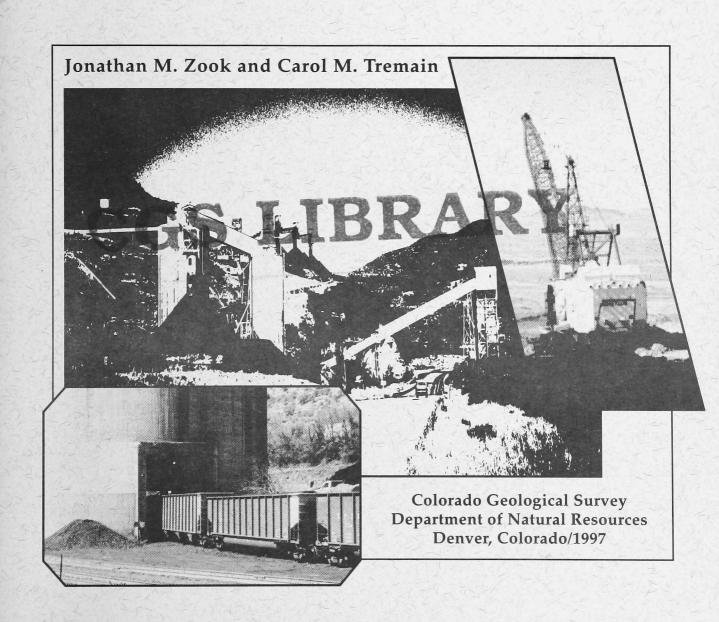
Resource Series 32

Directory and Statistics of Colorado Coal Mines with Distribution and Electric Generation Map, 1995–96



Resource Series 32

Directory and Statistics of Colorado Coal Mines with Distribution and Electric Generation Map, 1995–96

By Jonathan M. Zook and Carol M. Tremain

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Colorado Geological Survey
Department of Natural Resources
Denver, Colorado
1997

PREFACE

This directory is an update and revision of Resource Series 29 published in 1990. The purpose of the publication is to provide insight into the Colorado coal industry. The directory includes geologic, production and location data on coal mines that were operating in 1996 and two planned mines in the permitting stage. The map contains coal production, distribution, and electric generation information for 1995.

Data were compiled from previous Colorado Geological Survey publications and the following sources:

- Office of Surface Mining, U.S. Department of the Interior
- Division of Minerals & Geology, Colorado Department of Natural Resources
- State Board of Land Commissioners, Colorado Department of Natural Resources
- 1997 Keystone Coal Industry Manual

- Colorado Public Utilities Commission
- Department of Energy/Energy Information Administration, U.S. Department of the Interior

Additional information was obtained by contacting individual coal mine and power plant operators via mail, telephone and fax. The accompanying map locates mines and lists them by county and coal mine name.

Production data is tabulated by the Colorado Division of Minerals and Geology. Permit areas are shown on the individual maps accompanying the text.

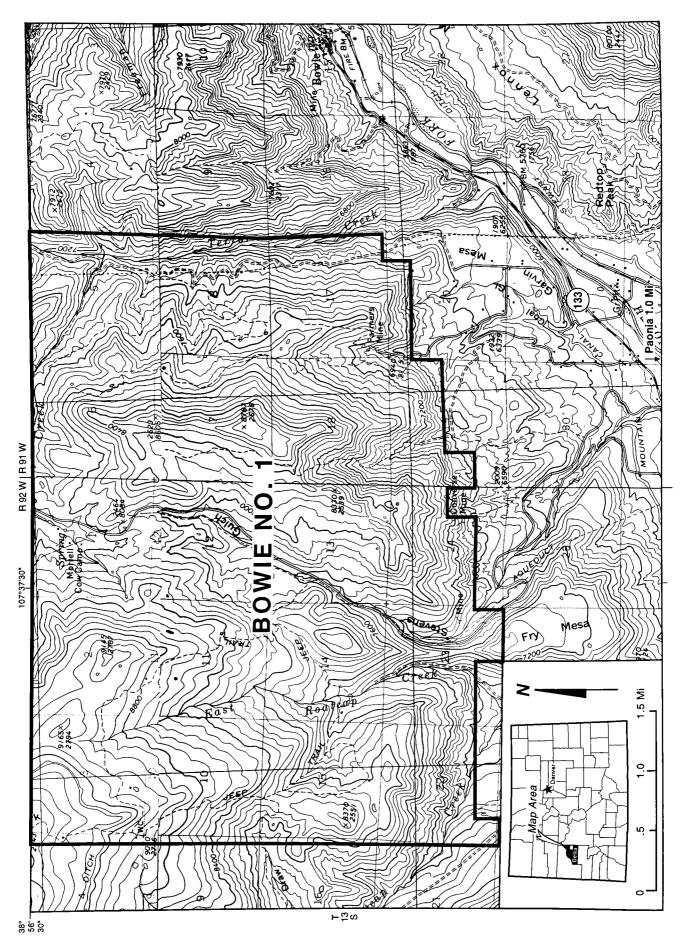
The information contained in this report is the best available at the time of writing, June 1, 1997. Accuracy and completeness cannot be guaranteed. Neither the Colorado Geological Survey nor the authors assume responsibility for incidental or consequential damages arising from use of information from this report.

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PLATE

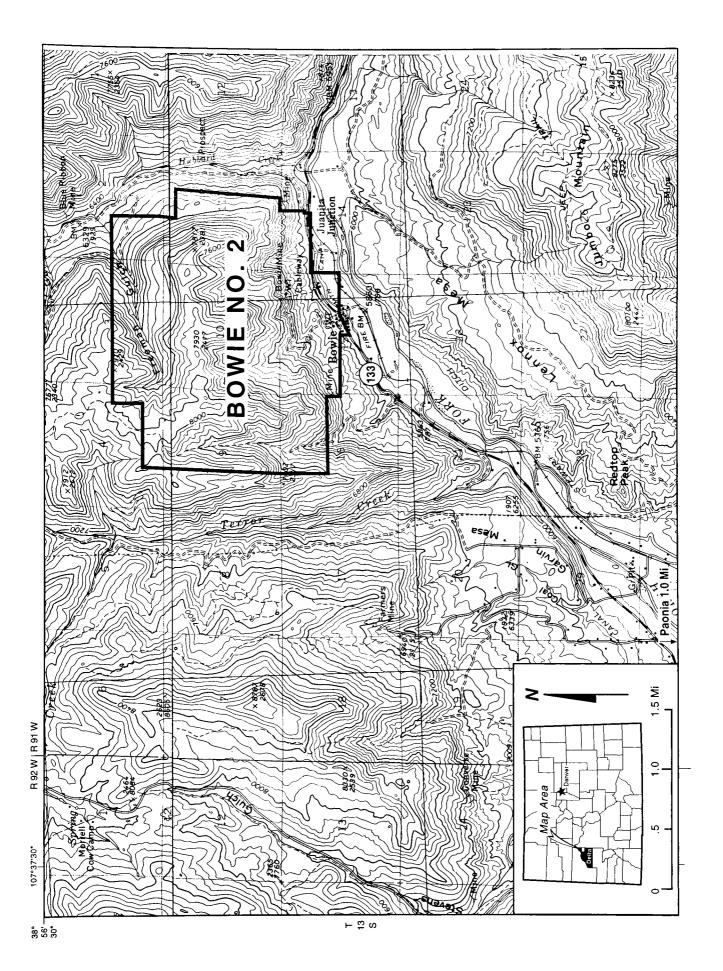
1 Coal production and distribution and electric generation map of Colorado In Pocket



BOWIE NO. 1 MINE

Map No. 1 M.L.R.D. Perm	it No. <u>C-81-038</u>				
ous Mine Names <u>Orchard Valley (Colorado Westmoreland, Inc.)</u>					
I OCATION INFORMATION					
LOCATION INFORMATION					
County <u>Delta</u>					
Permit Location (Sec., T., R.,) <u>Sec. 5–8, 17–20, , T. 13 S., R. 91 W. an</u> R. 92 W.					
Coal Region <u>Uinta</u> Topographic Quadrangle <u>Gray Reservoir, Bowie</u>	rieid Somersei				
Topographic Quadrangle Gruy Reservoir, bowle					
COMPANY INFORMATION					
Mine Operator Bowie Resources, Ltd.					
Address P. O. Box 1488, Paonia, CO 81428-1488					
Contacts Bill Bear, Jr. Telep	phone <u>(970) 527-4135</u>				
Parent Company <u>Bowie Resources, Ltd.</u>	<u></u>				
Address 1500 North Big Run Road, Ashland, KY 41102					
Contacts Al Perry, President, Bowie Coal Sales Telep	phone (812) 867-7727				
GENERAL INFORMATION					
Mine Type <u>Underground</u> Mining Mo	othod Continuous miners				
Mine Status <u>Producing</u> Start-Up					
No. of Employees Union Affili					
No. of Acres in Permit					
Surface: Federal X State					
Mineral: Federal X State					
GEOLOGIC INFORMATION					
Geologic Unit Mesaverde Group Geologic	c Age <u>Cretaceous</u>				
Coal Zone(s) or Bed(s)					
Coal Thickness(es) 10–20 ft					
Cleat Orientation and Spacing					
Dip of Bedding Strike of Bedding					
Overburden Thickness(es) <u>450–1800 ft</u>					
La Laukaund on Thiolmoss					
Interburden Thickness					

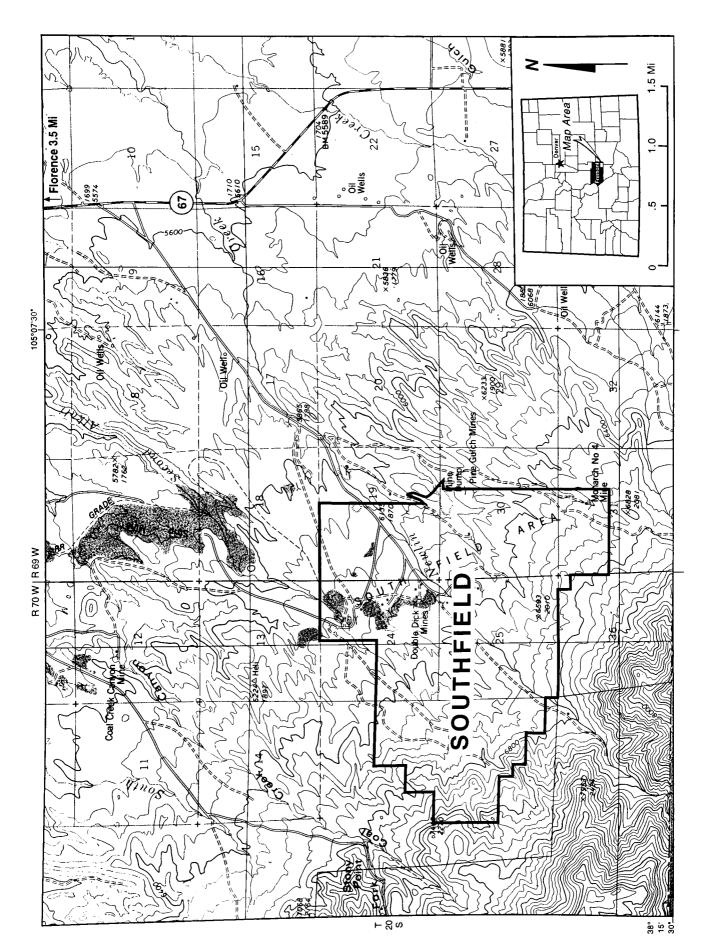
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	D			
Rank				
Moisture (%)	12.50		-	
Ash (%)	7.50			
Fixed Carbon (%)	47.0			
Volatile Matter (%)	34.6			
Sulfur (%)	0.45			, , ,
Heating Value (Btu/lb.)	11,400			
Free Swelling Index				
Hardgrove Grindability	45			
Ash-Softening Temperature (°F)	2,500			
Methane Characteristics				
Reflectance Data				-
COAL PRODUCTION				
1995 Production <u>522,384 tons</u>	19	996 Production	605,657 tons	
Cumulative Production Through 1996	15,301,65	5 tons		<u> </u>
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine	80 million tons	/2010		
Shifts Per Day 3—8 hrs		·		
Production Per Shift				
Equipment Continuous miners, shut	ttle cars, roof bolte	rs		
Haulage <u>Conveyors</u>				
Preparation Plant Crusher breaker		Tip]	ple <u>Converse</u>	
CALECDATA				
SALES DATA	Destination Inc	ductrial	Llag	
	Destination Ut		Use Use	
	Destination	шц	Use 	
	Rail		Ose	
Transportaton Mode/Mixed Modes	Kuii			
ADDITIONAL INFORMATION A	AND COMME	NTS		
Geologic Reference Map: Dunrud, Rici	hard C., 1989, Geo	ologic Map and Co	al Stratigraphic	Framework
of the Paonia Area, Delta and Gunnisc				
scale 1:50,000				



BOWIE NO. 2 MINE

Map No2	M.L.R.D. Permit No.	Applied for
Previous Mine Names <u>Orchard Valley Mine</u>		· · · · · · · · · · · · · · · · · · ·
LOCATION INFORMATION		
County Delta		
Permit Location (Sec., T., R.,) Sec. 2-4,9-11,14-16	, T. 13 S., R. 91 W.	
Coal Region <u>Uinta</u>	Field	Somerset
Topographic Quadrangle Bowie		
COMPANY INFORMATION		
Mine Operator <u>Bowie Resources, Ltd.</u>		
Address P.O. Box 1488, Paonia, CO 81428-1488	· · · · · · · · · · · · · · · · · · ·	
Contacts Bill Bear, Jr.	Telephone	(970) 527-4135
Parent Company Bowie Resources, Ltd.		
Address <u>1500 North Big Run Road, Ashland, K</u>	(41102	
Contacts <u>Al Perry, President—Bowie Coal Sales</u>	Telephone	(812) 867-7727
GENERAL INFORMATION		
Mine Type <u>Underground</u>	Mining Method	Continuous miners
Mine Status New operation	•	nticipated 1997
No. of Employees	-	•
No. of Acres in Permit1496		
	ite	Private X
		Private X
GEOLOGIC INFORMATION		
Geologic Unit <u>Mesaverde Group</u>	Geologic Age	Cretaceous
Coal Thickness(es) 10–20 ft	 11	
Cleat Orientation and Spacing		
Dip of Bedding <u>2-5° NNE</u>		
Overburden Thickness(es) 450–1800 ft		
T . 1 1 771 1		
Interburden Thickness		

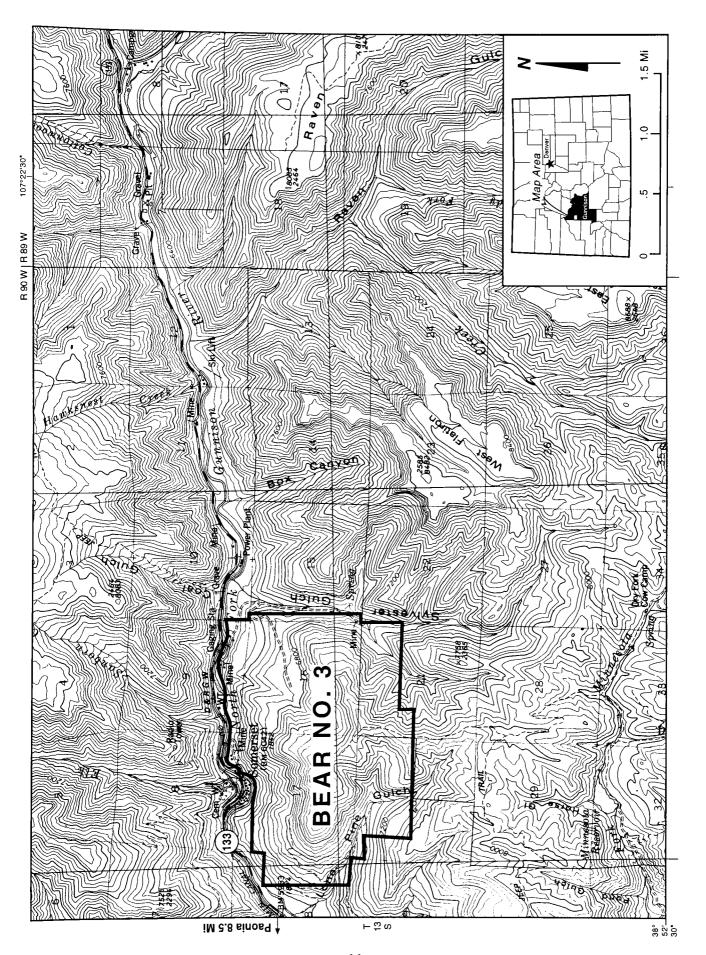
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	D	В	_	
Rank				
Moisture (%)	12.5	7.0		
Ash (%)	7.5	7.5	·	
Fixed Carbon (%)	47.0	49.0		
Volatile Matter (%)	34.6	36.5		
Sulfur (%)	0.45	0.50		
Heating Value (Btu/lb.)	11,400	12,300		
Free Swelling Index				.,
Hardgrove Grindability	45	58		
Ash-Softening Temperature (°F)	2,500	2,480		
Methane Characteristics				
Reflectance Data				
COAL PRODUCTION				
1995 Production New operation of				
Cumulative Production Through 199				
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine				
Shifts Per Day Production Per Shift			-	71.
	uttle save woof heltone			
Equipment <u>Continuous miners, shu</u> Haulage Conveyers	ittle cars, roof botters	-		····
	·	Tinal	o Coursiana	
Preparation Plant <u>Crusher breake</u>	1	Tippl	e <u>Converse</u>	
SALES DATA				
Percent In-State	Destination		Use	
Percent Out-of-State	Destination			
Percent Export				
Transportaton Mode/Mixed Modes				
				-
ADDITIONAL INFORMATION		ENTS		
Geologic Reference Map: See Bowie I	Vo. 1			
				
	· · · · -			



SOUTHFIELD MINE

Map No3	M.L.R.D. Permit No. <u>C-81-014</u>				
	ine Names Dorchester No. 1 (Dorchester Gas)				
LOCATION INFORMATION					
County Fremont					
	20 S., R. 69 W. and Secs. 23–26,36 T. 20 S., R. 70 W.				
Coal Region Canon City	Field Canon City				
Topographic Quadrangle Rockvale					
COMPANY INFORMATION					
Mine Operator <u>Energy Fuels Coal, Inc.—So</u>	uthfield Mine				
Address P. O. Box 459, Florence, CO 81226					
Contacts <u>George Patterson</u>	Telephone <u>(719) 784</u> –6395				
Parent Company <u>Energy Fuels Coal, Inc.</u>					
Address 1200 17th St., Ste. 1000, Denver, Co	80202				
Contacts Rich A. Munson	Telephone <u>(303) 893-6996</u>				
GENERAL INFORMATION					
Mine Type	Mining Method <u>Continuous miners</u>				
Mine Status Producing					
No. of Employees 40					
No. of Acres in Permit					
	State Private X				
Mineral: Federal	State Private X				
GEOLOGIC INFORMATION					
Geologic Unit <u>Vermejo Formation</u>	Geologic Age <u>Cretaceous</u>				
Coal Zone(s) or Bed(s) Dirty Jack O' Lante	rn, Red Arrow				
Coal Thickness(es) Dirty Jack O' Lantern—					
Cleat Orientation and Spacing In SESW Sec. 19, 20 S. 69 W. the face cleat strike is 285°					
-	Strike of Bedding N to N 40 E				
Overburden Thickness(es) <u>0–1300 ft</u>					
Interburden Thickness Dirty Jack O' Lan	tern-Red Arrow: 29 ft				

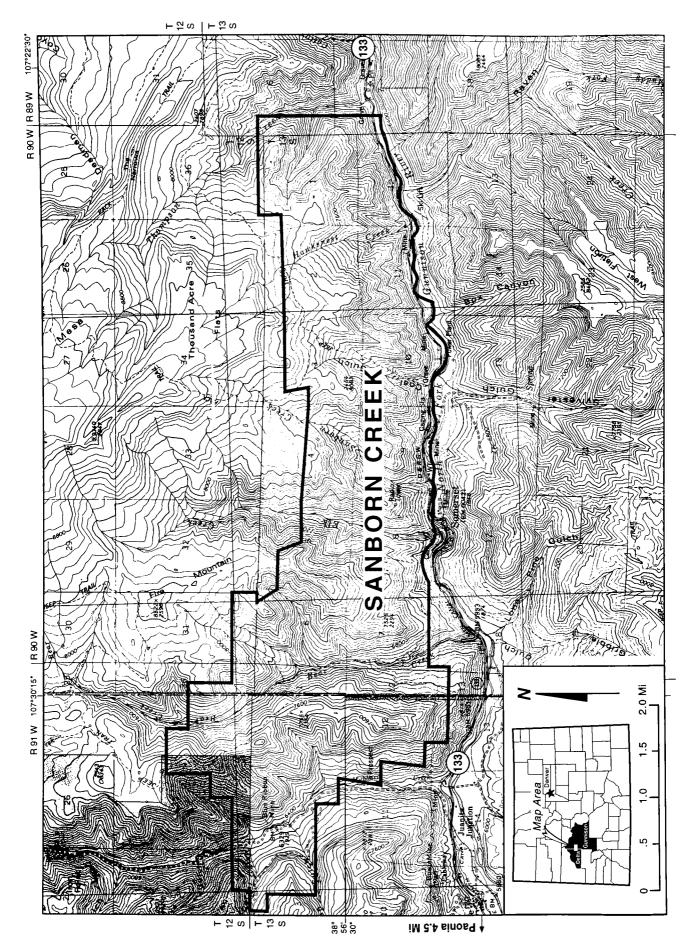
COAL QUALITY	Sampl	e 1 Sample 2	Sample 3	Sample 4
Seam	Dirty Ja	ck		
Rank	Bitumir	ious	W	
Moisture (%)	10.0	11.0		
Ash (%)	10.0	9.0		
Fixed Carbon (%)	35.0	46.0		
Volatile Matter (%)	44.0	34.0		
Sulfur (%)	0.6	0.6		
Heating Value (Btu/lb.)	11,000	11,100		
Free Swelling Index	0.5			
Hardgrove Grindability	45			
Ash-Softening Temperature (°F)	2,650			
Methane Characteristics	Minima	ıl		
Reflectance Data				
COAL PRODUCTION				
1995 Production 1995—302,233 to	ns	1996 Product	ion <u>170,3</u>	87 tons
Cumulative Production Through 1996	5,476,0	 051 tons		
Projected Production (tpy) 1997	•			-
Remaining Reserves/Life of Mine	10 years			
Shifts Per Day 2—8 hrs				
Production Per Shift				
Equipment Continuous miners				
Haulage Electric shuttle cars				
Preparation Plant Wash		Тірр	le	
SALES DATA				
	Destination	Canon City, Florence	Use S	team
	_	New Mexico		team
		TVEW TVICATED		icum
Transportation Mode/Mixed Modes	Truck			
	11 MCR			<u> </u>
ADDITIONAL INFORMATION A	AND COM	MENTS		
Geologic Map Reference: Scott, G.R., 1	1974, Reconna	issance Geologic Map o	of the Rockvale (Quadrangle,
Custer and Fremont Counties, Colorad	do, U.S. Geolog	gical Survey Map MF-	562, scale 1:24,	000



BEAR MINE NO. 3

Map No. <u>4</u>	M.L.R.D. Permit No.	C-81-033
Previous Mine Names <u>Bear No. 1 and Bear</u>		
LOCATION INFORMATION		
County Gunnison		
Permit Location (Sec., T., R.,) <u>Sec. 8,9,16–21, T.</u>	13 3., K. 30 VV.	
Coal Region Uinta	Field_	Somerset
Topographic Quadrangle Somerset		
COMPANY INFORMATION		
Mine Operator Bear Coal Co., Inc.		
Address P.O. Box 518, Somerset, CO 814334		
Contacts <u>Daniel E. Bear or David J. Hurr</u>	Telephone	(970) 929-5775
Parent Company		
Address		
Contacts	Telephone	
GENERAL INFORMATION		
Mine Type <u>Underground</u>	Mining Method	Continuous miners
Mine Status <u>Producing</u>	-	
No. of Employees 54		
No. of Acres in Permit 1652		
		Private X
Mineral: Federal X		
GEOLOGIC INFORMATION		
Geologic Unit <u>Mesaverde Group</u>	Geologic Age	Upper Cretaceous
Coal Zone(s) or Bed(s)B		
Coal Thickness(es) B: 8–10 ft		
Cleat Orientation and Spacing		
Dip of Bedding 3.5–6.25° NE		
Overburden Thickness(es) 100–1400 ft	-	
Interburden Thickness		
	· · · · · · · · · · · · · · · · · · ·	

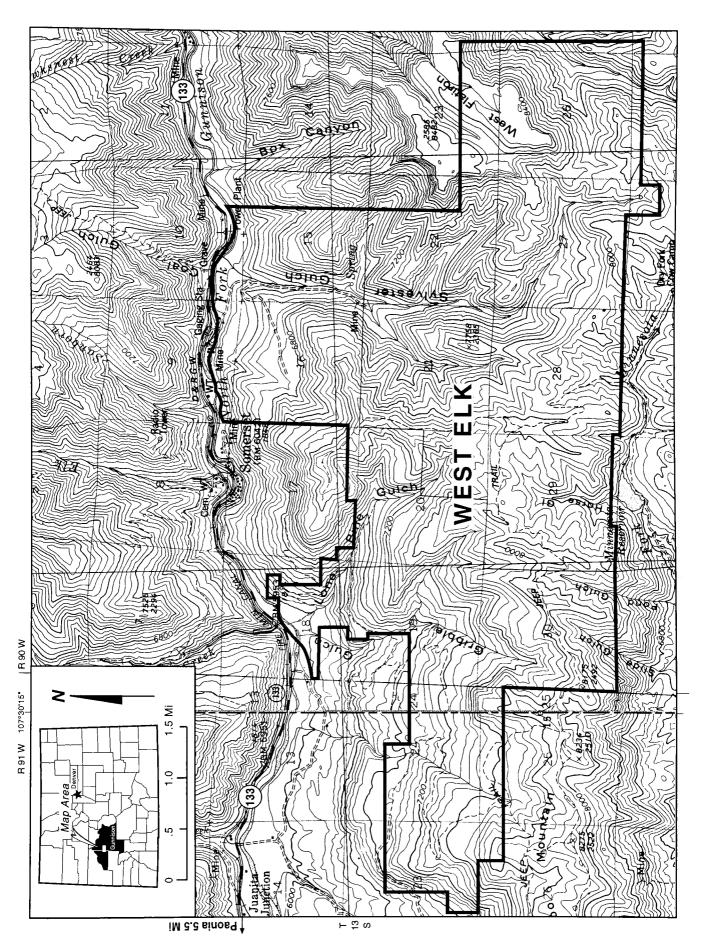
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	ם D	1	-	•
Rank				
Moisture (%)	8.5			
Ash (%)	8.0			
Fixed Carbon (%)	52.0		· · · · · · · · · · · · · · · · · · ·	
Volatile Matter (%)	41.0			.
Sulfur (%)	0.5			
Heating Value (Btu/lb.)	12,200			
Free Swelling Index				
Hardgrove Grindability	46		- · · · · · · · · · · · · · · · · · · ·	
Ash-Softening Temperature (°F)	2,550			
Methane Characteristics				
Reflectance Data				
COAL PRODUCTION				
1995 Production <u>468,002 tons</u>	199	6 Production	335,763 tons	
Cumulative Production Through 199	6 <u>9,107,275</u> to	ns		
Projected Production (tpy) 1997	None—closed 11/11/	96		
Remaining Reserves/Life of Mine _				
Chifte Day Day 2 0 love				
Production Per Shift1000 tons				
Equipment <u>Continuous miner, roof</u>	bolters, shuttle cars			
Haulage Belt				
Preparation PlantN/A		Tipple	N/A	
SALES DATA				
Percent In-State100	Destination Color	ado	Use St	eam
Percent Out-of-State			 Use	
Percent Export	 Destination		Use	
Transportation Mode/Mixed Modes	Rail—D&RGW	(Southern Pacific)		
	AND COMMENT	T.C.		
ADDITIONAL INFORMATION				
All coal is sold through an exclusive		Pacific Basin Kesou	rces for resale	
Geologic Map Reference: See Bowie l	No. 1	- 1A - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		



SANBORN CREEK MINE

Map No5	M.L.R.D. Permit No. <u>C-81-022</u>
Previous Mine Names	
LOCATION INFORMATION County Gunnison	
Permit Location (Sec., T., R.,) <u>Sec. 6,7, T. 13 S, R. 89</u>	W. Sec. 31 T 12 S R 90 W. Sec. 34_36 T 12 S
R. 91 W., Sec. 1–12, T 13 S., R. 90 W.; Sec 1–3, 11–	
Coal Region	
The control of the co	21010
COMPANY INFORMATION Mine Operator Oxbow Carbon and Minerals, Inc.	
Address <i>P.O. Box 535, Somerset, CO 81434</i>	
Contacts Walter Wright	
Parent Company <u>Oxbow Carbon and Minerals</u>	
Address 7901 S. Park Plaza, Suite 202, Littleton, C	
Contacts Paul Fritzler	Telephone <u>(303) 795-0413</u>
GENERAL INFORMATION Ming Type - Underground	Mining Method <u>Continuous</u>
71	Start-Up Date 1991
<u> </u>	Union Affiliation N/A
No. of Acres in Permit9,047	
	Private3,553
	Private 3,270
GEOLOGIC INFORMATION Geologic Unit	Geologic Age <u>Upper Cretaceous</u>
Coal Thickness(es) 18 ft	
Cleat Orientation and Spacing	
	Strike of Bedding S 27° E
Overburden Thickness(es)500-2,500 ft	
Interburden Thickness40–60 ft	

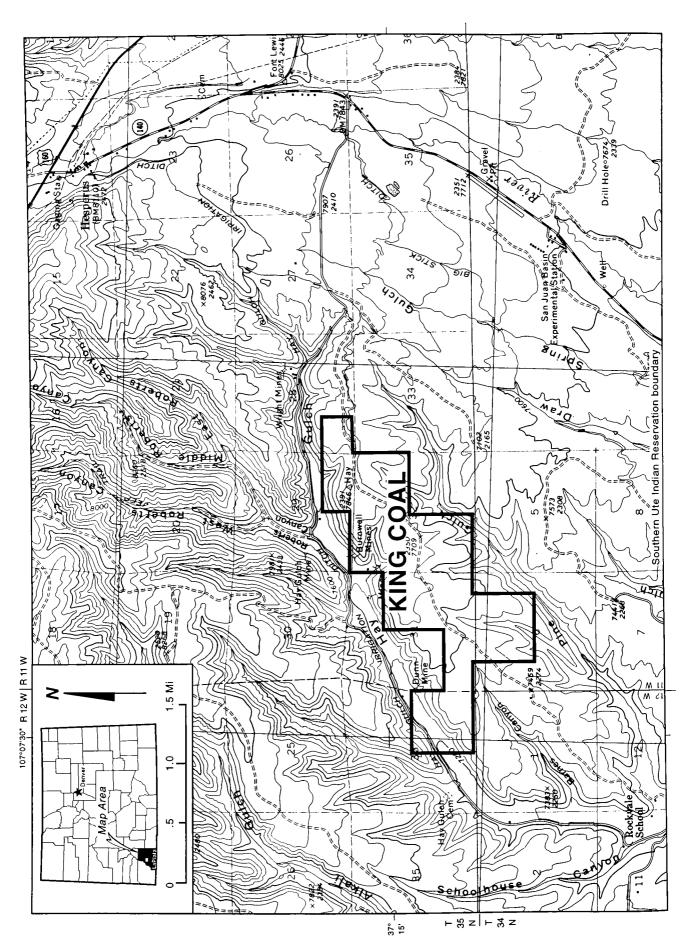
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	B			
Rank				
Moisture (%)	6.25			
Ash (%)	8.59			
Fixed Carbon (%)	47.25		ad 18	
Volatile Matter (%)	38			
Sulfur (%)	0.55		-1114	
Heating Value (Btu/lb.)	12,375			
Free Swelling Index	2.5			
Hardgrove Grindability	48			
Ash-Softening Temperature (°F)	2,470			
Methane Characteristics				
Reflectance Data	0.74			
COAL PRODUCTION			4 4 5	7.404 .
1995 Production				
Cumulative Production Through 1996 _				
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine	12 million tons			
Shifts Per Day 3—8 hrs				
Production Per Shift 4,400 tons per	day			
Equipment <u>Continuous miners</u>			***	
Haulage <u>Belt</u>				
Preparation Plant	·	Tippl	e	
CALECDATA				
SALES DATA Paragent In State	Destination		Use	
	Destination			
Percent Out-of-State I Percent Export I				Stm & metallurg
•				
Transportation Mode/Mixed Modes	Kan—Soutnern	Рисіліс		
ADDITIONAL INFORMATION A	ND COMMEN	TS		
Geologic Map Reference: See Bowie No	. 1			
•			,, ,, , , , , , , , , , , , , , , , ,	



WEST ELK MINE

Map No 6	M.L.R.D. Permit No. <u>C-80-007</u>			
Previous Mine Names Mt. Gunnison				
LOCATION INFORMATION				
County Gunnison				
Permit Location (Sec., T., R.,) <u>Sec. 9,10,15,16,18-30</u>				
R. 91 W.				
	Field Somerset			
Topographic Quadrangle Somerset, Minnesota				
COMPANY INFORMATION				
Mine Operator Mountain Coal Company, Inc.				
Address <u>P. O. Box 591, Somerset, CO 81434</u>				
	Telephone <u>(970) 929-5015</u>			
Parent Company <u>Arco Coal Co.</u>				
				
Contacts Terry O'Connor	Telephone <u>(303) 293-4000</u>			
GENERAL INFORMATION				
Mine Type <u>Underground</u>	Mining Method Continuous miners, longwall			
,1	Start-Up Date <u>March 29, 1980</u>			
	Union Affiliation <u>None</u>			
No. of Acres in Permit <u>14,590</u>				
	e Private <u>X</u>			
	e PrivateX			
GEOLOGIC INFORMATION				
	Caalagia Aga Custassays			
Geologic Unit <u>Mesaverde Group</u> Geologic Age <u>Cretaceous</u> Coal Zone(s) or Bed(s) <u>B Seam (mined 1994–present)</u> , <u>E Seam (unmined)</u> , <u>F seam (mined 1982–1991)</u>				
Coal Zone(s) or bea(s) <u>b Seum (mineu 1994–pre</u>	sent), E Seum (unmineu), F seum (mineu 1902–1991)			
Coal Thickness(es) B: 14 ft				
Cleat Orientation and Spacing N 65 E–N 70	E			
Dip of Bedding 3–5° SW-NE	Strike of Bedding			
	200 ft; E: 0–1700 ft, avg. 800 ft; F: 0–1500 ft, avg. 700 ft			
Interburden ThicknessB–E: 170–300 ft; E–F:	60–190 ft; avg. 120–130 ft			

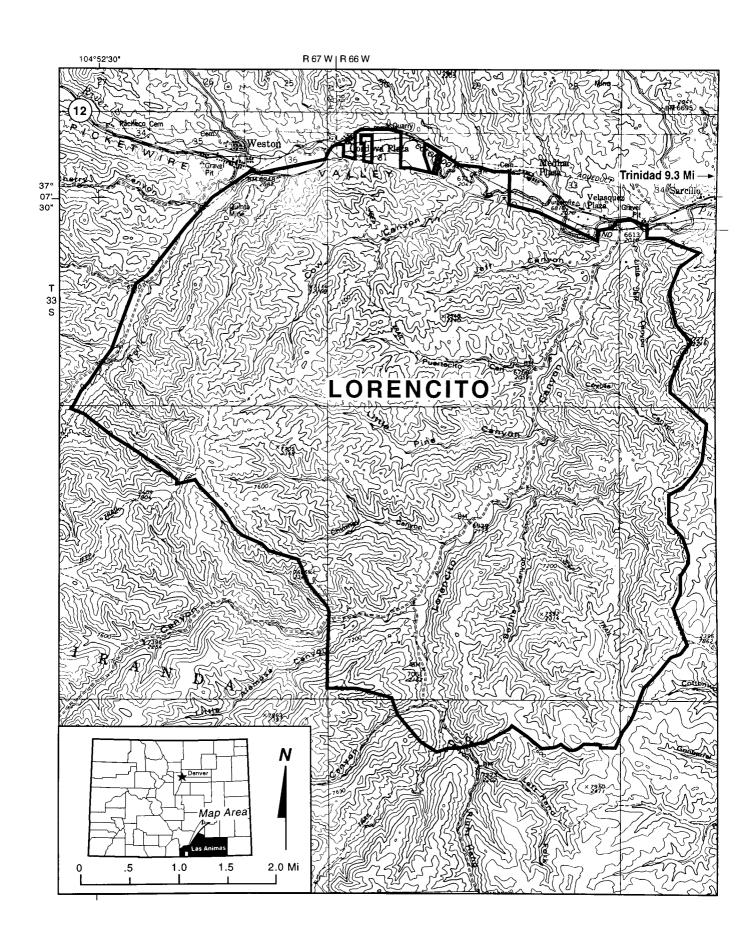
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	E	B (as shipped)		
Rank	Sub B	Sub B		
Moisture (%)	11.0	9.1		
Ash (%)	6.5	9.4		
Fixed Carbon (%)		46.5		
Volatile Matter (%)		35.0		_
Sulfur (%)	0.4	0.46		
Heating Value (Btu/lb.)	11,600	11,700		
Free Swelling Index				
Hardgrove Grindability		41–49		
Ash-Softening Temperature (°F)		2,500		
Methane Characteristics				
Reflectance Data				
COAL PRODUCTION				
1995 Production 5,318,650 tons		_ 1996 Production	5,948,	.912 tons
Cumulative Production Through 199		_	-	
Projected Production (tpy) 1997	6 million tons			
Remaining Reserves/Life of Mine				
Shifts Per Day3				
Production Per Shift			· · · · ·	
EquipmentLongwall, continuous n	iiners, diesel mobile ed	<i>quipment</i>		
Haulage Belt haulage out of mine				
Preparation Plant <u>Sizing only</u>		Tipple	Silos & ba	ıth weigh
SALES DATA				
Percent In-State 20	Destination Color	rado	Use St	eam
Percent Out-of-State70	Destination IL, IA	A, TN, TX, NV		
Percent Export10	Destination *			
Transportation Mode/Mixed Modes		_		
ADDITIONAL INFORMATION	_			
*Export destinations: Japan, Korea, E	•			
Geologic Reference Map: See Bowie I	No. 1			
		· · · · · · · · · · · · · · · · · · ·		



KING COAL MINE

Map No7	M.L.R.D. Permit No. <i>C-81-035</i>
Previous Mine Names <u>National King Coal, Ir</u>	
LOCATION INFORMATION	
County La Plata	
•	35 N., R. 11 W.; Sec. 6, T. 34 N., R. 11 W.; Sec. 36,
T. 35. N., R. 12 W.	
	Field Durango
T 1: 0 1 1 1/2 17	
COMPANY INFORMATION	
Address 4424 County Rd. 120, Hesperus, CO 81	1276
Contacts Tom Bird	
	rces
Address P.O. Box 2905, Durango, CO 81301	
Contacts Brad Gosche	
GENERAL INFORMATION	
Mine Type <u>Underground</u>	-
Mine Status <u>Producing</u>	_
No. of Employees56	Union Affiliation Non-union
No. of Acres in Permit	
	ate X Private X
Mineral: Federal X Sta	ate X Private X
GEOLOGIC INFORMATION	
Geologic Unit Upper Menefee	Geologic Age <u>Cretaceous</u>
Coal Zone(s) or Bed(s) <u>Upper</u>	
Coal Thickness(es) 52—72 in.	
Cleat Orientation and SpacingN51W, dip S	90°face, Sec. 32, T. 35 N., R. 11 W.
<u> </u>	Strike of Bedding
Overburden Thickness(es)0_300 ft	
Interburden Thickness	

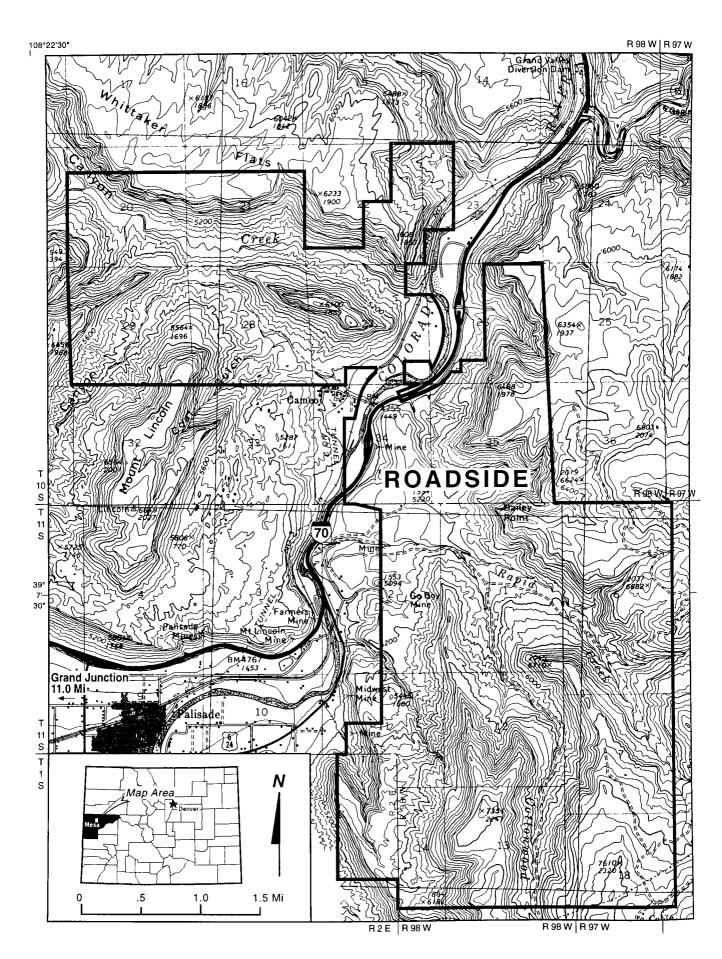
COAL QUALITY	Sampl	e 1 Sampl	e 2 Sa	ample 3	Sample 4
Seam					
Rank	·				
Moisture (%)					
Ash (%)					
Fixed Carbon (%)					
Volatile Matter (%)					
Sulfur (%)					
Heating Value (Btu/lb.)					
Free Swelling Index					
Hardgrove Grindability					
Ash-Softening Temperature (°F)					
Methane Characteristics			·		
Reflectance Data					
COAL PRODUCTION					
1995 Production <u>208,642 tons</u>		_ 1996 Produc	tion	190,613	tons
Cumulative Production Through 1996 _	2,808,9	963 tons			
Projected Production (tpy) 19972	.54,000				
Remaining Reserves/Life of Mine					
Shifts Per Day1—10 hrs					
Production Per Shift					
Equipment <u>Continuous miner sections</u>					
Haulage Shuttle car to belt					
Preparation Plant Operational 1997	, 4th quarter		Tipple		
SALES DATA					
Percent In-State 10 I	Destination_	СО		_ Use_	Domestic/Ind.
Percent Out-of-State79 I	Destination _	AZ,NM,UT		_ Use_	Industrial
Percent Export II I	Destination_	Japan		_ Use _	Steam
Transportation Mode/Mixed Modes	Truck			· · ·	
ADDITIONAL INFORMATION A	ND COM	MENTS			
Geologic Map Reference: Zapp, A.D., 1			ces of the D	Durango a:	rea. La Plata
and Montezuma Counties, Colorado: U					
,	α	<i>J</i>		,	



LORENCITO MINE

Map No 8	M.L.R.D. Permit No.	C-96-084	
Previous Mine Names			
LOCATION INFORMATION			
County Las Animas			
Permit Location (Sec., T., R.,) Lorencito Canyon are	ea (no survey)		
Coal Region Raton Mesa	Field_	Trinidad	
Topographic Quadrangle Weston			
COMPANY INFORMATION			
Mine Operator Lorencito Coal Company, LLC.	. , , , , , , , , , , , , , , , , , , ,		
Address <u>1311 Bentwood Drive, Evansville, IN 47</u>	711		
Contacts Al Perry	Telephone	(812) 867-772	7
Parent Company			
Address			
Contacts			
GENERAL INFORMATION			
Mine Type Surface and underground	Mining Method	.	
Mine Status Permit submitted 1997	_		
No. of Employees	Union Affiliation	Non-union	
No. of Acres in Permit		····	
Surface: Federal Sta	te	Private	100
	te	Private	100
GEOLOGIC INFORMATION			
Geologic Unit Raton Formation	Geologic Age	Paleocene	
Coal Zone(s) or Bed(s) Primero seam, Weston s	eam, and Ciruela seam		
Coal Thickness(es) 3–9 ft			
Cleat Orientation and Spacing			
Dip of Bedding 1% NE	Strike of Bedding		
Overburden Thickness(es) 0–350 ft Curuela,		nero	
Interburden Thickness			
			<u>.</u>

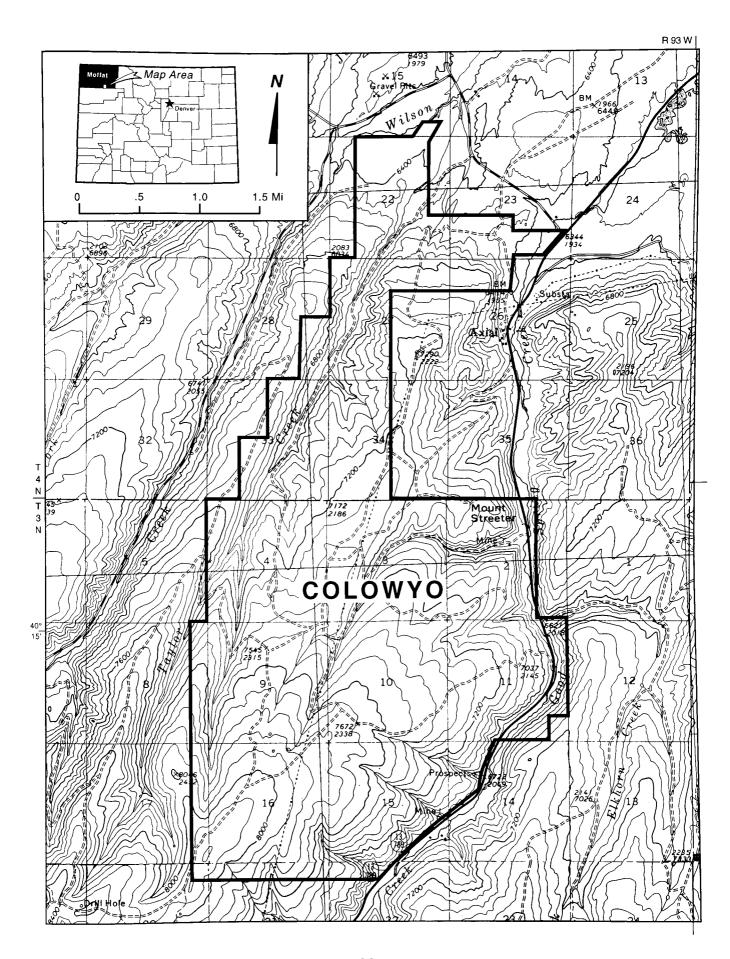
Seam Rank Moisture (%) Ash (%) Fixed Carbon (%) Volatile Matter (%)	7.00 10.00–12.00 57.00	Sample 2	Sample 3	Sample 4
Moisture (%) Ash (%) Fixed Carbon (%)	10.00–12.00 57.00			
Ash (%) Fixed Carbon (%)	10.00–12.00 57.00			
Fixed Carbon (%)	57.00			
				1.91-9
Volatile Matter (%)				
	31.00	· • • • • • • • • • • • • • • • • • • •		·
Sulfur (%)	0.60		· · · · · · · · · · · · · · · · · · ·	
Heating Value (Btu/lb.)	12,500–13,000)	·	
Free Swelling Index	7.5–9			
Hardgrove Grindability	65		· Mari	· · · ·
Ash-Softening Temperature (°F)	2,000–2,300			
Methane Characteristics		-		
Reflectance Data				
COAL PRODUCTION				
1995 Production	1996	6 Production _		
Cumulative Production Through 1996 _		***************************************		
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine				
Shifts Per Day				
Production Per Shift				
Equipment				
Haulage				
Preparation Plant			le	
SALES DATA				
Percent In-State D	estination		Use	
	estination			
	estination			
Transportaton Mode/Mixed Modes				
ADDITIONAL INFORMATION AND	COMMENTS			
*Surface—contour and mountaintop ren	ioval, Underground	l—longwall and	ł room and pilla	r
**Anticipated late 1997 or early 1998				
Geologic Map Reference: Johnson, R.B.,	1969, Geologic Maj	o of the Trinidac	l Quadrangle, S	outh-Central
Colorado: U.S.Geological Survey Misc.	· · · · · · · · · · · · · · · · · · ·		- 0 /-	



ROADSIDE MINE, North and South Portals

Map No 9	M.L.R.D. Permit No. <u>C-81-041</u>
Previous Mine Names Cameo Mine and Roa	dside Mine
LOCATION INFORMATION	
County <u>Mesa</u>	
	34–35, T. 10 S., R. 98 W.; Sec. 1–2, 11–14, T. 11 S.,
R. 98 W.; Sec. 6,7,18, T. 11 S., R. 97 W.; Sec. 1,	T. 1. S., R. 2 E., UTE P.M.
Coal Region Uinta	Field Grand Mesa
Topographic Quadrangle <u>Cameo, Palisade</u>	
COMPANY INFORMATION	
Mine Operator Powderhorn Coal Company	
Address P.O. Box 1430, Palisade, CO 81526	
Contacts Larry Reschke	Telephone <u>(970) 464-7951</u>
Parent Company Peabody Holding Company	
Address 301 N. Memorial Drive, P.O. Box 373,	
Contacts <u>James Campbell</u>	Telephone (314) 342-3400
GENERAL INFORMATION	Mining Mathed Continuous minus
Mine Type <u>Underground</u>	
Mine Status <u>Producing</u>	•
No. of Acres in Permit	Union Affiliation <u>Non-union</u>
	ate PrivateX
	rate Private X
Timera. Teacrar 50	
GEOLOGIC INFORMATION	
Geologic UnitMt. Garfield Formation	Geologic Age <u>Cretaceous</u>
Coal Zone(s) or Bed(s) Cameo B seam	
Coal Thickness(es) 4.4–9.4 ft	
1 0 =	7° butt, varied spacing, cleat dip 90°
Dip of Bedding 5%	Strike of Bedding <u>N 65 W</u>
Overburden Thickness(es) <u>0–2,000 ft</u>	
Interburden Thickness Cameo B seam lies 40 of the Mt. Garfield Formation and 35–90 ft below	00–450 ft above the Palisade seam, which occurs at the base w the Carbonera seam

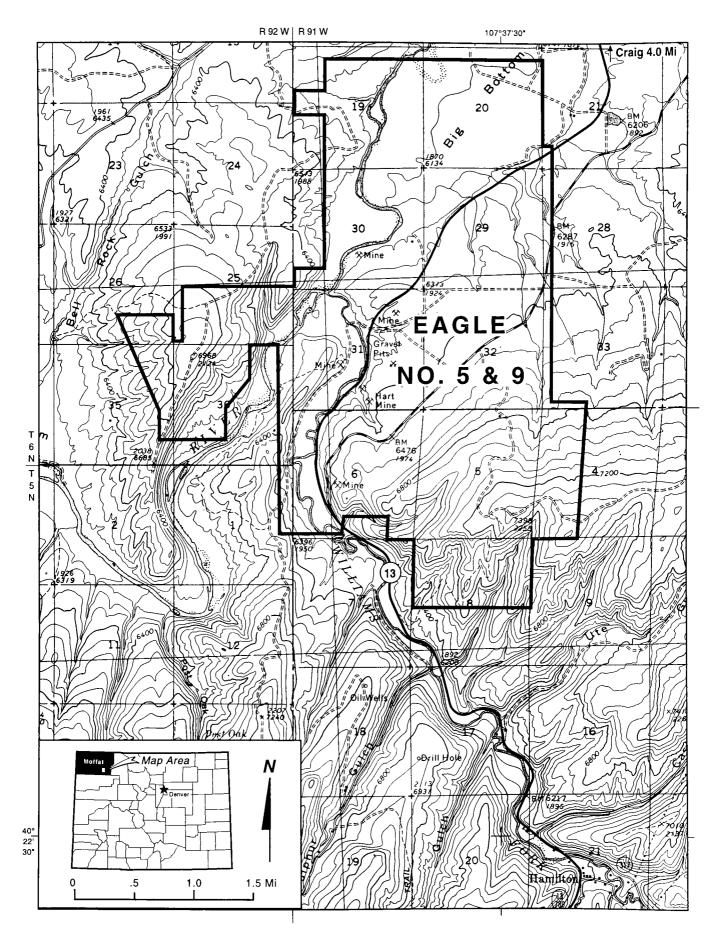
COAL QUALITY	Sample 1	Sample 2
Seam	Cameo B (blend base)	Cameo B (100% washed)
Rank		
Moisture (%)	8.0	9.3
Ash (%)	16.0	9.1
Fixed Carbon (%)	43.4	47
Volatile Matter (%)	32.6	35
Sulfur (%)	0.5	0.5
Heating Value (Btu/lb.)	10,800	11,800
Free Swelling Index	1.5	0.5
Hardgrove Grindability	48	
Ash-Softening Temperature (°F)		
Methane Characteristics		
Reflectance Data		
COAL PRODUCTION		
1995 Production <u>589,064 tons</u>	1996 Production	n <u>625,885 tons</u>
Cumulative Production Through 1996	9,063,923 tons	
Projected Production (tpy) 1997	· · · · · · · · · · · · · · · · · · ·	
Remaining Reserves/Life of Mine	35 million tons/17+ years	
Shifts Per Day 3		
Production Per Shift		
Equipment <u>continuous miners (remot</u>	te with scrubbers) and shuttle cars	3
Haulage <u>belt</u>	· · · · · · · · · · · · · · · · · · ·	
Preparation Plant <u>heavy media</u>	Ti	pple
SALES DATA		
Percent In-State 33 I	Destination Palisade	Use Steam
Percent Out-of-State67 I	Destination <u>Iowa</u>	Use Steam
	Destination	
Transportation Mode/Mixed Modes	Railroad—D&RGW (Souther	n Pacific)
Transportation Mode/Mixed Modes	Railroad—D&RGW (Souther	n Pacific)
Transportaton Mode/Mixed Modes		n Pacific)
	O COMMENTS	n Pacific)
ADDITIONAL INFORMATION AND	O COMMENTS ixed per customer request.	
ADDITIONAL INFORMATION AND Washed quality and blended quality mi	D COMMENTS ixed per customer request. ad Gabaldo V., 1989, Geologic Ma	p and Cross Sections of Parts



COLOWYO MINE

Map No	M.L.R.D. Permit No. <u>C-81-019</u>
Previous Mine Names	
LOCATION INFORMATION	
County Moffat	
Permit Location (Sec., T., R.,) <u>Sec. 15,22,23,26–28,</u>	33,34, T. 4 N., R. 93 W. and Sec. 2–4, 8–11, 14–17,
20–22, T. 3 N., R. 93 W.	
Coal Region <u>Uinta</u>	Field Danforth Hills
Topographic Quadrangle Ninemile Gap, Axia	1
COMPANY INFORMATION	
Mine Operator Colowyo Coal Company L.P.	
	641
Contacts John Harmon, G.M.	Telephone <u>(970) 824-1501</u>
Parent Company Kennecott Energy	
Address Gillette, WY	
Contacts Greg Boyce	Telephone <u>(307) 687-6000</u>
GENERAL INFORMATION	
Mine Type	Mining Method Dragline, truck, & shovel
Mine Status <u>Producing</u>	Start-Up Date
No. of Employees 316	Union Affiliation <u>Non-union</u>
No. of Acres in Permit	
Surface: Federal X Sta	te X Private X
Mineral: Federal X Sta	te X Private X
GEOLOGIC INFORMATION	
Geologic Unit Williams Fork Formation	Geologic Age Upper Cretaceous
Coal Zone(s) or Bed(s) 8 seams: Y3+Y2, X, A2	
Coal Thickness(es) 57.9 ft total; Y3+Y2—6.8 ft	, X—12.3 ft, A2+A3—6.7 ft, B—5.3 ft *
Cleat Orientation and Spacing132°	· · · · · · · · · · · · · · · · · · ·
Dip of Bedding <u>0-20° N</u>	Strike of Bedding <u>E-W</u>
Overburden Thickness(es)450 ft total overbu	rden and interburden
Interburden Thickness	

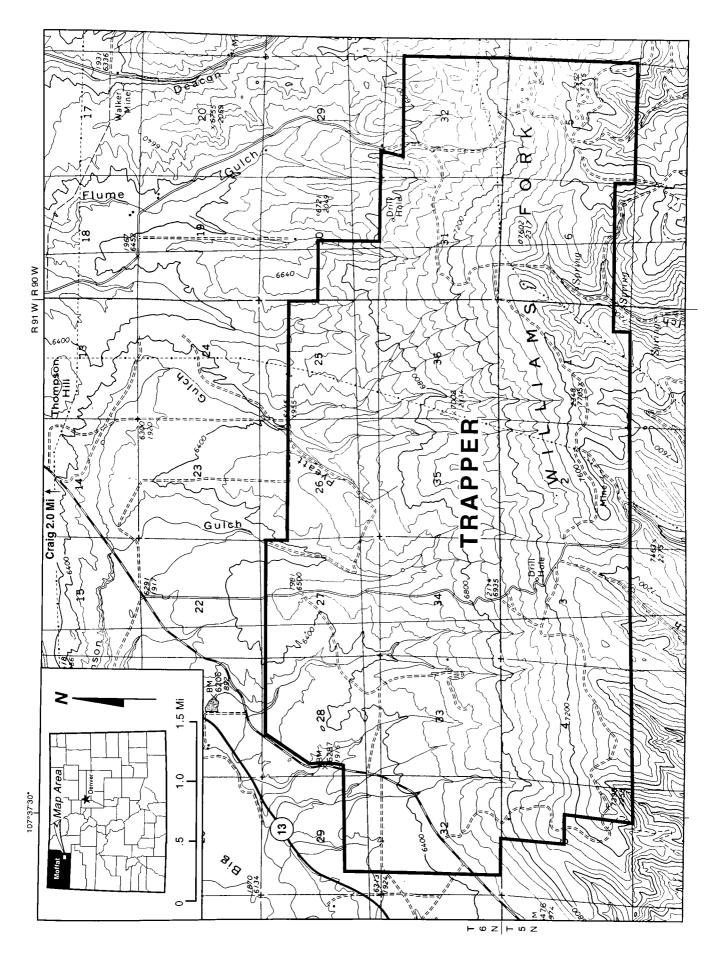
COAL QUALITY	Sample	1 Samp	le 2	Sample 3	Sample 4
Seam	Composite	2		-	•
Rank	Sub B				
Moisture (%)	16.72				
Ash (%)	5.76	-			
Fixed Carbon (%)	44.80				
Volatile Matter (%)	32.77				
Sulfur (%)	0.38				
Heating Value (Btu/lb.)	10,461				
Free Swelling Index	N/A				
Hardgrove Grindability	49				
Ash-Softening Temperature (°F)	2,300				
Methane Characteristics	N/A				
Reflectance Data	N/A				
COAL PRODUCTION					
COAL PRODUCTION		400 C D 1			- 4 .
1995 Production <u>4,395,865 tons</u>			tion	5,/13,56	4 tons
Cumulative Production Through 1996					·
Projected Production (tpy) 19976,0					
Remaining Reserves/Life of Mine					
Shifts Per Day 2—12 hrs in 1996, 7 do	ауѕ/шеек				
Production Per Shift	lon duille bull	domana fuant	and loaden		
Equipment Shovels, draglines, overburd			ena toaaer	<u>s</u>	
Haulage <u>Haulage trucks out of pit to cru</u> Preparation Plant Crusher and screen		:115	Tinnla	Vaa	
Treparation FlantCrusher unu screen.	<u> </u>		Tipple	<u>Yes</u>	
SALES DATA					
Percent In-State De	estination*	*		_ Use _	Steam, industrial
Percent Out-of-State De	estination*	**		Use _	Steam, industrial
Percent Export0 De	estination			Use _	
Transportaton Mode/Mixed Modes	Union Pacifi	c Railroad			
ADDITIONAL INFORMATION AN		ENTS			
*C—6.0 ft, D—10.1 ft, E—6.8 ft, F—5.4					
**Colorado Springs; Public Service Co. op	f Colorado, Ch	erokee Plant;	Craig		
***NB, TX, IL, IA, UT, TN, KN, AZ	17 1 7 4	207.6.1.:	16 .	<u> </u>	
Geologic Map Reference: Hardy, John and					
Quadrangle, Moffat County, Colorado: C	.olo. Geologica	u Survey Ope	n File Kep	ort 9/-5, s	scale 1:24,000



EAGLE MINE No. 5 & 9

Map No	M.L.R.D. Permit No. <u>C-81-044</u>
Previous Mine Names	
LOCATION INFORMATION	
County Moffat	
Permit Location (Sec., T., R.,) Secs. 19,20,21,28-	33, T. 6 N., R. 91 W. and Secs. 4–6, 8, T. 5 N., R. 91 W.,
and Secs. 25,26,35,36, T. 6 N., R. 92 W.	
Coal Region <u>Green River</u>	
Topographic Quadrangle Round Bottom, C	
COMPANY INFORMATION	
Mine Operator <u>Cyprus Empire Corporation</u>	
Address <i>P.O. Box 68, Craig, CO 81626</i>	
Contacts Rick Mills	Telephone (970) 879-8050
Address 9100 E. Mineral Circle, Englewood, C	O 80112
Contacts <u>Garold R. Spindler, President</u>	Telephone <u>(303) 643-5000</u>
GENERAL INFORMATION	
Mine Type <u>Underground</u>	Mining Method Longwall/continuous
Mine Status	
No. of Employees8	Union Affiliation <u>UMWA</u>
No. of Acres in Permit6,387	
Surface: Federal X S	state X Private X
Mineral: Federal X S	State X Private X
GEOLOGIC INFORMATION	
Geologic Unit Williams Fork Formation	Geologic Age Cretaceous
Coal Zone(s) or Bed(s)F	
Coal Thickness(es) 10.5 ft	
	ace cleat fairly well developed in NWSW 31, 6N, 91W
Dip of Bedding 12–15°	
Interburden Thickness	

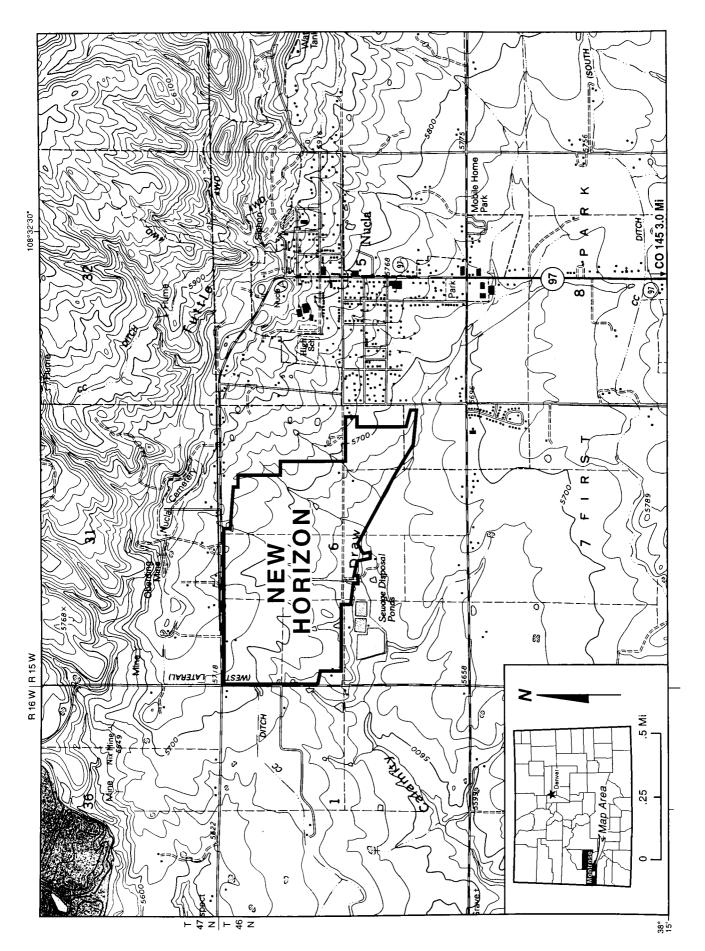
COAL QUALITY	Sample 1	Sample 2
Seam	F	
Rank	Sub B	
Moisture (%)	8.93–12.84	7.00
Ash (%)	4.99–10.36	10.00
Fixed Carbon (%)	41.75–52.85	49.37
Volatile Matter (%)	35.43–38.83	37.88
Sulfur (%)	0.46-0.57	0.58
Heating Value (Btu/lb.)	10,377–11,567	10,500
Free Swelling Index		- 1/
Hardgrove Grindability		
Ash-Softening Temperature (°F)		2,700
Methane Characteristics		
Reflectance Data		
COAL PRODUCTION		
1995 Production 745,074 tons (Eagle	. No. 5) 1996 Produ	action
Cumulative Production Through 1996		
Projected Production (tpy) 1997		
Remaining Reserves/Life of Mine		-
Production Per Shift Hemscheidt shi		
Equipment Anderson Mavor, Kloeckno		
Haulage	•	
Preparation Plant		TippleYes
SALES DATA		
Percent In-State 93 I	Destination *	Use <u>Steam</u>
Percent Out-of-State7 I		
Percent Export I		
Transportation Mode/Mixed Modes		
ADDITIONAL INFORMATION A		
*Boulder, Colorado Springs, Craig, Den		
Geologic Map Reference: See Seneca II		



TRAPPER MINE

Map No	M.L.R.D. Permit No.	C-81-010
Previous Mine Names		
LOCATION INFORMATION		
County Moffat Permit Location (Sec., T., R.,) Secs. 5,6, T. 5 N., R. 9		R. 91 W.: Sec. 30–32, T. 6 N.,
R. 90 W.; Secs. 25–29, 32–36, T. 6 N., R. 91 W.	0 11., 2000. 1 3, 110 11.,	
Coal Region Green River		
Topographic Quadrangle Castor Gulch		
COMPANY INFORMATION		
Mine Operator <u>Trapper Mining Inc.</u>		
Address <u>P.O. Box 187, Craig, CO 81626</u>		
Contacts Alan Rowley	Telephone	(970) 824-4401
Parent Company <u>Saltriver, Tri-State, & Platte I</u>	River Power Authority, I	Pacificorp
Address P.O. Box 1149, Montrose, CO 81402		
Contacts W. Gordon Peters	Telephone	(303) 249-4501
GENERAL INFORMATION		
Mine Type	Mining Method	Dragline
Mine Status <u>Producing</u>		
No. of Employees <u>147</u>	-	
NT (A : D : 10.202		
Surface: Federal Stat	te 45%	Private 55%
		Private 3%
GEOLOGIC INFORMATION		
Geologic Unit <u>Upper Williams Fork Formation</u>	Geologic Age	Cretaceous
Coal Zone(s) or Bed(s) G, H, I, Q, R		
	40 C D 4 C	
Coal Thickness(es) <u>G—4 ft, H—6 ft, I—5 ft, Q</u>		
Cleat Orientation and Spacing 327° face, 40°	·	
Dip of Bedding <u>16%</u>		
Overburden Thickness(es)30–140 ft		
Interhead on This leaves 2 50 ft		
Interburden Thickness 2–50 ft		

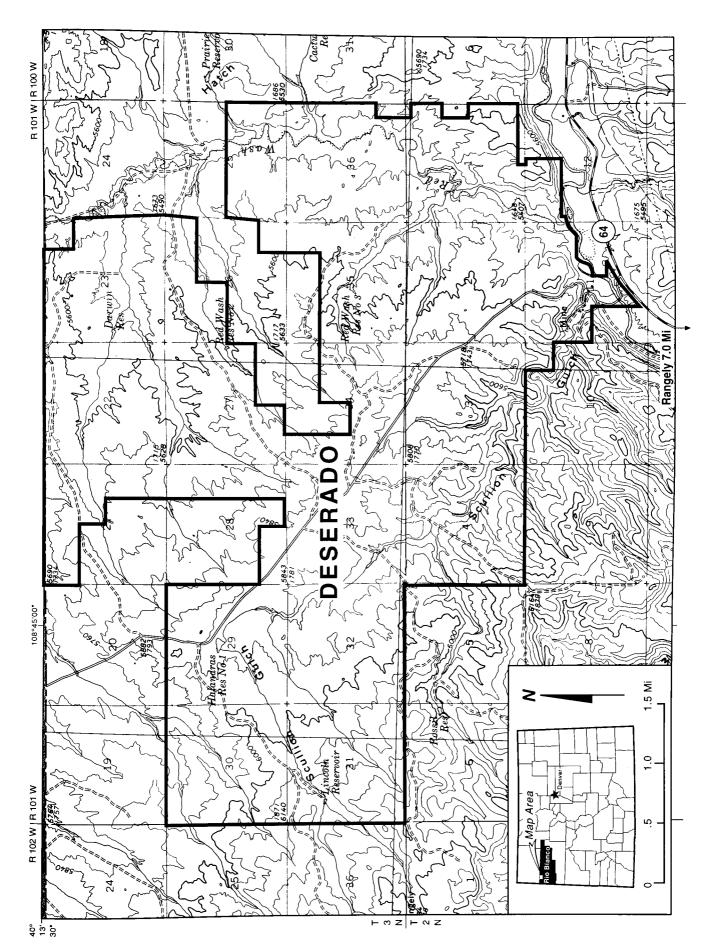
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	Average	4	•	•
Rank	Sub B			
Moisture (%)	16	17.5		
Ash (%)	8	7.5		
Fixed Carbon (%)	48	44.4		
Volatile Matter (%)	33	30.20		
Sulfur (%)	0.45	0.4		
Heating Value (Btu/lb.)	9,800	9,900		
Free Swelling Index			-	
Hardgrove Grindability				
Ash-Softening Temperature (°F)	2,120	2,242		
Methane Characteristics				
Reflectance Data			_	
COAL PRODUCTION				
1995 Production 2,024,186 tons	199	96 Production _	1,974,410 t	ons
Cumulative Production Through 1996 _				
Projected Production (tpy) 1997	<u> </u>			
Remaining Reserves/Life of Mine	Surface—36.6 mi	l tons, Undergroi	ınd—200 mil to	ns
Shifts Per Day1 (4—10 hrs/wk)				
Production Per Shift 55 tons/man sh	ift, 10,500 tons tot	al		
Equipment 3 draglines, 2 drills, 8 bulle	dozers, front-end lo	oaders, 2 hydrauli	ic excavaters	
Haulage 5 haul trucks from pit to powe	r plant			
Preparation Plant None		Tipp	le	
SALES DATA				
	Destination <u>Crai</u>	g Units 1 & 2	Use St	eam
	Destination	-		
	Destination			
Transportation Mode/Mixed Modes				
ADDITIONAL INFORMATION A	ND COMMEN'	TS		
	TID COMMENT		•	
	Craig Generating Si	tation Units 1 &	2	
All coal is burned at the Colorado Ute C Geologic Map Reference: See Seneca II		tation Units 1 &		



NEW HORIZON MINE

Map No13	M.L.R.D. Permit No. <i>C-81-008</i>
Previous Mine Names Nucla and Nucla East	
LOCATION INFORMATION	
County Montrose	
Permit Location (Sec., T., R.,) Mining—Sec. 6, T. 4	
R. 16 W.; Sec. 31, T. 47 N., R. 15 W.	•
Coal Region San Juan River	Field <i>Nucla-Naturita</i>
Topographic Quadrangle Nucla	
COMPANY INFORMATION	
Mine Operator Western Fuels Colorado-New He	orizion Mine
Address <i>P.O. Box 628, Nucla, CO 81424</i>	
Contacts R. Lance Wade	Telephone (970) 864-2165
Parent Company Western Fuels Colorado, LLC	·
Address 405 Urban Street, Suite 305, Lakewood,	CO 80228
Contacts Raja Upadhyay	Telephone <u>(303) 988-9626</u>
GENERAL INFORMATION	
Mine Type Surface	Mining Method Shovel, truck
Mine Status <u>Producing</u>	Start-Up Date
No. of Employees	Union Affiliation <u>UMWA Local 1281</u>
No. of Acres in Permit659	
Surface: Federal Sta	te Private <u>X</u>
Mineral: Federal Sta	te Private X
GEOLOGIC INFORMATION	
Geologic Unit	Geologic Age Cretaceous
•	
Coal Thickness(es) 1—1.6–3.3 ft, 2—5.9–7.9 ft	
	butt, 0.08–3 ft spacing
Dip of Bedding 1–2°SW	
Overburden Thickness(es)	
Interburden Thickness 6–10 ft	

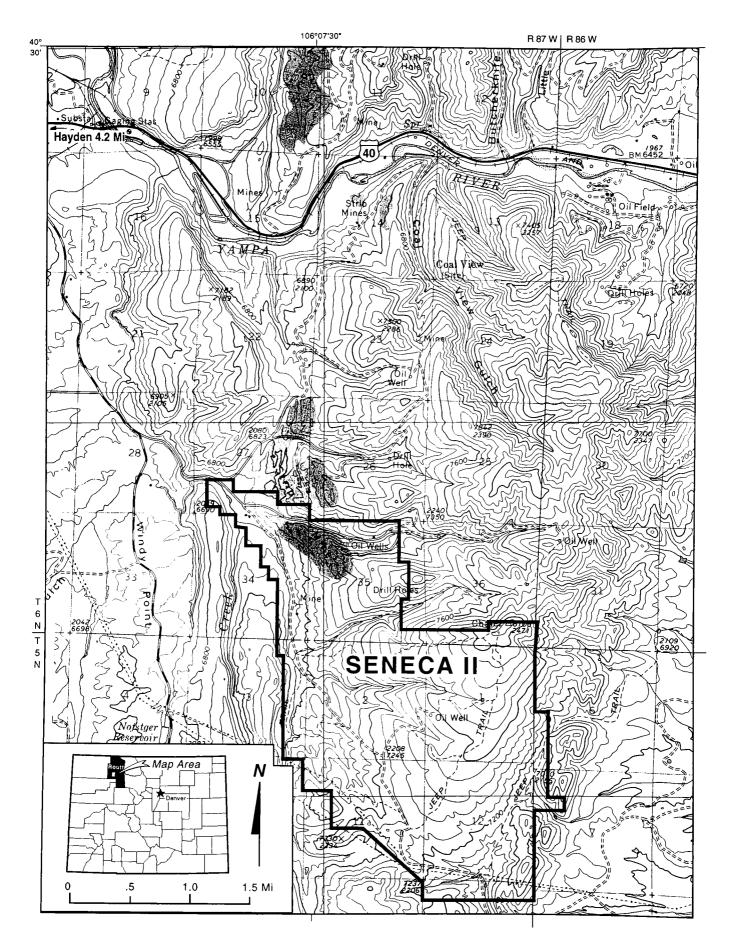
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	Dakota			
Rank				
Moisture (%)	6.7			
Ash (%)	15.1	18%		
Fixed Carbon (%)	47.0		<u> </u>	
Volatile Matter (%)	30.7			
Sulfur (%)	0.81			
Heating Value (Btu/lb.)	11,680	10,000–10,300		
Free Swelling Index				
Hardgrove Grindability				
Ash-Softening Temperature (°F)	2,750			
Methane Characteristics				
Reflectance Data				
COAL PRODUCTION				
1995 Production <u>374,266 tons</u>	199	6 Production	361,667 to	ns
Cumulative Production Through 1996 _	1,219,979 to	ns		·
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine	20–25 years			
Shifts Per Day 2				_
Production Per Shift <u>850 tons</u>				
Equipment Shovels, dozers, trucks, ove	rburden drill			
Haulage				
Preparation PlantN/A		Tipple	e <u>N/A</u>	
SALES DATA				
Percent In-State D	estination <u>Nucl</u>	a Power Plant*	Use <u>_S</u>	team
Percent Out-of-State D	estination		Use	
Percent Export D	estination		Use	
Transportaton Mode/Mixed Modes	Trucks haul from	pit to the power	olant	
ADDITIONAL INFORMATION AN	ND COMMENT	ΓS		
*Fluidized bed combustion unit				
	1964 Geology St	ructure and Uran	ium Deposits o	of the Moab
Geologic Map Reference: Williams, P.L.,	1001, 00000, 9, 000			



DESERADO MINE

Map No	M.L.R.D. Permit No.	C-81-018
Previous Mine Names		
LOCATION INFORMATION County Rio Blanco		
Permit Location (Sec., T., R.,) <u>Sec. 1–4,10–12, T. 21</u>	N., R. 101 W. and Sec. 2	1–23, 25–36, T. 3 N., R. 101 W.
<u> </u>	·	· · · · · · · · · · · · · · · · · · ·
Coal Region Uinta	Field	Lower White River
Topographic Quadrangle Rangley NE, Cactus	Reservoir	
COMPANY INFORMATION		
Mine Operator Western Fuels-Utah, Inc.		
Address <i>P.O. Box 1067, Rangely, CO 81648</i>	·	
Contacts Alan Hillard, Mine Manager		(970) 675-8431
Parent Company Deseret Generation and Trans	mission Coop.	
Address 8722 S. 300 W., Sandy, UT 84070		
Contacts <u>Edward Thatcher</u>	Telephone	(801) 566-1238
CENIED AL INICODALATIONI		
GENERAL INFORMATION Ming Type - Underground	Minima Mathad	I ou canall
Mine Type <u>Underground</u> Mine Status <u>Producing</u>	-	Longwall
Mine Status <u>Producing</u> No. of Employees <u>252</u>	Start-Up Date1 Union Affiliation	
No. of Acres in Permit 9,496.7	Official Affiliation	UIVIVA IVU. 1304
Surface: Federal X State	to	Private Y
Mineral: Federal X State		
GEOLOGIC INFORMATION		
Geologic Unit Williams Fork Formation		
Coal Zone(s) or Bed(s)	<u> </u>	
Coal Thickness(es)		
Cleat Orientation and Spacing 84–89° face, 1		
Dip of Bedding 3–7°		N 46 W
Overburden Thickness(es) 1,600–2,100 ft		
Interburden Thickness 10–50 ft		

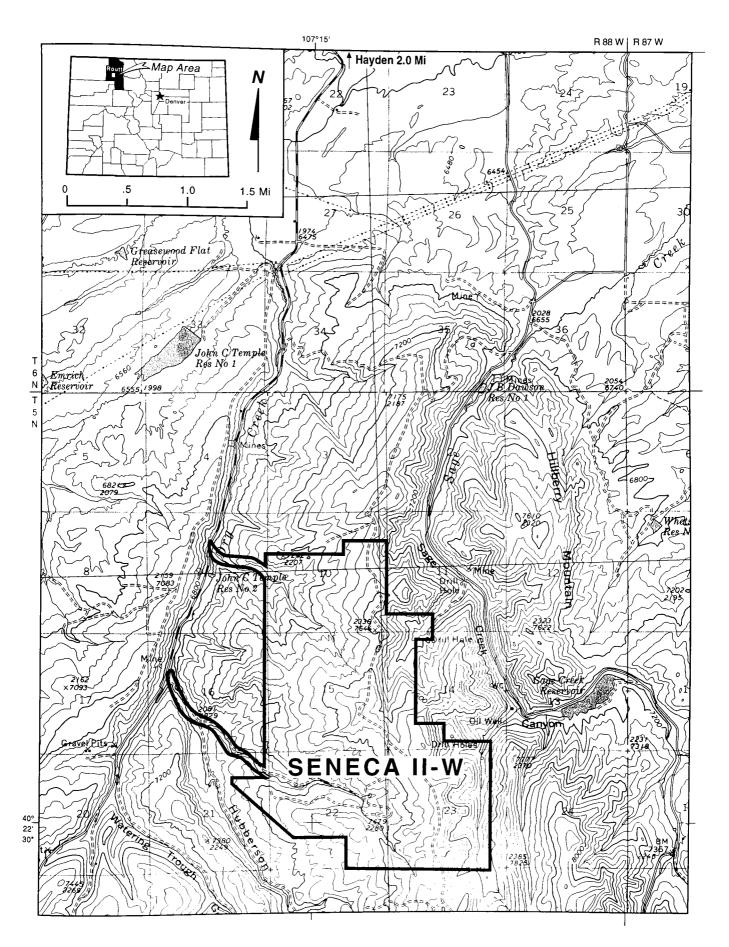
COAL QUALITY	Sample	e 1 Sample 2	Sample 3	Sample 4
Seam	A/B/C	D	•	•
Rank	Sub A	Sub A		
Moisture (%)	12.0	11.3	11.0	
Ash (%)	16.1	13.1	8.0	
Fixed Carbon (%)				
Volatile Matter (%)				
Sulfur (%)	0.41	0.44	0.41	
Heating Value (Btu/lb.)	9,400	10,000	10,930	
Free Swelling Index				
Hardgrove Grindability				
Ash-Softening Temperature (°F)	2,550	2,600		
Methane Characteristics	Low	Low		
Reflectance Data				
COAL PRODUCTION				
1995 Production <i>760,255 tons</i>		1996 Production	530,454 to	ากร
Cumulative Production Through 1996	13,625,	668 tons		
Projected Production (tpy) 1997		· ·		
Remaining Reserves/Life of Mine	Year 2033			
Shifts Per Day 3—8 hrs				
Production Per Shift				
Equipment				
Haulage				
Preparation Plant		Tippl	le	
SALES DATA				
Percent In-State	Destination_		Use _	
Percent Out-of-State100	Destination _	Utah (Bonanza Statio	<u>n)</u> Use <u>s</u>	Steam
Percent Export	Destination_			
Transportation Mode/Mixed Modes _	Electric uni	it train		
ADDITIONAL INFORMATION	AND COMM	IFNTS		
Captive fuel supply for the Bonanza F			by an electric	railroad to the
power plant. The "D" seam is current				
Geologic Map Reference: Barnum, B.I	11 11	es, R.S., 1980, Geologi	c Map and Co	al Sections of the
Cactus Reservoir Quadrangle, Rio Bl				
MF-1179, scale 1:24,000.		,		
		·		



SENECA II MINE

Map No15	M.L.R.D. Permit No. <u>C-80-005</u>
Previous Mine Names	
LOCATION INFORMATION	
County Routt	
	6 N., R. 87 W., Sec. 1–3, 11–13, T. 5 N., R. 87 W.; Sec. 6,7,
T. 5 N., R. 86 W.	
	Field Yampa
Topographic QuadrangleMilner, Mt. Harr	ris
COMPANY INFORMATION	
Mine Operator Seneca Coal Company	
Address P.O. Box Drawer D., Hayden CO 816	539
Contacts G. Brad Brown	Telephone (970) 276-3707
Parent Company Peabody Coal Company	
Address 1300 South Yale, Flagstaff, AZ 86001	1
Contacts Gary L. Melvin	Telephone <u>(520) 714-5253</u>
GENERAL INFORMATION	
Mine Type Surface	Mining Method <u>Dragline</u>
Mine Status <u>Producing</u>	Start-Up Date <u>1968</u>
No. of Employees 82*	Union Affiliation <u>UMWA</u>
No. of Acres in Permit	
Surface: Federal	State X Private X
Mineral: Federal X	State X Private X
GEOLOGIC INFORMATION	
Geologic Unit <u>Lower Williams Fork Formation</u>	n Geologic Age Late Cretaceous
Coal Zone(s) or Bed(s) Wolf Creek, Wadge	
Coal Thickness(es) Wolf Creek—average 15.	0 ft; Wadge—9.0–10.0 ft, average 9.8 ft
Cleat Orientation and Spacing	
	Strike of Bedding
Overburden Thickness(es) Wolf Creek aver	rage 111.3 ft, Wadge average 36.8 ft, range 0–120 ft
Interburden Thickness	

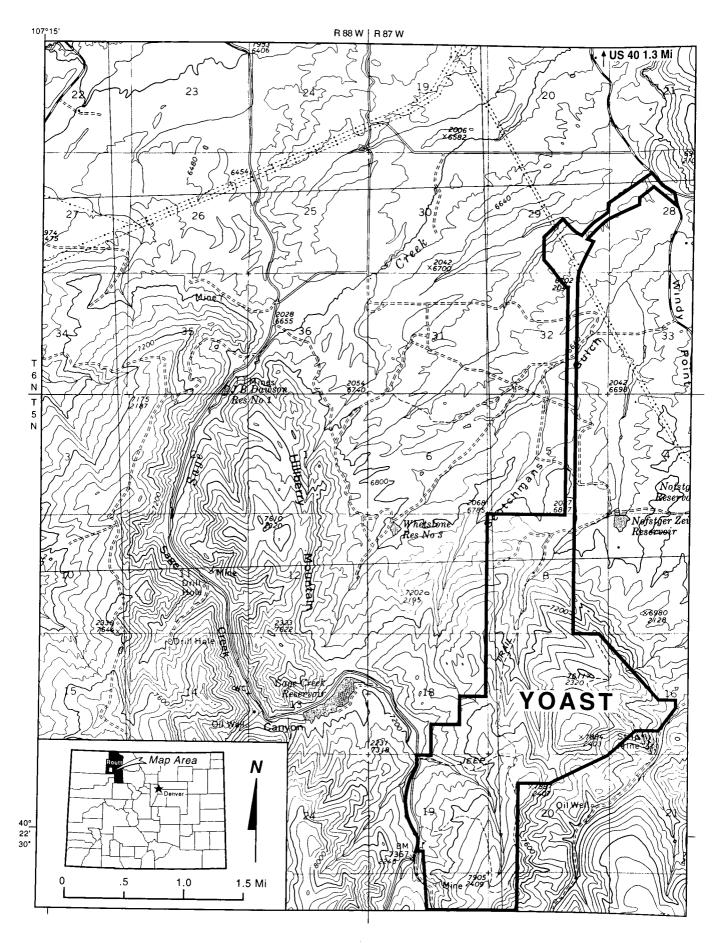
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	Wolf Creek	Wadge		
Rank		10.00		
Moisture (%)	12.00	12.00		
Ash (%)	10.79	7.74		
Fixed Carbon (%)				
Volatile Matter (%)				
Sulfur (%)				
Heating Value (Btu/lb.)	0.54	0.49		
Free Swelling Index	12,137	12,581		
Hardgrove Grindability	•			
Ash-Softening Temperature (°F)				
Methane Characteristics				
Reflectance Data			·	
COAL PRODUCTION				
1995 Production	19	96 Production _		
Cumulative Production Through 1995	30,805,180	tons		
Projected Production (tpy) 1997	<u> </u>			
Remaining Reserves/Life of Mine				
Shifts Per Day 2—8 hrs				
Production Per Shift 3,000–3,500				
Equipment Draglines, overburden d		ers, haul trucks		
Haulage				
Preparation Plant		Tipp	le	
SALES DATA				
Percent In-State 100	Destination Hay	den Power Plant	Use S	team
Percent Out-of-State	Destination			
Percent Export	Destination			
•		from mine to pow		
ADDITIONAL INCODMATION	AND COMMEN	TC		
*Total for Seneca Coal Company—all		15		
Surface reserves were stripped out in		50 draaline moze	d to the Yoast M	line
Geologic Map Reference: Tweto, Ogdo				-
				çic, ivoi inwesiern
Colorado: U.S. Geological Survey Mi	sc. invest. Series 1-97	2, Scale 1.250,00	<i>U</i> ,	
	<u>.</u>			



SENECA II-W MINE

Map No. <u>16</u>	M.L.R.D. Permit No. <u>C-82-057</u>
Previous Mine Names	
LOCATION INFORMATION	
County Routt	
Permit Location (Sec., T., R.,) Sec. 9–11, 14–16, 21	
1011111 Document (Sec., 1., 10,)	20) 270 210, 280 200
Coal Region Green River	Field Yampa
Topographic Quadrangle <u>Dunckley, Hayden,</u>	Hayden Gulch, Mt. Harris
COMPANY INFORMATION	
Mine Operator Seneca Coal Company	
Address P.O. Box Drawer D, Hayden, CO 8165	
Contacts G. Brad Brown	
	pany
Address 1300 South Yale, Flagstaff, AZ 86001	
Contacts Gary L. Melvin	Telephone <u>(520) 774-5253</u>
GENERAL INFORMATION	
Mine Type Surface	
Mine Status <u>Producing</u>	-
No. of Employees <u>See Seneca II</u>	
No. of Acres in Permit 2,676.6	
	ate X Private X
Mineral: Federal X Sta	ate Private
GEOLOGIC INFORMATION	
Geologic Unit Lower Williams Fork Formation	Geologic Age Late Cretaceous
Coal Zone(s) or Bed(s) Wadge, Wolf Creek, Sag	
Coal Thickness(es) Wadge—8.9–12.2 ft, average	ge 11.7 ft; Wolf Creek—average 20.4 ft;
Sage Creek—3.4–5.4 ft, average 4.6 ft	
Cleat Orientation and Spacing	
Dip of Bedding <u>8-14°</u>	Strike of Bedding
Overburden Thickness(es) Wadge—average	60.8 ft, Wolf Creek—average 95.7 ft, Sage
Creek—average 42.0 ft, range 0–100 ft	
Interburden Thickness	

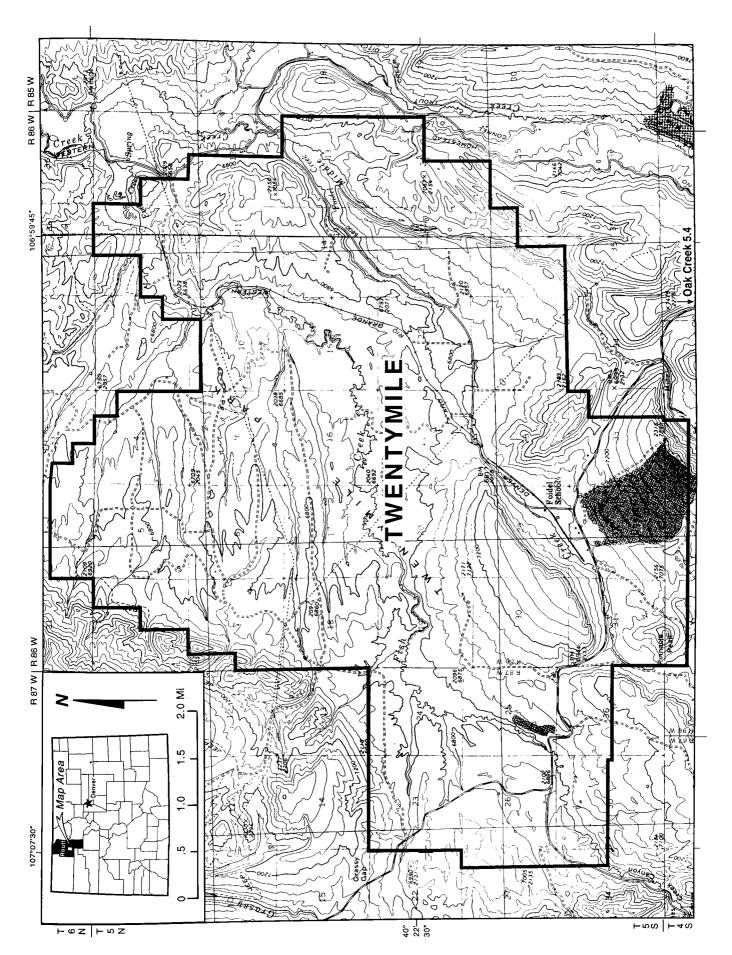
COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	Wadge	Wolf Creek	Sage Creek	_
Rank				
Moisture (%)	13.63	13.33	13.94	
Ash (%)	7.84	11.11	6.46	
Fixed Carbon (%)				
Volatile Matter (%)				
Sulfur (%)	0.48	0.61	0.68	
Heating Value (Btu/lb.)	12,322	11,908	12,325	
Free Swelling Index				
Hardgrove Grindability				
Ash-Softening Temperature (°F)				
Methane Characteristics				
Reflectance Data	=			
COAL PRODUCTION				
1995 Production	199	6 Production		
Cumulative Production Through 1995				
Projected Production (tpy) 1997				
Remaining Reserves/Life of Mine	8 years			
Shifts Per Day <u>2—8 hr</u>				
Production Per Shift See Seneca II				
Equipment Dragline, overburden drills	s, coal drills, loader	s, haul trucks		
Haulage				
Preparation Plant		Tipp	le	
SALES DATA				
Percent In-State D	estination Hava	len Power Plant	Use Sta	ram
Percent Out-of-State D	•			
Percent Export D				
Transportaton Mode/Mixed Modes				
ADDITION AND DESCRIPTION AND	VD 601 (1 (E) (T.O.		
ADDITIONAL INFORMATION AN	ND COMMEN	rs		
Geologic Map Reference: See Seneca II		***		
				
		-		



YOAST MINE

Map No17	M.L.R.D. Permit No. <u>C-94-082</u>
Previous Mine Names	
LOCATION INFORMATION	
County Routt	
	30, T. 5 N. R. 87 W.; Sec. 28,29,32, T. 6 N., R. 87 W.
Coal Region Green River	Field Yampa
Topographic Quadrangle Dunckley, Mt. Han	rris
COMPANY INFORMATION	
Mine Operator Seneca Coal Company	
Address P.O. Box Drawer D, Hayden, CO 8163	39
Contacts <u>G. Brad Brown</u>	Telephone <u>(970) 276-3707</u>
Parent Company Peabody Western Coal Com	грапу
Address 1300 South Yale, Flagstaff, AZ 86001	
Contacts Gary L. Melvin	Telephone <u>(520) 774-5253</u>
GENERAL INFORMATION Mine Type Surface	Mining Method Dragline
Mine Status Producing in 1996	
No. of Employees See Seneca II	-
No. of Acres in Permit	
	tate X Private X
	tate Private X
GEOLOGIC INFORMATION Geologic Unit Lower Williams Fork Formation Coal Zone(s) or Bed(s) Wadge, Wolf Creek	Geologic Age <u>Late Creteacous</u>
Coal Thickness(es) Wadge—9.3–14.2 ft, avg 1	
Cleat Orientation and Spacing	
Dip of Bedding <u>8–20°</u>	
Overburden Thickness(es) <u>Wadge—average</u>	e 55.0 ft, Wolf Creek—average 76.0 ft, range 0–120 ft
Interburden Thickness	

COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4
Seam	Wadge	Wolf Creek		
Rank				
Moisture (%)	12.66	12.42		
Ash (%)	7.62	13.21		
Fixed Carbon (%)				
Volatile Matter (%)			· · · · · · · · · · · · · · · · · · ·	. <u> </u>
Sulfur (%)	0.50	0.54		
Heating Value (Btu/lb.)	12,426	11,645	<u>-</u> .	·
Free Swelling Index				
Hardgrove Grindability				
Ash-Softening Temperature (°F)				· · · · · · · · · · · · · · · · · · ·
Methane Characteristics				
Reflectance Data				
COAL PRODUCTION				
1995 Production	19	96 Production _		
Cumulative Production Through 199				
Projected Production (tpy) 1997	See Seneca II			
Remaining Reserves/Life of Mine _	10 years			
Shifts Per Day2—8 hrs				
Production Per Shift See Seneca	II	,		
Equipment Draglines, overburden	drills, coal drills, load	ers, haul trucks		
Haulage				
Preparation Plant		Tipp	ole	
SALES DATA				
Percent In-State100	Destination Hay	den Power Plant	Use <u>S</u>	team
Percent Out-of-State	Destination		Use	40.
Percent Export	Destination			
Transportaton Mode/Mixed Modes	Haulage trucks	from mine to pou	ver plant	
ADDITIONAL INFORMATION	I AND COMMEN	TS		
Stripping of the first pit started in C				
Geologic Map Reference: See Seneca			- /-	
				
			-	



TWENTYMILE MINE

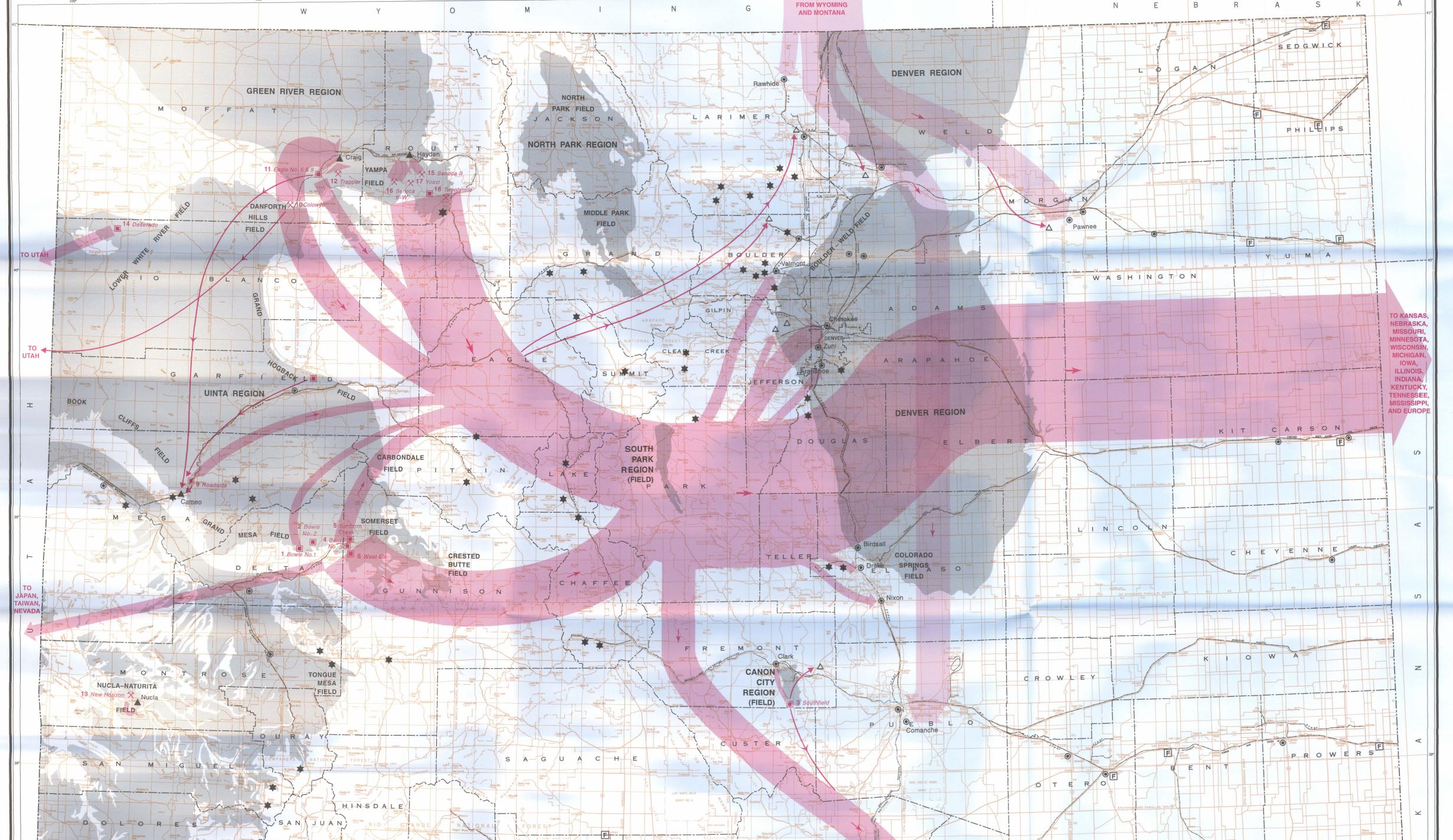
Map No. <u>18</u>	M.L.R.D. Permit No. <u>C-82-056</u>				
Previous Mine Names <u>Main, Foidel Creek</u>					
LOCATION INFORMATION					
LOCATION INFORMATION					
County Routt					
	. 86 W.; Sec. 32,33, T. 6 N., R. 86 W., Secs. 23–27,34–36,				
T. 5 N., R. 87 W.; Sec. 7–9, T. 4 N., R. 86 W.	Field Vanna				
Coal Region Green River Topographia Quadranela Rettlemaka Putta A					
Topographic Quadrangle <u>Rattlesnake Butte, N</u>	4unei				
COMPANY INFORMATION					
Mine Operator Cyprus Twentymile Coal Compa	ny				
Address 29515 Routt County Rd No. 27, Oak Cr	eek, CO 80457				
Contacts Ron Spangler	Telephone (970) 879-3800				
Parent Company Cyprus Coal Company					
Address 9100 E. Mineral Circle, Englewood, CO	80112				
Contacts Garold R. Spindler	Telephone <u>(303) 643-5000</u>				
GENERAL INFORMATION					
	Mining Mothed Languall/continuous miners				
Mine Type <u>Underground</u> Mine Status <u>Producing</u>					
Mine Status <u>Producing</u> No. of Employees <u>306</u>					
No. of Acres in Permit	Olion Alimaton				
· •	te X Private X				
	te X Private X				
	111vate				
GEOLOGIC INFORMATION					
Geologic Unit Williams Fork Formation Geologic Age Cretaceous					
Coal Zone(s) or Bed(s) <u>Wadge</u>					
Coal Thickness(es) 7–11 ft					
Cleat Orientation and Spacing N 40° W.					
Dip of Bedding 5–10°, max 15° Strike of Bedding N 25° E to N 50° W					
Overburden Thickness(es) 500–1,700 ft, average 1,100 ft					
Interburden Thickness N/A					

COAL QUALITY	Sample 1	Sample 2	Sample 3	Sample 4		
Seam	Wadge	Wadge	-	•		
Rank	Bit B	Bit C	<u> </u>			
Moisture (%)	9.0	10.30				
Ash (%)	7.1	9.8				
Fixed Carbon (%)	46.5	44.5				
Volatile Matter (%)	37.2	35.50				
Sulfur (%)	0.41	0.41				
Heating Value (Btu/lb.)	11,321	11,200	· · · · · · · · · · · · · · · · · · ·			
Free Swelling Index						
Hardgrove Grindability						
Ash-Softening Temperature (°F)	2,700	2,515				
Methane Characteristics						
Reflectance Data						
COAL PRODUCTION						
1995 Production <u>5,846,803 tons</u>	199	6 Production	5,844,262 to	ons		
Cumulative Production Through 1996 31,992,214 tons						
Projected Production (tpy) 19978,0						
Remaining Reserves/Life of Minet	o year 2023					
Shifts Per Day2—10 hrs						
Production Per Shift14,000 tons						
Equipment <u>MTA shields, Anderson EL 3</u>	3000 shearer, MT	A face conveyor				
Haulage						
Preparation Plant		Tipple				
SALES DATA						
Percent In-State 25 De	stination <u>Colo.</u>	Springs, Denver	Use _ <i>Ste</i>	am_		
Percent Out-of-State	stination <u>IL, IN</u>	I, TX, MS, KS	Use Ste	am, ind.		
Transportation Mode/Mixed Modes	Union Pacific Ra	ilroad				
ADDITIONAL INFORMATION AN	D COMMENT	TS .				
This longwall mining operation went in fi	rom the highwall o	of the Energy No.	1 surface mine.			
Geologic Map References: Tweto, Ogden, 1976 (see Seneca II); Dames & Moore, 1979, Coal Resource						
Occurrence and Coal Development Potential Maps of the Milner Quadrangle, Routt Co., Colo., scale						
1:24,000: U.S.G.S. OF Report 79-815; Dan						
Development Potential Maps of the Rattles		 -				
OF Report 1396						

Coal Production and Distribution and Electric Generation Map of Colorado, 1995



ANIMAS



Base from U.S.Geological Survey

RIVER REGION

Acknowledgments

The authors wish to thank all of the coal produc- J. Mitchie, Platte River Power Authority; Leslie ers, industrial coal consumers, and electric power Parker, Denver Water Department; George producers for their cooperation and assistance with special thanks to the following people: Michael Altivilla, Seneca Coal Co.; Saeed G. Barhaghi, Colorado Public Utilities Commission; Gregory A. Berwick, City of Colorado Springs; Bret Brown, Bowie Coal Sales Co.; Jim Burke, Tri- Transmission-Craig Station; Rocky Thompson, State Generation and Transmission-Nucla Station; Cyprus Coal Company; Jim Van Someren, Tri-Curtis J. Burns, UtiliCorp United, Inc.; Bruce Devers, Rawhide Power Station; Michael Gibson, Wade, Peabody Coal Co.; Jan Wagers, City of Colowyo Coal Company; Brad Gosche, National Colorado Springs; Brett Weidemann, City of King Coal, LLC; Matt Haag, City of Loveland; William Haffner, Tri-State Generation and Trans- Minerals, Inc. mission; Don Holbeck, City of Aspen; David Hurr, Bear Coal Co.; Shirley Just, Colorado Division of Minerals and Geology; Susan Koch, Colorado Springs Utilities; Wendell Koontz, Mountain

TO ARIZONA,

NEW MEXICO

Patterson, Energy Fuels Coal, Inc; Larry Reshke, Powderhorn Coal Co.; Randy Rhodes, Public Service Company of Colorado; Alan Rowley, Trapper Mining Co.; Stephen Self, Eastside Coal Co.; Rich Thompson, Tri-State Generation and State Generation and Transmission; R. Lance Boulder; and Walter Wright, Oxbow Carbon and

DURANGO FIELD

MINERAL

ARCHULET

RIOGRANDE

This map is a revision of Plate 1 of Resource Series 29 (1989) by Edwin A. Kuhn which was in turn a revision of Plate 1, Resource Series 26 (1983) by W.R. Taylor and L.R. Ladwig. Coal Co.; Jim Lepisto, City of Longmont; Thaine

EXPLANATION

10 0 10 20 30 40 50 Kilometers

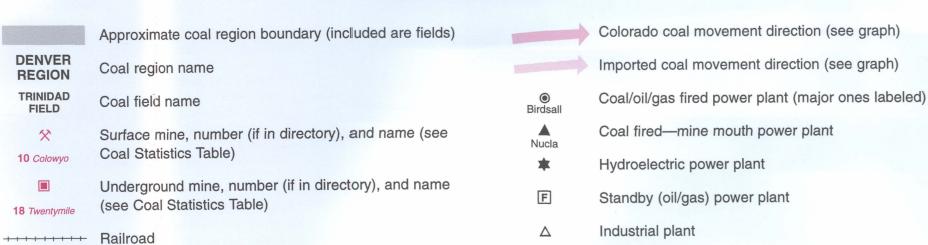
COSTILLA

MESA REGION

FIELD

TO NEW

MEXICO



1995 Colorado Coal Destination in Millions of Tons 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 OUT-OF-STATE IN-STATE 54% 46% 13.8 million tons 11.8 million tons

Scale: 0.25 in. =1 million tons of coal

OKLAHOMA

Edited by Wynn Eakins

Coal Resources

The eight coal-bearing regions of Colorado encompass approximately 26,900 square miles, or 28 percent of the total area of Colorado. Over 434 billion tons of in-place coal resources within 6,000 feet of the ground surface are believed to remain in Colorado (Averitt, 1975, p. 14). Nearly 129 billion tons are within 3,000 feet of the surface. In terms of remaining identified bituminous coal resources, Colorado ranks second behind Illinois (Averitt, 1975, p. 22), but is first in terms of low-sulfur bituminous coal. The demonstrated reserve base of coal in Colorado on January 1, 1995 is estimated at 16.8 billion tons [DOE/EIA-

Colorado coals range in age from early Late Cretaceous to Eocene; ranks range from lignite to anthracite. Over 70 percent of Colorado's coal resources are bituminous, approximately 23 percent are subbituminous, five percent are lignite, and less than one percent is anthracite.

Steam coal comprises nearly all current production in the state with the Green River and Uinta Coal Regions furnishing most of the total. In 1995, approximately half of Colorado's coal production of 25.9 million tons was burned in state and half shipped out of state. Another 5.7 million tons was imported from the Powder River Basin of Wyoming and burned in Colorado power plants. Approximately four percent of coal consumption was industrial, less than one percent was residential and commercial, and over 95 percent was used for electrical generation.

References

- Averitt, Paul, 1975, Coal resources of the United States, January 1, 1974: U.S. Geological Survey Bulletin 1412, 131 p. U.S. Department of Energy, 1995, Coal industry annual, 1995: DOE/EIA-
- U.S. Department of Energy, 1995, U.S. coal reserves: a review and update: DOE/EIA-0529(95), 105 p.

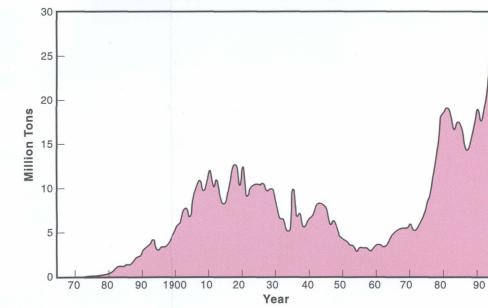
1995 Coal Statistics

	Directory			пррец	- Diolais
County	and Map No.	Mine	In-State	Out-of-Stat	Production te Tons
Delta					522,384 start-up 1997
Fremont	3So	outhfield	284,942 .	10,635	302,233
Garfield	**Ea	astside	375		375
Gunnison	5Sa	anborn Creek		1,057,996	468,002 1,057,996 5,318,650
La Plata	7Ki	ng Coal	10,784	197,332	208,642
Las Animas .					1,519,174 start-up 1997
Mesa	9R	oadside	194,391	377,000	589,064
Moffat	11E	agle No. 5 & 9 .	700,370 .	44,704	4,395,865 745,074 2,024,186
Montrose	13N	ew Horizon	374,266		374,266
Rio Blanco .	14D	eserado		760,255	760,255
Routt	15S 16S 17Y	eneca II eneca II-W past	738,424 1,005,358	<u> </u>	24,088 738,424 1,005,358 start-up 1996 5,846,803
Total	101	Tonty I I II O			25,900,839
			.,,.	,,	

* Total production may differ from amount shipped due to stockpile inventory. ** Mine closed in 1995. Not in Directory, but location shown on map.

Sources: Colorado Division of Minerals and Geology and coal-mine operators.

Colorado Coal Production 1864–1995



1995 Industrial Coal Consumption

major combanner	10110	Tillie, State
Coors Energy Company		
Golden, Colorado	380,000 E	Bowie Mine No. 1, Colorado
Holman, Inc.		
Portland, Colorado	185,000 S	Southfield Mine, Colorado
Fort Collins, Colorado	28,505	Sanborn Creek Mine, Colorado
Subtotal	213,505	
Southdown, Inc., Lyons Cement	Plant	
	72,097V	West Elk Mine. Colorado
	,	,
Western Sugar Company	44,000	Paring Crook Mine Mentons
		Spring Creek Mine, Montana
**		Spring Creek Mine, Montana
Subtotal	77,361	
Western Paving		
Denver, Colorado	376	Sufco Mine, Utah
Importe	77 737	
Imports		
In-state	003,002	
Total	7/13 330	

Electrical Generation

In 1995, over 35 billion kilowatt hours (kWh) of electricity were produced within the state. (This number represents net generation). Of this, an estimated 30 billion kWh was produced by coal-fired steam generation plants, 2 billion kWh by hydroelectric plants, and the remainder principally by oil and/or gas in major coal-fired plants and assorted gas- and oil-fired plants.

Coal is the predominant fuel burned in steam electric generation plants (95 percent of total generation). Approximately 68 percent of this coal was mined in-state while 32 percent came from other states, principally Wyoming [DOE/EIA-0584(95)]. The construction of large coal-fired plants during the 1950s through the mid 1980s caused numerous small city-owned generation facilities, mainly located throughout eastern Colorado, to be shut down or placed on standby. However, several hydraulic turbine and cogeneration units have been put into operation in the 1990s.

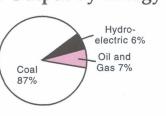
1995 Major Electric Utility Coal Consumption (Tons)

•	_
Imports5,653,912	
In-State11,232,790	
Total16,886,702	

RESOURCE SERIES 32

PLATE 1

1995 Electrical Output by Energy Source



1995 Major Steam Electric Generation and Consumption

	plate	Generation	Coal	Gas	Oi
	Rating (mW)	(x 1000)	(Tons)	(MCF)	(BB)
Bonneville Pacific	C				
Brush Cogeneration					
Rifle Cogeneration					
Subtotal	201	480,228			
City of Colorado					
George Birdsall					
Martin Drake					
Ray D. Nixon Subtotal					
City of Delta					
City of Lamar					
•		87,712		. 1,120,000	
Platte River Power Rawhide		1 7/6 005	1 049 000		
			1,046,000		
Public Service Co				10.629	
Arapahoe					
Cameo					
Cherokee					
Comanche					
Fort Lupton					
Fruita					
Hayden (JO)					
Pawnee					
Valmont					
Zuni					
Subtotal			9,225,164	. 1,413,699	8,14
ThermoCogenera				0.007.000	
Fort Lupton					
Greeley					
				13,490,000	
Tri-State Generat					
Craig					
NuclaSubtotal					
City of Trinidad					
		2,334	2,407		
UtiliCorp United, Pueblo #6		50.460		884 927	_
W.N. Clark					
Subtotal					
Total	5,911		16,886,702		
BBL - Barrels	kWh	- Kilowatt hour	mV	V - Megawatt	
	*	m 1011			

MCF - Thousand Cubic Feet JO - Jointly owned Sources: Colorado Public Utilițies Commission, DOE/EIA-0095(94) Inventory of Power Plants in the United States 1994, electric power producers.

1995 Hydro-Electric Power Generation

Owner	Plant	Nameplate Rating (mW)	kWh Generated (x 1000)
	Maroon Creek Ruedi Reservoir Subtotal	5.00	20,340
	Betasso	0.15 0.68 0.22 0.70	678 462 582 3,376
,	Manitou	1	2
	Dillon Foothills	3.1 2.0 5.5 1.0 3.0	7,780 10,285 9,687 6,382 12,789
	Bridal Veil Falls Ouray Subtotal	0.5	3
City of Loveland Ptarmigan Res. and Energy, Inc	Longmont Idlewild Vallecito. Ames Boulder Cabin Creek* Georgetown Palisade Salida Shoshone Tacoma Subtotal	1 5 	25,042 17 15 69 6 19 8 111
Redlands Water and Power Co Bureau of Reclamation	Redlands Big Thompson Blue Mesa. Crystal. Estes Flat Iron Green Mountain Lower Molina. Upper Molina. Mary's Lake Morrow Point Mount Elbert. Pole Hill Towaoc Subtotal		14,000352,000163,00099,000253,00056,00019,00031,00042,000517,000161,000206,00013,0001,926,000
STS Hydropower, Ltd			

Sources: Colorado Public Utilities Commission, DOE/EIA-0095(94) Inventory of Power Plants in the United States, 1994, and hydroelectric power producers.