

FAX



BUREAU OF RECLAMATION

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Date: 02-10-03

To: Dave Miller

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From: Brent Uilenberg

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Comments:

Dave,

I am faxing summary sheets of all ² transmountain diversion alternatives analyzed as part of Upper Gunnison - Uncompagre Basin Study. Detail sheets to follow via snail mail.

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Total Pages Including Cover Sheet: 3

Transmountain Diversion Alternative Summary Sheet

Alternative Description	Annual Cost/AF	Annual Cost/AF w/ 90% Tunnels	Annual Cost/AF w/ 80% Tunnels	Annual Cost/AF w/ 70% Tunnels	Annual Cost/AF w/ 60% Tunnels	Annual Cost/AF w/ 50% Tunnels
ALTERNATIVE #1 (60,000 AF/yr) Transmountain Diversion from Taylor Park to Arkansas R., gravity delivery system following Buena Vista Route.	\$534	\$486	\$438	\$390	\$342	\$295
ALTERNATIVE #2 (60,000 AF/yr) Transmountain Diversion from Taylor Park to S. Platte R., gravity delivery system following Buena Vista Route.	\$902	\$834	\$766	\$698	\$630	\$563
ALTERNATIVE #3 (60,000 AF/yr) Transmountain Diversion from Taylor Park to Arkansas R., PUMP lift from Taylor Park, following Buena Vista Pump Route.	\$337	\$318	\$299	\$280	\$261	\$242
ALTERNATIVE #4 (60,000 AF/yr) Transmountain Diversion from Taylor Park to S. Platte R., PUMP lift from Taylor Park, following Buena Vista Pump Route.	\$655	\$633	\$611	\$589	\$567	\$545
ALTERNATIVE #5 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to Arkansas R., gravity delivery system following Buena Vista Route.	\$441	\$422	\$402	\$382	\$362	\$343
ALTERNATIVE #6 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to S. Platte R., gravity delivery system following Buena Vista Route.	\$648	\$619	\$590	\$561	\$532	\$503
ALTERNATIVE #7 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to Arkansas R., PUMP lift from Taylor Park following Buena Vista Pump Route.	\$387	\$380	\$372	\$364	\$357	\$349
ALTERNATIVE #8 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to S. Platte R., PUMP lift from Taylor Park following Buena Vista Pump Route.	\$505	\$494	\$484	\$474	\$463	\$453
ALTERNATIVE #9 (60,000 AF/yr) Transmountain Diversion from Taylor Park to Arkansas R., PUMP lift from Taylor Park, following North Route.	\$556	\$510	\$463	\$417	\$370	\$324
ALTERNATIVE #10 (60,000 AF/yr) Transmountain Diversion from Taylor Park to S. Platte R., PUMP lift from Taylor Park, following North Route.	\$746	\$685	\$624	\$564	\$503	\$442
ALTERNATIVE #11 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to Arkansas R., PUMP lift from Taylor Park following North Route.	\$460	\$441	\$422	\$402	\$383	\$364
ALTERNATIVE #12 (210,000 AF/yr) PUMP lift from Blue Mesa to Taylor Park, transmountain diversion from Taylor Park to S. Platte R., PUMP lift from Taylor Park following North Route.	\$550	\$525	\$500	\$475	\$450	\$425

Alternative Description	Annual Cost/AF					
ALTERNATIVE #13 *(120,000 AF/yr) Union Park Water Supply Project.	\$875	\$836	\$798	\$760	\$721	\$683
ALTERNATIVE #14 (73,100 AF/yr) Collesiate Range Project.	\$833	\$776	\$718	\$661	\$603	\$546
ALTERNATIVE #15 (73,100 AF/yr) Collesiate Range Project w/o Almont Dam.	\$831	\$773	\$716	\$658	\$601	\$543
ALTERNATIVE # 16 (210,000 AF/yr) Pump lift from Blue Mesa to Tomichi Creek Tunnel, transmountain diversion to Arkansas R., following S. Arkansas R. Route.	\$405	\$387	\$368	\$350	\$331	\$313
ALTERNATIVE # 17 (60,000 AF/yr) Pump lift from Blue Mesa to Tomichi Creek Tunnel, transmountain diversion to Arkansas R., following S. Arkansas R. Route.	\$723	\$679	\$634	\$589	\$545	\$500
ALTERNATIVE # 18 (210,000 AF/yr) Pump lift from Blue Mesa to Monarch Tunnel, transmountain diversion to Arkansas R., following S. Arkansas R. Route.	\$358 ----	\$348 ---	\$338 ----	\$328 ----	\$318 ----	\$308 ----
ALTERNATIVE # 19 (60,000 AF/yr) Pump lift from Blue Mesa to Monarch Tunnel, transmountain diversion to Arkansas R., following S. Arkansas R. Route.	\$623	\$594	\$565	\$536	\$508	\$479

* M&I benefit based on NECD concept of wet year storage with dry year deliveries. Actual amount of annual storage in Union Park Reservoir equals 60,000 AF.

Description: Union Park Water Supply Project

Project Water Supply (acre-feet)	
Irrigation	0
Municipal & Industrial	60,000
Recreation	0
Fish & Wildlife	0
Power	0
Total	60,000

Stream Depletion (acre-feet) 60,000

Project Power and Energy Requirements	
Power (MW)	60.0
Energy (MWH)	161,160

Project Power and Energy Produced	
Power (KW)	60.0
Energy (KWH)	84,600

Features and Cost (Jan 87 Prices)	Capacity / Size	0.9		0.8		0.7		0.6		0.5	
		Cost (x1000)	Cost w/ 90% Tunnel (x1000)	Cost w/ 80% Tunnel (x1000)	Cost w/ 70% Tunnel (x1000)	Cost w/ 60% Tunnel (x1000)	Cost w/ 50% Tunnel (x1000)	Cost w/ 40% Tunnel (x1000)	Cost w/ 30% Tunnel (x1000)	Cost w/ 20% Tunnel (x1000)	Cost w/ 10% Tunnel (x1000)
Union Park Dam	900,000 af	32,428	32,428	32,428	32,428	32,428	32,428	32,428	32,428	32,428	32,428
Union Park Inlet/Outlet Structure	D=1,000-1,450 cfs	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Union Park Intake Channel	Q=1,000-1,450 cfs	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Taylor Park Inlet/Outlet Structure	Q=1,000-1,450 cfs	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Taylor Park to Union Park Conveyance System	Q=1,000-1,450 cfs, d=8.6-11', L=11,400	26,452	26,452	26,452	26,452	26,452	26,452	26,452	26,452	26,452	26,452
Power/Pump Plant Structures and Improvements	1 EA.	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Pump/Turbine and Motor/Generator	1 EA. 60MW, Q=1,000-1,450 cfs	9,900	9,900	9,900	9,900	9,900	9,900	9,900	9,900	9,900	9,900
Accessory Electrical and Misc. Equipment	LS.	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840
Access Tunnels and Cableway	d=11', L=5,700'	7,073	6,366	5,658	4,951	4,244	3,537				
Union Park Tunnel	Q=500 cfs, d=11', L=75,400'	212,880	191,592	170,304	149,016	127,728	106,440				
South Cottonwood Creek Pipeline	Q=500 cfs, d=8', L=13,500'	8,525	8,525	8,525	8,525	8,525	8,525	8,525	8,525	8,525	8,525
Arkansas Valley Siphon	Q=500 cfs, d=8', L=64,300'	227,612	227,612	227,612	227,612	227,612	227,612	227,612	227,612	227,612	227,612
Sevenmile Creek Pipeline	Q=500 cfs, d=8', L=4,300'	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
Trout Creek Pass Tunnel	Q=500 cfs, d=11', L=29,900'	66,894	60,205	53,515	46,826	40,136	33,447				
Salt Creek Drop Structure/Creek Stabilization	Q=500 cfs, L=23,000'	3,680	3,680	3,680	3,680	3,680	3,680	3,680	3,680	3,680	3,680
Transmission Line	69 KV, L=150,000'	3,409	3,409	3,409	3,409	3,409	3,409	3,409	3,409	3,409	3,409
Subtotal		616,881	588,196	559,512	530,827	502,142	473,458				
Unlisted Items (20%)		123,376	117,639	111,902	106,165	100,428	94,692				
Subtotal		740,257	705,836	671,414	636,992	602,571	568,149				
Engineering, Const. Admin., and Legal (25%)		185,064	176,459	167,853	159,248	150,643	142,037				
Total Construction Cost		925,322	882,294	839,267	796,240	753,213	710,186				
Interest during construction n = years		121,448	115,801	110,154	104,507	98,859	93,212				
Total investment		1,046,770	998,096	949,421	900,747	852,073	803,398				
Annual Equivalent Cost											
Amortized investment (8 7/8%, 50 yr)		94,241	89,859	85,476	81,094	76,712	72,330				
O&M		4,694	4,476	4,258	4,040	3,821	3,603				
Replacement Storage @ Blue Mesa		3,000	3,000	3,000	3,000	3,000	3,000				
Annual Power and Energy Costs		11,668	11,668	11,668	11,668	11,668	11,668				
Annual Power and Energy Revenues		8,644	8,644	8,644	8,644	8,644	8,644				
Total Annual Cost		104,959	100,359	95,758	91,158	86,557	81,957				
Annual Cost per af (\$/af)		075	036	798	760	721	683				