APPENDIX C3

NRCS Economic Analysis Calculations

Present Value Calculations, Logan Northern Canal Reconstruction EIS
Note: Discount rate used is 4.125%

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Value of Energy Savings on 785 Acres		
Year	Annual Savings	Present Value
1	$72,376	$69,508.76
2	$72,376	$66,755.12
3	$72,376	$64,110.55
4	$72,376	$61,570.76
5	$72,376	$59,131.58
6	$72,376	$56,789.04
7	$72,376	$54,539.29
8	$72,376	$52,378.67
9	$72,376	$50,303.64
10	$72,376	$48,310.82
11	$72,376	$46,396.95
12	$72,376	$44,558.89
13	$72,376	$42,793.66
14	$72,376	$41,098.35
15	$72,376	$39,470.20
16	$72,376	$37,906.56
17	$72,376	$36,404.86
18	$72,376	$34,962.65
19	$72,376	$33,577.57
20	$72,376	$32,247.37
21	$72,376	$30,969.86
22	$72,376	$29,742.97
23	$72,376	$28,564.67
24	$72,376	$27,433.06
25	$72,376	$26,346.27
26	$72,377	$25,302.89
27	$72,378	$24,300.83
28	$72,379	$23,338.46
29	$72,380	$22,414.20
30	$72,381	$21,526.54
31	$72,382	$20,674.03
32	$72,383	$19,855.28
33	$72,384	$19,068.96
34	$72,385	$18,313.78
35	$72,386	$17,588.51
36	$72,387	$16,891.96
37	$72,388	$16,223.00
38	$72,389	$15,580.52
39	$72,390	$14,963.49
40	$72,391	$14,370.90
41	$72,392	$13,801.78
42	$72,393	$13,255.19
43	$72,394	$12,730.25
44	$72,395	$12,226.10
45	$72,396	$11,741.91
46	$72,397	$11,276.90
47	$72,398	$10,830.31
48	$72,399	$10,401.40
49	$72,400	$9,989.48
50	$72,401	$9,593.87
Present Value:		$1,522,132.69

Value of Energy Savings on 4748 Acres		
Year	Annual Savings	Present Value
1	$435,485	$418,232.89
2	$435,485	$401,664.24
3	$435,485	$385,751.97
4	$435,485	$370,470.08
5	$435,485	$355,793.60
6	$435,485	$341,698.53
7	$435,485	$328,161.86
8	$435,485	$315,161.45
9	$435,485	$302,676.06
10	$435,485	$290,685.29
11	$435,485	$279,169.55
12	$435,485	$268,110.01
13	$435,485	$257,488.60
14	$435,485	$247,287.98
15	$435,485	$237,491.45
16	$435,485	$228,083.03
17	$435,485	$219,047.33
18	$435,485	$210,369.58
19	$435,485	$202,035.61
20	$435,485	$194,031.80
21	$435,485	$186,345.07
22	$435,485	$178,962.85
23	$435,485	$171,873.08
24	$435,485	$165,064.19
25	$435,485	$158,525.03
26	$435,486	$152,245.28
27	$435,487	$146,214.29
28	$435,488	$140,422.21
29	$435,489	$134,859.57
30	$435,490	$129,517.29
31	$435,491	$124,386.64
32	$435,492	$119,459.23
33	$435,493	$114,727.02
34	$435,494	$110,182.26
35	$435,495	$105,817.54
36	$435,496	$101,625.72
37	$435,497	$97,599.96
38	$435,498	$93,733.67
39	$435,499	$90,020.54
40	$435,500	$86,454.50
41	$435,501	$83,029.72
42	$435,502	$79,740.61
43	$435,503	$76,581.79
44	$435,504	$73,548.11
45	$435,505	$70,634.60
46	$435,506	$67,836.51
47	$435,507	$65,149.26
48	$435,508	$62,568.46
49	$435,509	$60,089.89
50	$435,510	$57,709.51
Present Value:		$9,158,335.29

All Options: Dryland versus Irrigated Crop Value (Net Return on 4748 Acres)		
Year	Annual Increase in Net Revenue	Present Value
1	$995,441	$956,005.82
2	$995,441	$918,132.84
3	$995,441	$881,760.23
4	$995,441	$846,828.55
5	$995,441	$813,280.72
6	$995,441	$781,061.92
7	$995,441	$750,119.49
8	$995,441	$720,402.87
9	$995,441	$691,863.50
10	$995,441	$664,454.74
11	$995,441	$638,131.81
12	$995,441	$612,851.68
13	$995,441	$588,573.04
14	$995,441	$565,256.22
15	$995,441	$542,863.12
16	$995,441	$521,357.13
17	$995,441	$500,703.13
18	$995,441	$480,867.35
19	$995,441	$461,817.38
20	$995,441	$443,522.10
21	$995,441	$425,951.59
22	$995,441	$409,077.16
23	$995,441	$392,871.22
24	$995,441	$377,307.30
25	$995,441	$362,359.95
26	$995,442	$348,005.10
27	$995,443	$334,218.92
28	$995,444	$320,978.88
29	$995,445	$308,263.34
30	$995,446	$296,051.52
31	$995,447	$284,323.48
32	$995,448	$273,060.04
33	$995,449	$262,242.80
34	$995,450	$251,854.08
35	$995,451	$241,876.91
36	$995,452	$232,294.98
37	$995,453	$223,092.65
38	$995,454	$214,254.86
39	$995,455	$205,767.18
40	$995,456	$197,615.73
41	$995,457	$189,787.21
42	$995,458	$182,268.81
43	$995,459	$175,048.25
44	$995,460	$168,113.74
45	$995,461	$161,453.93
46	$995,462	$155,057.95
47	$995,463	$148,915.35
48	$995,464	$143,016.09
49	$995,465	$137,350.52
50	$995,466	$131,909.40
Present Value:		$20,934,242.61

Value of Water Losses P
20,000 acre feet savings per AF
$120,000,000

Cache Calley Crop Values, Logan Northern Canal Reconstruction EIS

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Crop	Percent of County acres in this crop	Irrigated Yield	Unit	Market Price	Total Value	Weighted Gross Return	Production Cost	Weighted Production Cost	Net Return Per Acre	Weighted Net Return Per Acre
Alfalfa Hay	0.627	5.3	Ton	$124.25	$658.53	$412.90	$251.11	$157.45	$407.42	$255.45
Other Hay	0.099	4	Ton	$122.25	$489.00	$48.41	$232.68	$23.04	$256.32	$25.38
Corn for Silage	0.062	25	Ton	$31.50	$787.50	$48.83	$386.75	$23.98	$400.75	$24.85
Corn for Grain	0.008	164	Bu	$3.59	$588.76	$4.71	$415.82	$3.33	$172.94	$1.38
Barley	0.111	91	Bu	$3.37	$306.67	$34.04	$273.86	$30.40	$32.81	$3.64
Oats	0.007	77	Bu	$2.54	$195.58	$1.37	$238.34	$1.67	-$42.76	-$0.30
All Wheat	0.086	110	Bu	$6.06	$666.60	$57.33	$294.98	$25.37	$371.62	$31.96
Total	1				Total:	$607.58	$2,093.54	$265.22	$1,599.10	**$342.36**

Crop	Percent of County acres in this crop	% if in Dryland	Dryland Yield	Unit	Market Price	Total Value	Weighted Gross Return	Production Cost	Weighted Production Cost	Net Return per Acre	Weighted Net Return Per Acre
Alfalfa Hay	0.627	0.200	1.6	Ton	$124.25	$198.80	$39.76	$75.81	$15.16	$122.99	$24.60
Other Hay	0.099				$122.25	$0.00					
Corn for Silage	0.062				$31.50	$0.00					
Corn for Grain	0.008				$3.59	$0.00					
Barley	0.111				$3.37	$0.00					
Oats	0.007				$2.54	$0.00					
All Wheat	0.086	0.800	40	Bu	$6.06	$242.40	$193.92	$107.27	$85.82	$135.13	$108.10
Total	1.000	1.000				Total:	$233.68	$183.08	$100.98	$258.12	**$132.70**

Total Crop Acres Under Project	4,748
Difference in Net Return	$209.65
Total Annual Benefit on All Acres	**$995,441.06**

	Acres	AC FT/AC	Value/AC FT	Total Value
Estimated value of water rights:	4,748	3	$6,000	$85,464,000

Data Sources: USU Extension County Profiles, Cache County; 2009 Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report; NRCS Utah State Agronomis
Total irrigated acres are assumed to be planted in the same proportion as total acres overall. Dryland acres currently make up a negligible proportion of all acres in the County.
"% if in Dryland" is based on typical dryland planting proportions within the Utah.

Summary of Values, Logan Northern Canal Reconstruction EIS

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Narrative	Calculation	
Water and Energy savings due to gravity pressurization of system from 3100N to 1400N, 785 acres over life of system with conversion from flood irrigation (50% efficiency) to sprinkler systems (85% efficient). Estimated 5,900 acre-in of water savings. Energy savings, based on Et rates, approximately 18,000 acre-in of water is needed per year, at a electric pumping cost of $4/ac-in equals $72,376 savings to area per year, over the course of project life, minimum 25 years, $1.8 million in today's dollars.	Value of energy savings (due to pressurization) for 785 acres over 50 years	$1,522,133
Future development of gravity pressurized system to all Logan Northern water users, 4748 acres, $10.8 million over 25 years.	Value of energy savings (due to pressurization) for 4748 acres over 50 years	$9,158,335
Water savings due to lining of Irrigation canal, estimated 20% loss in 1.6 miles stretch, 25 cfs savings at 90acres/cfs irrigation application, an additional 2250 acres could be brought into production. Anticipated water savings of 40% from Sta 85+25 through Sta 243+34	Estimated total water savings based on prevented losses to seepage and evaporation: 20,000 acre feet per year; estimated market value of water rights for this amount ≈ $120,000,000 (based on approx. market value of $6,000/acre foot)	$120,000,000
Existing Irrigation canals to be used solely for storm water runoff by cities, projected $120 to $180 million savings to communities.	--	
	Value of difference in crops on 4748 acres, irrigated versus dryland production, over 50 years	$20,934,243

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