,498,000	------
Main Transmission Upgrade	$170,000	------
HS-3 Inline Power Station	$10,140,000	------
Transmission & Substation	$1,460,000	------
Main Transmission Upgrade	$140,700	------
HS-4 Inline Power Station	$8,880,000	------
Transmission & Substation	$9,520,000	------
Main Transmission Upgrade	$5,300,000	------
Hurricane Cliffs Peaking Power Station	$39,581,300	------
Transmission & Substation	$6,118,700	------
Main Transmission Upgrade	$5,091,000	------
Sand Hollow Power Station	$9,341,000	------
Transmission & Substation	$5,959,000	------
Main Transmission Upgrade	$947,000	------
Total Construction Direct Costs:		
Power Station	$88,252,100	$6,005,316
All Transmission	$38,438,400	$2,615,629
Total Construction Direct Costs:		
Direct	$126,690,500	$8,620,945
Indirect @16%	$20,270,480	$1,379,351
TOTAL:	$146,960,980	$10,000,296
Estimated OMR PV-2015$ (7% Direct Constr. PV):	$8,868,335	$603,466
Added (Marginal) Power Pumping Costs:	$0	$0
Total Cost:	$155,829,315	$10,603,762

Estimated MWhs (2048-2070 average annual MWhs):	147,880	147,880
Estimated Cost Per MWh (2048-2060 average annual MWhs):	$72	$72
Estimated Annual Avoided Cost (Wholesale Power Market):	$37	$40
Estimated Annual Avoided Cost (Gas CCCT Estimate**):	$87	$87
Estimated Annual Avoided Cost (Wind-Solar):	$100-110	$100-110
Estimated MWhs (2024-2070 average annual MWhs):	112,810	112,810
Estimated Cost Per MWh (2024-2060 average annual MWhs):	$94	$94
Estimated Annual Avoided Cost (Wholesale Power Market):	$37	$40
Estimated Annual Avoided Cost (Gas CCCT Estimate**):	$87	$87
Estimated Annual Avoided Cost (Wind-Solar PV):	$100-110	$100-110

Sources: MWH, Opinion of Probable Construction Costs, 2015 (Appendix B); EIA, 2016, Power Market Data for 2013-2015, Northwest Power Pool; and NCPPC, Northwest Power Plan, 7th, 2015-16.

For Analysis Purposes Here, Inline Power Benefits Are Set at $37/MWh.

* With $3/MWh Capacity Credit (2014-15 Market Conditions)..
** With $7/MWh CO2 Social Cost Adder.

Lake Powell Pipeline FERC-2 Economic Analysis
Water Project with Pump Storage Configuration
Hydro System Added (Marginal) Costs to Water Supply Project
Discount/Annualized Rate at 5.4%, All Values in 2015$

Power Production Benefits:	Annual MWh	Annual Value at $37/MWh	Annual Value at $40/MWh*
Power-Inline (2048-2070 Annual Ave. MWh)	43,380	$1,605,060	$1,735,200
Power-PS & SH (2048-2070 Annual Ave. MWh)	629,500	$23,291,500	$25,180,000
Total:	672,880	$24,896,560	$26,915,200
Power-Inline (2024-2070 Annual Ave. MWh)	34,460	$1,275,020	$1,378,400
Power-PS & SH (2024-2070 Annual Ave. MWh)	603,350	$22,323,950	$24,134,000
Total:	637,810	$23,598,970	$25,512,400

Estimated Power Production Costs:	PV or 2015$	Annual. PV
Capital Construction (Over-Night 2015$)		
Direct Costs:		
HS-1 Inline Power Station	$10,407,800	------
Transmission & Substation	$2,192,200	------
Main Transmission Upgrade	$41,800	------
HS-2 Inline Power Station	$9,902,000	------
Transmission & Substation	$1,498,000	------
Main Transmission Upgrade	$170,000	------
HS-3 Inline Power Station	$10,140,000	------
Transmission & Substation	$1,460,000	------
Main Transmission Upgrade	$140,700	------
HS-4 Inline Power Station	$8,880,000	------
Transmission & Substation	$9,520,000	------
Main Transmission Upgrade	$5,300,000	------
Hurricane Cliffs Peaking Power Station	$39,581,300	------
Transmission & Substation	$6,118,700	------
Main Transmission Upgrade	$5,091,000	------
Sand Hollow Power Station	$9,341,000	------
Transmission & Substation	$5,959,000	------
Main Transmission Upgrade	$947,000	------
Pump Storage Afterbay to SH	(Water Project)	
Pump Storage South Reservoir	(Water Project)	
Pump Storage North Reservoir	(Water Project)	
Pump Storage Tunnels-Shaft-Penstock	$99,600,000	
Pump Storage Power Station	$363,200,000	
Main Transmission Upgrade	$8,800,000	
Total Construction PS Direct Costs	$471,600,000	
Total Construction Direct Costs:		
Power Station	$451,452,100	$30,720,091
All Transmission	$47,238,400	$3,214,445
Total Construction Direct Costs:		
Direct	$598,290,500	$40,712,046
Indirect @16%	$95,726,480	$6,513,927
TOTAL:	$694,016,980	$47,225,974
Estimated OMR PV-2015$ (7% Direct Constr. PV):	$41,880,335	$2,849,843
Added PS Power Pumping Costs ($32/MWh):	$15,456,000	$15,456,000
(483,000 MWh Annual)		
Total Cost:	$751,353,315	$65,531,817

Estimated MWhs (2048-2070 average annual MWhs):	672,880	672,880
Estimated Cost Per MWh (2048-2070 average annual MWhs):	$97	$97
Estimated Annual Avoided Cost (Wholesale Power Market):	$37	$40
Estimated Annual Avoided Cost (Gas CCCT Estimate**):	$87	$87
Estimated Annual Avoided Cost (Wind-Solar):	$100-110	$100-110
Estimated MWhs (2024-2070 average annual MWhs):	637,810	637,810
Estimated Cost Per MWh (2024-2070 average annual MWhs):	$103	$103
Estimated Annual Avoided Cost (Wholesale Power Market):	$37	$40
Estimated Annual Avoided Cost (Gas CCCT Estimate**):	$87	87
Estimated Annual Avoided Cost (Wind-Solar PV):	$100-110	$100-110

Sources: MWH, Opinion of Probable Construction Costs, 2015 (Appendix B); EIA/DOE Power Market Data for 2013-2015, Northwest Power Pool; and NPPC, Northwest Power Plan, 7th, 2015-16.

For Analysis Purposes Here, Inline Power Valyes Are Set at $37/MWh.

* With $3/MWH Capacity Credit (2014-15 Market Conditions).
** With $7/MWh CO2 Social Cost Adder.