STATE OF COLORADO

1449 DEPARTMENT OF LAW

AGRICULTURAL ENGINEERING STUDY

SOUTHERN UTE & UTE MOUNTAIN

UTE INDIAN RESERVATIONS

UTE MOUNTAIN UTE
LA PLATA WATERSHED

FINAL REPORT

DESIGN & COST ESTIMATE FOR
OFF-FARM IRRIGATION FACILITIES &
PIA DETERMINATION

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UTE MOUNTAIN UTE LA PLATA WATERSHED

D.1 GENERAL

The purpose of this task report is to present the methodology for determining practicably irrigable acreage (PIA) for the Ute Mountain Ute La Plata Watershed on the Ute Mountain Ute Reservation. The test for PIA requires that the revenues exceed the cost. The land under consideration when cropped and irrigated must return sufficient net positive income to pay for the costs of providing irrigation water to the farm headgate. In order to determine PIA it is necessary to conceptually design an irrigation transmission system to deliver water to the farm headgate for each arable parcel. The annualized cost of the off-farm irrigation water transmission system is compared to the net positive income (payment capacity) of the parcel.

Arable lands were identified by Stoneman and Landers. Potential crops, irrigation water requirements, on-farm irrigation systems cost, and other related agronomic information were prepared by Boyle and presented in Task A and B reports. Economic methodology and net agricultural returns were prepared by Western Research Corporation.

This preliminary PIA analysis compares the preliminary net agricultural return with the cost of water delivery from the primary water source to the parcel headgate. For this preliminary analysis, the highest net agricultural return for each climatic zone is used.

Off-farm irrigation transmission facilities were conceptually designed for those parcels with preliminary payment capacities greater than the off-farm water pumping costs. The pumping cost was re-evaluated, added to the facilities cost, and compared to the preliminary payment capacity.

To complete the PIA analysis, the cropping pattern and payment capacities were reviewed by the economist taking into account the practicality of the cropping pattern for the particular parcel and any agronomic costs that might be particular to the parcel. Several iterations of this process between the economist and the engineer were sometimes necessary in order to develop the most economical parcel and facilities layout. Those parcels that still exhibited positive residual payment capacity after these further analyses were then determined to be practicably irrigable.

D.2 SELECTION OF PARCELS FOR OFF-FARM DESIGN

Parcels to be considered for PIA analysis were identified in the Task B Report along with on-farm irrigation costs. The Task B report identified irrigation costs for handmove sprinkler, sideroll sprinkler, gravity (furrow or basin), center pivot, and center pivot with sprinkler in the corners. Computer tabulation compared on-farm irrigation costs to the crop payment capacity for an alfalfa/malt barley rotation.

The first step in making this task analysis was determination of the presently irrigated lands on Ute Mountain Ute Indian lands. W. W. Wheeler & Associates, Inc., hydrology consultant, identified from aerial photographs and other information available to them the lands presently irrigated and provided to Boyle a marked print of the base map. The amount of irrigated acreage was then planimetered from the base map and tabulated. It should be noted that presently irrigated land covers some land not classified and Class 6 (non-irrigable) soils as determined by Stoneman-Landers, soil consultants.

For the remaining irrigable parcels, an analysis was made to determine the residual water payment capacity when only the off-farm static pumping lift costs where added to the on-farm costs identified in Task B. Based on the elevation of the nearest water supply and the elevation of the highest point in each parcel, the static lift to serve the parcel was calculated using the computer program developed for the Task B report. The power cost to lift the annual water requirement to each field was then calculated assuming a 75 percent pumping plant efficiency which is a conservatively high assumption; and a field delivery pressure of 60 psi for all but gravity irrigated fields.

It should be noted that the parcel water payment capacity residual analysis (Appendix D.1) was slightly modified from the analysis presented in the Task B draft report. Land leveling costs for gravity irrigated fields were not included in the Task B on-farm costs. The Task B report, however, estimated land leveling quantities in the range of one foot average cuts at a cost of \$0.50 to \$1.00 per cubic yard. As a conservatively low estimate, an average 6-inch cut at \$0.50 per cubic yard for a total cost of \$403 per acre was assumed for this Task D analysis. Amortizing this cost at 8-3/8 percent interest over 50 years gives a cost of \$34.40, or in round numbers, \$35 per acre. This cost was then included in the on-farm costs for gravity irrigation.

D.3 OFF-FARM IRRIGATION TRANSMISSION SYSTEM COST

D.3.1 General

The off-farm irrigation transmission facilities will generally consist of transmission pipelines, pumping stations, and diversion facilities. Roads for access to pump stations; rights-of-way; and the extension of electrical power services to pumping stations were not included in the cost analysis. Costs for those items included are based on experience with similar facilities. All costs are then amortized using a discount rate of 8-3/8 percent over a 50 year project life.

D.3.2 Pumping Stations

Pump station costs were estimated using an equation which considers flow and horsepower as variables. The equation is based on Boyle's experience with various size agricultural pump stations which include pump motor, pump structure, valves, surge control, and power panel. The equation is:

$$\text{Cost (\$)} = 2441(\text{GPM})^{0.41} + 150(\text{HP})^{1.05}$$

where GPM is the system flow rate in gallons per minute and HP is the gross horsepower.

D.3.3 Pipelines

The cost of pipelines is estimated based on experience in water transmission pipeline work. The least cost type of pipe material for the various diameters is reflected in the estimate. Pipeline costs have been compared with pipeline cost estimates from the United States Bureau of Reclamation (USBR) Dolores Project as well as the Animas-La Plata Definite Plan Report. Installed estimated pipeline costs are shown in Table D.1.

D.3.4 River Diversion Structures

River diversion structures were included for parcels over 30 acres. The diversion structure would be constructed across the river to form a pool of water with sufficient depth for the pump to draw from. A weir type diversion structure consists of a 4 foot high wall with a footing and riprap on each side for stability and protection from ice damage. The estimated cost of the structure is $210 per foot. The diversion structures were estimated to be 50 feet long for the La Plata River.

It may not be practical to build a massive diversion to serve a small parcel. A farmer farming a small parcel with low flow requirements would probably have a simple temporary diversion which could be nothing more than a berm graded across the river with a backhoe or dozer to form a shallow pool for his pump to take suction from if

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TABLE D.1
PIPELINE COSTS

Pipe Diamet. (inch)	Installed Cost - $/ft 1/ 100 psi	150 psi	200 psi	250 psi	300 psi	350 psi
4	10.50	11.00	11.50	12.00	12.50	13.00
6	12.00	12.50	13.00	14.00	14.50	15.00
8	15.50	16.00	17.00	17.50	18.50	20.00
10	20.00	21.00	22.50	23.50	25.00	26.50
12	24.00	26.50	28.50	31.00	33.00	35.00
14	28.50	32.00	35.00	38.00	41.00	44.00
15	31.00	34.50	38.50	42.50	45.50	49.00
16	34.00	37.50	42.00	46.00	50.00	54.00
18	41.00	45.00	50.00	54.00	59.50	65.00
20	48.50	53.00	58.00	63.50	69.00	75.00
21	50.50	55.50	60.50	66.00	71.50	77.00
24	62.00	69.00	75.50	82.00	88.50	95.50
27	75.50	82.00	88.50	96.50	104.00	112.00
30	89.50	96.50	103.00	111.00	120.00	128.50
33	104.50	111.00	116.50	126.50	137.50	148.50
36	115.50	122.00	130.50	142.00	155.00	166.00

1/ Unit construction cost including 10% allowance for appurtenances.

flows in the stream are low. If stream flows were too large to allow installation of a temporary diversion, a low flow could most likely be pumped without a diversion.

The berm may require regrading several times during the irrigation season. However, the overall cost of such diversions is minimal. The decision on the type and size of diversion will vary with each parcel and would require extensive review in the field. Therefore, in order to simplify the analysis it is assumed that no special diversion structure will be required for parcels of 30 acres or less.

In cases where several parcels can be served from one diversion and the combined acreage is over 30 acres, the cost of the diversion is divided between the parcels in proportion to parcel acreage. This approach is believed to be conservative (in favor of generating PIA) and realistic for this type of analysis.

D.3.5 Other Costs

Annual maintenance of major facilities including pipelines, pump stations, and river diversions is estimated at 0.5 percent of the initial construction cost.

The cost of electrical energy is assumed to be $0.068605/KWhr for the Southern Ute area and $0.065039/KWhr for the Mountain Ute area. These are commercial user rates being charged during the first half of 1985. A detailed discussion of the power costs was previously provided.

D.3.6 Other Costs not Included

Other known costs which could be considered are costs for access roads to the pump stations, right-of-way costs where pipelines or pump stations may be on non-Indian land, and costs to provide electric power service to the pump station. These costs are either minor and/or difficult to estimate with available information. Therefore, for these preliminary analyses, they have not been considered at this time.

The cost of power line extensions to serve pumping facilities could be quite high, especially if three phase power is required. Three phase power will be required for pump stations over 25 horsepower.

D.4 PRELIMINARY PRACTICABLE IRRIGABLE ACREAGE

D.4.1 Existing Irrigated Lands

Lands currently irrigated are assumed to be PIA requiring no further evaluation. No currently irrigated acreage was found in the Ute Mountain Ute La Plata Watershed.

D.4.2 Water Supply

An examination of the hydrology data for the La Plata River shows that there is sufficient virgin flow during the summer irrigation periods to serve the potential arable lands directly from the river. Therefore, it was not necessary to perform any operational studies involving storage reservoirs.

D.4.3 Cropping Pattern

For the preliminary analysis of PIA, a cropping pattern with the highest net agricultural returns for climatic Zone F was used. Table D.2 identifies this cropping pattern as well as the net agricultural return.

D.4.4 Preliminary PIA Analysis

A preliminary PIA analysis was performed comparing a parcel's payment capacity with a preliminary estimate of the cost to pump water from the river to the parcel. This preliminary water cost was based on the static pumping lift (the difference in elevation from the water surface in the river to the elevation of the parcel) for gravity irrigated fields plus a field delivery pressure of 60 psi for sprinkler irrigation. The La Plata River, which would supply water to the parcels in the Ute Mountain Ute La Plata Watershed, is located to the west in the Ute Mountain Ute Reservation. The water surface elevation was taken at points where the river comes closest to the Ute Mountain Ute reservation. Detailed tabulations of the analysis are shown in Appendix D.1.

No parcels in the Ute Mountain Ute La Plata Watershed had a positive residual payment capacity. Table D.3 summarizes the results of the analysis.

D.4.5 Practicably Irrigable Acreage Determination

No lands were identified as PIA in the La Plata Watershed.

TABLE D.2
PRELIMINARY CROPPING PATTERN

Climatic Zone	Elevation Range, ft.	Crop Mix 1/	Maximum Net Agricultural Return 2/ $/ac/yr
A	<5,000	Corn, Soybeans	375
B	5,000-5,400	Corn, Soybeans	330
C	5,400-5,800	Corn, Soybeans	285
D	5,800-6,200	Alfalfa, Malt Barley	270
E	6,200-6,600	Alfalfa, Malt Barley	240
F	6,600-7,000	Alfalfa, Malt Barley	210
G	7,000-7,400	Alfalfa, Malt Barley	185
H	7,400-7,800	Alfalfa, Malt Barley	160
I	7,800-8,200	Grass Hay, Pasture	85
J	>8,200	Grass Hay, Pasture	70

1/ Cropping mix and maximum net agricultural return provided by Western Research Corporation, April 11, 1986.

2/ Maximum net agricultural returns do not include on-farm irrigation costs.

TABLE D.3

SUMMARY OF PRELIMINARY RESIDUAL PAYMENT CAPACITY
(Considering pumping only)

Parcel No.	Gross Acres	Prelim. Residual Payment Capacity($/ac/yr)				
		Hndmve.1/	Sdroll.2/	Grav.3/	Cntrpvt.4/	Cpvt/Hmv.5/
ML201	52	-35	-53	-98	-165	-157
ML202	78	-35	-53	-102	-133	-126
ML203	31	-30	-60	-84		
ML204	83	-43	-61	-112	-135	-128
ML205	26	-49	-81	-101		
ML206a	123	-24	-43	-89	-58	-63
ML206b	787	-55	-75	-123	-72	-80
ML206c	289	-44	-64	-112	-63	-70
ML207	23	-37	-71	-86		
ML208a	248	-57	-77	-125	-74	-82
ML208b	2335	-88	-108	-159	-103	-112
ML209	24	-37	-70	-86		
ML210	41	-32	-51	-93		
ML211	144	-38	-58	-105	-62	-69

1/ Hndmve - Handmove sprinkler, on-farm irrigation system.

2/ Sdroll - Sideroll sprinkler, on-farm irrigation system.

3/ Grav - Gravity on-farm irrigation systems.

4/ Cntrpvt - Center pivot sprinkler, on-farm irrigation system.

5/ Cpvt/hmv - Center pivot sprinkler, on-farm irrigation system with hand move in the corners.

INPUT FI[illegible] A:MLAPL1
OUTPUT FILE= A:MLAPL1.OUT

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COLORADO UTE AGRICULTURAL ENGINEERING STUDY
PRELIMINARY PIA ANALYSIS
Mountain Ute La Plata Watershed

	* * * * * ACREAGE * * * * *						**** WATER REQUIREMENTS **** PER ACRE				****** PRELIMINARY ANNUAL PAYMENT CAPACITY ****** PER ACRE						PRELIM. OFF-FARM WATER COST				
												* * * ON-FARM IRRIG. COSTS * * *									
PARCEL I.D.	FIELD SIZE (ACRES)	REDUCTION FACTOR	NET ACREAGE	ELEVATION HIGH	ELEVATION LOW	CLIMATIC ZONE	IRRIG. SYSTEM TYPE	NET FEET	IRRIG. EFF.	APPLIED	PRELIMINARY NET AG. RETURN	CAPITAL	MAINT.	LABOR	PUMPING	PRELIM. PAYMENT CAPACITY	WATER SOURCE ELEV.	STATIC LIFT	ANNUAL POWER COST/ACRE	RESIDUAL PRELIM. PAYMENT CAPACITY
M13-ML-201	52	.99	51.4	6960	6840	F	HNDMVE	1.56	.7	2.22	$ 210	$ 34	$ 4	$ 26	$ 0	$ 143	6240	720	$ 179	$-35
M13-ML-201	52	.99	51.4	6960	6840	F	SDROLL	1.56	.7	2.22	$ 210	$ 55	$ 16	$ 12	$ 0	$ 125	6240	720	$ 179	$-53
M13-ML-201	52	.99	51.4	6960	6840	F	GRAV	1.56	.65	2.4	$ 210	$ 112	$ 6	$ 27	$ 0	$ 63	6240	720	$ 161	$-98
M13-ML-201	52	.83	43.3	6960	6840	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 127	$ 51	$ 6	$ 23	$ 1	6240	720	$ 167	$-165
M13-ML-201	52	.98	51.1	6960	6840	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 119	$ 45	$ 10	$ 23	$ 11	6240	720	$ 169	$-157
M13-ML-202	78	.99	77.2	6960	6840	F	HNDMVE	1.56	.7	2.22	$ 210	$ 34	$ 4	$ 26	$ 0	$ 143	6240	720	$ 179	$-35
M13-ML-202	78	.99	77.2	6960	6840	F	SDROLL	1.56	.7	2.22	$ 210	$ 55	$ 16	$ 12	$ 0	$ 125	6240	720	$ 179	$-53
M13-ML-202	78	.99	77.2	6960	6840	F	GRAV	1.56	.65	2.4	$ 210	$ 116	$ 7	$ 27	$ 0	$ 59	6240	720	$ 161	$-102
M13-ML-202	78	.83	64.9	6960	6840	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 108	$ 43	$ 5	$ 20	$ 33	6240	720	$ 167	$-133
M13-ML-202	78	.98	76.6	6960	6840	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 100	$ 37	$ 8	$ 20	$ 43	6240	720	$ 169	$-126
M13-ML-203	31	1	31	6920	6800	F	HNDMVE	1.56	.7	2.22	$ 210	$ 36	$ 4	$ 28	$ 0	$ 140	6240	680	$ 170	$-30
M13-ML-203	31	1	31	6920	6800	F	SDROLL	1.56	.7	2.22	$ 210	$ 61	$ 17	$ 19	$ 0	$ 110	6240	680	$ 170	$-60
M13-ML-203	31	1	31	6920	6800	F	GRAV	1.56	.65	2.4	$ 210	$ 108	$ 5	$ 27	$ 0	$ 68	6240	680	$ 152	$-84
M13-ML-204	83	.99	82.1	7000	6790	F	HNDMVE	1.56	.7	2.22	$ 210	$ 34	$ 4	$ 26	$ 0	$ 143	6240	760	$ 187	$-43
M13-ML-204	83	.99	82.1	7000	6790	F	SDROLL	1.56	.7	2.22	$ 210	$ 55	$ 16	$ 12	$ 0	$ 125	6240	760	$ 187	$-61
M13-ML-204	83	.99	82.1	7000	6790	F	GRAV	1.56	.65	2.4	$ 210	$ 116	$ 7	$ 27	$ 0	$ 58	6240	760	$ 170	$-112
M13-ML-204	83	.83	69.1	7000	6790	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 104	$ 41	$ 4	$ 19	$ 39	6240	760	$ 175	$-135
M13-ML-204	83	.98	81.5	7000	6790	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 97	$ 36	$ 8	$ 19	$ 48	6240	760	$ 176	$-128
M13-ML-205	26	1	26	7000	6880	F	HNDMVE	1.56	.7	2.22	$ 210	$ 38	$ 5	$ 28	$ 0	$ 138	6240	760	$ 187	$-49
M13-ML-205	26	1	26	7000	6880	F	SDROLL	1.56	.7	2.22	$ 210	$ 65	$ 18	$ 19	$ 0	$ 106	6240	760	$ 187	$-81
M13-ML-205	26	1	26	7000	6880	F	GRAV	1.56	.65	2.4	$ 210	$ 106	$ 5	$ 27	$ 0	$ 69	6240	760	$ 170	$-101

COLORADO UTE AGRICULTURAL ENGINEERING STUDY
PRELIMINARY PIA ANALYSIS
Mountain Ute La Plata Watershed

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	* * * * * ACREAGE * * * * *							* * * * WATER REQUIREMENTS * * * * PER ACRE				* * * * * * PRELIMINARY ANNUAL PAYMENT CAPACITY * * * * * * PER ACRE						PRELIM. OFF-FARM WATER COST			
												* * * ON-FARM IRRIG. COSTS * * *								
PARCEL I.D.	FIELD SIZE (ACRES)	REDUCTION FACTOR	NET ACREAGE	ELEVATION HIGH	ELEVATION LOW	CLIMATIC ZONE	IRRIG. SYSTEM TYPE	NET FEET	IRRIG. EFF.	APPLIED	PRELIMINARY NET AG. RETURN	CAPITAL	MAINT.	LABOR	PUMPING	PRELIM. PAYMENT CAPACITY	WATER SOURCE ELEV.	STATIC LIFT	ANNUAL POWER COST/ACRE	RESIDUAL PRELIM. PAYMENT CAPACITY
M13-ML-206a	123	.99	121.7	6900	6800	F	HNDMVE	1.56	.7	2.22	$ 210	$ 37	$ 4	$ 26	$ 0	$ 141	6240	660	$ 166	$-24
M13-ML-206a	123	.99	121.7	6900	6800	F	SDROLL	1.56	.7	2.22	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6240	660	$ 166	$-43
M13-ML-206a	123	.99	121.7	6900	6800	F	GRAV	1.56	.65	2.4	$ 210	$ 117	$ 6	$ 27	$ 0	$ 58	6240	660	$ 148	$-89
M13-ML-206a	123	.83	102.4	6900	6800	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 74	$ 28	$ 2	$ 7	$ 96	6240	660	$ 155	$-58
M13-ML-206a	123	.98	120.9	6900	6800	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 69	$ 25	$ 6	$ 14	$ 93	6240	660	$ 157	$-63
M13-ML-206b	787	.97	763.3	7050	6840	F	HNDMVE	1.56	.7	2.22	$ 210	$ 35	$ 4	$ 26	$ 0	$ 142	6240	810	$ 197	$-55
M13-ML-206b	787	.97	763.3	7050	6840	F	SDROLL	1.56	.7	2.22.	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6240	810	$ 197	$-75
M13-ML-206b	787	.97	763.3	7050	6840	F	GRAV	1.56	.65	2.4	$ 210	$ 118	$ 6	$ 27	$ 0	$ 58	6240	810	$ 182	$-123
M13-ML-206b	787	.83	655.5	7050	6840	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 63	$ 24	$ 2	$ 8	$ 111	6240	810	$ 184	$-72
M13-ML-206b	787	.98	772.4	7050	6840	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 59	$ 21	$ 6	$ 17	$ 106	6240	810	$ 186	$-80
M13-ML-206c	289	.98	283.2	7000	6840	F	HNDMVE	1.56	.7	2.22	$ 210	$ 35	$ 4	$ 26	$ 0	$ 142	6240	760	$ 187	$-44
M13-ML-206c	289	.98	283.2	7000	6840	F	SDROLL	1.56	.7	2.22	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6240	760	$ 187	$-64
M13-ML-206c	289	.98	283.2	7000	6840	F	GRAV	1.56	.65	2.4	$ 210	$ 118	$ 6	$ 27	$ 0	$ 58	6240	760	$ 170	$-112
M13-ML-206c	289	.83	240.7	7000	6840	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 63	$ 24	$ 2	$ 8	$ 111	6240	760	$ 175	$-63
M13-ML-206c	289	.98	283.6	7000	6840	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 58	$ 21	$ 6	$ 17	$ 106	6240	760	$ 176	$-70
M13-ML-207	23	1	23	6820	6760	F	HNDMVE	1.56	.7	2.22	$ 210	$ 39	$ 5	$ 28	$ 0	$ 137	6120	700	$ 175	$-37
M13-ML-207	23	1	23	6820	6760	F	SDROLL	1.56	.7	2.22	$ 210	$ 67	$ 19	$ 19	$ 0	$ 103	6120	700	$ 175	$-71
M13-ML-207	23	1	23	6820	6760	F	GRAV	1.56	.65	2.4	$ 210	$ 105	$ 5	$ 27	$ 0	$ 70	6120	700	$ 157	$-86
M13-ML-208a	248	.98	243	6940	6840	F	HNDMVE	1.56	.7	2.22	$ 210	$ 35	$ 4	$ 26	$ 0	$ 142	6120	820	$ 200	$-57
M13-ML-208a	248	.98	243	6940	6840	F	SDROLL	1.56	.7	2.22	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6120	820	$ 200	$-77
M13-ML-208a	248	.98	243	6940	6840	F	GRAV	1.56	.65	2.4	$ 210	$ 118	$ 6	$ 27	$ 0	$ 58	6120	820	$ 184	$-125
M13-ML-208a	248	.83	206.5	6940	6840	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 63	$ 24	$ 2	$ 8	$ 111	6120	820	$ 186	$-74
M13-ML-208a	248	.98	243.7	6940	6840	F	CPVT/HMV	1.56	.74	2.1	$ 210	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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COLORADO UTE AGRICULTURAL ENGINEERING STUDY
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Mountain Ute La Plata Watershed

PARCEL I.D.	* * * * * ACREAGE * * * * * FIELD SIZE (ACRES)	REDUCTION FACTOR	NET ACREAGE	ELEVATION HIGH	ELEVATION LOW	CLIMATIC ZONE	IRRIG. SYSTEM TYPE	* * * * WATER REQUIREMENTS PER ACRE * * * * NET FEET	IRRIG. EFF.	APPLIED	* * * * * * PRELIMINARY ANNUAL PAYMENT CAPACITY PER ACRE * * * * * * PRELIMINARY NET AG. RETURN	* * * ON-FARM IRRIG. COSTS * * * CAPITAL	MAINT.	LABOR	PUMPING	PRELIM. PAYMENT CAPACITY	PRELIM. OFF-FARM WATER COST WATER SOURCE ELEV.	STATIC LIFT	ANNUAL POWER COST/ACRE	RESIDUAL PRELIM. PAYMENT CAPACITY
M13-ML-208b	2335	.97	2264.9	7090	6850	F	HNDMVE	1.56	.7	2.22	$ 210	$ 35	$ 4	$ 26	$ 0	$ 142	6120	970	$ 231	$-88
M13-ML-208b	2335	.97	2264.9	7090	6850	F	SDROLL	1.56	.7	2.22	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6120	970	$ 231	$-108
M13-ML-208b	2335	.97	2264.9	7090	6850	F	GRAV	1.56	.65	2.4	$ 210	$ 118	$ 6	$ 27	$ 0	$ 58	6120	970	$ 218	$-159
M13-ML-208b	2335	.83	1945	7090	6850	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 63	$ 24	$ 2	$ 8	$ 111	6120	970	$ 215	$-103
M13-ML-208b	2335	.98	2288.3	7090	6850	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 59	$ 21	$ 6	$ 17	$ 106	6120	970	$ 218	$-112
M13-ML-209	24	1	24	6820	6760	F	HNDMVE	1.56	.7	2.22	$ 210	$ 39	$ 5	$ 28	$ 0	$ 137	6120	700	$ 175	$-37
M13-ML-209	24	1	24	6820	6760	F	SDROLL	1.56	.7	2.22	$ 210	$ 66	$ 19	$ 19	$ 0	$ 104	6120	700	$ 175	$-70
M13-ML-209	24	1	24	6820	6760	F	GRAV	1.56	.65	2.4	$ 210	$ 105	$ 5	$ 27	$ 0	$ 70	6120	700	$ 157	$-86
M13-ML-210	41	.99	40.5	6830	6760	F	HNDMVE	1.56	.7	2.22	$ 210	$ 33	$ 4	$ 26	$ 0	$ 144	6120	710	$ 177	$-32
M13-ML-210	41	1	41	6830	6760	F	SDROLL	1.56	.7	2.22	$ 210	$ 55	$ 16	$ 12	$ 0	$ 125	6120	710	$ 177	$-51
M13-ML-210	41	1	41	6830	6760	F	GRAV	1.56	.65	2.4	$ 210	$ 111	$ 6	$ 27	$ 0	$ 65	6120	710	$ 159	$-93
M13-ML-211	144	.99	142.5	6850	6720	F	HNDMVE	1.56	.7	2.22	$ 210	$ 36	$ 4	$ 26	$ 0	$ 142	6120	730	$ 181	$-38
M13-ML-211	144	.99	142.5	6850	6720	F	SDROLL	1.56	.7	2.22	$ 210	$ 58	$ 16	$ 12	$ 0	$ 122	6120	730	$ 181	$-58
M13-ML-211	144	.99	142.5	6850	6720	F	GRAV	1.56	.65	2.4	$ 210	$ 117	$ 6	$ 27	$ 0	$ 58	6120	730	$ 164	$-105
M13-ML-211	144	.83	119.9	6850	6720	F	CNTRPVT	1.56	.75	2.08	$ 210	$ 67	$ 25	$ 2	$ 7	$ 106	6120	730	$ 169	$-62
M13-ML-211	144	.98	141.5	6850	6720	F	CPVT/HMV	1.56	.74	2.1	$ 210	$ 63	$ 22	$ 6	$ 16	$ 101	6120	730	$ 171	$-69