Emery Deep Mine
ACT/015/015

CONSOL

Consolidation Coal Company
Mid-Continent Region
12755 Olive Boulevard
St. Louis, Missouri 63141
(314) 275-2300

Sue
Sims

March 26, 1986

Mr. Lowell P. Braxton, Administrator
Mineral Resource Development and
Reclamation Program
Division of Oil, Gas & Mining
3 Triad Center - Suite 350
Salt Lake City, Utah 84180-1203

RECEIVED
MAR 31 1986
DIVISION OF
OIL, GAS & MINING

RE: Annual Report for 1985
Emery Deep Mine

Dear Mr. Braxton:

As required by your letter of December 23, 1985, please find attached the Annual Report for 1985 for Consol's Emery Deep Mine. Please refer any questions or comments regarding the permitting of the Emery Mine to the signature below.

Should you require any additional information on the above-referenced report, please feel free to contact me.

Sincerely,

Nicolaus P. Neumann

Nicolaus P. Neumann, P.E.
Group Leader - Permits

NPN:vms

Attachment

RECEIVED
MAR 31 1986
DIVISION OF
OIL, GAS & MINING

ANNUAL REPORT FOR 1985

EMERY DEEP MINE

PERMIT ACT/015/015

Submitted March 28, 1986

(December 1985)

COAL MINING AND RECLAMATION OPERATIONS FOR 1985
(Authority UMC 784)

(Must be submitted to the Division by March 31, 1986)

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203
(801) 538-5340

Operator: CONSOLIDATION COAL COMPANY
Mine Name: EMERY DEEP MINE
Mailing Address: 12755 OLIVE ST., ST. LOUIS, MO 63141
Company Representative: NICOLAUS P. NEUMANN
Permit No.: ACT / 015 / 015
Date of Permanent Program Permit: JANUARY 10, 1986
Quantity of Coal Mined (tonnage) 1985: 628,000 TONS

Attach Most Recent Certificate of Insurance.

Attach Updated Mine Sequence Map.

All monitoring activities during the report period must be submitted with this report: (including, but not limited to)

A. Water Monitoring Data

B. Precipitation Data

C. Subsidence Monitoring

D. Vegetation Data (test plots) or Revegetation Success Monitoring (includes interim and final)

E. Permit Stipulation Status

0488R

(COAL)

CERTIFICATE OF LIABILITY INSURANCE
Issued to: State of Utah
Department of Natural Resources
Division of Oil, Gas, and Mining

THIS IS TO CERTIFY, That the Hartford Accident & Indemnity Company
(Name of Insurance Company)
of Hartford Plaza, Hartford, Connecticut 06115
(Home Office Address of Company)
has issued to Consolidation Coal Company of
(Name of Permit Applicant)
Consol Plaza, 1800 Washington Rd., Pittsburgh Policy No. 10 CLR P12452E
(Address of Permit Applicant)
effective from January 1, 19, 86 and continuing until cancelled, nonrenewed, or changed as provided herein, which policy provides personal injury and property damage insurance covering the obligations imposed upon such permit applicant with regard to Permit No. ACT/015/015 according to provisions of the coal mining and reclamation program of Utah, (Utah Code Annotated 40-10-1 et seq.), specifically Section UMC/SMC 806.14.

Underwriting Agent: Marsh and McLennan, Incorporated

Company Name: Hartford Accident & Indemnity Co. Phone: 405/767-3897

Address: 123 William Street, New York, NY 10038

The above-named insurance company agrees to notify the Division in writing of any substantive change in the above coverage, including cancellation, failure to renew, or other material change. No change shall be effective until at least thirty (30) days after such notice is received by the Division.

The undersigned affirms that the above information is true and complete to the best of his or her knowledge and belief, and that he or she is an authorized representative of the above-named insurance company.

12-18-85 Frank Prentice Hapgood Frank Prentice Hapgood - Claims Attorney
(Date, Signature, and Title of Authorized Representative of Insurance Company)

Signed and sworn to before me by Frank Prentice Hapgood this the 23rd day of December, 1985.

(Notary)

My Commission Expires: 8-16-89

1985 N.P.D.E.S. REPORT SUMMARY

Permit No. UT0022616 - Emery Deep Mine

Outfall 001 - Sedimentation Pond for Deep Pump Discharges.

The attached sheets summarize the effluent quality by month and quarter for 1985.

Outfall 002 - Mine Yard Area

No discharges occurred during 1985.

Permit No. UT0022624 - Emery Surface Mine

Outfall FAC A

This outfall has not been constructed, thus no discharge occurred during 1985.

Permit No. UT0024040 - Emery Mine Preparation Plant

Outfall 001 & 002

These outfalls have had no discharges for 1985.

POINT 001 DISCHARGES AT THE EMERY DEEP MINE FOR THE FIRST QUARTER 1985
REPORT PREPARED ON 04/15/85 AT 16:06:10

PARAMETER	MINIMUM	ARITHMETIC AVERAGE	MAXIMUM	UNITS	NUMBER EXCEED	NR. MSMTS
POINT 001		FIRST QUARTER 1985				
FLOW INSPECTIONS	0.72	0.84	0.97	CFS	N/A	11
PH	7.3		8.5	STD UNITS		11
TOT SUSP SOLIDS	2	6.1	15	MG/L		11
OIL & GREASE	0.5	2.0	6.4	MG/L		4
TOTAL IRON	0.04	0.15	0.20	MG/L		11
FLOW	0.465	0.542	0.627	MGD	N/A	11
TOT DISS SOLIDS	2932	3075	3200	MG/L		11
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.9						
POINT 001		JANUARY 1985				
FLOW INSPECTIONS	0.82	0.82	0.82	CFS	N/A	3
PH	7.8		8.3	STD UNITS		3
TOT SUSP SOLIDS	2	4.0	7	MG/L		3
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.05	0.15	0.20	MG/L		3
FLOW	0.530	0.530	0.530	MGD	N/A	3
TOT DISS SOLIDS	2932	3044	3200	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.7						
POINT 001		FEBRUARY 1985				
FLOW INSPECTIONS	0.72	0.72	0.72	CFS	N/A	4
PH	7.3		8.3	STD UNITS		4
TOT SUSP SOLIDS	3	9.8	15	MG/L		4
OIL & GREASE	0.5	3.4	6.4	MG/L		2
TOTAL IRON	0.04	0.13	0.20	MG/L		4
FLOW	0.465	0.465	0.465	MGD	N/A	4
TOT DISS SOLIDS	3048	3074	3114	MG/L		4
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.0						
POINT 001		MARCH 1985				
FLOW INSPECTIONS	0.97	0.97	0.97	CFS	N/A	4
PH	8.0		8.5	STD UNITS		4
TOT SUSP SOLIDS	2	4.0	6	MG/L		4
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.05	0.16	0.20	MG/L		4
FLOW	0.627	0.627	0.627	MGD	N/A	4
TOT DISS SOLIDS	3016	3099	3178	MG/L		4
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 8.1						

POINT 001 DISCHARGES AT THE EMERY DEEP MINE FOR THE SECOND QUARTER 1985
REPORT PREPARED ON 07/30/85 AT 14:41:08

PARAMETER	MINIMUM	ARITHMETIC AVERAGE	MAXIMUM	UNITS	NUMBER EXCEED	NR. MSMTS
POINT 001		SECOND QUARTER 1985				
FLOW INSPECTIONS	0.03	0.62	1.98	CFS	N/A	76
PH	7.5		8.5	STD UNITS		10
TOT SUSP SOLIDS	2	5.1	8	MG/L		9
OIL & GREASE	0.5	1.7	5.0	MG/L		4
TOTAL IRON	0.02	0.12	0.20	MG/L		10
FLOW	0.019	0.401	1.280	MGD	N/A	76
TOT DISS SOLIDS	2917	3103	3220	MG/L		10
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 4.8						
POINT 001		APRIL 1985				
FLOW INSPECTIONS	0.10	0.83	1.98	CFS	N/A	19
PH	8.0		8.4	STD UNITS		4
TOT SUSP SOLIDS	2	4.3	6	MG/L		3
OIL & GREASE	0.5	2.8	5.0	MG/L		2
TOTAL IRON	0.03	0.12	0.20	MG/L		4
FLOW	0.065	0.536	1.280	MGD	N/A	19
TOT DISS SOLIDS	2917	3114	3220	MG/L		4
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 9.5						
POINT 001		MAY 1985				
FLOW INSPECTIONS	0.03	0.51	1.70	CFS	N/A	26
PH	7.5		8.5	STD UNITS		3
TOT SUSP SOLIDS	2	4.0	5	MG/L		3
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.02	0.10	0.20	MG/L		3
FLOW	0.019	0.331	1.099	MGD	N/A	26
TOT DISS SOLIDS	3051	3120	3170	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 0.8						
POINT 001		JUNE 1985				
FLOW INSPECTIONS	0.03	0.58	1.44	CFS	N/A	31
PH	7.9		8.5	STD UNITS		3
TOT SUSP SOLIDS	6	6.8	8	MG/L		3
OIL & GREASE	0.9	0.9	0.9	MG/L		1
TOTAL IRON	0.07	0.16	0.20	MG/L		3
FLOW	0.019	0.376	0.931	MGD	N/A	31
TOT DISS SOLIDS	2942	3070	3214	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 2.5						

POINT 001 DISCHARGES AT THE EMERY DEEP MINE FOR THE FOURTH QUARTER 1985
REPORT PREPARED ON 01/22/86 AT 11:08:18

PARAMETER	MINIMUM	ARITHMETIC AVERAGE	MAXIMUM	UNITS	NUMBER EXCEED	NR. MSMTS
POINT 001		FOURTH QUARTER 1985				
FLOW INSPECTIONS	0.03	0.72	1.74	CFS	N/A	39
PH	7.7		8.4	STD UNITS		6
TOT SUSP SOLIDS	3	6.7	13	MG/L		7
OIL & GREASE	0.5	6.9	19.6	MG/L	1	3
TOTAL IRON	0.04	0.14	0.20	MG/L		7
FLOW	0.019	0.468	1.125	MGD	N/A	39
TOT DISS SOLIDS	2988	3172	3960	MG/L		7
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.0						
POINT 001		OCTOBER 1985				
FLOW INSPECTIONS	0.03	0.71	1.65	CFS	N/A	31
PH	8.3		8.4	STD UNITS		2
TOT SUSP SOLIDS	3	5.0	6	MG/L		3
OIL & GREASE	0.5	10.0	19.6	MG/L	1	2
TOTAL IRON	0.04	0.10	0.20	MG/L		3
FLOW	0.019	0.459	1.066	MGD	N/A	31
TOT DISS SOLIDS	2988	3337	3960	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 7.4						
POINT 001		NOVEMBER 1985				
FLOW INSPECTIONS	0.03	0.78	1.74	CFS	N/A	6
PH	8.2		8.3	STD UNITS		2
TOT SUSP SOLIDS	6	9.5	13	MG/L		2
OIL & GREASE				MG/L		0
TOTAL IRON	0.20	0.20	0.20	MG/L		2
FLOW	0.019	0.504	1.125	MGD	N/A	6
TOT DISS SOLIDS	3062	3081	3099	MG/L		2
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 3.3						
POINT 001		DECEMBER 1985				
FLOW INSPECTIONS	0.79	0.79	0.79	CFS	N/A	2
PH	7.7		8.2	STD UNITS		2
TOT SUSP SOLIDS	5	6.5	8	MG/L		2
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.06	0.13	0.20	MG/L		2
FLOW	0.511	0.511	0.511	MGD	N/A	2
TOT DISS SOLIDS	3000	3015	3030	MG/L		2
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.4						

POINT 001 DISCHARGES AT THE EMERY DEEP MINE FOR THE THIRD QUARTER 1985
REPORT PREPARED ON 10/29/85 AT 16:26:50

PARAMETER	MINIMUM	ARITHMETIC AVERAGE	MAXIMUM	UNITS	NUMBER EXCEED	NR. MSMTS
POINT 001		THIRD QUARTER 1985				
FLOW INSPECTIONS	0.01	0.76	1.79	CFS	N/A	85
PH	7.8		8.5	STD UNITS		9
TOT SUSP SOLIDS	1	4.1	9	MG/L		9
OIL & GREASE	0.5	1.3	3.0	MG/L		3
TOTAL IRON	0.00	0.12	0.20	MG/L		9
FLOW	0.006	0.489	1.157	MGD	N/A	85
TOT DISS SOLIDS	2438	2906	3078	MG/L		9
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 6.0						
POINT 001		JULY 1985				
FLOW INSPECTIONS	0.02	0.96	1.79	CFS	N/A	23
PH	7.8		8.4	STD UNITS		3
TOT SUSP SOLIDS	1	4.0	9	MG/L		3
OIL & GREASE	3.0	3.0	3.0	MG/L		1
TOTAL IRON	0.00	0.03	0.09	MG/L		3
FLOW	0.013	0.621	1.157	MGD	N/A	23
TOT DISS SOLIDS	2438	2829	3078	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 9.7						
POINT 001		AUGUST 1985				
FLOW INSPECTIONS	0.01	0.71	1.72	CFS	N/A	32
PH	8.2		8.4	STD UNITS		3
TOT SUSP SOLIDS	5	6.0	7	MG/L		3
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.16	0.19	0.20	MG/L		3
FLOW	0.006	0.462	1.112	MGD	N/A	32
TOT DISS SOLIDS	2916	2961	3020	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 0.4						
POINT 001		SEPTEMBER 1985				
FLOW INSPECTIONS	0.02	0.64	1.56	CFS	N/A	30
PH	7.9		8.5	STD UNITS		3
TOT SUSP SOLIDS	1	2.2	4	MG/L		3
OIL & GREASE	0.5	0.5	0.5	MG/L		1
TOTAL IRON	0.05	0.15	0.20	MG/L		3
FLOW	0.013	0.416	1.008	MGD	N/A	30
TOT DISS SOLIDS	2913	2929	2954	MG/L		3
SETTLABLE SOLIDS				ML/L		0
NOTE: AVE DAILY TDS LOAD - 8.0						

EMERY DEEP MINE - MONITORING WELL DATA

The following monitoring wells were sampled in 1985. The summary of the data follows:

Well Name	Water Bearing Unit(s)
Bryant	Upper Ferron S.S.
Emria 2	Bluegate Shale Upper Ferron S.S. Middle Ferron S.S. Lower Ferron S.S.
Kemmer	Lower Ferron S.S.
Lewis	Upper Ferron S.S.
TP	Upper Ferron S.S.
USGS 1-2	Upper Ferron S.S.
ZZ	Lower Ferron S.S.

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=BRYANT WATER BEARING UNIT=U

	--- RAW DATA--- 25MAR85	20JUN85
WATER DEPTH		
WATER LEVEL ELEV		
SP COND - LAB	2400	2310
PH - LAB	7.4	9.2
TDS	1519.0	1602.0
ACIDITY,TOT		0.00
ALKALINITY(CACO3)		
TOTAL	214.00	
NONCARBONATE	0.00	0.00
ANIONS		
HCO3	261.08	122.00
CO3	0.00	51.60
CL	65.00	77.00
SO4	795.00	755.00
NO3(N)	0.00	0.04
CATIONS		
NA	435.00	445.00
K	5.00	5.00
CA	40.00	12.00
MG	25.00	21.00
FE,TOT	8.55	3.08
MN	0.09	0.03
TRACE IONS		
AS		
B		
BA		
CD		
CR		
CU		
HG		
MO		
NI		
PB		
SE		
SR		0.33
ZN		
OTHER IONS		
AL		
F	0.75	0.38
FE,DISS		0.00
S	0.00	0.00
NH3(N)		
NO2(N)	0.00	0.00
P-ORTHO	0.07	0.05
P,TOT		
SIO2		2.30

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=BRYANT WATER BEARING UNIT=U

	--- RAW DATA---	
CALCULATED DATA		
HARDNESS	203	118
NC HARDNESS		
SAR	13	18
IONIC RATIOS(%)		
NA+K	82	89
CA	9	3
MG	9	8
HCO3+CO3	19	17
CL	8	10
SO4	73	73
TDS(SUM)	1635.5	1491.3
TDS(SUM)/SP COND	0.68	0.65
TDS(CALC)	1502.8	1429.3
TDS/TDS(CALC)	1.01	1.12
TOTAL CATIONS	23.41	21.81
TOTAL ANIONS	22.71	21.63
CAT-AN BALANCE	1.50	0.40

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=BRYANT WATER BEARING UNIT=U

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH				0.0	
WATER LEVEL ELEV				0.0	
SP COND - LAB	2355	2310	2400	2	64
PH - LAB	8.3	7.4	9.2	2.0	1.3
TDS	1560.5	1519.0	1602.0	2.0	58.7
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	214.00	214.00	214.00	1.00	
NONCARBONATE	0.00	0.00	0.00	2.00	0.00
ANIONS					
HCO3	191.54	122.00	261.08	2.00	98.34
CO3	25.80	0.00	51.60	2.00	36.49
CL	71.00	65.00	77.00	2.00	8.49
SO4	775.00	755.00	795.00	2.00	28.28
NO3(N)	0.02	0.00	0.04	2.00	0.03
CATIONS					
NA	440.00	435.00	445.00	2.00	7.07
K	5.00	5.00	5.00	2.00	0.00
CA	26.00	12.00	40.00	2.00	19.80
MG	23.00	21.00	25.00	2.00	2.83
FE,TOT	5.81	3.08	8.55	2.00	3.87
MN	0.06	0.03	0.09	2.00	0.04
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	0.33	0.33	0.33	1.00	
ZN				0.00	
OTHER IONS					
AL				0.00	
F	0.56	0.38	0.75	2.00	0.26
FE,DISS	0.00	0.00	0.00	1.00	
S	0.00	0.00	0.00	2.00	0.00
NH3(N)				0.00	
NO2(N)	0.00	0.00	0.00	2.00	0.00
P-ORTHO	0.06	0.05	0.07	2.00	0.01
P,TOT				0.00	
SIO2	2.30	2.30	2.30	1.00	

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=BRYANT WATER BEARING UNIT=U

	STATISTICS				
CALCULATED DATA					
HARDNESS	161	118	203	2	60
NC HARDNESS				0	
SAR	16	13	18	2	3
IONIC RATIOS(%)					
NA+K	86	82	89	2	5
CA	6	3	9	2	4
MG	8	8	9	2	1
HCO3+CO3	18	17	19	2	1
CL	9	8	10	2	1
SO4	73	73	73	2	0
TDS(SUM)	1563.4	1491.3	1635.5	2.0	101.9
TDS(SUM)/SP COND	0.66	0.65	0.68	2.00	0.03
TDS(CALC)	1466.1	1429.3	1502.8	2.0	51.9
TDS/TDS(CALC)	1.07	1.01	1.12	2.00	0.08
TOTAL CATIONS	22.61	21.81	23.41	2.00	1.13
TOTAL ANIONS	22.17	21.63	22.71	2.00	0.76
CAT-AN BALANCE	0.95	0.40	1.50	2.00	0.78

[redacted] EMF[redacted]INE [redacted]NOW[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted]ARCH[redacted] 19[redacted]20 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=EMRIA2 WATER BEARING UNIT=BGUML

	RAW DATA					
	21JAN85	27MAR85	26JUN85	31JUL85	19SEP85	11DEC85
WATER DEPTH	21.2	22.6	25.8		24.1	23.4
WATER LEVEL ELEV	6061.1	6059.7	6056.5		6058.2	6058.9
SP COND - LAB		6200		5800	4350	
PH - LAB		7.0		6.6	6.7	
TDS		4596.0		4455.0	4335.0	
ACIDITY,TOT				0.00		
ALKALINITY(CACO3)						
TOTAL		371.00		414.00	416.00	
NONCARBONATE		0.00		0.00	0.00	
ANIONS						
HCO3		452.62		505.08	507.52	
CO3		0.00		0.00	0.00	
CL		44.00		45.00	45.00	
SO4		3250.00		3000.00	2900.00	
NO3(N)		0.11		1.30	0.23	
CATIONS						
NA		231.00		211.00	202.00	
K		22.00		15.00	13.00	
CA		500.00		484.00	470.00	
MG		461.00		452.00	456.00	
FE,TOT		0.20		0.49	0.16	
MN		0.08		0.16	0.44	
TRACE IONS						
AS						
B						
BA						
CD						
CR						
CU						
HG						
MO						
NI						
PB						
SE						
SR				4.52	4.27	
ZN						
OTHER IONS						
AL						
F		0.48		0.36	0.36	
FE,DISS				0.00	0.00	
S		0.00		0.00	0.20	
NH3(N)						
NO2(N)		0.00		0.00	0.00	
P-ORTHO		0.05		0.08	0.07	
P,TOT						
SIO2				3.60	3.40	

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=EMRIA2 WATER BEARING UNIT=BGUML

	-------- RAW DATA--------		
CALCULATED DATA			
HARDNESS	3144	3070	3050
NC HARDNESS			
SAR	2	2	2
IONIC RATIOS(%)			
NA+K	14	13	13
CA	34	34	33
MG	52	52	54
HCO3+CO3	10	11	12
CL	2	2	2
SO4	89	87	86
TDS(SUM)	4961.5	4717.5	4597.9
TDS(SUM)/SP COND	0.80	0.81	1.06
TDS(CALC)	4731.4	4460.8	4340.0
TDS/TDS(CALC)	0.97	1.00	1.00
TOTAL CATIONS	73.49	70.90	70.10
TOTAL ANIONS	76.36	72.12	70.00
CAT-AN BALANCE	-1.90	-0.90	0.10

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=EMRIA2 WATER BEARING UNIT=BGUML

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH	23.4	21.2	25.8	5.0	1.7
WATER LEVEL ELEV	6058.9	6056.5	6061.1	5.0	1.7
SP COND - LAB	5450	4350	6200	3	973
PH - LAB	6.8	6.6	7.0	3.0	0.2
TDS	4462.0	4335.0	4596.0	3.0	130.6
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	400.33	371.00	416.00	3.00	25.42
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	488.41	452.62	507.52	3.00	31.02
CO3	0.00	0.00	0.00	3.00	0.00
CL	44.67	44.00	45.00	3.00	0.58
SO4	3050.00	2900.00	3250.00	3.00	180.28
NO3(N)	0.55	0.11	1.30	3.00	0.66
CATIONS					
NA	214.67	202.00	231.00	3.00	14.84
K	16.67	13.00	22.00	3.00	4.73
CA	484.67	470.00	500.00	3.00	15.01
MG	456.33	452.00	461.00	3.00	4.51
FE,TOT	0.28	0.16	0.49	3.00	0.18
MN	0.23	0.08	0.44	3.00	0.19
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	4.39	4.27	4.52	2.00	0.18
ZN				0.00	
OTHER IONS					
AL				0.00	
F	0.40	0.36	0.48	3.00	0.07
FE,DISS	0.00	0.00	0.00	2.00	0.00
S	0.07	0.00	0.20	3.00	0.12
NH3(N)				0.00	
NO2(N)	0.00	0.00	0.00	3.00	0.00
P-ORTHO	0.07	0.05	0.08	3.00	0.02
P,TOT				0.00	
SIO2	3.50	3.40	3.60	2.00	0.14

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=EMRIA2 WATER BEARING UNIT=BGUML

	STATISTICS				
CALCULATED DATA					
HARDNESS	3088	3050	3144	3	50
NC HARDNESS				0	
SAR	2	2	2	3	0
IONIC RATIOS(%)					
NA+K	14	13	14	3	1
CA	34	33	34	3	0
MG	53	52	54	3	1
HCO3+CO3	11	10	12	3	1
CL	2	2	2	3	0
SO4	87	86	89	3	1
TDS(SUM)	4759.0	4597.9	4961.5	3.0	185.3
TDS(SUM)/SP COND	0.89	0.80	1.06	3.00	0.14
TDS(CALC)	4510.7	4340.0	4731.4	3.0	200.4
TDS/TDS(CALC)	0.99	0.97	1.00	3.00	0.02
TOTAL CATIONS	71.50	70.10	73.49	3.00	1.77
TOTAL ANIONS	72.83	70.00	76.36	3.00	3.24
CAT-AN BALANCE	-0.90	-1.90	0.10	3.00	1.00

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=KEMMER WATER BEARING UNIT=L

	RAW DATA				
	21JAN85	25MAR85	24JUN85	19SEP85	11DEC85
WATER DEPTH	-34.0	-32.0	-32.0	-32.0	-37.0
WATER LEVEL ELEV	6318.7	6316.7	6316.7	6316.7	6321.7
SP COND - LAB		1100	1050	975	
PH - LAB		8.6	8.9	8.5	
TDS		556.0	645.0	622.0	
ACIDITY,TOT			0.00		
ALKALINITY(CACO3)					
TOTAL		200.00			
NONCARBONATE		0.00	0.00	0.00	
ANIONS					
HCO3		244.00	251.32	250.10	
CO3		25.20	24.00	24.00	
CL		18.00	21.00	19.00	
SO4		200.00	240.00	270.00	
NO3(N)		0.00	0.10	0.00	
CATIONS					
NA		180.00	202.00	210.00	
K		4.00	4.00	5.00	
CA		8.00	10.00	8.00	
MG		13.00	11.00	12.00	
FE,TOT		2.71	0.58	0.37	
MN		0.10	0.03	0.02	
TRACE IONS					
AS					
B					
BA					
CD					
CR					
CU					
HG					
MO					
NI					
PB					
SE					
SR			1.58	1.13	
ZN					
OTHER IONS					
AL					
F		0.78	0.37	0.66	
FE,DISS			0.00	0.00	
S		0.00	0.00	0.60	
NH3(N)					
NO2(N)		0.00	0.03	0.00	
P-ORTHO		0.09	0.08	0.04	
P,TOT					
SIO2			4.00	3.50	

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=KEMMER WATER BEARING UNIT=L

	RAW DATA		
CALCULATED DATA			
HARDNESS	74	72	70
NC HARDNESS			
SAR	9	11	11
IONIC RATIOS(%)			
NA+K	84	86	87
CA	4	5	4
MG	11	9	9
HCO3+CO3	51	47	44
CL	5	6	5
SO4	44	48	51
TDS(SUM)	695.8	767.8	802.3
TDS(SUM)/SP COND	0.63	0.73	0.82
TDS(CALC)	571.8	640.1	675.2
TDS/TDS(CALC)	0.97	1.01	0.92
TOTAL CATIONS	9.50	10.29	10.65
TOTAL ANIONS	9.55	10.54	11.09
CAT-AN BALANCE	-0.30	-1.20	-2.00

[redacted] EME[redacted]NE [redacted]N'WA[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted]ARCH[redacted] 198[redacted]59 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=KEMMER WATER BEARING UNIT=L

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH	-33.4	-37.0	-32.0	5.0	2.2
WATER LEVEL ELEV	6318.1	6316.7	6321.7	5.0	2.2
SP COND - LAB	1042	975	1100	3	63
PH - LAB	8.7	8.5	8.9	3.0	0.2
TDS	607.7	556.0	645.0	3.0	46.2
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	200.00	200.00	200.00	1.00	
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	248.47	244.00	251.32	3.00	3.92
CO3	24.40	24.00	25.20	3.00	0.69
CL	19.33	18.00	21.00	3.00	1.53
SO4	236.67	200.00	270.00	3.00	35.12
NO3(N)	0.03	0.00	0.10	3.00	0.06
CATIONS					
NA	197.33	180.00	210.00	3.00	15.53
K	4.33	4.00	5.00	3.00	0.58
CA	8.67	8.00	10.00	3.00	1.15
MG	12.00	11.00	13.00	3.00	1.00
FE,TOT	1.22	0.37	2.71	3.00	1.29
MN	0.05	0.02	0.10	3.00	0.04
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	1.35	1.13	1.58	2.00	0.32
ZN				0.00	
OTHER IONS					
AL				0.00	
F	0.60	0.37	0.78	3.00	0.21
FE,DISS	0.00	0.00	0.00	2.00	0.00
S	0.20	0.00	0.60	3.00	0.35
NH3(N)				0.00	
NO2(N)	0.01	0.00	0.03	3.00	0.02
P-ORTHO	0.07	0.04	0.09	3.00	0.03
P,TOT				0.00	
SIO2	3.75	3.50	4.00	2.00	0.35

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=KEMMER WATER BEARING UNIT=L

	STATISTICS				
CALCULATED DATA					
HARDNESS	72	70	74	3	2
NC HARDNESS				0	
SAR	10	9	11	3	1
IONIC RATIOS(%)					
NA+K	86	84	87	3	1
CA	4	4	5	3	1
MG	10	9	11	3	1
HCO3+CO3	47	44	51	3	3
CL	5	5	6	3	0
SO4	47	44	51	3	4
TDS(SUM)	755.3	695.8	802.3	3.0	54.3
TDS(SUM)/SP COND	0.73	0.63	0.82	3.00	0.10
TDS(CALC)	629.0	571.8	675.2	3.0	52.6
TDS/TDS(CALC)	0.97	0.92	1.01	3.00	0.04
TOTAL CATIONS	10.15	9.50	10.65	3.00	0.59
TOTAL ANIONS	10.39	9.55	11.09	3.00	0.78
CAT-AN BALANCE	-1.17	-2.00	-0.30	3.00	0.85

[redacted] EMER[redacted] INE [redacted]NDWA[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]29 [redacted]SDA [redacted]ARCH[redacted] 19[redacted]61 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=LEWIS WATER BEARING UNIT=U

	--- RAW DATA--- 20JUN85	19SEP85
WATER DEPTH		
WATER LEVEL ELEV		
SP COND - LAB	1600	1405
PH - LAB	8.3	8.3
TDS	895.0	912.0
ACIDITY,TOT	0.00	
ALKALINITY(CACO3)		
TOTAL		288.00
NONCARBONATE	0.00	0.00
ANIONS		
HCO3	347.70	351.36
CO3	0.00	
CL	41.00	38.00
SO4	380.00	456.00
NO3(N)	0.02	0.00
CATIONS		
NA	314.00	328.00
K	1.00	2.00
CA	4.00	6.00
MG	4.00	2.00
FE,TOT	0.12	0.13
MN	0.00	0.01
TRACE IONS		
AS		
B		
BA		
CD		
CR		
CU		
HG		
MO		
NI		
PB		
SE		
SR	0.72	0.73
ZN		
OTHER IONS		
AL		
F	0.48	0.79
FE,DISS	0.00	0.00
S	0.00	0.20
NH3(N)		
NO2(N)	0.00	0.00
P-ORTHO	0.10	0.04
P,TOT		
SIO2	4.90	4.20

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=LEWIS WATER BEARING UNIT=U

	--- RAW DATA----	
CALCULATED DATA		
HARDNESS	18	25
NC HARDNESS		
SAR	27	30
IONIC RATIOS(%)		
NA+K	96	97
CA	1	2
MG	2	1
HCO3+CO3	39	35
CL	8	7
SO4	54	58
TDS(SUM)	1097.1	1188.4
TDS(SUM)/SP COND	0.69	0.85
TDS(CALC)	920.4	1009.8
TDS/TDS(CALC)	0.97	0.90
TOTAL CATIONS	14.21	14.78
TOTAL ANIONS	14.79	16.37
CAT-AN BALANCE	-2.00	-5.10

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=LEWIS WATER BEARING UNIT=U

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH				0.0	
WATER LEVEL ELEV				0.0	
SP COND - LAB	1503	1405	1600	2	138
PH - LAB	8.3	8.3	8.3	2.0	0.0
TDS	903.5	895.0	912.0	2.0	12.0
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	288.00	288.00	288.00	1.00	
NONCARBONATE	0.00	0.00	0.00	2.00	0.00
ANIONS					
HCO3	349.53	347.70	351.36	2.00	2.59
CO3	0.00	0.00	0.00	1.00	
CL	39.50	38.00	41.00	2.00	2.12
SO4	418.00	380.00	456.00	2.00	53.74
NO3(N)	0.01	0.00	0.02	2.00	0.01
CATIONS					
NA	321.00	314.00	328.00	2.00	9.90
K	1.50	1.00	2.00	2.00	0.71
CA	5.00	4.00	6.00	2.00	1.41
MG	3.00	2.00	4.00	2.00	1.41
FE,TOT	0.12	0.12	0.13	2.00	0.01
MN	0.00	0.00	0.01	2.00	0.01
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	0.72	0.72	0.73	2.00	0.01
ZN				0.00	
OTHER IONS					
AL				0.00	
F	0.63	0.48	0.79	2.00	0.22
FE,DISS	0.00	0.00	0.00	2.00	0.00
S	0.10	0.00	0.20	2.00	0.14
NH3(N)				0.00	
NO2(N)	0.00	0.00	0.00	2.00	0.00
P-ORTHO	0.07	0.04	0.10	2.00	0.04
P,TOT				0.00	
SIO2	4.55	4.20	4.90	2.00	0.49

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=LEWIS WATER BEARING UNIT=U

	STATISTICS				
CALCULATED DATA					
HARDNESS	22	18	25	2	5
NC HARDNESS				0	
SAR	28	27	30	2	2
IONIC RATIOS(%)					
NA+K	97	96	97	2	0
CA	2	1	2	2	0
MG	2	1	2	2	1
HCO3+CO3	37	35	39	2	2
CL	7	7	8	2	1
SO4	56	54	58	2	3
TDS(SUM)	1142.7	1097.1	1188.4	2.0	64.5
TDS(SUM)/SP COND	0.77	0.69	0.85	2.00	0.11
TDS(CALC)	965.1	920.4	1009.8	2.0	63.2
TDS/TDS(CALC)	0.94	0.90	0.97	2.00	0.05
TOTAL CATIONS	14.50	14.21	14.78	2.00	0.40
TOTAL ANIONS	15.58	14.79	16.37	2.00	1.11
CAT-AN BALANCE	-3.55	-5.10	-2.00	2.00	2.19

[redacted] EME[redacted]NE [redacted]NOWA[redacted]MON[redacted]NG [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted]ARCH[redacted] 19[redacted]89 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=TP WATER BEARING UNIT=U

	RAW DATA				
	05APR85	18JUN85	31JUL85	26SEP85	19DEC85
WATER DEPTH	285.2	285.5		287.9	288.7
WATER LEVEL ELEV	5716.7	5716.4		5714.0	5713.2
SP COND - LAB			1400		
PH - LAB			9.9		
TDS			429.0		
ACIDITY,TOT			0.00		
ALKALINITY(CACO3)					
TOTAL					
NONCARBONATE			0.00		
ANIONS					
HCO3			192.76		
CO3			222.00		
CL			53.00		
SO4			125.00		
NO3(N)			0.00		
CATIONS					
NA			333.00		
K			3.00		
CA			2.00		
MG			2.00		
FE,TOT			22.60		
MN			0.25		
TRACE IONS					
AS					
B					
BA					
CD					
CR					
CU					
HG					
MO					
NI					
PB					
SE					
SR			0.16		
ZN					
OTHER IONS					
AL					
F			1.31		
FE,DISS			0.00		
S			0.00		
NH3(N)					
NO2(N)			0.00		
P-ORTHO			0.04		
P,TOT					
SIO2			1.00		

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=TP WATER BEARING UNIT=U

	- RAW DATA-
CALCULATED DATA	
HARDNESS	15
NC HARDNESS	
SAR	40
IONIC RATIOS(%)	
NA+K	98
CA	1
MG	1
HCO3+CO3	72
CL	10
SO4	18
TDS(SUM)	935.3
TDS(SUM)/SP COND	0.67
TDS(CALC)	837.3
TDS/TDS(CALC)	0.51
TOTAL CATIONS	14.84
TOTAL ANIONS	14.73
CAT-AN BALANCE	0.40

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=TP WATER BEARING UNIT=U

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH	286.8	285.2	288.7	4.0	1.7
WATER LEVEL ELEV	5715.1	5713.2	5716.7	4.0	1.7
SP COND - LAB	1400	1400	1400	1	
PH - LAB	9.9	9.9	9.9	1.0	
TDS	429.0	429.0	429.0	1.0	
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL				0.00	
NONCARBONATE	0.00	0.00	0.00	1.00	
ANIONS					
HCO3	192.76	192.76	192.76	1.00	
CO3	222.00	222.00	222.00	1.00	
CL	53.00	53.00	53.00	1.00	
SO4	125.00	125.00	125.00	1.00	
NO3(N)	0.00	0.00	0.00	1.00	
CATIONS					
NA	333.00	333.00	333.00	1.00	
K	3.00	3.00	3.00	1.00	
CA	2.00	2.00	2.00	1.00	
MG	2.00	2.00	2.00	1.00	
FE,TOT	22.60	22.60	22.60	1.00	
MN	0.25	0.25	0.25	1.00	
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	0.16	0.16	0.16	1.00	
ZN				0.00	
OTHER IONS					
AL				0.00	
F	1.31	1.31	1.31	1.00	
FE,DISS	0.00	0.00	0.00	1.00	
S	0.00	0.00	0.00	1.00	
NH3(N)				0.00	
NO2(N)	0.00	0.00	0.00	1.00	
P-ORTHO	0.04	0.04	0.04	1.00	
P,TOT				0.00	
SIO2	1.00	1.00	1.00	1.00	

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=TP WATER BEARING UNIT=U

	STATISTICS			
CALCULATED DATA				
HARDNESS	15	15	15	1
NC HARDNESS				0
SAR	40	40	40	1
IONIC RATIOS(%)				
NA+K	98	98	98	1
CA	1	1	1	1
MG	1	1	1	1
HCO3+CO3	72	72	72	1
CL	10	10	10	1
SO4	18	18	18	1
TDS(SUM)	935.3	935.3	935.3	1.0
TDS(SUM)/SP COND	0.67	0.67	0.67	1.00
TDS(CALC)	837.3	837.3	837.3	1.0
TDS/TDS(CALC)	0.51	0.51	0.51	1.00
TOTAL CATIONS	14.84	14.84	14.84	1.00
TOTAL ANIONS	14.73	14.73	14.73	1.00
CAT-AN BALANCE	0.40	0.40	0.40	1.00

[redacted] LME[redacted]INE [redacted]NDW[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted]ARCH[redacted] 19[redacted]05 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=USGS1-2 WATER BEARING UNIT=U

	RAW DATA				
	21JAN85	27MAR85	20JUN85	19SEP85	12DEC85
WATER DEPTH	88.2	87.8	87.1	87.7	87.3
WATER LEVEL ELEV	5957.5	5957.9	5958.6	5958.0	5958.4
SP COND - LAB		1200	1250	1100	
PH - LAB		7.5	7.4	7.4	
TDS		670.0	684.0	709.0	
ACIDITY,TOT			0.00		
ALKALINITY(CACO3)					
TOTAL		354.00	330.00	324.00	
NONCARBONATE		0.00	0.00	0.00	
ANIONS					
HCO3		431.88	402.60	395.28	
CO3		0.00	0.00	0.00	
CL		21.00	18.00	18.00	
SO4		180.00	240.00	280.00	
NO3(N)		0.00	0.06	0.01	
CATIONS					
NA		202.00	230.00	224.00	
K		2.00	2.00	3.00	
CA		30.00	24.00	24.00	
MG		11.00	10.00	12.00	
FE,TOT		0.40	0.20	0.85	
MN		0.08	0.03	0.06	
TRACE IONS					
AS					
B					
BA					
CD					
CR					
CU					
HG					
MO					
NI					
PB					
SE					
SR			1.62	1.56	
ZN					
OTHER IONS					
AL					
F		1.22	1.10	1.26	
FE,DISS			0.00	0.00	
S		0.00	0.00	0.60	
NH3(N)					
NO2(N)		0.00	0.02	0.00	
P-ORTHO		0.05	0.02	0.07	
P,TOT					
SIO2			5.40	5.10	

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=USGS1-2 WATER BEARING UNIT=U

	-------- RAW DATA--------		
CALCULATED DATA			
HARDNESS	122	102	110
NC HARDNESS			
SAR	8	10	9
IONIC RATIOS(%)			
NA+K	79	83	82
CA	13	10	10
MG	8	7	8
HCO3+CO3	62	55	51
CL	5	4	4
SO4	33	41	45
TDS(SUM)	879.6	933.2	962.7
TDS(SUM)/SP COND	0.73	0.75	0.88
TDS(CALC)	660.1	728.6	761.8
TDS/TDS(CALC)	1.02	0.94	0.93
TOTAL CATIONS	11.26	12.08	12.01
TOTAL ANIONS	11.48	12.17	12.88
CAT-AN BALANCE	-1.00	-0.40	-3.50

[redacted] ME[redacted]INE [redacted]NDW[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted]ARCH[redacted] 19[redacted]07 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=USGS1-2 WATER BEARING UNIT=U

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH	87.6	87.1	88.2	5.0	0.4
WATER LEVEL ELEV	5958.1	5957.5	5958.6	5.0	0.4
SP COND - LAB	1183	1100	1250	3	76
PH - LAB	7.4	7.4	7.5	3.0	0.1
TDS	687.7	670.0	709.0	3.0	19.8
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	336.00	324.00	354.00	3.00	15.87
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	409.92	395.28	431.88	3.00	19.37
CO3	0.00	0.00	0.00	3.00	0.00
CL	19.00	18.00	21.00	3.00	1.73
SO4	233.33	180.00	280.00	3.00	50.33
NO3(N)	0.02	0.00	0.06	3.00	0.03
CATIONS					
NA	218.67	202.00	230.00	3.00	14.74
K	2.33	2.00	3.00	3.00	0.58
CA	26.00	24.00	30.00	3.00	3.46
MG	11.00	10.00	12.00	3.00	1.00
FE,TOT	0.48	0.20	0.85	3.00	0.33
MN	0.06	0.03	0.08	3.00	0.03
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	1.59	1.56	1.62	2.00	0.04
ZN				0.00	
OTHER IONS					
AL				0.00	
F	1.19	1.10	1.26	3.00	0.08
FE,DISS	0.00	0.00	0.00	2.00	0.00
S	0.20	0.00	0.60	3.00	0.35
NH3(N)				0.00	
NO2(N)	0.01	0.00	0.02	3.00	0.01
P-ORTHO	0.05	0.02	0.07	3.00	0.03
P,TOT				0.00	
SIO2	5.25	5.10	5.40	2.00	0.21

[redacted] MER[redacted]NE [redacted]DWA[redacted]MONI[redacted]NG [redacted]T [redacted] [redacted]29 [redacted]DAY[redacted]RCH [redacted]198[redacted]08 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=USGS1-2 WATER BEARING UNIT=U

	STATISTICS				
CALCULATED DATA					
HARDNESS	111	102	122	3	10
NC HARDNESS				0	
SAR	9	8	10	3	1
IONIC RATIOS(%)					
NA+K	81	79	83	3	2
CA	11	10	13	3	2
MG	8	7	8	3	1
HCO3+CO3	56	51	62	3	6
CL	4	4	5	3	1
SO4	40	33	45	3	6
TDS(SUM)	925.2	879.6	962.7	3.0	42.1
TDS(SUM)/SP COND	0.78	0.73	0.88	3.00	0.08
TDS(CALC)	716.8	660.1	761.8	3.0	51.9
TDS/TDS(CALC)	0.96	0.93	1.02	3.00	0.05
TOTAL CATIONS	11.78	11.26	12.08	3.00	0.45
TOTAL ANIONS	12.18	11.48	12.88	3.00	0.70
CAT-AN BALANCE	-1.63	-3.50	-0.40	3.00	1.64

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=ZZ WATER BEARING UNIT=L

	RAW DATA				
	21JAN85	26MAR85	20JUN85	19SEP85	13DEC85
WATER DEPTH	142.6	142.7	142.8	143.1	142.5
WATER LEVEL ELEV	5923.1	5923.0	5922.9	5922.6	5923.2
SP COND - LAB		1400	1380	1205	
PH - LAB		7.6	7.5	7.3	
TDS		670.0	777.0	779.0	
ACIDITY,TOT			0.00		
ALKALINITY(CACO3)					
TOTAL		495.00	479.00	494.00	
NONCARBONATE		0.00	0.00	0.00	
ANIONS					
HCO3		603.90	584.38	602.68	
CO3		0.00	0.00	0.00	
CL		18.00	18.00	16.00	
SO4		80.00	200.00	168.00	
NO3(N)		0.00	0.02	0.00	
CATIONS					
NA		235.00	280.00	280.00	
K		4.00	3.00	5.00	
CA		18.00	16.00	16.00	
MG		9.00	8.00	8.00	
FE,TOT		0.60	0.41	1.07	
MN		0.03	0.02	0.05	
TRACE IONS					
AS					
B					
BA					
CD					
CR					
CU					
HG					
MO					
NI					
PB					
SE					
SR			1.62	0.64	
ZN					
OTHER IONS					
AL					
F		2.02	1.34	2.32	
FE,DISS			0.00	0.15	
S		0.00	0.50	0.80	
NH3(N)					
NO2(N)		0.00	0.04	0.00	
P-ORTHO		0.08	0.12	0.07	
P,TOT					
SIO2			6.20	5.10	

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=ZZ WATER BEARING UNIT=L

	-------- RAW DATA--------		
CALCULATED DATA			
HARDNESS	83	72	75
NC HARDNESS			
SAR	11	14	14
IONIC RATIOS(%)			
NA+K	86	89	89
CA	8	6	6
MG	6	5	5
HCO3+CO3	82	67	71
CL	4	4	3
SO4	14	29	25
TDS(SUM)	970.5	1117.0	1103.3
TDS(SUM)/SP COND	0.69	0.81	0.92
TDS(CALC)	663.6	820.0	797.0
TDS/TDS(CALC)	1.01	0.95	0.98
TOTAL CATIONS	11.99	13.71	13.77
TOTAL ANIONS	12.18	14.33	13.95
CAT-AN BALANCE	-0.80	-2.20	-0.60

[redacted] EME[redacted] INE [redacted]NDWA[redacted] MON[redacted]ING [redacted]RT [redacted] [redacted]:29 [redacted]SDA[redacted] ARCH [redacted] 198[redacted] 17 [redacted]

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL
*****

MONITORING AREA=DEEP MINE WELL=ZZ WATER BEARING UNIT=L

	STATISTICS				
	MEAN	MIN	MAX	N	STD
WATER DEPTH	142.7	142.5	143.1	5.0	0.2
WATER LEVEL ELEV	5923.0	5922.6	5923.2	5.0	0.2
SP COND - LAB	1328	1205	1400	3	107
PH - LAB	7.5	7.3	7.6	3.0	0.2
TDS	742.0	670.0	779.0	3.0	62.4
ACIDITY,TOT	0.00	0.00	0.00	1.00	
ALKALINITY(CACO3)					
TOTAL	489.33	479.00	495.00	3.00	8.96
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	596.99	584.38	603.90	3.00	10.93
CO3	0.00	0.00	0.00	3.00	0.00
CL	17.33	16.00	18.00	3.00	1.15
SO4	149.33	80.00	200.00	3.00	62.14
NO3(N)	0.01	0.00	0.02	3.00	0.01
CATIONS					
NA	265.00	235.00	280.00	3.00	25.98
K	4.00	3.00	5.00	3.00	1.00
CA	16.67	16.00	18.00	3.00	1.15
MG	8.33	8.00	9.00	3.00	0.58
FE,TOT	0.69	0.41	1.07	3.00	0.34
MN	0.03	0.02	0.05	3.00	0.02
TRACE IONS					
AS				0.00	
B				0.00	
BA				0.00	
CD				0.00	
CR				0.00	
CU				0.00	
HG				0.00	
MO				0.00	
NI				0.00	
PB				0.00	
SE				0.00	
SR	1.13	0.64	1.62	2.00	0.69
ZN				0.00	
OTHER IONS					
AL				0.00	
F	1.89	1.34	2.32	3.00	0.50
FE,DISS	0.07	0.00	0.15	2.00	0.11
S	0.43	0.00	0.80	3.00	0.40
NH3(N)				0.00	
NO2(N)	0.01	0.00	0.04	3.00	0.02
P-ORTHO	0.09	0.07	0.12	3.00	0.03
P,TOT				0.00	
SIO2	5.65	5.10	6.20	2.00	0.78

FOR ALL DATA FROM 850101 THROUGH 851231

WATER BEARING UNITS: QAL=QUITCHUPAH ALLUVIUM CAL=CHRISTIANSEN ALLUVIUM BG=BLUEGATE SHALE
U=UPPER FERRON SS M=MIDDLE FERRON SS L=LOWER FERRON SS
NOTE ON WATER DEPTH: NEGATIVE VALUE INDICATES A FLOWING WELL

*****

MONITORING AREA=DEEP MINE WELL=ZZ WATER BEARING UNIT=L

	STATISTICS				
CALCULATED DATA					
HARDNESS	77	72	83	3	6
NC HARDNESS				0	
SAR	13	11	14	3	2
IONIC RATIOS(%)					
NA+K	88	86	89	3	2
CA	6	6	8	3	1
MG	5	5	6	3	1
HCO3+CO3	74	67	82	3	8
CL	4	3	4	3	0
SO4	23	14	29	3	8
TDS(SUM)	1063.6	970.5	1117.0	3.0	80.9
TDS(SUM)/SP COND	0.81	0.69	0.92	3.00	0.11
TDS(CALC)	760.2	663.6	820.0	3.0	84.4
TDS/TDS(CALC)	0.98	0.95	1.01	3.00	0.03
TOTAL CATIONS	13.16	11.99	13.77	3.00	1.01
TOTAL ANIONS	13.49	12.18	14.33	3.00	1.15
CAT-AN BALANCE	-1.20	-2.20	-0.60	3.00	0.87

EMERY DEEP MINE
MONITORING WELL WATER LEVEL SUMMARY

The following is a summary of the water levels recorded in all of the monitoring wells for the Emery Deep Mine during 1985.

FOR THE PERIOD FROM 850101 TO 851231

WELL=AA AQUIFER=PG

DATE	READING	WLELEV
05APR85	58.2	5911.5
18JUN85	57.9	5911.8
03SEP85	58.3	5911.4
11DEC85	58.6	5911.1

WELL=AA AQUIFER=L

DATE	READING	WLELEV
05APR85	81.2	5887.4
18JUN85	81.4	5887.2
03SEP85	81.9	5886.7
11DEC85	83.0	5885.6

WELL=AA AQUIFER=M

DATE	READING	WLELEV
05APR85	66.1	5903.1
18JUN85	66.2	5903.0
03SEP85	67.3	5901.9
11DEC85	66.8	5902.4

WELL=AA AQUIFER=U

DATE	READING	WLELEV
05APR85	106.8	5863.0
18JUN85	107.2	5862.6
03SEP85	107.4	5862.4
11DEC85	108.5	5861.3

WELL=EMRIA1 AQUIFER=UM

DATE	READING	WLELEV
10APR85	138.2	6017.5
13JUN85	138.7	6017.0
20SEP85	138.4	6017.3
11DEC85	138.3	6017.4

WELL=EMRIA2 AQUIFER=BGUML

DATE	READING	WLELEV
21JAN85	22.3	6061.1
27MAR85	23.7	6059.7
26JUN85	26.9	6056.5
19SEP85	25.2	6058.2
11DEC85	24.5	6058.9

WELL=EMRIA3 AQUIFER=BGU

DATE	READING	WLELEV
21JAN85	73.5	6018.3
10APR85	75.2	6016.6
13JUN85	74.4	6017.4
20SEP85	67.6	6024.2
12DEC85	68.9	6022.9

WELL=FC346WW AQUIFER=UM

DATE	READING	WLELEV
21JAN85	55.0	6068.2
10APR85	58.4	6064.8
13JUN85	57.8	6065.4
20SEP85	54.2	6069.0
11DEC85	56.7	6066.5

WELL=FC363WW AQUIFER=UM

DATE	READING	WLELEV
21JAN85	18.1	.

WELL=FC363WW AQUIFER=UML

DATE	READING	WLELEV
27MAR85	18.1	6023.8
20JUN85	16.2	6025.7

WELL=H AQUIFER=BG

DATE	READING	WLELEV
14JAN85	34.2	6197.4
05APR85	34.0	6197.6
13JUN85	34.9	6196.7
26SEP85	30.6	6201.0
16DEC85	31.9	6199.7

---------- WELL=H AQUIFER=L ----------

DATE	READING	WLELEV
14JAN85	19.6	6210.8
05APR85	19.1	6211.3
13JUN85	19.8	6210.6
26SEP85	21.1	6209.3
16DEC85	23.5	6206.9

---------- WELL=H AQUIFER=M ----------

DATE	READING	WLELEV
14JAN85	59.9	6170.5
05APR85	53.8	6176.6
13JUN85	55.2	6175.2
26SEP85	57.6	6172.8
16DEC85	61.6	6168.8

---------- WELL=H AQUIFER=U ----------

DATE	READING	WLELEV
14JAN85	57.9	6172.5
05APR85	57.6	6172.8
13JUN85	57.8	6172.6
26SEP85	57.4	6173.0
16DEC85	57.5	6172.9

---------- WELL=I AQUIFER=BG ----------

DATE	READING	WLELEV
05APR85	16.8	6092.8
13JUN85	17.7	6091.9
26SEP85	18.8	6090.8
13DEC85	19.6	6090.0

---------- WELL=I AQUIFER=L ----------

DATE	READING	WLELEV
05APR85	14.0	6094.7
13JUN85	13.3	6095.4
26SEP85	13.3	6095.4
13DEC85	12.5	6096.2

WELL=I AQUIFER=4

DATE	READING	WLELEV
05APR85	159.9	5949.0
13JUN85	162.4	5946.5
26SEP85	168.2	5940.7
13DEC85	167.2	5941.7

WELL=KEMMER AQUIFER=L

DATE	READING	WLELEV
21JAN85	-32.0	6318.7
25MAR85	-30.0	6316.7
24JUN85	-30.0	6316.7
19SEP85	-30.0	6316.7
11DEC85	-35.0	6321.7

WELL=MUDDY1 AQUIFER=U

DATE	READING	WLELEV
21JAN85	129.6	5938.6
26MAR85	129.6	5938.6
20JUN85	129.2	5939.0
19SEP85	128.3	5939.9
13DEC85	128.4	5939.8

WELL=MUDDY2 AQUIFER=U

DATE	READING	WLELEV
21JAN85	85.9	5960.9
27MAR85	90.4	5956.4
20JUN85	78.2	5968.6
20SEP85	87.4	5959.4
13DEC85	82.1	5964.7

WELL=MUDDY3 AQUIFER=BGU

DATE	READING	WLELEV
21JAN85	20.0	6029.7
27MAR85	20.0	6029.7
26JUN85	19.5	6030.2

WELL=MUDDY4 AQUIFER=BGU

DATE	READING	WLELEV
21JAN85	10.5	6042.9
10APR85	10.1	6043.3
13JUN85	9.3	6044.1

WELL=RDA1 AQUIFER=QAL

DATE	READING	WLELEV
29JAN85	15.0	5943.5
03APR85	15.4	5943.1
03SEP85	17.8	5940.7
16DEC85	15.1	5943.4

WELL=RDA2 AQUIFER=QAL

DATE	READING	WLELEV
29JAN85	15.9	5939.8
03APR85	15.6	5940.1
03SEP85	15.0	5940.7
16DEC85	15.9	5939.8

WELL=RDA3 AQUIFER=QAL

DATE	READING	WLELEV
29JAN85	22.0	5924.5
03APR85	15.2	5931.3
03SEP85	23.2	5923.3
16DEC85	22.5	5924.0

WELL=RDA4 AQUIFER=QAL

DATE	READING	WLELEV
29JAN85	21.1	5922.9
03APR85	21.8	5922.2
03SEP85	23.0	5921.0
16DEC85	21.9	5922.1

WELL=RDA5 AQUIFER=QAL

DATE	READING	WLELEV
29JAN85	20.5	5921.9
03APR85	21.0	5921.4
03SEP85	21.0	5921.4
16DEC85	20.6	5921.8

FOR THE PERIOD FROM 850101 TO 851231

WELL=RDA6 AQUIFER=WAL

DATE	READING	WLELEV
29JAN85	15.2	5926.8
03APR85	19.9	5922.1
03SEP85	14.3	5927.7
16DEC85	15.6	5926.4

WELL=R1 AQUIFER=L

DATE	READING	WLELEV
14JAN85	-203.3	6237.5
05APR85	-198.7	6232.9
18JUN85	-198.7	6232.9
20SEP85	-189.4	6223.6
19DEC85	-188.6	6222.8

WELL=R2 AQUIFER=BG

DATE	READING	WLELEV
14JAN85	32.4	5999.3
05APR85	25.3	6006.4
18JUN85	28.4	6003.3
20SEP85	31.6	6000.1
19DEC85	46.2	5985.5

WELL=R2 AQUIFER=M

DATE	READING	WLELEV
14JAN85	-135.1	6166.2
05APR85	-131.7	6162.8
18JUN85	-130.5	6161.6
20SEP85	-110.9	6142.0
19DEC85	-109.3	6140.4

WELL=R2 AQUIFER=U

DATE	READING	WLELEV
14JAN85	132.0	5899.7
05APR85	132.0	5899.7
18JUN85	139.2	5892.5
20SEP85	140.8	5890.9
19DEC85	154.7	5877.0

WELL=SM1-1 AQUIFER=CAL

DATE	READING	WLELEV
21JAN85	7.3	6064.3
26FEB85	4.6	6067.0
08MAY85	5.0	6066.6
21NOV85	4.3	6067.3

WELL=SM1-1 AQUIFER=QAL

DATE	READING	WLELEV
14AUG85	2.0	.

WELL=SM1-2 AQUIFER=CAL

DATE	READING	WLELEV
21JAN85	3.7	6048.1
26FEB85	4.5	6047.3
08MAY85	1.5	6050.3
21NOV85	3.3	6048.5

WELL=SM1-2 AQUIFER=QAL

DATE	READING	WLELEV
14AUG85	3.2	.

WELL=SM1-3 AQUIFER=CAL

DATE	READING	WLELEV
21JAN85	9.3	6047.2
26FEB85	10.4	6046.1
08MAY85	9.2	6047.3
21NOV85	8.4	6048.1

WELL=SM1-3 AQUIFER=QAL

DATE	READING	WLELEV
14AUG85	8.3	.

WELL=SM1-4 AQUIFER=CAL

DATE	READING	WLELEV
08MAY85	13.9	5927.7
21NOV85	13.3	5928.3

FOR THE PERIOD FROM 850101 TO 851231

WELL=SMI-4 AQUIFER=QAL

DATE	READING	WLELEV
14AUG85	10.7	.

WELL=TP AQUIFER=U

DATE	READING	WLELEV
05APR85	286.0	5716.7
18JUN85	286.3	5716.4
26SEP85	288.7	5714.0
19DEC85	289.5	5713.2

WELL=T1 AQUIFER=BG

DATE	READING	WLELEV
26SEP85	13.0	5990.2
19DEC85	12.8	5990.4

WELL=T1 AQUIFER=U

DATE	READING	WLELEV
05APR85	340.0	5663.2
18JUN85	340.3	5662.9
26SEP85	343.1	5660.1
19DEC85	348.1	5655.1

WELL=T2 AQUIFER=BG

DATE	READING	WLELEV
26SEP85	13.2	5989.8
19DEC85	13.2	5989.8

WELL=T2 AQUIFER=U

DATE	READING	WLELEV
05APR85	273.8	5723.9
24JUN85	275.0	5722.7
26SEP85	276.7	5721.0
19DEC85	278.6	5719.1

WELL=USGS1-2 AQUIFER=U

DATE	READING	WLELEV
21JAN85	88.8	5957.5
27MAR85	88.4	5957.9
20JUN85	87.7	5958.6
19SEP85	88.3	5958.0
12DEC85	87.9	5958.4

WELL=USGS4-1 AQUIFER=BG

DATE	READING	WLELEV
21JAN85	18.4	6029.1
27MAR85	17.9	6029.6
20JUN85	16.7	6030.8
20SEP85	18.1	6029.4
12DEC85	18.3	6029.2

WELL=WW1 AQUIFER=L

DATE	READING	WLELEV
11DEC85	65.7	.

WELL=ZZ AQUIFER=L

DATE	READING	WLELEV
21JAN85	145.6	5923.1
26MAR85	145.7	5923.0
20JUN85	145.8	5922.9
19SEP85	146.1	5922.6
13DEC85	145.5	5923.2

EMERY DEEP MINE
SURFACE WATER MONITORING SUMMARY

The following is a summary of the data collected from the surface water monitoring for the Emery Deep Mine during 1985.

*****
SITE=S01

	RAW DATA		
	06JUN85	22JUL85	27SEP85
FLOW			
SP COND - LAB	875	1475	2184
PH - LAB	7.6	7.7	7.4
TSS	739.0	2322.0	237.0
TDS	503.0	994.0	1497.0
OIL & GREASE	0.0	0.9	0.5
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	246.00	276.00	307.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	300.12	336.72	374.54
CO3	0.00	0.00	
CL	19.00	21.00	45.00
SO4	200.00	500.00	800.00
NO3(N)	0.06	0.04	0.31
CATIONS			
NA	55.00	128.00	204.00
K	2.00	5.00	7.00
CA	68.00	108.00	144.00
MG	41.00	66.00	94.00
FE,DISS			
MN	0.19	0.41	0.07
OTHER IONS			
B	0.51	0.22	0.48
SR	0.74	1.32	1.83
F	0.41	0.40	0.47
FE,TOT	1.59	4.52	0.58
P-ORTHO	0.18	0.07	0.05
SIO2	3.80	4.60	4.70
CALCULATED DATA			
HARDNESS	340	540	745
NC HARDNESS			
SAR	1	2	3
IONIC RATIOS(%)			
NA+K	27	34	38
CA	37	33	30
MG	37	33	32
HCO3+CO3	51	33	26
CL	6	4	5
SO4	43	63	69
TDS(SUM)	691.7	1174.9	1675.1
TDS(SUM)/SP COND	0.79	0.80	0.77
TDS(CALC)	539.1	1003.8	1484.8
TDS/TDS(CALC)	0.93	0.99	1.01
TOTAL CATIONS	9.27	16.69	23.99
TOTAL ANIONS	9.65	16.55	24.11
CAT-AN BALANCE	-2.00	0.40	-0.20

FOR ALL DATA FROM 850101 THROUGH 851231

*****

SITE=S01

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	1511	875	2184	3	655
PH - LAB	7.6	7.4	7.7	3.0	0.2
TSS	1099.3	237.0	2322.0	3.0	1088.2
TDS	998.0	503.0	1497.0	3.0	497.0
OIL & GREASE	0.5	0.0	0.9	3.0	0.5
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	276.33	246.00	307.00	3.00	30.50
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	337.13	300.12	374.54	3.00	37.21
CO3	0.00	0.00	0.00	2.00	0.00
CL	28.33	19.00	45.00	3.00	14.47
SO4	500.00	200.00	800.00	3.00	300.00
NO3(N)	0.14	0.04	0.31	3.00	0.15
CATIONS					
NA	129.00	55.00	204.00	3.00	74.51
K	4.67	2.00	7.00	3.00	2.52
CA	106.67	68.00	144.00	3.00	38.02
MG	67.00	41.00	94.00	3.00	26.51
FE,DISS				0.00	
MN	0.22	0.07	0.41	3.00	0.17
OTHER IONS					
B	0.40	0.22	0.51	3.00	0.16
SR	1.30	0.74	1.83	3.00	0.55
F	0.43	0.40	0.47	3.00	0.04
FE,TOT	2.23	0.58	4.52	3.00	2.05
P-ORTHO	0.10	0.05	0.18	3.00	0.07
SIO2	4.37	3.80	4.70	3.00	0.49
CALCULATED DATA					
HARDNESS	542	340	745	3	203
NC HARDNESS				0	
SAR	2	1	3	3	1
IONIC RATIOS(%)					
NA+K	33	27	38	3	6
CA	33	30	37	3	3
MG	34	32	37	3	2
HCO3+CO3	37	26	51	3	13
CL	5	4	6	3	1
SO4	59	43	69	3	14
TDS(SUM)	1180.6	691.7	1675.1	3.0	491.8
TDS(SUM)/SP COND	0.78	0.77	0.80	3.00	0.02
TDS(CALC)	1009.2	539.1	1484.8	3.0	472.8
TDS/TDS(CALC)	0.98	0.93	1.01	3.00	0.04
TOTAL CATIONS	16.65	9.27	23.99	3.00	7.36
TOTAL ANIONS	16.77	9.65	24.11	3.00	7.24
CAT-AN BALANCE	-0.60	-2.00	0.40	3.00	1.25

*****
SITE=S02

	RAW DATA		
	05JUN85	22JUL85	26SEP85
FLOW			
SP COND - LAB	2300	2280	3425
PH - LAB	7.6	7.7	7.8
TSS	123.0	5622.0	106.0
TDS	1562.0	1656.0	2423.0
OIL & GREASE			
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	324.00	268.00	327.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	395.28	326.96	398.94
CO3	0.00	0.00	0.00
CL	40.00	30.00	47.00
SO4	900.00	880.00	1400.00
NO3(N)	0.25	0.18	0.96
CATIONS			
NA	218.00	226.00	391.00
K	8.00	8.00	10.00
CA	132.00	148.00	140.00
MG	123.00	111.00	153.00
FE,DISS			
MN	0.18	1.40	0.15
OTHER IONS			
B	0.06	0.32	0.38
SR	1.18	1.59	1.47
F	0.45	0.44	0.37
FE,TOT	1.17	4.56	0.35
P-ORTHO	0.15	0.10	0.06
SIO2	5.80	4.10	4.70
CALCULATED DATA			
HARDNESS	837	825	980
NC HARDNESS			
SAR	3	3	5
IONIC RATIOS(%)			
NA+K	37	38	47
CA	25	28	19
MG	38	34	34
HCO3+CO3	25	22	18
CL	4	3	4
SO4	71	75	79
TDS(SUM)	1824.2	1741.0	2546.8
TDS(SUM)/SP COND	0.79	0.76	0.74
TDS(CALC)	1623.3	1574.8	2344.1
TDS/TDS(CALC)	0.96	1.05	1.03
TOTAL CATIONS	26.44	26.77	36.85
TOTAL ANIONS	26.39	24.56	37.10
CAT-AN BALANCE	0.10	4.30	-0.30

*****
SITE=S02

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	2668	2280	3425	3	655
PH - LAB	7.7	7.6	7.8	3.0	0.1
TSS	1950.3	106.0	5622.0	3.0	3179.8
TDS	1880.3	1562.0	2423.0	3.0	472.3
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	306.33	268.00	327.00	3.00	33.23
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	373.73	326.96	398.94	3.00	40.54
CO3	0.00	0.00	0.00	3.00	0.00
CL	39.00	30.00	47.00	3.00	8.54
SO4	1060.00	880.00	1400.00	3.00	294.62
NO3(N)	0.46	0.18	0.96	3.00	0.43
CATIONS					
NA	278.33	218.00	391.00	3.00	97.65
K	8.67	8.00	10.00	3.00	1.15
CA	140.00	132.00	148.00	3.00	8.00
MG	129.00	111.00	153.00	3.00	21.63
FE.DISS				0.00	
MN	0.58	0.15	1.40	3.00	0.71
OTHER IONS					
B	0.25	0.06	0.38	3.00	0.17
SR	1.41	1.18	1.59	3.00	0.21
F	0.42	0.37	0.45	3.00	0.04
FE.TOT	2.03	0.35	4.56	3.00	2.23
P-ORTHO	0.10	0.06	0.15	3.00	0.05
SIO2	4.87	4.10	5.80	3.00	0.86
CALCULATED DATA					
HARDNESS	881	825	980	3	86
NC HARDNESS				0	
SAR	4	3	5	3	1
IONIC RATIOS(%)					
NA+K	40	37	47	3	6
CA	24	19	28	3	5
MG	36	34	38	3	2
HCO3+CO3	21	18	25	3	3
CL	4	3	4	3	0
SO4	75	71	79	3	4
TDS(SUM)	2037.3	1741.0	2546.8	3.0	443.2
TDS(SUM)/SP COND	0.77	0.74	0.79	3.00	0.02
TDS(CALC)	1847.4	1574.8	2344.1	3.0	430.8
TDS/TDS(CALC)	1.02	0.96	1.05	3.00	0.05
TOTAL CATIONS	30.02	26.44	36.85	3.00	5.92
TOTAL ANIONS	29.35	24.56	37.10	3.00	6.77
CAT-AN BALANCE	1.37	-0.30	4.30	3.00	2.55

*****
SITE=S03

	RAW DATA		
	06JUN85	23JUL85	27SEP85
FLOW			
SP COND - LAB	1400	1790	2312
PH - LAB	7.7	7.9	7.9
TSS	710.0	14336.0	62.0
TDS	867.0	1144.0	1645.0
OIL & GREASE			
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	252.00	250.00	310.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	307.44	305.00	378.20
CO3	0.00	0.00	0.00
CL	31.00	29.00	42.00
SO4	420.00	680.00	880.00
NO3(N)	0.16	0.14	0.78
CATIONS			
NA	128.00	162.00	233.00
K	4.00	7.00	7.00
CA	80.00	132.00	132.00
MG	62.00	81.00	107.00
FE,DISS			
MN	0.17	2.50	0.07
OTHER IONS			
B	0.06	0.19	0.31
SR	1.02	2.28	1.55
F	0.44	0.44	0.48
FE,TOT	1.81	3.00	0.35
P-ORTHO	0.08	0.11	0.05
SIO2	4.60	4.20	4.80
CALCULATED DATA			
HARDNESS	455	665	770
NC HARDNESS			
SAR	3	3	4
IONIC RATIOS(%)			
NA+K	38	35	40
CA	27	32	26
MG	35	33	34
HCO3+CO3	34	25	24
CL	6	4	5
SO4	60	71	71
TDS(SUM)	1039.7	1406.5	1786.0
TDS(SUM)/SP COND	0.74	0.79	0.77
TDS(CALC)	883.4	1251.4	1593.8
TDS/TDS(CALC)	0.98	0.91	1.03
TOTAL CATIONS	14.83	20.67	25.72
TOTAL ANIONS	14.69	20.01	25.79
CAT-AN BALANCE	0.50	1.60	-0.10

*****
SITE=S03

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	1834	1400	2312	3	458
PH - LAB	7.8	7.7	7.9	3.0	0.1
TSS	5036.0	62.0	14336.0	3.0	8060.6
TDS	1218.7	867.0	1645.0	3.0	394.3
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	270.67	250.00	310.00	3.00	34.08
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	330.21	305.00	378.20	3.00	41.58
CO3	0.00	0.00	0.00	3.00	0.00
CL	34.00	29.00	42.00	3.00	7.00
SO4	660.00	420.00	880.00	3.00	230.65
NO3(N)	0.36	0.14	0.78	3.00	0.36
CATIONS					
NA	174.33	128.00	233.00	3.00	53.58
K	5.00	4.00	7.00	3.00	1.73
CA	114.67	80.00	132.00	3.00	30.02
MG	83.33	62.00	107.00	3.00	22.59
FE,DISS				0.00	
MN	0.91	0.07	2.50	3.00	1.38
OTHER IONS					
B	0.19	0.06	0.31	3.00	0.13
SR	1.62	1.02	2.28	3.00	0.63
F	0.45	0.44	0.48	3.00	0.02
FE,TOT	1.72	0.35	3.00	3.00	1.33
P-ORTHO	0.08	0.05	0.11	3.00	0.03
SIO2	4.53	4.20	4.80	3.00	0.31
CALCULATED DATA					
HARDNESS	630	455	770	3	160
NC HARDNESS				0	
SAR	3	3	4	3	1
IONIC RATIOS(%)					
NA+K	38	35	40	3	2
CA	28	26	32	3	3
MG	34	33	35	3	1
HCO3+CO3	28	24	34	3	6
CL	5	4	6	3	1
SO4	67	60	71	3	7
TDS(SUM)	1410.7	1039.7	1786.0	3.0	373.2
TDS(SUM)/SP COND	0.77	0.74	0.79	3.00	0.02
TDS(CALC)	1242.9	883.4	1593.8	3.0	355.2
TDS/TDS(CALC)	0.98	0.91	1.03	3.00	0.06
TOTAL CATIONS	20.41	14.83	25.72	3.00	5.45
TOTAL ANIONS	20.16	14.69	25.79	3.00	5.55
CAT-AN BALANCE	0.67	-0.10	1.60	3.00	0.86

FOR ALL DATA FROM 850101 THROUGH 851231

*****

SITE=504

	RAW DATA		
	06JUN85	23JUL85	27SEP85
FLOW			
SP COND - LAB	1200	1490	2276
PH - LAB	7.8	7.8	7.6
TSS	802.0	16624.0	89.0
TDS	754.0	900.0	1560.0
OIL & GREASE	0.0	0.0	0.5
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	256.00	251.00	316.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	312.32	306.22	385.52
CO3	0.00	0.00	0.00
CL	33.00	33.00	49.00
SO4	300.00	506.00	780.00
NO3(N)	0.08	0.06	0.18
CATIONS			
NA	115.00	134.00	222.00
K	3.00	6.00	7.00
CA	70.00	114.00	130.00
MG	50.00	60.00	94.00
FE,DISS			
MN	0.20	2.52	0.05
OTHER IONS			
B	0.08	0.29	0.36
SR	1.04	2.51	1.58
F	0.43	0.43	0.45
FE,TOT	2.90	1.80	0.38
P-ORTHO	0.08	0.10	0.06
SIO2	3.80	4.10	4.80
CALCULATED DATA			
HARDNESS	380	530	712
NC HARDNESS			
SAR	3	3	4
IONIC RATIOS(%)			
NA+K	40	36	41
CA	28	34	27
MG	32	30	32
HCO3+CO3	42	30	26
CL	8	6	6
SO4	51	64	68
TDS(SUM)	890.8	1168.4	1673.7
TDS(SUM)/SP COND	0.74	0.78	0.74
TDS(CALC)	732.1	1012.8	1477.8
TDS/TDS(CALC)	1.03	0.89	1.06
TOTAL CATIONS	12.80	16.76	24.07
TOTAL ANIONS	12.33	16.51	23.98
CAT-AN BALANCE	1.90	0.80	0.20

*****
SITE=S04

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	1655	1200	2276	3	557
PH - LAB	7.7	7.6	7.8	3.0	0.1
TSS	5838.3	89.0	16624.0	3.0	9347.5
TDS	1071.3	754.0	1560.0	3.0	429.4
OIL & GREASE	0.2	0.0	0.5	3.0	0.3
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	274.33	251.00	316.00	3.00	36.17
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	334.69	306.22	385.52	3.00	44.13
CO3	0.00	0.00	0.00	3.00	0.00
CL	38.33	33.00	49.00	3.00	9.24
SO4	528.67	300.00	780.00	3.00	240.80
NO3(N)	0.11	0.06	0.18	3.00	0.06
CATIONS					
NA	157.00	115.00	222.00	3.00	57.09
K	5.33	3.00	7.00	3.00	2.08
CA	104.67	70.00	130.00	3.00	31.07
MG	68.00	50.00	94.00	3.00	23.07
FE,DISS				0.00	
MN	0.92	0.05	2.52	3.00	1.38
OTHER IONS					
B	0.24	0.08	0.36	3.00	0.15
SR	1.71	1.04	2.51	3.00	0.74
F	0.44	0.43	0.45	3.00	0.01
FE,TOT	1.69	0.38	2.90	3.00	1.26
P-ORTHO	0.08	0.06	0.10	3.00	0.02
SIO2	4.23	3.80	4.80	3.00	0.51
CALCULATED DATA					
HARDNESS	541	380	712	3	166
NC HARDNESS				0	
SAR	3	3	4	3	1
IONIC RATIOS(%)					
NA+K	39	36	41	3	3
CA	30	27	34	3	4
MG	31	30	32	3	1
HCO3+CO3	33	26	42	3	8
CL	6	6	8	3	1
SO4	61	51	68	3	9
TDS(SUM)	1244.3	890.8	1673.7	3.0	396.9
TDS(SUM)/SP COND	0.75	0.74	0.78	3.00	0.03
TDS(CALC)	1074.2	732.1	1477.8	3.0	376.6
TDS/TDS(CALC)	0.99	0.89	1.06	3.00	0.09
TOTAL CATIONS	17.88	12.80	24.07	3.00	5.72
TOTAL ANIONS	17.61	12.33	23.98	3.00	5.90
CAT-AN BALANCE	0.97	0.20	1.90	3.00	0.86

*****
SITE=S05

	RAW DATA		
	06JUN85	23JUL85	27SEP85
FLOW			
SP COND - LAB	1750	1900	2389
PH - LAB	7.7	7.7	7.6
TSS	186.0	10104.0	78.0
TDS	1209.0	1212.0	1744.0
OIL & GREASE			
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	302.00	255.00	316.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	368.44	311.10	385.52
CO3	0.00	0.00	0.00
CL	28.00	31.00	34.00
SO4	600.00	770.00	960.00
NO3(N)	0.40	0.40	1.20
CATIONS			
NA	143.00	180.00	239.00
K	7.00	8.00	7.00
CA	100.00	130.00	126.00
MG	97.00	95.00	127.00
FE,DISS			
MN	0.10	1.70	0.10
OTHER IONS			
B	0.06	0.34	0.42
SR	0.93	2.01	1.47
F	0.46	0.47	0.51
FE,TOT	1.04	6.76	0.23
P-ORTHO	0.11	0.11	0.05
SIO2	6.30	4.20	5.40
CALCULATED DATA			
HARDNESS	650	715	838
NC HARDNESS			
SAR	2	3	4
IONIC RATIOS(%)			
NA+K	33	36	39
CA	26	29	23
MG	41	35	38
HCO3+CO3	31	23	23
CL	4	4	4
SO4	65	73	73
TDS(SUM)	1351.8	1539.0	1886.4
TDS(SUM)/SP COND	0.77	0.81	0.79
TDS(CALC)	1164.5	1380.8	1690.4
TDS/TDS(CALC)	1.04	0.88	1.03
TOTAL CATIONS	19.41	22.64	27.32
TOTAL ANIONS	19.37	22.06	27.38
CAT-AN BALANCE	0.10	1.30	-0.10

*****
SITE=S05

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	2013	1750	2389	3	334
PH - LAB	7.7	7.6	7.7	3.0	0.1
TSS	3456.0	78.0	10104.0	3.0	5757.6
TDS	1388.3	1209.0	1744.0	3.0	308.0
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	291.00	255.00	316.00	3.00	31.95
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	355.02	311.10	385.52	3.00	38.98
CO3	0.00	0.00	0.00	3.00	0.00
CL	31.00	28.00	34.00	3.00	3.00
SO4	776.67	600.00	960.00	3.00	180.09
NO3(N)	0.67	0.40	1.20	3.00	0.46
CATIONS					
NA	187.33	143.00	239.00	3.00	48.42
K	7.33	7.00	8.00	3.00	0.58
CA	118.67	100.00	130.00	3.00	16.29
MG	106.33	95.00	127.00	3.00	17.93
FE,DISS				0.00	
MN	0.63	0.10	1.70	3.00	0.92
OTHER IONS					
B	0.27	0.06	0.42	3.00	0.19
SR	1.47	0.93	2.01	3.00	0.54
F	0.48	0.46	0.51	3.00	0.03
FE,TOT	2.68	0.23	6.76	3.00	3.56
P-ORTHO	0.09	0.05	0.11	3.00	0.03
SIO2	5.30	4.20	6.30	3.00	1.05
CALCULATED DATA					
HARDNESS	734	650	838	3	95
NC HARDNESS				0	
SAR	3	2	4	3	1
IONIC RATIOS(%)					
NA+K	36	33	39	3	3
CA	26	23	29	3	3
MG	38	35	41	3	3
HCO3+CO3	26	23	31	3	5
CL	4	4	4	3	0
SO4	70	65	73	3	5
TDS(SUM)	1592.4	1351.8	1886.4	3.0	271.3
TDS(SUM)/SP COND	0.79	0.77	0.81	3.00	0.02
TDS(CALC)	1411.9	1164.5	1690.4	3.0	264.3
TDS/TDS(CALC)	0.98	0.88	1.04	3.00	0.09
TOTAL CATIONS	23.12	19.41	27.32	3.00	3.98
TOTAL ANIONS	22.94	19.37	27.38	3.00	4.07
CAT-AN BALANCE	0.43	-0.10	1.30	3.00	0.76

*****
SITE=S06

	--- RAW DATA---- 17JAN85	25FEB85
FLOW		
SP COND - LAB	4000	3650
PH - LAB	7.8	7.3
TSS	3.0	15.0
TDS	2932.0	3063.0
OIL & GREASE	0.0	0.0
ACIDITY,TOT		
ALKALINITY(CACO3)		
TOTAL		
NONCARBONATE	0.00	0.00
ANIONS		
HCO3		
CO3		
CL		
SO4		
NO3(N)		
CATIONS		
NA		
K		
CA		
MG		
FE,DISS		
MN	0.00	0.02
OTHER IONS		
B		
SR		
F		
FE,TOT	0.00	0.08
P-ORTHO		
SIO2		
CALCULATED DATA		
HARDNESS		
NC HARDNESS		
SAR		
IONIC RATIOS(%)		
NA+K		
CA		
MG		
HCO3+CO3		
CL		
SO4		
TDS(SUM)	0.0	0.1
TDS(SUM)/SP COND	0.00	0.00
TDS(CALC)		
TDS/TDS(CALC)		
TOTAL CATIONS	0.00	0.00
TOTAL ANIONS	0.00	0.00
CAT-AN BALANCE		100.00

FOR ALL DATA FROM 850101 THROUGH 851231

*****

SITE=S06

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	3825	3650	4000	2	247
PH - LAB	7.5	7.3	7.8	2.0	0.4
TSS	9.0	3.0	15.0	2.0	8.5
TDS	2997.5	2932.0	3063.0	2.0	92.6
OIL & GREASE	0.0	0.0	0.0	2.0	0.0
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL				0.00	
NONCARBONATE	0.00	0.00	0.00	2.00	0.00
ANIONS					
HCO3				0.00	
CO3				0.00	
CL				0.00	
SO4				0.00	
NO3(N)				0.00	
CATIONS					
NA				0.00	
K				0.00	
CA				0.00	
MG				0.00	
FE,DISS				0.00	
MN	0.01	0.00	0.02	2.00	0.01
OTHER IONS					
B				0.00	
SR				0.00	
F				0.00	
FE,TOT	0.04	0.00	0.08	2.00	0.06
P-ORTHO				0.00	
SIO2				0.00	
CALCULATED DATA					
HARDNESS				0	
NC HARDNESS				0	
SAR				0	
IONIC RATIOS(%)					
NA+K				0	
CA				0	
MG				0	
HCO3+CO3				0	
CL				0	
SO4				0	
TDS(SUM)	0.0	0.0	0.1	2.0	0.1
TDS(SUM)/SP COND	0.00	0.00	0.00	2.00	0.00
TDS(CALC)				0.0	
TDS/TDS(CALC)				0.00	
TOTAL CATIONS	0.00	0.00	0.00	2.00	0.00
TOTAL ANIONS	0.00	0.00	0.00	2.00	0.00
CAT-AN BALANCE	100.00	100.00	100.00	1.00	

*****
SITE=SU8

	--- RAW DATA--- 05JUN85	26SEP85
FLOW		
SP COND - LAB	2375	2369
PH - LAB	7.7	8.3
TSS	527.0	28.0
TDS	1370.0	1507.0
OIL & GREASE		
ACIDITY,TOT		
ALKALINITY(CACO3)		
TOTAL	260.00	267.00
NONCARBONATE	0.00	0.00
ANIONS		
HCO3	317.20	325.74
CO3	0.00	0.00
CL	80.00	71.00
SO4	700.00	780.00
NO3(N)	0.05	0.00
CATIONS		
NA	264.00	314.00
K	9.00	9.00
CA	88.00	70.00
MG	64.00	83.00
FE,DISS		
MN	0.26	0.02
OTHER IONS		
B	0.06	0.14
SR	0.88	0.81
F	0.46	0.38
FE,TOT	4.50	0.13
P-ORTHO	0.23	0.12
SIO2	5.40	4.00
CALCULATED DATA		
HARDNESS	485	516
NC HARDNESS		
SAR	5	6
IONIC RATIOS(%)		
NA+K	55	57
CA	21	14
MG	25	28
HCO3+CO3	24	23
CL	10	8
SO4	66	69
TDS(SUM)	1532.9	1657.4
TDS(SUM)/SP COND	0.74	0.70
TDS(CALC)	1371.7	1491.8
TDS/TDS(CALC)	1.00	1.01
TOTAL CATIONS	21.54	24.22
TOTAL ANIONS	22.06	23.60
CAT-AN BALANCE	-1.20	1.30

FOR ALL DATA FROM 850101 THROUGH 851231

*****

SITE=S08

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	2222	2075	2369	2	208
PH - LAB	8.0	7.7	8.3	2.0	0.4
TSS	277.5	28.0	527.0	2.0	352.8
TDS	1438.5	1370.0	1507.0	2.0	96.9
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	263.50	260.00	267.00	2.00	4.95
NONCARBONATE	0.00	0.00	0.00	2.00	0.00
ANIONS					
HCO3	321.47	317.20	325.74	2.00	6.04
CO3	0.00	0.00	0.00	2.00	0.00
CL	75.50	71.00	80.00	2.00	6.36
SO4	740.00	700.00	780.00	2.00	56.57
NO3(N)	0.02	0.00	0.05	2.00	0.04
CATIONS					
NA	289.00	264.00	314.00	2.00	35.36
K	9.00	9.00	9.00	2.00	0.00
CA	79.00	70.00	88.00	2.00	12.73
MG	73.50	64.00	83.00	2.00	13.44
FE,DISS				0.00	
MN	0.14	0.02	0.26	2.00	0.17
OTHER IONS					
B	0.10	0.06	0.14	2.00	0.06
SR	0.84	0.81	0.88	2.00	0.05
F	0.42	0.38	0.46	2.00	0.06
FE,TOT	2.31	0.13	4.50	2.00	3.09
P-ORTHO	0.17	0.12	0.23	2.00	0.08
SIO2	4.70	4.00	5.40	2.00	0.99
CALCULATED DATA					
HARDNESS	501	485	516	2	22
NC HARDNESS				0	
SAR	6	5	6	2	1
IONIC RATIOS(%)					
NA+K	56	55	57	2	2
CA	17	14	21	2	4
MG	26	25	28	2	3
HCO3+CO3	23	23	24	2	1
CL	9	8	10	2	1
SO4	68	66	69	2	2
TDS(SUM)	1595.2	1532.9	1657.4	2.0	88.0
TDS(SUM)/SP COND	0.72	0.70	0.74	2.00	0.03
TDS(CALC)	1431.8	1371.7	1491.8	2.0	85.0
TDS/TDS(CALC)	1.00	1.00	1.01	2.00	0.01
TOTAL CATIONS	22.88	21.54	24.22	2.00	1.89
TOTAL ANIONS	22.83	22.06	23.60	2.00	1.09
CAT-AN BALANCE	0.05	-1.20	1.30	2.00	1.77

FOR ALL DATA FROM 850101 THROUGH 851231

*****
SITE=S09

	RAW DATA		
	05JUN85	22JUL85	26SEP85
FLOW			
SP COND - LAB	1650	1710	1978
PH - LAB	7.4	7.6	7.5
TSS	7.0	145.0	25.0
TDS	1137.0	1233.0	1416.0
OIL & GREASE			
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	180.00	156.00	161.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	219.60	190.32	196.42
CO3	0.00	0.00	0.00
CL	98.00	80.00	88.00
SO4	600.00	660.00	800.00
NO3(N)	0.04	0.03	0.01
CATIONS			
NA	72.00	66.00	80.00
K	5.00	5.00	6.00
CA	158.00	170.00	200.00
MG	92.00	102.00	108.00
FE,DISS			
MN	0.03	0.08	0.07
OTHER IONS			
B	0.11	0.27	0.17
SR	1.02	1.00	1.36
F	0.40	0.39	0.25
FE,TOT	0.15	0.40	0.09
P-ORTHO	0.10	0.04	0.01
SIO2	7.30	7.10	6.70
CALCULATED DATA			
HARDNESS	775	845	946
NC HARDNESS			
SAR	1	1	1
IONIC RATIOS(%)			
NA+K	17	15	16
CA	42	43	44
MG	40	42	39
HCO3+CO3	19	16	14
CL	15	12	11
SO4	66	72	74
TDS(SUM)	1252.6	1281.6	1495.7
TDS(SUM)/SP COND	0.76	0.75	0.75
TDS(CALC)	1141.0	1184.9	1385.9
TDS/TDS(CALC)	1.00	1.04	1.02
TOTAL CATIONS	18.72	19.89	22.50
TOTAL ANIONS	18.88	19.14	22.37
CAT-AN BALANCE	-0.40	1.90	0.30

*****
SITE=S09

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	1779	1650	1978	3	175
PH - LAB	7.5	7.4	7.6	3.0	0.1
TSS	59.0	7.0	145.0	3.0	75.0
TDS	1262.0	1137.0	1416.0	3.0	141.7
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	165.67	156.00	180.00	3.00	12.66
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	202.11	190.32	219.60	3.00	15.45
CO3	0.00	0.00	0.00	3.00	0.00
CL	88.67	80.00	98.00	3.00	9.02
SO4	686.67	600.00	800.00	3.00	102.63
NO3(N)	0.03	0.01	0.04	3.00	0.02
CATIONS					
NA	72.67	66.00	80.00	3.00	7.02
K	5.33	5.00	6.00	3.00	0.58
CA	176.00	158.00	200.00	3.00	21.63
MG	100.67	92.00	108.00	3.00	8.08
FE,DISS				0.00	
MN	0.06	0.03	0.08	3.00	0.03
OTHER IONS					
B	0.18	0.11	0.27	3.00	0.08
SR	1.13	1.00	1.36	3.00	0.20
F	0.35	0.25	0.40	3.00	0.08
FE,TOT	0.21	0.09	0.40	3.00	0.16
P-ORTHO	0.05	0.01	0.10	3.00	0.05
SIO2	7.03	6.70	7.30	3.00	0.31
CALCULATED DATA					
HARDNESS	855	775	946	3	86
NC HARDNESS				0	
SAR	1	1	1	3	0
IONIC RATIOS(%)					
NA+K	16	15	17	3	1
CA	43	42	44	3	1
MG	41	39	42	3	1
HCO3+CO3	17	14	19	3	2
CL	13	11	15	3	2
SO4	71	66	74	3	4
TDS(SUM)	1340.0	1252.6	1485.7	3.0	127.0
TDS(SUM)/SP COND	0.75	0.75	0.76	3.00	0.01
TDS(CALC)	1237.2	1141.0	1385.9	3.0	130.6
TDS/TDS(CALC)	1.02	1.00	1.04	3.00	0.02
TOTAL CATIONS	20.37	18.72	22.50	3.00	1.94
TOTAL ANIONS	20.13	18.88	22.37	3.00	1.95
CAT-AN BALANCE	0.60	-0.40	1.90	3.00	1.18

*****
SITE=S10

	RAW DATA		
	05JUN85	22JUL85	26SEP85
FLOW			
SP COND - LAB	3200	3200	4532
PH - LAB	7.7	7.5	7.8
TSS	133.0	441.0	15.0
TDS	2466.0	2484.0	3580.0
OIL & GREASE			
ACIDITY,TOT			
ALKALINITY(CACO3)			
TOTAL	237.00	220.00	237.00
NONCARBONATE	0.00	0.00	0.00
ANIONS			
HCO3	289.14	268.40	289.14
CO3	0.00	0.00	0.00
CL	162.00	141.00	163.00
SO4	1425.00	1600.00	2100.00
NO3(N)	0.04	0.03	0.04
CATIONS			
NA	285.00	246.00	395.00
K	9.00	15.00	15.00
CA	192.00	224.00	272.00
MG	204.00	214.00	277.00
FE,DISS			
MN	0.09	0.12	0.09
OTHER IONS			
B	0.14	0.71	0.74
SR	2.26	2.53	3.40
F	0.43	0.40	0.34
FE,TOT	0.73	1.50	0.07
P-ORTHO	0.07	0.03	0.04
SIO2	6.20	6.50	5.30
CALCULATED DATA			
HARDNESS	1320	1440	1818
NC HARDNESS			
SAR	3	3	4
IONIC RATIOS(%)			
NA+K	32	28	33
CA	25	28	25
MG	43	44	42
HCO3+CO3	12	11	9
CL	12	10	9
SO4	76	80	82
TDS(SUM)	2573.8	2717.7	3517.7
TDS(SUM)/SP COND	0.80	0.85	0.78
TDS(CALC)	2426.8	2581.2	3370.8
TDS/TDS(CALC)	1.02	0.96	1.06
TOTAL CATIONS	39.02	39.92	53.93
TOTAL ANIONS	39.00	41.71	53.08
CAT-AN BALANCE	0.00	-2.20	0.80

*****
SITE=S10

	STATISTICS				
	MEAN	MIN	MAX	N	STD
FLOW				0.0	
SP COND - LAB	3644	3200	4532	3	769
PH - LAB	7.7	7.5	7.8	3.0	0.2
TSS	196.3	15.0	441.0	3.0	219.9
TDS	2843.3	2466.0	3580.0	3.0	638.0
OIL & GREASE				0.0	
ACIDITY,TOT				0.00	
ALKALINITY(CACO3)					
TOTAL	231.33	220.00	237.00	3.00	9.81
NONCARBONATE	0.00	0.00	0.00	3.00	0.00
ANIONS					
HCO3	282.23	268.40	289.14	3.00	11.97
CO3	0.00	0.00	0.00	3.00	0.00
CL	155.33	141.00	163.00	3.00	12.42
SO4	1708.33	1425.00	2100.00	3.00	350.30
NO3(N)	0.04	0.03	0.04	3.00	0.01
CATIONS					
NA	308.67	246.00	395.00	3.00	77.27
K	13.00	9.00	15.00	3.00	3.46
CA	229.33	192.00	272.00	3.00	40.27
MG	231.67	204.00	277.00	3.00	39.58
FE,DISS				0.00	
MN	0.10	0.09	0.12	3.00	0.02
OTHER IONS					
B	0.53	0.14	0.74	3.00	0.34
SR	2.73	2.26	3.40	3.00	0.60
F	0.39	0.34	0.43	3.00	0.05
FE,TOT	0.77	0.07	1.50	3.00	0.72
P-ORTHO	0.05	0.03	0.07	3.00	0.02
SIO2	6.00	5.30	6.50	3.00	0.62
CALCULATED DATA					
HARDNESS	1526	1320	1818	3	260
NC HARDNESS				0	
SAR	3	3	4	3	1
IONIC RATIOS(%)					
NA+K	31	28	33	3	3
CA	26	25	28	3	2
MG	43	42	44	3	1
HCO3+CO3	11	9	12	3	2
CL	10	9	12	3	2
SO4	79	76	82	3	3
TDS(SUM)	2936.4	2573.8	3517.7	3.0	508.6
TDS(SUM)/SP COND	0.81	0.78	0.85	3.00	0.04
TDS(CALC)	2792.9	2426.8	3370.8	3.0	506.3
TDS/TDS(CALC)	1.01	0.96	1.06	3.00	0.05
TOTAL CATIONS	44.29	39.02	53.93	3.00	8.36
TOTAL ANIONS	44.60	39.00	53.08	3.00	7.47
CAT-AN BALANCE	-0.47	-2.20	0.80	3.00	1.55

SUBSIDENCE MONITORING - 1985

Mining Activities During 1985 the 2-Main West mains were advanced 1,450 feet, the 2-West mains 900 feet, and the 7-North mains 1,000 feet. Two panels, Third and Fourth Right were developed to the Quitchupah Creek subsidence barrier and mined out (partial pillar extraction) on retreat. In addition, retreat mining was completed in the Third East panel.

New Subsidence Stations Monuments 83-3, 4, 5, and 6 over the 3rd and 4th panels and 83- 1, 2 over 3rd East were installed in 1983. Monuments 85 - 1, 2 were established in 1985 to monitor mining in 5-Right panel scheduled to start early in 1986.

New Monuments 86- 1, 2, 3, 4, 5 will be established early in 1986 to monitor mining in 1-Federal and 1-Left mains that are scheduled for mining in 1986 and 1987 respectively.

The location of existing and proposed monuments are shown on the 1985 Emery Mine Map Environmental Overlay submitted with this report.

Subsidence Surveys Our approved subsidence monitoring plan requires that all monuments over advancing sections shall be surveyed within twelve months of mining with subsequent surveys only if there is an indication of significent movement. Surveys are required over pillar sections within six months after mining is completed with annual follow-up surveys if there has been no significant movement. If a survey indicates that there has been significant movement (defined in the permit as 0.5 feet), then follow-up surveys are required every six-months until the area has stabilized.

As a result of the mine's extended idle period (July 1983-February 1985) and the determination of no significant movement as indicated by 1984 check surveys, only the annual check surveys of monuments overlaying pillared sections were required in 1985.

Table Sm-1 summarizes the survey data obtained for the stations surveyed in 1985, including initial baseline data, and survey elevations from the most recent previous check survey.

Table SM-1 SUBSIDENCE MONITORING STATIONS - Survey 1985

Station	Location	Baseline Survey Data Date	Northing	Easting	Elevation	Prior Check Survey Date	Elevation	1985 Check Survey Date	Elevation
SMk-2	1-East	2/81	197,094.12	2,069,844.82	6,099.91	12/82	6,099.28	10/85	6,099.47
H-6	1-East	12/81	196,403.18	2,070,884.42	6,092.21	12/82	6,091.99	10/85	6,092.24
Smk-3	2-East	6/81	197,304.72	2,071,450.90	6,083.56	7/83	6,078.33	10/85	6,078.33
H-1	2-East	5/80	196,595.37	2,072,825.14	6,078.84	5/83	6,079.07	10/85	6,079.08
83-1	3-East	5/83	197,304.02	2,071,450.86	6,062.29	11/83	6,062.20	10/85	6,062.15
E	3-East	5/81	197,803.76	2,072,023.67	6,079.67	5/83	6,079.65	10/85	6,079.71
Q	1-Left	6/81	191,929.15	2,066,753.80	5,931.20	12/83	5,931.10	5/85	5,931.20
N	2-Right	12/82	193,874.72	2,065,955.61	5,948.67	5/84	5,948.41	5/85	5,948.40
W	2-Right	1/81	194,616.64	2,065,467.15	5,957.05	11/84	5,955.35	5/85	5,955.43
85-1	5-Right	12/85	194,958.12	2,063,444.68	5,974.25				
85-2	5-Right	12/85	194,929.82	2,064,644.94	5,978.85				

EMERY MINE REVEGETATION DEMONSTRATION SITE
ANNUAL MONITORING REPORT - 1985

CONSOLIDATION COAL COMPANY
EMERY MINE
EMERY, UTAH
U.D.O.G.M. PERMIT NO. ACT/015/015

March 31, 1986

Revegetation demonstration plots were established at the Emery Mine in the Spring of 1984 as discussed in our responses to Division's Apparent Completeness Review and subsequent correspondence. Plot establishment and subsequent vegetation monitoring follow the specifications outlined in the attached submittal (Final Plans for the Emery Revegetation Demonstration Sites, April 1984). This annual report describes vegetation existing on the three demonstration sites one year following plot establishment. The sites were surveyed during October, 1985, by Bio-Resources, Inc. personnel (Logan, Utah). This data was utilized by Consolidation Coal Company personnel to develope the annual report.

Analysis of data collected during 1985 was limited to development of frequency and density values for each treatment type and vegetative species encountered. Further analysis is not proposed at this stage of the project because of the limited amount of data available. We expect to utilize the 1985 and 1986 monitoring data to propose any necessary alterations of the originally approved revegetation demonstration plan. This will be discussed in detail in the 1986 annual report.

Items included in this report are as follow:

1) Final Plans for the Emery Revegetation Demonstration Sites - April 1984
2) Table 1 - Species Codes
3) Table 2 - Flume Site Vegetative Density
4) Table 3 - Flume Site Vegetative Frequency
5) Table 4 - Borehole Access Site Vegetative Density
6) Table 5 - Borehole Access Site Vegetative Frequency
7) Table 6 - Original Demonstration Site Vegetative Density
8) Table 7 - Original Demonstration Site Vegetative Frequency
9) Table 8 - Shrub Transplant Survival

TABLE 1. EMERY REVEGETATION DEMONSTRATION SITE: SPECIES CODES

	Species Code	Species	Common Name
GRASS			
	AGCR	*Agropyron cristatum*	crested wheatgrass
	AGSM	*Agropyron smithii*	western wheatgrass
	AGTR	*Agropyron trachycaulum*	slender wheatgrass
	AGSP	*Agropyron ssp.*	wheatgrass
	ARPU	*Aristida purpurea*	poverty grass
	BOGR	*Bouteloua gracilis*	blue grama
	BRTE	*Bromus tectorum*	cheatgrass brome
	HIJA	*Hilaria jamesii*	galleta
	HOVU	*Hordeum vulgare*	
	MUPU	*Muhlenbergia pungens*	muhly
	ORHY	*Oryzopsis hymenoides*	indian ricegrass
	SPAI	*Sporobolus airoides*	alkali sacaton
	SPCON	*Sporobolus contracta*	spike dropseed
	SPCR	*Sporobolus cryptandrus*	sand dropseed
	SPGI	*Sporobolus gigantus*	giant dropseed
	SPSP	*Sporobolus ssp.*	dropseed
	TRAE	*Triticum aestivum*	wheat
SHRUB			
	ATCA	*Atriplex canescens*	fourwing saltbush
	ATCO	*Atriplex confertifolia*	shadscale saltbush
	ATGA	*Atriplex gardneri*	gardner saltbush
	ATA	*Atriplex (annual)*	
	ATSP	*Atriplex spp.*	saltbush
	CELA	*Ceratoides lanata*	winterfat
	CHLI	*Chrysothamnus linifolius*	
	CHNA	*Chrysothamnus nauseosus*	rubber rabbitbrush
	EPVI	*Ephedra viridus*	green mormon tea
	GUSA	*Gutierrezia sarothrae*	broom snakeweed
	SAVE	*Sarcobatus vermiculatus*	black greasewood
	TARA	*Tamarix ramosissima*	tamarisk
FORB			
	AMAC	*Ambrosia acanthicarpa*	ragweed
	ASSP	*Astragalus spp.*	milkvetch
	CRSP	*Crypthantha spp.*	cryptantha
	DESP	*Descurainia spp.*	tansy mustard
	EUSP	*Euphorbia spp.*	spurge
	HAGL	*Halogeton glomeratus*	common halogeton
	KOSC	*Kochia scoparia*	fireweed summercypress
	LEER	*Leucelene ericoides*	
	MEOF	*Melilotus officinalis*	yellow sweetclover
	SAIB	*Salsola iberica*	
	SAKA	*Salsola kali*	russian thistle
	SPPA	*Sphaeralcea parvifolia*	
	STEX	*Stephanomenia exigua*	
	SUTO	*Suaeda torreyana*	
	TRDU	*Tragopogon dubius*	yellow salsify

TABLE 2. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE DENSITY AT FLUME SITE (OCTOBER 1985).

Species[1]	Density			
	Mulch (N=10[2])		No Mulch (N=10)	
	Total Stems	Stems/½M^2	Total Stems	Stems/½M^2
GRASS				
AGCR	15	1.5	25	2.5
AGSM	--	--	1	0.1
AGSP	18	1.8	47	4.7
BOGR	--	--	--	--
BRTE	14	1.4	--	--
ORHY	--	--	34	3.4
SPCR	1	0.1	--	--
TRAE	1	0.1	--	--
SHRUB				
ATCA	1	0.1	5	0.5
ATCO	2	0.2	2	0.2
ATGA	2	0.2	1	0.1
ATSP	--	--	--	--
EPVI	1	0.1	3	0.3
GUSA	1	0.1	--	--
TARA	50	5.0	18	1.8
FORB				
ATA	--	--	--	--
HAGL	1	--	3	0.3
KOSC	82	8.2	55	5.5
SAKA	--	--	12	1.2
SUTO	--	--	--	--

1) Refer to Table 1 for species codes.

2) N = 1/2M^2 Sample Plots

TABLE 3. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE FREQUENCY AT FLUME SITE (OCTOBER 1985).

Species[1]	Frequency[2]	
	Mulch	No Mulch
GRASS		
AGCR	53	60
AGSM	--	20
AGSP	48	54
BRTE	40	--
ORHY	--	38
SPCR	20	--
TRAE	20	--
SHRUB		
ATCA	20	25
ATCO	20	20
ATGA	20	20
EPVI	20	20
GUSA	20	--
TARA	63	53
FORB		
HAGL	20	60
KOSC	43	46
SAKA	--	80

1) Refer to Table 1 for species codes.

2) Species presence per 0.2 m^2 (%)

TABLE 4. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE DENSITY AT BOREHOLE ACCESS SITE (OCTOBER 1985).

Species[1]	Density				
	Mulch (N=16)			No Mulch (N=10)	
	Total Stems	Stems $1\frac{1}{2}M^2$		Total Stems	Stems $1\frac{1}{2}M^2$
GRASS					
AGCR	--	--		56	5.6
AGSM	--	--		1	0.1
AGSP	29	1.8		93	9.3
BOGR	--	--		1	0.1
BRTE	--	--		--	--
ORHY	68	4.3		103	10.3
SPCR	--	--		--	--
TRAE	--	--		--	--
SHRUB					
ATCA	3	0.2		3	0.3
ATCO	2	0.1		5	0.5
ATGA	--	--		--	--
ATSP	43	2.7		22	2.2
EPVI	7	0.4		18	1.8
GUSA	--	--		--	--
TARA	--	--		--	--
FORB					
ATA	31	1.9	50	88	8.8
HAGL	947	59.2	45	202	20.2
KOSC	7	0.4	40	379	37.9
SAKA	--	--	40	40	4.0
SUTO	1	0.1	--	--	--

1) Refer to Table 1 for species codes.

2) N = $1/2M^2$ Sample Plots

TABLE 5. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE FREQUENCY AT BOREHOLE ACCESS SITE (OCTOBER 1985).

Species[1]	Frequency[2]	
	Mulch	No Mulch
GRASS		
AGCR	--	50
AGSM	--	20
AGSP	48	56
BOGR	--	20
ORHY	47	60
SHRUB		
ATCA	30	30
ATCO	20	27
ATSP	46	40
EPVI	33	33
FORB		
ATA	36	66
HAGL	100	89
KOSC	20	80
SAKA	--	43
SUTO	20	--

1) Refer to Table 1 for species codes.

2) Species presence per 0.2 m^2 (%)

TABLE 6. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE DENSITY AT ORIGINAL DEMONSTRATION SITE (OCTOBER 1985).

	DENSITY[2]																			
	IRRIGATED															NOT IRRIGATED				
	No Topsoil					Topsoiled										No Topsoil				
Species[1] / Plot N[4]	A1 / 6	B1 / 6	C1 / 6	D1 / 5	D3[3] / 5	A1A / 3	B1A / 3	C1A / 3	D1A / 2	D3A[3] / 2	A2A / 3	B2A / 3	C2A / 3	D2A / 2	D4A[3] / 2	A2 / 6	B2 / 6	C2 / 6	D2 / 5	D4[3] / 5
GRASS																				
AGSM	--	--	--	--	--	--	--	--	--	2.5	--	--	0.3	--	--	--	--	--	8.4	2.4
AGSP	--	--	1.3	1.0	0.8	1.0	7.7	0.3	8.5	4.0	--	--	2.0	0.5	--	0.3	--	--	--	--
AGTR	--	--	--	--	--	--	--	--	--	--	--	--	1.0	--	--	--	--	--	5.0	--
HOVU	--	--	--	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
ORHY	--	--	--	--	--	--	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--
SPSP	5.3	1.2	1.3	0.2	--	11.7	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--
TRAE	--	--	0.5	--	--	--	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--
SHRUB																				
ATCA	1.0	0.2	--	--	0.8	2.7	3.7	--	1.5	1.5	0.3	0.6	--	1.0	1.0	0.8	0.2	--	0.8	--
ATCO	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.6	--	--	--	--
CELA	--	--	--	--	0.4	--	2.0	--	0.5	--	--	--	--	--	--	--	--	--	--	--
EPVI	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2	--	--	--	--
SAVE	--	--	--	--	--	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--
FORB																				
DESP	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0
HAGL	0.3	1.2	0.8	4.8	2.0	--	0.6	0.3	1.0	--	--	--	0.3	--	4.0	4.5	0.8	0.5	--	8.0
KOSC	31.5	24.5	100.3	28.4	28.0	69.0	55.7	116.7	148.0	163.0	0.3	45.7	80.0	213.0	86.5	4.5	6.0	16.8	42.0	30.0
MEOF	--	--	--	--	--	--	--	--	--	1.0	12.0	--	0.3	--	--	--	--	--	--	--
SAKA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2
SUTO	--	0.2	0.3	--	--	--	0.3	--	--	--	--	0.3	--	--	--	--	--	--	--	--

1) Refer to Table 1 for species codes.
2) Stems per $1/2M^2$
3) All plots mulched except D3, D3A, D4A, and D4.
4) N = $1/2M^2$ Sample Plots.

TABLE 7. EMERY REVEGETATION DEMONSTRATION SITES: VEGETATIVE FREQUENCY AT ORIGINAL DEMONSTRATION SITE (OCTOBER 1985).

	DENSITY[2]																			
	IRRIGATED										NOT IRRIGATED									
	No Topsoil					Topsoiled										No Topsoil				
Species[1] / Plot	A1	B1	C1	D1	D3[3]	A1A	B1A	C1A	D1A	D3A[3]	A2A	B2A	C2A	D2A	D4A[3]	A2	B2	C2	D2	D4[3]
GRASS																				
AGSM	--	--	--	--	--	--	--	--	--	30	--	--	20	--	--	--	--	--	60	50
AGSP	--	--	80	40	40	20	47	20	40	30	--	--	40	20	--	40	--	--	--	--
AGTR	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--	100	--
HOVU	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--
ORHY	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--	--	--
SPSP	52	35	60	20	--	80	--	40	--	--	--	--	--	--	--	--	--	--	--	--
TRAE	--	--	20	--	--	--	--	40	--	--	--	--	--	--	--	--	--	--	--	--
SHRUB																				
ATCA	20	20	--	--	36	40	40	--	67	36	20	20	--	50	50	27	20	--	45	--
ATCO	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	--	--	--	--
CELA	--	--	--	--	40	--	40	--	20	--	--	--	--	--	--	--	--	--	--	--
EPVI	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	--	--	--	--
SAVE	--	--	--	--	--	--	--	--	--	60	--	--	--	--	--	--	--	--	--	--
FORB																				
DESP	--	--	20	--	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--	40
HAGL	20	24	20	50	20	--	20	20	20	--	20	--	20	--	60	55	40	20	--	80
KOSC	88	80	87	72	60	73	87	100	100	100	67	100	100	100	100	32	60	56	60	64
MEOF	--	--	--	--	--	--	--	--	--	20	--	--	20	--	--	--	--	--	--	--
SAKA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20
SUTO	--	20	20	--	--	--	20	--	--	--	--	20	--	--	--	--	--	--	--	--

1) Refer to Table 1 for species codes.
2) Species presence per 0.2 M^2 (%)
3) All plots mulched except D3, D3A, D4A, and D4.

TABLE 8. EMERY REVEGETATION DEMONSTRATION SITES: SHRUB TRANSPLANT SURVIVAL ON ORIGINAL DEMONSTRATION SITE (OCTOBER 1985).

		IRRIGATED				NOT IRRIGATED			
		Topsoiled		No Topsoil		Topsoiled		No Topsoil	
PLOT		D1A (8)[3]	D3A (8)	D1 (16)	D3 (16)	D2A (8)	D4A (8)	D2 (16)	D4 (16)
Species[1]	ATCA	9	26	6	11	22	7	32	2
	ATCO	--	--	--	--	--	--	--	--
	ATTR	--	--	--	--	--	--	--	--
	(CELA[2])							(1[2])	
		113	325	38	69	275	88	200	13

1) Refer to Table 1 for species codes.

2) Volunteer - Not included in totals.

3) Number of individuals transplanted.

PERMIT STIPULATIONS

Permit ACT/015/015 was issued on January 10, 1986 with one "special condition" regarding the proposed soil reconstruction practices for prime farmlands. Attached is this special condition along with your agency's approval of Consol's proposed practice. No other stipulations are applicable.

Attachment A
Special Condition

Before conducting mining under prime farmland areas designated on plate 8-3 of the permit application package, the permittee's proposed methods of soil reconstruction shall be reviewed by the Secretary of Agriculture, through the Utah State Conservationist of the U. S. Soil Conservation Service, under the requirements of UMC 785.17(c).

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

February 7, 1986

Mr. Nick Neumann
Consolidation Coal Company
Mid-Continent Region
12755 Olive Boulevard
St.Louis, MO 63141

Dear Mr. Neumann:

Re: Special Condition to Permit Approval, Emery Deep Mine, ACT/015/015, Folder No. 2 and 4, Emery County, Utah

Pursuant to the terms of the Special Condition to the Emery Deep permit approval, the Division requested comment on the proposed soil reconstruction practices for prime farmlands within the Emery Deep Mine permit area from the Utah State Conservationist, U. S. Soil Conservation Service (SCS). The SCS has replied that reconstruction methods are adequate (see enclosures).

Therefore, the Division finds that the Special Condition to permit approval has been satisfied. The Office of Surface Mining (OSM) will also need to sign off on this stipulation for mining under any prime farmland areas on federal land.

Please feel free to contact me or Susan Linner if you have questions.

Sincerely,

L.P. Braxton

L. P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

SCL:jvb
cc: R. Holbrook
L. Hamm
D. Darby
S. Linner
0028R-69

Sue L

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

January 14, 1986

Mr. Frank Holt
State Conservationist
U. S. Soil Conservation Service
P.O. Box 11350
Salt Lake City, Utah

Dear Mr. Holt:

Re: Request for Comment on Soil Reconstruction for the Emery Deep Mine, ACT/015/015, Folder No. 3, Emery County, Utah

I request your assistance in reviewing the soil reconstruction comments submitted by Consolidation Coal Company for prime farmlands within the Emery Deep Mine's permit area to ensure they comply to U.S. Soil Conservation Service standards.

Regulation UMC 785.17(c), Prime Farmlands, of Utah's Coal Mining and Reclamation Act, Title 40-10, Utah Code Annotated 1953, requires review and comment by the U. S. Soil Conservation Service for soil reconstruction methods employed by coal mining operations on prime farmlands before a permit can be approved by the Division of Oil, Gas and Mining and the Office of Surface Mining. Currently the mine plan for the Emery Deep mine has been conditionally approved. A special condition denies Consolidation Coal Company from mining under prime farm land areas designated on plate 8-3 of the Emery Deep mine plan application until the soil reconstruction methods are reviewed by the Secretary of Agriculture, through the Utah State Conservationist of the U.S. Soil Conservation Service, in accordance with Regulation UMC 785.17(c).

Prime farmlands have been deliniated on the permit area of the Emery Deep mine site. Subsidence has taken place on some prime farmlands and will most likely continue in other areas. Most of the prime farmland is considered exempt from reconstruction standards since the mine was operating under an authorized permit prior to August 8, 1977 (regulation UMC 785.17(a)). However, the applicant will be required to reconstruct prime farmlands in these areas to meet post mining land use, in accordance with UMC 823, and any designated prime farmlands outside the grandfathered area that may be disrupted.

The applicant has proposed measures that will be taken to reconstruct areas (enclosed) that may be affected by subsidence, and in fact, has done so at two sites where farmland was subsided due to mining activity.

Basically, the operator's proposals for reconstruction of prime farmlands are:

1. Remove and stockpile topsoil of affected area, regrade to suitable topography to restore natural drainage, respread topsoil and revegetate area (Final Technical Analysis Response, May 18, 1984).

2. The operator will mitigate any damages caused by subsidence as agreed upon by the applicant, the regulatory authority (DOGM) and/or the land owner. The operator would either rehabilitate each materially damaged structure to the extent technologically and economically feasible, purchase the damaged feature for its pre-subsidence market value or compensate the owner for any material damage (Part 12.4.3.2, Subsidence Mitigation Plan, Emery Deep Mine Plan).

3. The operator will establish a list of items for consideration to arrive at a timetable which maximizes a sucessful mitigation plan and offers maximum benefits and minimum inconvienience to the landowner (Response to Stipulations, May 31, 1984).

Would you please examine the enclosed correspondence submitted by the applicant and make any comments you think necessary.

Thank you for your time. If you need any more information or assistance please contact Dave Darby or myself anytime.

Sincerely,

Susan C. Linner

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

DWD:jvb
Enclosure

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 11350
Salt Lake City, UT 84147

February 4, 1986

Susan C. Linner
Reclamation Biologist/Permit Supervisor
State of Utah Natural Resources
Oil, Gas & Mining
355 W. North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RECEIVED
FEB 05 1986
DIVISION OF
OIL, GAS & MINING

Dear Ms. Linner:

We have completed our review, as you requested, of the Emery Deep Mine report, ACT/015/015, Folder No. 3, Emery County, Utah. Measures described for reconstruction of areas of Prime Farmland affected by mining should be adequate.

If we can be of further assistance, please call on us.

Sincerely,

Ferris Allgood

FERRIS P. ALLGOOD
State Soil Scientist