

Attachment 7M-B
1991 Spring and Seep Inventory

SPRING AND SEEP INVENTORY
CO-OP BEAR CANYON MINE FEDERAL LEASE

SCOPE

An inventory was conducted on the Co-Op Mine Lease areas during June, 1990. The purpose of the inventory was to establish locations of seeps and springs within the actual permit area as well as a one-half mile periphery area which could feasibly be impacted through future subsidence. The inventory was designed to not only locate, but to establish baseline data relative to both quantitative and qualitative parameters of each site where springs were observed which had greater than 2 gpm. The area in question is defined on Figure 1.

METHODOLOGY

June 18, 1990, an aerial survey reconnaissance of the permit area was conducted by 3 staff members from E.I.S.. The purpose of the reconnaissance was to locate evidence of surface water through actual observation as well as suspect areas of moisture which would be indicated by a lushness of vegetation and/or indicator species such as willow, or cottonwood trees. An aerial survey was beneficial also in establishing a plan to contour ground search the area due to the extreme roughness of the terrain and limited access by any means other than foot.

With the information secured from the aerial survey, the U.S.F.S. was contacted and a search of their files was conducted to locate all existing water rights within the survey area. A copy of the rights are attached as Table 2. The location of all existing water rights were plotted on Figure 1 and correlated against the observation from the aerial survey. These water rights which fell within the area of potential influence were then confirmed with actual ground sightings. The results of the ground observations are recorded on Table 1 with photographs in Appendix #1.

The final phase was to conduct a ground survey of the entire area of potential influence. The method involved a 100% survey of all areas which could theoretically be impacted through mining activities; then to walk all areas within the area of influence at approximately a 200' interval (where accessible) with particular emphasis on all draws and drainage areas. This was accomplished by utilizing a four man team. Access to the ridge was gained by the road up Mohrland, then across Gentry Mt. to McCadden Hollow, then, a jeep trail down the main ridge separating Bear and Trail Canyons. Three men would be let out along the ridge, then contour search the side hills and canyon bottoms to the lower road where they would be picked up. Due to extreme roughness of the terrain and the time involved in transport, an normal working day was limited to approximately 6 hours. Each man carried with him, 2 sets of sample bottles, a thermometer, Ph and Conductivity meters, and the means to determine flow through time-volume materials. When a spring or seep was observed, its location was plotted on a map. If there was flow, it was measured as to volume, temperature, and Ph and Conductivity. There were no springs within the survey area (that were accessible) with flows in excess of 2 gpm's. The upper region of Bear Canyon was inaccessible and the main flow of Bear Creek originates approximately 300' below the ridge. This area is not accessible by conventional means, however, Bear Creek has been historically sampled by Co-Op Mine over the last 9 years.

CONCLUSIONS AND RESULTS

The area of potential influence in association with underground mining of the lease areas had springs and or seeps. There were a total of 14 seeps and/or springs that were located; none of these had sufficient flow to collect qualitative samples. The flow from 9 of the sampled springs was less then .5 gpm. Only 1 site had in excess of 2 gpm. These are labeled on Figure 1 as BL-8. BL-8 is associated with Water Right # 714 with a flow of 2 gpm. This spring is located at the outer edge of the area of potential influence and is the only source which has a well

defined outfall and established riparian zone. It is believed to be a permanent year-round source of water. M-4, (USFS # 142) has a flow of .25 gpm at the source but then diminishes to 0 gpm within approximately 200 ft. of channel. The absence of a well defined riparian zone leads to the assumption that this spring is of an intermittent nature and is most likely dry during the fall of the year.

All of the remaining springs and seeps had a very small area of influence with virtually no surface flow beyond 10' to 15' and no defined riparian zones other than that a minor lushness of vegetation in the immediate area of influence. There was no riparian based vegetation but simply a lushness of vegetation which was indigenous to the surrounding area. Table 1 lists each spring and seep with flow.

RECOMMENDATIONS

Only 1 spring has sufficient flow to warrant baseline monitoring. This constitutes the head water of Bear Creek BL-8. Due to the nature and location of this, it would necessitate an experienced rock climber to collect at the source, considering that the creek is sampled with 1300 to 1600 feet of the source, it would seem redundant to re-initiate baseline data in this inaccessible area.

CONCLUSIONS

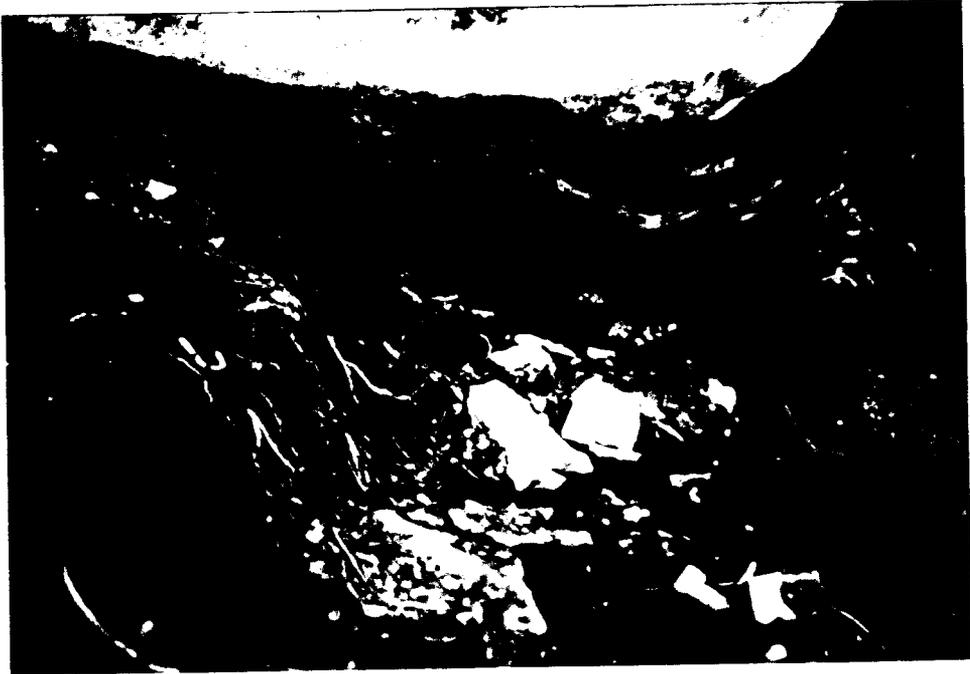
It is apparent after the survey, that surface water is conspicuously absent over the majority of the proposed lease area. In this light, all effort should be made to maintain the integrity of the existing springs. However, due to the amount of overburden and depth of the coal seam, no adverse impacts appear likely; in fact, the general consequence of the existing mining operation with its associated sediment control structures and ponds has resulted in a positive benefit to Bear Creek in eliminating considerable sediment as the creek transverses the existing permit area.

Table 1

BL-1	Spring	.3 gpm	
BL-2	Spring	.5 gpm	
BL-3	Seep	No Flow	
BL-3a	Associated seep	No Flow	
BL-4	Spring	.5 gpm	
BL-5	Spring	.5 gpm	
BL-6	Spring	.5 gpm	
BL-7	Spring	.5 gpm	
BL-8	Spring	2+ gpm	Main source
M-1a			
M-1b	Intermittant in main drainage		
M-1c			
M-2	Spring	.5 gpm	
M-3	Spring	.25 gpm	
M-4	Spring	.25 gpm	
T-1	Seep	.1 gpm	puddled

Table 2

USFS 712	Channel Area 151
USFS 714	Channel Area 142
USFS 713	Off Area of Influence



N-2



N-3



BI-1



BI-2



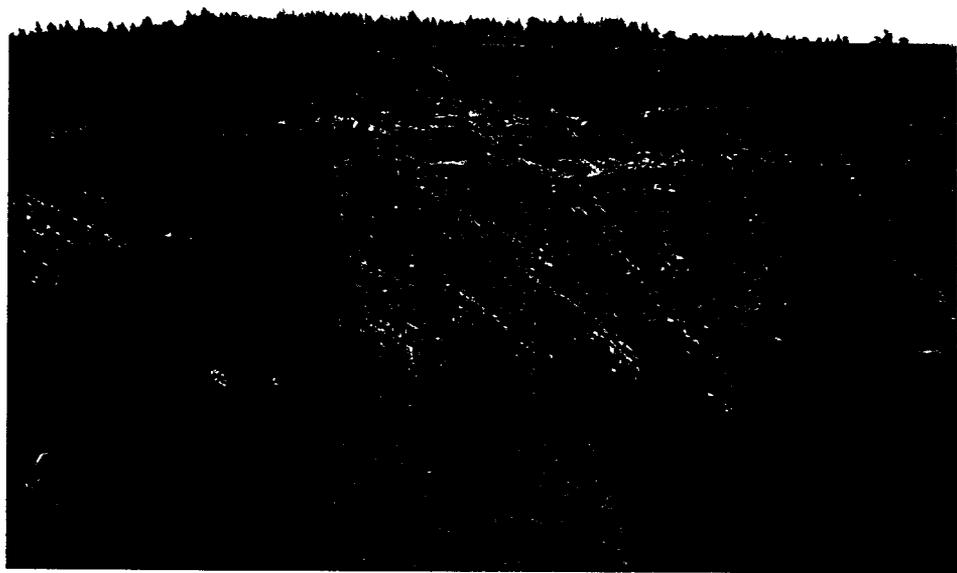
BL-3



BL-4



BL-5



BL-6 BL-7



BL-8

SPRING AND SEEP INVENTORY

CO-OP MINING CO. FEDERAL LEASES

AUGUST, 1991

Prepared by:

Environmental Industrial Services

P.O. Box 358

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SPRING AND SEEP INVENTORY
CO-OP MINING FEDERAL LEASES

SCOPE

An inventory was conducted on the Bear Canyon Mine Lease area during July and August, 1991. The purpose of the inventory was to establish locations of seeps and springs within the actual permit area as well as a one-quarter mile periphery area which could feasibly be impacted through future subsidence. The inventory was designed to not only locate, but to establish baseline data relative to both quantitative and qualitative parameters of each site where springs were observed which had flows greater than .2 gpm. The area in question is defined on Figure 1.

METHODOLOGY

July 28, 1991, an aerial survey reconnaissance of the permit area was conducted by 3 staff members from E.I.S.. The purpose of the reconnaissance was to locate evidence of surface water through actual observation as well as suspect areas of moisture which would be indicated by a lushness of vegetation and/or indicator species such as willow, or cottonwood trees. An aerial survey was beneficial also in establishing a plan to contour ground search the area due to the extreme roughness of the terrain and limited access by any means other than foot.

With the information secured from the aerial survey, the U.S.F.S. was contacted and a search of their files was conducted to locate all existing water rights within the survey area. A copy of the rights are attached as Table 2. The location of all existing water rights were plotted on Figure 1 and correlated against the observation from the aerial survey. These water rights which fell within the area of potential influence were then confirmed with actual ground sightings. The results of the ground observations are recorded on Table 1 with lab analysis in Appendix #1.

The final phase was to conduct a ground survey of the entire area of potential influence. The method involved a 100% survey of all areas which could theoretically be impacted through mining activities; then to walk all areas within the area of influence at approximately a 200' interval (where accessible) with particular emphasis on all draws and drainage areas. This was accomplished by utilizing a four to six man team. Access to the ridge was gained by the road up Cedar Creek from Mohrland, then across Gentry Mt. to the Lease area, then along jeep trails down the main ridges. Three to five men would be let out along the ridge, then contour search the side hills and canyon bottoms to the lower road where they would be picked up. Due to extreme roughness of the terrain and the time involved in transport, an normal working day was limited to approximately 6 hours. Each man carried with him, 2 sets of sample bottles, a thermometer, Ph and Conductivity meters, and the means to determine flow through

time-volume materials. When a spring or seep was observed, its location was plotted on a map. If there was flow, it was measured as to volume, temperature, and Ph and Conductivity.

CONCLUSIONS AND RESULTS

The area of potential influence in association with underground mining of the lease areas had springs and or seeps. There were a total of 25 seeps and/or springs that were located; 24 of these had sufficient flow to collect qualitative samples. The flow from 1 of the sampled springs was less than .5 gpm. The balance of the sites had in excess of 1 gpm. A brief description of each site and field data is as follows:

Table 1

Identification #	Flow	PH	Cond.	Date
# 1 Fish Creek	120	7.9	800	7/30/91
# 2 L.F. Fish Creek	2.5	7.6	500	7/31/91
# 3 Rt. F. Fish Creek	80	7.6	500	7/31/91
# 4 Head of L.F. Fish Creek	20	8.3	1050	7/30/91
# 5 Head of L.F. Fish Creek	31	8.2	600	7/30/91
# 6 Head of L.F. Fish Creek	40	8.2	450	7/30/91
# 7 Wild Horse Ridge Pt.	5	8.1	500	7/31/91
# 8 Wild Horse Ridge Trough	10	8	500	7/31/91
# 9 RF, RF Bear	4.7	8.1	510	8/08/91
#10 LF, RF Bear	>.2	8	1450	7/31/91
#11 McCadden Hollow	1.5	7.9	800	7/31/91
#12 McCadden Hollow	12	8.05	550	8/01/91
#13 McCadden Hollow	1.5	8	450	8/01/91
#14 McCadden Hollow Trough	8.7	7.5	500	8/01/91
#15 McCadden Hollow Trough	8.5	8	550	8/02/91
#16 (7 locations)	9.8	8.4	500	8/02/91
#17 Spring (Fish Creek)	2.1	8.2	700	7/30/91
#18 Tie Fork Above Fence	5	7.6	450	8/07/91
#19 Tie Fork Below Fence	22.4	7.6	480	8/07/91
#20 Main Creek Tie Fork	120	8	500	8/08/91

Table 1 (Continued)

<u>Identification #</u>	<u>Flow</u>	<u>PH</u>	<u>Cond.</u>	<u>Date</u>
#21 Side Canyon Hunt. Creek	15	8.4	300	8/08/91
#22 Head of Trail Creek	9	7.8	450	8/07/91
#23 Huntington Canyon (Hwy)	2.4 seep area	7.8	2000	8/08/91
#24 Wild Horse Ridge (Top side canyon)	4	8.1	450	8/08/91
#25 Head of Bear Creek	7.8	8.2	2000	8/08/91

RECOMMENDATIONS:

A number of the sources located are presently being monitored or have been historically monitored. A determination by Co-Op Mining Company, the U.S. Forest Service, Division of Oil, Gas & Mining and other concerned agencies should make a determination as to when and what new sources should be incorporated into the monitoring plan.

CONCLUSIONS:

It is apparent after the survey, that surface water is widely dispersed over the majority of the proposed lease area. In this light, all effort should be made to maintain the integrity of the existing springs. However, due to the amount of overburden and depth of the coal seam, no adverse impacts appear likely; in fact, the general consequence of the existing mining operation with its associates sediment control structures and ponds has resulted in a positive benefit to Bear Creek in eliminating considerable sediment as the creek transverses the existing permit area.

Table 2

Recorded Water Rights

Table 2 Recorded Water Rights

<u>W U C #</u>	<u>Name</u>	<u>Amount</u>
93-116	Utah Power & Light	11.28 acre-ft
93-129	Nevada Electric Investment Co. (NEICO)	0.85 acre-ft
93-130	U. S. Forest Service	11.28 acre-ft
93-131	Peabody Coal Company/NEICO	
93-138	Nevada Electric Investment Co.	0.85 acre-ft
93-139	U. S. Forest Service	11.28 acre-ft
93-140	Utah State Division of State Lands	4.70 acre-ft
93-141	Nevada Electric Investment Co.	0.85 acre-ft
93-142	U. S. Forest Service	11.28 acre-ft
93-143	Nevada Electric Investment Co.	
93-144	U. S. Forest Service	11.28 acre-ft
93-146	Nevada Electric Investment Co.	
93-147	U. S. Bureau of Land Management	
93-148	U. S. Bureau of Land Management	
93-149	Nevada Electric Investment Co.	
93-150	Nevada Electric Investment Co.	
93-151	U. S. Forest Service	11.28 acre-ft
93-155	U. S. Bureau of Land Management	
93-156	A. U. Mines Incorporated	
93-157	A.U. Mines Incorporated	
93-158	Intermountain Power Agency	
93-165	U. S. Bureau of Land Management	
93-166	U. S. Forest Service	
93-188	U. S. Forest Service	11.28 acre-ft
93-190	U. S. Forest Service	11.28 acre-ft
93-192	U. S. Forest Service	1.47 acre-ft
93-193	U. S. Forest Service	1.47 acre-ft
93-195	U. S. Forest Service	11.28 acre-ft
93-196	Hiatt, Marena Madden, et al	0.24 acre-ft
93-199	Utah Power & Light	
93-202	U. S. Bureau of Land Management	
93-203	McKinnon, Malcolm N.	
93-210	McKinnon, Malcolm N.	
93-214	Utah Power & Light	
93-217	Utah Power & Light	
93-219	Huntington Cleveland Irrigation Co.	150.00 cfs
93-220	Huntington Cleveland Irrigation Co.	150.00 cfs
93-253	Huntington Cleveland Irrigation Co.	150.00 cfs
93-254	Huntington Cleveland Irrigation Co.	150.00 cfs
93-259	U. S. Forest Service	11.28 acre-ft
93-260	Hiatt, Marena Madden, et al	0.24 acre-ft
93-303	Huntington Cleveland Irrigation Co.	
93-304	Huntington Cleveland Irrigation Co.	150.00 cfs
93-309	Huntington Cleveland Irrigation Co.	150.00 cfs
93-310	Huntington Cleveland Irrigation Co.	150.00 cfs
93-390	Nevada Electric Investment Co.	
93-564	State of Utah Division of State Lands	

Table 2 Recorded Water Rights (cont)

<u>W U C #</u>	<u>Name</u>	<u>Amount</u>
93-928	Huntington Cleveland Irrigation Co.	
93-955	Utah Board of Water Resources (Storage in Huntington Reservoir)	
93-1063	State of Utah Board of Water Resources	
93-1067	Kingston, Charles W.	0.25 cfs
93-1115	Utah Power & Light	20.00 cfs
93-1137	Huntington Cleveland Irrigation Co.	
93-1182	Peabody Coal Co.	
93-1183	Utah Power & Light	
93-1187	U.S. Forest Service	
93-1408	U. S. Forest Service	0.97 acre-ft
93-1411	U. S. Forest Service	1.47 acre-ft
93-1427	U. S. Forest Service	
93-1428	U. S. Forest Service	
93-1429	U. S. Forest Service	11.28 acre-ft
93-1430	U. S. Forest Service	11.28 acre-ft
93-1431	U. S. Forest Service	11.28 acre-ft
93-1432	U. S. Forest Service	11.28 acre-ft
93-1433	U. S. Forest Service	11.28 acre-ft
93-1434	U. S. Forest Service	11.28 acre-ft
93-1435	U. S. Forest Service	11.28 acre-ft
93-1436	U. S. Forest Service	11.28 acre-ft
93-2193	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2194	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2195	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2196	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2197	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2198	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2199	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2200	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2201	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2202	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2203	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2204	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2205	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2206	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2207	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2208	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2209	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2210	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2220	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2221	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2222	Huntington Cleveland Irrigation Co.	80.00 cfs
93-2223	Huntington Cleveland Irrigation Co.	45.00 cfs
93-2224	Huntington Cleveland Irrigation Co.	77.25 cfs
93-2225	Huntington Cleveland Irrigation Co.	80.00 cfs
93-3171	Northwest Carbon Corporation	
93-3195	State of Utah Board of Water Resources	
93-3207	U. S. Bureau of Land Management	
93-3208	U. S. Bureau of Land Management	

Table 2 Recorded Water Rights (cont)

<u>W U C #</u>	<u>Name</u>	<u>Amount</u>
93-3209	U. S. Bureau of Land Management	
93-3211	U. S. Bureau of Land Management	
93-3033	Northwest Carbon Corporation	
93-3657	Co-Op Mining Company	15.0 acre-ft
e1621	Utah Power & Light	
e1730	Utah Power & Light	
e2504	Castle Valley Special Service District	

Note: This table includes all water rights on file with the Utah Division of Water Rights on the following sections; Sec. 9, 10, 11, 12, 13, 14, 15, 23, 24, 25, 26, 27, 35 36, T16S R7E S.L.B.M. and Sections; 19, 20, 29, 30, 31, 32, T16S R8E S.L.B.M.

Appendix 1

Laboratory Analysis

CLIENT:	Co-Op Coal	DATE REPORTED:	09/18/91
ID:	Spring LF	DATE RECEIVED:	08/06/91
SITE:	Fish Creek #2 (FC-2)	DATE COLLECTED:	07/31/91
LAB NO:	F6833		

Lab pH (s.u.).....	7.57
Lab conductivity, umhos/cm.....	528
Lab resistivity, ohm-m.....	18.9
Total dissolved solids (180), mg/l..	272
Total dissolved solids (calc), mg/l.	276
Total suspended solids, mg/l.....	9
Total alkalinity as CaCO ₃ , mg/l.....	273
Total hardness as CaCO ₃ , mg/l.....	283
Sodium absorption ratio.....	0.072
Fluoride, mg/l.....	0.20
Sulfide as H ₂ S, mg/l.....	<0.1
Nitrate, mg/l.....	0.17
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.07

	mg/l	meq/l
Bicarbonate as HCO ₃	333	5.46
Carbonate as CO ₃	0	0
Chloride.....	2.13	0.06
Sulfate.....	9.05	0.19
Calcium.....	72.6	3.62
Magnesium.....	24.8	2.04
Potassium.....	0.33	0.01
Sodium.....	2.8	0.12
Major cations.....		5.79
Major anions.....		5.72
Cation/anion difference.....		0.62 %

CLIENT: Co-Op Coal
 ID: Right Fork
 SITE: Fish Creek #6 (WPR-7)
 LAB NO: F6837

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 07/30/91

Lab pH (s.u.).....	8.19
Lab conductivity, umhos/cm.....	434
Lab resistivity, ohm-m.....	23
Total dissolved solids (180), mg/l..	214
Total dissolved solids (calc), mg/l.	234
Total suspended solids, mg/l.....	10
Total alkalinity as CaCO ₃ , mg/l.....	205
Total hardness as CaCO ₃ , mg/l.....	224
Sodium absorption ratio.....	0.134
Fluoride, mg/l.....	0.19
Sulfide as H ₂ S, mg/l.....	<0.1
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.15

	mg/l	meq/l
Bicarbonate as HCO ₃	250	4.1
Carbonate as CO ₃	0	0
Chloride.....	2.53	0.07
Sulfate.....	28	0.58
Calcium.....	51.6	2.57
Magnesium.....	23.2	1.91
Potassium.....	0.88	0.02
Sodium.....	4.6	0.2
Major cations.....		4.7
Major anions.....		4.76
Cation/anion difference.....		0.54 %

CLIENT:	Co-Op Coal	DATE REPORTED:	09/18/91
ID:	Right Fork	DATE RECEIVED:	08/06/91
SITE:	Fish Creek #6 (WH0-7)	DATE COLLECTED:	07/30/91
LAB NO:	F6845 Lab Split		

Lab pH (s.u.).....		8.35
Lab conductivity, umhos/cm.....		429
Lab resistivity, ohm-m.....		23.3
Total dissolved solids (180), mg/l..		208
Total dissolved solids (calc), mg/l.		229
Total suspended solids, mg/l.....		<1
Total alkalinity as CaCO ₃ , mg/l.....		196
Total hardness as CaCO ₃ , mg/l.....		224
Sodium absorption ratio.....	0.136	
Fluoride, mg/l.....	0.21	
Sulfide as H ₂ S, mg/l.....	0	*
Nitrate, mg/l.....	<0.02	
Nitrite, mg/l.....	<0.02	
Ammonia, mg/l.....	0.13	
	mg/l	meq/l
Bicarbonate as HC0 ₃	230	3.77
Carbonate as C0 ₃	4.5	0.15
Chloride.....	2.64	0.07
Sulfate.....	28.4	0.59
Calcium.....	50.5	2.52
Magnesium.....	23.9	1.97
Potassium.....	0.9	0.02
Sodium.....	4.7	0.2
Major cations.....		4.72
Major anions.....		4.59
Cation/anion difference.....		1.36 †

* Insufficient sample for duplicate analysis.

CLIENT: Co-Op Coal
 ID: LF Spring
 SITE: Fish Creek #8 (WHR-2)
 LAB NO: F6839

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 07/31/91

Lab pH (s.u.).....	8.02
Lab conductivity, umhos/cm.....	515
Lab resistivity, ohm-m.....	19.4
Total dissolved solids (180), mg/l..	262
Total dissolved solids (calc), mg/l.	271
Total suspended solids, mg/l.....	185
Total alkalinity as CaCO3, mg/l.....	268
Total hardness as CaCO3, mg/l.....	272
Sodium absorption ratio.....	0.084
Fluoride, mg/l.....	0.29
Sulfide as H2S, mg/l.....	<0.1
Nitrate, mg/l.....	0.28
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.08

	mg/l	meq/l
Bicarbonate as HC03.....	328	5.37
Carbonate as C03.....	0	0
Chloride.....	2.23	0.06
Sulfate.....	8.23	0.17
Calcium.....	76.3	3.81
Magnesium.....	19.8	1.63
Potassium.....	0.4	0.01
Sodium.....	3.2	0.14
Major cations.....		5.58
Major anions.....		5.62
Cation/anion difference.....		0.36 %

CLIENT: Co-Op Coal
 ID: LF Spring
 SITE: Fish Creek #8 (w HR-2)
 LAB NO: F6839

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 07/31/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	1.3	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.35	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.90	<0.05
Manganese (Mn).....	0.02	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal

DATE REPORTED: 09/16/91

ID: 0945

SITE: Fish Creek Spring (5B(-14))

DATE RECEIVED: 08/13/91

LAB NO: F6907

DATE COLLECTED: 08/08/91

Lab pH (s.u.).....		8.11
Lab conductivity, umhos/cm.....		533
Lab resistivity, ohm-m.....		18.8
Total dissolved solids (180), mg/L..		312
Total dissolved solids (calc), mg/L.		300
Total suspended solids, mg/L.....		10
Total alkalinity as CaCO3, mg/L.....		302
Total hardness as CaCO3, mg/L.....		302
Sodium absorption ratio.....		0.068
Fluoride, mg/L.....		0.18
Sulfide as H2S, mg/L.....		<0.1
Nitrate, mg/L.....		0.27
Nitrite, mg/L.....		<0.02
Ammonia, mg/L.....		0.14
	mg/L	meq/L
Bicarbonate as HCO3.....	368	6.03
Carbonate as CO3.....	0	0
Chloride.....	2.53	0.07
Sulfate.....	7.41	0.15
Calcium.....	83	4.14
Magnesium.....	23.1	1.9
Potassium.....	0.28	0.01
Sodium.....	2.7	0.12
Major cations.....		6.17
Major anions.....		6.28
Cation/anion difference.....		0.83 %

CLIENT:	Co-Op Coal	DATE REPORTED:	09/18/91
ID:	Right Fork	DATE RECEIVED:	08/06/91
SITE:	Bear Canyon #10 (SBL-15)	DATE COLLECTED:	07/31/91
LAB NO:	F6840		

Lab pH (s.u.).....	7.96
Lab conductivity, umhos/cm.....	1480
Lab resistivity, ohm-m.....	6.76
Total dissolved solids (180), mg/l..	1140
Total dissolved solids (calc), mg/l.	1110
Total suspended solids, mg/l.....	13
Total alkalinity as CaCO ₃ , mg/l.....	412
Total hardness as CaCO ₃ , mg/l.....	891
Sodium absorption ratio.....	0.551
Fluoride, mg/l.....	0.37
Sulfide as H ₂ S, mg/l.....	<0.1
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.07

	mg/l	meq/l
Bicarbonate as HC03.....	503	8.24
Carbonate as C03.....	0	0
Chloride.....	18.8	0.53
Sulfate.....	541	11.3
Calcium.....	114	5.68
Magnesium.....	148	12.2
Potassium.....	5.86	0.15
Sodium.....	37.8	1.64
Major cations.....		19.6
Major anions.....		20
Cation/anion difference.....		1.04 %

CLIENT:	Co-Op Coal	DATE REPORTED:	09/18/91
ID:	1130	DATE RECEIVED:	08/06/91
SITE:	URF #11 (A4-1)	DATE COLLECTED:	07/31/91
LAB NO:	F6841		

Lab pH (s.u.).....	7.84
Lab conductivity, umhos/cm.....	770
Lab resistivity, ohm-m.....	13
Total dissolved solids (180), mg/l..	468
Total dissolved solids (calc), mg/l.	474
Total suspended solids, mg/l.....	8
Total alkalinity as CaCO ₃ , mg/l.....	381
Total hardness as CaCO ₃ , mg/l.....	445
Sodium absorption ratio.....	0.285
Fluoride, mg/l.....	0.34
Sulfide as H ₂ S, mg/l.....	<0.1
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.07

	mg/l	meq/l
Bicarbonate as HC03.....	464	7.61
Carbonate as C03.....	0	0
Chloride.....	15.3	0.43
Sulfate.....	72.8	1.52
Calcium.....	85.9	4.29
Magnesium.....	56.1	4.61
Potassium.....	1.53	0.04
Sodium.....	13.8	0.6
Major cations.....		9.54
Major anions.....		9.56
Cation/anion difference.....		0.12 %

CLIENT: Co-Op Coal
ID: 1130
SITE: URF #11 (14-1)
LAB NO: F6841

DATE REPORTED: 09/18/91
DATE RECEIVED: 08/06/91
DATE COLLECTED: 07/31/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	0.2	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.18	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.44	<0.05
Manganese (Mn).....	0.15	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co-Op Coal
 ID: 1045
 SITE: #12 (FBC-2)
 LAB NO: F6842

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 08/01/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	10.4	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.69	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.02	<0.01
Iron (Fe).....	7.60	<0.05
Manganese (Mn).....	0.26	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.01	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.03	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co-Op Coal
 ID: 1045
 SITE: #12 (FBC-2)
 LAB NO: F6842

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 08/01/91

Lab pH (s.u.).....	8.06
Lab conductivity, umhos/cm.....	548
Lab resistivity, ohm-m.....	18.2
Total dissolved solids (180), mg/l..	352
Total dissolved solids (calc), mg/l.	305
Total suspended solids, mg/l.....	158
Total alkalinity as CaCO ₃ , mg/l.....	311
Total hardness as CaCO ₃ , mg/l.....	305
Sodium absorption ratio.....	0.122
Fluoride, mg/l.....	0.33
Sulfide as H ₂ S, mg/l.....	<0.1
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.07

	mg/l	meq/l
Bicarbonate as HCO ₃	379	6.22
Carbonate as CO ₃	0	0
Chloride.....	2.33	0.07
Sulfate.....	5.76	0.12
Calcium.....	77.8	3.88
Magnesium.....	26.9	2.21
Potassium.....	0.89	0.02
Sodium.....	4.9	0.21
Major cations.....		6.33
Major anions.....		6.4
Cation/anion difference.....		0.58 %

CLIENT: Co - Op Coal
 ID: 1430
 SITE: # 14 (S114-4)
 LAB NO: F6908

DATE REPORTED: 09/16/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/01/91

Lab pH (s.u.).....	7.48
Lab conductivity, umhos/cm.....	514
Lab resistivity, ohm-m.....	19.5
Total dissolved solids (180), mg/L..	396
Total dissolved solids (calc), mg/L.	328
Total suspended solids, mg/L.....	1530
Total alkalinity as CaCO ₃ , mg/L.....	321
Total hardness as CaCO ₃ , mg/L.....	326
Sodium absorption ratio.....	0.111
Fluoride, mg/L.....	0.25
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.28

	mg/L	meq/L
Bicarbonate as HCO ₃	391	6.41
Carbonate as CO ₃	0	0
Chloride.....	5.27	0.15
Sulfate.....	8.64	0.18
Calcium.....	86.3	4.3
Magnesium.....	27	2.22
Potassium.....	3.4	0.09
Sodium.....	4.6	0.2
Major cations.....		6.81
Major anions.....		6.74
Cation/anion difference.....		0.51 %

CLIENT: Co - Op Coal
 ID: 1430
 SITE: # 14 (SMH - 4)
 LAB NO: F6908

DATE REPORTED: 09/16/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/01/91

Trace metals by AA (total concentration), mg/L

	Analytical Result:	Detection Limit:
Arsenic (As).....	0.008	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/L

	Analytical Result:	Detection Limit:
Aluminum (Al).....	6.7	<0.1
Boron (B).....	0.07	<0.01
Barium (Ba).....	0.49	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.02	<0.01
Iron (Fe).....	9.51	<0.05
Manganese (Mn).....	0.51	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.11	<0.01
Phosphorus (P).....	1.2	<0.5
Zinc (Zn).....	0.05	<0.01

ND - Analyte "not detected" at the stated detection limit.



 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1230
 SITE: # 15 (5714-2)
 LAB NO: F6909

DATE REPORTED: 09/16/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/02/91

Lab pH (s.u.).....	8.03
Lab conductivity, umhos/cm.....	548
Lab resistivity, ohm-m.....	18.2
Total dissolved solids (180), mg/L..	328
Total dissolved solids (calc), mg/L.	315
Total suspended solids, mg/L.....	16
Total alkalinity as CaCO ₃ , mg/L.....	301
Total hardness as CaCO ₃ , mg/L.....	302
Sodium absorption ratio.....	0.145
Fluoride, mg/L.....	0.34
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.12

	mg/L	meq/L
Bicarbonate as HCO ₃	367	6.01
Carbonate as CO ₃	0	0
Chloride.....	7.2	0.2
Sulfate.....	13	0.27
Calcium.....	81.7	4.07
Magnesium.....	23.9	1.96
Potassium.....	2.91	0.07
Sodium.....	5.8	0.25
Major cations.....		6.37
Major anions.....		6.48
Cation/anion difference.....		0.92 %

CLIENT: Co - Op Coal
 ID: 1230
 SITE: # 15 (5714-2)
 LAB NO: F6909

DATE REPORTED: 09/16/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/02/91

Trace metals by AA (total concentration), mg/L

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/L

	Analytical Result:	Detection Limit:
Aluminum (Al).....	1.3	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.24	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	1.24	<0.05
Manganese (Mn).....	0.06	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.02	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1245
 SITE: # 16 (S7A-1)
 LAB NO: F6910

DATE REPORTED: 09/16/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/02/91

Lab pH (s.u.).....	8.36
Lab conductivity, umhos/cm.....	490
Lab resistivity, ohm-m.....	20.4
Total dissolved solids (180), mg/L..	272
Total dissolved solids (calc), mg/L.	269
Total suspended solids, mg/L.....	3
Total alkalinity as CaCO3, mg/L.....	254
Total hardness as CaCO3, mg/L.....	261
Sodium absorption ratio.....	0.137
Fluoride, mg/L.....	0.28
Sulfide as H2S, mg/L.....	<0.1
Nitrate, mg/L.....	0.29
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.09

	mg/L	meq/L
Bicarbonate as HC03.....	303	4.97
Carbonate as C03.....	3.3	0.11
Chloride.....	5.27	0.15
Sulfate.....	15	0.31
Calcium.....	69.2	3.45
Magnesium.....	21.5	1.77
Potassium.....	0.61	0.02
Sodium.....	5.1	0.22
Major cations.....		5.46
Major anions.....		5.56
Cation/anion difference.....		0.89 %

CLIENT: Co-Op Coal
 ID: 1221
 SITE: Upper Fish Creek (FAC-7)
 LAB NO: F6844

DATE REPORTED: 09/18/91
 DATE RECEIVED: 08/06/91
 DATE COLLECTED: 07/30/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	7.0	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.20	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.03	<0.01
Iron (Fe).....	7.10	<0.05
Manganese (Mn).....	0.16	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.01	<0.01
Phosphorus (P).....	0.5	<0.5
Zinc (Zn).....	0.03	<0.01

ND - Analyte "not detected" at the stated detection limit.



Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1015
 SITE: Tie Fork 20
 LAB NO: F6898

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.07
Lab conductivity, umhos/cm.....	471
Lab resistivity, ohm-m.....	21.2
Total dissolved solids (180), mg/L..	250
Total dissolved solids (calc), mg/L.	265
Total suspended solids, mg/L.....	15
Total alkalinity as CaCO ₃ , mg/L.....	233
Total hardness as CaCO ₃ , mg/L.....	257
Sodium absorption ratio.....	0.125
Fluoride, mg/L.....	0.16
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.15

	mg/L	meq/L
Bicarbonate as HC0 ₃	284	4.66
Carbonate as C0 ₃	0	0
Chloride.....	4.06	0.11
Sulfate.....	31.3	0.65
Calcium.....	53.7	2.68
Magnesium.....	29.9	2.46
Potassium.....	1.58	0.04
Sodium.....	4.6	0.2
Major cations.....		5.38
Major anions.....		5.43
Cation/anion difference.....		0.41 %

CLIENT: Co - Op Coal
ID: 1015
SITE: Tie Fork 20
LAB NO: F6898

DATE REPORTED: 09/11/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.02	<0.01
Barium (Ba).....	0.13	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.01	<0.01
Iron (Fe).....	0.28	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.09	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co - Op Coal	DATE REPORTED: 09/11/91
ID: 1110	
SITE: Hunting Canyon 21 (FBC-11)	DATE RECEIVED: 08/13/91
LAB NO: F6899	DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.36
Lab conductivity, umhos/cm.....	329
Lab resistivity, ohm-m.....	30.4
Total dissolved solids (180), mg/L..	182
Total dissolved solids (calc), mg/L.	179
Total suspended solids, mg/L.....	20
Total alkalinity as CaCO ₃ , mg/L.....	167
Total hardness as CaCO ₃ , mg/L.....	169
Sodium absorption ratio.....	0.107
Fluoride, mg/L.....	0.12
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	0.03
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.14

	mg/L	meq/L
Bicarbonate as HC03.....	194	3.18
Carbonate as C03.....	5.1	0.17
Chloride.....	3.35	0.09
Sulfate.....	9.88	0.21
Calcium.....	52.3	2.61
Magnesium.....	9.39	0.77
Potassium.....	0.82	0.02
Sodium.....	3.2	0.14
Major cations.....		3.54
Major anions.....		3.65
Cation/anion difference.....		1.45 %

CLIENT: Co - Op Coal
 ID: 1100
 SITE: Head Trail 22 (FBC-K)
 LAB NO: F6900

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/07/91

Lab pH (s.u.).....	7.74
Lab conductivity, umhos/cm.....	478
Lab resistivity, ohm-m.....	20.9
Total dissolved solids (180), mg/L..	244
Total dissolved solids (calc), mg/L.	250
Total suspended solids, mg/L.....	74
Total alkalinity as CaCO ₃ , mg/L.....	241
Total hardness as CaCO ₃ , mg/L.....	244
Sodium absorption ratio.....	0.15
Fluoride, mg/L.....	0.31
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	0.39
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.07

	mg/L	meq/L
Bicarbonate as HC0 ₃	294	4.82
Carbonate as C0 ₃	0	0
Chloride.....	8.01	0.23
Sulfate.....	9.05	0.19
Calcium.....	60	2.99
Magnesium.....	22.9	1.89
Potassium.....	0.4	0.01
Sodium.....	5.4	0.23
Major cations.....		5.13
Major anions.....		5.26
Cation/anion difference.....		1.3 %

CLIENT: Co - Op Coal
 ID: 1100
 SITE: Head Trail 22 (FBC-10)
 LAB NO: F6900

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/07/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	1.7	<0.1
Boron (B).....	0.02	<0.01
Barium (Ba).....	0.27	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.01	<0.01
Iron (Fe).....	1.27	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.03	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.



Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1100
 SITE: Head Trail 22 (FB(-10))
 LAB NO: F6902 Split

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/07/91

Lab pH (s.u.).....	7.86
Lab conductivity, umhos/cm.....	483
Lab resistivity, ohm-m.....	20.7
Total dissolved solids (180), mg/L..	238
Total dissolved solids (calc), mg/L.	257
Total suspended solids, mg/L.....	74
Total alkalinity as CaCO ₃ , mg/L.....	243
Total hardness as CaCO ₃ , mg/L.....	254
Sodium absorption ratio.....	0.164
Fluoride, mg/L.....	0.29
Sulfide as H ₂ S, mg/L.....	*
Nitrate, mg/L.....	0.39
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.04

	mg/L	meq/L
Bicarbonate as HC0 ₃	296	4.86
Carbonate as C0 ₃	0	0
Chloride.....	7.91	0.22
Sulfate.....	10.3	0.21
Calcium.....	64.2	3.2
Magnesium.....	22.8	1.88
Potassium.....	0.44	0.01
Sodium.....	6	0.26
Major cations.....		5.35
Major anions.....		5.32
Cation/anion difference.....		0.29 %

* Insufficient sample to run duplicate analysis.

CLIENT: Co - Op Coal
 ID: 1100
 SITE: Head Trail 22 (FBC - 10)
 LAB NO: F6902 Split

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/07/91

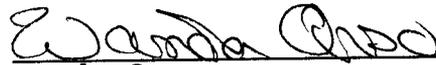
Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	1.9	<0.1
Boron (B).....	0.03	<0.01
Barium (Ba).....	0.27	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	1.32	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.05	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT:	Co -Op Coal	DATE REPORTED:	09/11/91
ID:	1100	DATE RECEIVED:	08/13/91
SITE:	Hunington Canyon 23	DATE COLLECTED:	08/08/91
LAB NO:	F6901		

Lab pH (s.u.).....	7.80
Lab conductivity, umhos/cm.....	2050
Lab resistivity, ohm-m.....	4.88
Total dissolved solids (180), mg/L..	1540
Total dissolved solids (calc), mg/L.	1490
Total suspended solids, mg/L.....	652
Total alkalinity as CaCO3, mg/L.....	545
Total hardness as CaCO3, mg/L.....	1190
Sodium absorption ratio.....	0.642
Fluoride, mg/L.....	0.61
Sulfide as H2S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.05

	mg/L	meq/L
Bicarbonate as HC03.....	665	10.9
Carbonate as C03.....	0	0
Chloride.....	81.9	2.31
Sulfate.....	676	14.1
Calcium.....	126	6.27
Magnesium.....	213	17.5
Potassium.....	10.6	0.27
Sodium.....	50.9	2.21
Major cations.....		26.2
Major anions.....		27.3
Cation/anion difference.....		1.98 %

CLIENT:	Co - Op Coal	DATE REPORTED:	09/16/91
ID:	1500	DATE RECEIVED:	08/13/91
SITE:	# 24 (WAR-9)	DATE COLLECTED:	08/08/91
LAB NO:	F6911		

Lab pH (s.u.).....	8.16
Lab conductivity, umhos/cm.....	482
Lab resistivity, ohm-m.....	20.7
Total dissolved solids (180), mg/L..	270
Total dissolved solids (calc), mg/L.	262
Total suspended solids, mg/L.....	230
Total alkalinity as CaCO ₃ , mg/L.....	262
Total hardness as CaCO ₃ , mg/L.....	258
Sodium absorption ratio.....	0.065
Fluoride, mg/L.....	0.19
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	0.20
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.22

	mg/L	meq/L
Bicarbonate as HCO ₃	320	5.24
Carbonate as CO ₃	0	0
Chloride.....	3.04	0.09
Sulfate.....	6.58	0.14
Calcium.....	76.1	3.8
Magnesium.....	16.6	1.37
Potassium.....	0.22	0.01
Sodium.....	2.4	0.1
Major cations.....		5.27
Major anions.....		5.48
Cation/anion difference.....		1.87 %

CLIENT: Co - Op Coal
ID: 1500
SITE: # 24 (with 9)
LAB NO: F6911

DATE REPORTED: 09/16/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

Trace metals by AA (total concentration), mg/L

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/L

	Analytical Result:	Detection Limit:
Aluminum (Al).....	0.7	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.36	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.71	<0.05
Manganese (Mn).....	0.02	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.02	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT:	Co - Op Coal	DATE REPORTED:	09/16/91
ID:	1500	DATE RECEIVED:	08/13/91
SITE:	# 24 (WHR-9)	DATE COLLECTED:	08/08/91
LAB NO:	F6916 Lab Split		

Lab pH (s.u.).....	7.86
Lab conductivity, umhos/cm.....	485
Lab resistivity, ohm-m.....	20.6
Total dissolved solids (180), mg/L..	288
Total dissolved solids (calc), mg/L.	262
Total suspended solids, mg/L.....	47
Total alkalinity as CaCO ₃ , mg/L.....	264
Total hardness as CaCO ₃ , mg/L.....	261
Sodium absorption ratio.....	0.07
Fluoride, mg/L.....	0.24
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	0.20
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.18

	mg/L	meq/L
Bicarbonate as HCO ₃	322	5.28
Carbonate as CO ₃	0	0
Chloride.....	2.94	0.08
Sulfate.....	5.35	0.11
Calcium.....	72.9	3.64
Magnesium.....	19.3	1.59
Potassium.....	0.23	0.01
Sodium.....	2.6	0.11
Major cations.....		5.34
Major anions.....		5.48
Cation/anion difference.....		1.28 %

CLIENT: Co - Op Coal
ID: 1500
SITE: # 24 (WHR-9)
LAB NO: F6916 Lab Split

DATE REPORTED: 09/16/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

Trace metals by AA (total concentration), mg/L

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/L

	Analytical Result:	Detection Limit:
Aluminum (Al).....	0.1	<0.1
Boron (B).....	0.02	<0.01
Barium (Ba).....	0.36	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.79	<0.05
Manganese (Mn).....	0.03	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.01	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.



Wanda Orso
Water Lab Manager

CLIENT:	Co - Op Coal	DATE REPORTED:	09/16/91
ID:	1100	DATE RECEIVED:	08/13/91
SITE:	# 25 (580-12)	DATE COLLECTED:	08/08/91
LAB NO:	F6912		

Lab pH (s.u.).....		8.23
Lab conductivity, umhos/cm.....		1910
Lab resistivity, ohm-m.....		5.24
Total dissolved solids (180), mg/L..		1640
Total dissolved solids (calc), mg/L.		1560
Total suspended solids, mg/L.....		2
Total alkalinity as CaCO ₃ , mg/L.....		264
Total hardness as CaCO ₃ , mg/L.....		1180
Sodium absorption ratio.....		0.37
Fluoride, mg/L.....		0.64
Sulfide as H ₂ S, mg/L.....		<0.1
Nitrate, mg/L.....		0.27
Nitrite, mg/L.....		<0.02
Ammonia, mg/L.....		0.05
	mg/L	meq/L
Bicarbonate as HCO ₃	322	5.28
Carbonate as CO ₃	0	0
Chloride.....	9.43	0.27
Sulfate.....	993	20.7
Calcium.....	148	7.38
Magnesium.....	198	16.2
Potassium.....	24.5	0.63
Sodium.....	29.2	1.27
Major cations.....		25.5
Major anions.....		26.2
Cation/anion difference.....		1.4 %

Appendix 2

Existing Monitoring Points

CLIENT: Co - Op Coal
ID: 1205
SITE: BC -1
LAB NO: F6904 NPDES

DATE REPORTED: 09/11/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.14
Lab conductivity, umhos/cm.....	746
Lab resistivity, ohm-m.....	13.4
Total dissolved solids (180), mg/L..	404 *
Total dissolved solids (calc), mg/L.	537
Total suspended solids, mg/L.....	500
Total alkalinity as CaCO3, mg/L.....	270
Total hardness as CaCO3, mg/L.....	457
Sodium absorption ratio.....	0.206
Fluoride, mg/L.....	0.38
Oil and grease (gravimetric), mg/L..	<5

	mg/L	meq/L
Bicarbonate as HC03.....	329	5.4
Carbonate as C03.....	0	0
Chloride.....	5.17	0.15
Sulfate.....	218	4.55
Calcium.....	62.9	3.14
Magnesium.....	72.9	5.99
Potassium.....	5.32	0.14
Sodium.....	10.1	0.44
Major cations.....		9.71
Major anions.....		10.1
Cation/anion difference.....		1.92 ‡

* Analyzed twice.

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	5.63	<0.05

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1137
 SITE: BC -2
 LAB NO: F6905 NPDES

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

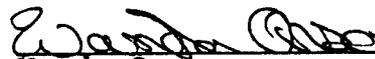
Lab pH (s.u.).....	8.17
Lab conductivity, umhos/cm.....	622
Lab resistivity, ohm-m.....	16.1
Total dissolved solids (180), mg/L..	424
Total dissolved solids (calc), mg/L.	436
Total suspended solids, mg/L.....	400
Total alkalinity as CaCO ₃ , mg/L.....	280
Total hardness as CaCO ₃ , mg/L.....	400
Sodium absorption ratio.....	0.157
Fluoride, mg/L.....	0.28
Oil and grease (gravimetric), mg/L..	<5

	mg/L	meq/L
Bicarbonate as HC0 ₃	342	5.6
Carbonate as C0 ₃	0	0
Chloride.....	5.17	0.15
Sulfate.....	130	2.71
Calcium.....	61.9	3.09
Magnesium.....	59.8	4.92
Potassium.....	3.68	0.09
Sodium.....	7.2	0.31
Major cations.....		8.42
Major anions.....		8.46
Cation/anion difference.....		0.24 %

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	5.54	<0.05

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
ID: 1140
SITE: NPDES
LAB NO: F6906

DATE REPORTED: 09/11/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	7.88
Lab conductivity, umhos/cm.....	557
Lab resistivity, ohm-m.....	18
Total dissolved solids (180), mg/L..	362
Total dissolved solids (calc), mg/L.	324
Total suspended solids, mg/L.....	<1
Total alkalinity as CaCO3, mg/L.....	277
Total hardness as CaCO3, mg/L.....	311
Sodium absorption ratio.....	0.116
Fluoride, mg/L.....	0.16
Oil and grease (gravimetric), mg/L..	<5

	mg/L	meq/L
Bicarbonate as HCO3.....	339	5.55
Carbonate as CO3.....	0	0
Chloride.....	3.65	0.1
Sulfate.....	41.1	0.86
Calcium.....	77.8	3.88
Magnesium.....	28.5	2.34
Potassium.....	1.72	0.04
Sodium.....	4.7	0.2
Major cations.....		6.47
Major anions.....		6.51
Cation/anion difference.....		0.26 %

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	0.23	<0.05

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1105
 SITE: SBC 4
 LAB NO: F6913

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.34
Lab conductivity, umhos/cm.....	633
Lab resistivity, ohm-m.....	15.8
Total dissolved solids (180), mg/L..	366
Total dissolved solids (calc), mg/L.	366
Total suspended solids, mg/L.....	<1
Total alkalinity as CaCO ₃ , mg/L.....	300
Total hardness as CaCO ₃ , mg/L.....	346
Sodium absorption ratio.....	0.124
Fluoride, mg/L.....	0.19
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	0.27
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.04
Oil and grease (gravimetric), mg/L..	<5

	mg/L	meq/L
Bicarbonate as HCO ₃	360	5.9
Carbonate as CO ₃	2.7	0.09
Chloride.....	4.06	0.11
Sulfate.....	57	1.19
Calcium.....	87.3	4.36
Magnesium.....	31.2	2.56
Potassium.....	1.43	0.04
Sodium.....	5.3	0.23
Major cations.....		7.19
Major anions.....		7.31
Cation/anion difference.....		0.86 %

CLIENT: Co - Op Coal
 ID: 1105
 SITE: SBC 4
 LAB NO: F6913

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.16	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	ND	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1105
 SITE: SBC 5
 LAB NO: F6914

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Lab pH (s.u.).....		7.53
Lab conductivity, umhos/cm.....		788
Lab resistivity, ohm-m.....		12.7
Total dissolved solids (180), mg/L..		480
Total dissolved solids (calc), mg/L.		478
Total suspended solids, mg/L.....		1
Total alkalinity as CaCO ₃ , mg/L.....		325
Total hardness as CaCO ₃ , mg/L.....		441
Sodium absorption ratio.....		0.145
Fluoride, mg/L.....		0.16
Sulfide as H ₂ S, mg/L.....		<0.1
Nitrate, mg/L.....		0.03
Nitrite, mg/L.....		<0.02
Ammonia, mg/L.....		0.03
Oil and grease (gravimetric), mg/L..		<5
	mg/L	meq/L
Bicarbonate as HCO ₃	397	6.51
Carbonate as CO ₃	0	0
Chloride.....	5.78	0.16
Sulfate.....	121	2.52
Calcium.....	101	5.05
Magnesium.....	45.8	3.77
Potassium.....	2.2	0.06
Sodium.....	7	0.3
Major cations.....		9.19
Major anions.....		9.19
Cation/anion difference.....		0.03 %

CLIENT: Co - Op Coal
ID: 1105
SITE: SBC 5
LAB NO: F6914

DATE REPORTED: 09/11/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

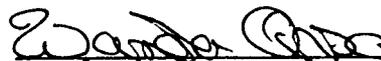
Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.11	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	ND	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.01	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1410
 SITE: SBC 9
 LAB NO: F6915

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.10
Lab conductivity, umhos/cm.....	565
Lab resistivity, ohm-m.....	17.7
Total dissolved solids (180), mg/L..	340
Total dissolved solids (calc), mg/L.	317
Total suspended solids, mg/L.....	18
Total alkalinity as CaCO ₃ , mg/L.....	286
Total hardness as CaCO ₃ , mg/L.....	312
Sodium absorption ratio.....	0.091
Fluoride, mg/L.....	0.17
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.03
Oil and grease (gravimetric), mg/L..	<5

	mg/L	meq/L
Bicarbonate as HCO ₃	349	5.72
Carbonate as CO ₃	0	0
Chloride.....	3.85	0.11
Sulfate.....	31.1	0.65
Calcium.....	75.5	3.77
Magnesium.....	29.9	2.46
Potassium.....	1.59	0.04
Sodium.....	3.7	0.16
Major cations.....		6.43
Major anions.....		6.48
Cation/anion difference.....		0.36 %

CLIENT: Co - Op Coal
 ID: 1410
 SITE: SBC 9
 LAB NO: F6915

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.04	<0.01
Barium (Ba).....	0.15	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.02	<0.01
Iron (Fe).....	0.53	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.25	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.22	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager

CLIENT: Co - Op Coal
 ID: 1410
 SITE: SBC 9 Lab Split
 LAB NO: F6917

DATE REPORTED: 09/11/91
 DATE RECEIVED: 08/13/91
 DATE COLLECTED: 08/08/91

Lab pH (s.u.).....	8.18
Lab conductivity, umhos/cm.....	561
Lab resistivity, ohm-m.....	17.8
Total dissolved solids (180), mg/L..	340
Total dissolved solids (calc), mg/L.	321
Total suspended solids, mg/L.....	<1
Total alkalinity as CaCO ₃ , mg/L.....	292
Total hardness as CaCO ₃ , mg/L.....	311
Sodium absorption ratio.....	0.091
Fluoride, mg/L.....	0.18
Sulfide as H ₂ S, mg/L.....	<0.1
Nitrate, mg/L.....	<0.02
Nitrite, mg/L.....	<0.02
Ammonia, mg/L.....	0.04
Oil and grease (gravimetric), mg/L..	*

	mg/L	meq/L
Bicarbonate as HC0 ₃	356	5.83
Carbonate as C0 ₃	0	0
Chloride.....	4.16	0.12
Sulfate.....	30.5	0.63
Calcium.....	78	3.89
Magnesium.....	28.3	2.33
Potassium.....	1.61	0.04
Sodium.....	3.7	0.16
Major cations.....		6.42
Major anions.....		6.59
Cation/anion difference.....		1.29 †

CLIENT: Co - Op Coal
ID: 1410
SITE: SBC 9 Lab Split
LAB NO: F6917

DATE REPORTED: 09/11/91
DATE RECEIVED: 08/13/91
DATE COLLECTED: 08/08/91

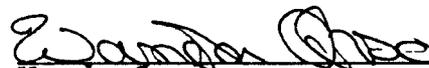
Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	ND	<0.01
Barium (Ba).....	0.15	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.01	<0.01
Iron (Fe).....	0.55	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.25	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	0.22	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co-Op Mining
ID: 1130
SITE: NPDES
LAB NO: F6791

DATE REPORTED: 08/21/91
DATE RECEIVED: 08/01/91
DATE COLLECTED: 07/29/91

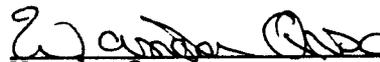
Lab pH (s.u.).....	7.89
Lab conductivity, umhos/cm.....	522
Lab resistivity, ohm-m.....	19.2
Total dissolved solids (180), mg/l..	300
Total dissolved solids (calc), mg/l.	299
Total suspended solids, mg/l.....	3
Total alkalinity as CaCO3, mg/l.....	247
Total hardness as CaCO3, mg/l.....	283
Sodium absorption ratio.....	0.109
Oil and grease (gravimetric), mg/l..	<5.0

	mg/l	meq/l
Bicarbonate as HC03.....	301	4.93
Carbonate as C03.....	0	0
Chloride.....	3.85	0.11
Sulfate.....	46.7	0.97
Calcium.....	64.5	3.22
Magnesium.....	29.7	2.45
Potassium.....	1.71	0.04
Sodium.....	4.2	0.18
Major cations.....		5.89
Major anions.....		6.01
Cation/anion difference.....		1.03 %

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	0.09	<0.05

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co-Op Mining
ID: 1100
SITE: SBC-4
LAB NO: F6794

DATE REPORTED: 08/21/91
DATE RECEIVED: 08/01/91
DATE COLLECTED: 07/29/91

Lab pH (s.u.).....	8.17
Lab conductivity, umhos/cm.....	611
Lab resistivity, ohm-m.....	16.4
Total dissolved solids (180), mg/l..	382
Total dissolved solids (calc), mg/l.	365
Total suspended solids, mg/l.....	24
Total alkalinity as CaCO3, mg/l.....	300
Total hardness as CaCO3, mg/l.....	347
Sodium absorption ratio.....	0.117
Sulfide as H2S, mg/l.....	<0.10
Nitrate, mg/l.....	0.19
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.33
Oil and grease (gravimetric), mg/l..	5.70

	mg/l	meq/l
Bicarbonate as HCO3.....	365	5.99
Carbonate as CO3.....	0	0
Chloride.....	3.85	0.11
Sulfate.....	58	1.21
Calcium.....	82.7	4.13
Magnesium.....	34.2	2.81
Potassium.....	1.55	0.04
Sodium.....	5	0.22
Major cations.....		7.19
Major anions.....		7.31
Cation/anion difference.....		0.8 %

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	0.27	<0.05
Manganese (Mn).....	ND	<0.02

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co-Op Mining
ID: 1000
SITE: SBC-5
LAB NO: F6793

DATE REPORTED: 08/21/91
DATE RECEIVED: 08/01/91
DATE COLLECTED: 07/29/91

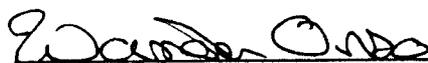
Lab pH (s.u.).....	7.97
Lab conductivity, umhos/cm.....	819
Lab resistivity, ohm-m.....	12.2
Total dissolved solids (180), mg/l..	508
Total dissolved solids (calc), mg/l.	480
Total suspended solids, mg/l.....	<1
Total alkalinity as CaCO ₃ , mg/l.....	325
Total hardness as CaCO ₃ , mg/l.....	436
Sodium absorption ratio.....	0.148
Sulfide as H ₂ S, mg/l.....	0.10
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.30
Oil and grease (gravimetric), mg/l..	<5.0

	mg/l	meq/l
Bicarbonate as HCO ₃	397	6.5
Carbonate as CO ₃	0	0
Chloride.....	6.59	0.19
Sulfate.....	124	2.58
Calcium.....	99	4.94
Magnesium.....	46	3.79
Potassium.....	2.28	0.06
Sodium.....	7.1	0.31
Major cations.....		9.09
Major anions.....		9.26
Cation/anion difference.....		0.93 %

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Iron (Fe).....	0.47	<0.05
Manganese (Mn).....	ND	<0.02

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager

CLIENT: Co-Op Mining
ID: 1215
SITE: SBC-9
LAB NO: F6792

DATE REPORTED: 09/04/91
DATE RECEIVED: 08/01/91
DATE COLLECTED: 07/29/91

Lab pH (s.u.).....	8.20
Lab conductivity, umhos/cm.....	570
Lab resistivity, ohm-m.....	17.5
Total dissolved solids (180), mg/l..	312
Total dissolved solids (calc), mg/l.	318
Total suspended solids, mg/l.....	<1
Total alkalinity as CaCO ₃ , mg/l.....	290
Total hardness as CaCO ₃ , mg/l.....	315
Sodium absorption ratio.....	0.098
Fluoride, mg/l.....	0.17
Sulfide as H ₂ S, mg/l.....	<0.10
Nitrate, mg/l.....	<0.02
Nitrite, mg/l.....	<0.02
Ammonia, mg/l.....	0.22

	mg/l	meq/l
Bicarbonate as HC0 ₃	354	5.8
Carbonate as C0 ₃	0	0
Chloride.....	1.62	0.05
Sulfate.....	31.5	0.66
Calcium.....	74.1	3.7
Magnesium.....	31.5	2.59
Potassium.....	1.64	0.04
Sodium.....	4	0.17
Major cations.....		6.51
Major anions.....		6.5
Cation/anion difference.....		0.07 %

CLIENT: Co-Op Mining
ID: 1215
SITE: SBC-9
LAB NO: F6792

DATE REPORTED: 09/04/91
DATE RECEIVED: 08/01/91
DATE COLLECTED: 07/29/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.001
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.15	<0.01
Barium (Ba).....	0.16	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	0.07	<0.01
Iron (Fe).....	0.08	<0.05
Manganese (Mn).....	ND	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	0.02	<0.01
Phosphorus (P).....	0.8	<0.5
Zinc (Zn).....	0.42	<0.01

ND - Analyte "not detected" at the stated detection limit.


Wanda Orso
Water Lab Manager



2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

CLIENT: Co-op Coal
ID:
SITE: Birch Spring
LAB NO: F6545

DATE REPORTED: 07/24/91
DATE RECEIVED: 06/21/91
DATE COLLECTED: 06/17/91

Lab pH (s.u.).....	7.84
Lab conductivity, umhos/cm.....	771
Lab resistivity, ohm-m.....	13
Total dissolved solids (180), mg/l..	500
Total dissolved solids (calc), mg/l.	483
Total suspended solids, mg/l.....	3
Total alkalinity as CaCO ₃ , mg/l.....	328
Total hardness as CaCO ₃ , mg/l.....	442
Sodium absorption ratio.....	0.145
Fluoride, mg/l.....	0.17
Nitrate, mg/l.....	0.05
Nitrite, mg/l.....	<0.01
Ammonia, mg/l.....	0.12

	mg/l	meq/l
Bicarbonate as HCO ₃	400	6.55
Carbonate as CO ₃	0	0
Chloride.....	6.64	0.19
Sulfate.....	123	2.57
Calcium.....	101	5.02
Magnesium.....	46.5	3.82
Potassium.....	2.64	0.07
Sodium.....	7	0.3
Major cations.....		9.21
Major anions.....		9.31
Cation/anion difference.....		0.53 %



2506 West Main Street
 Farmington, New Mexico 87401
 Tel. (505) 326-4737

CLIENT: Co-op Coal
 ID:
 SITE: Birch Spring
 LAB NO: F6545

DATE REPORTED: 07/24/91
 DATE RECEIVED: 06/21/91
 DATE COLLECTED: 06/17/91

Trace metals by AA (total concentration), mg/l

	Analytical Result:	Detection Limit:
Arsenic (As).....	ND	<0.005
Cadmium (Cd).....	ND	<0.05
Mercury (Hg).....	ND	<0.0002
Lead (Pb).....	ND	<0.2
Selenium (Se).....	ND	<0.005

Trace metals by ICAP (total concentration), mg/l

	Analytical Result:	Detection Limit:
Aluminum (Al).....	ND	<0.1
Boron (B).....	0.02	<0.01
Barium (Ba).....	0.13	<0.05
Chromium (Cr).....	ND	<0.02
Copper (Cu).....	ND	<0.01
Iron (Fe).....	0.12	<0.05
Manganese (Mn).....	0.02	<0.02
Molybdenum (Mo).....	ND	<0.01
Nickel (Ni).....	ND	<0.01
Phosphorus (P).....	ND	<0.5
Zinc (Zn).....	ND	<0.01

ND - Analyte "not detected" at the stated detection limit.


 Wanda Orso
 Water Lab Manager