UTAH POWER & LIGHT COMPANY
HYDROLOGIC MONITORING PROGRAM
ANNUAL REPORT FOR 1982

MARCH 1983

Submitted to: United States Department of the Interior
Office of Surface Mining
Minerals Management Service
Utah Division of Oil, Gas and Mining

Prepared and submitted for Utah Power & Light Company by:

Hydrologic Section of the Power Operation Department

and

Mining and Exploration Department

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INTRODUCTION

This 1982 Water Monitoring Report is hereby submitted in accordance with the U. S. Department of Interior, Office of Surface Mining requirements for hydrologic monitoring in areas adjacent to coal mining operations. The specific regulations are set forth in Section 30 CFR 211 of the Coal Mine Operating Regulations of 1977.

This report is the fifth annual hydrologic report submitted by Utah Power & Light Company since the report entitled "Monitoring of the Water Resources in the Mining Areas of East Mountain, Emery County, Utah" was submitted to the U. S. Geological Survey and the Utah Division of Oil, Gas and Mining in December 1977. The annual hydrologic report for 1982 is written to answer questions raised in the Apparent Completeness Review made by the Utah Division of Oil, Gas and Mining for the Utah Power & Light Company mines. This report addresses both flow observations as well as water quality characteristics of the water resources adjacent to Utah Power & Light Company (UP&L) mining areas in Emery County (see Figures 1a and 1b).

Information was compiled the past year from in-house as well as from state, federal and private agencies which are shown as follows:

U. S. Geological Survey
U. S. Forest Service
U. S. Department of Commerce, National Weather Service
Utah Division of Oil, Gas and Mining
Utah Division of Environmental Health
Huntington-Cleveland Irrigation Company
Emery Water Conservancy District
Cottonwood Creek Consolidated Irrigation Company

Information from outside agencies will continue to be utilized each year for as long as their data gathering programs continue. By using this outside information, a cooperative effort is realized and duplication of effort and expense is substantially reduced.

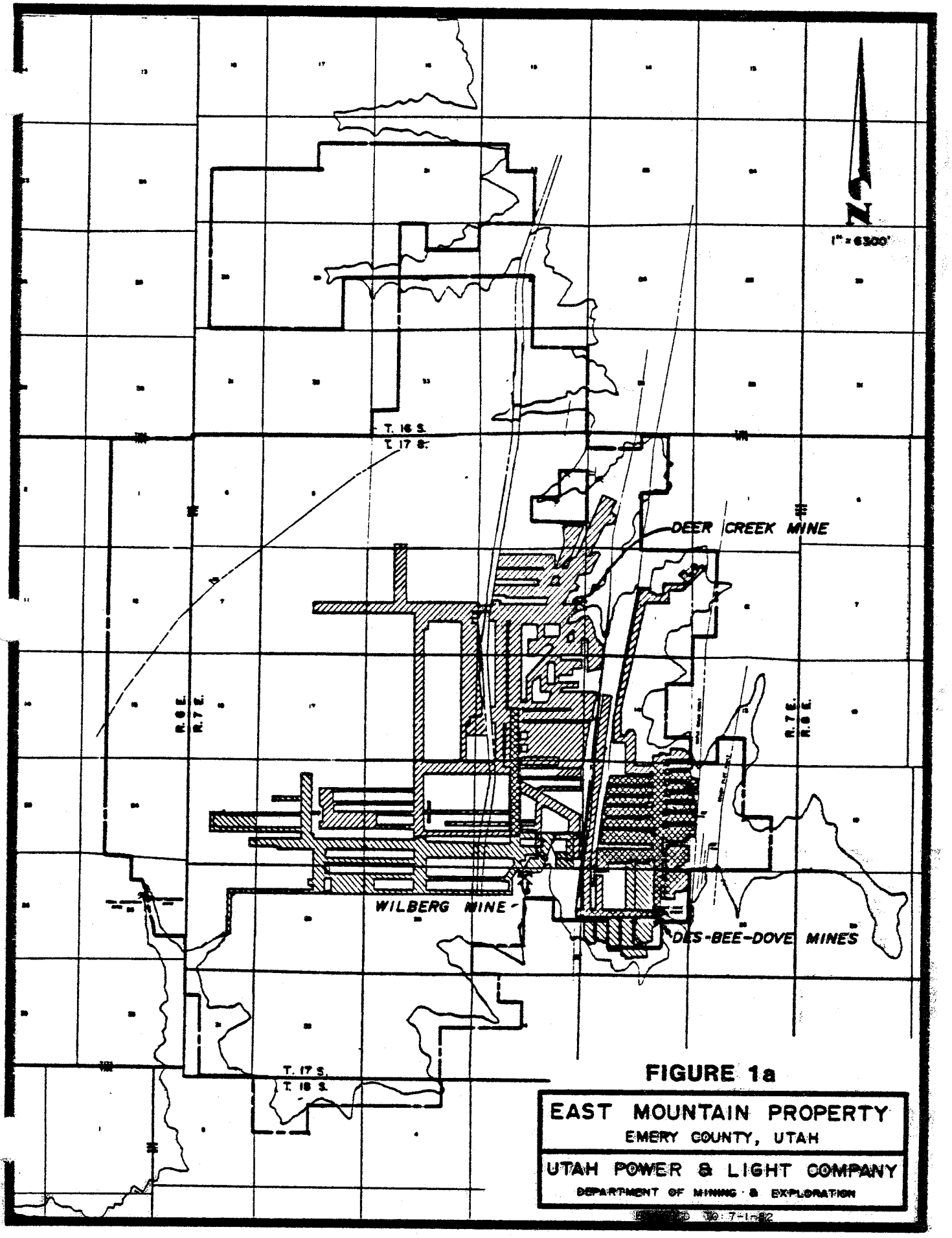
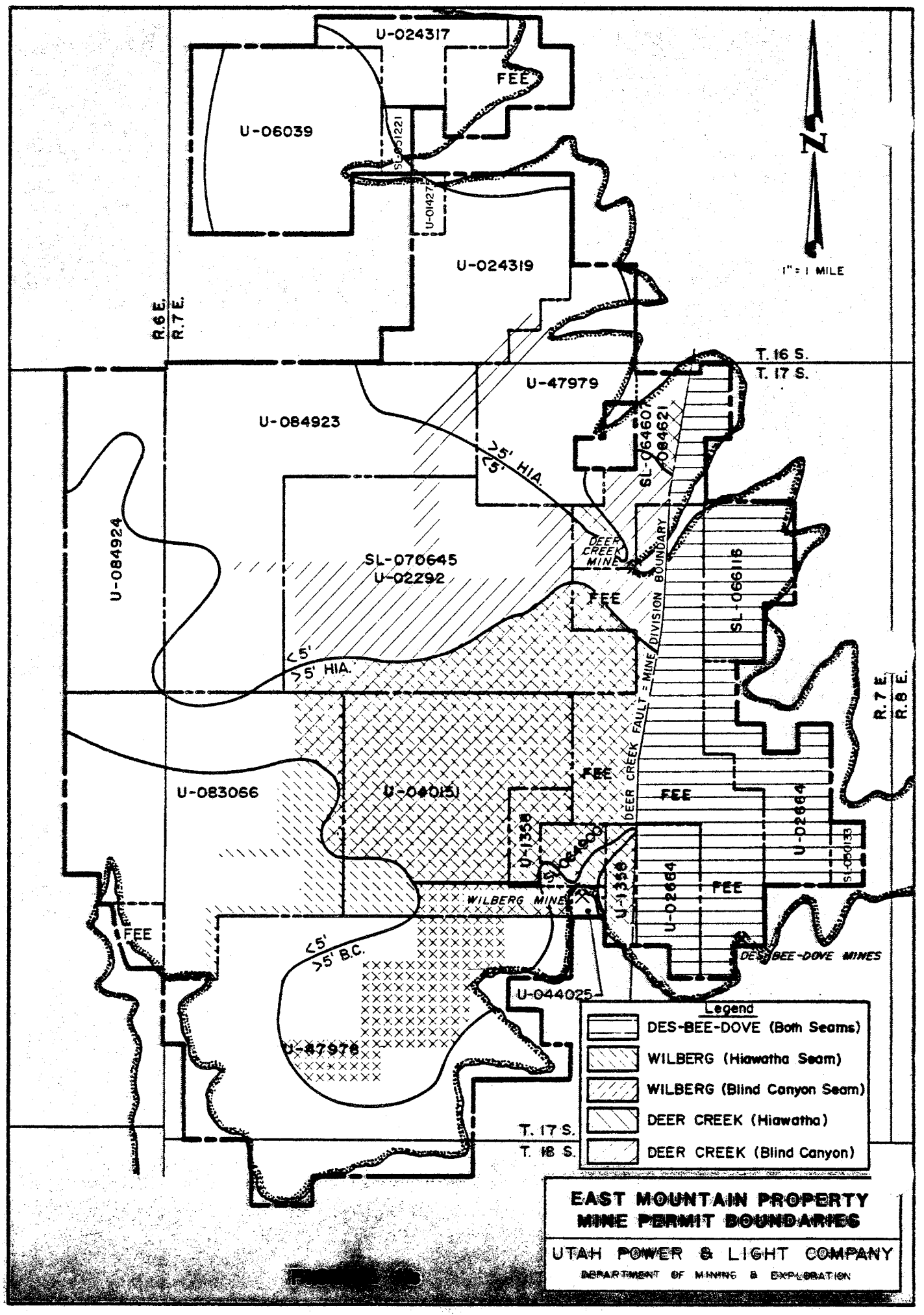


FIGURE 1a

EAST MOUNTAIN PROPERTY
EMERY COUNTY, UTAH

UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

7-1-82


U-024317
FEE
U-06039
SL-051221
U-01427
U-024319
N
1" = 1 MILE
R.6 E.
R.7 E.
T. 16 S.
T. 17 S.
U-47979
U-084923
>5' HIA.
<5'
SL-064607
SL-064621
U-084924
SL-070645
U-02292
DEER CREEK MINE
FEE
DEER CREEK FAULT = MINE DIVISION BOUNDARY
SL-066118
<5'
>5' HIA.
R. 7 E.
R. 8 E.
U-083066
U-040151
FEE
DEER CREEK
FEE
U-1358
U-02664
U-02664
U-02664
SL-050133
WILBERG MINE
FEE
FEE
<5'
>5' B.C.
DES-BEE-DOVE MINES
U-044025
U-47978
T. 17 S.
T. 18 S.
Legend
DES-BEE-DOVE (Both Seams)
WILBERG (Hiawatha Seam)
WILBERG (Blind Canyon Seam)
DEER CREEK (Hiawatha)
DEER CREEK (Blind Canyon)
EAST MOUNTAIN PROPERTY
MINE PERMIT BOUNDARIES
UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

CLIMATIC OBSERVATIONS

In general, runoff and subsequent water supplies are a direct function of the climatic conditions in any given area. Furthermore, the significance of the weather affecting the flow characteristics of the East Mountain springs cannot be overemphasized.

Most of the water supply in the Western United States originates in the high mountain ranges as snowfall during winter periods. Snowmelt augmented by spring precipitation produces runoff which is utilized downstream. Fall precipitation influences soil moisture conditions prior to snowpack accumulation and has a bearing upon runoff the following year.

REGIONAL CLIMATOLOGY

Weather patterns during the past three years have been highly variable in the Western United States. During 1980 near record breaking amounts of precipitation and associated snowfall accumulated throughout the Intermountain West. The corresponding runoff during 1980 approached all time highs.

In 1981, the winter weather pattern was a complete reversal of 1980. In 1981, the winter snowfall was less than 50% in most areas of the West and the corresponding 1981 runoff was extremely low. However, in areas with reservoir storage, water supplies were sufficient to meet user needs.

The 1982 weather pattern again changed dramatically from 1981. Winter snowfall in 1982 was extremely heavy, especially in the Central Rocky Mountains. Several snow reporting stations received snowfall in excess of 200% of normal with most other stations reporting snowfall in excess of 130%

in abnormally high stream flows during September and October 1982 in many areas of the West.

LOCAL CLIMATOLOGY

1) Precipitation

Precipitation in Emery County during 1982 was similar to other intermountain areas. The mountains in the San Rafael Basin received extremely heavy snowfall during the 1982 winter. April 1, 1982 snow surveys indicated snow cover at 154% of normal. The resulting 1982 runoff provided ample water for all users in the San Rafael drainage.

A permanent weather monitoring station was installed on East Mountain by UP&L representatives on October 25, 1980. The weather station is located above the Church Mines at an elevation of 8985 feet (1060 feet east, 1500 feet south of the Northwest corner of Section 26, Township 17 South, Range 7 East, Emery County, Utah). The location and orientation of the station followed National Weather Service recommendations. The instrumentation includes: a recording rain gauge, a maximum/minimum thermometer, and a recording hygrothermograph (temperature and relative humidity). The information provided by this station has supplied data which are valuable in correlating climatological and hydrologic data.

Precipitation amounts recorded at the Hunter (Emery) Plant, Huntington Plant, Electric Lake and East Mountain for the 1982 water year (October 1981 to September 1982) will be presented since these sites include low elevation, intermediate elevation and two high elevation observation sites in the immediate vicinity of mining activities. The values are shown in Table 1 on the following page.

TABLE 1: PRECIPITATION IN EMERY COUNTY, UTAH (1982 Water Year)

Month	Hunter Plant (Elev. 5800') Precip. (in.)	Hunter Plant % Of Normal	Huntington Plant (Elev. 6500') Precip. (in.)	Huntington Plant % Of Normal	Electric Lake (Elev. 8350') Precip. (in.)	Electric Lake % Of Normal	East Mountain (Elev. 8985') Precip. (in.)	East Mountain % Of * Normal
1981								
Oct.	.58	74	1.12	90	4.18	197	1.95	NA
Nov.	.27	53	.25	42	1.44	77	.40	NA
Dec.	.45	83	1.30	277	4.79	165	.90	NA
1982								
Jan.	.94	219	1.63	308	5.26	260	2.90	NA
Feb.	.45	110	.20	59	1.66	95	.60	NA
Mar.	.54	129	.73	118	5.06	265	1.40	NA
Apr.	0	0	0	0	1.11	66	.20	NA
May	.02	3	.17	30	1.40	94	.40	NA
June	0	0	0	0	.59	73	.05	NA
July	.15	26	.08	8	1.26	108	1.95	NA
Aug.	1.06	105	.71	104	2.29	269	1.25	NA
Sept.	1.23	154	1.91	360	5.38	512	2.45	NA
TOTALS	5.69	82	8.10	108	34.42	176	14.45	NA
Mean Monthly	.47	--	.68	--	2.87	--	1.20	--

*Historical data not available for the East Mountain weather station.

A comparison of precipitation for 1981 and 1982 merits consideration in this study. The intent is to develop a correlation between yearly precipitation and spring discharges on East Mountain. Table 2 is a comparison of the 1981-1982 precipitation levels recorded at the four locations.

Table 2: Comparison of 1981 and 1982 Precipitation

Station	1981 Amount	1981 % of Normal	1982 Amount	1982 % of Normal	1982 As % of 1981
Hunter Plant	6.37	92	5.69	82	89
Huntington Plant	6.30	84	8.10	108	129
Electric Lake	18.97	97	34.42	176	181
East Mountain	11.90	*	14.4	*	121
Average %		91		122	130

*Insufficient data to establish normal precipitation.

Table 2 indicates that while 1982 precipitation at the Hunter and Huntington sites was comparable with 1981 values, mountain precipitation was much greater in 1982, especially at Electric Lake. The overall production at the four stations averaged 30% higher in 1982 than 1981 values.

Tables 3, 4 and 5 indicate monthly precipitation values at Hunter, Huntington, and Electric Lake from the beginning of operation at each site. These tables indicate monthly trends as well as the great fluctuation in yearly totals. Figure 2 shows monthly precipitation on at the East Mountain site for 1981 and 1982.

The correlation of precipitation levels with spring discharges will be discussed in the East Mountain Springs section of this report.

TABLE 3: HUNTER PLANT PRECIPITATION-HISTORICAL
Elevation - 5,800 Feet

Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
75-76	.13	.25	.19	.02	.40	.00	.89	.84	.03	.31	.08	.70	3.84
76-77	.00	.02	.00	.37	.07	.00	.03	1.28	.07	1.35	.41	.50	4.10
77-78	.01	.18	.00	1.28	1.05	1.74	.34	1.21	.00	.69	1.14	.14	7.78
78-79	.03	2.22	.22	1.43	.53	2.43	.24	.47	.00	.00	.79	.00	8.36
79-80	.00	.00	.41	1.70	1.70	.67	.75	1.11	.00	.02	.51	2.06	8.93
80-81	.66	.06	.02	.00	.07	1.48	.16	.45	.14	.20	.70	2.43	6.37
81-82	.58	.27	.45	.94	.45	.54	.00	.02	.00	.15	1.06	1.23	5.69
82-83	.20	1.25	.45	.54									

TABLE 4: HUNTINGTON PLANT PRECIPITATION
Elevation - 6,500 Feet

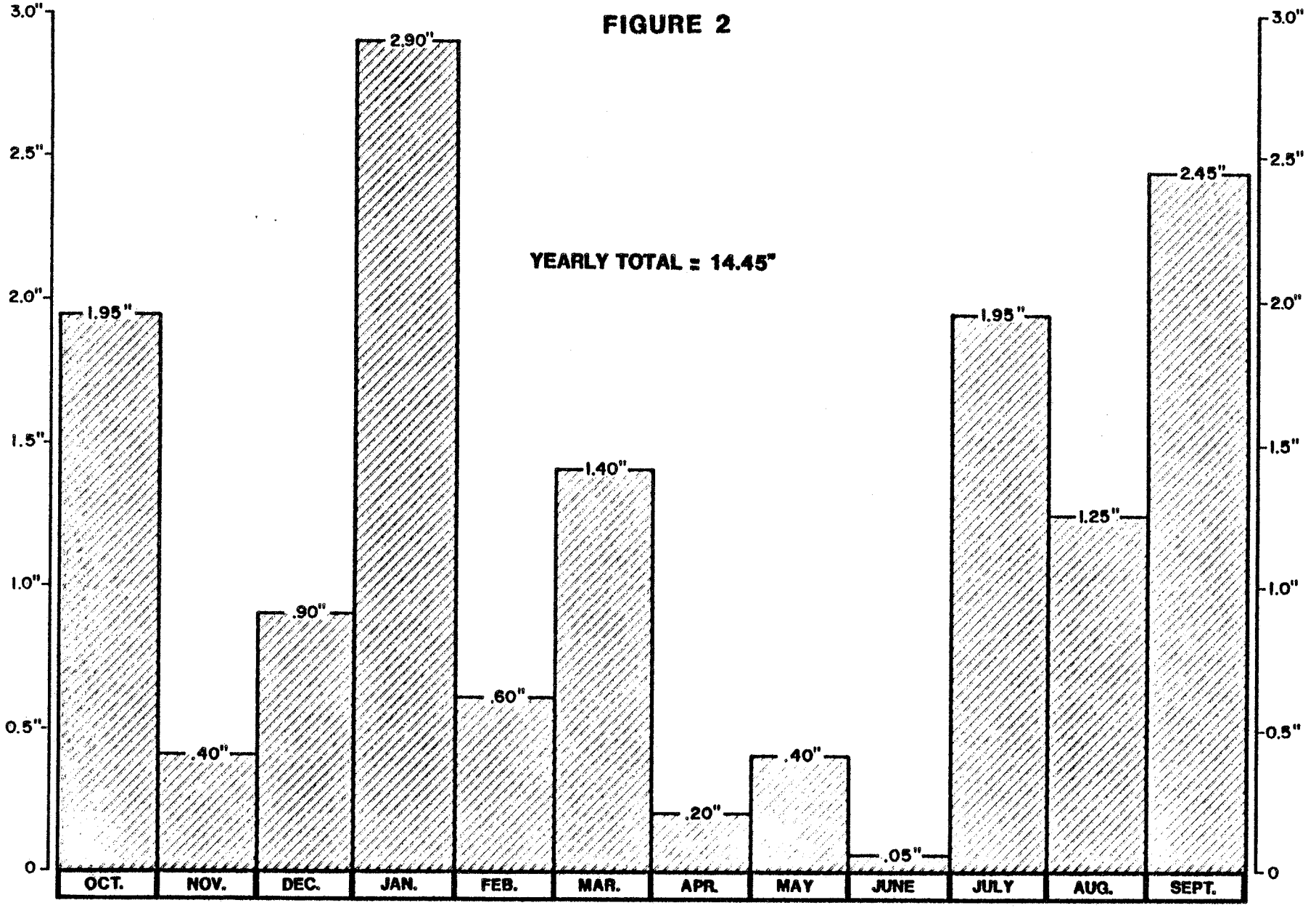
Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
70-71	-	-	-	-	-	.08	.29	.16	.11	.57	.63	.43	2.27
71-72	2.26	.59	1.62	.04	.00	.32	.28	.16	.77	.40	.66	1.07	8.17
72-73	4.27	1.28	.34	.49	.80	2.42	.50	.17	.97	1.09	1.94	.12	14.39
73-74	.08	.02	.37	.20	.03	.01	.00	.00	.00	.09	.00	.07	.87
74-75	.68	1.19	.13	1.01	.30	.80	.03	.75	1.44	2.62	.31	.24	9.50
75-76	.23	.95	.03	.20	.23	.00	2.34	.86	.02	.73	.19	.85	6.63
76-77	.56	.00	.00	.35	.00	.00	.00	1.76	.00	2.08	.96	.70	6.41
77-78	.66	.12	.82	1.45	1.00	1.36	.94	.72	.12	.05	.72	.77	8.73
78-79	.02	2.65	.25	1.21	.52	2.50	.00	.84	.05	.09	3.32	.20	11.65
79-80	.17	.14	.15	2.88	3.63	.68	1.13	1.88	.65	.18	.38	2.22	14.09
80-81	1.20	.06	.00	.00	.00	.62	.08	1.75	.48	.00	.58	1.53	6.30
81-82	1.12	.25	1.30	1.63	.20	.73	.00	.17	.00	.08	.71	1.91	8.10
82-83	.20	.60	.67	.16									

TABLE 5: ELECTRIC LAKE PRECIPITATION
Elevation - 8,350 Feet

Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
70-71	2.46	2.35	6.41	1.13	1.66	.36	1.05	.66	.47	.40	2.15	.78	19.88
71-72	3.49	1.69	4.07	3.35	.58	.70	1.02	.28	1.49	.70	.80	2.91	21.08
72-73	4.18	3.43	3.27	.97	2.09	2.74	3.67	1.42	.85	.82	1.23	1.15	25.82
73-74	.79	1.90	3.52	2.70	1.12	1.52	2.49	.20	.13	2.09	.06	.09	16.61
74-75	2.27	.62	1.73	2.10	2.37	3.42	1.23	3.21	1.08	1.93	.49	.25	20.70
75-76	1.31	2.57	.82	1.44	2.23	1.35	1.47	2.00	1.23	1.07	.54	1.19	17.22
76-77	1.00	.25	.14	.76	1.14	2.00	.05	3.00	.90	2.28	1.31	1.26	14.09
77-78	1.47	2.10	3.20	3.68	2.74	3.16	2.46	1.18	.30	.10	.24	.77	21.40
78-79	.40	3.18	2.66	2.90	2.18	2.53	.72	1.67	.19	.96	2.29	.32	20.00
79-80	1.55	2.23	.37	4.95	6.01	3.34	1.27	3.09	.12	.37	.38	1.80	25.48
10 Year	1.892	2.032	2.619	2.398	2.212	2.112	1.543	1.671	.666	1.072	.949	1.052	20.218
80-81	1.45	.98	.32	1.30	1.04	3.20	1.45	3.06	.39	1.61	2.73	1.44	18.97
81-82	4.18	1.44	4.79	5.26	1.66	5.06	1.11	1.40	.59	1.26	2.29	5.38	34.42
82-83	1.88	3.68	2.76	2.41									

NOTE: Climatic Station was moved from a point one mile above the dam site to a point 500 feet below dam site on November 15, 1973.

NOTE: October, November, and December 70-71 were estimated by correlation with Clear Creek Weather Station.



EAST MOUNTAIN PRECIPITATION TOTALS
for the
WATER YEAR of C ' '81 thru SEPT. '82

2) Temperatures

Temperature variations have a great influence on water supplies from the standpoint of peak flows as well as for duration of runoff from a watershed area. Accordingly, temperature information has been incorporated into this report.

Temperatures were highly variable during 1982 in Emery County (see Table 6 on following page). The monthly temperatures were warmer than normal at the Hunter and Huntington Plants with the exception of October, January, and February at Hunter and February at Huntington, which were colder than normal for all months except for November, December, and August which were warmer than normal. Temperatures at the three locations in 1982 averaged 3.0° lower than 1981 values. The 1982 temperatures at Hunter averaged 4.4° less than 1981 temperatures.

The monthly temperatures which were recorded at the East Mountain station are shown in Figure 3. Since only two years of temperature information has been recorded, only the 1981 values are shown as a comparison with 1982 (Figure 4).

WATER MONITORING PROGRAM

Utah Power & Light Company collected flow and water quality data pertaining to (1) surface drainage systems; (2) East Mountain springs; and (3) from the Utah Power & Light Company coal mines. These data have been collected and interpreted in the following sections of this report. All raw data are included in Appendices A through M.

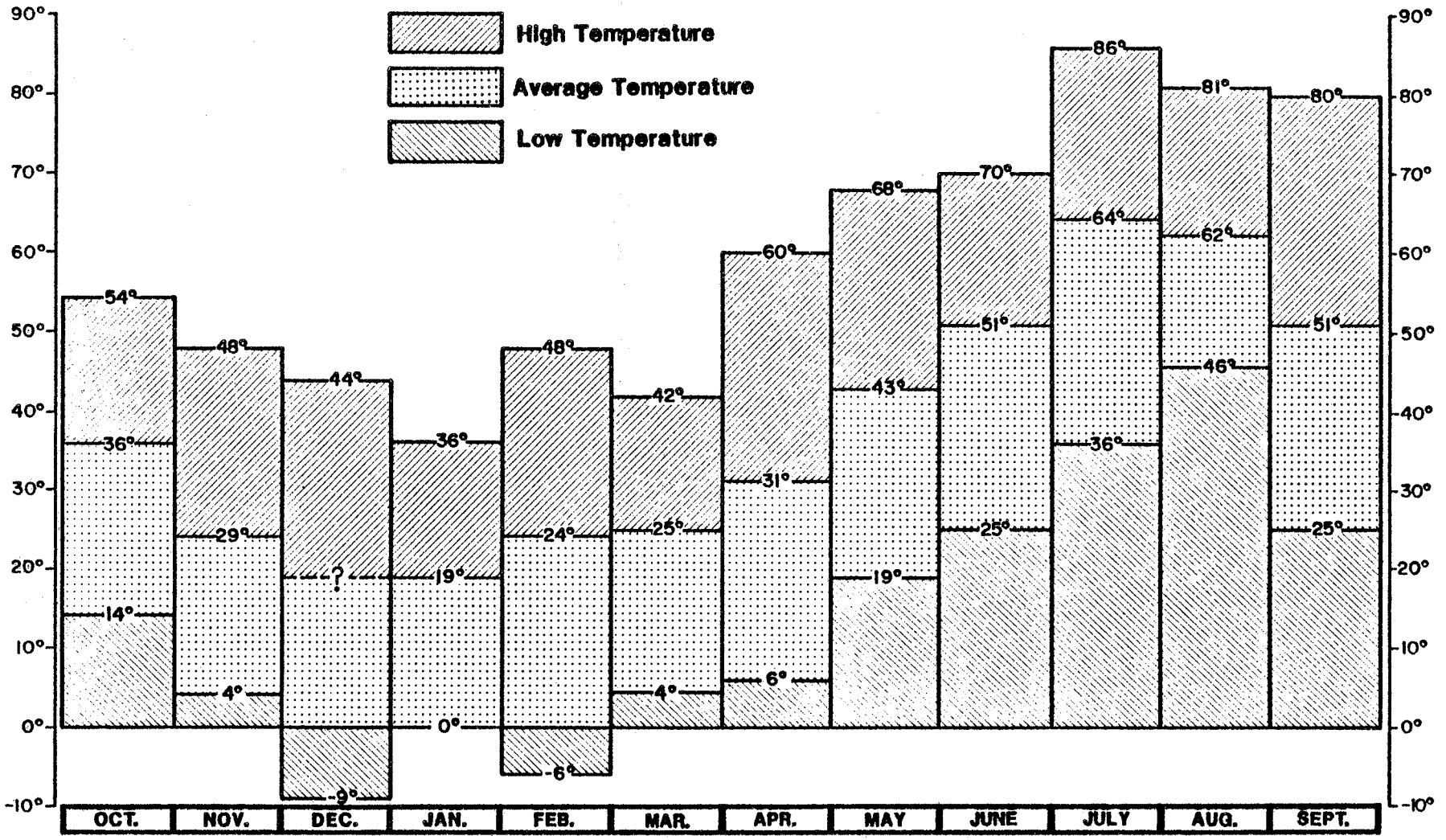


FIGURE 3
EAST MOUNTAIN AIR TEMPERATURE (°F)
for the
WATER YEAR of OCT. '81 thru SEPT. '82

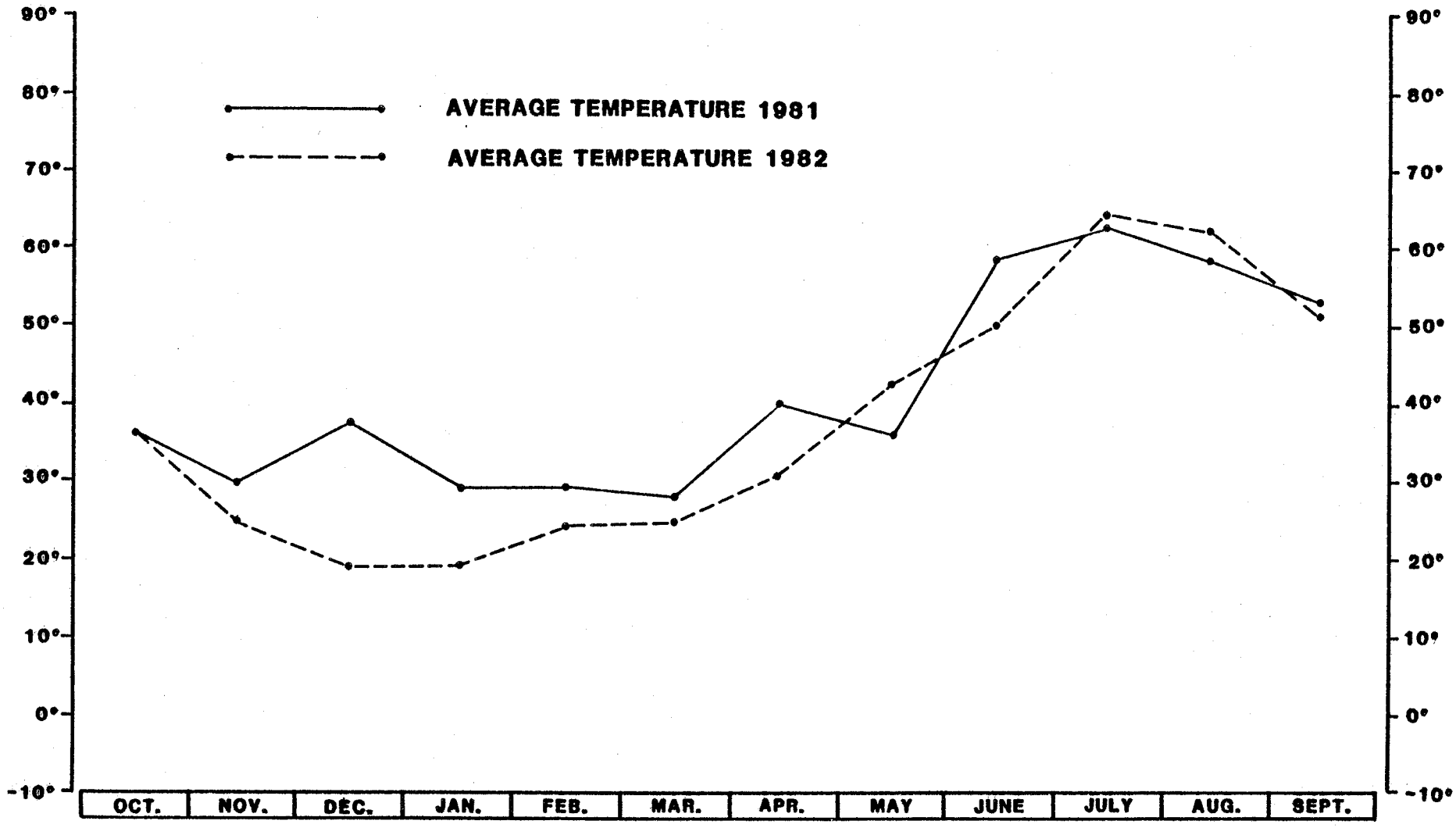


FIGURE 4
EAST MOUNTAIN AIR TEMPERATURE (° F)
COMPARISON FOR 1981, 1982

TABLE 6: TEMPERATURES IN EMERY COUNTY, UTAH (1982 WATER YEAR)

Month	Hunter Plant Average Temp. (°F)	Hunter Plant Departure From Normal	Huntington Plant Average Temp. (°F)	Huntington Plant Departure From Normal	Electric Lake Average Temp. (°F)	Electric Lake Departure From Normal
1981						
Oct.	47.7	-0.7	50.8	+1.4	33.7	-3.8
Nov.	39.6	+4.4	43.0	+7.0	29.3	+3.6
Dec.	28.0	+1.3	33.0	+5.6	19.3	+3.5
1982						
Jan.	14.5	-9.6	24.8	+1.2	11.6	-3.0
Feb.	26.0	-2.4	28.7	-1.5	12.4	-6.9
Mar.	38.4	+2.6	39.8	+2.1	20.8	0
Apr.	45.1	+0.5	46.1	+1.0	25.7	-3.0
May	56.1	+4.0	57.5	+2.6	35.6	-3.4
June	63.8	+2.4	66.5	+0.7	46.9	-1.7
July	70.7	+2.3	73.9	+2.2	54.4	-1.3
Aug.	72.1	+5.7	71.8	+2.4	55.2	+1.4
Sept.	61.6	+2.9	61.5	+1.1	46.8	-0.7
TOTALS	47.0	+1.1	49.8	+2.2	32.6	- 1.3

A comparison of 1981 and 1982 temperatures for the three stations is addressed since temperatures also influence water supplies from year to year. Table 7 depicts the variation and 1981 to 1982.

TABLE 7: COMPARISON OF 1981 AND 1982 TEMPERATURES

Station	1981 Average Temp. (°F)	1981 Departure From Normal	1982 Average Temp. (°F)	1982 Departure From Normal	1982 Departure From 1981
Hunter Plant	51.3	+5.5	47.0	+1.1	-4.4
Huntington Plant	51.5	+3.8	49.8	+2.2	-1.6
Electric Lake	35.9	+2.0	32.6	-1.3	-3.3
Average Departure From Normal		+3.8		+0.7	-3.1

DRAINAGE SYSTEMS

The surface drainage system on East Mountain is divided into two major drainages; the southwest portion forms part of the Cottonwood Creek drainage and the northeast portion of East Mountain contributes to the Huntington Creek drainage (see Map 1). These drainage boundaries, including minor subdivisions to Cottonwood and Huntington Creeks, are designated on the accompanying map. Both Huntington and Cottonwood Creeks flow out of the Wasatch Plateau in a southeasterly direction. The creeks merge with Ferron Creek to form the San Rafael River which is a tributary to the Green River.

Huntington Creek Drainage System

The Huntington Creek is comprised of many smaller tributary streams that feed the main stream. Deer Creek is the only tributary to Huntington Creek that emanates from within Utah Power & Light's coal mine areas. Data concerning Huntington Creek are addressed, followed by a discussion of Deer Creek.

1) Huntington Creek

Flow data are recorded on a continuous basis by Utah Power & Light at two locations; one station is located near the UP&L Huntington Plant, the other is located about 22 miles upstream from the Huntington Plant. Flow records are maintained by Utah Power & Light Company in order to determine water entitlements and reservoir storage allocation for the various users on the river.

The Utah Power & Light station near the plant was established in the fall of 1973. Prior flow records were obtained from the U. S. Geological Survey Station located about one mile downstream from Utah Power & Light's existing station. The U. S. Geological Survey Station was established in

1909, was discontinued in 1970 and was re-established in 1978. The Utah Power & Light Station below Electric Lake was established in 1970 in order to determine available water supply for Electric Lake Dam. The dam was completed in December 1973 and water storage commenced shortly afterward.

The following table (Table 8) shows a summary of actual Huntington Creek flows below Electric Lake, at Huntington Plant, and calculated natural flow at Huntington Plant. The calculated natural flow considers actual flow recorded at the plant, plant diversions, Electric Lake storage change and lake evaporation. The average daily discharges for the 1982 water year (October 1981 - September 1982) at the two stations plus the calculated natural flow are found in Appendix A.

TABLE 8: HUNTINGTON CREEK WATER FLOWS (1982 WATER YEAR)

	Huntington Creek Below Electric Lake	Huntington Creek At Plant	Calc. Natural Flow At Plant
Total Yearly Flow (Ac. Ft.)	22,010	72,750	93,259
% Of Normal	*101	*104	133
Mean Discharge In Cubic Feed Per Second (CFS)	30.4	100	129
Maximum Discharge (CFS)	321	430	690
Date of Maximum Discharge	5/30/82	6/18/82	5/27/82
Minimum Discharge In CFS	12	5.3	110
Date Of Minimum Discharge	10/14/81	2/5/82	11/1/81

* Due to upstream storage in Electric Lake.

During the 1982 spring runoff period (April thru July), approximately 9,862 acre feet of water was impounded behind Electric Lake Dam, which is more than 3 times the volume stored in 1981. During spring runoff the dam reached its' highest level on May 29. Total storage on this date amounted to 31,695 acre feet which is 423 acre feet higher than full capacity. Inflows to Electric Lake during 1982 were calculated to be 26,794 acre feet which is about the highest inflow since the dam was constructed in 1973. Reservoir releases for the fishery and Huntington Plant needs during the summer period dropped the lake to 28,514 acre feet by September 30, 1982.

A comparison of runoff values from 1981 and 1982 is presented in Table 9 to demonstrate the great fluctuation in surface discharges from year to year.

TABLE 9: COMPARISON OF 1981 AND 1982 RUNOFF VALUES

	1981		1982		
	Amount	% Of Normal	Amount	% Of Normal	1982 As A % Of 1981
Spring Runoff Stored In Electric Lake (Ac. Ft.)	3,140	31	*9,862	97	314
Calculated Natural Flow At Plant (Ac. Ft.)	53,191	75	93,259	134	175
Actual Maximum **Discharge At Plant (CFS)	190	---	430	---	226
	(July 11, 1981)		(June 18, 1982)		

*In addition to 9,862 acre feet of water stored, approximately 9,600 acre feet of water spilled over the spillway during the runoff period.

**Maximum flow is the maximum daily flow recorded during the year.

An examination of Table 2 indicates that precipitation recorded at Electric Lake and Huntington plant during 1982 averaged 155 percent of the 1981 values while natural flow runoff for 1982 was 175 percent of 1981 (Table 9). The similarity of high precipitation and heavy runoff becomes evident in this analysis.

Water quality information on Huntington Creek was compiled on a monthly basis during 1982. Utah Power & Light's Environmental Department conducted the sampling program and the analyses were performed by Standard Labs, Huntington, Utah. The location of water quality sampling stations on Huntington Creek that were considered for this report are listed as follows (refer to Map #1):

1. Below Electric Lake
2. Above the Forks
3. Above the Power Plant Diversion
4. Below the Power Plant

Specific water quality constituents which were analyzed are shown in Table 10. Values are in milligrams per liter unless otherwise noted. Raw data can be found in Appendix B.

TABLE 10: HUNTINGTON CREEK WATER QUALITY (1982 WATER YEAR)

Parameter	Below Electric Lake			Right Fork Above Left Fork			Above Power Plant			Below Power Plant		
	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.
pH (N.U.)	8.0	8.5	6.8	8.5	8.7	8.2	8.5	8.8	8.2	8.6	8.7	8.1
Diss. Oxygen	10.4	14.5	7.7	10.5	13.5	8.3	11.8	14.0	8.6	11.4	13.3	8.4
Sulfate	-	-	-	-	-	-	89.9	150.	45.0	88.1	130.	41.2
Susp. Solids	2.4	7.0	0.5	21.4	54.0	0.5	40.1	123.	5.0	42.8	108.	11.0
Diss. Solids	164.	214.	116.	194.	257.	138.	239.	320.	161.	250.	332.	166.
Spec. Cond. (umhos)	-	-	-	-	-	-	358.	480.	250.	427.	590.	300.
Turbidity (FTU)	1.9	2.7	0.7	9.2	26.0	1.1	-	-	-	-	-	-
Alkalinity (TOT)	-	-	-	-	-	-	194.	259.	150.	203.	259.	166.
Hardness	-	-	-	-	-	-	226.	264.	170	250.	302.	176.

The values at the station below Electric Lake do not express the actual natural drainage water quality characteristics above Electric Lake because of the lake effect but it appears that the surface flow in Huntington Canyon is of very high quality in the upper reaches with some natural degradation occurring as the flow proceeds to the canyon mouth.

The comparison of water quality characteristics with the Huntington drainage for 1981 and 1982 is presented in Table 11. This comparison merits consideration in order to evaluate the changes in water quality from year to year. Average values are presented in milligrams per liter unless otherwise noted.

TABLE 11: HUNTINGTON CREEK WATER QUALITY 1981-1982

	Below Electric Lake		Right Fork Above Left Fork		Above Power Plant		Below Power Plant	
Parameter	1981	1982	1981	1982	1981	1982	1981	1982
pH (N.U.)	7.7	8.0	8.1	8.5	8.3	8.5	8.3	8.6
Diss. Oxy.	7.4	10.4	7.9	10.5	11.1	11.8	10.0	11.4
Sulfate	-	-	-	-	101	89.9	146	88.1
T. Susp. Solids	2.9	2.4	12.5	21.4	28.4	40.1	88.8	42.8
T. Diss. Solids	175	164	209	194	262	239	336	250
Spec. Cond. (umhos)	300*		300		379	358	502	427
Turbidity (FTU)	1.2	1.9	7.6	9.2	-	-	-	-
Alkalinity (TOT)	-	-	-	-	158	194	186	203
T. Hardness	-	-	-	-	250	226	304	250

* Based on analysis of (1) sample.

An examination of Table 11 indicates that 1982 water quality was much improved over 1981 values. The pH, dissolved oxygen, turbidity and alkalinity values were high in 1982 while all other parameters showed a decrease over 1981. It has previously been mentioned that the natural flow in Huntington Creek was 53,191 acre feet in 1981 and 94,971 acre feet in 1982. Thus, the dilution effect becomes evident in 1982 water quality values.

2) Deer Creek

Deer Creek is a tributary to Huntington Creek and flows from the same canyon in which the Deer Creek Mine is located. Permanent runoff sampling sites were established in 1980. They include the following locations (see Map 1):

1) Above the Mine

Location: (Approximately 600 feet upstream from the mine facility) 2000 feet North, 800 West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

2) Below the Mine

Location: (Approximately 12,000 feet downstream from the mine facility) 480 feet South, 3360 East of the Northwest corner of Section 1, Township 17 South, Range 7 East.

To obtain accurate flow measurements during runoff periods Parshall flumes were installed at each of the sampling locations in the Deer Creek drainage. The installation took place during the month of May 1982. The first set of runoff samples were collected before the installation of the flumes, only estimated flow data was recorded. Flow information gathered for 1982 can be found on the individual analysis in Appendix C.

A water sampling schedule was established in 1981 which includes collection of water quality samples (grab type) along with quantity measurements. This information is collected on a monthly basis during the

first or second week of each month throughout the duration of the runoff season. In all cases, samples are taken above and below the Deer Creek Mine (disturb area) with an hour interval. Permanent sampling locations and consistent scheduling should help in correlating water quality with runoff flow fluctuations from a year to year basis.

The results of the 1982 quality analysis are listed in Table 12 and 13. The minimum, maximum and mean values are given for each year in which data was collected along with the historical results. Values are in milligrams per liter unless otherwise noted. Complete raw data can be found in Appendix C. It is apparent from the tables that the quality of the Deer Creek runoff degradates slightly from the upper to the lower sampling point. The quality of the lower sampling point is possibly affected by the Mancos Shale which surrounds the sampling location. An examination of Tables 12 and 13 indicates that the data for 1982 follows closely with the historical data, except for total suspended solids and iron, in which these parameters show a considerable decrease for both locations.

As a result of the higher than average precipitation received during the 1982 water year, the duration of the Deer Creek runoff continued longer than in previously recorded water years. Both locations ceased flowing (frozen or dry) as of November 1982.

Cottonwood Creek Drainage System

1) Cottonwood Creek

Cottonwood Creek continued to be sampled by UP&L with a total of four sets of samples collected during 1982. Accurate locations of the

TABLE 12: DEER CREEK SURFACE WATER QUALITY

ABOVE THE MINE

1982 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
5-3	8.0	510	289	92	0.87	0.18
6-1	7.3	510	280	52	0.80	0.16
7-6	7.8	500	276	9.0	0.81	0.13
8-3	7.9	510	281	0.5	0.76	0.12
9-15	8.2	490	308	1.5	0.19	0.06
10-11	8.1	640	359	12.0	0.15	0.12
Min.	7.3	490	276	0.5	0.15	0.06
Max.	8.2	640	359	92.0	0.87	0.18
Mean	7.9	526.7	298.8	27.8	0.6	0.13
1978*						
Min.	7.0	360	235	521	0.29	0.19
Max.	7.0	360	235	521	0.29	0.19
Mean	7.0	360	235	521	0.29	0.19
1979						
Min.	7.7	470	260	4.6	0.32	-
Max.	8.5	470	310	1400	40.1	-
Mean	8.1	470	285	702.3	20.2	-
1980						
Min.	7.9	570	337	0.5	0.07	0.01
Max.	8.0	820	533	3592	0.20	0.24
Mean	7.9	695	435	1796.3	0.13	0.13
1981						
Min.	8.3	600	332	0.5	0.09	0.01
Max.	8.3	700	482	3.5	0.20	0.02
Mean	8.3	633.3	384.7	1.7	0.13	0.01
Historical 1978 - 1981						
Min.	7.0	360	235	0.5	0.07	0.01
Max.	8.5	820	533	3592	40.1	0.24
Mean	8.0	588.6	353.6	690.4	5.2	0.08

* Only one sample collected.

TABLE 13: DEER CREEK SURFACE WATER QUALITY BELOW THE MINE

1982 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
5-3	8.0	880	520	183	1.78	0.23
6-1	7.7	650	367	54	1.79	0.19
7-6	7.9	720	399	3.5	1.13	0.20
8-3	8.0	900	497	29.5	1.00	0.19
9-15	8.2	1180	649	4.5	0.27	0.09
10-11	8.3	1380	868	2.0	0.10	0.09
Min.	7.7	650	367	2.0	0.10	0.09
Max.	8.3	1380	868	183.0	1.80	0.23
Mean	8.0	951.7	550	46.1	1.01	0.17
1978*						
Min.	6.9	420	273	1124	0.39	0.21
Max.	6.9	420	273	1124	0.39	0.21
Mean	6.9	420	273	1124	0.39	0.21
1979						
Min.	7.4	730	440	40.6	0.65	-
Max.	8.4	730	477	20.540	170	-
Mean	7.9	730	459	10.290	85.3	-
1980						
Min.	7.9	790	452	9.5	0.16	0.01
Max.	8.0	870	567	396	0.30	0.27
Mean	8.0	830	510	203	0.21	0.14
1981						
Min.	8.2	1500	959	2.5	0.09	0.01
Max.	8.3	1650	1021	5.5	0.24	0.03
Mean	8.3	1575	990	4.0	0.17	0.02
Historical 1978 - 1981						
Min.	6.9	420	273	2.5	0.09	0.01
Max.	8.4	1650	1021	20,540	170	0.27
Mean	7.9	993.3	598.4	3159.7	24.5	0.11

* Only one sample collected.

sampling sites established in 1979 are given below:

1. Above the Trail Mountain Mine

Location: 1000 feet South, 2100 feet West of the Northeast corner of Section 25, Township 17 South, Range 6 East.

2. Below the Trail Mountain Mine

Location: 1000 feet North, 1500 feet West of the Southeast corner of Section 25, Township 17 South, Range 6 East.

3. U.S.G.S. Flume

Location: 1700 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.

4. Above Straight Canyon

Location: 300 feet South, 1700 feet West of the Northeast corner of Section 7, Township 18 South, Range 7 East.

Maximum flow of Cottonwood Creek occurred during the month of May with the flow of 2181.3 gallons per minute (GPM) or 4.86 cubic feet per second (CFS). The minimum flow occurred during the month of October with a flow of 327.6 GPM or 0.73 CFS. Average flow for 1982 was approximately 915 GPM or 2.04 CFS. The average flow for 1982 shows a 300 percent increase over 1981. This was the result of the above normal precipitation received during the winter of 1981-1982. Refer to Climatology section for more details.

The baseline study conducted on Cottonwood Creek to determine water quality characteristics for the proposed Cottonwood portal began in 1979. A property acquisition was made by UP&L during 1981 (Cottonwood tract) which has resulted in mine plan changes. The current Wilberg Mine site will be used to access the Cottonwood reserves. The excavation site in Cottonwood Canyon may be used as a ventilation fan site sometime in the future.

As a result of these developments the baseline water quality study conducted on Cottonwood Creek will be terminated as of January 1, 1983. A total of 23 sets of samples were collected since the study was initiated in 1979. Appendix D contains the minimum, maximum and mean values on a year by year basis, along with historical values for all four sampling locations.

In the event the Cottonwood Creek sediment pond discharge samples will be taken consisting of (1) sediment pond discharge water, (2) Cottonwood Creek 100 feet upstream from the point of discharge, and (3) Cottonwood Creek 100 feet downstream from the point of discharge. The parameters to be performed on both the ambient and discharge water will be those stated in the Wilberg Mine discharge permit.

2) Grimes Wash

Grimes Wash is a tributary to Cottonwood Creek and flows from the same canyon in which the Wilberg Mine is located. Three permanent runoff sampling sites were established in 1980. They include the following (see Map 1):

1. Right Fork

Location: (Approximately 1500 feet upstream from the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southeast corner of Section 22, Township 17 South, Range 7 East.

2. Left Fork

Location: (Approximately 50 feet upstream from the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.

3. Below the Mine

Location: (Approximately 500 feet downstream from the outlet culvert below

the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.

Accurate flow measurements were obtained during the runoff period for the Right Fork location after the installation of a Parshall flume in May 1982. Estimated flow data were collected prior to that time. A flume will be installed at the Left Fork location during 1983. Flow information gathered for 1982 can be found on the individual analysis in Appendix E.

A sampling schedule was established in 1981 which includes collection of water (grab type) quality samples along with quantity measurements. This information is collected on a monthly basis during the first or second week of each month throughout the duration of the runoff season. If the drainage runoff persists through the winter months sampling will continue on a quarterly basis until the beginning of next runoff period.

The results of the 1982 quality analysis are listed in Tables 14, 15 and 16. The minimum, maximum and mean values are given for each year in which data was collected along with the historical results. Values are in milligram per liter unless otherwise noted. Complete raw data can be found in Appendix E.

Grimes Wash drainage quality is greatly affected by the influx of the Right Fork. The Right Fork originates in the North Horn Formation, (interbedded shales, siltstones and sandstones) which is abundant with calcareous material. As a result the Right Fork contributes a relatively high amount of suspended solids to the Grimes Wash drainage. The concentration of solids decreases at the sampling location below the mine as a result of the Left Fork and Wilberg Mine discharge influence.

TABLE 14: GRIMES WASH SURFACE WATER

QUALITY RIGHT FORK

1982 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
5-3	8.1	550	320	92	2.02	0.24
6-1	8.4	500	285	255	1.96	0.25
7-6	7.6	600	348	485	1.83	0.30
8-2	8.2	500	280	32.5	1.00	0.22
9-15	8.3	550	339	30.5	0.87	0.08
10-11	8.2	720	435	160	1.54	0.19
Min.	7.6	500	280	30.5	0.87	0.08
Max.	8.4	720	435	485	2.02	0.30
Mean	8.1	570	334	175.8	1.54	0.21
1979						
Min.	7.8	-	322	22.2	1.01	-
Max.	8.5	-	700	1860	7.2	-
Mean	8.0	-	523	677.3	3.4	-
1980						
Min.	8.2	680	339	224.7	0.12	0.11
Max.	8.3	690	410	576	5.3	0.28
Mean	8.25	685	375	400.4	2.7	0.20
1981						
Min.	8.2	600	379	1.5	0.01	0.02
Max.	8.5	700	476	46.5	0.29	0.02
Mean	8.35	650	427	24.0	0.15	0.02
Historical 1979 - 1981						
Min.	7.8	600	322	1.5	0.01	0.02
Max.	8.5	700	700	1860	7.2	0.28
Mean	8.17	667.5	461.6	444.7	2.4	0.11

TABLE 15: GRIMES WASH SURFACE WATER QUALITY LEFT FORK

1982 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
5-3	7.9	790	448	2.0	0.25	0.14
6-1	8.1	600	352	0.5	0.26	0.13
7-6	7.8	600	354	23.5	0.29	0.10
8-2	8.1	610	339	1.0	0.30	0.09
9-15	8.2	590	362	2.5	0.20	0.09
10-11	8.2	680	386	8.2	0.36	0.15
Min.	7.8	590	339	0.5	0.20	0.09
Max.	8.2	790	448	23.5	0.36	0.15
Mean	8.05	645	373.5	6.3	0.28	0.12
1979*						
Min.	8.7	-	327	28.2	0.81	-
Max.	8.7	-	327	28.2	0.81	-
Mean	8.7	-	327	28.2	0.81	-
1981						
Min.	8.0	610	379	0.5	0.07	0.02
Max.	8.3	750	518	8.5	0.30	0.05
Mean	8.2	682.5	453	4.8	0.22	0.03
Historical 1978 - 1981						
Min.	8.0	610	327	0.5	0.07	0.02
Max.	8.7	750	518	28.2	0.81	0.05
Mean	8.3	682.5	427.8	9.4	0.34	0.03

* Only one sample collected.

TABLE 16: GRIMES WASH SURFACE WATER QUALITY BELOW THE MINE

1982 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
5-3	8.0	870	497	171	0.93	0.19
6-1	7.9	910	589	11.0	0.87	0.09
7-6	7.9	780	435	75.0	0.80	0.09
8-2	7.9	960	537	22.0	0.83	0.09
9-15*	8.2	1000	679	101.5	1.20	0.10
10-11	8.1	920	591	3.0	0.26	0.15
Min.	7.9	780	435	3.0	0.26	0.09
Max.	8.2	1000	679	171.0	1.20	0.19
Mean	8.0	906.7	554.7	63.92	0.82	0.12
1979						
Min.	7.55	-	172.0	10.0	0.74	-
Max.	8.5	-	382.0	1180	18.90	-
Mean	8.0	-	308.0	407	6.84	-
1980						
Min.	8.1	710	363	234.7	0.13	0.09
Max.	8.2	780	448	738.5	4.2	0.30
Mean	8.15	745	405.5	486.6	2.17	0.20
1981						
Min.	8.0	790	434	0.5	0.01	0.01
Max.	8.3	1100	715	19.5	0.06	0.03
Mean	8.15	970.0	609.8	6.34	0.03	0.02
Historical 1978 - 1981						
Min.	7.55	710.0	172	0.5	0.01	0.01
Max.	8.5	1100	715	1180	18.90	0.30
Mean	8.1	895	463.8	246.6	2.78	0.08

* Sediment was disturbed during the measurement of the Left Fork, resulting in a slight degradation of water quality at the Below the Mine location.

As summarized previously, the above average precipitation received during the 1982 water year resulted in the runoff period to continue longer than previous recorded water years. As of November, the Right Fork location was dry, Left Fork continued to flow and will be sampled until the flow stops.

EAST MOUNTAIN SPRINGS

The 1982 water reconnaissance program of East Mountain springs was initiated in July with the routine sampling and flow measurements of springs identified in 1979-1980 and previous years(see Map 2). At least one spring from each mode of occurrence described in the 1980 annual water report, (a revised version is presented as Table 17) was sampled a second time during the month of October.

As in 1980, emphasis has again been placed on water chemistry rather than water quality. Cation and anion concentration was measured and presented as stiff diagrams to help determine similar modes of occurrence (Appendix F).

In the 1981 annual water report it was mentioned that as new springs are identified a detailed geologic description will be included in the annual report. The format used in the 1980 annual report will be the standard. In 1982 three new springs were identified. A detailed geologic description of these springs is given in Appendix G. In Tables 17 and 18 the new springs are represented by asterisks.

SPRING FLOW

Due to the higher than normal precipitation received during the winter and spring of 1981-1982, discharge rates measured in 1982 were considerably higher than the measurements from 1981. Table 18 is a tabulation of the flow data collected during 1982 season. To record the season variation at least one spring from each mode of occurrence was

TABLE 17: MODES OF OCCURRENCE EAST MOUNTAIN SPRINGS

Stratigraphic Location	Occurrences: Permeable fluvial channels that intersect the land surface	Flow along permeable strata underlain by impermeable mudstone which intersects the land surface	Contact of permeable beds and the Roans Canyon Fault zone	Mode of occurrence not identified
Base of Flagstaff Limestone		79-6, 79-7, 79-35	Sheba Springs 79-1	
North Horn Formation	Teds Tub, Burnt Tree, 79-2, 79-3, 79-8, 79-9, 79-11, 79-12, 79-13, 79-14, 79-15, 79-16, 79-17, 79-21, 79-22, 79-26, 79-27, 79-28, 79-29, 79-34, 79-39, 80-42, 80-43, 80-46, 80-47, 80-48		Elk Springs, 79-10, 79-18, 79-19, 79-20	
Base of North Horn Formation		79-23, 79-25, 79-32, 79-36, 79-37, 79-38	79-30, 79-31	
Other Stratigraphic Horizons			80-49 (Price River) Bear Canyon Fault Zone *82-51	Flagstaff Limestone 79-4, 79-5, Pine Springs Price River Formation 79-24, 79-33, 79-40, 80-41, 80-44, 80-45, *82-52, *Jerk Water Blackhawk Formation 80-50

TABLE 18A: EAST MOUNTAIN SPRINGS DISCHARGE

Spring	Date Sampled	Flow (GPM)	Temperature F°	Date Sampled	Flow (GPM)	Temperature F°	Seasonal Net Change %
Sheba	7-14-82	15.0	39°	10-6-82	6.0	42°	-60
Elk Spring	7- 8-82	546.6	39°	10-6-82	113.5	39°	-79
Burnt Tree	7-19-82	12.0	41°	10-12-82	13.3	42°	+11
*Jerk Water	7-21-82	2.5	39°	10-10-82	2.1	39°	-16
Pine Springs	7-16-82	5.3	42°	10- 6-82	.73	43°	-86
Pine Springs Trough	7-16-82	8.6	40°	10- 6-82	.17	38°	-98
Ted's Tub	7-19-82	60.0	39°	10-10-82	7.5	38°	-88
79-1	7- 8-82	72.0	38°	10-10-82	13.0	39°	-82
79-2	7-19-82	12.0	40°	10-12-82	3.0	44°	-75
79-3	7-19-82	10.0	40°	10-13-82	Damp		
79-4	7-14-82	4.3	39°				
79-5	7-14-82	5.0	54°				
79-6	7-14-82	1.0	58°				
79-7	7-14-82	1.0	44°				
79-8	7-14-82	2.4	44°				
79-9	7-14-82	5.0	41°	10- 6-82	1.33	42°	-73
79-10	7-14-82	32.0	39°	10- 6-82	10.0	40°	-69
79-11	7-19-82	2.0	41°				
79-12	8- 2-82	1.0	-				
79-13	7-15-82	10.0	44°				
79-14	7-15-82	.5	70°				
79-15	7-15-82	27.5	40°	10- 9-82	6.0	38°	-78
79-16	7-15-82	12.0	50°				
79-17	7- 8-82	4.6	40°	10-12-82	2.0	40°	-57
79-18	7-15-82	20.0	39°	10-12-82	Dry		
79-19	7-15-82	46.0	39°	10-12-82	15.0	40°	-67
79-20	7-15-82	4.3	41°	10-12-82	1.0	40°	-77
79-21	7-19-82	Dry					
79-22	7-19-82	.5	-				
79-23	7-20-82	3.0	42°	10-12-82	Dry		
79-24 (Tom's Spg.)	Still flowing from 79-23						

* Springs identified in 1982.

TABLE 18B: EAST MOUNTAIN SPRINGS DISCHARGE (cont.)

Spring	Date Sampled	Flow (GPM)	Temperature F°	Date Sampled	Flow (GPM)	Temperature F°	Seasonal Net Change %
79-25	7-14-82	12.0	41°				
79-26	7-16-82	7.5	42°	10- 9-82	2.7	39°	-64
79-27	7-16-82	3.0	41°	10- 9-82	1.7	39°	-43
79-28	7-16-82	4.6	39°	10- 9-82	4.0	39°	-13
79-29	7-19-82	4.0	40°	10- 9-82	3.2	38°	-20
79-30	7-14-82	10.0	49°				
79-31	7-14-82	1.0	44°				
79-32	7-14-82	2.1	42°	10- 9-82	1.0	32°	-52
79-33	7-14-82	2.8	42°				
79-34	7-15-82	30.0	39°				
79-35	7-16-82	7.6	39°	10- 6-82	3.5	39°	-54
79-36	7-16-82	Damp					
79-37	7-16-82	.4	43°				
79-38	7-20-82	10.0	43°				
79-39							
79-40	7-20-82	3.2	39°				
80-41	7-20-82	1.0	38°				
80-42	7-19-82	Dry					
80-43	7-19-82	10.0	41°	10-12-82	Damp		
80-44	7-20-82	12.0	39°				
80-45	7-20-82	4.0	41°				
80-46	7-19-82	12.0	39°	10-10-82	4.0	39°	-67
80-47	7-19-82	12.0	38°	10-10-82	10.0	39°	-17
80-48	7-13-82	1.33	44°				
80-49	7-13-82	15.0	44°				
80-50	7-12-82	3.3	44°	10-14-82	1.5	46°	-55
*82-51	7-20-82	3.0	46°				
*82-52	7-23-82	16.0	39°	10-10-82	7.5	39°	-53

* Springs identified in 1982.

monitored more than once. The seasonal variation is represented in Table 18A and B under the column head "Seasonal Net Change". The percentage figures represent the amount of change either positive or negative. The average change reveals a 57 percent decrease from the July to the October measurements. Only one spring increased in flow from July to October, Burnt Tree Spring, a 11 percent increase. A possible explanation could have been runoff from a recent snowfall which occurred just prior to sampling in October.

A four year comparison of spring discharge is shown in Table 19. This table includes a year by year comparison of springs identified from each mode of occurrence, Table 17. The springs utilized in this comparison are underlined in Table 17. The flow values for the individual springs represent the July measurements. October measurements were not utilized due to the winter weather conditions causing some springs to be inaccessible.

Table 19 has then been compared to local climatology to see how closely spring discharge rates follow local annual precipitation. Figure 5 reflects the direct correlation between spring discharge and precipitation. The annual precipitation is an average of the four weather stations reported in the Climatology section, i.e., Hunter Plant, Huntington Plant, Electric Lake and East Mountain. This comparison will be vital in determining mining effects on spring discharge versus general changes in annual precipitation.

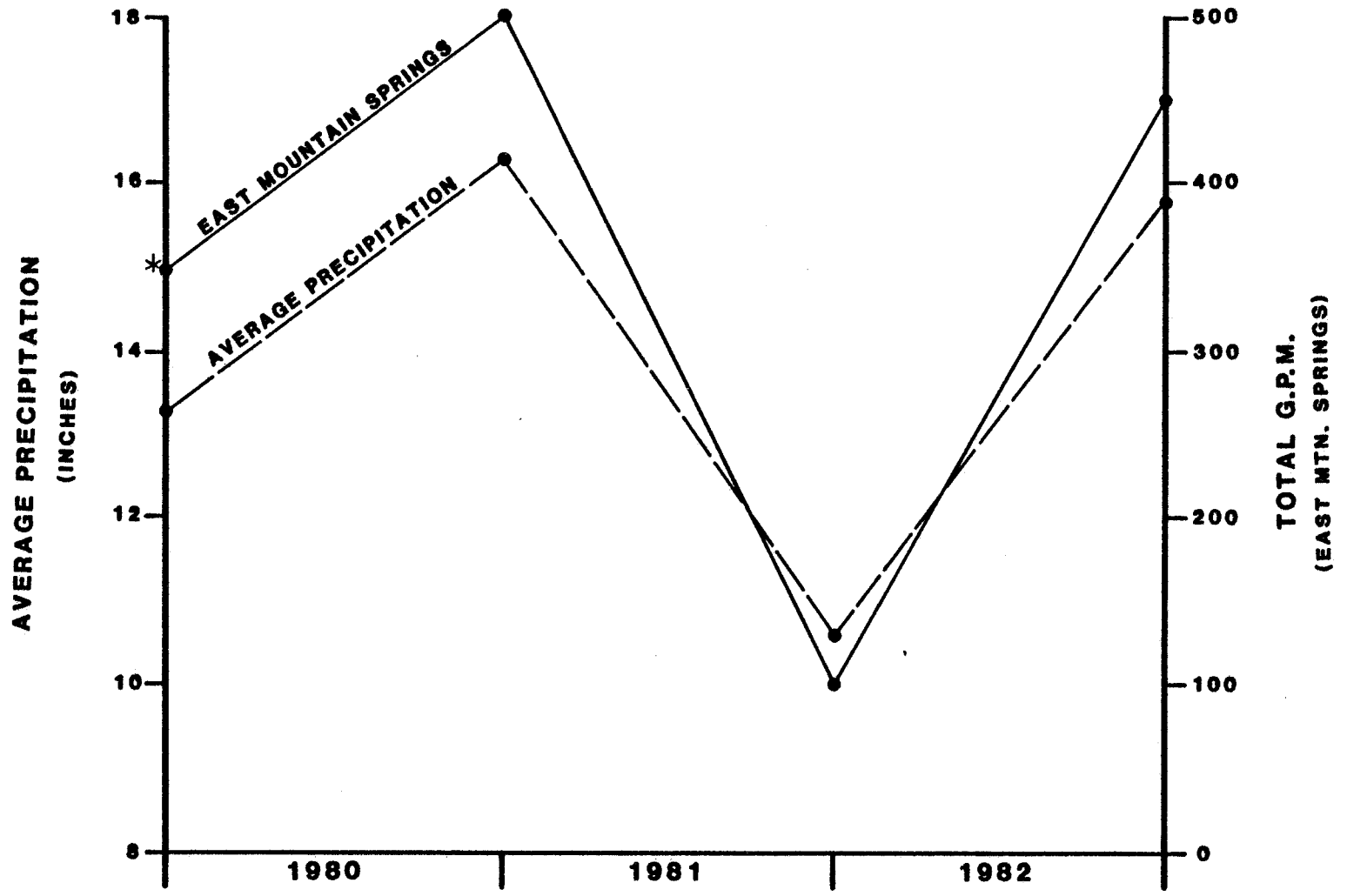
QUALITY

To more closely identify springs which are related one with another, samples of their water were analyzed to determine the percentage of cations and anions in solution. These percentages have been graphically represented as cation-anion diagrams (see Appendix F). The purpose of the cation-anion diagrams is to identify groups of related springs by water

TABLE 19: YEARLY SPRING DISCHARGE VARIATIONS (GPM)
(July Measurements)

Spring	1979	1980	1981	1982
Sheba	12.0	13.0	10.7	15.0
Burnt Tree	12.0	26.0	9.2	12.0
Pine Springs	4.1	12.0	2.6	5.3
Pine Springs Trough	6.6	Dry	6.9	8.6
Ted's Tub	65.0	78.0	27.3	60.0
79-1	40.0	130.0	28.3	72.0
79-2	0.5	7.5	10.0	12.0
79-3	2.6	15.0	2.6	10.0
79-4	2.4	1.2	3.0	4.3
79-5	3.1	1.2	4.6	5.0
79-6	0.86	Damp	Dry	1.0
79-7	0.53	Damp	5.0	1.0
79-8	2.0	1.5	1.7	2.4
79-11	6.0	5.0	0.5	2.0
79-15	2.0	5.0	7.2	27.5
79-17	0.5	0.5	0.2	4.6
79-18	4.0	17.0	16.0	20.0
79-19	3.0	Dry	3.5	46.0
79-20	40.0	1.0	Dry	4.3
79-21	20.0	Dry	Dry	Dry
79-22	14.0	Dry	Dry	0.5
79-25	10.0	8.0	4.6	12.0
79-28	3.0	43.0	4.0	4.6
79-29	4.0	6.0	1.3	4.0
79-30	1.5	2.0	Damp	10.0
79-31	0.6	0.5	0.4	1.0
79-32	1.4	3.0	0.45	2.1
79-34	10.0	5.0	2.4	30.0
Sub-Total	271.69	381.40	152.45	377.20
80-41		14.0	0.4	1.0
80-42		5.7	Dry	Dry
80-43		10.0	Damp	10.0
80-44		20.0	39.6	12.0
80-45		12.0	Damp	4.0
80-46		31.0	1.6	12.0
80-47		12.0	4.6	12.0
80-48		5.0	1.8	1.33
80-49		4.0	1.3	15.0
TOTALS (Includes All Springs)	350*	495.10	201.75	444.53

* Estimated



* INCLUDES ESTIMATED DISCHARGE OF SPRINGS NOT SAMPLED IN 1979

FIGURE 5

AVERAGE YEARLY PRECIPITATION vs. TOTAL SPRING DISCHARGE

chemistry. These diagrams clearly show the similarity of water quality of springs originating in the same geologic formation. To better visualize this concept, the cation/anion diagrams are presented by the geologic formation in which it originates. A general pattern for the Flagstaff and Price River Formations can be recognized for each year in which the cation/anions were analyzed. A consistent pattern for the North Horn is less obvious due to the complex geology of the formation itself.

The quality of the springs sampled in 1982 shows only a slight change from samples collected in 1981. Then compared to the historical results one parameter showed a significant increase-sulfate content. No explanation could be found for the increase experience since 1981.

A summary of the water quality analysis for a representative group of East Mountain springs is presented in Table 20. In this table the mean values for 1982 are compared to the historical results for each respective spring. The raw data regarding all springs sampled is contained in Appendix H.

MINE HYDROLOGY

In reviewing the Apparent Completeness Report (ACR) issued by the Division of Oil, Gas and Mining for both the Deer Creek and Wilberg Mines, concern was raised on several points pertaining to the hydrology of the East Mountain property. Main points of concern were the following: (1) Piezometric Map - In-Mine Aquifers, (2) location of surface water sources in relatinship to mine workings and (3) Ground Water Quality and Collection Procedures. The following gives an explanation for each area of concern raised in the ACR.

1) <u>Piezometric Map - In-mine Aquifers</u>

Water level elevations from all available East Mountain drill holes (surface and in-mine), were utilized to construct a piezometric

TABLE 20: EAST MOUNTAIN SPRINGS WATER QUALITY (HISTORICAL TO 1982)

Parameter	Burnt Tree		Elk Springs		Sheba Springs		Ted's Tub		79-28 Flag Lake	
	Historical (1978-81)	1982	Historical (1978-81)	1982	Historical (1979-81)	1982	Historical (1979-81)	1982	Historical (1979-81)	1982
Elevation	9260		9350		9740		9290		9340	
Geologic Formation*	TKN		TKN		TF		TKN		TKN	
pH	7.7	7.5	7.8	7.6	7.7	7.5	7.9	7.8	7.7	7.6
Alkalinity	283.0	281.0	244.5	255.0	238.5	234.5	266.0	278.0	256.6	274.5
Total Suspended Solids	1.8	0.5	2.3	0.8	2.1	7.8	13.5	5.3	84.5	13.0
Total Dissolved Solids	286.9	300.5	267.8	268.5	276.4	298.0	307.0	279.5	433.6	426.0
Sulfate	33.6	110.0	47.4	115.0	52.0	160.5	40.1	117.3	167.3	215.0
Iron	0.52	0.19	0.15	0.16	0.28	0.24	0.16	0.28	0.8	0.28

* TKN = Tertiary North Horn Formation

* TF = Tertiary Flagstaff Formation

gradient map. The degree of variability between the data points reveal no positive piezometric trends. Additional in-mine drill holes will be utilized during 1983 in an attempt to establish a piezometric gradient map for the area on the west side of the Pleasant Valley Fault system.

It has been stated both in the mining permit and annual hydrologic reports that only perched or limited aquifers exist within the strata overlying the coal seams. The perched aquifers exist as fluvial channels (ancient river systems) which overlie an scour into the underlying strata, refer to Figures 6 and 7. The channel systems were part of a deltic depositional setting active during and after the coal forming peat accumulation. The largest influx of water encountered during the mining process occurs beneath the fluvial channels. The sandstone channels are mainly composed of a fine to medium-grain sand with similar porosity and permeability characteristics as that of the Starpoint Sandstone. The semi-permeable and porous nature of these channels allows an effective route of water transport. Other rock type constituents of the Blackhawk Formation (i.e, mudstone, carbonaceous mudstone and interbedded material), generally act as aquicludes which impede water flow unless fracturing or faulting of these units has induced secondary permeability.

Evidence from dewateration studies reveal that of the water producing areas, those closest to the active mining face exhibit the greatest flows, 1979 Hydrologic Monitoring Report. Data collect in 1978-79 indicates a 90% reduction (or more) in water flows from sampling sites over a relatively short time frame as the mining face is advanced. It appears that the water source is being dewatered since excavated areas of the mine do not produce water indefinitely. The data confirms that perched - limited aquifers exist within the Blackhawk Formation.

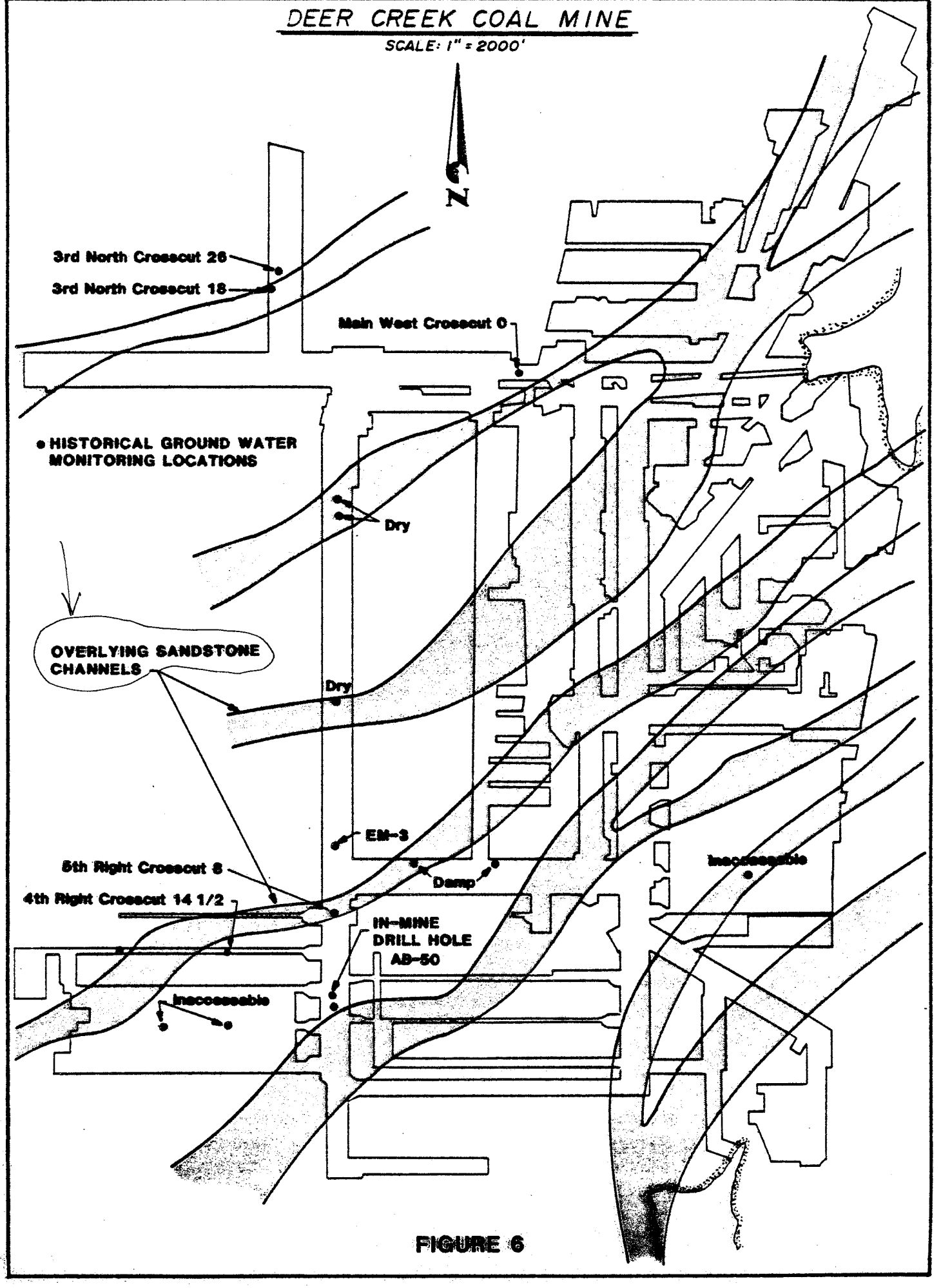
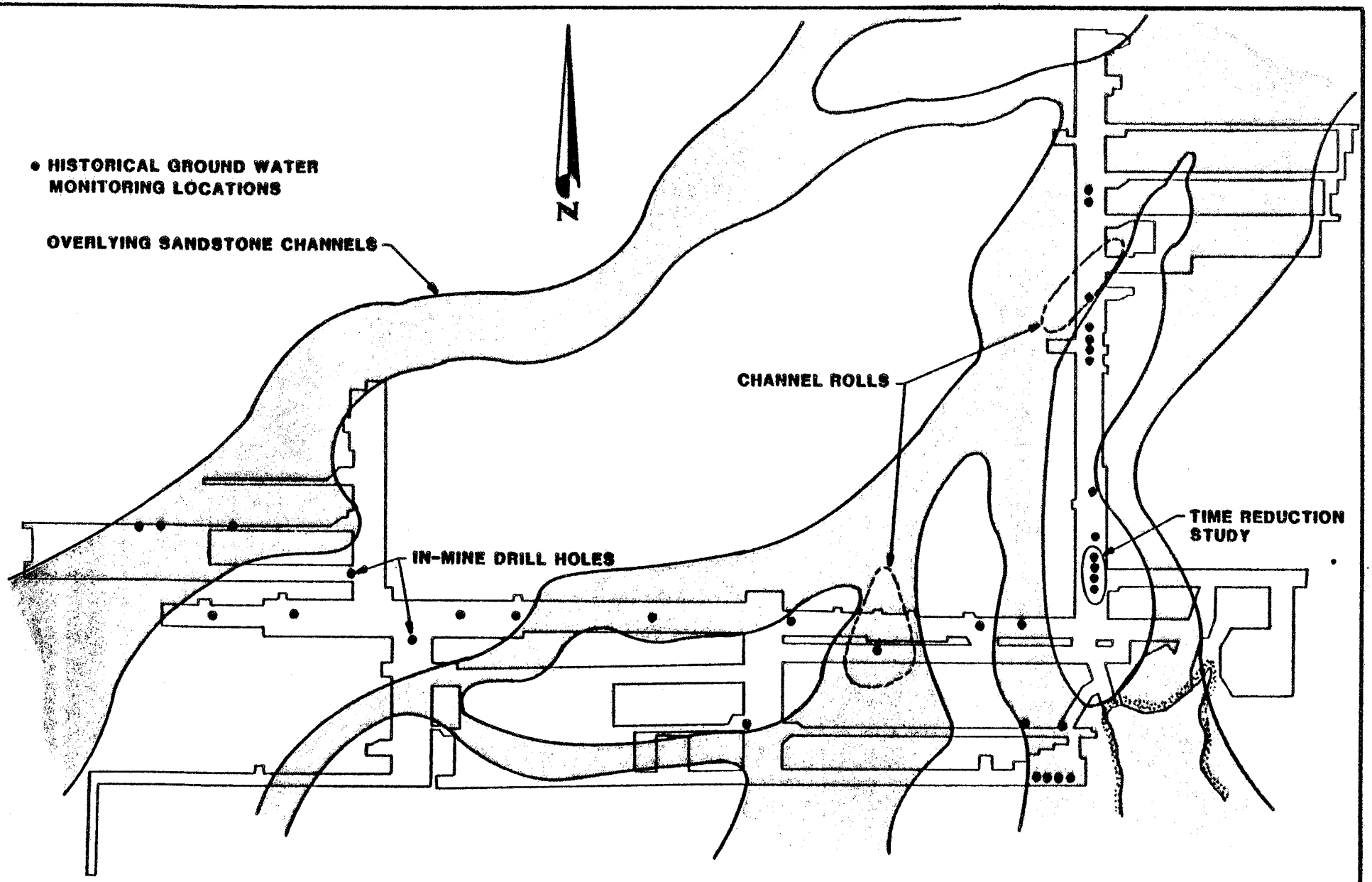

DEER CREEK COAL MINE
SCALE: 1" = 2000'
N
3rd North Crosscut 26
3rd North Crosscut 18
Main West Crosscut 0
• HISTORICAL GROUND WATER MONITORING LOCATIONS
Dry
OVERLYING SANDSTONE CHANNELS
Dry
EM-3
5th Right Crosscut 8
Damp
4th Right Crosscut 14 1/2
IN-MINE DRILL HOLE AB-50
Inaccessible
Inaccessible

FIGURE 6



WILBERG COAL MINE

Scale: 1" = 2000'

FIGURE 7

Long-term water producing areas do exist within the current mine workings, four types of occurrences have been recognized, refer to Figure 8. They include:

1. Structural rolls with overlying fluvial channels.
2. Pleasant Valley Fault system.
3. Fractures and joints (lineaments).
4. Roof bolt and in-mine drill holes.

2) Surface Water Sources in Relation to Mine Workings

Many of the regulations listed in 30 CFR 211 or the Utah Mining Code are aimed at minimizing the effects that mining has on the surface waters. Figures 9 and 10 show the relationship of the Deer Creek and Wilberg Mine workings with the overlying springs. These springs will be discussed in more detail in the East Mountain springs section.

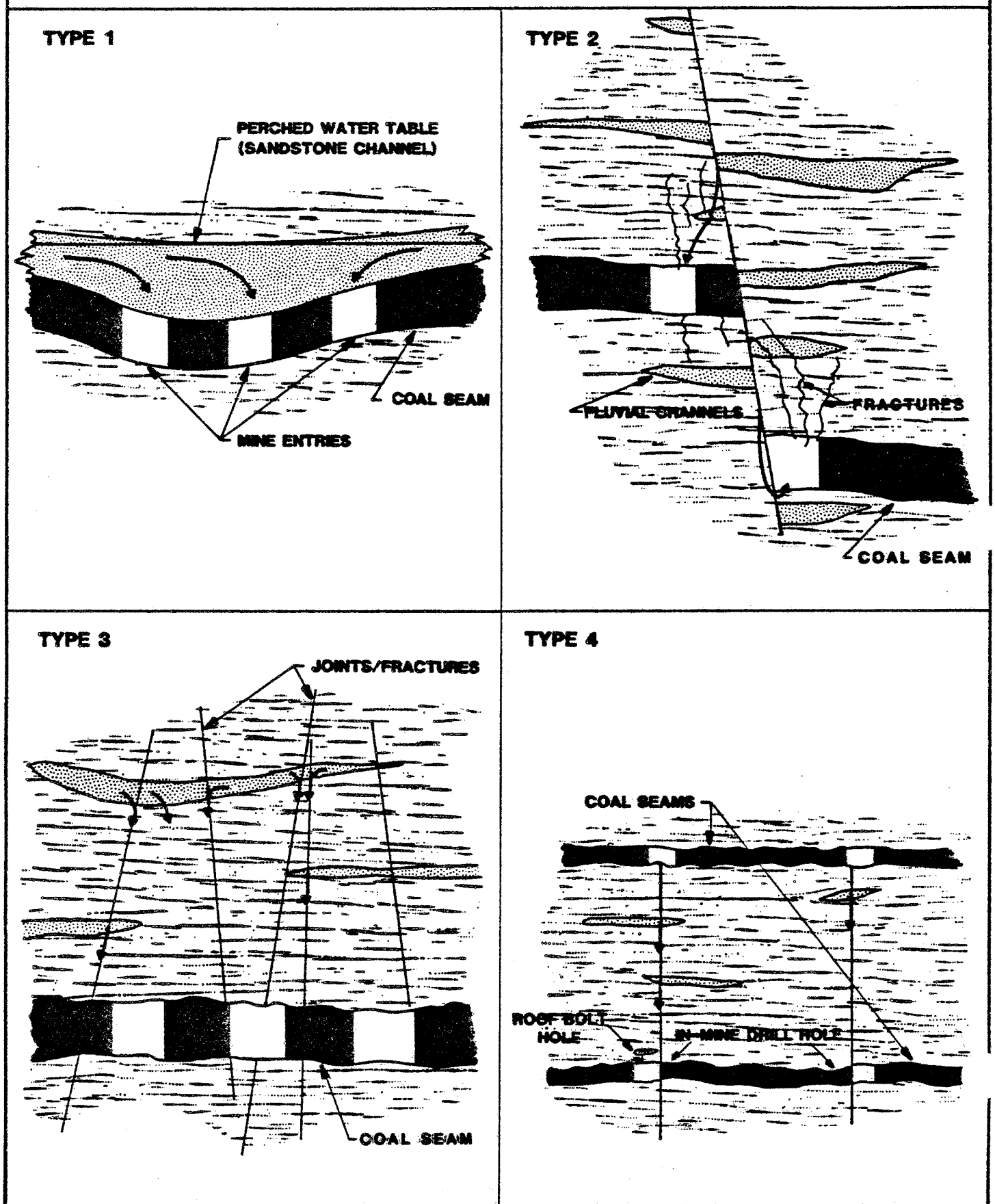
3) Ground Water Quality and Collection Procedures

In-mine quality and quantity measurements began by UP&L in 1977 and have continued through 1982. With the collection of numerous samples throughout the extent of the mine workings, the quality has remained relatively constant. Refer to Figure 6 and 7 for historical in-mine sampling sites. Figure 11 depicts the consistency of the ground water quality by the use of cation and anion diagrams. It also reveals the similarity between Deer Creek and Wilberg Mines.

Collection procedures for ground water quality consist of two grab samples collected and analyzed per quarter at each of the mines which produce measurable quantities. Sampling according to this established plan began in the first quarter of 1982.

FIGURE 8

LONG TERM WATER SOURCES



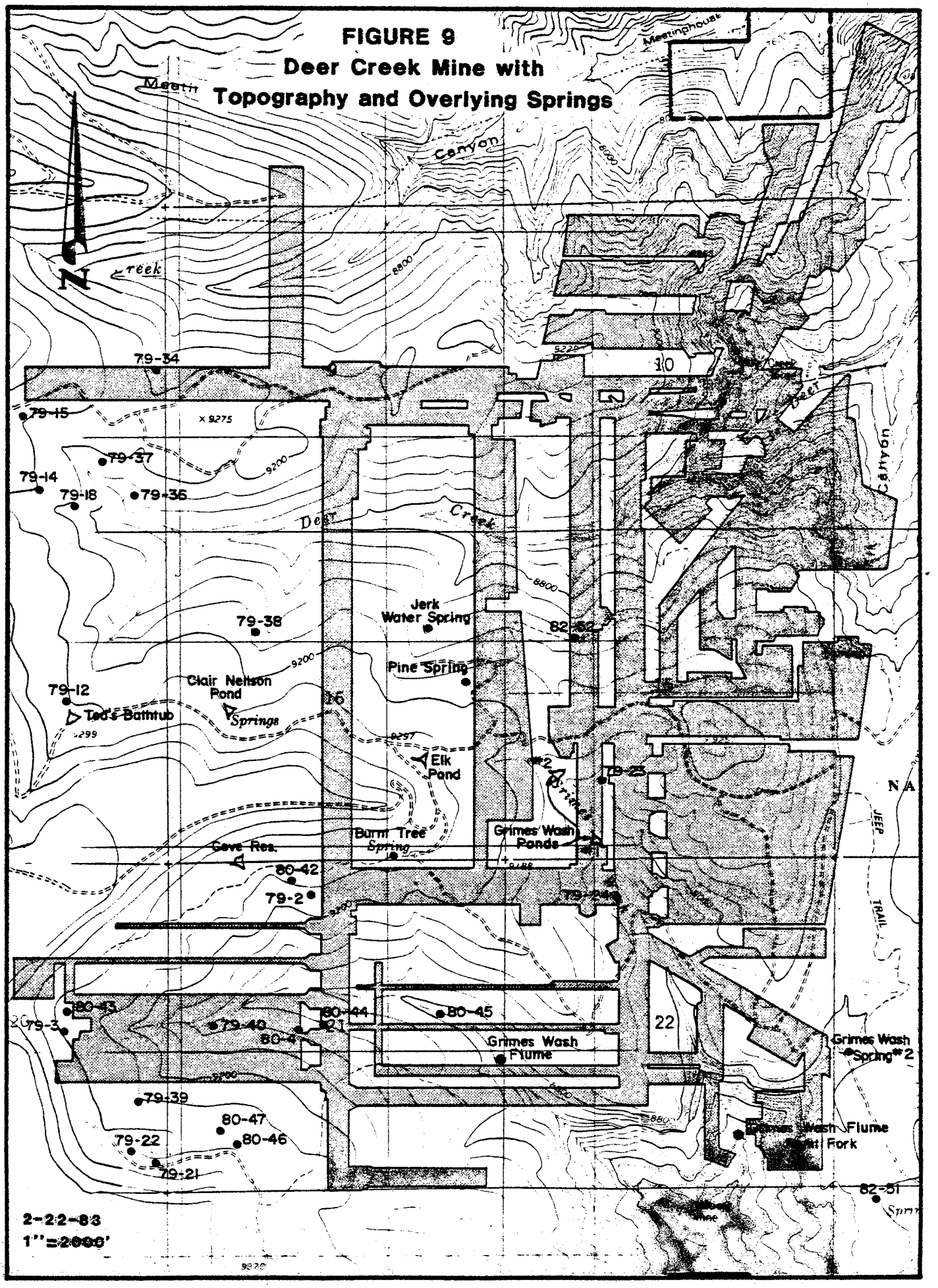


FIGURE 9
Deer Creek Mine with
Topography and Overlying Springs

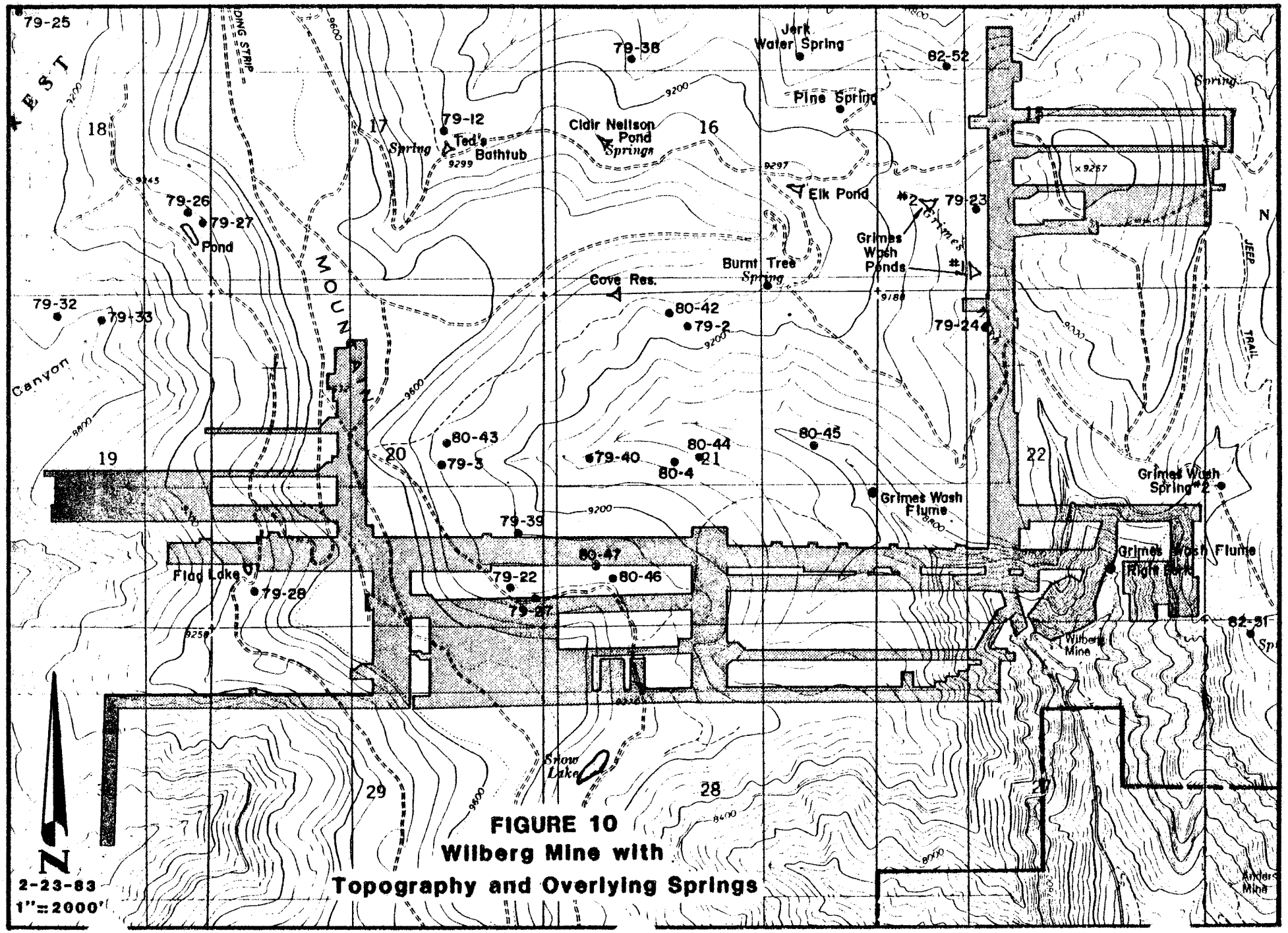


FIGURE 10
Wilberg Mine with Topography and Overlying Springs

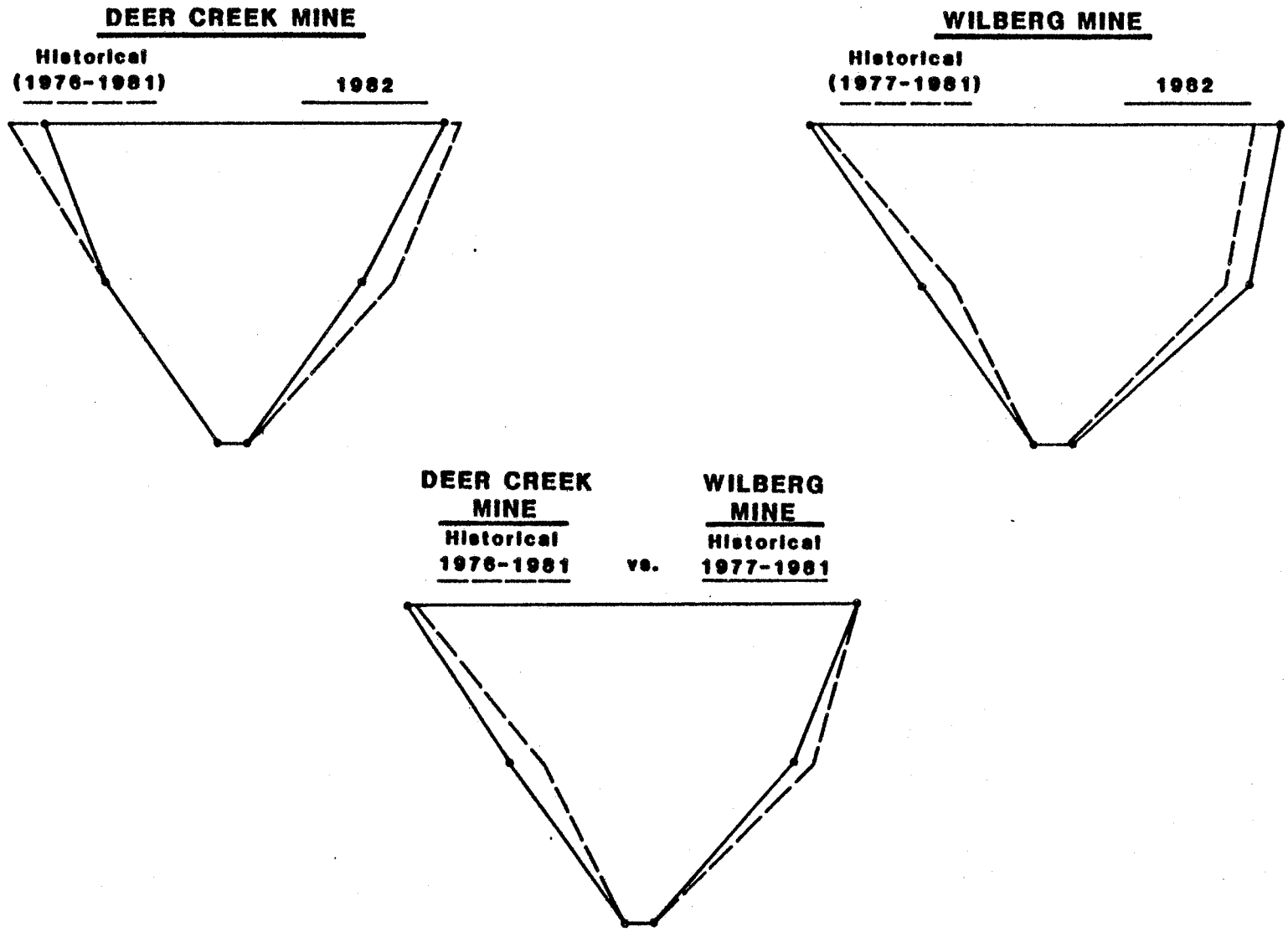


FIGURE 11
GROUND WATER COMPARISON

MINE WATER

The following section describes the individual characteristic of each of the mines in which ground water occurrences exist in the Church, Deer Creek and Wilberg Mines.

CHURCH MINES

1) In-mine Monitoring

As in the past, the mine workings of the Church Mines have been generally dry since the inception of mining. Two minor exceptions existed during 1982, (1) Little Dove Mine - 1st North entry, and (2) Deseret Mine - 2nd North entry.

The 1981 Annual Hydrologic Report described the ground water occurrence in the Little Dove - 1st North entry. The overlying sandstone encountered in mid-1981 produced minor quantities of water until the second quarter of 1982. At this time measurable quantities ceased to exist. The Little Dove water occurrence tends to support the concept of a perched - limited aquifer. As in most cases the flow diminished rapidly as the active mining face advanced away from the ground water source.

The ground water occurrence in the Deseret Mine, 2nd North entry, was of an unusual nature. Fractures in the Starpoint floor began to produce water at an estimated rate of 10 GPM during mid-1982. As in the case of most multiple seam extraction mining of the upper seam (Little Dove Mine), precedes the mining of the lower seam (Deseret Mine). During the Little Dove development a sump was constructed at crosscut 38, for in-mine water storage. As the mine workings of the Deseret were developed below the area in which Little Dove sump is located, fractures in the Starpoint (Deseret floor) began

to produce water. A possible explanation could be water from the Little Dove sump is percolating along fractures associated with the Deer Creek Fault and enters the Deseret Mine through fractures in the Starpoint floor.

2) In-Mine Quality

The Little Dove ground water source ceased flowing as of June 1982. As a result, a total of two samples were collected during 1982. Table 21 compares the water quality results for 1982 to the average quality in 1981. The complete chemical analysis for water samples collected in 1982 can be found in Appendix I. Table 21 establishes the continuity of the Little Dove ground water influx.

Table 21: Little Dove In-Mine Water Quality

Location	Date	pH	Alkalinity	TSS	TDS	SO_4	Flow (GPM)
1st N XC 75 2L	3-24-82	7.2	475	3.5	1268	754	0.08
1st N XC 84 1R	3-24-82	7.1	470	2.0	1197	677	0.08
1982 Mean		7.15	472.5	2.75	1232.5	715.5	0.08
1981 Min.		6.9	440	2.0	1078.0	444.0	0.02
Max.		7.6	576	4.0	1410.0	704.0	0.25
Mean		7.28	496	3.1	1179.2	548.4	0.08

The ground water occurrence in the Deseret Mine (fractures in the Starpoint floor) was only sampled once in 1982. This was due to the difficulty in collecting accurate quality samples from a floor source. The chemical analysis of this sample can be found in Appendix F.

WILBERG MINE

1) In-Mine Monitoring

The Wilberg Mine water monitoring program consists of measuring flows and collecting water samples for quality analyses of in-mine and discharge waters. In-mine sampling is performed on a quarterly basis (2 grab

samples per quarter), where as discharge quality samples (grab type), are collected monthly.

As reported in the 1981 annual report, a water service line was completed from Wilberg Mine to the Church Mines. Excess water from the Wilberg Mine will be utilized by the Church Mines for in-mine dust suppression as well as domestic usage. A total of 19 million gallons were transmitted during 1982.

The best estimate of in-mine water production was arrived at by combining the values of water leaving the mine and domestic usage. The amount of water discharged from the Wilberg Mine in 1982 was 155.5 million gallons, this includes the 19 million gallons transmitted to the Church Mines and the estimated evaporation due to the humidity differential of intake versus return, which in 1982 was 19 million gallons. The parameters utilized in the calculation of evaporation remained constant from 1981 to 1982, i.e., 570,000 CFM, humidity: enters = 45%, exits 98%. It is likely that some water leaves the mine by flowing downward into the Starpoint Sandstone but this cannot be measured. The domestic use of water in 1982 was 5 million gallons, the same as in 1981. It is, therefore, estimates that the quantity of water flowing into the Wilberg Mine in 1982 was about 160.5 million gallons which equates to an instantaneous flow of 305 gallons per minute.

The in-mine water production sources were reported under the mine hydrology section of this report.

2) In-Mine Quality

A total of nine samples were collected in the Wilberg Mine in 1982. Table 22 lists the characteristics of the samples collected and compares the mean, minimum and maximum results of 1982 to the historical values. It is apparent from Table 22 that the average quality of the in-mine water has

TABLE 22: WILBERG IN-MINE WATER QUALITY

Location	*1st North XC 49 1R	10th Right XC 38½ 1R	9th Right XC 12 1L	3rd Left XC 13½ 1R	3rd Left XC 15½ 1R	1st South Neck Off XC 3 1 L	4th East XC 42 1L	1st North XC 85½ 2R	12th Right XC 14 1L	1982 Min.	1982 Max.	1982 Mean	Historical (1977-1981) Min.	Historical (1977-1981) Max.	Historical (1977-1981) Mean
pH	7.0	7.4	7.2	7.6	7.4	7.2	6.8	7.0	7.0	6.8	7.6	7.2	6.6	8.2	7.4
Alkalinity	491.0	504.0	500.0	337.0	338.0	338.0	566.0	404.0	380.0	336	566	428.4	218	545	380.8
Calcium	179.0	180.0	150.0	135.0	140.0	131.0	285.0	115.0	118.0	115	285	159.2	66	356	155.3
Chloride	14.7	14.0	15.2	7.3	14.3	13.9	17.8	8.5	10.6	7.3	17.8	13.8	1.0	17.7	8.6
Conductivity	950	1000	1090	810	800	970	1980	820	880	800	1980	1033.3	620	2000	1063.3
Magnesium	64.0	46.0	67.0	31.0	30.0	49.0	126	39.5	40.0	31.0	126	54.7	13.0	92.5	40.8
Potassium	3.44	4.25	3.73	4.0	4.5	21.0	3.97	12.0	12.0	3.44	21.0	7.7	1.0	19.0	9.1
Sodium	37.0	32.0	41.0	32.0	31.5	59.0	40.0	47.0	50.0	31.5	59.0	41.1	17.0	129.0	41.2
Sulfate	325.0	222.0	222.0	170.0	230.0	250.0	780.0	170.0	210.0	170	780	287.0	78.0	670.0	247.1
TDS	710.0	609.0	610.0	451.0	449.0	573.0	1496.0	481.0	535.0	449	1496	657.1	419.0	1610	689.7
TSS	1.5	0.5	1.0	4.5	1.0	4.0	1.0	0.5	0.5	0.5	4.5	1.6	0.1	70.1	4.5

* Example: 1st North XC 49 1R = 1st North, Cross Cut Number 49, 1st Right Entry.

remained relatively constant. The consistency was also depicted in the stiff diagrams presented as Figure 11. The complete chemical analysis of samples can be found in Appendix J.

3) Discharge

Water produced in the Wilberg Mine is pumped to a primary sump location within the old Wilberg workings by a complex pumping and piping system, Figure 12. The sump, which functions as a settling basin, effectively removes setteable solids from the water. A portion of this water is redistributed to various areas of the mine to be utilized in the mining operations. Water from this sump is also used to supply the water treatment plant at the Wilberg Mine and water to the Church Mines as previously mentioned. Excess water is discharged into the Left Fork of Grimes Wash after passing through an oil skimmer in accordance with stipulations of the Wilberg Mine Discharge Permit UT-0022896.

The rate of frequency of discharge is dependent upon the water level in the sump. As the sump approaches its capacity, discharge is initiated until the water is drawn down to a reasonable level.

The total water that was discharged from the Wilberg Mine during 1982 amounted to 419 acre feet or 136.5 million gallons. This is equivalent to an average instantaneous flow of 0.58 cubic feet per second or 260 gallons per minute. The recorded flow of 419 acre feet during 1982 is considerably more than the 1981 discharge of 279 acre feet. The average monthly discharges are shown in Figure 13. Also included is a graph displaying the discharge rates from January 1979 through December 1982, Figure 14. The rapid variations from month to month could possibly be the result of several factors which include: (1) increase in annual coal production, (2) increase in the labor force (higher culinary use), (3) improved pumping techniques,

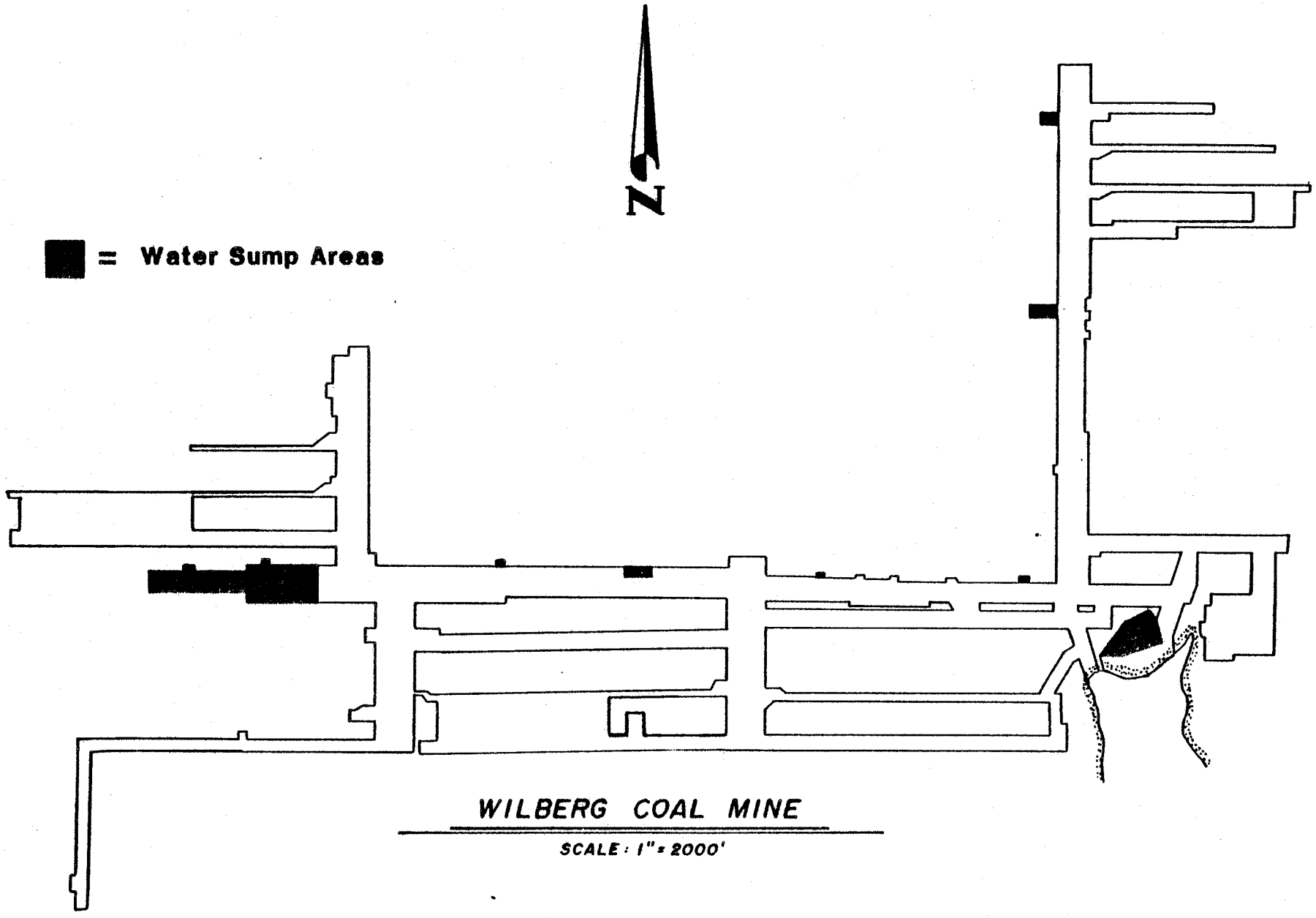


FIGURE 12

UPDATE 1/14/83

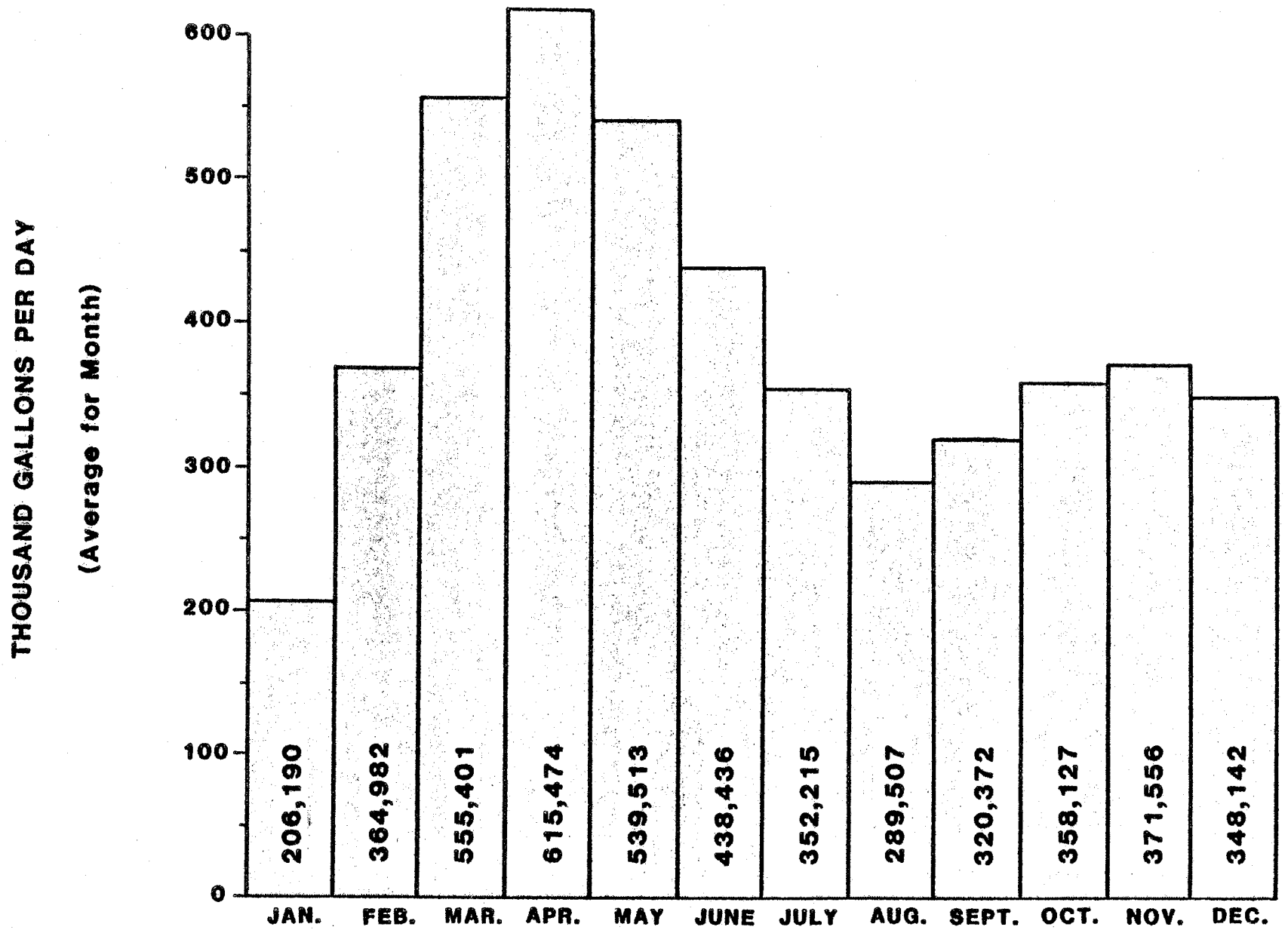


FIGURE 13

* INCLUDES WATER TRANSMITTED TO THE CHURCH MINES

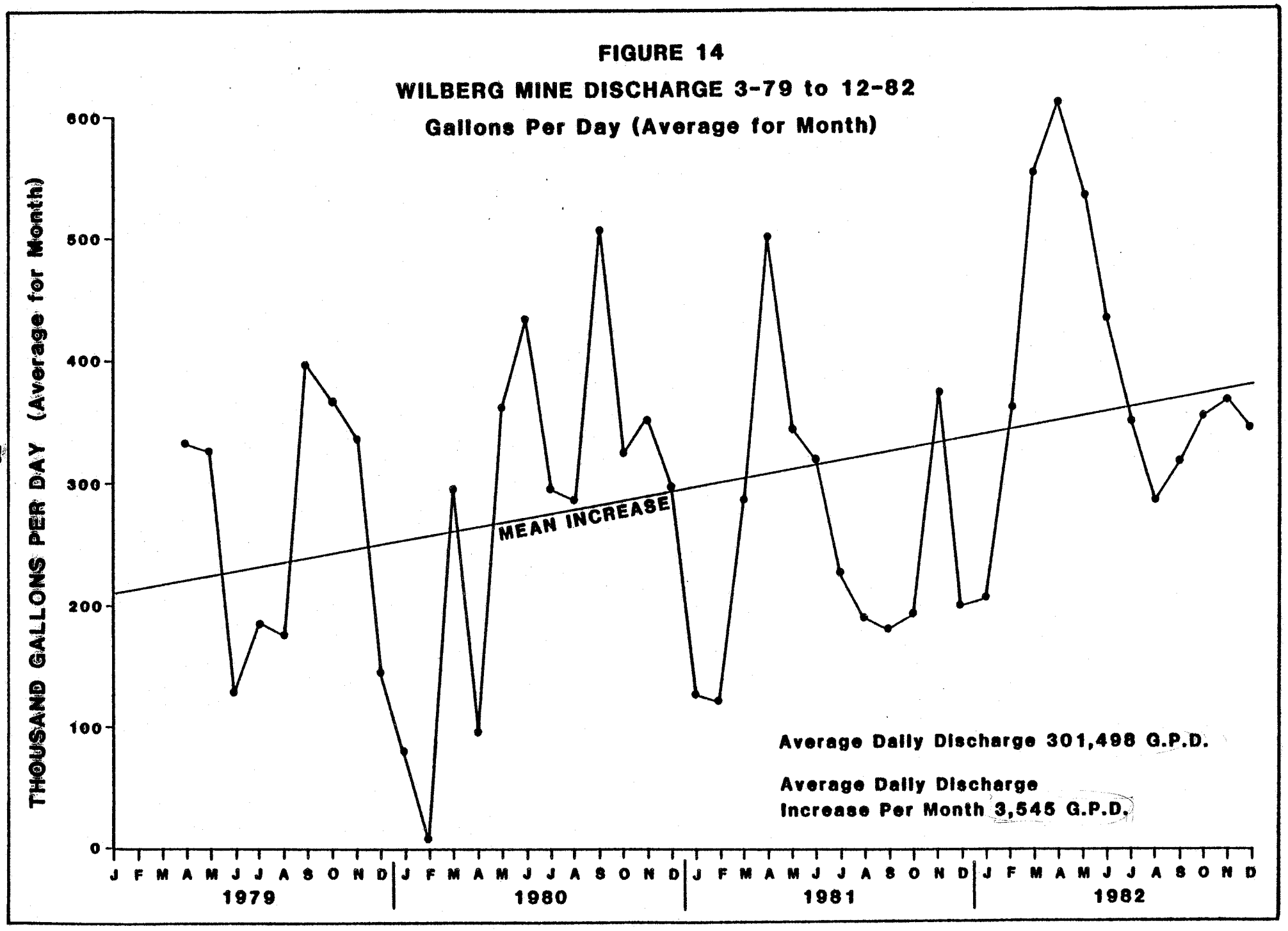


FIGURE 14
WILBERG MINE DISCHARGE 3-79 to 12-82
Gallons Per Day (Average for Month)
THOUSAND GALLONS PER DAY (Average for Month)
600
500
400
300
200
100
0
MEAN INCREASE
Average Daily Discharge 301,498 G.P.D.
Average Daily Discharge
Increase Per Month 3,545 G.P.D.
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1979
1980
1981
1982

and (4) near portal ground water sources freezing during the winter months resulting in an overall decrease in discharge rates during this period. It is thought that the factor of greatest influence on ground water is the increase in the annual coal production especially in areas inflicted by the overlying sandstone channels.

Monthly water quality samples were collected to insure that the water discharged was in compliance with the Wilberg Mine discharge permit. Table 23 compares the minimum, maximum and means values from an historical standpoint to 1982. An examination of Table 23 shows no significant change in quality between samples collected in 1982 to the historical results. Individual analysis can be found in Appendix K.

TABLE 23: WILBERG MINE - DISCHARGE WATER QUALITY

	1982			Historical (1976-1981)		
Parameters	Minimum	Maximum	Mean	Minimum	Maximum	Mean
pH	7.2	8.1	7.7	6.98	8.2	7.6
Acidity	1.0	1.0	1.0	0.0	62.0	10.7
Alkalinity	227	364	299.1	216.0	322.0	268.3
BOD_5	0.3	1.1	0.9	0.7	11.0	2.2
Chloride	9.6	16.6	12.4	2.7	63.3	14.7
Coliforms:						
Fecal	2.0	4.0	2.7	2.0	30.0	4.7
Total	2.0	79.0	33.7	3.0	9300	561.41
Iron	0.18	0.74	0.5	0.01	3.0	0.34
Oil & Grease	0.5	2.2	0.6	0.0	23.8	3.1
Sulfate	136	290	211.3	29.2	305	173.3
TDS	516	598	565.6	424.0	705	526.1
TSS	0.5	13.0	4.0	0.5	222	11.2

DEER CREEK MINE

1) In-Mine Monitoring

The Deer Creek Mine water monitoring program is consistent with the program established for the Wilberg Mine, i.e. in-mine - 2 grab samples per quarter, discharge - monthly grab samples.

The amount of water flowing into the Deer Creek Mine is estimated by combining the amount of water leaving the mine with the water used for domestic purposes. The amount discharged from Deer Creek Mine in 1982 was 117 million gallons. Estimated water loss due to evaporation was approximately 19 million gallons. Domestic usage for 1982 amounted to approximately 8 million gallons. Therefore, the water flowing into the Deer Creek Mine in 1982 was approximately 144 million gallons, which equates to an instantaneous flow of 274 gallons per minute.

As in the case of the Wilberg Mine, the sources of in-mine water production were discussed in the mine hydrology section of this report.

2) In-Mine Quality

A total of eight samples were collected in the Deer Creek Mine during 1982. Table 24 compares the quality characteristics of the samples collected in 1982 to the historical values. The consistency of the in-mine quality can be recognized both from Table 24 and the stiff diagrams presented in Figure 11. The complete chemical analysis of the samples collected in 1982 can be found in Appendix L.

3) Discharge

Excess water not utilized in the mining operation or for domestic use was either pumped to storage areas or discharged from the mine. The

TABLE 24: DEER CREEK IN-MINE QUALITY

Location	*3rd North XC 26 2L	Main West XC 0 TE	4th Right XC 14½ 1R	EM-3	4th Right XC 14½ 1R	5th Right XC 8 1R	EM-3	3rd North XC 18 3L	1982 Min.	1982 Max.	1982 Mean	Historical (1976-1981) Min.	Historical (1976-1981) Max.	Historical (1976-1981) Mean
pH	6.8	7.6	7.2	6.8	7.0	7.0	7.4	7.1	6.8	7.6	7.4	7.0	8.2	7.5
Alkalinity	396.0	297	396	417	425	410	393	374	297.0	425.0	404.3	214.7	554.4	410.4
Calcium	150.0	90.0	120	100.0	130.0	139.0	152.0	140.0	90.0	152.0	138.3	60.8	245.0	149.0
Chloride	6.4	8.9	12.8	11.2	11.8	11.4	12.0	5.95	6.0	12.8	10.6	7.2	16.0	10.9
Conducitivity	800	470	720	650	920	920	1000	890	1000	470	898.7	620	1700	953.3
Magnesium	57.1	16.0	58.0	53.0	59.0	60.0	47.0	57.0	16.0	60.0	51.3	4.4	79.5	51.6
Potassium	10.0	5.0	2.24	2.4	3.50	4.0	4.5	3.5	2.2	10.0	4.7	1.99	6.5	4.9
Sodium	30.0	46.0	24.0	30.0	27.0	31.0	30.0	29.0	27.0	46.0	34.0	10.22	66.0	37.1
Sulfate	240.0	86.4	181.0	115.0	220.0	200.0	230.0	180	86.4	240.0	210.0	40.0	1280	226.8
TDS	496	263	421	360	552	517	565	539	263	565	573.7	445.0	982.0	614.1
TSS	2	7.0	6.0	2.0	2.0	1.0	0.5	2.0	7.0	0.5	5.1	0.1	26.0	5.5

* Example: 3rd North XC 26 2L = 3rd North, Cross Cut Number 26, 2nd Left entry.

location of the main sump areas within the mine are shown in Figure 15. The largest volume of water is stored in the western part of Main West, an area that has not been actively mined for several years.

The water that is discharged from the mine flows through an oil skimmer and then a recording weir before being piped to UP&L's Huntington Power Plant. None of the discharge water leaving the mine enters any of the natural streams in the region, but instead is used in the cooling towers at the power plant.

The total water that was discharged from the Deer Creek Mine during 1982 amounted to 359 acre feet or 117 million gallons. This is equivalent to an average instantaneous flow of 0.50 cubic feet per second or 223 gallons per minute. The recorded flow of 359 acre feet during 1982 is slightly lower than the 1981 discharge of 384 acre feet. The average monthly discharges are shown in Figure 16. A graph displaying the historical discharge rates is included as Figure 17. The factors affecting the monthly variations depicted in Figure 17 are consistent with the interpretations made for the same phenomenon occurring with the Wilberg Mine discharge.

Monthly water quality samples were collected for 1982. Table 25 compares the 1982 analysis to the historical values. Individual analysis can be found in Appendix M.

EFFECTS OF MINING AND SUBSIDENCE ON HYDROLOGY

Since the development of the UP&L mining complex on East Mountain, coal in several areas of the property have been extracted causing the partial collapse of the immediate overburden strata. The areas where the partial collapse of roof strata occurs is in areas of retreat mining in room and pillar sections and in areas of longwall mining. The areas of East Mountain where partial roof collapse has occurred are shown in Figure 16.

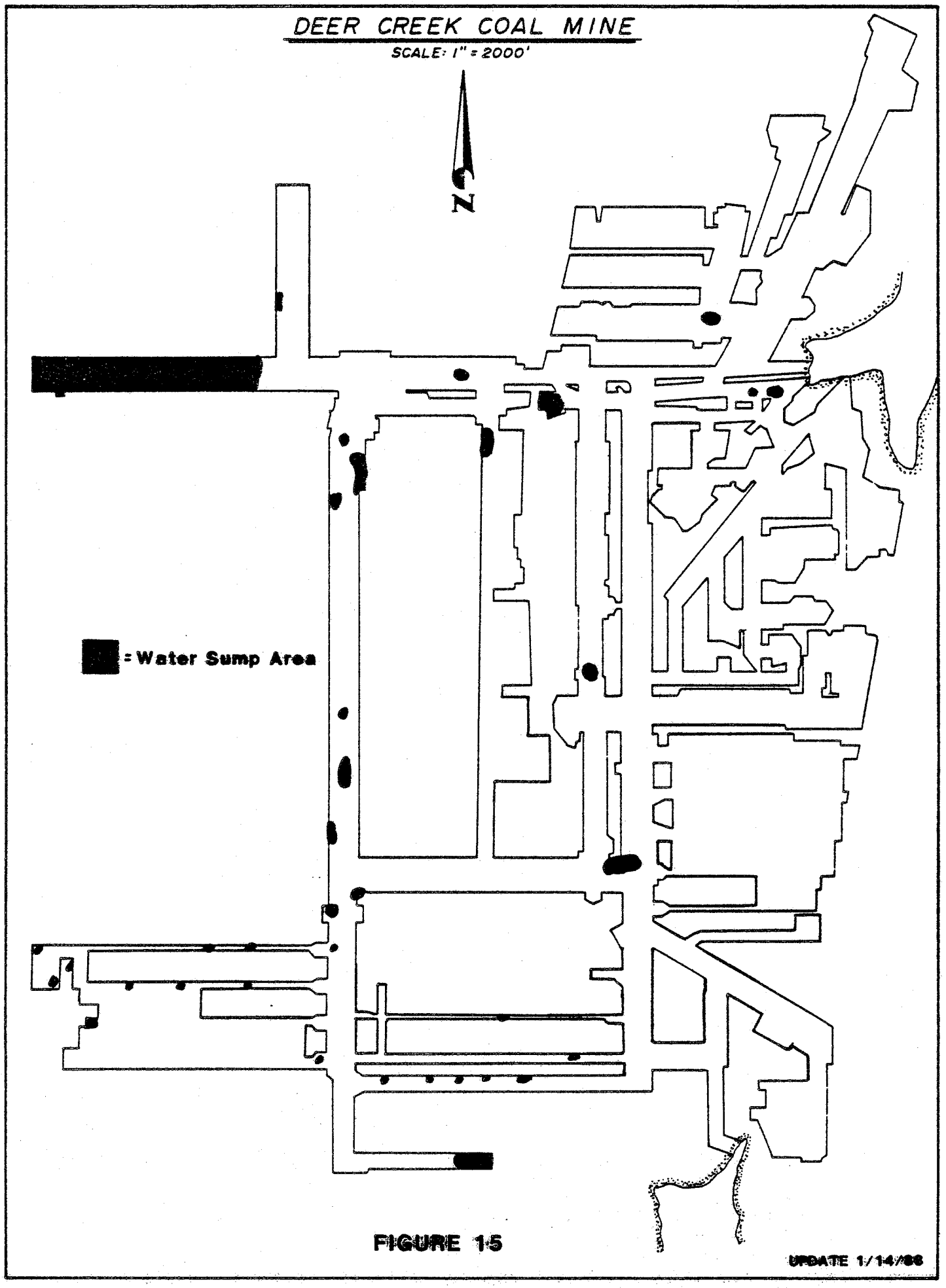

DEER CREEK COAL MINE
SCALE: 1" = 2000'
N
= Water Sump Area
UPDATE 1/14/86

FIGURE 1-5

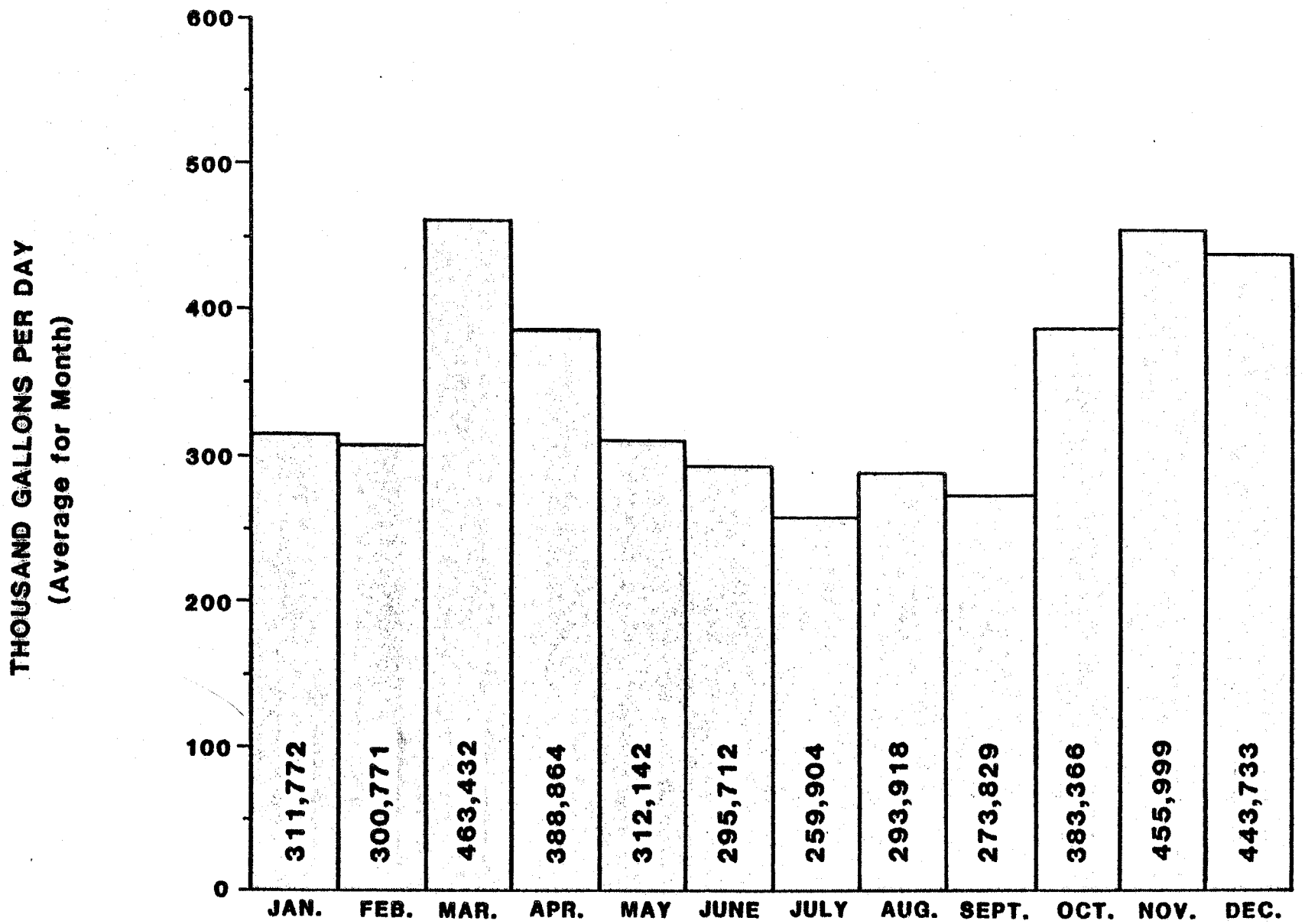

1982 DEER CREEK MINE WATER DISCHARGE
THOUSAND GALLONS PER DAY
(Average for Month)
600
500
400
300
200
100
0
311,772
300,771
463,432
388,864
312,142
295,712
259,904
293,918
273,829
383,366
455,999
443,733
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.

FIGURE 16

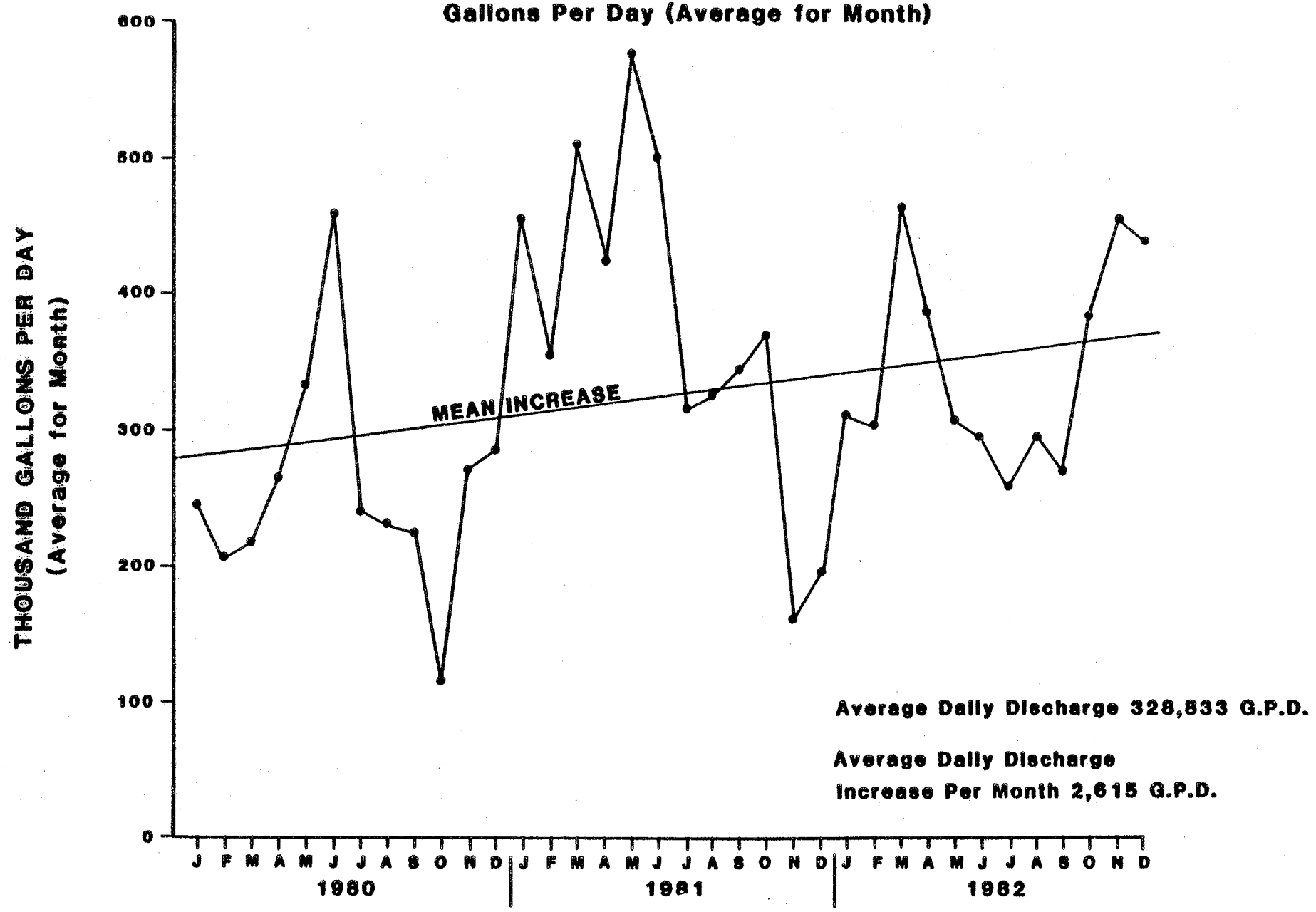


FIGURE 17
DEER CREEK MINE DISCHARGE 1-80 to 12-82
Gallons Per Day (Average for Month)

TABLE 25: DEER CREEK MINE - DISCHARGE* WATER QUALITY

	1982			Historical (1976-1981)		
Parameters	Minimum	Maximum	Mean	Minimum	Maximum	Mean
pH	7.2	7.8	7.5	6.8	8.1	7.5
Acidity	1.0	1.0	1.0	0.0	52.0	14.0
Alkalinity	280.0	414.0	343.0	207.0	403.0	288.7
Chloride	8.3	16.7	12.2	2.4	2700	111.2
Conductivity	520	1300	961	480	10000	1345
Iron	0.2	1.4	0.8	0.03	7.5	0.7
Oil & Grease	0.5	0.5	0.5	0.01	8.4	1.8
Sulfate	70.0	300	185.5	29.8	497.0	189.2
TDS	320	893	635.5	339.0	5100	747.0
TSS	0.5	31.5	9.3	1.9	272	29.9

* Used only in the power plant cooling system.

Five areas of subsidence have been observed on East Mountain (see Figure 18). Springs adjacent to these areas were observed to flow at increased rates compared to 1981, which is understandable considering the high precipitation in 1982water year. The areas of subsidence will be discussed in detail in the subsidence monitoring report.

The springs and surface waters above all areas of mine workings are being monitored closely to measure the affects of mining. No mining related changes to the springs or surface waters have been identified in the data collected. The water flowing into the mine workings, although temporarily diverted or detained, has not had an impact on the surface waters of East Mountain or the surrounding area.

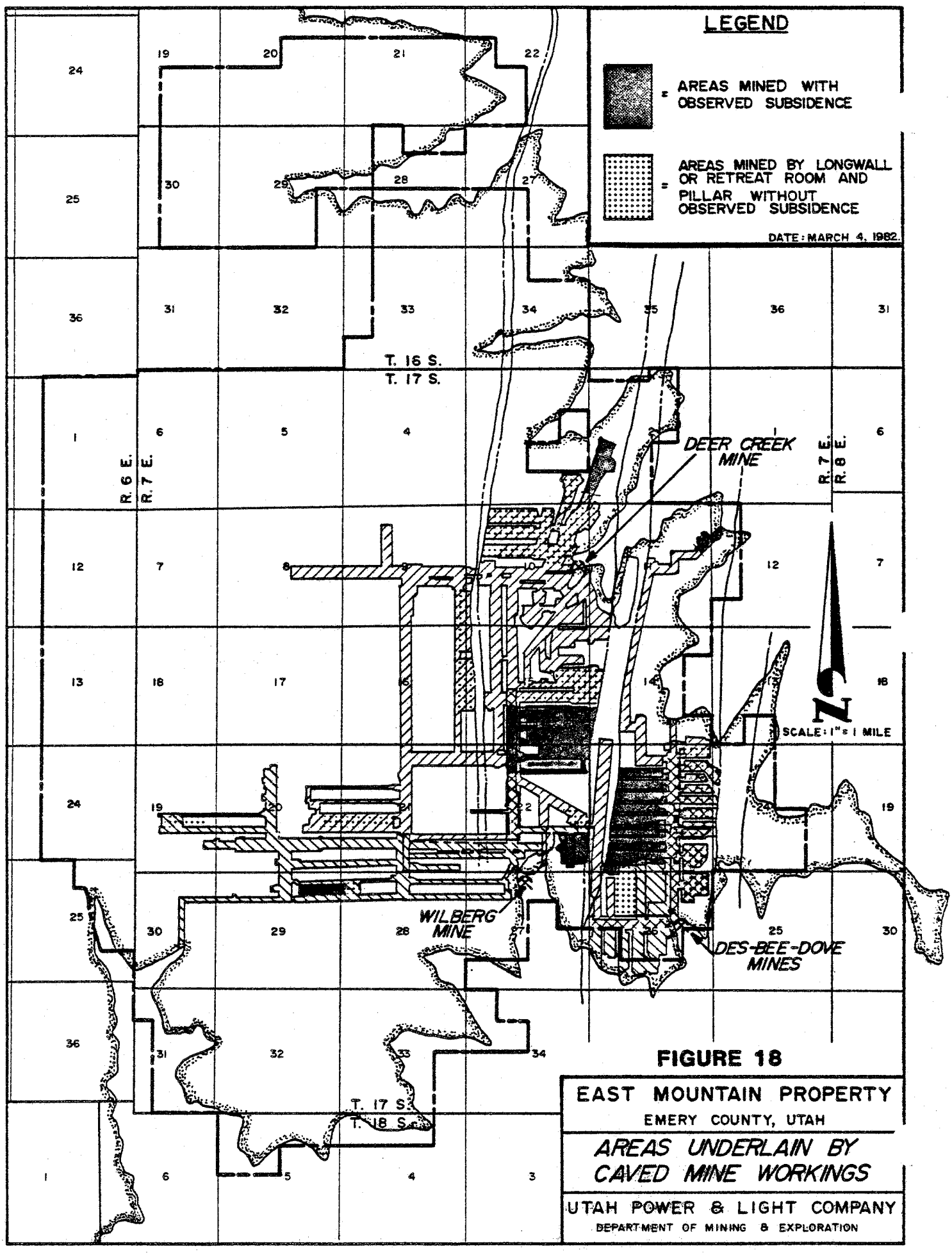


FIGURE 18

EAST MOUNTAIN PROPERTY
EMERY COUNTY, UTAH

AREAS UNDERLAIN BY CAVED MINE WORKINGS

UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

SUMMARY AND RECOMMENDATION

Utah Power & Light Company has been conducting a water monitoring program in the area of their underground coal mines in Emery County, Utah in accordance with regulations set forth in Section 30 CFR 211 of the Coal Mine Operating Regulations of 1977. This program has been in existence since 1977 and this is the fifth annual report submitted concerning hydrology. Information contained within this report was written to comply with the Apparent Completeness Review received by UP&L during 1982.

Unusually high precipitation throughout 1982 caused high runoff in all drainage on and around East Mountain and discharge rates for springs also increased. The high volume of water created some degradation of water quality due to increased accumulation of suspended solids.

The springs on East Mountain were studied in detail to determine the geologic conditions affecting each spring. As reported in the 1980 report, four main modes of spring occurrence have been identified on East Mountain. These are: (1) the base of the Flagstaff Limestone, (2) fluvial channels within the North Horn Formation, (3) the base of the North Horn Formation, and (4) the Roans Canyon Fault graben. The chemistry of the spring water was also studied to determine springs which appear to share the same water source. The data collected from 1980 through 1982 clearly shows a similarity of water quality of springs originating in the same geologic formation, i.e., Flagstaff Limestone, North Horn, Price River and the Blackhawk Formations. Cation and anion diagrams were organized by geologic formation occurrence in Appendix D to visualize the relationships which exist.

Three new springs were identified during 1982, Appendix C gives the geologic description of which of the new springs.

The in-mine water monitoring program continued in 1982 as in previous years. Changes evolved in the ground water occurrences within the Church Mine complex.

1. Water production in the Little Dove Mine ceased as of June 1982.
2. Deseret Mine began to produce minor quantities of water during 1982.

The ground water occurrences of the Church Mine complex are described in detail on page 49.

The mining activities on East Mountain apparently have not affected the hydrologic regime. Close monitoring of all surface and subsurface waters on East Mountain has revealed flow trends which are related to seasonal climatic trends, but no apparent mining related changes have been observed.

It is proposed that Utah Power & Light Company continue its' water monitoring program as has been done since 1977 with the exception of the following changes:

1. Water chemistry information pertaining to the East Mountain springs will be curtailed to include only those springs which exist within the present and five year mine plan areas, refer to Figure 1B. All springs which reside outside the extent of the five year mine limit will be monitored to obtain flow information only.

2. The Cottonwood portal site is no longer considered as an access portal. As a result the baseline study conducted on Cottonwood Creek to determine water quality characteristics will be discontinued as of January 1983. If the sediment pond structures located in Cottonwood Canyon discharge, samples of Cottonwood Creek as well as sediment pond discharge will be analyzed to establish water quality characteristics.

APPENDIX A

UTAH POWER & LIGHT COMPANY
STREAM DISCHARGE RECORDS

STATION HUNTINGTON CREEK AT PLANT
DATE OCT81-SEPT82

DAILY DISCHARGE (CFS)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	48.00	22.00	34.00	26.00	16.00	28.00	30.00	120.00	423.00	290.00	137.00	90.00	1
2	47.00	24.00	34.00	25.00	18.00	31.00	29.00	149.00	410.00	254.00	131.00	91.00	2
3	46.00	25.00	33.00	16.00	20.00	29.00	28.00	157.00	393.00	224.00	129.00	91.00	3
4	46.00	23.00	33.00	21.00	14.00	27.00	30.00	165.00	396.00	219.00	130.00	90.00	4
5	44.00	23.00	33.00	22.00	5.30	24.00	31.00	172.00	410.00	205.00	104.00	92.00	5
6	43.00	23.00	33.00	23.00	9.10	25.00	25.00	180.00	385.00	184.00	99.00	93.00	6
7	42.00	23.00	33.00	18.00	15.00	27.00	23.00	188.00	356.00	166.00	89.00	94.00	7
8	41.00	23.00	32.00	18.00	20.00	26.00	23.00	195.00	357.00	168.00	90.00	95.00	8
9	40.00	16.00	32.00	24.00	17.00	24.00	23.00	203.00	352.00	199.00	91.00	97.00	9
10	39.00	14.00	32.00	30.00	18.00	23.00	22.00	211.00	350.00	187.00	85.00	115.00	10
11	40.00	14.00	32.00	28.00	22.00	24.00	25.00	219.00	362.00	171.00	81.00	112.00	11
12	38.00	15.00	31.00	23.00	20.00	26.00	29.00	228.00	390.00	158.00	88.00	110.00	12
13	37.00	15.00	31.00	22.00	23.00	24.00	34.00	236.00	419.00	150.00	93.00	118.00	13
14	36.00	16.00	31.00	20.00	26.00	27.00	39.00	245.00	422.00	152.00	89.00	111.00	14
15	35.00	19.00	31.00	20.00	26.00	28.00	43.00	254.00	412.00	139.00	86.00	99.00	15
16	34.00	18.00	31.00	18.00	25.00	27.00	43.00	264.00	388.00	132.00	86.00	81.00	16
17	33.00	18.00	30.00	20.00	23.00	25.00	41.00	273.00	417.00	127.00	87.00	70.00	17
18	32.00	20.00	30.00	20.00	22.00	25.00	42.00	282.00	430.00	143.00	91.00	73.00	18
19	31.00	16.00	30.00	17.00	18.00	24.00	39.00	292.00	402.00	147.00	91.00	84.00	19
20	31.00	17.00	30.00	19.00	23.00	23.00	35.00	302.00	383.00	167.00	89.00	79.00	20
21	30.00	20.00	29.00	18.00	25.00	21.00	32.00	312.00	375.00	162.00	92.00	78.00	21
22	29.00	20.00	29.00	18.00	27.00	28.00	31.00	322.00	375.00	160.00	96.00	80.00	22
23	28.00	20.00	29.00	13.00	28.00	35.00	35.00	332.00	352.00	162.00	97.00	75.00	23
24	27.00	20.00	29.00	23.00	27.00	33.00	40.00	343.00	332.00	159.00	83.00	74.00	24
25	26.00	16.00	29.00	20.00	28.00	33.00	55.00	354.00	331.00	157.00	93.00	77.00	25
26	26.00	9.60	28.00	20.00	27.00	37.00	65.00	365.00	328.00	156.00	106.00	87.00	26
27	25.00	8.90	28.00	20.00	28.00	33.00	72.00	377.00	331.00	195.00	103.00	108.00	27
28	24.00	17.00	28.00	14.00	29.00	27.00	82.00	389.00	327.00	166.00	100.00	90.00	28
29	24.00	30.00	28.00	24.00	0.0	28.00	102.00	401.00	313.00	157.00	100.00	97.00	29
30	23.00	34.00	28.00	14.00	0.0	26.00	113.00	413.00	299.00	155.00	97.00	110.00	30
31	23.00	0.0	29.00	22.00	0.0	40.00	0.0	425.00	0.0	142.00	91.00	0.0	31
MONTHLY													
TOT	1068.00	579.50	950.00	636.00	599.40	860.00	1261.00	8368.00	11220.00	5353.00	3024.00	2761.00	
MEA	34.50	19.30	30.60	20.50	21.40	27.70	42.00	270.00	374.00	173.00	97.50	92.00	
MAX	48.00	34.00	34.00	30.00	29.00	40.00	113.00	425.00	430.00	290.00	137.00	118.00	
MIN	23.00	8.90	28.00	13.00	5.30	21.00	22.00	120.00	299.00	127.00	81.00	70.00	
ACR FT	2120.00	1150.00	1880.00	1260.00	1190.00	1710.00	2500.00	16600.00	22250.00	10620.00	6000.00	5480.00	

OCT81-SEPT82 TOTAL 36679.90 MEAN 100.00 MAX 430.00 MIN 5.30 TOT ACR FT 72750.00

TOTAL MEAN MAX MIN TOT ACR FT

MAX UNIT DISCHARGE 446.00 CFS (3.72 FT) DATE JUN 18 MIN UNIT DISCHARGE 3.60 CFS DATE FEB 5

REMARKS:

UTAH POWER & LIGHT COMPANY
INFLOW AND UTILIZATION RECORDS

TITLE HUNTINGTON CREEK NATURAL FLOW AT PLANT-IN C.F.S. (USES ALSO NOS. 41,22,23)
DATE OCT81-SEPT82

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	29.	11.	43.	41.	34.	36.	45.	233.	462.	320.	149.	83.	1
2	29.	16.	39.	37.	33.	39.	46.	293.	457.	278.	144.	84.	2
3	27.	35.	38.	29.	36.	38.	45.	326.	420.	243.	139.	89.	3
4	35.	34.	41.	34.	31.	37.	46.	350.	425.	237.	133.	86.	4
5	34.	32.	43.	36.	23.	35.	55.	371.	437.	226.	104.	92.	5
6	26.	32.	45.	37.	29.	37.	49.	371.	405.	208.	100.	95.	6
7	35.	33.	48.	33.	36.	41.	48.	359.	369.	184.	89.	93.	7
8	47.	35.	47.	35.	42.	44.	47.	363.	370.	194.	92.	95.	8
9	44.	32.	48.	41.	40.	42.	47.	370.	369.	227.	94.	97.	9
10	48.	28.	49.	47.	38.	40.	46.	364.	370.	205.	84.	116.	10
11	52.	28.	51.	46.	40.	42.	49.	347.	386.	187.	79.	114.	11
12	41.	30.	46.	40.	38.	44.	53.	335.	420.	172.	90.	110.	12
13	44.	31.	44.	39.	38.	43.	57.	335.	446.	162.	96.	127.	13
14	50.	35.	47.	37.	40.	45.	68.	346.	443.	165.	91.	119.	14
15	55.	39.	51.	37.	38.	46.	72.	368.	428.	150.	83.	101.	15
16	55.	34.	51.	35.	37.	45.	74.	390.	404.	142.	87.	84.	16
17	49.	37.	47.	37.	35.	43.	77.	421.	441.	136.	92.	84.	17
18	47.	39.	47.	36.	33.	42.	78.	465.	466.	152.	95.	93.	18
19	46.	28.	43.	33.	30.	41.	76.	489.	436.	157.	93.	100.	19
20	44.	28.	39.	36.	34.	40.	71.	490.	404.	177.	92.	98.	20
21	43.	33.	38.	35.	36.	37.	67.	503.	396.	171.	100.	97.	21
22	39.	33.	41.	33.	38.	44.	68.	526.	400.	170.	105.	98.	22
23	35.	33.	41.	28.	39.	51.	75.	558.	378.	177.	100.	94.	23
24	30.	33.	41.	39.	38.	49.	76.	605.	356.	172.	84.	92.	24
25	28.	28.	41.	35.	38.	49.	93.	643.	354.	169.	96.	99.	25
26	28.	19.	41.	36.	37.	52.	118.	669.	351.	172.	106.	124.	26
27	27.	19.	41.	36.	38.	49.	159.	690.	356.	215.	102.	150.	27
28	28.	27.	41.	30.	39.	43.	190.	645.	351.	180.	99.	134.	28
29	37.	41.	42.	40.	0.	43.	214.	525.	337.	166.	99.	140.	29
30	35.	47.	42.	31.	0.	41.	217.	448.	326.	157.	94.	145.	30
31	26.	0.	44.	40.	0.	55.	0.	437.	0.	145.	88.	0.	31
MONTHLY													
TOT	1194.	931.	1358.	1125.	1005.	1331.	2425.	13638.	11963.	5816.	3100.	3130.	
MEA	39.	31.	44.	36.	36.	43.	81.	440.	399.	188.	100.	104.	
MAX	55.	47.	51.	47.	42.	55.	217.	690.	466.	320.	149.	150.	
MIN	26.	11.	38.	28.	23.	35.	45.	233.	326.	136.	79.	83.	

OCT81-SEPT82 TOTAL 47018. MEAN 129. MAX 690. MIN 11.
TOTAL MEAN MAX MIN

REMARKS:

UTAH POWER & LIGHT COMPANY
STREAM DISCHARGE RECORDS

STATION HUNTINGTON CREEK BELOW ELECTRIC LAKE
DATE OCT81-SEPT82

DAILY DISCHARGE (CFS)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	42.00	12.00	12.00	13.00	12.00	12.00	12.00	13.00	213.00	63.00	29.00	31.00	1
2	42.00	12.00	12.00	13.00	12.00	12.00	12.00	12.00	200.00	58.00	29.00	31.00	2
3	42.00	12.00	12.00	13.00	12.00	12.00	12.00	13.00	189.00	55.00	32.00	31.00	3
4	42.00	12.00	12.00	13.00	12.00	12.00	12.00	13.00	185.00	50.00	36.00	31.00	4
5	42.00	12.00	12.00	13.00	12.00	12.00	12.00	12.00	181.00	47.00	35.00	31.00	5
6	38.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	168.00	45.00	35.00	31.00	6
7	28.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	152.00	42.00	35.00	31.00	7
8	28.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	142.00	40.00	35.00	31.00	8
9	28.00	12.00	13.00	12.00	12.00	13.00	12.00	13.00	133.00	43.00	35.00	31.00	9
10	28.00	12.00	13.00	12.00	12.00	13.00	12.00	13.00	129.00	42.00	35.00	31.00	10
11	28.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	130.00	40.00	35.00	31.00	11
12	28.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	137.00	39.00	35.00	31.00	12
13	18.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	141.00	39.00	35.00	30.00	13
14	12.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	139.00	39.00	35.00	30.00	14
15	12.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	131.00	38.00	35.00	30.00	15
16	12.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	124.00	38.00	35.00	20.00	16
17	12.00	12.00	13.00	12.00	12.00	12.00	12.00	13.00	125.00	38.00	35.00	12.00	17
18	12.00	12.00	13.00	12.00	12.00	13.00	12.00	13.00	135.00	38.00	34.00	12.00	18
19	12.00	12.00	13.00	12.00	12.00	13.00	12.00	13.00	134.00	38.00	34.00	12.00	19
20	12.00	12.00	13.00	12.00	12.00	13.00	12.00	22.00	124.00	38.00	34.00	12.00	20
21	12.00	12.00	13.00	12.00	12.00	12.00	12.00	18.00	115.00	38.00	34.00	12.00	21
22	12.00	12.00	13.00	12.00	12.00	12.00	12.00	18.00	110.00	38.00	34.00	12.00	22
23	12.00	12.00	13.00	12.00	12.00	12.00	12.00	18.00	103.00	38.00	34.00	12.00	23
24	12.00	12.00	13.00	12.00	12.00	12.00	13.00	18.00	96.00	37.00	27.00	12.00	24
25	12.00	12.00	13.00	12.00	12.00	12.00	13.00	18.00	90.00	37.00	31.00	12.00	25
26	12.00	12.00	13.00	12.00	12.00	12.00	13.00	19.00	83.00	37.00	31.00	12.00	26
27	12.00	12.00	13.00	12.00	12.00	12.00	13.00	33.00	77.00	37.00	31.00	12.00	27
28	12.00	12.00	13.00	12.00	12.00	12.00	13.00	140.00	71.00	37.00	31.00	12.00	28
29	12.00	12.00	13.00	12.00	0.0	12.00	13.00	287.00	67.00	37.00	31.00	12.00	29
30	12.00	12.00	13.00	12.00	0.0	12.00	13.00	321.00	64.00	35.00	31.00	12.00	30
31	12.00	0.0	13.00	12.00	0.0	12.00	0.0	240.00	0.0	29.00	31.00	0.0	31
MONTHLY													
TOT	650.00	360.00	397.00	377.00	336.00	377.00	367.00	1396.00	3888.00	1270.00	1029.00	650.00	
MEA	21.00	12.00	12.80	12.20	12.00	12.20	12.20	45.00	130.00	41.00	33.20	21.70	
MAX	42.00	12.00	13.00	13.00	12.00	13.00	13.00	321.00	213.00	63.00	36.00	31.00	
MIN	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	64.00	29.00	27.00	12.00	
ACR FT	1290.00	714.00	787.00	748.00	666.00	748.00	728.00	2770.00	7710.00	2520.00	2040.00	1290.00	

OCT81-SEPT82 TOTAL 11097.00 MEAN 30.40 MAX 321.00 MIN 12.00 TOT ACR FT 22010.00

TOTAL MEAN MAX MIN TOT ACR FT

MAX UNIT DISCHARGE 335.00 CFS (3.13 FT) DATE MAY 30 MIN UNIT DISCHARGE 1.80 CFS DATE AUG 24

REMARKS:

UTAH POWER & LIGHT COMPANY
RESERVOIR RECORDS

STATION ELECTRIC LAKE
DATE OCT81-SEPT82

DAILY GAGE HEIGHT (FEET)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	257.76	255.62	254.56	253.91	253.18	252.27	251.60	254.42	275.91	275.35	273.61	270.39	1
2	257.56	255.60	254.52	253.89	253.14	252.24	251.59	255.16	275.83	275.30	273.55	270.28	2
3	257.37	255.57	254.48	253.87	253.10	252.21	251.57	256.01	275.87	275.25	273.47	270.15	3
4	257.27	255.53	254.44	253.85	253.06	252.18	251.56	256.92	275.86	275.19	273.36	270.02	4
5	257.08	255.49	254.40	253.83	253.02	252.15	251.55	257.90	275.85	275.18	273.25	269.93	5
6	256.90	255.45	254.35	253.81	252.98	252.12	251.54	258.72	275.80	275.15	273.14	269.82	6
7	256.79	255.41	254.32	253.79	252.94	252.10	251.53	259.48	275.75	275.10	273.03	269.70	7
8	256.74	255.38	254.26	253.77	252.91	252.08	251.52	260.25	275.72	275.14	272.93	269.60	8
9	256.61	255.35	254.23	253.74	252.88	252.06	251.51	260.99	275.70	275.12	272.83	269.47	9
10	256.61	255.30	254.19	253.72	252.84	252.04	251.50	261.62	275.69	275.08	272.70	269.38	10
11	256.51	255.26	254.19	253.70	252.81	252.02	251.49	262.10	275.71	275.05	272.60	269.26	11
12	256.41	255.22	254.10	253.68	252.78	252.00	251.47	262.52	275.74	275.00	272.50	269.15	12
13	256.35	255.18	254.08	253.66	252.75	251.98	251.46	262.91	275.74	274.96	272.41	269.11	13
14	256.32	255.17	254.03	253.64	252.72	251.96	251.45	263.34	275.72	274.91	272.30	269.00	14
15	256.33	255.14	254.05	253.62	252.69	251.94	251.44	263.85	275.68	274.85	272.17	268.90	15
16	256.31	255.10	254.00	253.60	252.66	251.92	251.45	264.40	275.66	274.78	272.09	268.80	16
17	256.27	255.11	253.99	253.58	252.63	251.90	251.47	265.11	275.68	274.71	272.00	268.80	17
18	256.24	255.07	253.97	253.55	252.60	251.88	251.49	265.97	275.73	274.64	271.91	268.76	18
19	256.20	255.02	253.95	253.53	252.57	251.86	251.51	266.80	275.70	274.57	271.80	268.72	19
20	256.16	254.97	253.92	253.51	252.54	251.84	251.53	267.55	275.65	274.50	271.72	268.70	20
21	256.12	254.94	253.92	253.48	252.51	251.82	251.54	268.39	275.62	274.41	271.65	268.66	21
22	256.08	254.90	253.92	253.45	252.48	251.80	251.57	269.25	275.60	274.35	271.58	268.64	22
23	256.05	254.87	253.92	253.42	252.45	251.78	251.62	270.26	275.57	274.29	271.46	268.60	23
24	256.00	254.84	253.92	253.39	252.42	251.76	251.68	271.42	275.54	274.21	271.36	268.57	24
25	255.96	254.80	253.92	253.36	252.39	251.74	251.75	272.64	275.50	274.14	271.26	268.57	25
26	255.91	254.75	253.92	253.33	252.36	251.72	251.99	273.86	275.47	274.10	271.14	268.68	26
27	255.87	254.72	253.92	253.30	252.33	251.70	252.45	275.10	275.44	274.06	271.03	268.73	27
28	255.84	254.67	253.92	253.27	252.30	251.68	252.94	275.79	275.40	273.97	270.92	268.85	28
29	255.90	254.65	253.92	253.25	0.0	251.66	253.43	275.90	275.37	273.89	270.81	268.90	29
30	255.86	254.62	253.92	253.23	0.0	251.64	253.83	275.84	275.36	273.74	270.68	268.95	30
31	255.82	0.0	253.92	253.22	0.0	251.61	0.0	275.76	0.0	273.67	270.57	0.0	31

MAXIMUM GAGE HEIGHT 275.91 JUN 1 MINIMUM GAGE HEIGHT 251.44 APR 15

NOTE: ADD 8300 FEET TO GAGE HEIGHT TO OBTAIN ELEVATION

UTAH POWER & LIGHT COMPANY
RESERVOIR RECORDS

STATION ELECTRIC LAKE
DATE OCT81-SEPT82

DAILY CONTENTS (ACRE FEET)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	23996.	23201.	22815.	22580.	22319.	21997.	21761.	22764.	31699.	31431.	30610.	29146.	1
2	23921.	23194.	22800.	22573.	22305.	21986.	21758.	23033.	31685.	31407.	30582.	29098.	2
3	23850.	23183.	22786.	22566.	22291.	21975.	21751.	23345.	31680.	31383.	30545.	29040.	3
4	23812.	23168.	22771.	22559.	22276.	21965.	21747.	23682.	31675.	31355.	30493.	28983.	4
5	23741.	23154.	22757.	22552.	22262.	21954.	21744.	24049.	31671.	31350.	30443.	28943.	5
6	23674.	23139.	22739.	22544.	22248.	21944.	21740.	24359.	31647.	31336.	30392.	28895.	6
7	23633.	23124.	22728.	22537.	22234.	21937.	21737.	24650.	31623.	31312.	30341.	28842.	7
8	23615.	23113.	22706.	22530.	22223.	21930.	21733.	24947.	31608.	31331.	30295.	28798.	8
9	23566.	23102.	22696.	22519.	22212.	21923.	21730.	25235.	31599.	31321.	30249.	28741.	9
10	23566.	23084.	22681.	22512.	22198.	21916.	21726.	25482.	31594.	31302.	30189.	28702.	10
11	23529.	23069.	22681.	22505.	22188.	21909.	21723.	25672.	31603.	31288.	30143.	28649.	11
12	23492.	23055.	22649.	22498.	22177.	21902.	21716.	25839.	31618.	31264.	30097.	28601.	12
13	23470.	23040.	22641.	22491.	22166.	21895.	21712.	25995.	31618.	31245.	30056.	28584.	13
14	23459.	23037.	22623.	22483.	22156.	21888.	21709.	26168.	31608.	31221.	30006.	28536.	14
15	23463.	23026.	22631.	22476.	22145.	21881.	21705.	26374.	31589.	31193.	29947.	28493.	15
16	23455.	23011.	22613.	22469.	22134.	21873.	21709.	26598.	31579.	31160.	29910.	28449.	16
17	23440.	23015.	22609.	22462.	22124.	21866.	21716.	26889.	31589.	31126.	29869.	28449.	17
18	23429.	23000.	22602.	22451.	22113.	21859.	21723.	27246.	31613.	31093.	29828.	28432.	18
19	23415.	22982.	22595.	22444.	22103.	21852.	21730.	27594.	31599.	31060.	29778.	28415.	19
20	23400.	22964.	22584.	22437.	22092.	21845.	21737.	27912.	31575.	31027.	29742.	28406.	20
21	23385.	22953.	22584.	22426.	22081.	21838.	21740.	28272.	31560.	30985.	29711.	28389.	21
22	23370.	22938.	22584.	22415.	22071.	21831.	21751.	28645.	31551.	30956.	29679.	28380.	22
23	23359.	22927.	22584.	22405.	22060.	21824.	21768.	29089.	31536.	30928.	29625.	28363.	23
24	23341.	22916.	22584.	22394.	22050.	21817.	21789.	29607.	31522.	30890.	29580.	28350.	24
25	23326.	22902.	22584.	22383.	22039.	21810.	21814.	30161.	31503.	30858.	29535.	28350.	25
26	23308.	22884.	22584.	22373.	22028.	21803.	21898.	30726.	31488.	30839.	29481.	28397.	26
27	23293.	22873.	22584.	22362.	22018.	21796.	22060.	31312.	31474.	30820.	29432.	28419.	27
28	23282.	22855.	22584.	22351.	22007.	21789.	22234.	31642.	31455.	30778.	29382.	28471.	28
29	23304.	22847.	22584.	22344.	0.	21782.	22408.	31695.	31441.	30740.	29333.	28493.	29
30	23289.	22837.	22584.	22337.	0.	21775.	22552.	31666.	31436.	30670.	29275.	28514.	30
31	23275.	0.	22584.	22333.	0.	21765.	0.	31627.	0.	30638.	29226.	0.	31
MONTHLY CHANGE	-800.	-438.	-253.	-251.	-326.	-242.	787.	9075.	-191.	-798.	-1412.	-712.	

OCT81-SEPT82 TOTAL CHANGE 4439. MAX CONTENTS 31699. AC FT JUN 1 MIN CONTENTS 21705. AC FT APR 15

TOTAL CHANGE MAX CONTENTS MIN CONTENTS

REMARKS:

APPENDIX B

UTAH POWER & LIGHT COMPANY
WATER QUALITY DATA

Station UPL-3 LOC 03
Location Huntington creek below Electric Lake.

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLORO-PHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L	NITROGEN AMMONIA AS NH_3-N MG/L	NITROGEN NITRATE AS NO_3-N MG/L	NITROGEN NITRITE AS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL AS PO_4-P MG/L	PHOSPHATE ORTHO AS PO_4-P MG/L	SULFATE AS SO_4 MG/L	HYDROXIDE AS OH MG/L	SURFACTANT AS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µMHOS CM	TURBIDITY NTU	CARBONATE ALK. AS CO_3 MG/L	BICARBONATE ALK. AS HCO_3 MG/L	TOTAL ALK. AS $CaCO_3$ MG/L	TOTAL HARDNESS AS $CaCO_3$ MG/L	ACIDITY AS $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-82			canyon closed																																					
2-16-82	12:40			3	6.8	31	<2	<2					10.4				<0.01	<0.01			0.015	0.011				4.5		177					2.7							
4-1-82			canyon closed																																					
4-20-82	1014	*		3	8.54	<2	<2	<2					14.5				0.322	<0.002			<0.002	<0.002				<2		161					0.7							
6-2-82	1454			6.0	8.21	<2	<2	<2					8.3				0.296	<0.01			<0.01	<0.01				7.0		152					1.0							
6-30-82					7.1	<2	<2	<2									0.290	<0.01			<0.01	<0.01				<0.5		116					1.8							
7-30-82			No sample																																					
9-2-82				7.8	8.31								7.7				<0.01	<0.01			0.210	0.100				1.0		185					2.50							
10-14-82	1457			6.4	8.45	<2	<2	<2					10.3				0.210	<0.01			<0.01	<0.01				0.5		214					1.5							
11-16-82	1550			4.5	8.50	<2	<2	<2									0.193	<0.01			<0.01	<0.01				2.0		125					2.7							
12-21-82	1014			4.5	7.75	<2	<2	<2					11.5				0.126	<0.01			<0.01	<0.01				1.5		185					2.0							

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS MG/L	CHROMIUM HEX AS CR. MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE AS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA AS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	CHROMIUM TOTAL MG/L	WELL DEPTH	COMMENTS
1-82																																	canyon closed
2-16-82																																	
4-1-82																																	canyon closed
4-20-82																																	* Flow-see Hydrology
6-2-82																																	
6-30-82																																	
7-30-82																																	No sample
9-2-82																																	
10-14-82																																	
11-16-82																																	
12-21-82																																	

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station UPL-2 LOC02
Location Right Fork, Huntington creek above Left Fork

DATE	TIME	FLOW	TEMPERATURE AIR	TEMPERATURE WATER	FIELD pH	COLIFORM TOTAL	COLIFORM FECAL	FECAL STREP	C.O.D.	B.O.D.	T.O.C.	CHLORO-PHYLL-a	DIS-SOLVED OXYGEN	OIL & GREASE	PHENOL	NITROGEN AMMONIA AS NH_3-N	NITROGEN NITRATE AS NO_3-N	NITROGEN NITRITE AS NO_2-N	NITROGEN TOTAL KJELDAHL	NITROGEN ORGANIC	PHOSPHATE TOTAL AS PO_4-P	PHOSPHATE ORTHO AS PO_4-P	SULFATE AS SO_4	HYDROXIDE AS OH	SURFACTANT AS MBAS	SOLIDS TSS	SOLIDS TOTAL SETTLEABLE SOLIDS	SOLIDS T.D.S.	SOLIDS TOTAL SOLIDS	SOLIDS TOTAL VOLATILE SOLIDS	SOLIDS VOLATILE SUSPENDED SOLIDS	SPECIFIC COND	TURBIDITY	CARBONATE ALK. AS CO_3	BICARBONATE ALK. AS HCO_3	TOTAL ALK AS $CaCO_3$	TOTAL HARDNESS AS $CaCO_3$	ACIDITY AS $CaCO_3$	ALPHA RADIOACTIVITY	BETA RADIOACTIVITY
		CFS	°C	°C		MPN	MPN	MPN	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	CM MHOS	NTU	MG/L	MG/L	MG/L	MG/L	MG/L	pCi/L	pCi/L
1-82			canyon closed																																					
2-16-82			canyon closed																																					
4-1-82			canyon closed																																					
4-20-82	1050	26		-4	8.6	34	<2	<2					MAX				0.204	<0.002			0.029	<0.002				17.0		217					3.1							
6-2-82	1524			9.0	8.34	21	<2	<2					8.3				0.297	<0.01			0.037	0.011				13.0		174					2.9							
6-30-82	0610			7.5	8.40	18	<2	<2					13.5				0.121	<0.01			0.040	<0.01				6.0		138												
7-30-82			No sample																																					
9-2-82	1206			8.5	8.68								9.4				0.21	0.02			0.070	0.050				17.0		228					1.10							
10-14-82	1523			7.7	8.54	<2	<2	<2					10.8				0.129	<0.01			0.031	<0.01				<0.5		257					2.8							
11-16-82	1617	50		1.7	8.51	<2	<2	<2									0.131	<0.01			0.040	<0.01				54.0		159					26.0							
12-21-82	0940			0.7	8.19	<2	<2	<2									0.130	<0.01			0.036	<0.01				42.0		188					19.0							

DATE	ALUMINUM TOTAL	ANTIMONY TOTAL	ARSENIC TOTAL	BARIUM TOTAL	BERYLLIUM TOTAL	BORON TOTAL	CADMIUM TOTAL	CALCIUM TOTAL	CHLORIDE DISS	CHROMIUM HEX AS CR.	COBALT TOTAL	COPPER TOTAL	CYANIDE AS CN	FLUORIDE DISS.	GERMANIUM TOTAL	IRON DISS	IRON TOTAL	LEAD TOTAL	MAGNESIUM TOTAL	MANGANESE TOTAL	MERCURY TOTAL	MOLYBDENUM TOTAL	NICKEL TOTAL	POTASSIUM TOTAL	SELENIUM TOTAL	SILICA AS SiO_2	SILVER TOTAL	SODIUM TOTAL	ZINC TOTAL	VANADIUM TOTAL	CHROMIUM TOTAL	WELL DEPTH	COMMENTS
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L		
1-82																																	canyon closed
2-16-82																																	canyon closed
4-1-82																																	canyon closed
4-20-82																																	
6-2-82																																	
6-30-82																																	
7-30-82																																	No sample
9-2-82																																	
10-14-82																																	
11-16-82																																	
12-21-82																																	

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station H-1 Loc 15
Location Huntington Creek above Huntington Plant Diversion

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLORO-PHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L
1-12-82	1646			0.7	8.2								12.0	1.0	
2-16-82			In-accessible												
4-1-82	1524			4	8.7								12.3		
4-20-82	1125	*		1.8	8.75								14.0	<0.5	
6-2-82	1544			9.2	8.48								8.6		
6-30-82	0640			8.4	8.54								14.0		
7-30-82			No sample												
9-2-82	1225			12.4	8.66								9.8		
9-3-82														<0.2	
9-9-82	1957			13.9	8.60										
10-14-82	1558			7.0	8.56								11.6	<0.5	
11-16-82	1649			0.3	8.41										
12-21-82	1113			-0.1	8.19										

DATE	NITROGEN AMMONIA as NH_3-N MG/L	NITROGEN NITRATE as NO_3-N MG/L	NITROGEN NITRITE as NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL as PO_4-P MG/L	PHOSPHATE ORTHO as PO_4-P MG/L	SULFATE as SO_4 MG/L	HYDROXIDE as OH MG/L	SURFACTANT as MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µ MHOS CM	TURBIDITY BTU	CARBONATE ALK. as CO_3 MG/L	BICARBONATE ALK. as HCO_3 MG/L	TOTAL ALK as $CaCO_3$ MG/L	TOTAL HARDNESS as $CaCO_3$ MG/L	ACIDITY as $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-12-82		<0.002				0.036	<0.002	52.8			46.0		225.0				400			316	259.0	242.0				
2-16-82																										
4-1-82		<0.002				0.012	<0.002	101			5.0		274				480			256	210	241				
4-20-82		0.111				<0.002	<0.002	111.0			22.0		255				400			276	226	261				
6-2-82		0.101				0.062	0.018	45.3			80.0		161				250			218	179	195				
6-30-82		0.100				0.059	<0.01	91.0			37.0		199				338			170	170	188				
7-30-82																										
9-2-82		0.093				0.055	<0.01	93.0			30.0		207				310			204	167	201				
9-3-82		0.06				0.150	0.120	45.0			123		219				280			183	150	170				
9-9-82																										
10-14-82		0.098				0.063	<0.01	100			11.0		245				342			233	191	251				
11-16-82		0.099				0.065	<0.01	110			40.5		288				360			211	173	252				
12-21-82		0.100				0.060	<0.01	150			6.5		320				422			257	211	264				

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS MG/L	CHROMIUM HEX as CR MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE as CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA as SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	CHROMIUM TOTAL MG/L	WELL DEPTH	COMMENTS
1-12-82			<0.0003		<0.005	0.124	<0.005	82.0	5.8			<0.02					0.69	<0.001	9.10	0.11	<0.0002	<0.1	<0.04	1.66	<0.0003			34.00	0.021		<0.05		
2-16-82																																		In-accessible
4-1-82			<0.0003		<0.005	0.098	<0.005	81.0	10.5			<0.02					0.71	<0.001	9.20	0.13	<0.0002		<0.04	1.36	<0.0003			32.00	0.030		<0.05		
4-20-82			<0.0003		<0.005	0.183	<0.005	88.0	8.8			<0.02					0.66	<0.001	10.00	0.10	<0.0002	<0.1	<0.04	2.00	<0.0003			35.00	0.033		<0.05		*see Hydrology
6-2-82			<0.0003		<0.005	<0.05	<0.005	65.0	3.6			<0.02					0.60	<0.001	7.90	0.06	<0.0002		<0.04	2.10	<0.0003			20.00	0.030		<0.05		
6-30-82			<0.001		<0.005	0.073	<0.005	62.0	4.1			<0.02					0.53	<0.05	8.00	0.06	<0.0002		<0.04	2.00	<0.0003			21.0	0.031		<0.05		
7-30-82																																		No sample
9-2-82			<0.001		<0.005	0.079	<0.005	68.0	4.7			<0.02					0.61	<0.05	7.50	0.05	<0.0002		<0.04	2.00	<0.0003			23.0	0.047		<0.05		
9-3-82			<0.001		<0.001	0.010	<0.001	44.00	2.40			<0.001					0.165	<0.001	14.40	0.030	<0.0002	<0.001	<0.001	8.70	<0.001		<0.001	10.2			<0.001		
9-9-82																																		
10-14-82			<0.001		<0.005	0.110	<0.005	84.0	4.7			<0.02					0.51	<0.05	10.0	0.05	<0.0002	<0.1	<0.04	1.50	<0.0003			20.0	0.042		<0.05		
11-16-82			<0.001		<0.005	0.121	<0.005	84.5	5.3			<0.02					0.57	<0.05	10.0	0.06	<0.0002		<0.04	2.50	<0.003			22.0	0.044		<0.05		
12-21-82			<0.001		<0.005	0.092	<0.005	90.0	5.31			<0.02					0.53	<0.05	9.50	0.07	<0.0002		<0.04	3.00	<0.0003			45.0	0.050		<0.05		

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station UPL-9 LOC10
Location Huntington Creek above Fish Creek

	DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLORO-PHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L	NITROGEN AMMONIA AS NH_3-N MG/L	NITROGEN NITRATE AS NO_3-N MG/L	NITROGEN NITRITE AS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL AS PO_4-P MG/L	PHOSPHATE ORTHO AS PO_4-P MG/L	SULFATE AS SO_4 MG/L	HYDROXIDE AS OH MG/L	SURFACTANT AS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLE-ABLE SOLIDS MG/L	SOLIDS TDS MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µmhos CM	TURBIDITY NTU	CARBONATE ALK. AS CO_3 MG/L	BICARBONATE ALK. AS HCO_3 MG/L	TOTAL ALK AS $CaCO_3$ MG/L	TOTAL HARDNESS AS $CaCO_3$ MG/L	ACIDITY AS $CaCO_3$ MG/L	ALPHA RADIO-ACTIVITY pCi/L	BETA RADIO-ACTIVITY pCi/L
	1-12-82					8.1								11.8				<0.002				0.047	<0.002	90.5			17.5		290.0				510			316	259.0	287.0			
	2-16-82					In-accessible																																					
	4-1-82	1546			5	8.6								12.2				<0.002				0.011	<0.002	130.0			11.0		332				590			260	213	302			
	4-20-82	1225	*		4.4	8.69								10.4				0.107				<0.002	<0.002	119			24.0		291				500			273	224	295			
	6-2-82	1806			9.6	8.63								8.4				0.097				0.049	<0.002	41.2			86.0		166				300			221	181	176			
A	6-29-82	1713			15.4	8.71								13.3				0.090				0.052	<0.01	52.0			42.5		167				300			173	173	176			
B	6-29-82	1713			15.4	8.71								13.3				0.090				0.050	<0.01	52.0			40.5		210				353			166	166	176			
	8-5-82					No sampling																																					
	10-14-82	1632			8.3	8.55								10.5				0.100				0.047	<0.01	110			12.5		281				429			275	225	299			
	11-17-82	1155			1.9	8.44												0.109				0.051	<0.01	110			108		263				433			186	186	291			
						✓								✓										✓			✓		✓								✓	✓			

	DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS MG/L	CHROMIUM HEX OR CR AS CR MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE AS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA AS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	CHROMIUM TOTAL MG/L	WELL DEPTH	COMMENTS
	1-12-82			<0.0003		<0.005	0.126	<0.005	92.0	12.5			<0.02					0.65	<0.001	14.00	0.14	<0.0002	<0.1	<0.04	1.88	<0.0003			31.00	0.022		<0.05		
	2-16-82																																		In-accessible
	4-1-82			<0.0003		<0.005	0.132	<0.005	91.9	17.8			<0.02					0.60	<0.001	17.30	0.17	<0.0002		<0.04	2.08	<0.0003			37.00	0.039		<0.05		1.58, staff
	4-20-82			<0.0003		<0.005	0.183	<0.005	90.0	14.5			<0.02					0.63	<0.001	17.00	0.09	<0.0002	<0.1	<0.04	2.00	<0.0003			35.00	0.042		<0.05		Flow-see Hydrology
	6-2-82			<0.0003		<0.005	0.485	<0.005	59.5	4.6			<0.02					0.61	<0.001	6.50	0.06	<0.0002		<0.04	2.00	0.0006			21.00	0.053		<0.05		
A	6-29-82			<0.001		<0.005	0.100	<0.005	59.0	4.5			<0.02					0.63	<0.05	7.00	0.07	<0.0002		<0.04	2.50	0.0004			22.0	0.059		<0.05		
B	6-29-82			<0.001		<0.005	0.132	<0.005	59.0	5.2			<0.02					0.63	<0.05	7.00	0.07	<0.0002		<0.04	2.50	0.0004			22.0	0.059		<0.05		
	8-5-82																																		No sampling
	10-14-82			<0.001		<0.005	0.510	<0.005	100	10.8			<0.02					0.60	<0.05	12.0	0.05	<0.0002	<0.1	<0.04	2.00	<0.0003			25.00	0.047		<0.05		
	11-17-82			<0.001		<0.005	0.495	<0.005	95.0	15.6			<0.02					0.77	<0.05	13.0	0.10	<0.0002		<0.04	1.90	0.0004			26.00	0.057		<0.05		

APPENDIX C

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2671

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

FLOW: 400 GPM (estimated)

TEMP: 38°F
3°C

Date Rec. 5-3-82

Date Sampled 5-3-82

Sample ID Deer Creek Runoff Above the Mine

pH	8.0	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	510	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.87	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.18	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	289	mg/l			
Solids, Total Suspended	92.0	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2670

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

FLOW: 350 GPM (estimated)
TEMP: 46°F
8°C

Date Rec. 5-3-82

Date Sampled 5-3-82

Sample ID Deer Creek Runoff Below the Mine

pH	8.0	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	880	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.78	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.23	mg
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	520	mg/l			
Solids, Total Suspended	183	mg/l			
Sulfate		mg/l			

Respectfully submitted

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STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2729

Date Rec. 06-01-82

Date Sampled 06-01-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Deer Creek Runoff
Above Mine

pH	7.3	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	510	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	280	mg/l
Solids, Total Suspended	52.0	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.80	mg/l
Lead		mg/l
Manganese	0.16	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Temperature: 42 ~~C~~F

Flow; ~600GPM
Over the capacity of the flume

Respectfully submitted [signature]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2730

Date Rec. 06-01-82

Date Sampled 06-01-82

FOR Utah power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Deer Creek Runoff
Below Mine

pH	7.7	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	650	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	367	mg/l
Solids, Total Suspended	54.0	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.79	mg/l
Lead		mg/l
Manganese	0.19	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Temperature: 50 ØF

Flow: + 500 GPM
Over the capacity of the flume

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2900

FOR Utah Power & Light Co.
Mining & Exploration
Huntington, Utah 84528

FLOW: 411 GPM
TEMP: 44°F
7°C

Date Rec. 07-06-82

Sample ID Deer Creek, Above Mine

Date Sampled 07-06-82

pH	7.8	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	500	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.81	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.13	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	276	mg/l			
Solids, Total Suspended	9.0	mg/l			
Sulfate		mg/l			

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AUG 2 1982

MINING & EXPLORATION
FIELD OFFICE

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-290₁

FOR Utah Power & Light Co.
Mining & Exploration
Huntington, Utah 84528

FLOW: 385 GPM
TEMP: 60°F
16° C

Date Rec. 07-06-82

Date Sampled 07-06-82

Sample ID Deer Creek, Below Mine

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	720	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.13	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.20	mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	399	mg/l			
Solids, Total Suspended	3.5	mg/l			
Sulfate		mg/l			

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AUG 2 1982

MINING & EXPLORATION
FIELD OFFICE

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3015

Date Rec. 08-04-82

Date Sampled 08-03-82

FOR Utah Powre & Light Co.
Field Office
Huntington, utah 84528

FLOW: 181.3 GPM

TEMP: 50°F
10°C

Sample ID Deer Creek Runoff, above mine

C

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	510	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.76	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.12	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	281	mg/l			
Solids, Total Suspended	< 0.5	mg/l			
Sulfate		mg/l			

1.3 gpm
50°

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3016

FOR Utah Power & Light Co.
Field Office
Huntington, utah 84528

FLOW: 129.7 GPM
TEMP: 68°F
20°C

Date Rec. 08-04-82

Date Sampled 08-03-82

Sample ID Deer Crek Runoff, below mine

pH	8.0 Units	Arsenic	mg/l
Alkalinity, Total	mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	mg/l $CaCo_3$	Boron	mg/l
Calcium	mg/l	Cadmium	mg/l
Chloride	mg/l	Chromium	mg/l
Conductivity	900 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	1.00 mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	mg/l	Manganese	0.19 mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	mg/l	Zinc	mg/l
Sodium	mg/l		
Solids, Total Dissolved	497 mg/l		
Solids, Total Suspended	29.5 mg/l		
Sulfate	mg/l		

129.7 gpm
68°

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3143

Date Rec. 9-15-82

Date Sampled 9-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Runoff Above the MIne Flow, GPM 58.8 Temp. 42 F

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	490	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.19	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.06	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	308	mg/l			
Solids, Total Suspended	1.5	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3144

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 9-15-82

Date Sampled 9-15-82

Sample ID Deer Creek Runoff Below the Mine Flow, GPM 52.5 Temp. 52 F

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	1180	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.27	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.09	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	649	mg/l			
Solids, Total Suspended	4.5	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3248

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 10-11-82

Date Sampled 10-11-82

Sample ID Deer Creek Runoff Below the Mine Temp. 42 Flow,GPM 34.1

pH	8.3	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	1380	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.10	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.09	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	868	mg/l			
Solids, Total Suspended	2.0	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3247

Date Rec. 10-11-82

Date Sampled 10-11-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Runoff Above the Mine Temp. 42 Flow,GPM 34.1

pH	8.1	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	640	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.15	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.12	mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	359	mg/l			
Solids, Total Suspended	12.0	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

APPENDIX D

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105 - Historical

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1 Acidity	0.00000	22.00000	5.952
2 Alkalinity	240.00000	341.20000	286.368
3 Arsenic	0.00030	0.02000	0.001
4 BOD	0.90000	1.90000	1.214
5 Bicarbonate	278.16000	416.26000	348.063
6 Cadium	0.00100	0.02000	0.003
7 Calcium	44.00000	108.00000	80.581
8 Chloride	1.47000	22.00000	12.544
9 Fluoride	0.10000	0.31000	0.183
10 Iron	0.06500	15.90000	2.095

PROCESSING COMPLETED SUCCESSFULLY ***

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1 Lead	0.00100	0.05000	0.010
2 Fecal Coliform	0.00000	170.00000	20.047
3 Total Coliform	0.00000	1300.00000	178.666
4 Magnesium	2.40000	52.80000	32.534
5 Manganese	0.00700	1.31000	0.139
6 Nitrite	0.00200	0.05000	0.009
7 Oil & Grease	0.50000	358.00000	18.563
8 Ortho Phosphorus	0.00100	0.12000	0.040
9 Potassium	1.48000	21.00000	5.124
10 Selenium	0.00030	0.60000	0.028

SPECIAL PROCESSING COMPLETED SUCCESSFULLY ***

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1 Silica	6.70000	12.20000	8.020
2 Sodium	12.40000	60.00000	29.160
3 Sulfate	42.00000	238.70000	103.593
4 TSS	0.50000	1298.00000	88.363
5 TDS	322.00000	508.00000	392.000
6 TKN	0.01000	0.67000	0.175
7 Zinc	0.00100	0.21400	0.034
8 pH	7.10000	8.30000	7.785
9 0	0.00000	0.00000	0.000
10 0	0.00000	0.00000	0.000

*** SPECIAL PROCESSING COMPLETED SUCCESSFULLY ***

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105 - 1982

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	1.00000	1.00000	1.000
2. Alkalinity	292.00000	326.00000	308.500
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.00000	1.50000	1.175
5. Bicarbonate	356.00000	398.00000	376.500
6. Cadium	0.00500	0.00500	0.005
7. Calcium	80.00000	97.00000	88.550
8. Chloride	6.50000	13.80000	10.925
9. Fluoride	0.16000	0.31000	0.220
10. Iron	0.17000	15.90000	7.070

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.025
2. Fecal Coliform	2.00000	2.00000	2.000
3. Total Coliform	2.00000	2.00000	2.000
4. Magnesium	36.60000	49.00000	42.775
5. Manganese	0.08000	1.31000	0.617
6. Nitrite	0.00200	0.01000	0.006
7. Oil & Grease	0.50000	2.80000	1.075
8. Ortho Phosphorus	0.03000	0.05400	0.042
9. Potassium	5.00000	21.00000	12.750
10. Selenium	0.00030	0.00030	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	7.30000	10.20000	9.125
2. Sodium	21.50000	39.00000	29.875
3. Sulfate	132.00000	190.00000	156.500
4. TSS	4.50000	1298.00000	407.375
5. TDS	355.00000	433.00000	392.750
6. TKN	0.10000	0.20000	0.167
7. Zinc	0.03100	0.04700	0.038
8. pH	7.20000	8.20000	7.850
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231 - 1981

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	1.00000	0.750
2. Alkalinity	259.40000	314.00000	279.725
3. Arsenic	0.00030	0.00100	0.000
4. BOD	0.90000	1.90000	1.425
5. Bicarbonate	316.50000	383.00000	341.275
6. Cadium	0.00500	0.00500	0.005
7. Calcium	66.10000	107.00000	90.150
8. Chloride	11.80000	15.40000	13.750
9. Fluoride	0.21000	0.23000	0.217
10. Iron	0.11000	9.00000	2.570

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.013
2. Fecal Coliform	2.00000	3.00000	2.250
3. Total Coliform	2.00000	9.00000	3.750
4. Magnesium	25.50000	45.00000	37.475
5. Manganese	0.03000	0.13000	0.082
6. Nitrite	0.00200	0.00200	0.002
7. Oil & Grease	0.50000	1.60000	0.775
8. Ortho Phosphorus	0.00200	0.00500	0.002
9. Potassium	5.00000	10.00000	7.500
10. Selenium	0.00030	0.00200	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.90000	12.20000	8.725
2. Sodium	21.00000	54.40000	38.725
3. Sulfate	119.00000	238.70000	184.200
4. TSS	1.00000	77.00000	25.000
5. TDS	347.00000	472.00000	399.500
6. TKN	0.14000	0.25000	0.196
7. Zinc	0.02200	0.21400	0.075
8. pH	8.00000	8.30000	8.150
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231 - 1980

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	18.00000	5.333
2. Alkalinity	240.00000	341.20000	291.022
3. Arsenic	0.00100	0.02000	0.003
4. BOD	1.00000	1.90000	1.225
5. Bicarbonate	278.16000	416.26000	351.793
6. Cadium	0.00100	0.02000	0.003
7. Calcium	44.00000	108.00000	65.733
8. Chloride	1.47000	22.00000	14.141
9. Fluoride	0.10000	0.23000	0.162
10. Iron	0.11000	3.00000	0.760

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.007
2. Fecal Coliform	0.00000	31.00000	5.375
3. Total Coliform	0.00000	460.00000	95.000
4. Magnesium	20.00000	52.80000	37.088
5. Manganese	0.01000	0.06000	0.022
6. Nitrite	0.01000	0.05000	0.014
7. Oil & Grease	0.60000	358.00000	43.444
8. Ortho Phosphorus	0.00100	0.10000	0.036
9. Potassium	1.48000	3.50000	2.540
10. Selenium	0.00100	0.60000	0.067

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.70000	9.10000	7.410
2. Sodium	12.40000	60.00000	28.433
3. Sulfate	42.00000	124.00000	72.828
4. TSS	0.50000	54.00000	19.944
5. TDS	322.00000	508.00000	395.777
6. TKN	0.01000	0.67000	0.211
7. Zinc	0.00100	0.14000	0.023
8. pH	7.10000	8.10000	7.808
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231 - 1979

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	10.00000	22.00000	17.500
2. Alkalinity	248.00000	280.00000	265.600
3. Arsenic	0.00100	0.00100	0.001
4. BOD	1.00000	1.30000	1.060
5. Bicarbonate	302.56000	341.60000	324.032
6. Cadium	0.00100	0.00100	0.001
7. Calcium	63.20000	106.40000	93.280
8. Chloride	6.00000	14.00000	10.000
9. Fluoride	0.10000	0.23000	0.162
10. Iron	0.06500	0.26000	0.139

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.00200	0.001
2. Fecal Coliform	2.00000	170.00000	72.200
3. Total Coliform	33.00000	1300.00000	593.800
4. Magnesium	2.40000	36.00000	12.192
5. Manganese	0.00700	0.01700	0.011
6. Nitrite	0.01000	0.01000	0.010
7. Oil & Grease	1.00000	4.20000	2.000
8. Ortho Phosphorus	0.00100	0.12000	0.076
9. Potassium	1.50000	1.98400	1.774
10. Selenium	0.00100	0.01000	0.003

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW01

LOCATION CCW01 COTTONWOOD CREEK ABOVE TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.70000	10.00000	7.670
2. Sodium	18.89000	25.00000	20.517
3. Sulfate	50.00000	56.80000	52.160
4. TSS	2.00000	21.00000	7.000
5. TDS	350.00000	460.00000	378.600
6. TKN	0.01000	0.25000	0.085
7. Zinc	0.01200	0.03400	0.019
8. pH	7.20000	7.70000	7.400
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105 - Historical

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	22.00000	5.623
2. Alkalinity	221.40000	375.00000	280.195
3. Arsenic	0.00030	0.20000	0.010
4. BOD	1.00000	20.00000	3.133
5. Bicarbonate	268.40000	458.00000	340.528
6. Cadium	0.00100	0.02000	0.003
7. Calcium	42.40000	123.20000	81.579
8. Chloride	1.48000	32.00000	13.044
9. Fluoride	0.11000	0.40000	0.194
10. Iron	0.11000	16.20000	2.519

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.010
2. Fecal Coliform	0.00000	49.00000	7.727
3. Total Coliform	2.00000	490.00000	125.272
4. Magnesium	2.40000	51.36000	32.786
5. Manganese	0.00600	1.37000	0.182
6. Nitrite	0.00200	0.25000	0.022
7. Oil & Grease	0.50000	9.00000	2.059
8. Ortho Phosphorus	0.00100	0.14000	0.036
9. Potassium	1.50000	25.60000	7.848
10. Selenium	0.00020	0.30000	0.014

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.50000	17.33000	8.301
2. Sodium	11.85000	53.10000	28.560
3. Sulfate	26.00000	246.90000	111.310
4. TSS	1.00000	1004.00000	72.090
5. TDS	290.00000	700.00000	397.727
6. TKN	0.01000	0.83000	0.244
7. Zinc	0.00100	0.25000	0.051
8. pH	7.12000	8.30000	7.868
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105 - 1982

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	1.00000	1.00000	1.000
2. Alkalinity	292.00000	375.00000	321.750
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.20000	7.00000	3.550
5. Bicarbonate	356.00000	458.00000	392.750
6. Cadium	0.00500	0.00500	0.005
7. Calcium	79.00000	120.00000	93.375
8. Chloride	6.80000	32.00000	16.575
9. Fluoride	0.16200	0.25000	0.200
10. Iron	0.47000	16.20000	7.267

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.025
2. Fecal Coliform	2.00000	2.00000	2.000
3. Total Coliform	2.00000	5.00000	2.750
4. Magnesium	30.00000	39.00000	33.775
5. Manganese	0.11000	1.37000	0.690
6. Nitrite	0.00200	0.01000	0.006
7. Oil & Grease	0.50000	0.50000	0.500
8. Ortho Phosphorus	0.00200	0.04900	0.034
9. Potassium	4.70000	21.00000	12.650
10. Selenium	0.00030	0.00050	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	7.30000	9.00000	8.300
2. Sodium	22.30000	46.00000	33.575
3. Sulfate	90.50000	187.00000	146.375
4. TSS	5.50000	1004.00000	270.875
5. TDS	290.00000	407.00000	360.000
6. TKN	0.16000	0.20000	0.187
7. Zinc	0.03000	0.03900	0.036
8. pH	7.30000	8.20000	7.900
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231 - 1981

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	1.00000	0.750
2. Alkalinity	256.50000	323.00000	281.475
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.20000	20.00000	8.500
5. Bicarbonate	312.90000	394.00000	343.300
6. Cadium	0.00500	0.00600	0.005
7. Calcium	75.60000	99.00000	88.150
8. Chloride	11.10000	17.70000	14.800
9. Fluoride	0.20000	0.23000	0.217
10. Iron	0.30000	15.00000	4.112

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.013
2. Fecal Coliform	2.00000	4.00000	2.500
3. Total Coliform	21.00000	64.00000	34.750
4. Magnesium	38.80000	49.00000	43.200
5. Manganese	0.03000	0.12000	0.080
6. Nitrite	0.00200	0.00200	0.002
7. Oil & Grease	0.50000	1.20000	0.700
8. Ortho Phosphorus	0.00200	0.02000	0.006
9. Potassium	2.80000	5.50000	4.600
10. Selenium	0.00020	0.00050	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	7.50000	11.20000	8.575
2. Sodium	21.50000	44.70000	30.850
3. Sulfate	120.00000	246.90000	175.150
4. TSS	10.00000	95.00000	48.000
5. TDS	347.00000	466.00000	386.500
6. TKN	0.20000	0.22000	0.206
7. Zinc	0.01000	0.25000	0.081
8. pH	7.90000	8.30000	8.125
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231 - 1980

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	16.00000	5.887
2. Alkalinity	221.40000	312.00000	269.675
3. Arsenic	0.00100	0.20000	0.026
4. BOD	1.00000	3.80000	1.571
5. Bicarbonate	268.40000	380.64000	325.343
6. Cadium	0.00100	0.02000	0.004
7. Calcium	42.40000	102.00000	64.681
8. Chloride	1.48000	20.00000	13.185
9. Fluoride	0.11000	0.40000	0.222
10. Iron	0.25000	3.00000	1.021

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.009
2. Fecal Coliform	0.00000	49.00000	7.875
3. Total Coliform	22.00000	490.00000	175.500
4. Magnesium	20.00000	51.36000	39.555
5. Manganese	0.01200	0.25000	0.105
6. Nitrite	0.01000	0.25000	0.050
7. Oil & Grease	0.50000	5.60000	2.912
8. Ortho Phosphorus	0.00100	0.07500	0.023
9. Potassium	1.50000	25.60000	11.333
10. Selenium	0.00100	0.30000	0.038

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.70000	17.33000	8.291
2. Sodium	12.30000	53.10000	32.625
3. Sulfate	26.00000	188.00000	107.216
4. TSS	5.00000	70.00000	31.312
5. TDS	295.00000	700.00000	454.625
6. TKN	0.01000	0.83000	0.391
7. Zinc	0.00100	0.16000	0.066
8. pH	7.12000	8.05000	7.840
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231 - 1979

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	4.00000	22.00000	12.800
2. Alkalinity	252.00000	288.00000	265.666
3. Arsenic	0.00100	0.00100	0.001
4. BOD	1.00000	1.60000	1.100
5. Bicarbonate	307.44000	351.36000	324.113
6. Cadium	0.00100	0.00100	0.001
7. Calcium	58.40000	123.20000	91.866
8. Chloride	6.00000	12.00000	9.333
9. Fluoride	0.11000	0.16000	0.138
10. Iron	0.11000	0.75000	0.290

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.00100	0.001
2. Fecal Coliform	2.00000	33.00000	14.833
3. Total Coliform	23.00000	460.00000	200.333
4. Magnesium	2.40000	38.88000	16.160
5. Manganese	0.00600	0.02000	0.013
6. Nitrite	0.01000	0.01000	0.010
7. Oil & Grease	1.00000	9.00000	2.866
8. Ortho Phosphorus	0.03000	0.14000	0.071
9. Potassium	1.75900	3.65000	2.166
10. Selenium	0.00100	0.01000	0.002

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW02

LOCATION CCW02 COTTONWOOD CREEK BELOW TRAIL MOUNTAIN MINE
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.50000	10.00000	8.133
2. Sodium	11.85000	19.53000	16.214
3. Sulfate	48.00000	55.00000	50.833
4. TSS	1.00000	24.00000	10.000
5. TDS	320.00000	378.00000	354.500
6. TKN	0.01000	0.31000	0.078
7. Zinc	0.00100	0.03500	0.021
8. pH	7.40000	8.10000	7.713
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 750101 END DATE 830105 - Historical

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	18.00000	4.819
2. Alkalinity	194.00000	338.80000	268.663
3. Arsenic	0.00030	0.20000	0.009
4. BOD	1.00000	2.90000	1.419
5. Bicarbonate	207.44000	413.34000	320.422
6. Cadium	0.00100	0.02000	0.003
7. Calcium	41.60000	257.00000	84.768
8. Chloride	1.48000	597.00000	38.340
9. Fluoride	0.10000	0.60000	0.192
10. Iron	0.08000	20.30000	3.040

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.010
2. Fecal Coliform	0.00000	110.00000	17.909
3. Total Coliform	2.00000	2300.00000	379.636
4. Magnesium	2.00000	61.20000	33.187
5. Manganese	0.00100	7.97000	0.550
6. Nitrite	0.00200	0.05000	0.010
7. Oil & Grease	0.01000	180.80000	10.055
8. Ortho Phosphorus	0.00100	0.16000	0.045
9. Potassium	0.05000	106.00000	9.664
10. Selenium	0.00020	0.20000	0.011

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	4.40000	10.50000	7.755
2. Sodium	12.50000	236.00000	35.777
3. Sulfate	24.00000	384.00000	111.513
4. TSS	1.00000	20000.00000	991.090
5. TDS	289.00000	1685.00000	430.659
6. TKN	0.01000	0.83000	0.148
7. Zinc	0.00100	0.22800	0.058
8. pH	7.30000	8.50000	7.894
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 820101 END DATE 830105 - 1982

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	1.00000	1.00000	1.000
2. Alkalinity	194.00000	317.00000	269.250
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.60000	2.00000	1.800
5. Bicarbonate	237.00000	387.00000	328.500
6. Cadium	0.00500	0.00500	0.005
7. Calcium	81.00000	257.00000	133.250
8. Chloride	6.80000	597.00000	157.900
9. Fluoride	0.15800	0.60000	0.289
10. Iron	0.10000	20.30000	9.132

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.025
2. Fecal Coliform	2.00000	2.00000	2.000
3. Total Coliform	2.00000	4.00000	2.500
4. Magnesium	26.60000	40.50000	32.800
5. Manganese	0.06000	7.97000	2.772
6. Nitrite	0.00200	0.01000	0.006
7. Oil & Grease	0.50000	3.20000	1.275
8. Ortho Phosphorus	0.04900	0.05800	0.052
9. Potassium	4.30000	106.00000	36.325
10. Selenium	0.00030	0.00030	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	7.40000	8.50000	7.850
2. Sodium	20.00000	236.00000	80.750
3. Sulfate	94.00000	384.00000	206.250
4. TSS	14.00000	20000.00000	5129.125
5. TDS	289.00000	1685.00000	694.500
6. TKN	0.16000	0.20000	0.190
7. Zinc	0.06200	0.07300	0.068
8. pH	7.30000	8.20000	7.850
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 810101 END DATE 811231 - 1981

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	1.00000	0.750
2. Alkalinity	226.00000	334.00000	269.200
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.30000	2.90000	2.075
5. Bicarbonate	244.00000	402.00000	319.100
6. Cadium	0.00500	0.00500	0.005
7. Calcium	68.50000	113.00000	85.175
8. Chloride	11.00000	16.80000	14.600
9. Fluoride	0.19000	0.34000	0.242
10. Iron	0.10000	18.00000	4.877

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.013
2. Fecal Coliform	2.00000	9.00000	3.750
3. Total Coliform	14.00000	150.00000	50.250
4. Magnesium	26.70000	52.30000	40.625
5. Manganese	0.02000	0.12000	0.077
6. Nitrite	0.00200	0.00200	0.002
7. Oil & Grease	0.50000	5.20000	1.675
8. Ortho Phosphorus	0.00200	0.00600	0.003
9. Potassium	1.90000	5.00000	3.575
10. Selenium	0.00020	0.00090	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	4.40000	10.40000	8.150
2. Sodium	21.00000	40.70000	31.125
3. Sulfate	156.40000	165.00000	162.200
4. TSS	4.00000	129.00000	46.000
5. TDS	345.00000	389.50000	370.875
6. TKN	0.07000	0.10000	0.090
7. Zinc	0.05100	0.22800	0.098
8. pH	8.00000	8.50000	8.300
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 800101 END DATE 801231 - 1980

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	10.00000	3.275
2. Alkalinity	228.00000	338.80000	283.350
3. Arsenic	0.00100	0.20000	0.025
4. BOD	1.00000	1.50000	1.085
5. Bicarbonate	263.52000	413.34000	342.637
6. Cadium	0.00100	0.02000	0.003
7. Calcium	41.60000	108.00000	62.900
8. Chloride	1.48000	22.00000	11.935
9. Fluoride	0.10000	0.21000	0.165
10. Iron	0.22000	3.00000	1.078

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.007
2. Fecal Coliform	0.00000	49.00000	12.875
3. Total Coliform	43.00000	490.00000	246.375
4. Magnesium	20.00000	61.20000	42.543
5. Manganese	0.00100	0.16000	0.073
6. Nitrite	0.01000	0.05000	0.017
7. Oil & Grease	0.01000	180.80000	25.276
8. Ortho Phosphorus	0.00100	0.08000	0.031
9. Potassium	0.05000	12.50000	5.193
10. Selenium	0.00100	0.20000	0.034

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.65000	8.77000	7.233
2. Sodium	12.50000	55.00000	25.725
3. Sulfate	24.00000	130.00000	84.436
4. TSS	3.00000	642.00000	125.187
5. TDS	300.00000	496.00000	401.500
6. TKN	0.01000	0.83000	0.207
7. Zinc	0.00100	0.16600	0.059
8. pH	7.60000	8.10000	7.912
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 790101 END DATE 791231 - 1979

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	8.00000	18.00000	13.600
2. Alkalinity	230.00000	270.00000	248.333
3. Arsenic	0.00100	0.00100	0.001
4. BOD	1.00000	1.70000	1.116
5. Bicarbonate	207.44000	329.40000	286.300
6. Cadium	0.00100	0.00100	0.001
7. Calcium	47.20000	97.60000	81.333
8. Chloride	6.00000	12.00000	9.666
9. Fluoride	0.11000	0.16000	0.130
10. Iron	0.08000	1.08000	0.370

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.00100	0.001
2. Fecal Coliform	11.00000	110.00000	44.666
3. Total Coliform	170.00000	2300.00000	1028.333
4. Magnesium	2.00000	36.48000	16.013
5. Manganese	0.00500	0.04100	0.020
6. Nitrite	0.01000	0.01000	0.010
7. Oil & Grease	0.80000	2.20000	1.200
8. Ortho Phosphorus	0.00100	0.16000	0.085
9. Potassium	1.82300	2.19000	1.909
10. Selenium	0.00100	0.01000	0.002

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW03

LOCATION CCW03 COTTONWOOD CANYON - U.S.G.S. FLUME
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.50000	10.50000	8.125
2. Sodium	14.75000	29.00000	19.606
3. Sulfate	45.00000	56.00000	50.666
4. TSS	1.00000	52.00000	17.000
5. TDS	310.00000	344.00000	333.500
6. TKN	0.01000	0.20000	0.056
7. Zinc	0.00500	0.03900	0.022
8. pH	7.38000	7.90000	7.630
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 750101 END DATE 830105 - Historical

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	18.00000	4.671
2. Alkalinity	242.00000	352.80000	288.018
3. Arsenic	0.00030	0.20000	0.009
4. BOD	1.00000	3.90000	1.800
5. Bicarbonate	273.00000	430.40000	344.550
6. Cadium	0.00100	0.02000	0.003
7. Calcium	42.40000	120.80000	86.518
8. Chloride	1.67000	33.10000	14.757
9. Fluoride	0.10000	0.34000	0.181
10. Iron	0.04000	19.00000	2.771

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.010
2. Fecal Coliform	0.00000	94.00000	13.045
3. Total Coliform	2.00000	1800.00000	378.772
4. Magnesium	2.40000	65.00000	33.874
5. Manganese	0.00100	2.48000	0.250
6. Nitrite	0.00200	0.05000	0.010
7. Oil & Grease	0.50000	114.00000	6.859
8. Ortho Phosphorus	0.00100	2.00000	0.148
9. Potassium	1.62000	23.00000	5.506
10. Selenium	0.00020	0.20000	0.010

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 750101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.50000	11.00000	8.300
2. Sodium	14.00000	50.30000	30.075
3. Sulfate	37.00000	264.60000	125.750
4. TSS	1.00000	5024.00000	355.227
5. TDS	40.00000	660.00000	401.272
6. TKN	0.01000	1.00000	0.194
7. Zinc	0.00100	0.15600	0.046
8. pH	7.20000	8.50000	7.943
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 820101 END DATE 830105 - 1982

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	1.00000	1.00000	1.000
2. Alkalinity	252.00000	352.00000	305.500
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.70000	2.70000	2.075
5. Bicarbonate	307.00000	429.00000	372.500
6. Cadium	0.00500	0.00500	0.005
7. Calcium	100.00000	120.00000	111.750
8. Chloride	7.40000	17.20000	13.750
9. Fluoride	0.15700	0.34000	0.219
10. Iron	0.16000	16.30000	7.415

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.025
2. Fecal Coliform	2.00000	2.00000	2.000
3. Total Coliform	2.00000	2.00000	2.000
4. Magnesium	18.60000	43.00000	28.400
5. Manganese	0.07000	2.48000	1.145
6. Nitrite	0.00200	0.01000	0.006
7. Oil & Grease	0.50000	0.50000	0.500
8. Ortho Phosphorus	0.05000	0.20300	0.104
9. Potassium	5.00000	23.00000	12.625
10. Selenium	0.00030	0.00030	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 820101 END DATE 830105

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	8.80000	9.50000	9.125
2. Sodium	30.50000	49.00000	38.125
3. Sulfate	135.00000	210.00000	177.250
4. TSS	29.00000	5024.00000	1420.500
5. TDS	315.00000	426.00000	388.250
6. TKN	0.20000	0.30000	0.250
7. Zinc	0.03200	0.04700	0.040
8. pH	7.30000	8.20000	7.900
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 810101 END DATE 811231 - 1981

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	1.00000	0.750
2. Alkalinity	242.00000	352.80000	292.575
3. Arsenic	0.00030	0.00100	0.000
4. BOD	1.50000	3.90000	2.875
5. Bicarbonate	273.00000	430.40000	349.325
6. Cadium	0.00500	0.00500	0.005
7. Calcium	71.00000	105.00000	90.550
8. Chloride	11.90000	33.10000	20.500
9. Fluoride	0.19000	0.31000	0.240
10. Iron	0.17000	19.00000	5.057

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.013
2. Fecal Coliform	2.00000	4.00000	2.500
3. Total Coliform	2.00000	93.00000	25.250
4. Magnesium	29.20000	65.00000	48.225
5. Manganese	0.02000	0.12000	0.067
6. Nitrite	0.00200	0.00200	0.002
7. Oil & Grease	0.50000	2.40000	1.150
8. Ortho Phosphorus	0.00200	0.01100	0.005
9. Potassium	4.00000	6.00000	4.875
10. Selenium	0.00020	0.00130	0.000

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 810101 END DATE 811231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	7.60000	10.70000	8.975
2. Sodium	26.50000	50.30000	41.700
3. Sulfate	183.20000	264.60000	207.950
4. TSS	4.00000	65.00000	23.500
5. TDS	396.00000	660.00000	484.250
6. TKN	0.22000	0.30000	0.270
7. Zinc	0.02600	0.15600	0.076
8. pH	8.00000	8.50000	8.300
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 800101 END DATE 801231 - 1980

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	0.00000	12.00000	4.012
2. Alkalinity	244.00000	352.10000	288.762
3. Arsenic	0.00100	0.20000	0.025
4. BOD	1.00000	3.50000	1.357
5. Bicarbonate	278.16000	429.56000	343.750
6. Cadium	0.00100	0.02000	0.003
7. Calcium	42.40000	103.00000	66.875
8. Chloride	1.67000	20.00000	12.708
9. Fluoride	0.10000	0.22000	0.160
10. Iron	0.16600	3.43000	1.198

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.05000	0.007
2. Fecal Coliform	0.00000	21.00000	4.875
3. Total Coliform	4.00000	1100.00000	408.000
4. Magnesium	21.00000	56.16000	40.151
5. Manganese	0.00100	0.16600	0.074
6. Nitrite	0.01000	0.05000	0.016
7. Oil & Grease	0.50000	114.00000	16.487
8. Ortho Phosphorus	0.00100	0.28000	0.053
9. Potassium	1.62000	8.95000	4.605
10. Selenium	0.00100	0.20000	0.026

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 800101 END DATE 801231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.90000	8.56000	7.488
2. Sodium	14.90000	48.00000	24.887
3. Sulfate	37.00000	139.00000	94.838
4. TSS	4.00000	1364.00000	245.500
5. TDS	40.00000	500.00000	372.875
6. TKN	0.01000	1.00000	0.237
7. Zinc	0.00100	0.12700	0.055
8. pH	7.20000	8.20000	7.888
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 790101 END DATE 791231 - 1979

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Acidity	1.00000	18.00000	11.800
2. Alkalinity	244.00000	294.00000	272.333
3. Arsenic	0.00100	0.00100	0.001
4. BOD	1.00000	2.40000	1.416
5. Bicarbonate	297.68000	346.48000	323.800
6. Cadium	0.00100	0.00100	0.001
7. Calcium	56.00000	120.80000	93.200
8. Chloride	12.00000	24.00000	14.333
9. Fluoride	0.11000	0.19000	0.146
10. Iron	0.04000	0.59000	0.250

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V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Lead	0.00100	0.00100	0.001
2. Fecal Coliform	2.00000	94.00000	38.333
3. Total Coliform	170.00000	1800.00000	826.666
4. Magnesium	2.40000	46.08000	19.586
5. Manganese	0.00500	0.01900	0.010
6. Nitrite	0.01000	0.01000	0.010
7. Oil & Grease	1.00000	6.20000	2.066
8. Ortho Phosphorus	0.03000	2.00000	0.385
9. Potassium	2.06100	2.80400	2.383
10. Selenium	0.00100	0.01000	0.002

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E N V / E N G W A T E R Q U A L I T Y
V A L U E A N A L Y S I S

OPTION TRK 5AP KEY CCW04

LOCATION CCW04 COTTONWOOD CREEK ABOVE STRAIGHT CANYON FORK
BEGIN DATE 790101 END DATE 791231

PARAMETERS	MINIMUM	MAXIMUM	MEAN
1. Silica	6.50000	11.00000	8.383
2. Sodium	14.00000	32.31000	22.638
3. Sulfate	60.00000	100.00000	77.833
4. TSS	1.00000	34.00000	12.500
5. TDS	366.00000	462.00000	392.500
6. TKN	0.01000	0.10000	0.034
7. Zinc	0.00500	0.03800	0.017
8. pH	7.40000	8.40000	7.806
9. 0	0.00000	0.00000	0.000
10. 0	0.00000	0.00000	0.000

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, UT 84528 801-653-2314
HUNTINGTON UTAH 84528

SAMPLE ID: COTTONWOOD CR. ABOVE MINE 2600 — LAB NUMBER W- 2600

DATE SAMPLED: 4. 7. 82 — DATE REC'D: 4. 7. 82

REPORT DATE: 4. 21. 82 — SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	7. 9	UNITS
BOD-5	1. 0	MG/L
TSS	14. 0	MG/L
TKN	0. 2	MG/L
OIL/GREASE	2. 8	MG/L
T. COLIFORM	<2	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	97. 0	MG/L
MAGNESIUM	38. 50	MG/L
POTASSIUM	5. 00	MG/L
SODIUM	21. 50	MG/L
TDS	397. 0	MG/L
BICARB. ALK	294. 0	MG/L CACO3 (HCO_3 359 mg/l)
CHLORIDE	13. 2	MG/L
FLOURIDE	0. 25	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 054	MG/L
SULFATE	154. 0	MG/L
SILICA	7. 3	MG/L
T. ALK	294. 0	MG/L CACO3
Acidity	<1.0	mg/l CACO3

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 17	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 08	MG/L
SELENIUM	<0. 0003	MG/L
ZINC	0. 047	MG/L

T. CATION 9. 1 MEQ/L — T. ANION 9. 5 MEQ/L

TDS/COND 0. 778 — TDS BAL 397: 324

RAY A. SIM, MANAGER

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UTAH POWER & LIGHT CO.
M&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: COTTONWOOD CR. BELOW MINE 2601 — LAB NUMBER W-2601
DATE SAMPLED: 4. 7. 82 — DATE REC'D: 4. 7. 82
REPORT DATE: 4. 21. 82 — SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8.0	UNITS
BOD-5	7.0	MG/L
TSS	30.0	MG/L
TKN	0.2	MG/L
OIL & GREASE	<0.5	MG/L
T. COLI	5	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	120.0	MG/L
MAGNESIUM	30.00	MG/L
POTASSIUM	4.90	MG/L
SODIUM	23.00	MG/L
TDS	393.0	MG/L
BICARB. ALK	292.0	MG/L CACO3 (HCO_3 356 mg/l)
CHLORIDE	13.9	MG/L
FLOURIDE	0.20	MG/L
NO2-N	<0.002	MG/L
ORHTO-PHOS.	<0.002	MG/L
SULFATE	187.0	MG/L
SILICA	7.3	MG/L
T. ALK	292.0	MG/L CACO3
Acidity	<1.0	mg/l CACO3

METALLIC ANALYSIS

ARSENIC	<0.0003	MG/L
CADMIUM	<0.005	MG/L
IRON	0.47	MG/L
LEAD	<0.001	MG/L
MANGANESE	0.16	MG/L
SELENIUM	0.0004	MG/L
ZINC	0.030	MG/L

T. CATION 9.6 MEQ/L — T. ANION 10.1 MEQ/L
TDS/COND 0.771 — TDS BAL 393 : 374

STANDARD LABORATORIES, INC.
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UTAH POWER & LIGHT CO.
M&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: COTTONWOOD CR. USGS FLUME 2602 — LAB NUMBER W-2602
DATE SAMPLED: 4. 7. 82 — DATE REC'D: 4. 7. 82
REPORT DATE: 4. 21. 82 — SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8.1	UNITS
BOD-5	1.9	MG/L
TSS	14.0	MG/L
TKN	0.2	MG/L
OIL/GREASE	3.2	MG/L
T. COLI	4	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	100.0	MG/L
MAGNESIUM	40.50	MG/L
POTASSIUM	5.00	MG/L
SODIUM	27.00	MG/L
TDS	401.0	MG/L
BICARB. ALK	278.0	MG/L CACO3 (HCO_3 339 mg/l)
CHLORIDE	14.3	MG/L
FLOURIDE	0.18	MG/L
NO2-N	<0.002	MG/L
O. PHOS	0.050	MG/L
SULFATE	182.0	MG/L
SILICA	7.4	MG/L
T. ALK	278.0	MG/L CACO3
Acidity	<1.0	mg/l CACO3

METALLIC ANALYSIS

ARSENIC	<0.0003	MG/L
CADMIUM	<0.005	MG/L
IRON	0.13	MG/L
LEAD	<0.001	MG/L
MANGANESE	0.06	MG/L
SELENIUM	<0.0003	MG/L
ZINC	0.062	MG/L

T. CATION 9.6 MEQ/L — T. ANION 9.8 MEQ/L
TDS/COND 0.786 — TDS BAL 401: 364

REV. FIELD MANAGER

STANDARD LABORATORIES, INC.
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UTAH POWER & LIGHT CO.
M&E FIELD OFFICE
TAH 84528

SAMPLE ID: COTTONWOOD CR. ABV. STR. CANYON 2603 LAB NUMBER W- 2603
DATE SAMPLED: 4. 7. 82 DATE REC'D: 4. 7. 82
REPORT DATE: 4. 21. 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8. 0	UNITS
BOD-5	2. 7	MG/L
TSS	236. 0	MG/L
TKN	0. 3	MG/L
OIL & GREASE	<0. 5	MG/L
T. COLIFORM	<2	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	112. 0	MG/L
MAGNESIUM	43. 00	MG/L
POTASSIUM	5. 50	MG/L
SODIUM	30. 50	MG/L
TDS	400. 0	MG/L
BICARB. ALK	352. 0	MG/L CACO3 429 as CaCO3
CHLORIDE	14. 8	MG/L
FLOURIDE	0. 18	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 203	MG/L
SULFATE	169. 0	MG/L
SILICA	8. 8	MG/L
T. ALK	352. 0	MG/L CACO3
Acidity	<1.0	mg/l CACO3

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 20	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 10	MG/L
SELENIUM	<0. 0003	MG/L
ZINC	0. 032	MG/L

T. CATION 10. 6 MEQ/L T. ANION 11. 0 MEQ/L
TDS/COND 0. 784 TDS BAL 400: 369

RAY A. SIM, MANAGER

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UTAH POWER & LIGHT CO.
P. O. BOX 899
SALT LAKE CIYT UTAH 84110

SAMPLE ID: COTTON WOOD CRK ABOVE TRAIL MTN MINE
LAB NUMBER W-2734
DATE SAMPLED: 06. 01. 82 DATE REC'D: 06. 02. 82
REPORT DATE: 06. 17 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8. 2	UNITS
BOD-5	1. 5	MG/L
TSS	313. 0	MG/L
TKN	0. 2	MG/L
OIL & GREASE	<0. 5	MG/L
T. COLIFORM	<2	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	96. 2	MG/L
MAGNESIUM	36. 60	MG/L
POTASSIUM	5. 00	MG/L
SODIUM	22. 00	MG/L
TDS	355. 0	MG/L
BICARB. ALK	393. 0	MG/L ~~CACO3~~ HCO3
CHLORIDE	6. 5	MG/L
FLOURIDE	0. 31	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 050	MG/L
SULFATE	132. 0	MG/L
SILICA	9. 0	MG/L
T. ALK	322. 0	MG/L CACO3

322 $CaCO_3$

Acidity < 1.0 mg/l

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 21	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 09	MG/L
SELENIUM	<0. 0003	MG/L
ZINC	0. 040	MG/L

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
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UTAH POWER & LIGHT CO.
P. O BOX 899
SALT LAKE CIYT UTAH 84110

SAMPLE ID: COTTONWOOD CRK BELOW TRAIL MT MINE
LAB NUMBER W-2735
DATE SAMPLED: 06. 01. 82 DATE REC'D: 06. 02. 82
REPORT DATE: 06. 17. 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8. 2	UNITS
BOD-5	4. 1	MG/L
TSS	44. 0	MG/L
TKN	0. 2	MG/L
OIL & GREASE	<0. 5	MG/L
T. COLIFORM	<2	MPN/100ML
F COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	94. 5	MG/L
MAGNESIUM	30. 10	MG/L
POTASSIUM	4. 70	MG/L
SODIUM	22. 30	MG/L
TDS	290. 0	MG/L
BICARB. ALK	387. 0	MG/L HCO3 ~~CACO3~~
CHLORIDE	6. 8	MG/L
FLOURIDE	0. 25	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 048	MG/L
SULFATE	90. 5	MG/L
SILICA	7. 9	MG/L
T. ALK	317. 0	MG/L CACO3

Acidity < 1.0 mg/l

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 50	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 11	MG/L
SELENIUM	0. 0005	MG/L
ZINC	0. 037	MG/L

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

UTAH POWER & LIGHT CO.
P. O. BOX 899
SALT LAKE CIYT UTAH 84110

SAMPLE ID: COTTONWOOD CREEK USGS FLUME LAB NUMBER W- 2736
2736
DATE SAMPLED: 06. 01. 82 DATE REC'D: 06. 02. 82
REPORT DATE: 06. 17. 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8. 2	UNITS
BOD-5	2. 0	MG/L
TSS	480. 0	MG/L
TKN	0. 2	MG/L
OIL/GREASE	0. 9	MG/L
T. COLIFORM	<2	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	95. 0	MG/L
MAGNESIUM	27. 10	MG/L
POTASSIUM	4. 30	MG/L
SODIUM	20. 00	MG/L
TDS	289. 0	MG/L
BICARB. ALK	387. 0	MG/L HCO3 ~~CACO3~~
CHLORIDE	6. 0	MG/L
FLOURIDE	0. 22	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 058	MG/L
SULFATE	94. 0	MG/L
SILICA	7. 5	MG/L
T. ALK	317. 0	MG/L CACO3

Acidity < 1.0 mg/l

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 10	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 06	MG/L
SELENIUM	<0. 0003	MG/L
ZINC	0. 069	MG/L

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

UTAH POWER & LIGHT CO.
P. O. BOX 899
SALT LAKE CIYT UTAH 84110

SAMPLE ID: COTTONWOOD CREEK ABOVE STRAIGHT CYN
LAB NUMBER W-2737
DATE SAMPLED: 06. 01. 82 DATE REC'D: 06. 02. 82
REPORT DATE: 06. 17. 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	8. 2	UNITS
BOD-5	2. 0	MG/L
TSS	393. 0	MG/L
TKN	0. 3	MG/L
OIL & GREASE	<0. 5	MG/L
T. COLIFORM	<2	MPN/100ML
F. COLIFORM	<2	MPN/100ML

CHEMICAL ANALYSIS

CALCIUM	100 0	MG/L
MAGNESIUM	32. 00	MG/L
POTASSIUM	5. 00	MG/L
SODIUM	32. 00	MG/L
TDS	315. 0	MG/L
BICARB. ALK	389. 0	MG/L ~~CACO3~~ HCO3
CHLORIDE	7. 4	MG/L
FLOURIDE	0. 20	MG/L
NO2-N	<0. 002	MG/L
O. PHOS	0. 075	MG/L
SULFATE	135. 0	MG/L
SILICA	9. 0	MG/L
T. ALK	319. 0	MG/L CACO3

Acidity <1.0 mg/l

METALLIC ANALYSIS

ARSENIC	<0. 0003	MG/L
CADMIUM	<0. 005	MG/L
IRON	0. 16	MG/L
LEAD	<0. 001	MG/L
MANGANESE	0. 07	MG/L
SELENIUM	<0. 0003	MG/L
ZINC	0. 041	MG/L

PAT L. SIM MANAGER

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3214

Date Rec. 10-1-82

Date Sampled 9-30-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84110

Sample ID Cottonwood Creek Above Mine Temp. F 44 Flow, GPM ---

pH	8.1	Units	Arsenic	<0.001	mg/l
Alkalinity, Total	326	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	326	mg/l $CaCo_3$ 398 HCO_3	Boron		mg/l
Calcium	80.0	mg/l	Cadmium	<0.005	mg/l
Chloride	13.8	mg/l	Chromium		mg/l
Conductivity		umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	15.9	mg/l
Hardness		mg/l $CaCo_3$	Lead	<0.05	mg/l
Magnesium	47.0	mg/l	Manganese	1.31	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho	0.030	mg/l	Selenium	<0.0003	mg/l
Potassium	21.0	mg/l	Zinc	0.036	mg/l
Sodium	39.0	mg/l			
Solids, Total Dissolved	386	mg/l	Coliforms, Total	<2 MPN/100ml	
Solids, Total Suspended	1298	mg/l	Coliforms, Fecal	<2 MPN/100ml	
Sulfate	150	mg/l			

B.O.D.5	1.0 mg/l
T.K.N.	0.10 mg/l
Oil & Grease	<0.5 mg/l
Fluoride	0.16 mg/l
Nitrite as N	<0.01 mg/l
Silica	10.2 mg/l
Acidity	<1.0 mg/l $CaCo_3$

Respectfully submitted

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STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3215

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Temp. F 48 Flow, GPM ---

Date Rec. 10-1-82

Date Sampled 9-30-82

Sample ID Cottonwood Creek Below Mine

pH	8.1 Units	Arsenic	< 0.001 mg/l
Alkalinity, Total	375 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	375 mg/l $CaCo_3$ 458 HCO_3	Boron	mg/l
Calcium	79.0 mg/l	Cadmium	< 0.005 mg/l
Chloride	32.0 mg/l	Chromium	mg/l
Conductivity	umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	16.2 mg/l
Hardness	mg/l $CaCo_3$	Lead	< 0.05 mg/l
Magnesium	39.0 mg/l	Manganese	1.37 mg/
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	0.049 mg/l	Selenium	0.0003 mg/l
Potassium	21.0 mg/l	Zinc	0.039 mg/l
Sodium	46.0 mg/l	Coliforms, Total	< 2 MPN/100ml
Solids, Total Dissolved	350 mg/l	Coliforms, Fecal	< 2 MPN/100ml
Solids, Total Suspended	1004 mg/l		
Sulfate	148 mg/l		

B.O.D.5	1.9 mg/l
T.K.N.	0.16 mg/l
Oil & Grease	<0.5 mg/l
Fluoride	0.19 mg/l
Nitrite as N	<0.01 mg/l
Silica	9.0 mg/l
Acidity	<1.0 mg/l $CaCo_3$

Respectfully submitted [signature]

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STANDARD LABORATORIES, INC.

O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3216

Date Rec. 10-1-82

Date Sampled 9-30-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Cottonwood Creek USGS Temp. F 48 Flow,GPM 978

pH	7.8	Units	Arsenic	<0.001	mg/l
Alkalinity, Total	194	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	194	mg/l $CaCo_3$ 237 HCO_3	Boron		mg/l
Calcium	257	mg/l	Cadmium	<0.005	mg/l
Chloride	597	mg/l	Chromium		mg/l
Conductivity		µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	20.3	mg/l
Hardness		mg/l $CaCo_3$	Lead	<0.05	mg/l
Magnesium	26.6	mg/l	Manganese	7.97	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho	0.049	mg/l	Selenium	<0.0003	mg/l
Potassium	106	mg/l	Zinc	0.070	mg/l
Sodium	236	mg/l			
Solids, Total Dissolved	1685	mg/l	Coliform, Total	< 2 MPN/100ml	
Solids, Total Suspended	>20,000	mg/l	Coliform, Fecal	< 2 MPN/100ml	
Sulfate	384	mg/l			

BOD_5	1.6 mg/l
T.K.N.	0.20 mg/l
Oil & Grease	<0.5 mg/l
Fluoride	0.60 mg/l
Nitrite	<0.01 mg/l
Silica	8.5 mg/l
Acidity	<1.0 mg/l $CaCo_3$

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3217

Date Rec. 10-1-82

Date Sampled 9-30-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Cottonwood Creek Above Straight Canyon Temp. F 50 Flow, GPM ---

pH	8.1	Units	Arsenic	< 0.001	mg/l
Alkalinity, Total	252	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	252	mg/l $CaCo_3$ 307 HCO_3	Boron		mg/l
Calcium	115	mg/l	Cadmium	< 0.005	mg/l
Chloride	17.2	mg/l	Chromium		mg/l
Conductivity		umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	16.3	mg/l
Hardness		mg/l $CaCo_3$	Lead	< 0.05	mg/l
Magnesium	18.6	mg/l	Manganese	2.48	mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho	0.090	mg/l	Selenium	< 0.0003	mg/l
Potassium	23.0	mg/l	Zinc	0.043	mg/l
Sodium	41.0	mg/l	Coliform, Total	< 2 MPN/100ml	
Solids, Total Dissolved	412	mg/l	Coliform, Fecal	< 2 MPN/100ml	
Solids, Total Suspended	5024	mg/l			
Sulfate	210	mg/l			

B.O.D.5	1.7 mg/l
T.K.N.	0.20 mg/l
Oil & Grease	<0.5 mg/l
Fluoride	0.34 mg/l
Nitrite	<0.01 mg/l
Silica	9.2 mg/l
Acidity	< 1.0 mg/l $CaCo_3$

Respectfully submitted

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3475

Date Rec'd 1-4-83

Date Sampled 1-4-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P.O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Cottonwood Cr.
Above the Mine

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	292	mg/l $CaCO_3$
Alkalinity, Bicarbonate	292	mg/l $CaCO_3$ 356 HCO_3
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	10.2	mg/l
Coliform, Fecal	< 2	MPN/100 ml
Coliform, Total	< 2	MPN/100 ml
Conductivity		umhos/cm
Fluoride	0.162	mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
rogen, Nitrate		mg/l
Nitrogen, Nitrite	< 0.01	mg/l
Oil & Grease	< 0.5	mg/l
pH	7.2	Units
Phosphorus, Ortho	0.035	mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	433	mg/l
Solids, Total Suspended	4.5	mg/l
Sulfate	190	mg/l
Sulfide		mg/l
Turbidity		NTU
BODS	1.2	
TKN	0.17	

Aluminum		mg/l
Arsenic	< 0.001	mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	< 0.005	mg/l
Calcium	81.0	mg/l
Chromium		mg/l
Copper		mg/l
Iron	12.0	mg/l
Lead	< 0.05	mg/l
Magnesium	49.0	mg/l
Manganese	0.99	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	20.0	mg/l
Selenium	< 0.0003	mg/l
Silica	10.0	mg/l
Sodium	37.0	mg/l
Vanadium		mg/l
Zinc	0.031	mg/l

Respectfully submitted Ray A. Sim / [illegible]

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STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3476

Date Rec'd 1-4-83

Date Sampled 1-4-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Cottonwood Cr.
Below the Mine

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	303	mg/l $CaCO_3$
Alkalinity, Bicarbonate	303	mg/l $CaCO_3$ 370 HCO_3
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	13.6	mg/l
Coliform, Fecal	< 2	MPN/100 ml
Coliform, Total	< 2	MPN/100 ml
Conductivity		umhos/cm
Fluoride	0.162	mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite	< 0.01	mg/l
Oil & Grease	< 0.5	mg/l
pH	7.3	Units
Phosphorus, Ortho	0.040	mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	407	mg/l
Solids, Total Suspended	5.5	mg/l
Sulfate	160	mg/l
Sulfide		mg/l
Turbidity		NTU
BOD5	1.2	
TKN	0.19	

Aluminum		mg/l
Arsenic	< 0.001	mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	< 0.005	mg/l
Calcium	80.0	mg/l
Chromium		mg/l
Copper		mg/l
Iron	11.9	mg/l
Lead	< 0.05	mg/l
Magnesium	36.0	mg/l
Manganese	1.12	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	20.0	mg/l
Selenium	0.0004	mg/l
Silica	9.0	mg/l
Sodium	43.0	mg/l
Vanadium		mg/l
Zinc	0.038	mg/l

Respectfully submitted Ray A. Simpson

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3477

Date Rec'd 1-4-83

Date Sampled 1-4-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Cottonwood Cr.
USGS Flume

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	288	mg/l $CaCO_3$
Alkalinity, Bicarbonate	288	mg/l $CaCO_3$ 351 HCO_3
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	13.5	mg/l
Coliform, Fecal	< 2	MPN/100 ml
Coliform, Total	< 2	MPN/100 ml
Conductivity		umhos/cm
Fluoride	0.158	mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
rogen, Nitrate		mg/l
Nitrogen, Nitrite	< 0.01	mg/l
Oil & Grease	< 0.5	mg/l
pH	7.3	Units
Phosphorus, Ortho	0.053	mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	403	mg/l
Solids, Total Suspended	22.5	mg/l
Sulfate	165	mg/l
Sulfide		mg/l
Turbidity		NTU
BODS	1.7	
TKN	0.16	

Aluminum		mg/l
Arsenic	< 0.001	mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	< 0.005	mg/l
Calcium	81.0	mg/l
Chromium		mg/l
Copper		mg/l
Iron	16.0	mg/l
Lead	< 0.05	mg/l
Magnesium	37.0	mg/l
Manganese	3.00	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	30.0	mg/l
Selenium	< 0.0003	mg/l
Silica	8.0	mg/l
Sodium	40.0	mg/l
Vanadium		mg/l
Zinc	0.073	mg/l

Respectfully submitted Ray A. Sim

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3478
Date Rec'd 1-4-83
Date Sampled 1-4-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Cottonwood Cr.
Above Straight Canyon

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	299	mg/l $CaCO_3$
Alkalinity, Bicarbonate	299	mg/l $CaCO_3$ 365 HCO_3
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	15.6	mg/l
Coliform, Fecal	< 2	MPN/100 ml
Coliform, Total	< 2	MPN/100 ml
Conductivity		umhos/cm
Fluoride	0.157	mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite	<0.01	mg/l
Oil & Grease	<0.5	mg/l
pH	7.3	Units
Phosphorus, Ortho	0.050	mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	426	mg/l
Solids, Total Suspended	29.0	mg/l
Sulfate	195	mg/l
Sulfide		mg/l
Turbidity		NTU
BODS	1.9	
TKN	0.20	

Aluminum		mg/l
Arsenic	<0.001	mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	<0.005	mg/l
Calcium	120	mg/l
Chromium		mg/l
Copper		mg/l
Iron	13.0	mg/l
Lead	<0.05	mg/l
Magnesium	20.0	mg/l
Manganese	1.93	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	17.0	mg/l
Selenium	<0.0003	mg/l
Silica	9.5	mg/l
Sodium	49.0	mg/l
Vanadium		mg/l
Zinc	0.047	mg/l

Respectfully submitted, Ray A. Sim[illegible]

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APPENDIX E

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2673

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

FLOW: 150 GPM (estimated)

TEMP: 46° F
8° C

Date Rec. 5-3-82

Date Sampled 5-3-82

Sample ID Grimes Wash Runoff Right Fork A.the Mine

pH	8.1	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	550	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	2.02	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.24	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	320	mg/l			
Solids, Total Suspended	92.0	mg/l			
Sulfate		mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2672

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

FLOW: 70 GPM (estimated)

TEMP: 46° F
8° C
Amended

Date Rec. 5-3-82

Date Sampled 5-3-82

Sample ID Grimes Wash Runoff Left Fork

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	790	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.25	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.14	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	448	mg/l			
Solids, Total Suspended	2.0	mg/l			
Sulfate		mg/l			

Respectfully submitted

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2674

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

FLOW: 350 GPM (estimated) *

TEMP: 52° F
11° C

Date Rec. 5-3-82

Date Sampled 5-3-82

Sample ID Wilberg Grimes Wash Runoff Below the Mine Ammended

pH	8.0	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	870	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.93	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.19	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	497	mg/l			
Solids, Total Suspended	171	mg/l			
Sulfate		mg/l			

* Includes Wilberg Mine Discharge

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2733

Date Rec. 06-02-82

Date Sampled 06-01-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Grimes Wash, Right fork

pH	8.4	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	500	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.96	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.25	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	285	mg/l			
Solids, Total Suspended	255	mg/l			
Sulfate		mg/l			

Temperature: 52 °F

Flow: 46 GPM

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2732

Date Rec. 06-02-82

Date Sampled 06-01-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Grimes Wash, Left Fork

pH	8.1	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	600	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	352	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.26	mg/l
Lead		mg/l
Manganese	0.13	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Temperature: 44 °F

Flow: ≈ 70 GPM

Respectfully submitted

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2731

Date Rec. 06-02-82

Date Sampled 06-01-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Grimes Wash
Below Mine

pH	7.9	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	910	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	589	mg/l
Solids, Total Suspended	11.0	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.87	mg/l
Lead		mg/l
Manganese	0.09	mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Temperature: 52 °F

Flow ~200 GPM *

* Includes Wilberg Mine Discharge

Respectfully submitted

Certified Environmental Laboratory

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STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2898

FOR Utah Power & Light Co.
Mining & Exploration
Huntington, Utah 84528

FLOW: 37 GPM
TEMP: 12°C
54°F

Date Rec. 07-06-82

Date Sampled 07-06-82

Sample ID Grimes Wash, Right Fork

pH	7.6	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	600	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.83	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.30	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	348	mg/l			
Solids, Total Suspended	485	mg/l			
Sulfate		mg/l			

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Lab. No. W-2897

FOR Utah Power & Light Co.
Mining & Exploration
Huntington, Utah 84528

FLOW: est. 75 GPM
TEMP: 52°F
11°C

Date Rec. 07-06-82

Date Sampled 07-06-82

Sample ID Grimes Wash, Left Fork

pH	7.8	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	600	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	354	mg/l
Solids, Total Suspended	23.5	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.29	mg/l
Lead		mg/l
Manganese	0.10	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

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Lab. No. W-2899

Date Rec. 07-06-82

Date Sampled 07-06-82

FOR Utah Power & Light Co.
Mining & Exploration
Huntington, Utah 84528

FLOW: est. 200 GPM *
TEMP: 54°F
12° C

Sample ID Grimes Wash, Below Mine

pH	7.9	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	780	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	435	mg/l
Solids, Total Suspended	75.0	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.80	mg/l
Lead		mg/l
Manganese	0.09	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

* Includes Wilberg Mine Discharge

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AUG 2 1982

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FIELD OFFICE

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P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3012

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

FLOW: 14.8 GPM
TEMP: 62° F
17° C

Date Rec. 08-03-82

Date Sampled 08-02-82

Sample ID Grimes Wash, right fork

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	500	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.00	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.22	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	280	mg/l			
Solids, Total Suspended	32.5	mg/l			
Sulfate		mg/l			

14.8 gpm
62°

Respectfully submitted

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O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3013

FOR Utah power & Light Co
Field Office
Huntington, utah 84528

FLOW: 80 GPM (estimated)
TEMP: 58° F
14° C

Date Rec. 08-03-82

Date Sampled 08-02-82

Sample ID Grimes Wash, left fork

pH	8.1	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	610	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.30	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.09	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	339	mg/l			
Solids, Total Suspended	1.0	mg/l			
Sulfate		mg/l			

~80 gpm
58°

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3014

FOR Utah Power & Light Co.
Field Office
Huntington, utah 84528

FLOW: 175 GPM (estimated)*

TEMP: 58° F
14° C

Date Rec. 08-03-82

Date Sampled 08-02-82

Sample ID Grimes Wash, below mine

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	960	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.83	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.09	mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	537	mg/l			
Solids, Total Suspended	22.0	mg/l			
Sulfate		mg/l			

* Includes Wilberg Mine Discharge

≈175 gpm
58°

Respectfully submitted

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STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3146

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 9-15-82

Date Sampled 9-15-82

Sample ID Grimes Wash Right Fork Flow, GPM 4.3 Temp. 44 F

pH	8.3	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	550	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.87	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.08	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	339	mg/l			
Solids, Total Suspended	30.5	mg/l			
Sulfate		mg/l			

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P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3145

Date Rec. 9-15-82

Date Sampled 9-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Grimes Wash Left Fork Flow, GPM 40.0 Temp. 53 F

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	590	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.20	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.09	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	362	mg/l			
Solids, Total Suspended	2.5	mg/l			
Sulfate		mg/l			

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Lab. No. W-3147

Date Rec. 9-15-82

Date Sampled 9-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Grimes Wash Below the Mine

Flow, GPM≈300 * Temp. 52 F

pH	8.2	Units
Alkalinity, Total		mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride		mg/l
Conductivity	1000	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	679	mg/l
Solids, Total Suspended	101.5	mg/l
Sulfate		mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.20	mg/l
Lead		mg/l
Manganese	0.10	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

* Includes Wilberg Mine Discharge

Respectfully submitted

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P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3250

FOR Utah Power & LIght Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 10-11-82

Date Sampled 10-11-82

Sample ID Grimes Wash Runoff Right Fork Temp. 40 Flow,GPM 14.8

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	720	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	1.54	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.19	mg,
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	435	mg/l			
Solids, Total Suspended	160	mg/l			
Sulfate		mg/l			

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STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3249

Date Rec. 10-11-82

Date Sampled 10-11-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Grimes Wash Runoff Left Fork Temp. 39 Flow,GPM≈ 35.0

pH	8.2	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	680	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.36	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.15	mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	386	mg/l			
Solids, Total Suspended	8.2	mg/l			
Sulfate		mg/l			

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3251

Date Rec. 10-11-82

Date Sampled 10-11-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Grimes Wash Runoff Below the Mine Temp. 50 Flow, GPM ~ 300*

pH	8.1	Units	Arsenic		mg/l
Alkalinity, Total		mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride		mg/l	Chromium		mg/l
Conductivity	920	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.26	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese	0.15	mg
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	591	mg/l			
Solids, Total Suspended	3.0	mg/l			
Sulfate		mg/l			

* Includes Wilberg Mine Discharge

Respectfully submitted

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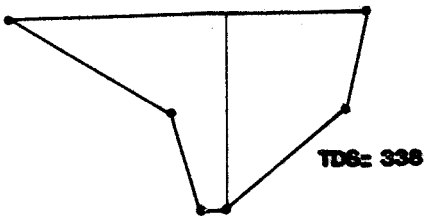
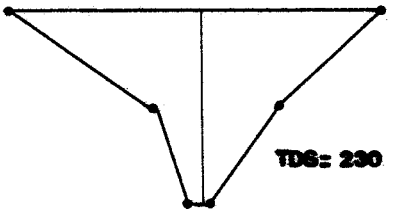
APPENDIX F

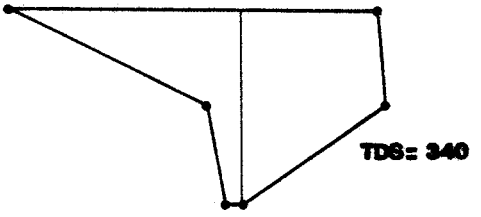
CATION-ANION DIAGRAMS
FLAGSTAFF FORMATION



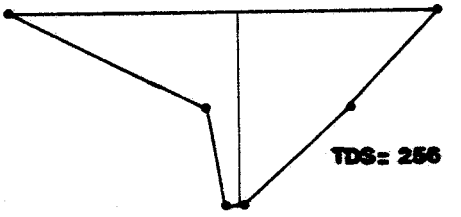
PINE SPRINGS
7/16/82



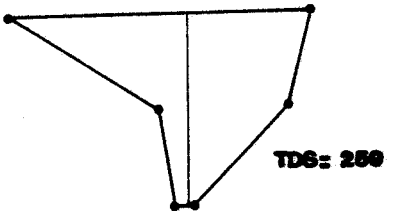
PINE SPRINGS
10/6/82



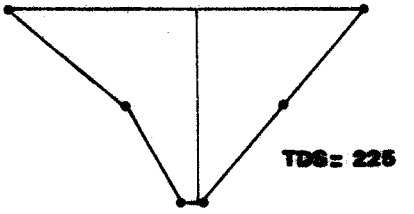
SHEBA SPRINGS
7/14/82



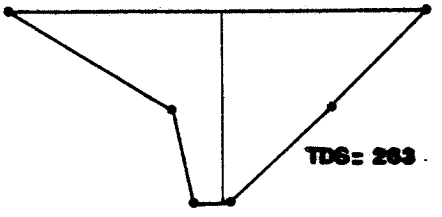
SHEBA SPRINGS
10/6/82



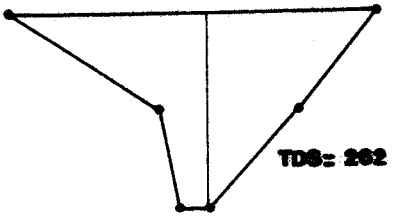
79-1
7/8/82



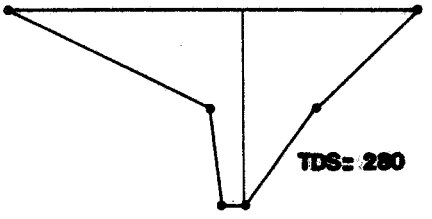
79-1
10/12/82



79-35
10/6/82



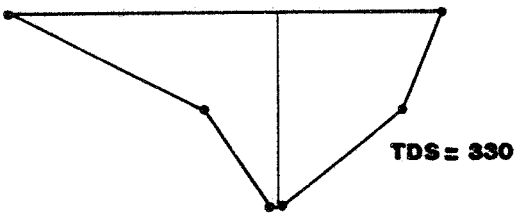
79-35
7/16/82



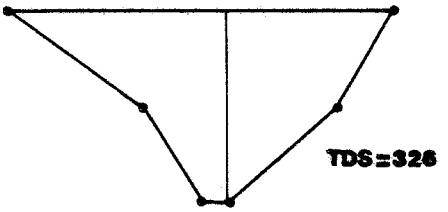
79-4
7/14/82

CATION-ANION DIAGRAMS

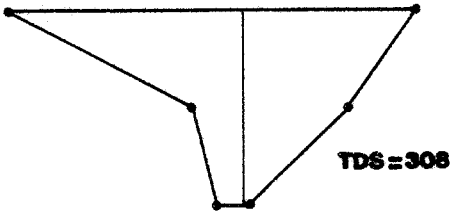
NORTH HORN FORMATION



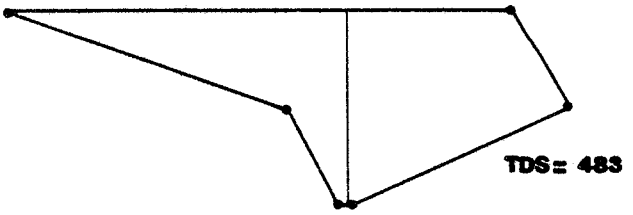
79-16
7/15/82



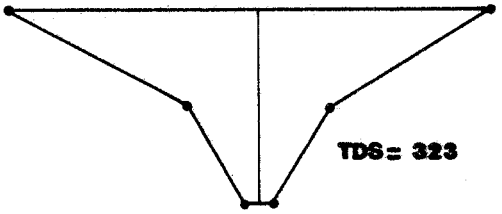
79-10
7/15/82



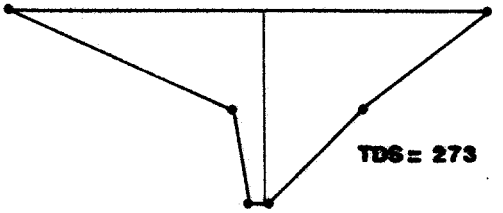
79-17
7/8/82



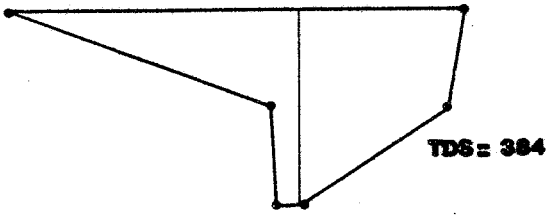
79-18
7/15/82



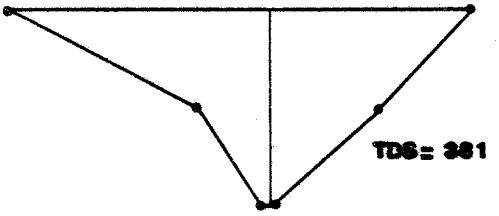
79-23
7/20/82



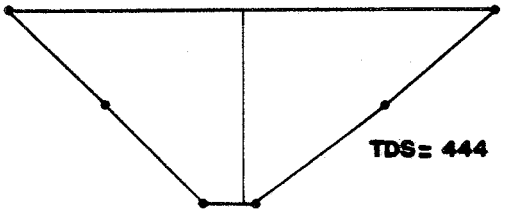
79-19
10/12/82



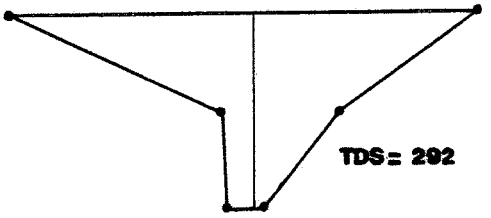
79-19
7/15/82



79-25
7/16/82

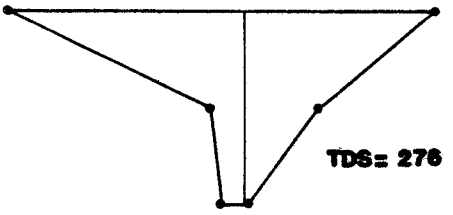


79-30
7/16/82

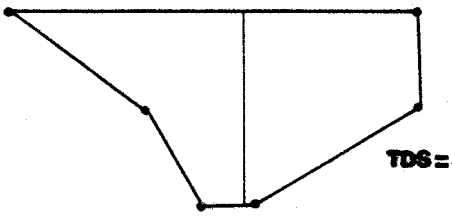


79-26
10/9/82

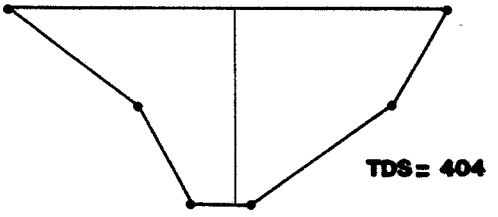
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



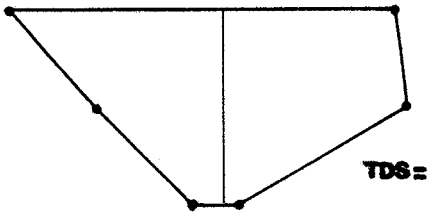
79-26
7/16/82



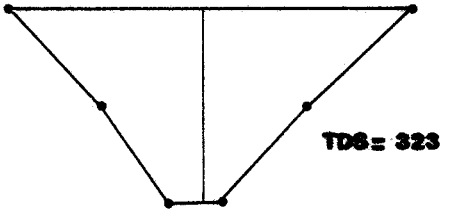
79-28
7/16/82



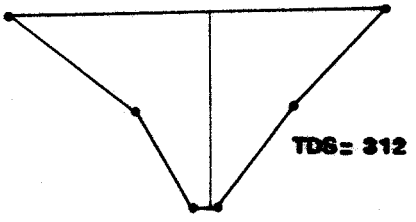
79-28
10/19/82



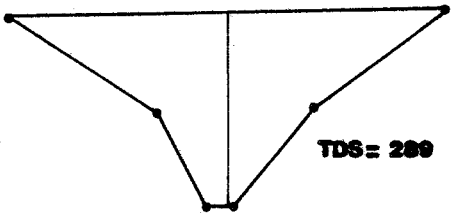
79-29
7/19/82



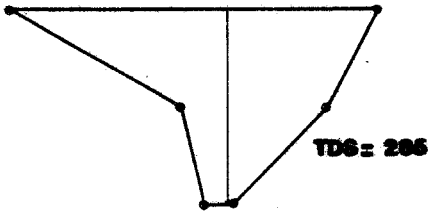
79-29
10/19/82



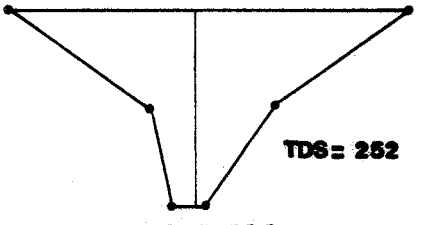
BURNT TREE
7/19/82



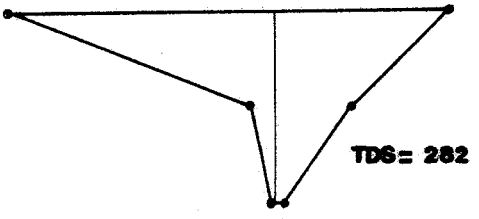
BURNT TREE
10/12/82



ELK SPRINGS
7/8/82



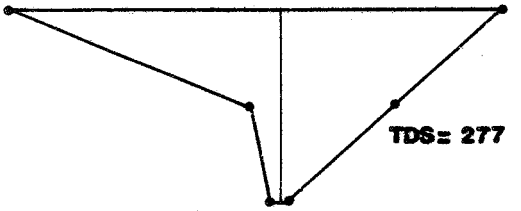
ELK SPRINGS
10/ 6/ 82



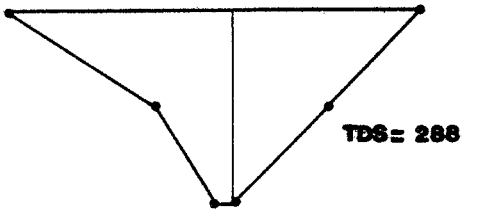
TED'S TUB
7/19/82

CATION-ANION DIAGRAMS

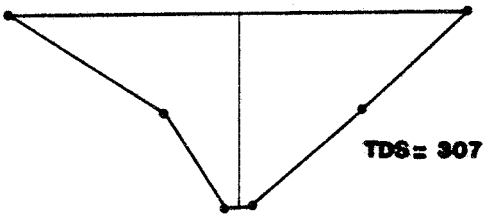
NORTH HORN FORMATION



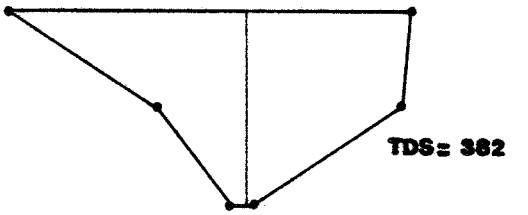
TED'S TUB
10/10/82



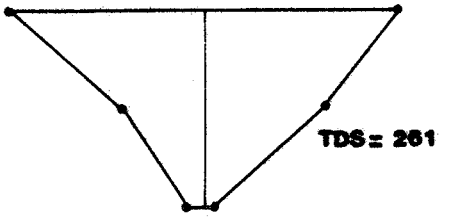
79-2
7/19/82



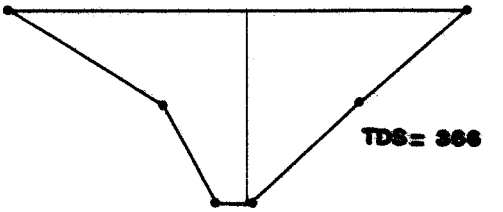
79-2
10/12/82



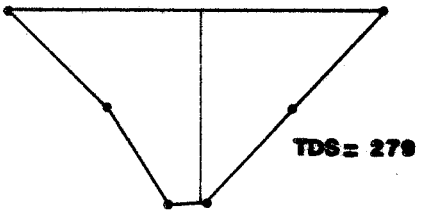
79-9
7/14/82



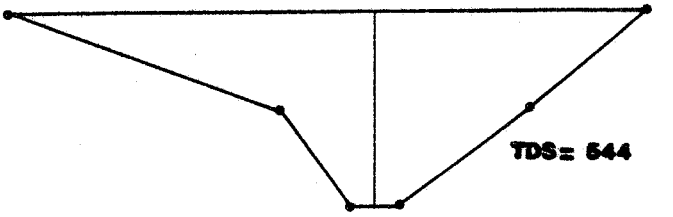
79-9
10/6/82



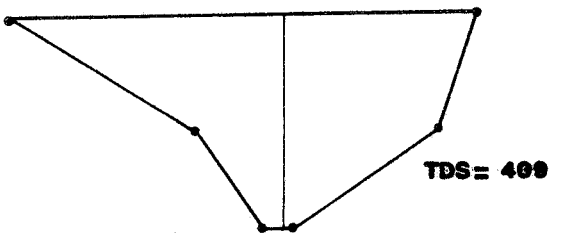
79-15
7/15/82



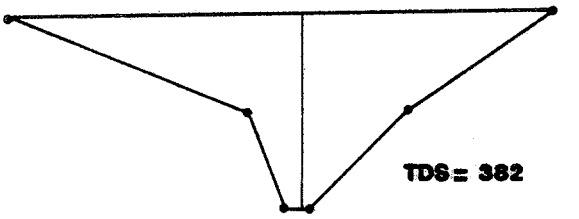
79-15
10/9/82



79-32
7/16/82

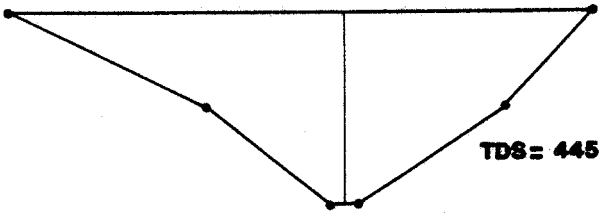


79-34
7/15/82

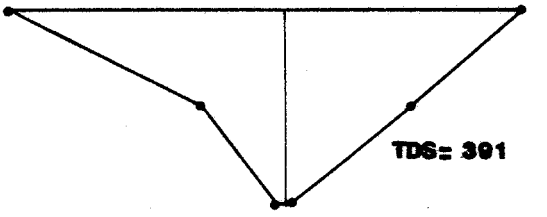


79-37
7/16/82

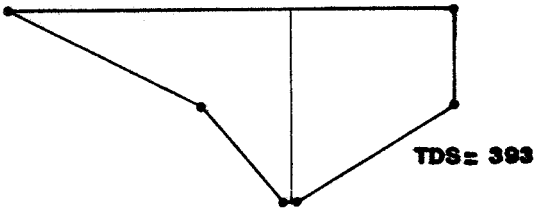
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



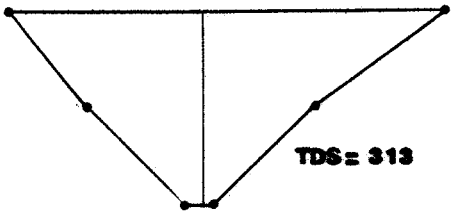
79-38
7/20/82



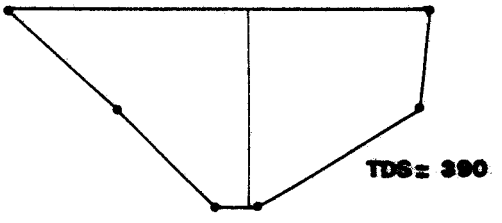
80-43
7/19/82



80-48
7/13/82



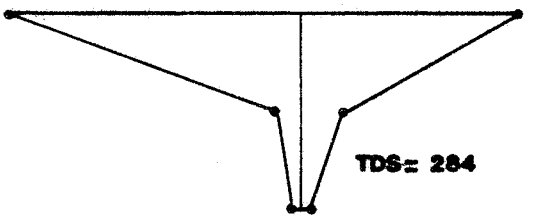
80-47
10/10/82



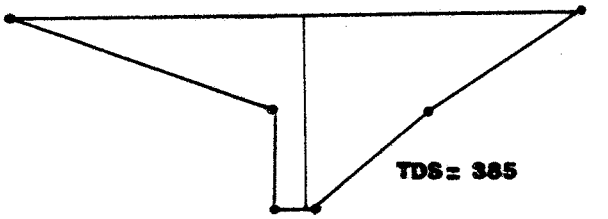
80-47
7/19/82

CATION-ANION DIAGRAMS

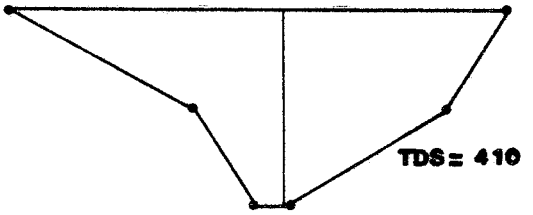
PRICE RIVER FORMATION



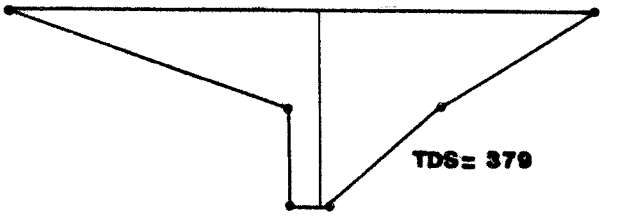
JERK WATER
7/21/82



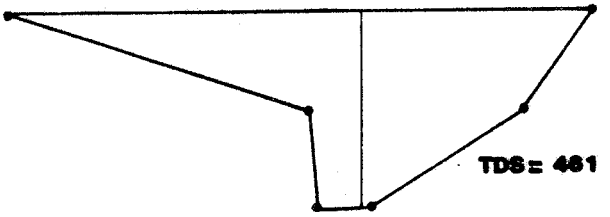
JERK WATER
10/10/82



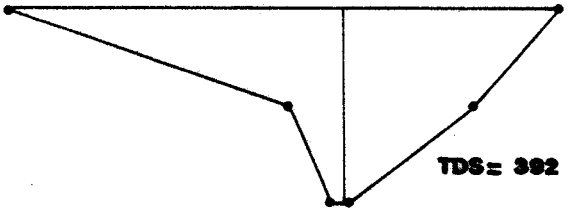
82-52
7/23/82



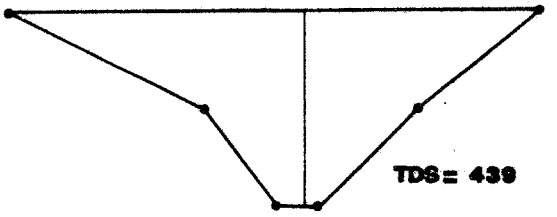
SHEEP HERDER
82-52
10/10/82



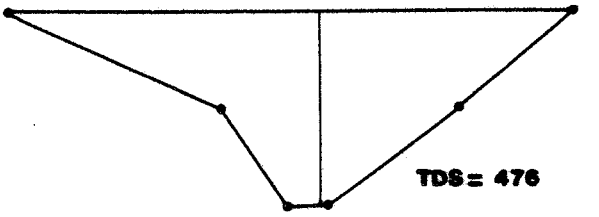
79-33
7/16/82



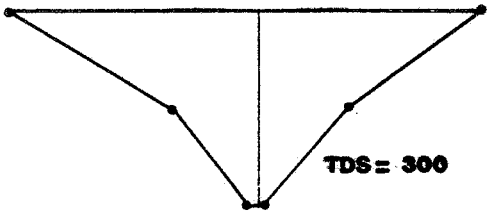
80-41
7/20/82



80-44
7/20/82



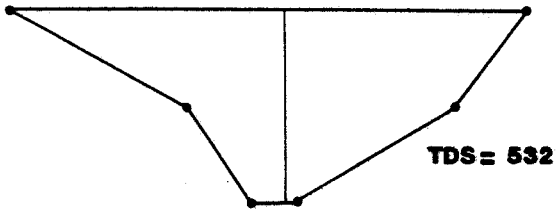
80-45
7/20/ 82



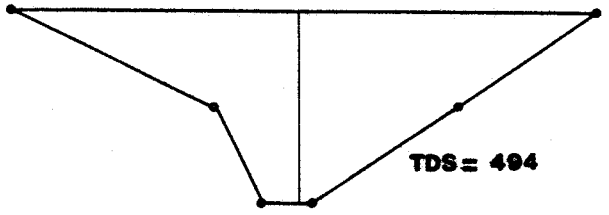
EMS 80-49
7/13/82

CATION-ANION DIAGRAMS

BLACKHAWK FORMATION



80-50
7/12/82



80-50
10/14/82

APPENDIX G

SPRINGS GEOLOGIC CONDITIONS INVENTORY

Spring Name/Number: JERK WATER

Location: 1660 Feet [redacted] S 1300 Feet [redacted]W of the NORTHEAST Corner of Section 16 Township 17 SOUTH Range 7 EAST

Elevation: 8980 Feet above mean sea level

Location Comments: SPRING DEVELOPED FOR LIVESTOCK. WATER FLOWS FROM SPRING THROUGH AN UNDERGROUND PIPE TO A TROUGH.

Formation: PRICE RIVER 70 Feet from Top [redacted]

Probable Recharge Area: AREAS OF HIGHER ELEVATION WHICH ARE LOCATED TO THE SOUTH.

Relationship to Adjacent Springs: THIS SPRING OCCURS IN THE SAME MANNER AS SPRING 82-52.

Geologic Circumstances of Spring: The geologic occurrence of this spring has not been determined. It is possible that water flowing along fractures in the Price River Formation intersects the land surface forming the spring.

SPRINGS GEOLOGIC CONDITIONS INVENTORY

Spring Name/Number: 82-51

Location: 140 Feet [redacted] S 660 Feet E[redacted] of the NORTHWEST Corner of Section 26 Township 17 SOUTH Range 7 EAST

Elevation: 8975 Feet above mean sea level

Location Comments: SPRING LOCATED ON A GENTLE SAGEBRUSH COVERED SLOPE.

Formation: PRICE RIVER 145 Feet from Top [redacted]

Probable Recharge Area: HIGHLAND AREAS TO THE EAST.

Relationship to Adjacent Springs: NOT RELATED TO OTHER SPRINGS

Geologic Circumstances of Spring: WATER FLOWING ALONG THE BEAR CANYON FAULT INTERSECTS THE LAND SURFACE FORMING A SPRING.

SPRINGS GEOLOGIC CONDITIONS INVENTORY

Spring Name/Number: 82-52 SHEEP HERDER

Location: 1780 Feet [redacted] S 1050 Feet E[redacted] of the NORTHWEST Corner of Section 15 Township 17 SOUTH Range 7 EAST

Elevation: 8995 Feet above mean sea level

Location Comments: SPRING LOCATED IN A SMALL GULLY WHICH IS DENSELY VEGETATED WITH SPRUCE TREES

Formation: PRICE RIVER 20 Feet from Top [redacted]

Probable Recharge Area: HIGHLAND AREAS TO THE SOUTH.

Relationship to Adjacent Springs: THIS SPRING IS RELATED TO JERK WATER SPRING.

Geologic Circumstances of Spring: The geologic occurrence of this spring has not been determined. It is possible that water flowing along fractures in the Price River Formation intersects the land surface forming the spring.

APPENDIX H

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2965

Date Rec. 07-21-82

Date Sampled 07-19-82

FOR Utah Power & Light Co.
Field Office
Huntington, utah 84528

Sample ID Burnt Tree

pH	7.7	Units	
Alkalinity, Total	284	mg/l $CaCo_3$	
Alkalinity, Bicarbonate	284	mg/l $CaCo_3$	346 HCO_3
Calcium	100	mg/l	
Chloride	5.4	mg/l	
Conductivity	550	umhos/cm	
Dissolved Oxygen		mg/l	
Hardness		mg/l $CaCo_3$	
Magnesium	21.0	mg/l	
Nitrogen, Nitrate		mg/l	
Phosphorus, Total		mg/l	
Phosphorus, Ortho		mg/l	
Potassium	1.90	mg/l	
Sodium	23.0	mg/l	
Solids, Total Dissolved	312	mg/l	
Solids, Total Suspended	< 0.5	mg/l	
Sulfate	110	mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.20	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.10	mg/l
Turbidity	1.2	NTU

129 pm
110

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W 3274

FOR Utah Power & Light Co.
M&E Field Office
HUntington, Utah 84528

Date Rec. 10-13-82

Date Sampled 10-12-82

Sample ID Burnt Tree EMS Temp. 42 °F Flow, GPM 13.3

pH	7.3	Units	Arsenic		mg/l
Alkalinity, Total	278	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	278	mg/l $CaCo_3$ 339 HCO_3	Boron		mg/l
Calcium	110	mg/l	Cadmium		mg/l
Chloride	6.2	mg/l	Chromium		mg/l
Conductivity	510	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	22.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	2.00	mg/l	Zinc		mg/l
Sodium	25.0	mg/l			
Solids, Total Dissolved	289	mg/l			
Solids, Total Suspended	<0.5	mg/l			
Sulfate	110	mg/l			
Fluoride	0.19 mg/l				
Turbidity	1.9 NTU				
Iron, dissolved	0.17 mg/l				

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2907

Date Rec. 7-9-82

Date Sampled 7-8-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84110

Sample ID Elk Spring (Temp.F 39 Flow,GPM 546.6)

pH	7.6	Units	Arsenic		mg/l
Alkalinity, Total	238	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	238	mg/l $CaCo_3$ 290.56 HCO_3	Boron		mg/l
Calcium	112	mg/l	Cadmium		mg/l
Chloride	3.3	mg/l	Chromium		mg/l
Conductivity	500	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	15.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.50	mg/l	Zinc		mg/l
Sodium	20.0	mg/l			
Solids, Total Dissolved	285	mg/l			
Solids, Total Suspended	1.0	mg/l			
Sulfate	130	mg/l			
Iron, dissolved	0.16	mg/l			
Turbidity	1.2	mg/l			
Fluoride	0.36	mg/l			

Respectfully submitted Ray A. Sims / [illegible]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3240

Date Rec. 10-11-82

Date Sampled 10-6-82

FOR Utah Power & LIght Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Elk Spring EMS Temp. 39 Flow,GPM -- 113.5

pH	7.6 Units	Arsenic	mg/l
Alkalinity, Total	272 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	272 mg/l $CaCo_3$ 332 HCO_3	Boron	mg/l
Calcium	102 mg/l	Cadmium	mg/l
Chloride	5.0 mg/l	Chromium	mg/l
Conductivity	388 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	17.0 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	10.0 mg/l	Zinc	mg/l
Sodium	29.0 mg/l		
Solids, Total Dissolved	252 mg/l		
Solids, Total Suspended	$<$0.5 mg/l		
Sulfate	100 mg/l		
Fluoride	0.19 mg/l		
Turbidity	1.3 NTU		
Iron, dissolved	0.15 mg/l		

Respectfully submitted

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Lab. No. W-2963

Date Rec. 07-21-82

Date Sampled 07-21-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID Jerk Water

pH	7.5	Units
Alkalinity, Total	346	mg/l $CaCo_3$
Alkalinity, Bicarbonate	346	mg/l $CaCo_3$ 422 HCO_3
Calcium	140	mg/l
Chloride	9.8	mg/l
Conductivity	500	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	7.00	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	2.00	mg/l
Sodium	9.00	mg/l
Solids, Total Dissolved	284	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	53.5	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.20	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.12	mg/l
Turbidity	1.0	NTU

2.5 ppm

Respectfully submitted

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Lab. No. W-3243

Date Rec. 10-11-82

Date Sampled 10-10-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Jerk Water EMS Temp. 39 Flow, GPM 2.1

pH	7.5 Units	Arsenic	mg/l
Alkalinity, Total	364 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	364 mg/l $CaCo_3$ 444 HCO_3	Boron	mg/l
Calcium	156 mg/l	Cadmium	mg/l
Chloride	11.7 mg/l	Chromium	mg/l
Conductivity	590 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	9.00 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	5.50 mg/l	Zinc	mg/l
Sodium	39.0 mg/l		
Solids, Total Dissolved	385 mg/l		
Solids, Total Suspended	1.0 mg/l		
Sulfate	160 mg/l		
Fluoride	0.26 mg/l		
Turbidity	1.4 NTU		
IRon, dissolved	0.29 mg/l		

Respectfully submitted

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Lab. No. W-2947

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Pine Spring (Temp. F 42 Flow,GPM 5.3)

pH	7.5	Units
Alkalinity, Total	221	mg/l $CaCo_3$
Alkalinity, Bicarbonate	221	mg/l $CaCo_3$
Calcium	109	mg/l
Chloride	2.4	mg/l
Conductivity	430	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	15.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	9.00	mg/l
Sodium	14.0	mg/l
Solids, Total Dissolved	338	mg/l
Solids, Total Suspended	6.0	mg/l
Sulfate	156	mg/l
Iron, dissolved	0.40	mg/l
Flouride	0.16	mg/l
Turbidity	0.6	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim/DH

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Lab. No. W-3242

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 10-11-82

Date Sampled 10-6-82

Sample ID Pine Spring EMS Temp. 43 Flow, GPM XXXX 0.73

pH	7.6 Units	Arsenic	mg/l
Alkalinity, Total	230 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	230 mg/l $CaCo_3$ 281 HCO_3	Boron	mg/l
Calcium	100 mg/l	Cadmium	mg/l
Chloride	3.9 mg/l	Chromium	mg/l
Conductivity	341 µmhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	16.0 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	9.00 mg/l	Zinc	mg/l
Sodium	13.5 mg/l		
Solids, Total Dissolved	230 mg/l		
Solids, Total Suspended	5.0 mg/l		
Sulfate	100 mg/l		
Fluoride	0.19 mg/l		
Turbidity	6.6 NTU		
IRon, dissolved	0.32 mg/l		

Respectfully submitted

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Lab. No. W-2933

Date Rec. 7-15-82

Date Sampled 7-14-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Sheba Spring (Temp. F 39 Flow,GPM 15)

pH	7.4	Units	Arsenic		mg/l
Alkalinity, Total	210	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	210	mg/l $CaCo_3$	Boron		mg/l
Calcium	119	mg/l	Cadmium		mg/l
Chloride	3.2	mg/l	Chromium		mg/l
Conductivity	450	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
iagnesium	10.6	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	8.50	mg/l	Zinc		mg/l
Sodium	13.5	mg/l			
Solids, Total Dissolved	340	mg/l			
Solids, Total Suspended	15.0	mg/l			
Sulfate	181	mg/l			
Iron, dissloved	0.30	mg/l			
Fluoride	0.15	mg/l			
Turbidity	2.7	mg/l			

Respectfully submitted Ray A. Sam [illegible]

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Lab. No. W-3241

Date Rec. 10-11-82

Date Sampled 10-6-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Sheba Spring EMS Temp. 42 Flow, GPM 6.0

pH	7.5	Units	Arsenic	mg/l
Alkalinity, Total	259	mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	259	mg/l $CaCo_3$ 316 HCO_3	Boron	mg/l
Calcium	120	mg/l	Cadmium	mg/l
Chloride	3.9	mg/l	Chromium	mg/l
Conductivity	377	umhos/cm	Copper	mg/l
Dissolved Oxygen		mg/l	Iron	mg/l
Hardness		mg/l $CaCo_3$	Lead	mg/l
Magnesium	10.0	mg/l	Manganese	mg/l
Nitrogen, Nitrate		mg/l	Mercury	µg/l
Phosphorus, Total		mg/l	Nickel	mg/l
Phosphorus, Ortho		mg/l	Selenium	mg/l
Potassium	8.00	mg/l	Zinc	mg/l
Sodium	14.0	mg/l		
Solids, Total Dissolved	256	mg/l		
Solids, Total Suspended	<0.5	mg/l		
Sulfate	140	mg/l		
Fluoride	0.16 mg/l			
Turbidity	1.2 NTU			
Iron, dissolved	0.17 mg/l			

Respectfully submitted

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FOR Utah Power & Light Co.
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Huntington, Utah 84528

Lab. No. W-2962

Date Rec. 07-21-82

Date Sampled 07-19-82

Sample ID Ted's Tub

pH	7.8	Units
Alkalinity, Total	278	mg/l $CaCo_3$
Alkalinity, Bicarbonate	278	mg/l $CaCo_3$
Calcium	138	mg/l
Chloride	4.1	mg/l
Conductivity	510	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	7.00	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	1.00	mg/l
Sodium	8.00	mg/l
Solids, Total Dissolved	282	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	94.6	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.41	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.10	mg/l
Turbidity	2.0	NTU

60 gpm
9c

Respectfully submitted

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Lab. No. W 3245

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 10-11-82

Date Sampled 10-10-82

Sample ID Ted's Tub EMS Temp. 38 Flow, GPM 7.5

pH	7.7 Units	Arsenic	mg/l
Alkalinity, Total	278 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	278 mg/l $CaCo_3$ 339 HCO_3	Boron	mg/l
Calcium	143 mg/l	Cadmium	mg/l
Chloride	5.4 mg/l	Chromium	mg/l
Conductivity	429 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	8.00 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	3.00 mg/l	Zinc	mg/l
Sodium	10.0 mg/l		
Solids, Total Dissolved	277 mg/l		
Solids, Total Suspended	10.0 mg/l		
Sulfate	140 mg/l		
Fluoride	0.20 mg/l		
Turbidity	2.8 NTU		
Iron, dissolved	0.15 mg/l		

Respectfully submitted

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Lab. No. W-2908

Date Rec. 7-9-82

Date Sampled 7-8-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

Sample ID EMS 79-1 (Temp. F 38 Flow, GPM 72)

pH	7.7	Units	Arsenic		mg/l
Alkalinity, Total	193	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	193	mg/l $CaCo_3$	Boron		mg/l
Calcium	90.0	mg/l	Cadmium		mg/l
Chloride	2.9	mg/l	Chromium		mg/l
Conductivity	370	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	10.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	5.00	mg/l	Zinc		mg/l
Sodium	19.0	mg/l			
Solids, Total Dissolved	259	mg/l			
Solids, Total Suspended	8.5	mg/l			
Sulfate	120	mg/l			
Iron, dissolved	0.39	mg/l			
Fluoride	0.26	mg/l			
Turbidity	2.8	NTU			

Respectfully submitted Ray A Sim /for

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Lab. No. W-3271

Date Rec. 10-13-82

Date Sampled 10-12-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-1 EMS Temp/ 39 Flow, GPM ~~XXX~~ 13.6

pH	7.5 Units		Arsenic	mg/l
Alkalinity, Total	220 mg/l $CaCo_3$		Beryllium	mg/l
Alkalinity, Bicarbonate	220 mg/l $CaCo_3$	268 HCO_3	Boron	mg/l
Calcium	98.0 mg/l		Cadmium	mg/l
Chloride	4.0 mg/l		Chromium	mg/l
Conductivity	359 µmhos/cm		Copper	mg/l
Dissolved Oxygen	mg/l		Iron	mg/l
Hardness	mg/l $CaCo_3$		Lead	mg/l
Magnesium	21.0 mg/l		Manganese	mg/l
Nitrogen, Nitrate	mg/l		Mercury	µg/l
Phosphorus, Total	mg/l		Nickel	mg/l
Phosphorus, Ortho	mg/l		Selenium	mg/l
Potassium	5.00 mg/l		Zinc	mg/l
Sodium	16.0 mg/l			
Solids, Total Dissolved	225 mg/l			
Solids, Total Suspended	19.0 mg/l			
Sulfate	120 mg/l			
Fluroide	0.12 mg/l			
Turbidity	3.6 NTU			
Iron, dissolved	0.17 mg/l			

Respectfully submitted

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FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Lab. No. W-2952

Date Rec. 07-21-82

Date Sampled 07-19-82

Sample ID EMS 79-2

pH	7.4	Units
Alkalinity, Total	297	mg/l $CaCo_3$
Alkalinity, Bicarbonate	297	mg/l $CaCo_3$ 362 HCO_3
Calcium	112	mg/l
Chloride	4.0	mg/l
Conductivity	390	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	23.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	6.00	mg/l
Sodium	18.0	mg/l
Solids, Total Dissolved	288	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	125	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (Dissolved)	0.20	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.16	mg/l
Turbidity	1.1	NTU

126 gpm
46°

Respectfully submitted

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Lab. No. W 3272

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 10-13-82

Date Sampled 10-12-82

Sample ID 79-2 EMS Surging Spring Temp/ 42 Flow,GPM 3.0

pH	7.2 Units	Arsenic	mg/l
Alkalinity, Total	290 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	290 mg/l $CaCo_3$ 354 HCO_3	Boron	mg/l
Calcium	120 mg/l	Cadmium	mg/l
Chloride	4.6 mg/l	Chromium	mg/l
Conductivity	530 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	24.0 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	4.50 mg/l	Zinc	mg/l
Sodium	20.0 mg/l		
Solids, Total Dissolved	307 mg/l		
Solids, Total Suspended	<0.5 mg/l		
Sulfate	150 mg/l		
Fluoride	0.17 mg/l		
Turbidity	1.5 NTU		
Iron, dissolved	0.21 mg/l		

Respectfully submitted

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Lab. No. W-2932

Date Rec. 7-15-82

Date Sampled 7-14-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-4 (Temp. F 39 Flow,GPM 4.3)

pH	7.5	Units	Arsenic		mg/l
Alkalinity, Total	273	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	273	mg/l $CaCo_3$	Boron		mg/l
Calcium	120	mg/l	Cadmium		mg/l
Chloride	2.8	mg/l	Chromium		mg/l
Conductivity	500	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	9.50	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	6.50	mg/l	Zinc		mg/l
Sodium	14.5	mg/l			
Solids, Total Dissolved	280	mg/l			
Solids, Total Suspended	252	mg/l			
Sulfate	86.4	mg/l			
Iron, dissolved	0.21	mg/l			
Fluoride	0.19	mg/l			
Turbidity	54.0	mg/l			

Respectfully submitted Floyd R. Simpkins

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Lab. No. W-2931

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 7-15-82

Date Sampled 7-14-82

Sample ID EMS 79-9 (Temp. F 41 Flow,GPM 5.0)

pH	7.4	Units
Alkalinity, Total	260	mg/l $CaCo_3$
Alkalinity, Bicarbonate	260	mg/l $CaCo_3$
Calcium	121	mg/l
Chloride	5.8	mg/l
Conductivity	499	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	28.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.00	mg/l
Sodium	16.0	mg/l
Solids, Total Dissolved	382	mg/l
Solids, Total Suspended	1.0	mg/l
Sulfate	193	mg/l
Iron, dissolved	0.30	mg/l
Fluoride	0.24	mg/l
Turbidity	1.3	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim / [illegible]

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P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3233

Date Rec. 10-11-82

Date Sampled 10-6-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-9 EMS Temp. 42 °F Flow, GPM 1.33

pH	7.3	Units	Arsenic		mg/l
Alkalinity, Total	253	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	253	mg/l $CaCo_3$ 309 HCO_3	Boron		mg/l
Calcium	100	mg/l	Cadmium		mg/l
Chloride	7.0	mg/l	Chromium		mg/l
Conductivity	402	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	25.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.00	mg/l	Zinc		mg/l
Sodium	17.0	mg/l			
Solids, Total Dissolved	261	mg/l			
Solids, Total Suspended	1.0	mg/l			
Sulfate	150	mg/l			
Fluoride	0.25 mg/l				
Turbidity	1.8 NTU				
Iron, dissolved	0.20 mg/l				

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2930

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-10 (Temp. F 39 Flow, GPM 32)

pH	7.5	Units	Arsenic		mg/l
Alkalinity, Total	272	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	272	mg/l $CaCo_3$	Boron		mg/l
Calcium	109	mg/l	Cadmium		mg/l
Chloride	4.4	mg/l	Chromium		mg/l
Conductivity	510	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	25.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.00	mg/l	Zinc		mg/l
Sodium	16.5	mg/l			
Solids, Total Dissolved	326	mg/l			
Solids, Total Suspended	4.0	mg/l			
Sulfate	144	mg/l			
Iron, dissolved	0.33	mg/l			
Fluoride	0.20	mg/l			
Turbidity	1.8	mg/l			

Respectfully submitted Ray A Sim

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Lab. No. W-2934

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-15 (Temp. F 40 Flow,GPM 27.5)

pH	7.3	Units
Alkalinity, Total	354	mg/l $CaCo_3$
Alkalinity, Bicarbonate	354	mg/l $CaCo_3$
Calcium	122	mg/l
Chloride	4.5	mg/l
Conductivity	510	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	27.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.00	mg/l
Sodium	39.0	mg/l
Solids, Total Dissolved	366	mg/l
Solids, Total Suspended	5.5	mg/l
Sulfate	148	mg/l
Iron, dissolved	0.16	mg/l
Fluoride	0.19	mg/l
Turbidity	2.9	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Simpkins

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Lab. No. W-3234

Date Rec. 10-11-82

Date Sampled 10-9-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-15 EMS Temp. 38 °F Flow, GPM 6.0

pH	7.4	Units	Arsenic		mg/l
Alkalinity, Total	280	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	280	mg/l $CaCo_3$	Boron		mg/l
Calcium	97.0	mg/l	Cadmium		mg/l
Chloride	5.4	mg/l	Chromium		mg/l
Conductivity	420	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	29.00	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	8.0	mg/l	Zinc		mg/l
Sodium	34.0	mg/l			
Solids, Total Dissolved	279	mg/l			
Solids, Total Suspended	0.5	mg/l			
Sulfate	120	mg/l			
Fluoride	0.21	mg/l			
Turbidity	2.1	NTU			
Iron, dissolved	0.14	mg/l			

Respectfully submitted

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Lab. No. W-2935

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-16 (Temp. F 50 Flow,GPM 12)

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total	263	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	263	mg/l $CaCo_3$	Boron		mg/l
Calcium	136	mg/l	Cadmium		mg/l
Chloride	3.9	mg/l	Chromium		mg/l
Conductivity	510	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	21.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	2.00	mg/l	Zinc		mg/l
Sodium	4.00	mg/l			
Solids, Total Dissolved	330	mg/l			
Solids, Total Suspended	21.5	mg/l			
Sulfate	156	mg/l			
Iron, dissolved	0.23	mg/l			
Fluoride	0.14	mg/l			
Turbidity	4.6	mg/l			

Respectfully submitted Ray A Simpson

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Lab. No. W-2909

Date Rec. 7-9-82

Date Sampled 7-8-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

Sample ID EMS 79-17 (Temp. F 40 Flow, GPM 4.6)

pH	7.9	Units
Alkalinity, Total	273	mg/l $CaCo_3$
Alkalinity, Bicarbonate	273	mg/l $CaCo_3$
Calcium	120	mg/l
Chloride	3.2	mg/l
Conductivity	500	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	17.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	8.50	mg/l
Sodium	22.0	mg/l
Solids, Total Dissolved	308	mg/l
Solids, Total Suspended	9.5	mg/l
Sulfate	132	mg/l
Iron, dissolved	0.22	mg/l
Fluoride	0.22	mg/l
Turbidity	3.9	NTU

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

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Respectfully submitted Ray A. Sim[illegible]

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Lab. No. W-2936

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-18 (Temp. F 39 Flow, GPM 20)

pH	7.4	Units
Alkalinity, Total	262	mg/l $CaCo_3$
Alkalinity, Bicarbonate	262	mg/l $CaCo_3$
Calcium	173	mg/l
Chloride	2.9	mg/l
Conductivity	610	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	18.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.00	mg/l
Sodium	6.00	mg/l
Solids, Total Dissolved	483	mg/l
Solids, Total Suspended	6.5	mg/l
Sulfate	274	mg/l
Iron, dissolved	0.25	mg/l
Fluoride	0.14	mg/l
Turbidity	3.9	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim / RW

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Lab. No. W-2937

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-19 (Temp. F 39 Flow, GPM 46)

pH	7.5	Units
Alkalinity, Total	251	mg/l $CaCo_3$
Alkalinity, Bicarbonate	251	mg/l $CaCo_3$
Calcium	149	mg/l
Chloride	2.9	mg/l
Conductivity	499	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	8.50	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	20.0	mg/l
Sodium	7.00	mg/l
Solids, Total Dissolved	384	mg/l
Solids, Total Suspended	15.5	mg/l
Sulfate	189	mg/l
Iron, dissolved	0.10	mg/l
Fluoride	0.14	mg/l
Turbidity	2.1	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A Sim / [illegible]

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Lab. No. W-3273

Date Rec. 10-13-82

Date Sampled 10-12-82

FOR UtaH Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-19 EMS Temp. 40 °C Flow, GPM 15.0

pH	7.3	Units	Arsenic		mg/l
Alkalinity, Total	278	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	278	mg/l $CaCo_3$ 339 HCO_3	Boron		mg/l
Calcium	130	mg/l	Cadmium		mg/l
Chloride	4.0	mg/l	Chromium		mg/l
Conductivity	462	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	10.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.00	mg/l	Zinc		mg/l
Sodium	10.0	mg/l			
Solids, Total Dissolved	273	mg/l			
Solids, Total Suspended	0.5	mg/l			
Sulfate	120	mg/l			
Fluoride	0.15 mg/l				
Turbidity	1.6 NTU				
Iron, Dissolved	0.08 mg/l				

Respectfully submitted

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Lab. No. W-2953

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Date Rec. 07-21-82

Date Sampled 07-20-82

Sample ID EMS 79-23

pH	7.5 Units		Arsenic	mg/l
Alkalinity, Total	358 mg/l $CaCo_3$		Beryllium	mg/l
Alkalinity, Bicarbonate	358 mg/l $CaCo_3$	437 HCO_3	Boron	mg/l
Calcium	132 mg/l		Cadmium	mg/l
Chloride	11.1 mg/l		Chromium	mg/l
Conductivity	550 µmhos/cm		Copper	mg/l
Dissolved Oxygen	mg/l		Iron (dissolved)	0.30 mg/l
Hardness	mg/l $CaCo_3$		Lead	mg/l
Magnesium	23.0 mg/l		Manganese	mg/.
Nitrogen, Nitrate	mg/l		Mercury	µg/l
Phosphorus, Total	mg/l		Nickel	mg/l
Phosphorus, Ortho	mg/l		Selenium	mg/l
Potassium	7.00 mg/l		Zinc	mg/l
Sodium	14.0 mg/l			
Solids, Total Dissolved	323 mg/l			
Solids, Total Suspended	120 mg/l			
Sulfate	91.2 mg/l		Fluoride	0.21 mg/l
			Turbidity	28.0 NTU

3.0 gpm
42'

Respectfully submitted

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Lab. No. W-2940

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMC 79-25 (Temp. F 41 Flow, GPM 12)

pH	7.1	Units	Arsenic		mg/l
Alkalinity, Total	315	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	315	mg/l $CaCo_3$	Boron		mg/l
Calcium	134	mg/l	Cadmium		mg/l
Chloride	8.3	mg/l	Chromium		mg/l
Conductivity	690	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	22.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	1.50	mg/l	Zinc		mg/l
Sodium	9.00	mg/l			
Solids, Total Dissolved	381	mg/l			
Solids, Total Suspended	< 0.5	mg/l			
Sulfate	139	mg/l			
Iron, dissolved	0.71	mg/l			
Flouride	0.17	mg/l			
Turbidity	0.8	mg/l			

Respectfully submitted Ray A. Sim

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Lab. No. W-2941

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-26 (Temp. F 42 Flow,GPM 7.5)

pH	7.6	Units	Arsenic		mg/l
Alkalinity, Total	297	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	297	mg/l $CaCo_3$	Boron		mg/l
Calcium	120	mg/l	Cadmium		mg/l
Chloride	7.5	mg/l	Chromium		mg/l
Conductivity	500	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	9.00	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	5.00	mg/l	Zinc		mg/l
Sodium	21.0	mg/l			
Solids, Total Dissolved	276	mg/l			
Solids, Total Suspended	33.0	mg/l			
Sulfate	97.5	mg/l			

Iron, dissolved 0.36 mg/l
Fluoride 0.17 mg/l
Turbidity 8.1 mg/l

Respectfully submitted Ray A. Sm[illegible]

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Lab. No. W-3235

Date Rec. 10-11-82

Date Sampled 10-9-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-26 EMS Temp. 39 Flow, GPM 2.7

pH	7.8	Units	Arsenic	mg/l
Alkalinity, Total	289	mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	289	mg/l $CaCo_3$ 353 HCO_3	Boron	mg/l
Calcium	127	mg/l	Cadmium	mg/l
Chloride	8.3	mg/l	Chromium	mg/l
Conductivity	431	umhos/cm	Copper	mg/l
Dissolved Oxygen		mg/l	Iron	mg/l
Hardness		mg/l $CaCo_3$	Lead	mg/l
Magnesium	10.0	mg/l	Manganese	mg/l
Nitrogen, Nitrate		mg/l	Mercury	µg/l
Phosphorus, Total		mg/l	Nickel	mg/l
Phosphorus, Ortho		mg/l	Selenium	mg/l
Potassium	7.00	mg/l	Zinc	mg/l
Sodium	29.0	mg/l		
Solids, Total Dissolved	292	mg/l		
Solids, Total Suspended	30.0	mg/l		
Sulfate	120	mg/l		
Fluoride	0.23	mg/l		
Turbidity	9.0	NTU		
Iron, dissolved	0.46	mg/l		

Respectfully submitted

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Lab. No. W-2942

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-28 (Temp. F 39 Flow,GPM 4.6)

pH	7.7	Units
Alkalinity, Total	278	mg/l $CaCo_3$
Alkalinity, Bicarbonate	278	mg/l $CaCo_3$
Calcium	118	mg/l
Chloride	13.9	mg/l
Conductivity	571	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	30.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	8.00	mg/l
Sodium	48.0	mg/l
Solids, Total Dissolved	448	mg/l
Solids, Total Suspended	13.0	mg/l
Sulfate	230	mg/l
Iron, Dissolved	0.29	mg/l
Flouride	0.26	mg/l
Turbidity	3.3	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Simpson

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Lab. No. W-3236

Date Rec. 10-11-82

Date Sampled 10-9-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-28 EMS Flag Lake Temp. 39 °F Flow, GPM 4.0

pH	7.4 Units	Arsenic	mg/l
Alkalinity, Total	271 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	271 mg/l $CaCo_3$ 331 HCO_3	Boron	mg/l
Calcium	116 mg/l	Cadmium	mg/l
Chloride	17.2 mg/l	Chromium	mg/l
Conductivity	580 µmhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	29.0 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	7.00 mg/l	Zinc	mg/l
Sodium	46.0 mg/l		
Solids, Total Dissolved	404 mg/l		
Solids, Total Suspended	13.0 mg/l		
Sulfate	200 mg/l		
Fluoride	0.40 mg/l		
Turbidity	2.8 NTU		
Iron, dissolved	0.26 mg/l		

Respectfully submitted

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Lab. No. W-2954

FOR Utah Power & Light Co.
Field Office
Huntigton, Utah 84528

Date Rec. 07-21-82

Date Sampled 07-19-82

Sample ID EMS 79-29

pH	7.6	Units
Alkalinity, Total	274	mg/l $CaCo_3$
Alkalinity, Bicarbonate	274	mg/l $CaCo_3$ 334 HCO_3
Calcium	110	mg/l
Chloride	16.2	mg/l
Conductivity	610	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	39.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	9.00	mg/l
Sodium	33.0	mg/l
Solids, Total Dissolved	432	mg/l
Solids, Total Suspended	21.5	mg/l
Sulfate	230	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (Dissolved)	0.26	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.22	mg/l
Turbidity	5.4	NTU

4.0 gpm
46°

Respectfully submitted

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Lab. No. W-3237

Date Rec. 10-11-82

Date Sampled 10-9-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-29 EMS Temp. 38 Flow, GPM 3.2

pH	7.6	Units	Arsenic	mg/l
Alkalinity, Total	269	mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	269	mg/l $CaCo_3$ 328 HCO_3	Boron	mg/l
Calcium	100	mg/l	Cadmium	mg/l
Chloride	19.9	mg/l	Chromium	mg/l
Conductivity	479	umhos/cm	Copper	mg/l
Dissolved Oxygen		mg/l	Iron	mg/l
Hardness		mg/l $CaCo_3$	Lead	mg/l
Magnesium	30.0	mg/l	Manganese	mg/l
Nitrogen, Nitrate		mg/l	Mercury	µg/l
Phosphorus, Total		mg/l	Nickel	mg/l
Phosphorus, Ortho		mg/l	Selenium	mg/l
Potassium	9.00	mg/l	Zinc	mg/l
Sodium	27.0	mg/l		
Solids, Total Dissolved	323	mg/l		
Solids, Total Suspended	3.0	mg/l		
Sulfate	140	mg/l		
Fluoride	0.33 mg/l			
Turbidity	2.4 NTU			
Iron, dissolved	0.25 mg/l			

Respectfully submitted

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Lab. No. W-2927

Date Rec. 7-15-82

Date Sampled 7-14-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-30 (Temp. F 49 Flow, GPM 10)

pH	7.7	Units	Arsenic		mg/l
Alkalinity, Total	399	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	399	mg/l $CaCo_3$	Boron		mg/l
Calcium	120	mg/l	Cadmium		mg/l
Chloride	10.5	mg/l	Chromium		mg/l
Conductivity	800	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	41.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.00	mg/l	Zinc		mg/l
Sodium	40.0	mg/l			
Solids, Total Dissolved	444	mg/l			
Solids, Total Suspended	9.5	mg/l			
Sulfate	169	mg/l			
Iron, dissolved	0.29	mg/l			
Turbidity	3.6	mg/l			
Fluoride	0.19	mg/l			

Respectfully submitted [signature]

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Lab. No. W-2943

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-32 (Temp. F 46 Flow, GPM 2.1)

pH	7.5	Units
Alkalinity, Total	422	mg/l $CaCo_3$
Alkalinity, Bicarbonate	422	mg/l $CaCo_3$
Calcium	188	mg/l
Chloride	18.5	mg/l
Conductivity	980	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	30.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	8.00	mg/l
Sodium	21.0	mg/l
Solids, Total Dissolved	544	mg/l
Solids, Total Suspended	3.0	mg/l
Sulfate	197	mg/l
Iron, dissolved	0.29	mg/l
Flouride	0.40	mg/l
Turbidity	4.6	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Roy A. Sim/KH

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Lab. No. W-2944

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-33 (Temp. F 42 Flow,GPM 2.8)

pH	7.6	Units
Alkalinity, Total	369	mg/l $CaCo_3$
Alkalinity, Bicarbonate	369	mg/l $CaCo_3$
Calcium	180	mg/l
Chloride	14.2	mg/l
Conductivity	810	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	16.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.00	mg/l
Sodium	41.0	mg/l
Solids, Total Dissolved	461	mg/l
Solids, Total Suspended	59.0	mg/l
Sulfate	214	mg/l
Iron, dissolved	0.40	mg/l
Flouride	0.29	mg/l
Turbidity	24.0	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim

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Lab. No. W-2738

Date Rec. 7-16-82

Date Sampled 7-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-34 (Temp. F 39 Flow,GPM 30)

pH	7.3	Units	Arsenic		mg/l
Alkalinity, Total	306	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	306	mg/l $CaCo_3$	Boron		mg/l
Calcium	140	mg/l	Cadmium		mg/l
Chloride	7.1	mg/l	Chromium		mg/l
Conductivity	600	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
lagnesium	26.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	7.00	mg/l	Zinc		mg/l
Sodium	17.0	mg/l			
Solids, Total Dissolved	409	mg/l			
Solids, Total Suspended	1.0	mg/l			
Sulfate	193	mg/l			
Iron, dissolved	0.37 mg/l				
Fluoride	0.19 mg/l				
Turbidity	3.2 mg/l				

Respectfully submitted Ray A. Sim / [illegible]

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Lab. No. W-2945

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 79-35 (Temp. F 39 Flow,GPM 7.6)

pH	7.6	Units
Alkalinity, Total	267	mg/l $CaCo_3$
Alkalinity, Bicarbonate	267	mg/l $CaCo_3$
Calcium	100	mg/l
Chloride	3.8	mg/l
Conductivity	465	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	14.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	2.00	mg/l
Sodium	28.0	mg/l
Solids, Total Dissolved	262	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	119	mg/l
Iron, dissolved	0.47 mg/l	
Flouride	0.17 mg/l	
Turbidity	0.9 mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sam / [illegible]

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STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3239

Date Rec. 10-11-82

Date Sampled 10-6-82

FOR Utah Power & LIght Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 79-35 EMS Temp. 39 Flow,GPM 3.5

pH	7.6 Units	Arsenic	mg/l
Alkalinity, Total	264 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	264 mg/l $CaCo_3$ 322 HCO_3	Boron	mg/l
Calcium	110 mg/l	Cadmium	mg/l
Chloride	5.3 mg/l	Chromium	mg/l
Conductivity	390 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
agnesium	16.0 mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	4.00 mg/l	Zinc	mg/l
Sodium	36.0 mg/l		
Solids, Total Dissolved	263 mg/l		
Solids, Total Suspended	0.5 mg/l		
Sulfate	130 mg/l		
Fluoride	0.17 mg/l		
Turbidity	1.4 NTU		
Iron, dissolved	0.20 mg/l		

Respectfully submitted

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P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2946

Date Rec. 7-19-82

Date Sampled 7-16-82

FOR Utah Power & Light Co.
M&E Field office
Huntington, Utah 84528

Sample ID EMS 79-37 (Temp. F 43 Flow,GPM 0.4)

pH	7.8	Units
Alkalinity, Total	338	mg/l $CaCo_3$
Alkalinity, Bicarbonate	338	mg/l $CaCo_3$
Calcium	150	mg/l
Chloride	6.8	mg/l
Conductivity	680	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	17.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.50	mg/l
Sodium	21.0	mg/l
Solids, Total Dissolved	382	mg/l
Solids, Total Suspended	133	mg/l
Sulfate	144	mg/l
Iron, dissolved	0.49	mg/l
Flouride	0.22	mg/l
Turbidity	37.0	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Simpkins

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Lab. No. W-2955

Date Rec. 07-21-82

Date Sampled 07-20-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID EMS 79-38

pH	7.8	Units
Alkalinity, Total	392	mg/l $CaCo_3$
Alkalinity, Bicarbonate	392	mg/l $CaCo_3$ 478 HCO_3
Calcium	170	mg/l
Chloride	9.5	mg/l
Conductivity	710	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
lagnesium	42.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	8.50	mg/l
Sodium	11.5	mg/l
Solids, Total Dissolved	445	mg/l
Solids, Total Suspended	8.5	mg/l
Sulfate	198	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.41	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.19	mg/l
Turbidity	3.7	NTU

10 gpm
43°

Respectfully submitted

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Lab. No. W-2956

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Date Rec. 07-21-82

Date Sampled 07-20-82

Sample ID EMS 79-40

pH	7.9	Units
Alkalinity, Total	320	mg/l $CaCo_3$
Alkalinity, Bicarbonate	320	mg/l $CaCo_3$ 390 HCO_3
Calcium	110	mg/l
Chloride	7.5	mg/l
Conductivity	600	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	26.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.00	mg/l
Sodium	44.0	mg/l
Solids, Total Dissolved	336	mg/l
Solids, Total Suspended	80.5	mg/l
Sulfate	139	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.37	mg/l
Lead		mg/l
Manganese		mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.15	mg/1
Turbidity	29.0	NTU

3.2 gpm
39°

Respectfully submitted

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Lab. No. W-2957

Date Rec. 07-21-82

Date Sampled 07-20-82

FOR Utah Power & Light Co.
Field Office
Huntington, utah 84528

Sample ID EMS 80-41

pH	7.9	Units
Alkalinity, Total	345	mg/l $CaCo_3$
Alkalinity, Bicarbonate	345	mg/l $CaCo_3$ 421 HCO_3
Calcium	190	mg/l
Chloride	10.0	mg/l
Conductivity	700	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	16.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.00	mg/l
Sodium	6.50	mg/l
Solids, Total Dissolved	392	mg/l
Solids, Total Suspended	35.5	mg/l
Sulfate	170	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.33	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Fluoride	0.15	mg/l
Turbidity	12.0	NTU

1.0 gpm
38°

Respectfully submitted

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Lab. No. W-2958

Date Rec. 07-21-82

Date Sampled 07-19-82

FOR Utah Power & Light Co.
Field Office
Huntington, utah 84528

Sample ID EMS 80-43

pH	7.8	Units
Alkalinity, Total	315	mg/l $CaCo_3$
Alkalinity, Bicarbonate	315	mg/l $CaCo_3$ 384 HCO_3
Calcium	142	mg/l
Chloride	4.2	mg/l
Conductivity	590	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	27.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.00	mg/l
Sodium	7.00	mg/l
Solids, Total Dissolved	391	mg/l
Solids, Total Suspended	11.5	mg/l
Sulfate	160	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.31	mg/l
Lead		mg/l
Manganese		mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.12	mg/l
Turbidity	3.6	NTU

10 gpm
41°

Respectfully submitted

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P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2959

Date Rec. 07-21-82

Date Sampled 07-20-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID EMS 80-44

pH	8.0	Units		Arsenic	mg/l
Alkalinity, Total	372	mg/l $CaCo_3$		Beryllium	mg/l
Alkalinity, Bicarbonate	372	mg/l $CaCo_3$	454 HCO_3	Boron	mg/l
Calcium	155	mg/l		Cadmium	mg/l
Chloride	11.8	mg/l		Chromium	mg/l
Conductivity	790	umhos/cm		Copper	mg/l
Dissolved Oxygen		mg/l		Iron (dissolved)	0.30 mg/l
Hardness		mg/l $CaCo_3$		Lead	mg/l
Magnesium	30.0	mg/l		Manganese	mg/l
Nitrogen, Nitrate		mg/l		Mercury	µg/l
Phosphorus, Total		mg/l		Nickel	mg/l
Phosphorus, Ortho		mg/l		Selenium	mg/l
Potassium	8.00	mg/l		Zinc	mg/l
Sodium	25.0	mg/l			
Solids, Total Dissolved	439	mg/l			
Solids, Total Suspended	89.0	mg/l			
Sulfate	139	mg/l		Fluoride	0.15 mg/l
				Turbidity	25.0 NTU

12 gpm
39°

Respectfully submitted

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Lab. No. W-2960

Date Rec. 07-21-82

Date Sampled 07-20-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID EMS 80-45

pH	7.7	Units
Alkalinity, Total	406	mg/l $CaCo_3$
Alkalinity, Bicarbonate	406	mg/l $CaCo_3$
Calcium	160	mg/l
Chloride	12.2	mg/l
Conductivity	860	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	30.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.50	mg/l
Sodium	29.0	mg/l
Solids, Total Dissolved	476	mg/l
Solids, Total Suspended	731	mg/l
Sulfate	173	mg/l

495 HCO_3

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.29	mg/l
Lead		mg/l
Manganese		mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.15	mg/l
Turbidity	110	NTU

4.0 gpm
41°

Respectfully submitted

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FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Lab. No. W-2961

Date Rec. 07-21-82

Date Sampled 07-19-82

Sample ID EMS 80-47

pH	7.9	Units
Alkalinity, Total	292	mg/l $CaCo_3$
Alkalinity, Bicarbonate	292	mg/l $CaCo_3$
Calcium	125	mg/l
Chloride	4.7	mg/l
Conductivity	590	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	41.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	7.50	mg/l
Sodium	23.0	mg/l
Solids, Total Dissolved	390	mg/l
Solids, Total Suspended	12.0	mg/l
Sulfate	218	mg/l

356 HCO_3

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.22	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.12	mg/l
Turbidity	4.1	NTU

12 gpm
58°

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3238

Date Rec. 10-11-82

Date Sampled 10-10-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 80-47 EMS Temp. 39 Flow, GPM 10.0

pH	7.8 Units	Arsenic	mg/l
Alkalinity, Total	310 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	310 mg/l $CaCo_3$ 378 HCO_3	Boron	mg/l
Calcium	98.0 mg/l	Cadmium	mg/l
Chloride	5.6 mg/l	Chromium	mg/l
Conductivity	462 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	36.0 mg/l	Manganese	mg/
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	7.50 mg/l	Zinc	mg/l
Sodium	20.0 mg/l		
Solids, Total Dissolved	313 mg/l		
Solids, Total Suspended	12.0 mg/l		
Sulfate	140 mg/l		
Fluoride	0.22 mg/l		
Turbidity	5.7 NTU		
Iron, dissolved	0.26 mg/l		

Respectfully submitted

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O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W 2928

Date Rec. 7-15-82

Date Sampled 7-13-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 80-48 (Temp. F 49 Flow, GPM 1.3)

pH	7.4	Units
Alkalinity, Total	264	mg/l $CaCo_3$
Alkalinity, Bicarbonate	264	mg/l $CaCo_3$
Calcium	143	mg/l
Chloride	4.6	mg/l
Conductivity	500	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	26.5	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	4.00	mg/l
Sodium	6.00	mg/l
Solids, Total Dissolved	393	mg/l
Solids, Total Suspended	145	mg/l
Sulfate	210	mg/l
Iron, dissolved	0.71	mg/l
Fluoride	0.27	mg/l
Turbidity	30.0	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sam

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2929

Date Rec. 7-15-82

Date Sampled 7-13-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID EMS 80-49 (Temp. F 44 Flow, GPM 15)

pH	7.4	Units	Arsenic		mg/l
Alkalinity, Total	342	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	342	mg/l $CaCo_3$	Boron		mg/l
Calcium	130	mg/l	Cadmium		mg/l
Chloride	6.2	mg/l	Chromium		mg/l
Conductivity	540	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	28.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	9.50	mg/l	Zinc		mg/l
Sodium	7.00	mg/l			
Solids, Total Dissolved	300	mg/l			
Solids, Total Suspended	8.0	mg/l			
Sulfate	106	mg/l			
Iron, dissolved	0.36	mg/l			
Fluoride	0.19	mg/l			
Turbidity	2.8	mg/l			

Respectfully submitted Ray A. Sam /RH

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STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2910

Date Rec. 7-12-82

Date Sampled 7-12-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

Sample ID EMS 80-50 (Temp. F 44 Flow, GPM -)

pH	7.5	Units	Arsenic		mg/l
Alkalinity, Total	385	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	385	mg/l $CaCo_3$	Boron		mg/l
Calcium	143	mg/l	Cadmium		mg/l
Chloride	10.3	mg/l	Chromium		mg/l
Conductivity	900	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	29.5	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	12.0	mg/l	Zinc		mg/l
Sodium	46.0	mg/l			
Solids, Total Dissolved	532	mg/l			
Solids, Total Suspended	79.0	mg/l			
Sulfate	215	mg/l			
Iron, dissolved	0.40	mg/l			
Fluoride	0.25	mg/l			
Turbidity	18.0	NTU			

Respectfully submitted Ray A. Sim /RH

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3275

Date Rec. 10-14-82

Date Sampled 10-14-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 80-50 EMS Temp. 46 Flow, GPM 1.5

pH	7.5	Units	Arsenic		mg/l
Alkalinity, Total	380	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate	380	mg/l $CaCo_3$ 464	Boron		mg/l
Calcium	150	mg/l	Cadmium		mg/l
Chloride	11.8	mg/l	Chromium		mg/l
Conductivity	880	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	27.0	mg/l	Manganese		mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	10.0	mg/l	Zinc		mg/l
Sodium	44.0	mg/l			
Solids, Total Dissolved	494	mg/l			
Solids, Total Suspended	1.5	mg/l			
Sulfate	200	mg/l			
Fluoride	0.21 mg/l				
Turbidity	1.9 NTU				
IRon, dissolved	0.33 mg/l				

Respectfully submitted

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STANDARD LABORATORIES, INC.

). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2973

Date Rec. 07-26-82

Date Sampled 07-23-82

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Sample ID EMS 82-52

pH	7.4	Units	
Alkalinity, Total	342	mg/l $CaCo_3$	
Alkalinity, Bicarbonate	342	mg/l $CaCo_3$	417 HCO3
Calcium	140	mg/l	
Chloride	7.7	mg/l	
Conductivity	740	umhos/cm	
Dissolved Oxygen		mg/l	
Hardness		mg/l $CaCo_3$	
iagnesium	28.0	mg/l	
Nitrogen, Nitrate		mg/l	
Phosphorus, Total		mg/l	
Phosphorus, Ortho		mg/l	
Potassium	8.00	mg/l	
Sodium	23.0	mg/l	
Solids, Total Dissolved	410	mg/l	
Solids, Total Suspended	< 0.5	mg/l	
Sulfate	211	mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron (dissolved)	0.29	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Fluoride	0.19	mg/l
Turbidity	0.9	NTU

Respectfully submitted

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3244

Date Rec. 10-11-82

Date Sampled 10-10-82

FOR Utah Power & Light Co.
M&E Field Office
HUntington, Utah 84528

Sample ID Sheep Header EMS 82-52 Temp. 39 Flow, GPM 7.5

pH	7.7 Units	Arsenic	mg/l
Alkalinity, Total	359 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	359 mg/l $CaCo_3$ 438 HCO_3	Boron	mg/l
Calcium	160 mg/l	Cadmium	mg/l
Chloride	13.0 mg/l	Chromium	mg/l
Conductivity	590 umhos/cm	Copper	mg/l
Dissolved Oxygen	mg/l	Iron	mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	8.00 mg/l	Manganese	mg/.
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	4.00 mg/l	Zinc	mg/l
Sodium	33.0 mg/l		
Solids, Total Dissolved	379 mg/l		
Solids, Total Suspended	0.5 mg/l		
Sulfate	160 mg/l		
Fluoride	0.30 mg/l		
Turbidity	1.4 NTU		
Iron, dissolved	0.12 mg/l		

Respectfully submitted

Certified Environmental Laboratory

APPENDIX I

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

[illegible] CO.
P. O. BOX 999
SALT LAKE CITY UTAH 84110

SAMPLE ID:LITTLE DOVE IN 1RXD84 LAB NUMBER W-2567
2567
DATE SAMPLED:3. 24. 82 DATE REC'D:3. 24. 82
REPORT DATE:3. 30. 82 SAMPLED BY:UPL

FLOW .08gpm
TEMP. 56° F
13° C

WASTEWATER ANALYSIS

PH	7.0	UNITS
TSS	2.0	MG/L

CHEMICAL ANALYSIS

CALCIUM	270.0	MG/L
MAGNESIUM	95.20	MG/L
POTASSIUM	17.00	MG/L
SODIUM	84.00	MG/L
SP. COND	1750	UHMOS/CM
DS	1197.0	MG/L
BICARB. ALK	470.0	MG/L CACO3
CHLORIDE	23.8	MG/L
SULFATE	677.0	MG/L
T. ALK	470.0	MG/L CACO3

T. CATION 25.4 MEQ/L T. ANION 23.9 MEQ/L
TDS/COND 0.684 TDS BAL 1197: 1150

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

UTAH POWER & LIGHT CO.
P. O. BOX 899
SALT LAKE CITY UTAH 84110

SAMPLE ID: LITTLE DOVE IN 2LNC75 LAB NUMBER W-25681
2568
DATE SAMPLED: 3. 24. 82 DATE REC'D: 3. 24. 82
REPORT DATE: 3. 30. 82 SAMPLED BY: UPL

FLOW .08 gpm

TEMP. 58° F
14° C

WASTEWATER ANALYSIS

PH	7.2	UNITS
TSS	3.5	MG/L

CHEMICAL ANALYSIS

CALCIUM	285.0	MG/L
MAGNESIUM	104.00	MG/L
POTASSIUM	13.00	MG/L
SODIUM	93.00	MG/L
SP. COND	1900	UHMOS/CM
TDS	1268.0	MG/L
BICARB. ALK	475.0	MG/L CACO3
CHLORIDE	27.2	MG/L
SULFATE	754.0	MG/L
T. ALK	475.0	MG/L CACO3

T. CATION 26.7 MEQ/L T. ANION 25.7 MEQ/L
TDS/COND 0.667 TDS BAL 1268: 1253

RAY A. SIM, MANAGER

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3212

Date Rec. 10-1-82

Date Sampled 9-30-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID 2NxC 38½ Desert Floor Sample

pH	7.3	Units
Alkalinity, Total	334	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	200	mg/l
Chloride	19.8	mg/l
Conductivity	1230	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	78.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	12.0	mg/l
Sodium	53.0	mg/l
Solids, Total Dissolved	920	mg/l
Solids, Total Suspended	96.0	mg/l
Sulfate	560	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

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APPENDIX J

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, UT 84528 801-653-2311

M&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: WILBERG IN MINE INX49 IR 2427
LAB NUMBER W- 2427
FLOW: 0.25 GPM
DATE SAMPLED: 1. 15. 82
TEMP: 50° F
10° C
DATE REC'D: 1. 18. 82
REPORT DATE: 1. 21. 82
SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	7.0	UNITS
TSS	1.5	MG/L

CHEMICAL ANALYSIS

CALCIUM	179.0	MG/L
MAGNESIUM	64.00	MG/L
POTASSIUM	3.44	MG/L
SODIUM	37.00	MG/L
SP. COND	950	UHMOS/CM
TDS	710.0	MG/L
BICARB. ALK	491.0	MG/L CACO3
CHLORIDE	14.7	MG/L
SULFATE	325.0	MG/L
T. ALK	491.0	MG/L CACO3

T. CATION 15.9 MEQ/L
T. ANION 17.0 MEQ/L
TDS/COND 0.747
TDS BAL 710: 620

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

UTAH POWER & LIGHT CO.
M&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: WILBERG IN MINE 10RX38 1/2 IL LAB NUMBER W- 2429
2429 FLOW: 0.08 GPM
DATE SAMPLED: 1. 15. 82 DATE REC'D: 1. 18. 82
REPORT DATE: 1. 21. 82 SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	7.4	UNITS
TSS	0.5	MG/L

CHEMICAL ANALYSIS

CALCIUM	180.0	MG/L
MAGNESIUM	46.00	MG/L
POTASSIUM	4.25	MG/L
SODIUM	32.00	MG/L
SP. COND	1000	UHMOS/CM
TDS	609.0	MG/L
BICARB. ALK	504.0	MG/L CACO3
CHLORIDE	14.0	MG/L
SULFATE	222.0	MG/L
T. ALK	504.0	MG/L CACO3

T. CATION 14.3 MEQ/L T. ANION 15.1 MEQ/L
TDS/COND 0.609 TDS BAL 609: 494

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

...T CO.
...&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: WILBERG IN MINE 9TH RX12 IL 2428 FLOW: 0.08 GPM
LAB NUMBER W- 2428
DATE SAMPLED: 1. 15. 82
DATE REC'D: 1. 18. 82
REPORT DATE: 1. 21. 82
SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	7.2	UNITS
TSS	1.0	MG/L

CHEMICAL ANALYSIS

CALCIUM	150.0	MG/L
MAGNESIUM	67.00	MG/L
POTASSIUM	3.73	MG/L
SODIUM	41.00	MG/L
SP. COND	1090	UHMOS/CM
TDS	610.0	MG/L
ICARB. ALK	500.0	MG/L CACO3
CHLORIDE	15.2	MG/L
SULFATE	222.0	MG/L
T. ALK	500.0	MG/L CACO3

T. CATION 14.9 MEQ/L
T. ANION 15.1 MEQ/L
TDS/COND 0.560
TDS BAL 610: 495

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, UT 84528 · 801-653-2314

UTAH POWER & LIGHT CO.
J&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: WILBERG IN MINE 3L IR X C 15 1/2
LAB NUMBER W-2605
DATE SAMPLED: 4. 12. 82
REPORT DATE: 4. 26. 82

DATE REC'D: 4. 12. 82
SAMPLED BY: UPL

Flow .75 gpm
Temp. 58° F
14° C

WASTEWATER ANALYSIS

PH	7. 4	UNITS
TSS	1. 0	MG/L

CHEMICAL ANALYSIS

CALCIUM	140. 0	MG/L
MAGNESIUM	30. 00	MG/L
POTASSIUM	4. 50	MG/L
SODIUM	31. 50	MG/L
SP. COND	800	UHMOS/CM
TDS	449. 0	MG/L
BICARB. ALK	336. 0	MG/L CACO3
CHLORIDE	14. 3	MG/L
SULFATE	230. 0	MG/L
T. ALK	336. 0	MG/L CACO3

T. CATION 10. 9 MEQ/L T. ANION 11. 6 MEQ/L
TDS/COND 0. 561 TDS BAL 449: 446

RAY A. SIM, MANAGER

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UTAH POWER & LIGHT CO.
J&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID:WILBERG IN MINE 3L IR X 13 1/2
2604
DATE SAMPLED:4. 12. 82
REPORT DATE:4. 26. 82

LAB NUMBER W-2604

DATE REC'D:4. 12. 82
SAMPLED BY:UPL

Flow .06 gpm
Temp. 58° F
14° C

WASTEWATER ANALYSIS

PH	7. 6	UNITS
TSS	4. 5	MG/L

CHEMICAL ANALYSIS

CALCIUM	135. 0	MG/L
MAGNESIUM	31. 00	MG/L
POTASSIUM	4. 00	MG/L
SODIUM	32. 00	MG/L
SP. COND	810	UHMOS/CM
TDS	451. 0	MG/L
BICARB. ALK	337. 0	MG/L CACO3
CHLORIDE	7. 3	MG/L
SULFATE	170. 0	MG/L
T. ALK	337. 0	MG/L CACO3

T. CATION 10. 8 MEQ/L T. ANION 10. 2 MEQ/L
TDS/COND 0. 557 TDS BAL 451: 375

RAY A. SIM, MANAGER

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3056

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Date Rec. 8-27-82

Date Sampled 8-27-82

Sample ID Wilberg In mine 1st So. Neck off x C 3 IL

Temperature F 52
Flow, GPM ~~0.33~~ .035

pH	7.2	Units	Arsenic		mg/l
Alkalinity, Total	388	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium	131	mg/l	Cadmium		mg/l
Chloride	13.9	mg/l	Chromium		mg/l
Conductivity	970	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	49.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	21.0	mg/l	Zinc		mg/l
Sodium	59.0	mg/l			
Solids, Total Dissolved	573	mg/l			
Solids, Total Suspended	4.0	mg/l			
Sulfate	250	mg/l			

Total Cations 13.6
Total Anions 13.4

Respectfully submitted

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STANDARD LABORATORIES, INC.
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FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Lab. No. W-3055

Date Rec. 8-27-82

Date Sampled 8-27-82

Sample ID Wilberg In Mine 4E x C 42 IL Flow GPM ~~0.3~~ .03 Temperature F 52

pH	6.8	Units
Alkalinity, Total	566	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	285	mg/l
Chloride	17.8	mg/l
Conductivity	1980	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	126	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.97	mg/l
Sodium	40.0	mg/l
Solids, Total Dissolved	1496	mg/l
Solids, Total Suspended	1.0	mg/l
Sulfate	780	mg/l

Total Cations	26.4
Total Anions	28.0

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Lab. No. W-3303

Date Rec. 10-28-82

Date Sampled 10-27-82

Sample ID Wilberg IN x C 85½ 2 R

Temp. 52 Flow, GPM 0.5

pH	7.0	Units
Alkalinity, Total	404	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	115	mg/l
Chloride	8.5	mg/l
Conductivity	820	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	39.5	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	12.0	mg/l
Sodium	47.0	mg/l
Solids, Total Dissolved	481	mg/l
Solids, Total Suspended	<0.5	mg/l
Sulfate	170	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

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CERTIFICATE OF ANALYSIS

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P.O. Box 1140, Huntington, Utah 84528 801-653-2314

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Lab. No. W-3302

Date Rec. 10-28-82

Date Sampled 10-27-82

Sample ID Wilberg 12 R x C 14 1L Temp. 52 Flow, GPM 0.125

pH	7.0	Units
Alkalinity, Total	380	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	118	mg/l
Chloride	10.6	mg/l
Conductivity	880	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	40.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	12.0	mg/l
Sodium	50.0	mg/l
Solids, Total Dissolved	535	mg/l
Solids, Total Suspended	<0.5	mg/l
Sulfate	210	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

APPENDIX K

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2418

Date Rec. 1-8-82

Date Sampled 1-8-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Mine Discharge Quarterly

pH	8.1 Units	Arsenic	mg/l
Alkalinity, Total	326 mg/l $CaCo_3$	Beryllium	mg/l
Alkalinity, Bicarbonate	mg/l $CaCo_3$	Boron	mg/l
Calcium	mg/l	Cadmium	mg/l
Chloride	12.5 mg/l	Chromium	mg/l
Conductivity	umhos/cm	Copper	mg/l
Dissolved Oxygen	8.4 mg/l	Iron	0.64 mg/l
Hardness	mg/l $CaCo_3$	Lead	mg/l
Magnesium	mg/l	Manganese	mg/l
Nitrogen, Nitrate	mg/l	Mercury	µg/l
Phosphorus, Total	mg/l	Nickel	mg/l
Phosphorus, Ortho	mg/l	Selenium	mg/l
Potassium	mg/l	Zinc	mg/l
Sodium	mg/l		
Solids, Total Dissolved	516 mg/l		
Solids, Total Suspended	5.5 mg/l		
Sulfate	267 mg/l		
O & G	<0.5 mg/l	Coliforms, Total	79 MPN/100 ml
Acidity	<1.0 mg/l $CaCO_3$	Coliforms, Fecal	4 MPN/100 ml
BOD-5 day	1.1 mg/l		

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2478

FOR Utah Power & Light Co.
M&E Field Office

Date Rec. 2-5-82

Date Sampled 2-5-82

Sample ID Wilberg Discharge

pH	8.1	Units
Alkalinity, Total	313	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	9.6	mg/l
Conductivity	890	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	543	mg/l
Solids, Total Suspended	3.5	mg/l
Sulfate	165	mg/l
Acidity	< 1.0	mg/l $CaCO_3$
Oil & Grease	2.2	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.61	mg/l
Lead		mg/l
Manganese		mg/
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2516

Date Rec. 3-1-82

Date Sampled 3-1-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Mine Discharge

pH	7.9	Units	Arsenic		mg/l
Alkalinity, Total	227	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	13.6	mg/l	Chromium		mg/l
Conductivity		umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.69	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	549.	mg/l			
Solids, Total Suspended	13.0	mg/l			
Sulfate	214.	mg/l			
Oil & Grease	<0.5	mg/l			
Acidity	<1.0	mg/l $CaCO_3$			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2599

Date Rec. 4-7-82

Date Sampled 4-7-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Discharge

pH	7.8	Units
Alkalinity, Total	277	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	11.1	mg/l
Conductivity	910	umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	568	mg/l
Solids, Total Suspended	<0.5	mg/l
Sulfate	181	mg/l
Acidity	<1.0 mg/l CACO3	
O & G	<0.5 mg/l	
B.O.D.	1.0 mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.66	mg/l
Lead		mg/l
Manganese		mg,
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Coliforms, total	20	MPN/100ml
Coliforms, fecal	<2 MPN/100 ml	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2675

Date Rec. 5-3-82

Date Sampled 5-3-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Discharge

pH	7.7	Units	Arsenic		mg/l
Alkalinity, Total	317	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	12.5	mg/l	Chromium		mg/l
Conductivity		µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.74	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	550	mg/l			
Solids, Total Suspended	8.0	mg/l			
Sulfate	226	mg/l			
Acidity	1.0 mg/l $CaCo_3$				
Oil & Grease	< 0.5 mg/l				

Respectfully submitted [signature]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2738

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Date Rec. 06-02-82

Sample ID Wilberg Discharge 15:30

Date Sampled 06-01-82

pH	8.0	Units	Arsenic		mg/l
Alkalinity, Total	328	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	11.1	mg/l	Chromium		mg/l
Conductivity		µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.73	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	562	mg/l			
Solids, Total Suspended	70	mg/l			
Sulfate	245	mg/l	Acidity	< 1.0	mg/l
			Oil & Grease	< 0.5	mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Lab. No. W-2975

Date Rec. 07-26-82

Date Sampled 07-26-82

Sample ID Wilberg Discharge USGS Special

pH	7.8	Units
Alkalinity, Total	296	mg/l $CaCo_3$
Alkalinity, Bicarbonate	296	mg/l $CaCo_3$ 361 HCO_3
Calcium	140	mg/l
Chloride	9.7	mg/l
Conductivity	980	µmhos/cm
Dissolved Oxygen	5.9	mg/l
Hardness		mg/l $CaCo_3$
Magnesium	8.52	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total	< 0.01	mg/l
Phosphorus, Ortho		mg/l
Potassium	3.62	mg/l
Sodium	17.1	mg/l
Solids, Total Dissolved	553	mg/l
Solids, Total Suspended	0.5	mg/l
Sulfate	136	mg/l

Arsenic	< 0.001	mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	< 0.005	mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.32	mg/l
Lead	< 0.05	mg/l
Manganese	0.09	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium	< 0.0003	mg/l
Zinc	0.063	mg/l
Fluoride	0.17	mg/l
Silica	11.3	mg/l
Nitirte-N	< 0.01	mg/l
BOD-5	0.3	mg/l
TKN	0.21	mg/l
Oil & Grease	< 0.5	mg/l
Acidity	< 1.0	mg/l $CaCO_3$

Respectfully submitted

Certified Environmental Laboratory

Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 09/28/82

CERTIFICATE OF ANALYSIS

UTAH POWER & LIGHT
FIELD OFFICE
P.O. 1005
HUNTINGTON, UT 84528

82-004655

SAMPLE: WATER SAMPLES COLLECTED 8-19-82 RECEIVED 8-20-82 FOR ANALYSIS.

	DEER CREEK 1:50 PM	WILBERG MINE 8:50 AM
Gross Alpha pci/l	<2.0	<2.0
Gross Beta pci/l	<.1	<.1
Total Organic Carbon mg/l	21.60	12.50

FORD CHEMICAL LABORATORY, INC.

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. Box 1140, Huntington, Utah 84528 801-653-2314

FOR Utah power & Light Co.
Field Office
Huntington, Utah 84528

Lab. No. W-3011

Date Rec. 08-03-82

Date Sampled 08-02-82

Sample ID Wilberg Discharge

pH	7.4	Units
Alkalinity, Total	299	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	10.9	mg/l
Conductivity	990	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	561	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	290	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.66	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Oil & Grease	< 0.5	mg/l
Acidity	< 1.0	mg/l $CaCO_3$

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3142

Date Rec. 9-15-82

Date Sampled 9-15-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Discharge

pH	7.6	Units
Alkalinity, Total	364	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	13.4	mg/l
Conductivity		umhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	595	mg/l
Solids, Total Suspended	6.0	mg/l
Sulfate	210	mg/l
Acidity	<1.0	mg/l $CaCO_3$
Oil & Grease	<0.5	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.24	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3246

Date Rec. 10-11-82

Date Sampled 10-11-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Mine Discharge

pH	7.7	Units	Arsenic		mg/l
Alkalinity, Total	288	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	16.6	mg/l	Chromium		mg/l
Conductivity		µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.18	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
agnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l	Coliforms, Total	<2 MPN/100ml	
Solids, Total Dissolved	598	mg/l	Coliforms, Fecal	<2 MPN/100ml	
Solids, Total Suspended	2.0	mg/l			
Sulfate	220	mg/l			
Acidity	< 1.0 mg/l $CaCO_3$				
B.O.D.5	1.0 mg/l				
Oil & Grease	<0.5 mg/l				

Respectfully submitted

Certified Environmental Laboratory

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

Lab No. W-3336

Date Rec. 11-10-82

Date Sampled 11-20-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Wilberg Discharge

pH	7.5	Units	Arsenic		mg/l
Alkalinity, Total	271	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	14.2	mg/l	Chromium		mg/l
Conductivity		umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.19	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		mg/l
Phosphorus, Ortho		mg/l	Nickel		mg/l
Potassium		mg/l	Selenium		mg/l
Sodium		mg/l	Zinc		mg/l
Solids, Total Dissolved	595	mg/l			
Solids, Total Suspended	1.0	mg/l			
Sulfate	200	mg/l			
Oil & Grease	< 0.5	mg/l			
Acidity	< 1.0	mg/l $CaCo_3$			

Respectfully submitted

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3412
Date Rec'd 12-13-82
Date Sampled 12-13-82
Time Sampled

Client: Utah Power & Light Co.
Mining & Exploration Field Office
P.O. BOX 1005
Huntington, Utah 84528

Sample ID: Wilberg Mine Discharge

Acidity	1.0	mg/l $CaCO_3$
Alkalinity, Total	283	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	14.0	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity		umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
ogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	0.5	mg/l
pH	7.2	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	597	mg/l
Solids, Total Suspended	0.5	mg/l
Sulfate	182	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.27	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

APPENDIX L

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, UT 84528 801-653-2314

P. O. BOX 895
SALT LAKE CITY UTAH 84110

SAMPLE ID: DEER CR 3RD NW26 2L
2569

LAB NUMBER W- 2569

DATE SAMPLED: 3. 25. 92
REPORT DATE: 3. 30. 92

DATE REC'D: 3. 25. 92
SAMPLED BY: UPL

FLOW .08 gpm

TEMP. 58° F
14° C

WASTEWATER ANALYSIS

PH 6.8 UNITS
TSS <2 MG/L

CHEMICAL ANALYSIS

CALCIUM	150.0	MG/L
MAGNESIUM	57.10	MG/L
POTASSIUM	10.00	MG/L
SODIUM	36.00	MG/L
SP. COND	800	UHMOS/CM
TDS	496.0	MG/L
TCARB. ALK	396.0	MG/L CACO3
CHLORIDE	6.4	MG/L
SULFATE	240.0	MG/L
T. ALK	396.0	MG/L CACO3

T. CATION 12.7 MEQ/L T. ANION 12.8 MEQ/L
TDS/COND 0.620 TDS BAL 496: 484

RAY A. SIM, MANAGER

STANDARD LABORATORIES, INC.
P.O. Box 1140 Huntington, UT 84528 801-653-2314

UTAH POWER & LIGHT CO.
M&E FIELD OFFICE
HUNTINGTON UTAH 84528

SAMPLE ID: DR. CR. IN MINE MW x CO (after the rock tunnel)
DATE SAMPLED: 4. 23. 82
REPORT DATE: 5. 12. 82

LAB NUMBER W-2655
DATE REC'D: 4. 23. 82
SAMPLED BY: UPL

WASTEWATER ANALYSIS

PH	7. 6	UNITS
TSS	7. 0	MG/L

CHEMICAL ANALYSIS

CALCIUM	90. 0	MG/L
MAGNESIUM	16. 00	MG/L
POTASSIUM	5. 00	MG/L
SODIUM	46. 00	MG/L
SP. COND	470	UHMOS/CM
TDS	263. 0	MG/L
BICARB. ALK	297. 0	MG/L CACO3
CHLORIDE	8. 9	MG/L
SULFATE	86. 4	MG/L
T. ALK	297. 0	MG/L CACO3

T. CATION 7. 9 MEQ/L T. ANION 7. 7 MEQ/L
TDS/COND 0. 560 TDS BAL 263: 247

RAY A. SIM, MANAGER

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2832

FOR Utah Power & Light Co.
Field Office
Huntington, Utah 84528

Flow: .13 GPM
Temp: 48° F

Date Rec. 6-24-82

Date Sampled 6-24-82

Sample ID Deer Creek In-Mine 4th Right X C 14½ IL

pH	7.2	Units
Alkalinity, Total	376	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	120	mg/l
Chloride	12.8	mg/l
Conductivity	720	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	58.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	2.24	mg/l
Sodium	24.0	mg/l
Solids, Total Dissolved	421	mg/l
Solids, Total Suspended	6.0	mg/l
Sulfate	181	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2833

FOR Utah Power & Light CO.
Field Office
Huntington, Utah 84528

Flow: 10 GPM Estimated
Temp: 52° F

Date Rec. 6-24-82

Date Sampled 6-24-82

Sample ID Deer Creek In-Mine EM-3

pH	6.8	Units	Arsenic		mg/l
Alkalinity, Total	417	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium	100	mg/l	Cadmium		mg/l
Chloride	11.2	mg/l	Chromium		mg/l
Conductivity	650	umhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron		mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium	53.0	mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium	2.40	mg/l	Zinc		mg/l
Sodium	30.0	mg/l			
Solids, Total Dissolved	360	mg/l			
Solids, Total Suspended	2.0	mg/l			
Sulfate	115	mg/l			

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3194

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

FLOW: 0.78 GPM
TEMP. 56° F
13° C

Date Rec. 9-29-82

Date Sampled 9-28-82

Sample ID Deer Creek 5RxC8 1R

pH	7.0	Units
Alkalinity, Total	410	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	139	mg/l
Chloride	11.4	mg/l
Conductivity	920	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	60.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	4.00	mg/l
Sodium	31.0	mg/l
Solids, Total Dissolved	517	mg/l
Solids, Total Suspended	1.0	mg/l
Sulfate	200	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3193

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

FLOW: 0.17 GPM

TEMP: 56° F
13° C

Date Rec. 9-29-82

Date Sampled 9-28-82

Sample ID Deer Creek 4RxC14½ 1R

pH	7.0	Units
Alkalinity, Total	425	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium	130	mg/l
Chloride	11.8	mg/l
Conductivity	920	µmhos/cm
Dissolved Oxygen		mg/l
Hardness		mg/l $CaCo_3$
Magnesium	59.0	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium	3.50	mg/l
Sodium	27.0	mg/l
Solids, Total Dissolved	552	mg/l
Solids, Total Suspended	2.0	mg/l
Sulfate	220	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3467
Date Rec'd 12-28-82
Date Sampled 12-28-82
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Deer Creek In-Mine
EM-3

Flow: 10 GPM Estimated

Acidity		mg/l $CaCO_3$
Alkalinity, Total	393	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	12.0	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1000	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
trogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.4	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	565	mg/l
Solids, Total Suspended	0.5	mg/l
Sulfate	230	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium	152	mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium	47.0	mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	4.50	mg/l
Selenium		mg/l
Silica		mg/l
Sodium	30.0	mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim / [illegible]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3473

Date Rec'd 1-3-83

Date Sampled 12-30-82

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Deer Creek (In Mine)
3 N X Cut 18-3 Left Entry
FLOW: 0.08 GPM

Acidity		mg/l $CaCO_3$
Alkalinity, Total	374	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
*Chloride	64.9	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	890	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.1	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	539	mg/l
Solids, Total Suspended	2.0	mg/l
Sulfate	180	mg/l
Sulfide		mg/l
Turbidity		NTU
* Repeat analysis	5.95	mg/l

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium	140	mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium	57.0	mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	3.50	mg/l
Selenium		mg/l
Silica		mg/l
Sodium	29.0	mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sim / [illegible]

Certified Environmental Laboratory

APPENDIX M

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2449

Date Rec. 1-25-82

Date Sampled 1-22-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.8	Units
Alkalinity, Total	371	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	16.5	mg/l
Conductivity	930	umhos/cm
Dissolved Oxygen	9.8	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	575	mg/l
Solids, Total Suspended	2.0	mg/l
Sulfate	123	mg/l
O & G	<0.5	mg/l
Acidity	<1.0	mg/l $CaCO_3$

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.42	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2480

Date Rec. 2-15-82

Date Sampled 2-15-82

FOR Utah Power & Light Co.,
M&E Field Office
Huntignton, Utah 84528

Sample ID Deer Creek Discharge

pH	7.2	Units	Arsenic		mg/l
Alkalinity, Total	413	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	9.5	mg/l	Chromium		mg/l
Conductivity	800	umhos/cm	Copper		mg/l
Dissolved Oxygen	10.2	mg/l	Iron	1.19	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	639	mg/l			
Solids, Total Suspended	10.0	mg/l			
Sulfate	132	mg/l			
Acidity	< 1.0 mg/l	$CaCO_3$			
Oil & Grease	< 0.5mg/l				

Temperature 14°C in Lab.

Respectfully submitted [signature]

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2549

Date Rec. 3-16-82

Date Sampled 3-16-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.6	Units
Alkalinity, Total	328	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	15.8	mg/l
Conductivity	990	µmhos/cm
Dissolved Oxygen	10.9	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	571	mg/l
Solids, Total Suspended	11.0	mg/l
Sulfate	86.4	mg/l
Oil & Grease	0.5	mg/l
Acidity	1.0	mg/l $CACO_3$

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.07	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2608

Date Rec. 4-13-82

Date Sampled 4-13-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.7	Units
Alkalinity, Total	280	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	12.9	mg/l
Conductivity	1020	umhos/cm
Dissolved Oxygen	9.8	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	640.	mg/l
Solids, Total Suspended	1.0	mg/l
Sulfate	183.	mg/l
Acidity	<1.0 mg/l $CaCo_3$	
O & G	<0.5 mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.00	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2717

Date Rec. 6-25-82

Date Sampled 6-24-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.5	Units
Alkalinity, Total	414	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	8.5	mg/l
Conductivity	980	umhos/cm
Dissolved Oxygen	10.4	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	543	mg/l
Solids, Total Suspended	27.0	mg/l
Sulfate	70.0	mg/l
Acidity	< 1.0	mg/l $CaCo_3$
O. & G.	< 0.5	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.93	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted [signature]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-2800

Date Rec. 6-14-82

Date Sampled 6-14-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.4	Units
Alkalinity, Total	311	mg/l $CaCo_3$
Alkalinity, Bicarbonate		mg/l $CaCo_3$
Calcium		mg/l
Chloride	9.6	mg/l
Conductivity		µmhos/cm
Dissolved Oxygen	9.8	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	600	mg/l
Solids, Total Suspended	4.0	mg/l
Sulfate	210	mg/l
Acidity	< 1.0 mg/l CaCo3	
O & G	< 0.5 mg/l	

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	1.40	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
.O. Box 1140, Huntington, Utah 84528 801-653-2314

FOR Utah power & Light Co.
Field Office
Huntington, Utah 84528

Lab. No. W-2974

Date Rec. 07-26-82

Date Sampled 07-26-82

Sample ID Deer Creek Discharge USGS Special

pH	7.6	Units
Alkalinity, Total	356	mg/l $CaCo_3$
Alkalinity, Bicarbonate	356	mg/l $CaCo_3$ 434 HCO_3
Calcium	220	mg/l
Chloride	12.9	mg/l
Conductivity	1300	umhos/cm
Dissolved Oxygen	6.8	mg/l
Hardness		mg/l $CaCo_3$
Magnesium	8.73	mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total	< 0.01	mg/l
Phosphorus, Ortho		mg/l
Potassium	4.18	mg/l
Sodium	34.5	mg/l
Solids, Total Dissolved	765	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	276	mg/l

Acidity	< 1.0	mg/l $CaCO_3$
Oil & Grease	< 0.5	mg/l

Arsenic	< 0.001	mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium	< 0.005	mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.34	mg/l
Lead	< 0.05	mg/l
Manganese	0.09	mg/l
Mercury		µg/l
Nickel		mg/l
Selenium	~~< 0.0003~~	mg/l
Zinc	0.067	mg/l

Fluoride	0.14	mg/l
Silica	10.1	mg/l
Nitrite-N	< 0.01	mg/l
BOD-5	0.3	mg/l
TKN	0.27	mg/l

Respectfully submitted

Certified Environmental Laboratory

Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 09/28/82

CERTIFICATE OF ANALYSIS

UTAH POWER & LIGHT
FIELD OFFICE
P.O. 1005
HUNTINGTON, UT 84528

82-004655

SAMPLE: WATER SAMPLES COLLECTED 8-19-82 RECEIVED 8-20-82 FOR ANALYSIS.

	DEER CREEK 1:50 PM	WILBERG MINE 8:50 AM
Gross Alpha pci/l	<2.0	<2.0
Gross Beta pci/l	<.1	<.1
Total Organic Carbon mg/l	21.60	12.50

FORD CHEMICAL LABORATORY, INC.

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3047

Date Rec. 8-19-82

Date Sampled 8-19-82

FOR Utah Power & Light Co.
M & E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.4	Units	Arsenic		mg/l
Alkalinity, Total	282	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	8.3	mg/l	Chromium		mg/l
Conductivity	520	umhos/cm	Copper		mg/l
Dissolved Oxygen	6.9	mg/l	Iron	0.24	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	320	mg/l			
Solids, Total Suspended	0.6	mg/l			
Sulfate	180	mg/l			
Acidity	<1.0 mg/l $CaCO_3$				
Oil & Grease	<0.5 mg/l				

Respectfully submitted Roy A Simpson

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3192

Date Rec. 9-29-82

Date Sampled 9-28-82

FOR Utah Power & Light Co.
M&E Field Office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.4	Units
Alkalinity, Total	308	mg/l $CaCo_3$
Alkalinity, Bicarbonate	.	mg/l $CaCo_3$
Calcium		mg/l
Chloride	12.4	mg/l
Conductivity	910	µmhos/cm
Dissolved Oxygen	6.9	mg/l
Hardness		mg/l $CaCo_3$
Magnesium		mg/l
Nitrogen, Nitrate		mg/l
Phosphorus, Total		mg/l
Phosphorus, Ortho		mg/l
Potassium		mg/l
Sodium		mg/l
Solids, Total Dissolved	647	mg/l
Solids, Total Suspended	31.5	mg/l
Sulfate	220	mg/l

Arsenic		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.27	mg/l
Lead		mg/l
Manganese		mg/l
Mercury		µg/l
Nickel		mg/l
Selenium		mg/l
Zinc		mg/l
Oil & Grease	<0.5	mg/l
Acidity	<1.0	mg/l $CaCO_3$

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. W-3304

Date Rec. 10-28-82

Date Sampled 10-28-82

FOR Utah Power & Light Co.
M&E Field office
Huntington, Utah 84528

Sample ID Deer Creek Discharge

pH	7.2	Units	Arsenic		mg/l
Alkalinity, Total	365	mg/l $CaCo_3$	Beryllium		mg/l
Alkalinity, Bicarbonate		mg/l $CaCo_3$	Boron		mg/l
Calcium		mg/l	Cadmium		mg/l
Chloride	16.7	mg/l	Chromium		mg/l
Conductivity	1140	µmhos/cm	Copper		mg/l
Dissolved Oxygen		mg/l	Iron	0.20	mg/l
Hardness		mg/l $CaCo_3$	Lead		mg/l
Magnesium		mg/l	Manganese		mg/l
Nitrogen, Nitrate		mg/l	Mercury		µg/l
Phosphorus, Total		mg/l	Nickel		mg/l
Phosphorus, Ortho		mg/l	Selenium		mg/l
Potassium		mg/l	Zinc		mg/l
Sodium		mg/l			
Solids, Total Dissolved	797	mg/l			
Solids, Total Suspended	7.0	mg/l			
Sulfate	260.	mg/l			
Acidity	<1.0 mg/l $CACO_3$				
Oil & Grease	<0.5 mg/l				

Respectfully submitted [signature]

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3390
Date Rec'd 11-23-82
Date Sampled 11-23-82
Time Sampled ??

Client: Utah Power & Light
Field Office
Huntington, Utah

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	344	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	11.5	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1020	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	< 0.5	mg/l
pH	7.2	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	893	mg/l
Solids, Total Suspended	7.5	mg/l
Sulfate	300	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.33	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3472
Date Rec'd 1-3-83
Date Sampled 12-30-82
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Industrial Training Center
Huntington, Utah 84528

Sample ID: Deer Creek
Discharge

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	336	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	9.26	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1080	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
rogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	< 0.5	mg/l
pH	7.2	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	721	mg/l
Solids, Total Suspended	6.0	mg/l
Sulfate	220	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.23	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted Ray A Sim/

Certified Environmental Laboratory