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Effects of Metal-mine drainage on Water Quality in selected areas of Colorado, 1972-73

Colorado Water Resources Circular 25

By Robert E. Moran and Dennis A. Wentz

Introduction

Colorado is a child of mining. In the past, towns such as Cripple Creek, Leadville, Creede, and many others were the lifeblood of the economy. While metal mining is still economically important to Colorado, another legacy of this past activity is attracting increasing attention—the detrimental effects of drainage from abandoned and active mines and tailings piles (waste rock piles) on streams. Concern with metal-mine drainage is due to the acid resulting from oxidation of pyritic material. The acid itself can be harmful to aquatic organisms, and can make the water unusable for various recreational and industrial needs. Just as importantly, however, the acid dissolves metals from ores and tailings piles and releases them into the streams. Many of the metals are toxic to aquatic organisms, humans, and livestock; and, like excess acidity, the metals can make streams unusable for some types of recreation and industry.

In July 1971, a study of the effects of both metal- and coal-mine drainage on surface-water quality in Colorado was undertaken by the U.S. Geological Survey in cooperation with the Colorado Water Pollution Control Commission. Based on the reconnaissance phase of this project (Wentz, 1974), 17 areas judged to be adversely affected by metal-mine drainage were chosen for further study. One additional area was included because it is the only place found in Colorado that potentially could be affected by coal-mine drainage. The present report summarizes the intensive study of these areas; it is the second product of the mine-drainage study. The first report was published as Colorado Water Resources Circular 21.

CWR Circular 25

- Entire Report
  (PDF - 259 pgs, 6.0 MB)
- Report Text
  (PDF - 95 pgs, 2.5 MB)
- Data Tables
  (PDF - 164 pgs, 3.6 MB)

Colorado

WATER RESOURCES

CIRCULAR NO. 25

EFFECTS OF METAL-MINE DRAINAGE ON WATER QUALITY IN SELECTED AREAS OF COLORADO, 1972-73

1974

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In charge of cooperative water-resources investigations in Colorado.

COVER: These are examples of surface waters in Colorado which are adversely affected by metal-mine drainage. See the back cover for explanation.

COLORADO WATER RESOURCES
CIRCULAR NO. 25

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By Robert E. Moran and Dennis A. Wentz
U.S. Geological Survey

Prepared by the
U.S. GEOLOGICAL SURVEY
in cooperation with the
COLORADO WATER POLLUTION CONTROL COMMISSION

COLORADO WATER CONSERVATION BOARD
1845 Sherman Street
Denver, Colorado 80203

1974

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EFFECTS OF METAL-MINE DRAINAGE ON WATER QUALITY IN SELECTED AREAS OF COLORADO, 1972-73

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ABSTRACT

Intensive study of 18 different areas in Colorado--most of them complex-ore mining districts--has shown that significant amounts of acidity and metals are added to surface waters by drainage from mines and associated tailings.

In the vicinity of Kerber Creek, acid drainage from an abandoned adit flows through a tailings pile and then into the stream; metal contributions from the tailings are greater than those from the adit. Stream pH's increase below the drainage due to dilution and neutralization of the acid by bicarbonate. Dissolved metal concentrations decrease due to dilution, chemical precipitation, and probably adsorption onto ferric hydroxide particles. The relationships between pH and the various dissolved metals are inverse and, generally, well-defined.

Total metal concentrations (dissolved plus suspended) in streams of the Kerber Creek area decrease below the drainage due to dilution and to settling of the precipitates. The latter process coats the stream bottom for a considerable distance downstream during low flows. Manganese (Mn) and zinc (Zn) remain predominantly in the dissolved phase: when they do precipitate they settle out rapidly. Cadmium (Cd), copper (Cu), iron (Fe), lead (Pb), and nickel (Ni), on the other hand, gradually shift from the dissolved to the suspended fraction, indicating a different removal process. The mobility sequence for the metals studied generally follows the order (decreasing mobility):

$$Mn \simeq Zn > Cu > Cd > Fe > Ni > Pb.$$

This sequence is based on the percentage of each metal in solution and is predominantly independent of stream discharge.

Both total and dissolved metal loads in streams of the Kerber Creek area are greater during high flow than during low flow, owing to flushing of water from mines and tailings piles, erosion of tailings, and scouring of chemical precipitates from the stream bottom. Generally speaking, total and dissolved loads decrease downstream regardless of discharge, the primary exception being total Fe during high flow. In June 1973, for example, the total Fe

load increased throughout the entire length of the study reach below the acid drainage--a distance of greater than 20 miles (32 kilometres). This is apparently due to scouring of the light, flocculent precipitate from the stream bottom. Analysis of this precipitate shows it to be primarily an amorphous, hydrated ferric oxide.

Intensive study of 17 additional areas in Colorado has shown that comparable processes act in all areas affected by metal-mine drainage. Precipitates from several complex-ore study areas are similar in composition. And, given enough time and distance, the streams recover naturally by dilution, chemical precipitation, and settling.

One additional natural recovery mechanism was noted in the Alamosa Creek and Lake Creek study areas, where lakes downstream from metal-mine drainage acted as metal sinks. This effect was independent of stream discharge.

INTRODUCTION

Colorado is a child of mining. In the past, towns such as Cripple Creek, Leadville, Creede, and many others were the lifeblood of the economy. While metal mining is still economically important to Colorado, another legacy of this past activity is attracting increasing attention--the detrimental effects of drainage from abandoned and active mines and tailings piles (waste rock piles) on streams. Concern with metal-mine drainage is due to the acid resulting from oxidation of pyritic material. The acid itself can be harmful to aquatic organisms, and can make the water unusable for various recreational and industrial needs. Just as importantly, however, the acid dissolves metals from ores and tailings piles and releases them into the streams. Many of the metals are toxic to aquatic organisms, humans, and livestock; and, like excess acidity, the metals can make streams unusable for some types of recreation and industry.

In July 1971, a study of the effects of both metal- and coal-mine drainage on surface-water quality in Colorado was undertaken by the U.S. Geological Survey in cooperation with the Colorado Water Pollution Control Commission. Based on the reconnaissance phase of this project (Wentz, 1974), 17 areas judged to be adversely affected by metal-mine drainage were chosen for further study (see fig. 1). One additional area (area 18, fig. 1) was included because it is the only place found in Colorado that potentially could be affected by coal-mine drainage. The present report summarizes the intensive study of these areas; it is the second product of the mine-drainage study. The first report was published as Colorado Water Resources Circular 21.

Figure 1.--Areas chosen for intensive study of the effects of metal mining on water quality in Colorado (areas are discussed in text in numerical order).

English units in this report may be expressed as metric units by use of the following conversion factors:

From	*Multiply by*	*To obtain*
inches (in)	25.4	millimetres (mm)
feet (ft)	.3048	metres (m)
miles (mi)	1.609	kilometres (km)
pounds (lb)	.4536	kilograms (kg)
tons (short)	.9072	tonnes (metric ton)
cubic feet per second (ft^3/s)	.02832	cubic metres per second (m^3/s)

Purpose and Scope

The basic objective of this study was to determine the extent to which mining activities have affected the water quality in the 18 study areas and to gain a better understanding of the physical and chemical processes involved. More specifically, the intent was to determine what metals were entering the streams, how far they traveled downstream, how they varied seasonally, and what mechanisms were responsible for their transport and removal from the aqueous phase. In addition, the report discusses specific sources of pollution, observed and potential effects of mining activities on organisms, and effects on the ground-water resource.

A total of 268 water samples were collected at 134 sites in the 18 study areas between October 1, 1972, and June 28, 1973. One sample was collected on April 23, 1974. These areas together account for approximately 291 miles (468 km) of streams which, to varying degrees, have been adversely affected by mine drainage.

BACKGROUND

Colorado Mineral Belt

Metal mining in Colorado has generally been concentrated in a region known as the Colorado mineral belt, which extends from near Durango in the southwestern part of the State to Boulder in the Front Range. Figure 1 shows the 18 study areas in relation to the mineral belt.

The Colorado mineral belt coincides with a zone of weakness characterized by northeasterly trending Precambrian shear zones (Tweto and Sims, 1963). During and after the Laramide mountain-building episode, these shear zones were reactivated, resulting in extensive magmatic intrusion and volcanic activity. This igneous activity produced the ore deposits in most of the mining areas studied.

Metal Deposits

The non-sedimentary metal deposits of Colorado are generally considered to be of three distinct ages (Tweto, 1968): Precambrian, Late Cretaceous to early Tertiary (Laramide), and Oligocene (post-Laramide). Ores of the mining districts covered in this study can also be classified according to ore type.

The majority of the study areas contain a type of ore that may be from any one of the three ages previously mentioned; it is commonly termed "complex ore" (U.S. Congress, 1964, p. 29). This is a combination of base metals (usually copper, lead, and zinc) and precious metals (gold and silver). The base metals and silver are most commonly found as sulfides. Most of the gold and some silver occur in the elemental form, generally disseminated in the gangue minerals, but occasionally they seem to be incorporated into the structure of metallic minerals (Sims and others, 1963). Some complex ores contain minor amounts of gold and silver tellurides.

A second ore type is one in which gold and silver tellurides are the predominant economic minerals. According to Tweto (1968), these deposits are post-Laramide. Molybdenum ores, which are also reported to be post-Laramide (Tweto, 1968) and which often contain economic quantities of tungsten and tin (Wallace and others, 1968), represent a third category of metal ores.

One additional type of metal deposit was dealt with very briefly: the uranium-vanadium ores found in certain Mesozoic sedimentary rocks of the Uravan mineral belt (fig. 1). Also, another area was studied even though it involved a non-metallic environment--a draining adit in a coal-mining area. Table 1 groups all study areas according to the above ore types.

Table 1.--*Ore types found in intensive study areas of Colorado*[1]

Ore type	Study area (Number in parentheses refers to location in fig. 1)
Complex	Alamosa Creek (8)
	Boulder[2] (3)
	Clear Creek
	Idaho Springs[2] (12)
	Lion Creek (11)
	North Clear Creek (10)
	Creede (6)
	Crested Butte (4)
	French Gulch (13)
	Kerber Creek (1)
	Lake Creek (9)
	Leadville (2)
	Ouray (7)
	Snake River (5)
Gold-silver telluride	Boulder[2] (3)
	Fourmile Creek (16)
	Idaho Springs[2] (12)
Molybdenum	Climax (14)
	Urad-Henderson (15)
Uranium-vanadium	Uravan (17)
Coal	Oak Creek (18)

[1]Summarized from: Tweto (1968), Vanderwilt (1947), Del Rio (1960), and Steven (1968).

[2]Sites listed twice have had production from more than one type of ore.

Acid Formation and Trace Element Liberation

Draining mines and tailings piles are sources of concern because of the acid and metals they release. The acid results from the breakdown of pyrite (FeS_2) when it is exposed to oxidizing conditions. In this process, ferrous (Fe^{+2}) ions are released and oxidized to the ferric state (Fe^{+3}). The ferric ions hydrolyze, thus forming relatively insoluble ferric hydroxide [$Fe(OH)_3$], which precipitates on the stream bottom. Other metal ions may be adsorbed on (Jenne, 1968) or coprecipitated with (J. D. Hem, written commun., 1973) the $Fe(OH)_3$, thereby forming a metal-rich orange coating (yellow boy) on rocks in affected streams. The overall process can be summarized as follows:

$$FeS_{2(s)} + \frac{15}{4}O_2 + \frac{7}{2}H_2O \rightleftarrows Fe(OH)_{3(s)} + 2SO_4^{-2} + 4H^{+1}. \quad (1)$$

Metal sulfides other than pyrite [for example, sphalerite (ZnS) and galena (PbS)] will be broken down by the acid released in the above reaction. Their dissolution releases metals to the water but does not result in the production of additional net acid (Wentz, 1974).

More detailed discussions of pyrite oxidation and acid formation can be found in Coal Industry Advisory Committee (1965, 1968, 1970), Stumm and Morgan (1970), Ohio State University Research Foundation (1971), and Wentz (1974).

APPROACH

Study areas discussed in this report were chosen from a list of areas presented by Wentz (1974, p. 107). Areas were selected so that results might (with appropriate adjustments for differences in geology and hydrology) be extrapolated to other areas.

At the area of primary emphasis (Kerber Creek), samples were to be collected bimonthly. At secondary areas, it was intended that sampling be done twice--once during low flows and once during spring runoff. The last category (tertiary areas) contained sites that were to be sampled only during low flow conditions. The areas that received the most intensive study were chosen because (1) they had been studied little, or not at all, by other investigators, and (2) they represented areas that were typical of other metal-mining areas in Colorado, and thus would most readily allow extrapolation of results.

Information gained from the first round of sampling suggested the answers to some questions, but more often merely raised new questions. For this reason, several deviations from the original sampling schedule were adopted at varying stages of the project.

Field Measurements and Observations

Field measurements of water temperature were made with a mercury thermometer and are accurate to the nearest 0.5°C (Celsius). Measurements of pH were obtained using a portable pH meter. Two-point calibration procedures were used (pH 4 and 7, or pH 7 and 10), and sample measurements were made in a beaker. The values reported are accurate to within ±0.05 pH unit. Specific conductance measurements were made directly in the stream using an instrument having a range of 50 to 8,000 μmhos/cm (micromhos per centimetre) at 25°C. Values are accurate to within ±2 percent of the number reported.

At each site, visual observations were made regarding the condition of the water and stream bottom. The presence of turbidity and chemical precipitates was recorded, as was the location of any obvious source of pollution, such as a tailings pile or draining adit.

Wherever Colorado Division of Natural Resources or U.S. Geological Survey stream gages were present, discharges were determined from the gage-height record. In other areas, discharges were computed from measurements made using a wading rod and pygmy meter, following procedures outlined in Buchanan and Somers (1969).

Sample Collection

At most sites, both filtered and unfiltered water samples were collected for analysis by atomic-absorption spectrophotometry. Samples were filtered at the time of collection by forcing the water through a 0.45-μm (micrometre) membrane filter from a polyvinyl chloride chamber, using a tire pump as the pressure source. At sites where much suspended sediment occurred, a glass-fiber prefilter was used in addition to the 0.45-μm filter. The samples were retained in acid-washed, 1-litre polyethylene bottles. Immediately after filtration, samples were acidified with 1.5 ml (millilitre) double-distilled, analytical-grade nitric acid per litre of water (in order to prevent chemical precipitation and adsorption of the metals onto the walls of the containers).

Filtration through a 0.45-μm filter allows some colloidal material to pass through the filter (V. C. Kennedy, written commun., 1973). Acidification of the samples with nitric acid may leach some metals (especially iron, manganese, and aluminum) from silicate lattices of these colloids and remove adsorbed metals from particle surfaces. These processes can diminish the accuracy of data from filtered samples because the measureable concentrations of certain metals will increase with storage time (E. A. Jenne and others, written commun., 1971) Because some of the study samples were stored for as much as 2 months, the concentrations may reflect this acid leaching.

Unfiltered samples were collected using a depth-integrating suspended-sediment sampler (Model DH-48), following procedures outlined in Guy and Norman (1970). To prevent trace-element contamination, the butyl-rubber gasket of this sampler was replaced with one made from silicone rubber. Also, the brass nozzle was replaced by a Teflon nozzle (W. H. Durum, written commun., 1971). Immediately after collection, unfiltered samples were acidified and retained in the same manner as filtered samples.

In addition to samples obtained for trace-element analysis, an unfiltered, unacidified sample was collected at each site for the for the determination of alkalinity. To facilitate this determination under field conditions where glass burets could easily be broken and where the weather was often severe, titration was performed in the evening for all of the samples collected during the day. It was recognized that the carbon dioxide concentration might change during storage, thereby altering the alkalinity values. However, for the waters in question, such changes were thought to be relatively insignificant, especially since the sample bottle was completely filled and was not opened until titration.

Biologic Samplers

Because one of the initial interests of the project was to determine the extent to which metal-mine drainage was affecting stream biota, various types of artificial substrate samplers were put out at many of the stream sites. Those tried included Hester-Dendy samplers[1], brick and glass slide periphyton samplers, and Mylar strips (Am. Public Health Assoc., 1971; Slack and others, 1973), and also glass microscope slides in glass staining trays (K. V. Slack, oral commun., 1972).

This part of the project was most notable for its lack of positive results. Only a very small percentage of the samplers placed in the streams were recovered; therefore, no discussion of results has been attempted. However, the following summary of the major problems encountered might prove useful to others attempting such an experiment.

Most of the difficulties can be directly attributed to the harsh climatic conditions of the Colorado Rockies--specifically to exceptional accumulations of snow during the winter of 1972-73. In general, samplers were tied to a metal stake with 50-pound test (23-kg) fishing line. This stake was then hammered into the stream bottom or bank. Pains were taken to choose sites that would be hidden from vandals but were near some large object (tree, boulder) that would be visible above the accumulations of snow and ice that were sure to come. Even though difficulties in relocating samplers had been anticipated, and sketch maps of the exact sites had been drawn, 4-5 feet (1.2-1.5 m) of snow on top of 2 feet (0.6 m) of ice invariably presented problems.

Colored flagging, such as that used by highway crews, could be tied to a tree limb, but experience has shown that under these weather conditions one needs to be within 1 foot (0.3 m) of the sampler or it will not be recovered.

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[1]The use of named products in this report is for identification only and does not imply endorsement by the U.S. Geological Survey.

Knowledge of the location need not be so precise if a power auger were used to cut the ice.

Some samplers were frozen in ice or were otherwise out of the water when recovered. In anticipation of these difficulties, they had been placed in water greater than 6 inches (150 mm) deep whenever possible. However, the magnitude of flow fluctuations was underestimated, and several samplers that had originally been set in 1.5-2 feet (0.4-0.6 m) of water were found exposed.

Many of the mountain streams have bedload material which is quite coarse (gravel to boulders), and therefore it was often difficult to drive the anchoring stakes into the stream bottom. Attempts were made to place all samplers in riffle areas, but some sites, because of the swift flow, necessitated placement in pools. In these cases, attachment to the bank was not practical, and siltation became a problem.

Those samplers composed wholly or partly of glass were prone to breakage by saltating rocks. Brick and glass slide periphyton samplers are not recommended in high velocity streams because the plastic adhesive used was not sufficiently strong to prevent the slides from being washed off the brick. This may have been partly due to the reduced "stickiness" that resulted when the adhesive was placed in cold water. In contrast, Mylar strips worked satisfactorily.

Due to recovery problems in the winter months, it was decided that most samplers would be left in place until spring when much of the snow and ice had thawed. The resulting high flow conditions often ripped the metal stakes from the streambed, leading to the suggestion that spring runoff conditions be avoided whenever large increases in flow are anticipated.

Subsequent studies, not reported here, have shown that at elevations above about 8,000 feet (2,400 m) one might expect reasonable success with artificial substrate samplers if they are set out and retrieved within the period from August to November. This means only one or two samples per year can be collected. In order to determine seasonal patterns, one of the natural substrate collection procedures might allow a certain degree of success. A detailed discussion of aquatic sampling may be found in Slack, Averett, Greeson, and Lipscomb (1973).

Laboratory Procedures

Preliminary sampling at each of the study areas during the reconnaissance phase provided information needed to decide which chemical parameters would be studied during the intensive study phase.

With few exceptions, cadmium (Cd), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), and zinc (Zn) concentrations were determined on both filtered and unfiltered samples. In addition, one or more of the following elements were determined at areas where there was evidence to suspect that they might be present in "unusually" high concentrations: arsenic (As), cobalt (Co), mercury (Hg), molybdenum (Mo), selenium (Se), silver (Ag), and vanadium (V). Silica (SiO_2) and aluminum (Al) were determined on filtered samples at selected sites in order to obtain a better understanding of the overall water chemistry. Analyses were performed by the U.S. Geological Survey's laboratory in Salt Lake City, Utah, following accepted procedures described in Brown, Skougstad, and Fishman (1970). These procedures are summarized in table 2.

Table 2.--*Summary of analytical methods*

[Method of analysis: S, spectrophotometric; (d)AA, atomic absorption-direct aspiration; (e)AA, atomic absorption-extraction[1]; (f)AA, flameless atomic absorption]

ELEMENTS	METHOD
Filtered samples	
Al, Mo, Si, V,------------------------	S
Ca, Fe, Mg, Mn, Zn-------------------	(d)AA
Cd, Co, Cu, Pb, Ni, Ag---------------	(e)AA
As[2], Se[2]------------------------------	S
Hg[2]------------------------------------	(f)AA
Unfiltered samples	
Mo, V----------------------------------	HCl digestion[3], S
As[2], Se[2]------------------------------	S
Hg[2]------------------------------------	(f)AA
Cd, Co, Cu, Fe, Mn, Ni, Pb, Ag, Zn----	HCl digestion[3], (d)AA

[1]The extraction procedure involves chelation of the element with ammonium pyrrolidine dithiocarbamate (APDC), followed by extraction with methyl isobutyl ketone (MIBK).

[2]Same procedure for filtered and unfiltered samples; no HCl digestion.

[3]Hydrochloric acid (HCl) digestion involves the addition of 25 ml of double-redistilled, reagent-grade, concentrated HCl to 500 ml of sample and heating to just below boiling for 0.5 hour.

Estimates of the analytical precision for filtered samples are presented in table 3. Precision data for unfiltered samples are not available. In some cases, reported concentrations in filtered samples exceeded those in unfiltered samples collected from the same site. This may be due to analytical interference from Fe and Mn in high concentrations in the unfiltered samples (Brown and others, 1970).

Table 3.--*Estimates of precision for laboratory analyses*

(Frances ReMillard, written commun., 1973)

Element	Standard deviation for dissolved constituents (determined at mean concentration given in parentheses), in micrograms per litre	
Arsenic	4	(28)
Cadmium	.6	(9.5)
Chromium	4	(7)
Cobalt	2	(10)
Copper	10	(242)
	61	(639)
Iron	10	(121)
	29	(829)
Lead	5.4	(22.9)
Manganese	9	(65)
	12	(117)
Mercury	.64	(6.57)
Molybdenum	1	(18)
Nickel	1.1	(3.3)
	3.3	(24.1)
Selenium	6	(24)
Silver	1	(10)
Vanadium	.25	(1.5)
Zinc	27	(528)

Hereafter, data from filtered samples are referred to as "dissolved," whereas those from unfiltered samples are called "total." These terms are operationally defined by the field and laboratory procedures used in this study. The previous discussion regarding colloidal material and acid leaching should be kept in mind when reference is made to "dissolved" concentrations. Furthermore, the HCl digestion summarized in table 2 certainly is not drastic enough to break down most organic matter or silicates. Thus, the term "total," as used in this report, most likely represents some compromise between dissolved plus desorbable metals and true total metals.

Whereas the majority of trace-element determinations were obtained using atomic absorption and spectrophotometric techniques, a small number of water and precipitate samples were analyzed by means of emission spectroscopy. For the water samples, this was done both as a check against the values obtained by the other methods, and as a means of determining additional elements not readily detected by atomic absorption procedures.

Duplicate water samples from four sites were collected. One set was analyzed by means of atomic absorption, whereas the other was done by emission spectroscopy. Comparison of the results (table 4) shows reasonable agreement between the values for most parameters, and provides some measure of confidence in the accuracy of the overall data set. Emission spectroscopic analyses were performed by the U.S. Geological Survey's laboratory, Denver, Colo.

Finally, chemical precipitates and sediment samples from affected streams were analyzed by means of X-ray diffraction and petrographic techniques at the U.S. Geological Survey's laboratory, Denver, Colo.

RESULTS AND DISCUSSION

Each of the 18 study areas is discussed separately in the present section. The first area, Kerber Creek, contains complex ore. Streams from this area were sampled more intensively than those from any other area. It was reasoned that chemical and physical processes operating at Kerber Creek would be similar to those in other complex-ore areas, and therefore the former could be used as a model from which generalizations could be extrapolated to the latter. Hence, most of the process-oriented material is discussed in the Kerber Creek section. Any pertinent processes and (or) characteristics unique to other areas are treated in their respective sections.

Individual sections include a "summary" of the water quality problems in that area. That is, whenever metal concentrations exceed U.S. Public Health Service (1962, 1970) drinking water standards (see table 5) they are noted. Also, pH values are listed if they are outside the limits specified by the Colorado Department of Health (1971b) for water to be treated as a potable supply (see table 5). It should be noted that the standards for Mn [50 μg/l (micrograms per litre)] and Fe (300 μg/l) have been established for esthetic (staining of clothes and porcelain) rather than health reasons. Even though Mn has often been listed as a "problem," its importance as a toxic substance is relatively minor. In fact, surface waters of the Colorado Rockies are sometimes anomalously high in manganese--even when unaffected by mining activities (Wentz, 1974).

Because many of the study-area streams have been classified for fish and wildlife uses by the Colorado Department of Health (1971b) these standards have also been considered. However, the present Colorado standards are too general to be of value for management, reclamation, or enforcement purposes. For example, the toxic-material standard for class B waters (those classified for fish and wildlife uses) states that the water shall be "Free from biocides, toxic, or other deleterious substances attributable to municipal, domestic, or industrial wastes, or other controllable sources in levels, concentrations, or combinations sufficient to be harmful to aquatic life." For this reason, the metal concentrations measured have been compared to a table of suggested stream criteria for fish and other aquatic life compiled and discussed by Wentz (1974). These criteria are also presented in table 5.

Table 4.--*Comparison of emission spectroscopy and atomic absorption analyses, Kerber Creek, May 1-2, 1973*

[Concentrations in micrograms per litre]

Metal	Filtered		Unfiltered	
	Emission spectroscopy	Atomic absorption	Emission spectroscopy	Atomic absorption
		Station SL-3		
Cd----	15	30	40	------
Cu----	290	220	1,100	------
Fe----	2,800	1,900	18,000	------
Pb----	7	1	24	------
Mn----	5,000	5,200	5,000	------
Ni----	15	50	22	------
Zn----	7,000	5,600	10,000	------
		Station SL-6		
Cd----	130	100	130	110
Cu----	1,400	1,400	1,500	1,600
Fe----	180	250	3,600	1,300
Pb----	40	33	150	100
Mn----	12,000	15,000	14,000	14,000
Ni----	40	50	65	<50
Zn----	28,000	25,000	29,000	24,000
		Station SL-7		
Cd----	150	80	130	90
Cu----	6,000	6,500	6,200	6,300
Fe----	21,000	18,000	36,000	35,000
Pb----	90	53	111	200
Mn----	20,000	21,000	19,000	20,000
Ni----	46	50	50	50
Zn----	26,000	21,000	25,000	21,000
		Station SL-S7A		
Cd----	130	110	140	110
Cu----	380	420	370	420
Fe----	4,500	4,300	5,500	4,800
Pb----	17	18	19	<100
Mn----	22,000	29,000	26,000	29,000
Ni----	40	50	46	50
Zn----	30,000	28,000	33,000	29,000

Table 5.--*Drinking water standards and suggested stream criteria for fish and other aquatic life in regard to trace elements and pH*

[All values except pH expressed as micrograms per litre. Minimum values shown for pH--maximum acidity]

Water-quality parameter	Drinking water standards [U.S. Public Health Service (1962, 1970); Colorado Dept. Health (1971a)]	Suggested criteria for fish and other aquatic life [Wentz (1974, table 3, p. 27)]
Arsenic-------	[1]50, ([2]10)	1,000
Barium--------	[1]1,000	-------
Cadmium-------	[1]10	10
Chromium------	[1,3]50	[4]50
Cobalt--------	----------	500
Copper--------	[2]1,000	10-20
Cyanide-------	[1]200, ([2]10)	-------
Iron----------	[2]300	300
Lead----------	[1]50	5-10
Manganese-----	[2]50	1,000
Mercury-------	[1]5	1
Nickel--------	----------	50
Selenium------	[1]10	1,000
Silver--------	[1]50	.1
Zinc----------	[2]5,000	30-70
pH (units)[5]---	$6.0 \leq pH \leq 9.0$	$6.5 \leq pH \leq 8.5$

[1]Maximum permissible concentration.
[2]Recommended limit.
[3]Refers to Cr(VI).
[4]Refers to total dissolved Cr.
[5]From Colorado Department of Health (1971b).

In many cases, the suggested biologic limits are lower than the accepted U.S. Public Health Service (1962, 1970) drinking water standards. Often the concentration of a metal much below that allowable for drinking purposes can be toxic to fish or other organisms. Like the drinking water standards, the suggested biologic standards have their shortcomings. For example, they do not deal with combinations of metals. It has been shown that certain combinations of metals may be even more toxic to aquatic organisms than the individual metals (McKee and Wolf, 1963). Many other complexities must be considered when evaluating trace-element toxicity (for example, water temperature, hardness, oxidation state of the elements, dissolved oxygen concentration, biologic species involved). These topics have been treated in detail by McKee and Wolf (1963) and Singer (1973).

Aside from metals listed in table 5, two other categories of potential pollutants were briefly studied. The first group includes some metals for which there are no U.S. Public Health standards or stream criteria for fish and other aquatic life. Specifically, these include molybdenum and vanadium. There are several mining areas where concentrations of these metals in the streams are much higher than in local, unmined areas. However, since there are no standards and since there has been relatively little research published on these metals in natural waters, evaluation of their environmental impact at these sites would seem premature. Nevertheless, instances in which these metals were present in concentrations considerably higher than at control sites have been noted.

Lastly, there is good reason to believe that a few of the areas studied warrant testing for cyanide. Although this is not a metal, it is used in the extraction processes for gold and silver associated with sulfides. Only one area with an active mill was sampled for cyanide, and the concentration (includes all cyanide forms) was 75 times the U.S. Public Health Service drinking water standard of 200 μg/l. Other sites with potential cyanide problems have been noted.

Kerber Creek

The Kerber Creek study area is located at the extreme northeast edge of the San Juan volcanic field (fig. 1) near the junction of the Sawatch Range and the Sangre de Cristo Mountains. Most of the local mining activity has been centered around the town of Bonanza--approximately 16 miles (26 km) west of Villa Grove and U.S. Highway 285 (fig. 2). Economic deposits of complex ore in Tertiary volcanic rocks have been mined in the district (Burbank, 1932). No active mining was conducted in 1973, but exploration work was carried on as recently as 1972.

Sites sampled in the Kerber Creek area are depicted in figure 2. Stations SL-8 and SL-10 represent control sites upstream from mining influences. Because SL-8 was inaccessible much of the year, a winter control (SL-7B) was sampled instead. Locations of the major tailings piles are also shown on figure 2.

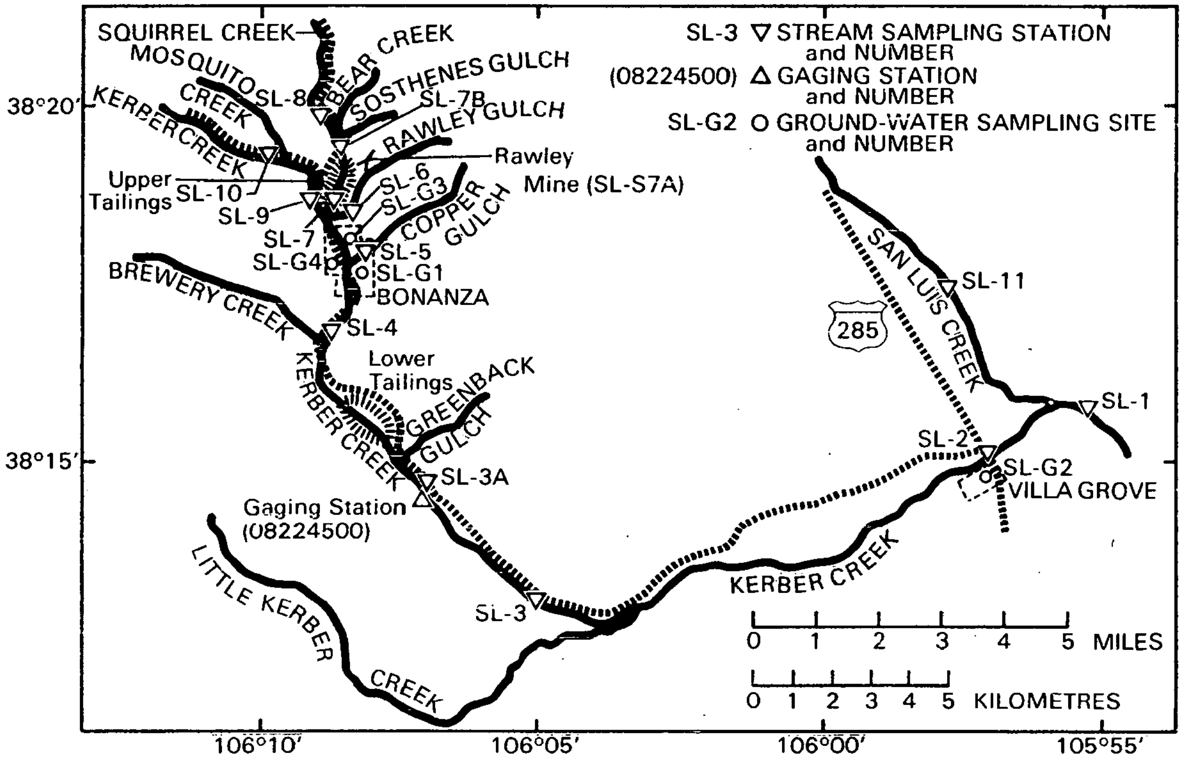

Figure 2.--Sampling sites in the Kerber Creek area, Colorado.

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Squirrel Creek															
Rawley Mine-------------	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Tailings immediately downstream from Rawley Mine-------------	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rawley Gulch (several draining adits----------	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Mine and mill tailings along Kerber Creek upstream and downstream from Bonanza[2]-----------	---------?---------							----------?----------							

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

[2]That these tailings are at least a potential source of metals and acid is inferred from what is known to be contributed by the tailings immediately downstream from the Rawley Mine.

Overview

Water from Kerber Creek is used to irrigate fields upon which cattle and sheep are grazed. In some cases, the livestock drink directly from the stream.

Degradation of the water quality in Kerber Creek is primarily due to acid water draining from the Rawley Mine (site SL-S7A) and from tailings piles (upper tailings) in Squirrel Creek, immediately downstream from this draining adit. Several mines are hydrologically interconnected by vertical shafts that collectively drain into the Rawley Mine. In addition, several draining mines and smaller tailings accumulations are present in Rawley Gulch. Downstream from Bonanza more tailings piles (lower tailings) are traversed by Kerber Creek.

Downstream Variations of Chemical Constituents

Figure 3 shows the downstream variation of hardness in the Kerber Creek drainage between stations SL-8 and SL-1. Side streams are not included in this or any of the similar graphs subsequently presented. Sample sites are plotted on the horizontal axis in downstream order. The most outstanding feature of figure 3 is the great increase in hardness due to draining mines at site SL-S7A. (Values for site SL-S7A are not plotted as this is considered a side stream.) This is the cause of the rise in concentration between the controls (SL-7B and SL-8) and site SL-7.

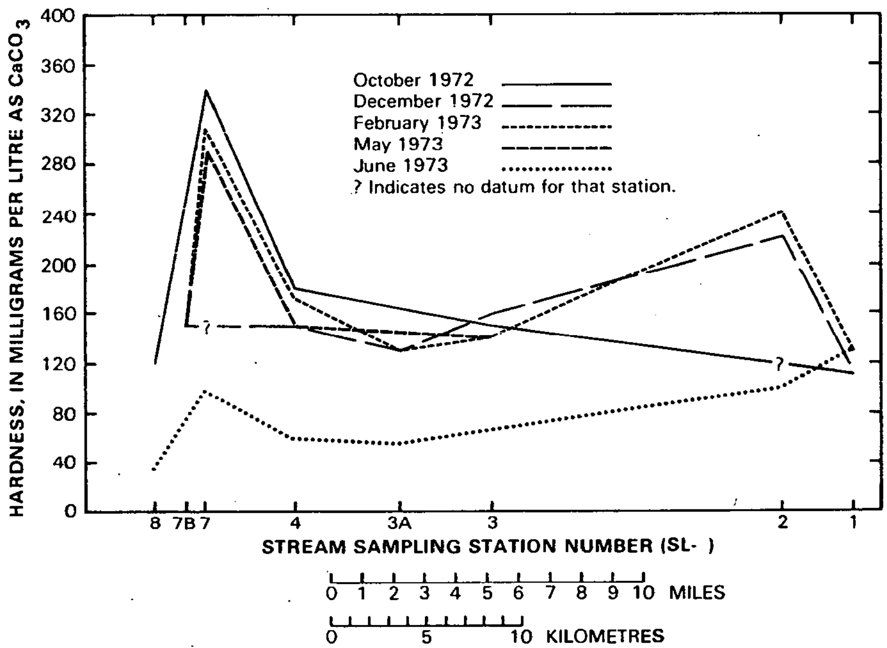

Figure 3.--Hardness concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

Sites immediately downstream from the mines show a general decline in hardness concentrations until station SL-3A is reached. Downstream from this point the concentrations generally increase. Scattered outcrops of Mississippian limestone with visible alkaline springs are located near sites SL-3A and SL-3, suggesting that ground-water inflow is the most likely reason for the downstream rise in hardness below these stations. This speculation is supported by comparing hardness concentrations in water from wells at Bonanza (sites SL-G1 and SL-G3) with the hardness in a well at Villa Grove (SL-G2). The latter has a total hardness concentration of 230 mg/l compared to 130 mg/l for the Bonanza wells in February 1973. Such reasoning may appear inconsistent since Kerber Creek appears to recharge the alluvium in the reach downstream from station SL-3A. However, the aforementioned limestone springs are often found 10 to 20 feet (3 to 6 m) in elevation above the stream, making simultaneous ground-water inflow to the stream and recharge from the stream possible. It seems unlikely that the addition of calcium phosphate fertilizers is raising the hardness since very little, if any, fertilizing is done on these meadows.

Specific conductance exhibits downstream patterns very similar to those of hardness. These patterns are also related to the contributions of ions from draining mines and ground-water inflow.

Figure 4 is a graph of downstream variation in dissolved zinc concentrations. Comparison of station SL-7 with the controls (SL-7B and SL-8) upstream shows a 18- to 1,600-fold increase in dissolved zinc concentrations in the stream below the adit and associated tailings.

Downstream from station SL-7 there is a general decline in the dissolved zinc concentration which, as will be discussed later, is due to dilution, chemical precipitation, and probably adsorption onto $Fe(OH)_3$ particles.

The graphical patterns of dissolved Zn and total Cd (fig. 5) are representative of concentrations of most of the other metals, both dissolved and total. Total concentrations would be affected by all factors affecting dissolved concentrations. In addition, total concentrations would reflect changes in the suspended fraction. Suspended metals might increase between sites SL-S7A and SL-7 due to erosion of the tailings. Downstream, suspended metals would decrease as a result of dilution and settling.

Total Pb, total Ni, and dissolved Ni are major exceptions to the above patterns. Graphs of these metals do not possess the same general downstream-declining pattern and seasonal regularity that graphs of the other metals do. The "uniqueness" of these distributions may be due to the fact that low concentrations are often reported as qualified values (for example, less than 50 µg/l). It may also be due to a relatively high degree of analytical error. There is, additionally, the possibility that these data are accurate and that the results reflect geochemical processes that we do not understand. When contrasted with the regular "behavior" of the other metals, such a possibility seems unlikely.

Bicarbonate concentrations and pH values (figs. 6 and 7, respectively), are low immediately below the mines and tailings, and increase downstream. Contributions from less acid side streams (1) dilute the H^+ concentration and (2) increase the bicarbonate concentration, which neutralizes the acid, thereby raising the pH at downstream sites.

As expected, the pH-metal relationships are inverse. Graphs of pH versus dissolved Ni (fig. 8) and Mn (fig. 9) exhibit this relationship and are typical of similar graphs of the other metals.

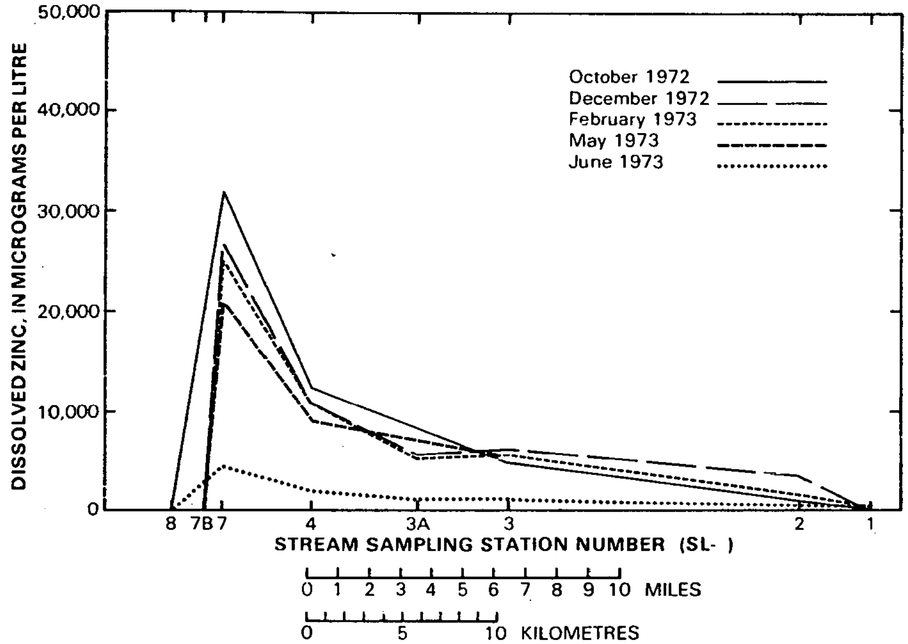

Figure 4.--Dissolved zinc concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

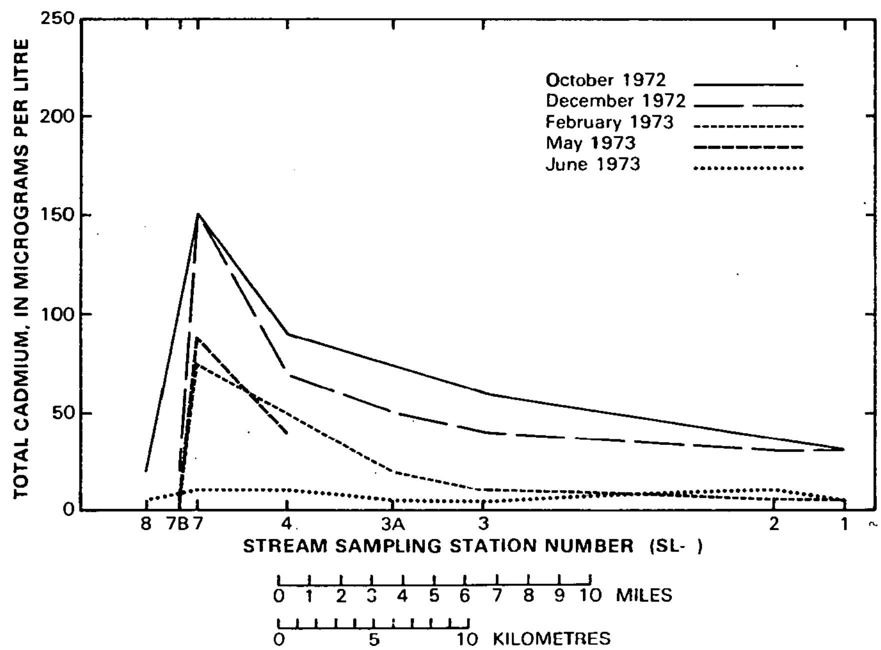

Figure 5.--Total cadmium concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

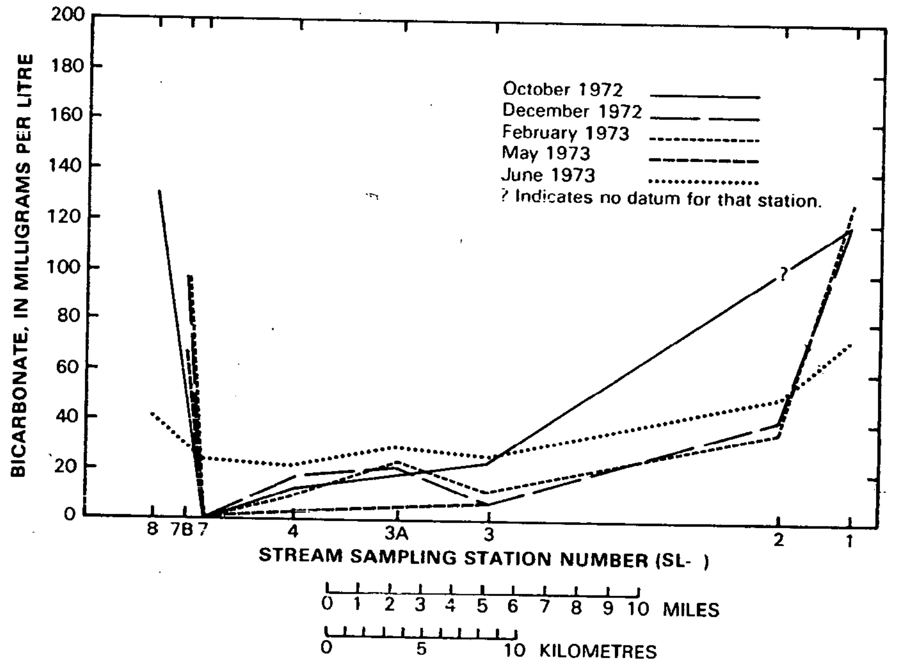

Figure 6.--Bicarbonate concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

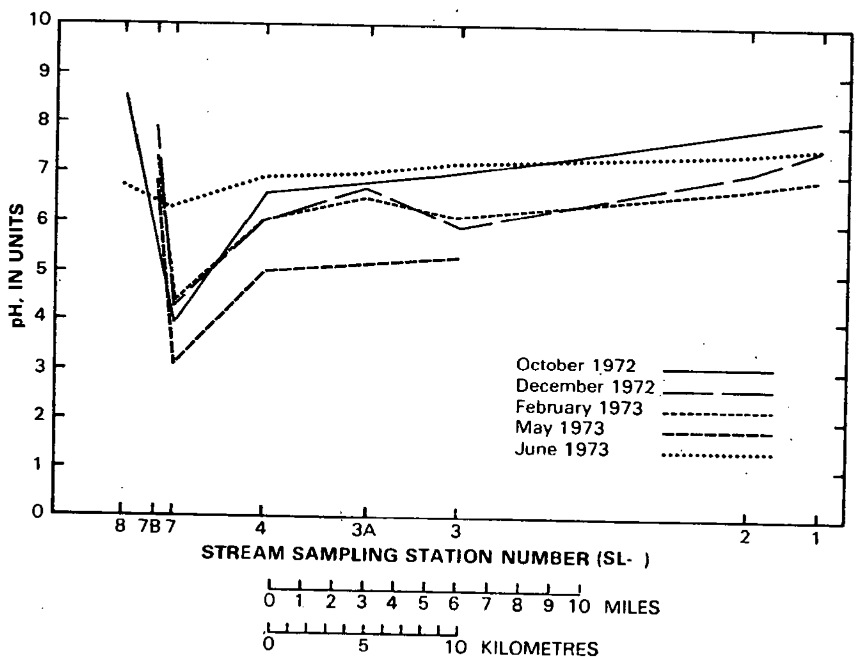

Figure 7.--The pH in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

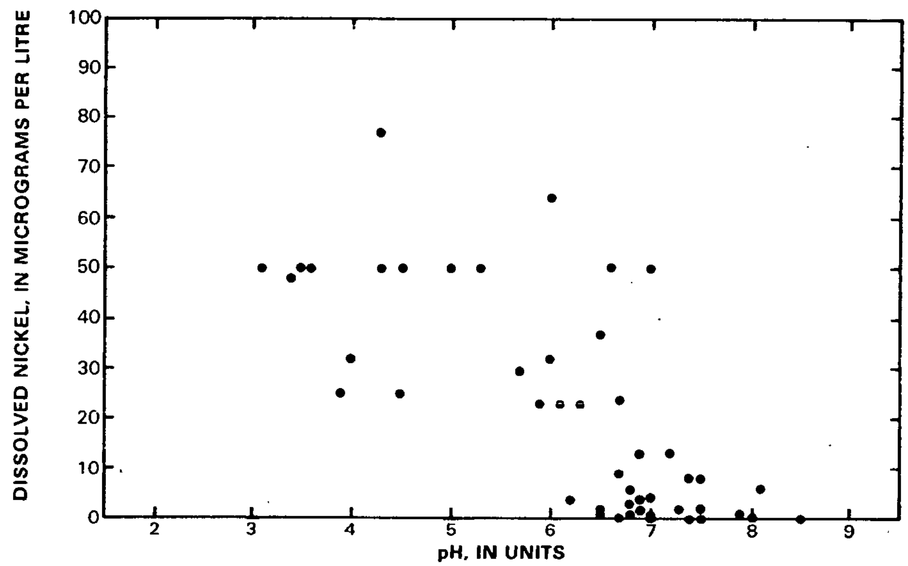

Figure 8.--Relation between pH and dissolved nickel concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

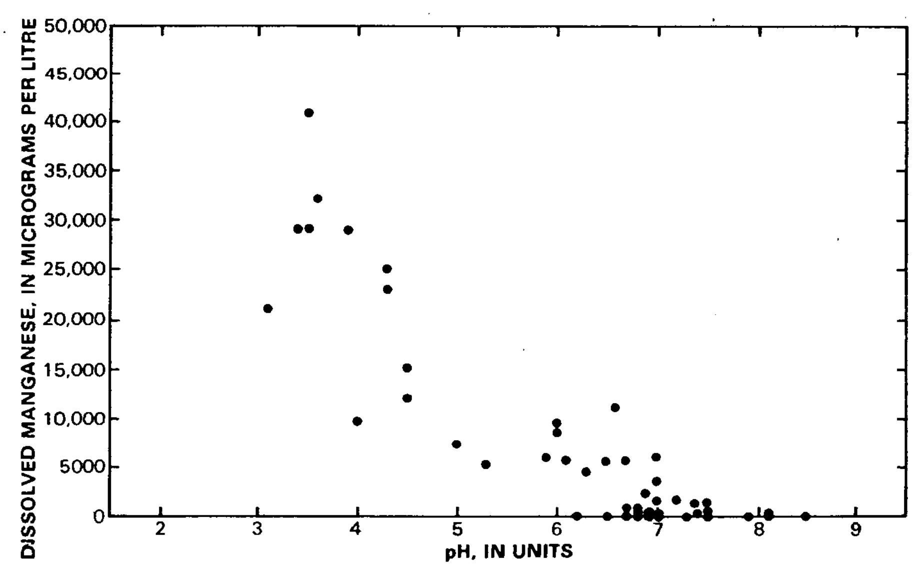

Figure 9.--Relation between pH and dissolved manganese concentrations in the Kerber Creek drainage, Colorado, October 1972 to June 1973.

Metal Transport

Metals in true solution may be in the form of dissolved ionic species and inorganic associations, or they may be complexed with organic molecules. Due to the very limited extent of soil development, it has been assumed that metal-humate complexes are an insignificant part of the dissolved fraction in the Kerber Creek area. Likewise, the lack of active sources of industrial pollutants leads to the conclusion that other dissolved organometallic complexes are insignificant in this area.

Concentrations in unfiltered samples suggest that the suspended load carries significant quantities of metals. These metals may be: (1) adsorbed onto solids, including colloids; (2) contained in coatings on grains (precipitates and coprecipitates); (3) incorporated in solid biologic materials; and (4) incorporated in crystalline structures (Gibbs, 1973). Based on a literature review by Andelman (1973), it seems that an additional category should be added: (5) complexed with organic materials that are not in true solution. In the present study, it is impossible to state what percentage of the suspended metal load is transported in each of these forms. Moreover, whereas it is conceivable that reaction rates might account for some of the observations discussed below, this study was not designed to consider chemical kinetics, and this possibility, therefore, will not be considered further.

The dependence of dissolved metal concentrations on pH can drastically affect metal transport, because dissolved constituents generally are the most mobile fraction of the stream load (mass transported per unit time). Suspended materials may be relatively mobile while the water is flowing at a given velocity, but these materials settle out when the velocity decreases.

As mentioned previously, pH in the Kerber Creek drainage increases downstream. This lowers the solubilities of the metal hydroxides and carbonates, two of the more likely precipitation controls on dissolved-metal concentrations. The expected and generally observed result is a downstream decrease in the mass of metals transported, both in the dissolved and the total fractions. The dissolved load decreases due to precipitation, but this would not affect the total load if the precipitated material remained in suspension. The total load decreases as the stream gradient becomes flatter (see fig. 10), velocities decrease, and suspended materials settle out.

Increased pH's do not affect all metal solubilities to the same degree. By noting the percent of each metal in the dissolved phase [(dissolved concentration/total concentration) × 100] at downstream stations, an indication of the relative effect of pH on solubility can be obtained. Figure 11 illustrates downstream changes in percentage of each metal in the dissolved phase during low flow in December 1972. Even though the dissolved loads of all metals decrease downstream, the percentage of Zn and Mn dissolved is affected very little by the rise in pH between stations SL-7 and SL-2. This indicates that most of the Mn and Zn lost from solution does not become part of the suspended load, but quickly settles to the stream bottom.

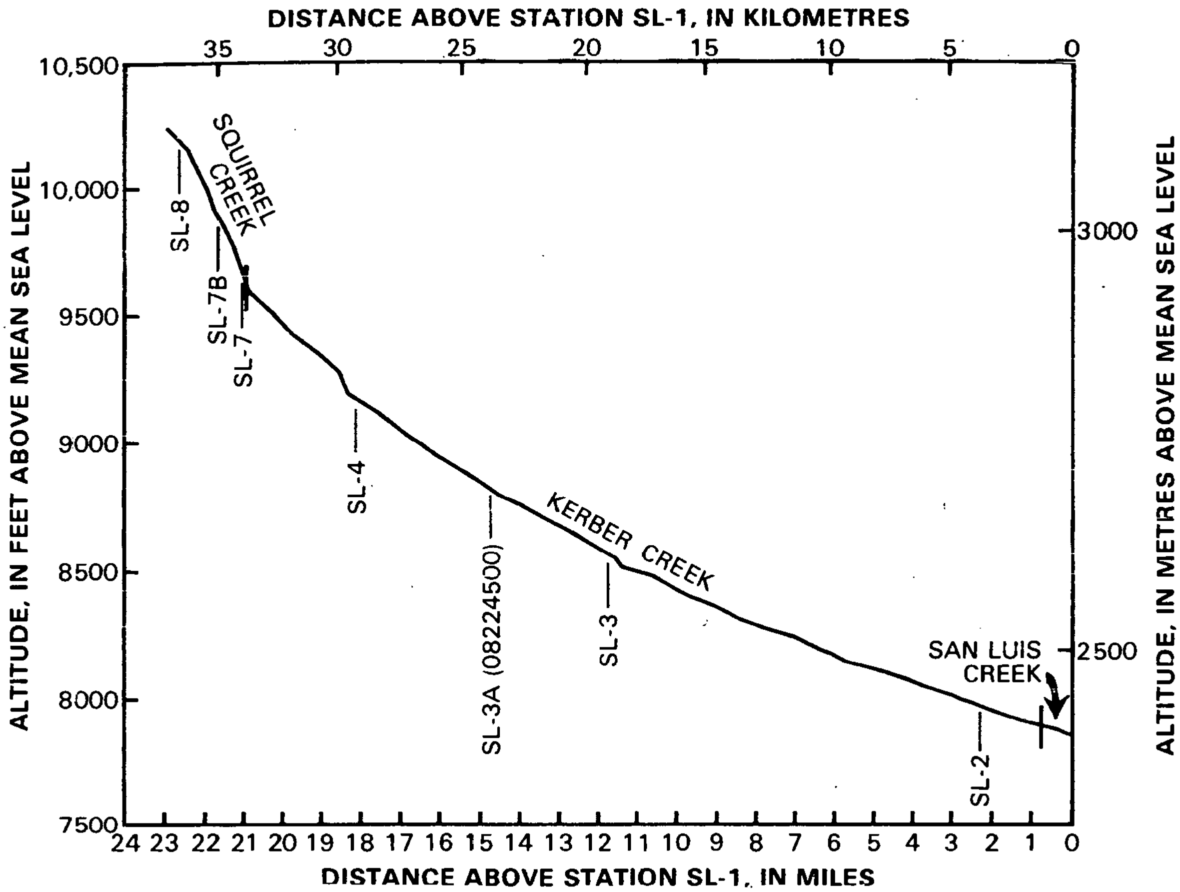

Figure 10.--Gradient of the Kerber Creek drainage, Colorado.

On the other hand, less than 10 percent of the Ni and Pb were still dissolved at station SL-2, with Cd, Cu, and Fe having intermediate percentages. This suggests that considerable amounts of these metals move from the dissolved to the suspended fraction.

A first approximation of the relative geochemical mobilities of the metals of concern in this study can be obtained by neglecting the suspended phase. This simplifies matters by removing a variable that is a function of stream velocity. With this in mind, the curves in figure 11 suggest the following geochemical mobility sequence based on the percent of each metal in the dissolved phase during December 1972 at Kerber Creek:

$$Mn \simeq Zn > Cu > Cd > Fe > Ni > Pb.$$

Due to increased runoff and the resulting rise in pH's, it is not surprising to see that overall the percentage dissolved of most metals decreased in June 1973 (fig. 12). At station SL-2, Zn, Cu, and Fe percentages showed

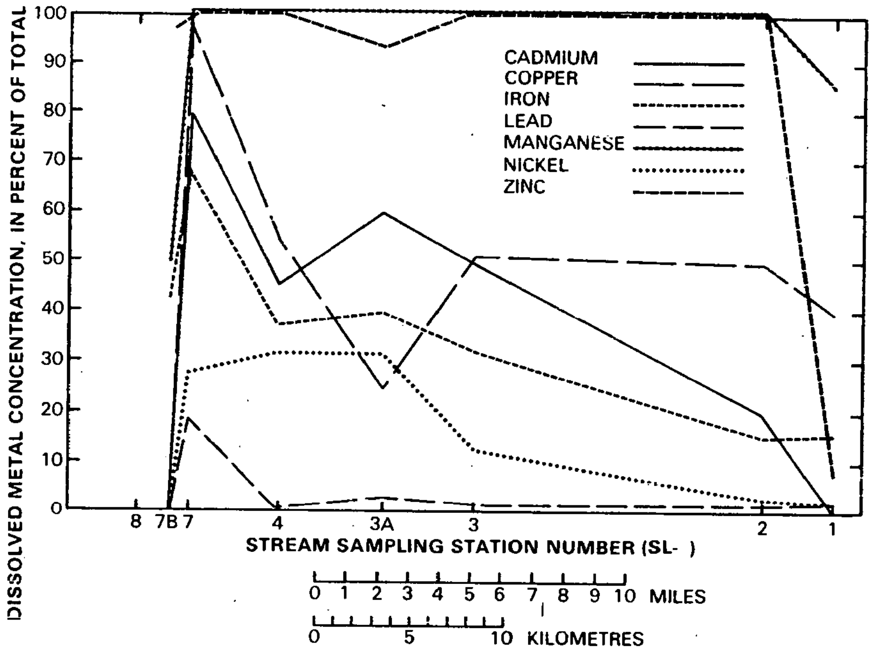

Figure 11.--Percentage of dissolved metals in the Kerber Creek drainage, Colorado, December 1972.

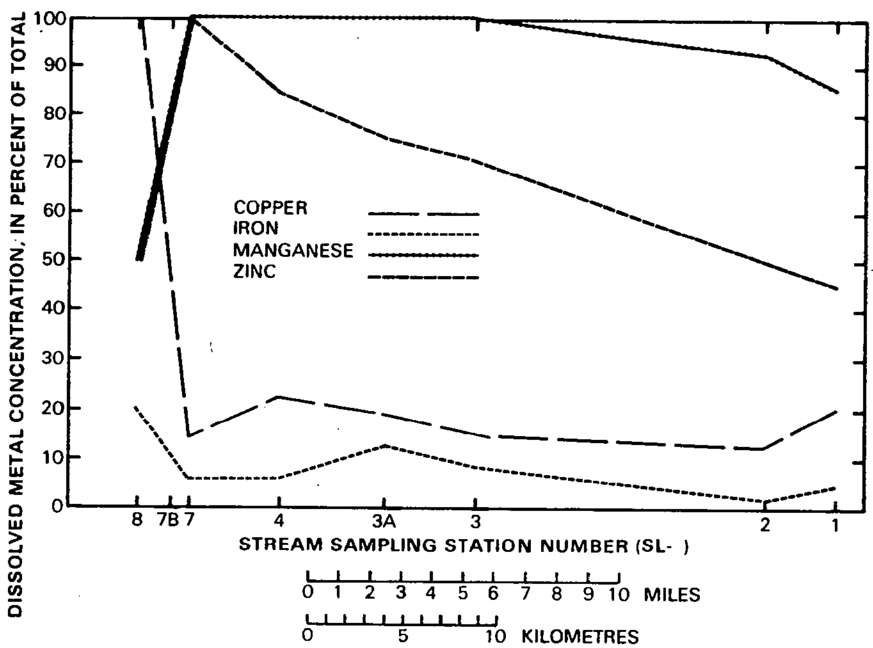

Figure 12.--Percentage of dissolved metals in the Kerber Creek drainage, Colorado, June 1973.

the most pronounced decreases but Mn was affected only slightly. Despite these changes, the geochemical mobility sequence remained approximately the same:

$$Mn > Zn > Cu > Fe.$$

The patterns of percentage dissolved Cd, Pb, and Ni in June could not be determined because total concentrations were often lower than the detection limit for unfiltered samples.

Although the pH dependence of dissolved metal concentrations may be partly due to individual precipitation reactions, it is also possible that adsorption onto suspended ferric hydroxide is contributing to the loss of metals from solution. Jenne (1968) has reviewed the literature on this subject and notes that the process seems to be more important at neutral than at acidic pH's. This fits the previously observed patterns of metal concentrations and pH in the Kerber Creek drainage (see, for example, figs. 4 and 7). Adsorption would be expected to be more important for Cd, Cu, Pb, and Ni (elements transported in the suspended fraction) than for Mn and Zn (elements not transported in the suspended fraction).

Coprecipitation of other metals with ferric hydroxide is a controversial subject. J. D. Hem (written commun., 1973) has presented good theoretical evidence for this possibility. However, experimental evidence for Cu (Boyles and others, 1973) and Ba and Sr (Kurbatov and others, 1945) tends to refute this as an important control.

The adsorption of metals onto manganese oxides or hydroxides is also not believed to be important at Kerber Creek, because pH values are seldom high enough to cause precipitation of these compounds. Thermodynamic calculations indicate that the drop in percent dissolved Mn between stations SL-2 and SL-1 (see figs. 11 and 12) may be due to precipitation of the metal as a carbonate: bicarbonate increased greatly in this reach (fig. 6), whereas pH changes very little (fig. 7).

The foregoing discussion of metal solubility has been predicated on the assumption that 0.45-μm filtered samples contain only truly dissolved metal constituents. As discussed earlier, such samples may actually contain materials in addition to those in true solution. For instance, those colloidal particles that are less than 0.45 μm in diameter should pass the filter and increase the measured concentrations of certain trace elements (V. C. Kennedy, written commun., 1973). This would severely restrict the use of thermodynamic calculations to estimate solubility controls. However, waters affected by mine drainage often contain considerable suspended material that will clog the filter, thereby reducing the effective pore size and, thus, the amount of particulate load that might be expected to pass through the filter. Moreover, as all filtrates were initially clear and colorless and remained so for extended periods, it seems that these filtered samples provide reasonable approximations of the metal concentrations in true solution.

Further insight into transport processes can be gained from an analysis of metal loads. In this way, the effects of dilution can be taken into account, because dilution affects concentration but not mass. Figures 13 and 14 show how both the dissolved and total loads of two metals (Fe and Cu, respectively) vary downstream in the Kerber Creek drainage during periods of low and high flows.

Peaks at station SL-7 in December 1972 are due to contributions of dissolved and suspended Fe and Cu from draining mines and tailings piles. Similar peaks at station SL-3A may be due to additions of dissolved and suspended Fe from the downstream tailings piles.

June 1973 loads for all metals studied were generally higher than those for December 1972. This is due partly to the greatly increased stream discharge available to erode metals from the tailings during spring runoff, and partly because the tailings piles are frozen during the winter low flows thereby making erosion difficult. In addition, it has been observed that increased flows in the spring and early summer cause scouring of the metal-laden precipitates from the stream bottom.

With but one exception--total Fe--the total and dissolved loads of all metals decreased between stations SL-3A and SL-2 in June 1973. (This reach is considered because it is downstream from all metal sources.) Thus, it seems that some sort of removal mechanism was operating.

As discussed earlier, the removal mechanism might be expected to be a combination of individual precipitation reactions and adsorption onto ferric hydroxide particles. The latter alternative, however, does present a dilemma: if metals are adsorbed onto ferric hydroxide particles, and if these particles remain in suspension, then the total metal loads should not decrease. On the other hand, if metals precipitate independently and then settle out, both total and dissolved loads should decrease. The obvious conclusion is that adsorption onto ferric hydroxide is of minor importance in Kerber Creek--at least during high flows.

As mentioned, the total Fe load increases from stations SL-3A to SL-2 in June. No tailings piles exist in this reach of the stream, indicating that the increase is due to scouring of ferric hydroxide precipitate from the stream bottom. However, if the precipitate contains considerable amounts of other metals, why does such scouring not cause a similar increase in the total loads of metals other than Fe? The implication is that the precipitate in this reach of the stream is comprised mostly of Fe and contains relatively small amounts of the other metals. No precipitates from the stream bottom were collected from stations SL-3A or SL-2; but an analysis of the precipitate at station SL-7 (table 6) shows that Fe makes up the bulk of the material, and that significant amounts of some other metals (Zn, Cu) are also present. (Table 6 also presents precipitate analyses from two other study areas, which will be discussed later.) The precipitate analysis from station SL-7, together with the total load data, would indicate that the metal content (excluding Fe) of the stream precipitates decreases downstream. Such a pattern is consistent with variations in solubility and differences in grain sizes of

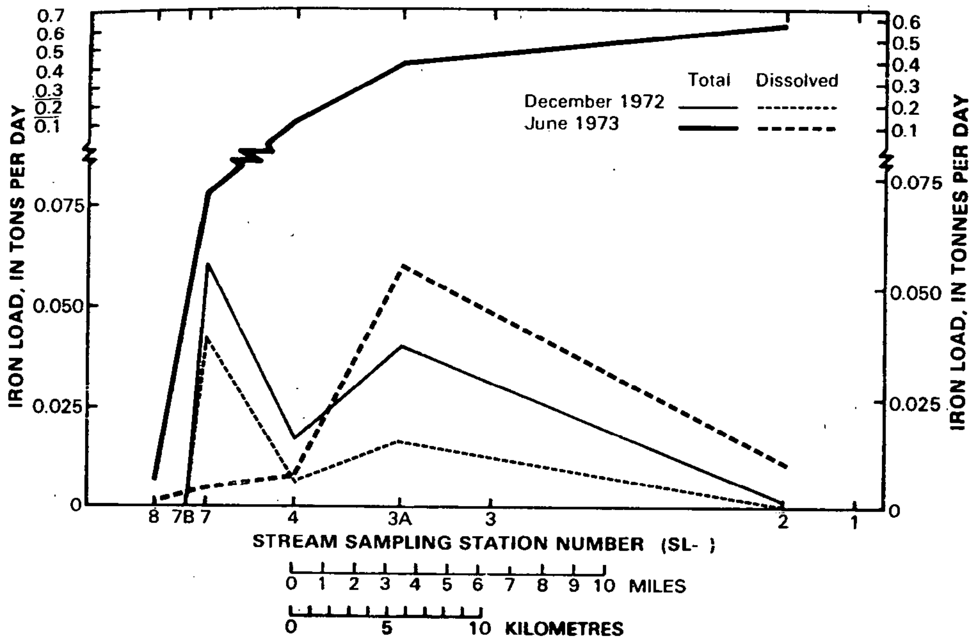

Figure 13.--Iron loads in the Kerber Creek drainage, Colorado, December 1972 and June 1973.

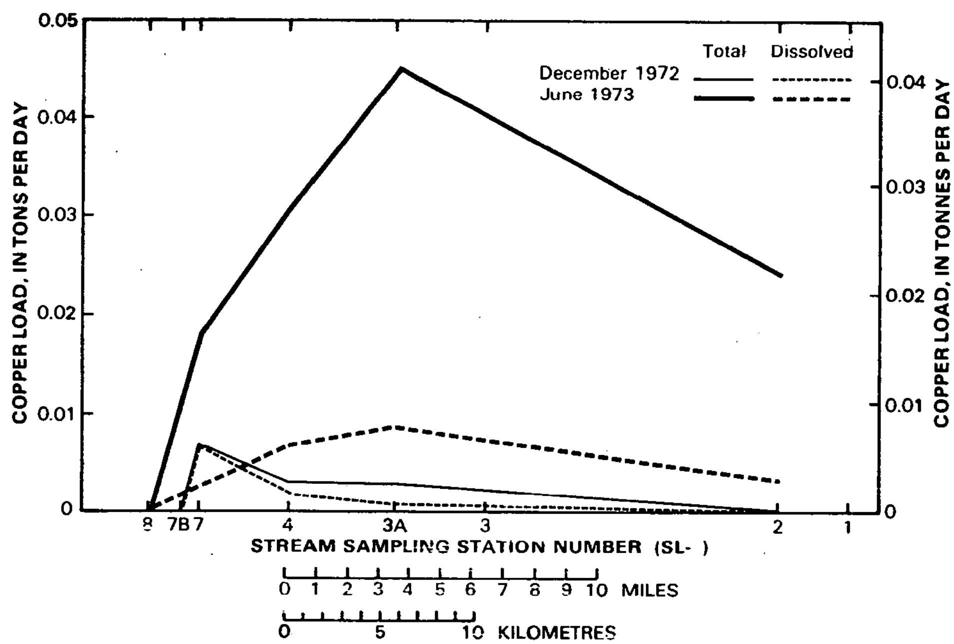

Figure 14.--Copper loads in the Kerber Creek drainage, Colorado, December 1972 and June 1973.

the source materials. For example, increases in the suspended Pb and Cu loads occur immediately downstream from the tailings, indicating that relatively large, suspended tailings particles are being collected and analyzed in the unfiltered samples. These particles would tend to settle out as the stream gradient decreases. The iron hydroxide precipitate, on the other hand, is probably composed of colloidal particles (Hem and Skougstad, 1960) that would travel farther downstream.

Table 6.--*Spectrographic analyses of chemical precipitates from the stream bottoms of three complex-ore mining districts in Colorado*

[Data expressed as milligrams per kilogram]

Station: Collected: pH of water: Study area:	SL-7 2/7/73 4.3 Kerber Creek	EF-S6 11/6/72 3.9 Leadville	UR-9 12/15/72 3.3 Ouray
Element			
Al	550	3,000	6,000
Ba	100	50	140
Be	<1	<1	<1
Bi	<5	<5	<5
B	<5	5	<5
Cd	<20	<20	<20
Cr	<5	<5	<5
Co	<5	<5	<5
Cu	800	150	160
Ga	<2	<2	<2
Ge	<5	<5	<5
Fe	>10,000	>10,000	>10,000
Pb	140	>200	150
Mn	70	100	110
Mo	9	7	10
Ni	<3	<3	<3
Ag	2	12	3
Sr	<10	10	33
Ti	<5	100	>200
V	<3	5	17
Zn	900	1,400	790
Zr	<5	9	21

The presence of other colloidal materials can greatly enhance the mobility of some metals. Clay minerals are known to adsorb metals onto their surface (Kennedy, 1965), thereby transporting them downstream until desorption or flocculation occurs. Bottom sediment samples collected during February 1973 showed 25 percent clay in the fine sand and smaller fraction at station SL-3, whereas clay minerals were only noted as being "present" at station SL-4. X-ray diffraction analysis indicated that the clay minerals were probably illite and either montmorillonite or mixed-layer illite-montmorillonite (table 7). Thus, adsorption onto the surfaces of clays should be considered as a possible transport mechanism for metals in Kerber Creek.

Table 7.--*X-ray diffraction analyses of sediment and chemical-precipitate samples from the Kerber Creek study area, February 3, 1973*

Station	Sample description	Constituents	Percent composition
SL-3---	Bottom sediment ($\leq$0.125 mm ≅ sand and smaller fraction)	Quartz-------------------	25
		Plagioclase feldspar-----	15
		Potassium feldspar-------	10
		Clay minerals[1]-----------	25
		([2])	
SL-4---	Bottom sediment ($\leq$0.062 mm ≅ silt and smaller fraction)	Quartz-------------------	35
		Plagioclase feldspar-----	10
		([3])	
SL-7---	Mixture of bottom sediment and chemical precipitate	Quartz-------------------	15-20
		Pyrite-------------------	10-20
		Mixed-layer clay minerals	$\leq$10
		([4])	

[1]Probably illite and montmorillonite or mixed-layer illite-montmorillonite.

[2]Some augite and iron oxides may be present.

[3]Clay minerals and amorphous material also present.

[4]The remainder of the sample is amorphous material, probably mostly $Fe(OH)_3$.

Precipitates

Petrographic and X-ray diffraction analyses of chemical precipitates collected at Kerber Creek and Leadville show the material to consist predominantly of amorphous, probably hydrated, iron oxides. As expected, spectrographic analysis of these two orange precipitates and one from the Ouray study area (table 6) show the most abundant metal to be Fe.

Based on the similarity of the analyses, the chemical precipitation processes operating at the many complex-ore districts in Colorado are thought to be very similar. As the flow of metal-laden water moves away from the acid environment of the adit, pH's rise and metals are removed from solution. Ferric iron is extremely insoluble and begins to precipitate immediately.

Metals, such as Pb, also form very insoluble compounds and undoubtedly are precipitated within a very short distance of the adit opening. Other metals, for example Zn, form more soluble compounds under these conditions and continue to precipitate for a greater distance downstream. Thus, the percentage of the more mobile metals in the precipitates would increase with distance from the source (Boyles and others, 1973).

Comparison of precipitate analyses with analyses of filtered water samples collected from the same site at the same time gives an indication of the degree to which metals are concentrated in the chemical precipitates. Table 8 compares metal concentration factors (ratios of chemical-precipitate concentration in micrograms per kilogram/filtered-water concentration in micrograms per litre) for the three samples listed in table 6.

Table 8.--*Concentration factors for metals in chemical precipitates from three complex-ore mining districts in Colorado*

Site: Date:	Kerber Creek, SL-7 2/7/73	Leadville, EF-S6 11/6/72	Ouray, UR-9 12/15/72
Metal			
Cu-------	620	140	110
Pb-------	3,200	>18,000	1,100
Mn-------	3.0	3.6	41
Zn-------	36	26	220

No accurate estimate of the concentration factors for Fe, Ni, and Cd could be obtained because their precipitate concentrations were reported as qualified values. Even though all Fe concentrations were reported as >10,000 mg/l, the relative order of Fe concentrations in the three precipitates can be determined from the varying widths of the spectrograph lines. This order is: Ouray > Leadville > Kerber Creek (P. R. Barnett, oral commun., 1973). Larger amounts of precipitating Fe at the Ouray study area might account for the lower pH's at this site (UR-9). It is interesting to note that several metals that were detected at very low concentrations in the water are significantly concentrated in the precipitates--for example, Pb.

In addition to the variation in precipitate composition with distance from the drainage source, it is also likely that much of the variation present in both the precipitate compositions and the concentration factors can be accounted for by the differing mineral compositions of the local ores and tailings piles.

As previously mentioned, high flows cause scouring of the stream bottom. Under these conditions, precipitate accumulations are broken up and carried downstream. Although the initial result is a great increase in the total metal load, it seems encouraging to note that, following such a high-flow period, precipitates have essentially been flushed from the stream bottom. This suggests that if, by some means, the sources of metals were removed or bypassed, the stream would cleanse itself following one normal spring runoff period.

Relative Adit and Tailings Contributions

Precise knowledge concerning the sources of metal contaminants is necessary if any reclamation attempts at Kerber Creek are to be successful. For this reason, the section of the Kerber Creek drainage that encompasses a large tailings accumulation and the most flagrant source of adit drainage was studied in detail to determine the relative metal and acid contributions of these two sources (see fig. 15).

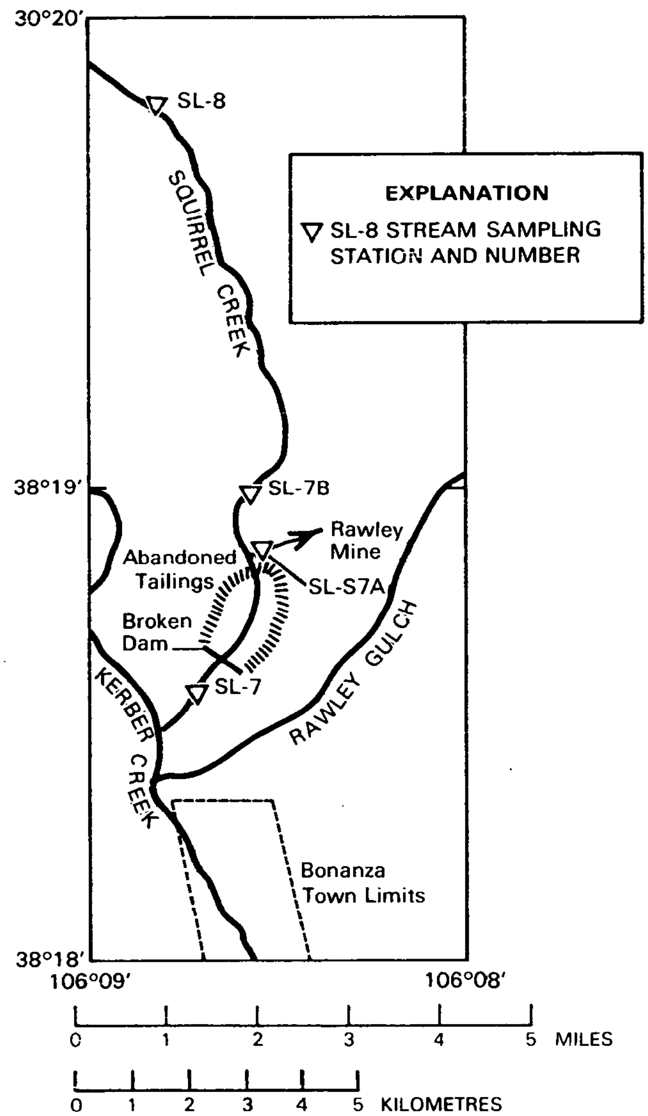

Figure 15.--Section of the Kerber Creek study area used for determination of relative adit and tailings contributions.

Metal concentrations at the adit in question (site SL-S7A) generally decline as the winter progresses, but begin to rise again in May as the flow increases due to snowmelt. Adit pH's varied little from December 1972 to June 1973 (3.4 to 3.6). Concentrations and loads of all metals generally were highest at the adit in June. Apparently this situation results from the build-up of acid and dissolved metals during the winter. With the onset of spring, ground-water recharge increases, flushing the accumulated acid and metals from rock fractures. Discharges at this adit average about 0.5 ft^3/s (0.01 m^3/s) and, as will be shown, represent a less significant source of metals than do the tailings.

Tailings piles are accumulations of waste rock separated during the mining and milling processes because they are too low in metal content to be processed economically. Due to relatively inefficient separation techniques, the older piles contained much greater concentrations of metals (when deposited) than those resulting from more modern operations. Tailings accumulations lying in the channel of the Kerber Creek drainage are from 5 to 90 years in age. Since milling activity has been quite limited at Bonanza in the last 25-30 years, the majority of the tailings are of the older, more metalliferous variety. Like the adit, these tailings also add acid and metals to the stream. Immediately downstream from the upper tailings (station SL-7), low-flow pH values are highest in the winter, probably because of the frozen conditions and reduced flow of water around and through the piles. However, a sharp drop in the pH occurs at this site about the beginning of May, with the values rising sharply in June. As snowmelt begins to increase in May, pyrite degradation products are flushed into the stream, thus depressing the pH. The pH's rise in June as a result of dilution from surface runoff. As in the adit, it appears that pyrite oxidation and acid production continue throughout the winter, but that the reduced flow of water prevents transport of the acidity and metal ions from the tailings.

Metals leached by the acid from the tailings represent the largest single source of metals added to the Kerber Creek drainage. This conclusion was reached by comparing the metal loads at sites upstream and downstream from the tailings (fig. 15).

Table 9 lists the metal loads contributed by the upper tailings during December 1972 and during May and June 1973. Table 10 lists these contributions as percentages of the individual metal loads at SL-7. Most importantly, the data from tables 9 and 10 show that there is a net gain in most metal loads as the stream passes through the tailings, and that this contribution is often considerably larger than that from the draining adit.

Conclusions about the dissolved percentages of Cu, Fe, and Pb derived from the tailings in June are not so straightforward. Data for these metals indicate a loss of dissolved load as the stream passes through the tailings. It is possible that metals are being trapped by the tailings (adsorbed onto the particles), but there is no indication that such a process is occurring to a significant degree during any of the other months. Also, dissolved Cd, Zn, Mn, and Ni loads in June increase (after passing through the tailings), which also indicates that adsorption is probably not occurring to any great

Table 9.--*Net change in metal loads due to passage through upper tailings, Kerber Creek study area*

[Values expressed as tons per day]

Metal	December 1972	May 1973	June 1973
		Dissolved	
Cd----------	$+1.8 \times 10^{-4}$	$+1.7 \times 10^{-4}$	$+5.6 \times 10^{-5}$
Cu----------	$+5.9 \times 10^{-3}$	$+2.6 \times 10^{-2}$	-1.9×10^{-3}
Fe----------	----------	$+6.7 \times 10^{-2}$	-3.6×10^{-3}
Pb----------	$+1.6 \times 10^{-4}$	$+1.9 \times 10^{-4}$	-8.0×10^{-5}
Mn----------	$+5.1 \times 10^{-2}$	$+4.4 \times 10^{-2}$	$+7.3 \times 10^{-2}$
Ni----------	$+1.2 \times 10^{-4}$	$+1.3 \times 10^{-4}$	$+5.4 \times 10^{-4}$
Zn----------	$+5.5 \times 10^{-2}$	$+4.4 \times 10^{-2}$	$+6.7 \times 10^{-2}$
		Total	
Cd----------	----------	$+1.9 \times 10^{-4}$	$>-1.4 \times 10^{-4}$
Cu----------	----------	$+2.5 \times 10^{-2}$	$+1.3 \times 10^{-2}$
Fe----------	----------	$+1.3 \times 10^{-1}$	$+6.4 \times 10^{-2}$
Pb----------	----------	$>+4.0 \times 10^{-4}$	$>+1.1 \times 10^{-3}$
Mn----------	----------	$+4.0 \times 10^{-2}$	$+6.3 \times 10^{-2}$
Ni----------	----------	>0	$>+2.3 \times 10^{-4}$
Zn----------	----------	$+4.2 \times 10^{-2}$	$+6.7 \times 10^{-2}$

Table 10.--*Metal loads contributed by upper tailings, Kerber Creek study area*

[Values expressed as percent of load at station SL-7]

Metal	December 1972	May 1973	June 1973
		Dissolved	
Cd----------	40	53	17
Cu----------	87	98	-73
Fe----------	--	92	-78
Pb----------	76	89	-103
Mn----------	54	52	63
Ni----------	63	63	91
Zn----------	54	52	58
		Total	
Cd----------	--	52	>-56
Cu----------	--	97	>74
Fe----------	--	95	82
Pb----------	--	>50	>43
Mn----------	--	49	58
Ni----------	--	>0	>35
Zn----------	--	50	58

degree. Instead it seems likely that the declines of dissolved Cu, Fe, and Pb loads are due to precipitation of these metals in the reach between stations SL-S7A and SL-7. The pH increases greatly between these two stations in June (pH 3.5 to 6.3), thereby lowering metal solubilities. Chemical precipitation in this reach during May would be greatly reduced because the pH actually decreases (pH 3.5 to 3.1 between stations SL-S7A and SL-7). Since Cu, Fe, and Pb solubilities are known to be more pH dependent than those of Zn, Cd, or Mn (Boyles and others, 1973), it is not surprising that only the Cu, Fe, and Pb loads should decrease below the tailings in June.

Toxic Effects of Mine Drainage

Based on field examination of rocks and artificial substrate samplers from the Kerber Creek area, it is inferred that no aquatic macroinvertebrates live in the reach between stations SL-S7A and SL-3. Benthic organisms first reappear at station SL-2--approximately 20 miles (32 km) downstream from SL-S7A. Such a condition also implies that no fish exist in this reach. A variety of benthic organisms--caddisfly, stonefly, and mayfly larvae, midges, and diatoms--were collected from control sites in the area. The absence of bottom-dwelling organisms for some distance downstream from the mines is undoubtedly due, either directly or indirectly, to the high concentrations of metals and acid. Reappearance of bottom organisms at station SL-2 reflects the degree to which Kerber Creek "recovers" chemically downstream.

In regard to indirect control of aquatic biota alluded to above, it is possible that high concentrations of Fe^{+2} in the adit drainage could cause a depletion of dissolved oxygen in the stream below the point of discharge:

$$Fe^{+2} + \frac{1}{4}O_2 + H^{+1} \rightleftarrows Fe^{+3} + \frac{1}{2}H_2O. \qquad (2)$$

This might then restrict the biotic community in the affected reach. It would not, on the other hand, be expected to completely eliminate all life, because there are certain organisms that can live under very low dissolved-oxygen concentrations. Dissolved-oxygen measurements were not made in conjunction with this study. However, because the reach of stream that is devoid of life is rather long and because the reaeration potential of the stream is relatively high, any effect due to the absence of dissolved oxygen is expected to be minimal in comparison to the toxicity effect of high metal concentrations and low pH.

The improvement of Kerber Creek water quality with respect to metals is summarized in table 11. For the month of December 1972, all dissolved metals exceeded U.S. Public Health Service drinking water standards (1962) at station SL-7 (with the exception of Ni, for which no standard exists). However, at SL-2 only dissolved Mn exceeded the standards. But aquatic invertebrates, fish, and livestock do not reside in or ingest filtered water. Data from unfiltered samples present a somewhat different situation. Under these conditions, total Pb and Cd exceed the standards at SL-2, in addition to total Mn.

Table 11.--*Chemical recovery of the Kerber Creek drainage, as indicated by dissolved and total metals that exceed drinking water standards at stations SL-7 and SL-2 in December 1972*

[Concentrations in larger type exceed the standards]

Metal	Dissolved concentration (μg/l)		Total concentration (μg/l)		U.S. Public Health Service drinking water standards (1962) (μg/l)
	SL-7 (pH=4.3)	SL-2 (pH=7.0)	SL-7 (pH=4.3)	SL-2 (pH=7.0)	
Cd-------	120	6	150	30	[1]10
Cu-------	1,800	10	1,850	20	[2]1,000
Fe-------	11,000	40	16,000	260	[2]300
Pb-------	56	3	300	200	[1]50
Mn-------	25,000	3,530	25,000	3,360	[2]50
Ni-------	50	4	180	150	-----
Zn-------	27,000	3,500	27,000	3,400	[2]5,000

[1]Maximum permissible concentration.
[2]Recommended limit.

Reasonable interpretation of data, such as those presented in table 11, depends greatly on the existing or intended use of the water. As mentioned, fish, invertebrates, and livestock don't normally live in or drink filtered water. Therefore, data from unfiltered samples may give a more realistic idea of the metal load ingested. On the other hand, for water used for human consumption, reliance on such total concentrations may be unrealistic. Because surface water used as a municipal supply is generally flocculated, settled, and (or) filtered before distribution, most of the suspended material is removed. Also, ground water generally contains only slight amounts of material in suspension, even in shallow alluvial aquifers with local surface-water recharge. Hence, use of data from filtered samples may be called for in such situations.

Obviously, it is important to rely on samples which best represent the environmental conditions in question. It is not presently known what fraction of the total metals consumed is biologically "available." When a steer drinks water containing greater than 10 μg/l of Cd, how much of this metal is absorbed from its digestive tract into the blood and concentrated in various organs? How much Cd is harmlessly eliminated? The answers to such questions are only partially known and are beyond the scope of this report. However, it would seem unrealistic to assume that only those metal species that are truly dissolved are biologically available. Given the highly acid environment of the mammalian stomach--pH 1-2 (White and others, 1964, p. 707)--it seems very likely that metals desorbed from colloidal surfaces and leached from silicate lattices and organic matrices are also, to some extent, biologically available.

The previous discussion emphasizes the importance of physiologic data in establishing water-quality standards. However, insufficient physiologic data on metal toxicity were available in the 1940's when the U.S. Public Health Service drinking water standards were being developed. As a result, many of the standards were based on limitations in analytical techniques and on esthetic considerations (Great Lakes Laboratory, 1971). Physiologic testing in the last 25 years has often shown that toxic effects can occur at metal concentrations much lower than those allowed by the U.S. Public Health Service standards (McKee and Wolf, 1963). Also, the United States presently (1973) has no limits for several elements that are known to be toxic to mammals, including nickel and vanadium (Lee, 1972). With these shortcomings in mind, Wentz (1974) compiled, from many literature sources, a list of suggested "stream criteria for fish and other aquatic life" (see table 5).

Table 12 lists those constituents that exceeded the suggested biological criteria at station SL-2 some time during the sampling period. Such a table probably conveys a more reasonable impression of the potential impact on aquatic life than do comparisons to U.S. Public Health Service drinking water standards. Moreover, keep in mind that evaluation of the potential toxic effects of metals is further complicated by antagonistic and synergistic effects, the chemical form of the metal(s) in question, and the biologic species involved.

Table 12.--*Metals exceeding suggested biological criteria*[1] *at station SL-2, Kerber Creek study area, during the period October 1972 to June 1973*

Filtered samples	Unfiltered samples
--	Cd
--	Cu
--	Pb
Mn	Mn
--	Ni
Zn	Zn

[1]Table 5, this report.

Effects of Mine Drainage on Ground Water

Due to the emphasis on surface water in this project, only four wells were sampled in the Kerber Creek area. All wells bottom in alluvium and are less than 20 feet (6 m) deep. Even though the wells in Bonanza (SL-G1, SL-G3, SL-G4) are located less than 200 feet (60 m) laterally from Kerber Creek, none of the metals determined exceeded U.S. Public Health Service standards. However, draining mines and tailings on Kerber Creek are contributing metals to the ground water. The public well (SL-G1) contained higher concentrations of Fe than did the winter control site on Squirrel Creek (SL-7B) in February 1973. All other metals were either the same or lower in concentration than at SL-7B. Two private wells in the town contained higher Cu, Fe, and Zn concentrations than did SL-7B.

It would appear that ground-water inflow from Kerber Creek is being "filtered" by the alluvium. Adsorption and cation-exchange processes are probably responsible for the lowering of metal and hardness concentrations as water flows from the stream through the alluvium. Also, reduction in porosity owing to formation of metal precipitates may aid in this filtering process.

As mentioned previously, inflow of very hard ground water probably accounts for the rise in hardness at downstream surface-water stations on Kerber Creek. In addition to increased hardness, the well sampled at Villa Grove (SL-G2) had a higher Zn concentration than either the town well in Bonanza (SL-G1), or the winter control station (SL-7B). Between SL-3 and SL-2 Kerber Creek loses flow, indicating that it is recharging the aquifer. This recharge, coupled with the relatively great mobility of Zn could account for the high concentration of Zn in ground water approximately 20 miles (32 km) downstream from the mining area. It is also possible that the increased Zn concentrations at Villa Grove may be due to contamination from metal-casing and (or) pump parts. However, such contamination might be expected to occur in all the wells.

Leadville

The Leadville area (see fig. 1) contains the Leadville and Sugar Loaf-St. Kevin mining districts and is characterized by Tertiary replacement and vein-type ore deposits in a Paleozoic sequence of dolomite and quartzite. Such deposits have yielded economic amounts of many mineral products, including: silver, zinc, lead, gold, copper, manganese, iron, bismuth, and pyrite (Tweto, 1968).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
California Gulch (Yak Tunnel, other draining mines, and tailings)---------------	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
St. Kevin Gulch-----------	X	X		X		X	X	X	X	X	X		X		X
Leadville Drain-----------		X		X		X	X		X		X		X		X
Iowa Gulch															
Below Black Cloud Mine--	X[2]		X			X		X[3]		X		X	X		X
Above Black Cloud Mine but below Sherman Tunnel----------------												X			
Evans Gulch[4]--------------															X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.
[2]Exceeds upper limit of 9.
[3]Exceeds upper limit of 8.5.
[4]Only flows part of the year.

Overview

Metals and acid entering surface waters in the Leadville area come from several sources. The most important of these is the Yak Tunnel (EF-S6), which collects water from many mines in the district, drains into California Gulch, and flows over extensive tailings piles to the Arkansas River (see fig. 16). All mines drained by this tunnel are currently inactive (Colorado Bureau of Mines, oral commun., 1973). California Gulch is normally dry above the Yak Tunnel; but, during periods of high flow, contaminated water flows down the channel and combines with the drainage from the tunnel.

The Leadville Drain (EF-15), which empties into the East Fork of the Arkansas River, also collects water from a number of mines in the Leadville area. However, this drain is a relatively minor source of pollution compared to the Yak Tunnel on California Gulch. Of the metals tested, Zn seems to be the most significant problem in the effluent from the Leadville Drain.

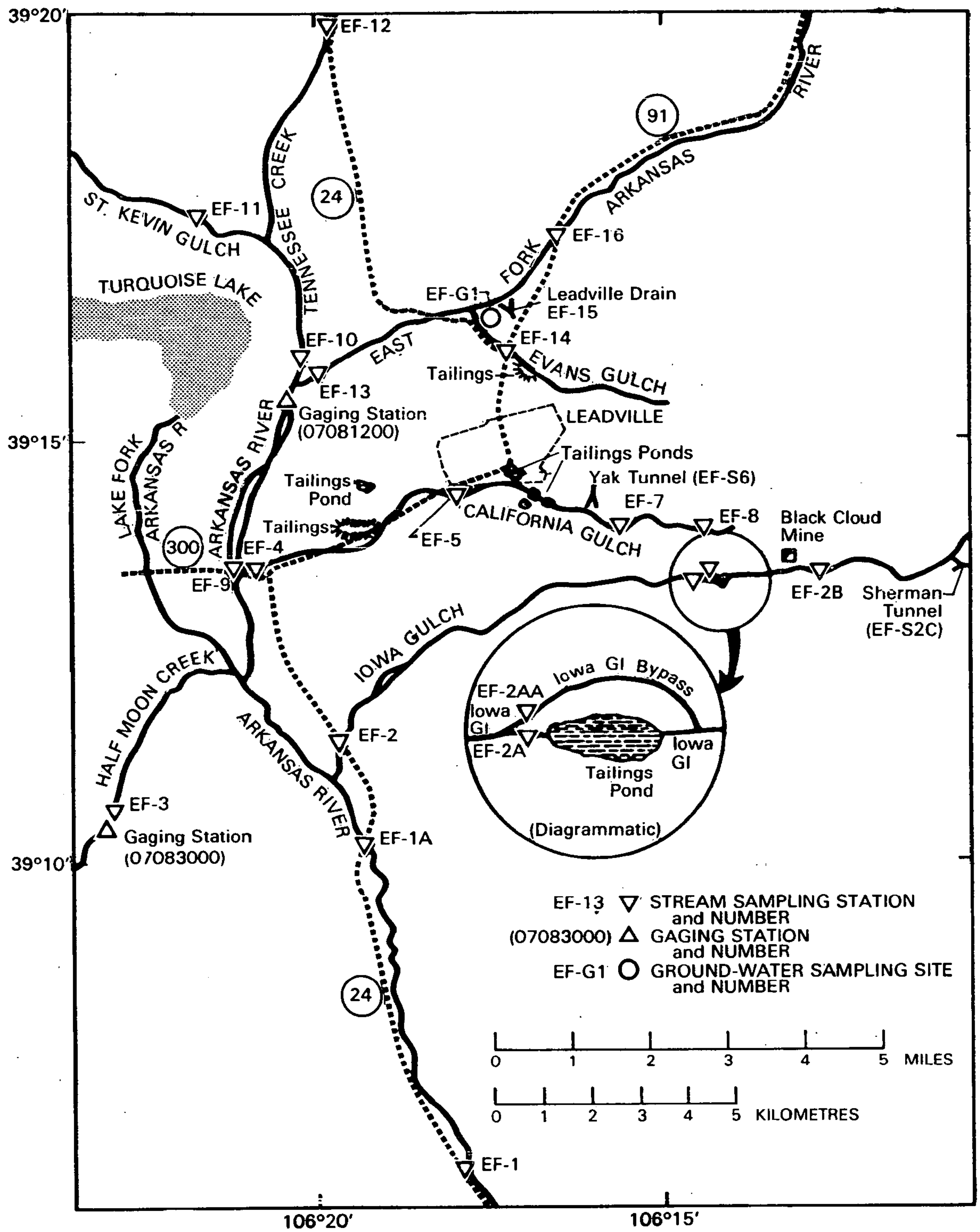

Figure 16.--Sampling sites in the Leadville area, Colorado.

Contributions from mines and tailings in St. Kevin Gulch enter Tennessee Creek, but do not seem to significantly degrade the water quality of Tennessee Creek.

Current mining and milling of complex ore is responsible for the pollution of surface water in Iowa Gulch. At station EF-2A, downstream from this operation, dissolved Cu and Mn concentrations exceed U.S. Public Health Service drinking water standards at certain times of the year. More importantly, a very high concentration (15 mg/l) of cyanide (includes all forms) was detected in November 1972 at this site. During the milling process, cyanide is added to facilitate the extraction of gold. These milling processes are also responsible for the high pH's (10.0 and 10.8 in November 1972 and May 1973, respectively) measured at station EF-2A. The streambed at this site is coated with a brownish-black scum of undetermined composition.

Examination of rocks from the streambed at station EF-2A revealed no living macroinvertebrates, although mayflies and caddisfly cases were found at station EF-2B upstream from the mining operation. Due to the high pH levels, little lead was detected in filtered samples from this station; this is consistent with the findings of Hem and Durum (1973). However, the unfiltered samples taken at station EF-2A in May 1973 contained 900 μg/l Pb.

The above contaminants (CN and Pb) probably have little, if any, effect on the water quality of the Arkansas River since Iowa Gulch has no surface flow at station EF-2, except during spring runoff. This lack of flow is probably because of recharge of the valley alluvium, and possibly some diversion for irrigation purposes.

Thus, it appears that the major contributor of metals and acid to the Arkansas River is California Gulch. As a result there is a significant deterioration of water quality at least down to the inflow of Lake Creek. Further degradation of water quality in the Arkansas River could result if planned diversions of water from Halfmoon Creek and the Lake Fork of the Arkansas are implemented by the U.S. Bureau of Reclamation. Such measures would greatly reduce the flow of these streams, which presently help to dilute the metals and acid from California Gulch.

Downstream and Seasonal Variations of pH and Metals in California Gulch and the Arkansas River

Patterns of downstream and seasonal metal variation at California Gulch are very similar to those at Kerber Creek. Metal loads contributed by the Yak Tunnel and tailings piles in California Gulch are generally greatest during periods of high flow (June). On the other hand, drainage from the Yak Tunnel fluctuates in pH more than similar adit drainage (station SL-S7A) at Kerber Creek, probably because of the larger number of sources drained.

Between stations EF-S6 and EF-4, the drainage of California Gulch flows through or around numerous tailings piles. These tailings would be expected to increase dissolved-metal loads in the drainage in a manner similar to that at Kerber Creek. This was the case in May 1973, just prior to spring runoff. But, in November 1972 (low flow) and June 1973 (high flow), the dissolved-metal loads decreased or remained the same between EF-S6 and EF-4. At first glance, this seems to be a contradiction of the processes occurring at Kerber Creek. However, the distance between EF-S6 and EF-4 (about 5.5 miles or 8.8 km) is much greater than the distance under consideration at Kerber Creek (several hundred yards between stations SL-S7A and SL-7). Thus, the precipitation processes have more time to operate to remove metals from solution at Leadville. These processes are probably enhanced by the addition of effluent from Leadville's sewage treatment plant just below station EF-5. This effluent constitutes one-third to one-half of the flow in the gulch below this point and raises the pH by dilution. Thus, in November and June the metals contributed by the tailings are more than counterbalanced by those removed via precipitation and other chemical processes in the channel.

Table 13 demonstrates the improvement in water quality which occurs in California Gulch and the Arkansas River between stations EF-S6 and EF-1, a

Table 13.--*Recovery of California Gulch and the Arkansas River, as indicated by water-quality parameters that exceed drinking water standards and biological criteria*[1]

EF-S6	EF-4	EF-1A	EF-1
Exceeds drinking water standards[2]			
pH	pH	--	--
Cd	Cd	--	--
Cu	--	--	--
Fe	Fe	Fe	--
Pb	--	--	--
Mn	Mn	Mn	Mn
Zn	Zn	--	--
Exceeds biological criteria[2]			
pH	pH	--	--
Cd	Cd	--	--
Cu	Cu	Cu	Cu
Fe	Fe	Fe	--
Pb	Pb	--	--
Mn	Mn	--	--
Ni	--	--	--
Zn	Zn	Zn	Zn

[1]Based on filtered samples.
[2]See table 5.

distance of about 15.5 stream miles (24.9 km). Although some self-purification occurs between EF-S6 and EF-4, the majority of the metals drop out between stations EF-4 and EF-1A. This is probably due primarily to dilution as California Gulch mixes with the Arkansas River. Because of this dilution, chemical and biological degradation of the Arkansas is much less significant than at Kerber Creek. In addition, the presence of extensive limestone and dolomite in the Leadville area may play a role in controlling the concentrations of dissolved metals by increasing background hardness, alkalinity, and pH values.

Boulder

The Boulder area is comprised of the Gold Hill and Jamestown mining districts. Only the latter will be discussed here, as mine-drainage effects are most severe in the streams draining this district.

The Jamestown District is located in the Front Range at the extreme northeastern end of the Colorado mineral belt (see fig. 1). In the central part of the district the Precambrian complex has been intruded by stocks and dikes of early Tertiary age (Vanderwilt, 1947). Most of the ore deposits occur in veins that are distributed irregularly around one of the smaller stocks. Lead-silver and fluorspar deposits occur nearer the stock, whereas pyritic gold and gold telluride occur farther away. Only fluorspar was actively mined in the area in 1972 (Colorado Div. Mines, 1973).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Little James Creek (drainage in the area of the Argo-Burlington-Emmit complex)----------		X		X		X	X	X	X	X	X		X	X	X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

At least some of the mine drainage entering Little James Creek appears to be coming from seeps in the area of the Argo-Burlington-Emmit complex near the headwaters (see fig. 17). The Argo Mine is an abandoned lead-silver mine, whereas the Burlington (active) and Emmit (inactive) are both fluorspar mines. Fluorspar mining normally is not thought to be a serious problem to surface-water quality; however, the oxidation of associated pyrite and other sulfides can contribute drainage high in acidity and metals.

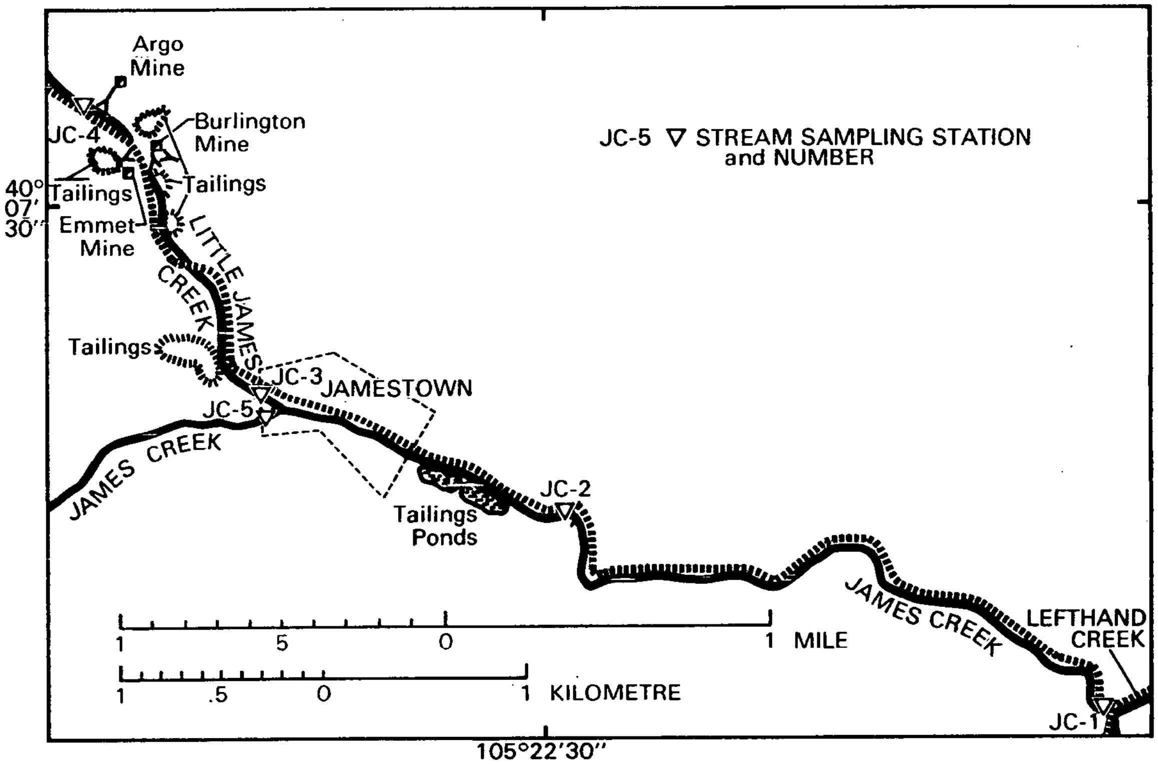

Figure 17.--Sampling sites in the Boulder area, Colorado.

Tailings piles exist near the mouth of Little James Creek and on James Creek just downstream from Jamestown. Although the effect of these tailings on the quality of the water flowing past them cannot be definitely stated from the results of this study, they would be expected to increase metal loads in a manner similar to that at Kerber Creek.

Downstream Variations

The downstream changes of dissolved-metal concentrations in Little James and James Creeks are reflected in table 14. This table shows that all metals except Cu are introduced into Little James Creek primarily between stations JC-4 and JC-3. Metals are diluted by James Creek so that all but Zn fall below the biological criteria by the time station JC-2 is reached. Because of its tendency to stay in solution, Zn is still above the suggested biological criterion at station JC-1. Cu and Zn are the only metals to exceed their biological criteria at a station other than JC-3. Apparently there is a signficant source of these metals, particularly Cu, above station JC-4.

Table 14.--*Pollution and recovery of Little James and James Creeks, as indicated by metals that exceed biological criteria*[1,2]

[Numbers in parentheses are ratios of concentrations at that station to concentrations at station JC-3 for November 30 to December 1, 1972]

JC-4		JC-3		JC-2		JC-1	
--	(0.02)	Cd	(1.00)	--	(0.04)	--	(0.02)
Cu	(.83)	Cu	(1.00)	--	(.00)	--	(.02)
--	(.31)	Fe	(1.00)	--	(.54)	--	(.10)
--	(.01)	Mn	(1.00)	--	(.05)	--	(.04)
--	(.02)	Ni	(1.00)	--	(.02)	--	(.03)
Zn	(.04)	Zn	(1.00)	Zn	(.06)	Zn	(.04)

[1]Based on filtered samples.
[2]See table 5 for biological standards.

Crested Butte

The Crested Butte district lies on the west edge of the Colorado mineral belt in the west-central part of the State (see fig. 1). The area is typified by Tertiary intrusives (generally laccoliths) in Cretaceous sedimentary rocks. Little has been published on the ore deposits of this district, though some are known to occur as replacement and vein deposits in the sedimentary rocks in a manner similar to those in Leadville (Tweto, 1968). Silver, lead, and zinc have been the principal products of the area, though historic production has been only about one-hundredth that of the Leadville district. The Colorado Division of Mines (1973) lists two active mines and one mill in the area during 1972. In addition, some exploratory work has been conducted near Gothic, just north of the town of Crested Butte.

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Coal Creek															
Below Keystone Mine (adit drainage and tailings)-------------	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Above Keystone Mine (specific sources unknown)--------------						X									X
Oh-Be-Joyful Creek (specific sources unknown)----------------						X						X			X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

The most important source of metals and acidity in the Crested Butte area is adit drainage (SR-S4), and probably drainage from tailings, in the vicinity of the Keystone Mine on Coal Creek (see fig. 18). Every metal analyzed exceeded its drinking water standard and biological criterion. The Keystone Mine drainage severely affects Coal Creek down to its mouth at the town of Crested Butte.

Above the Keystone Mine, Coal Creek is affected only slightly. The exact source(s) of drainage contributing to this effect is not known; however, it is believed to be either (1) the Forest Queen Mine at Irwin or (2) Elk Creek, which enters Coal Creek just above the Keystone Mine and drains an area containing a number of abandoned mines.

Oh-Be-Joyful Creek, which enters the Slate River northwest of the town of Crested Butte, also contains several metals in relatively high concentrations. Again, the specific source(s) of the metals cannot be determined, but it is known that several abandoned mines exist in the watershed.

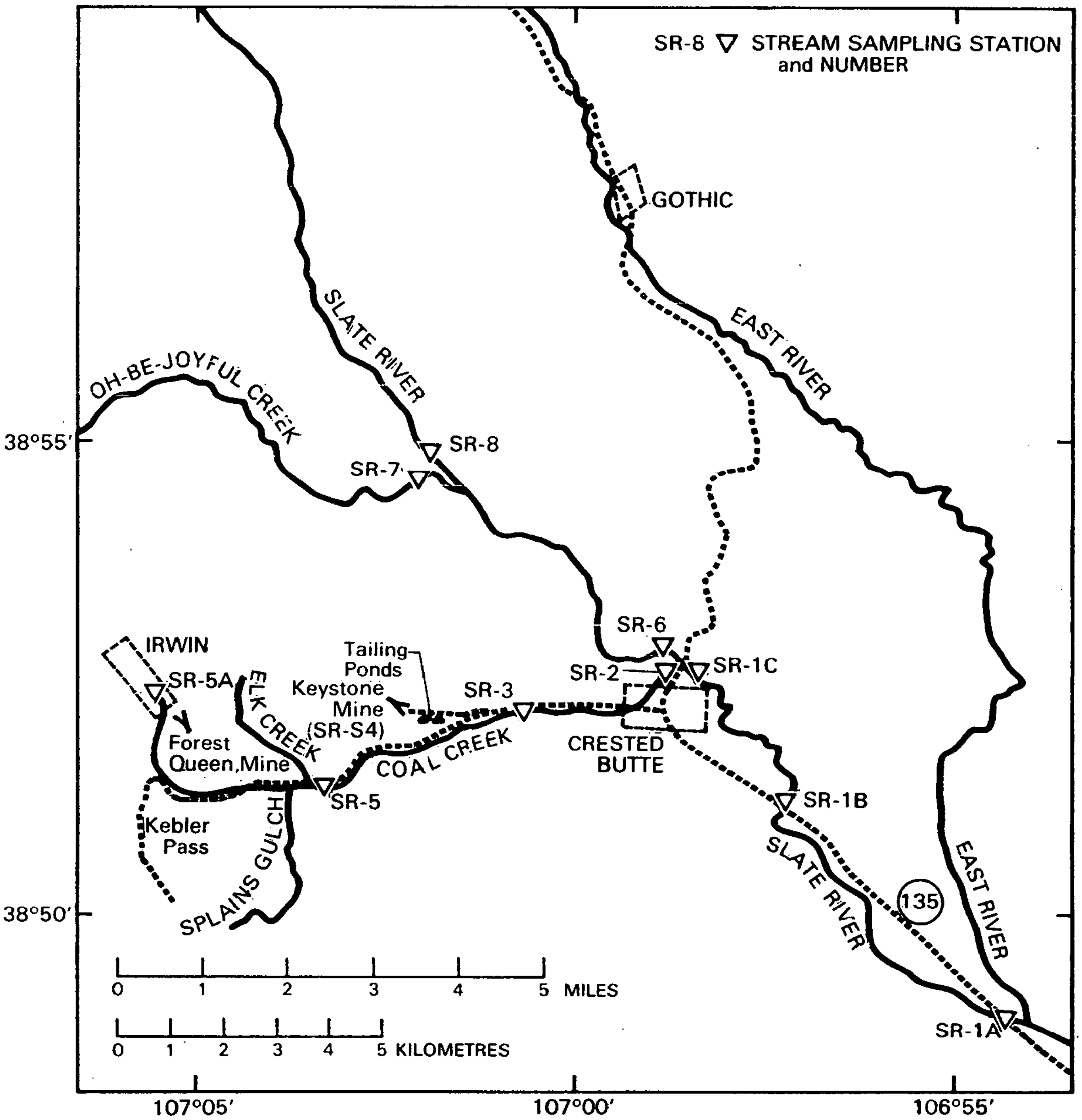

Figure 18.--Sampling sites in the Crested Butte area, Colorado.

Effect of Metal Mining on Water Quality in the Slate River

The Slate River above Oh-Be-Joyful Creek (SR-8) shows little or no effect due to metal-mining activity (see table 15). However, 5 miles (8 km) downstream from Oh-Be-Joyful Creek (SR-6, just above Coal Creek), Zn exceeds its biological criterion and Mn exceeds its drinking water standard. These effects are most likely the direct result of the addition of waters high in Zn and Mn from Oh-Be-Joyful Creek (SR-7), but may be partly due to seepage into the Slate River along its course. Just below Coal Creek at station SR-1C (0.15 mile or 0.24 km downstream from Coal Creek), Cd and Mn exceed the U.S. Public Health Service drinking water standards, whereas these two metals and Zn exceed the biological criteria. The downstream limit of this manifestation of Coal Creek is not known for sure, but it extends at least as far as the East River.

Table 15.--*Effect of metal mining on water quality in the Slate River*[1]

SR-8	SR-6	SR-1C
	Exceeds drinking water standards[2]	
----	----	Cd
----	Mn	Mn
	Exceeds biological criteria[2]	
----	----	Cd
----	----	Mn
----	Zn	Zn

[1]Based on filtered samples.
[2]See table 5.

Snake River

The Snake River study area (see figs. 1 and 19) includes most of the region drained by the Snake River and its tributaries, particularly Peru Creek. The ore deposits of this area, also known as the Montezuma mining district, are chiefly mesothermal veins associated with Tertiary intrusives in Precambrian granite, gneiss, and schist. Lead, zinc, and silver sulfides are the predominant minerals that have been mined, though minor amounts of gold, copper, and bismuth have also been noted. There was no active mining in the area in 1972 (Colorado Div. Mines, 1973).

In addition to the primary sulfides mentioned above, a secondary bog-iron ore deposit is known to exist above Deer Creek in the upper reaches of the Snake River valley. This deposit has been described by Deul (1947).

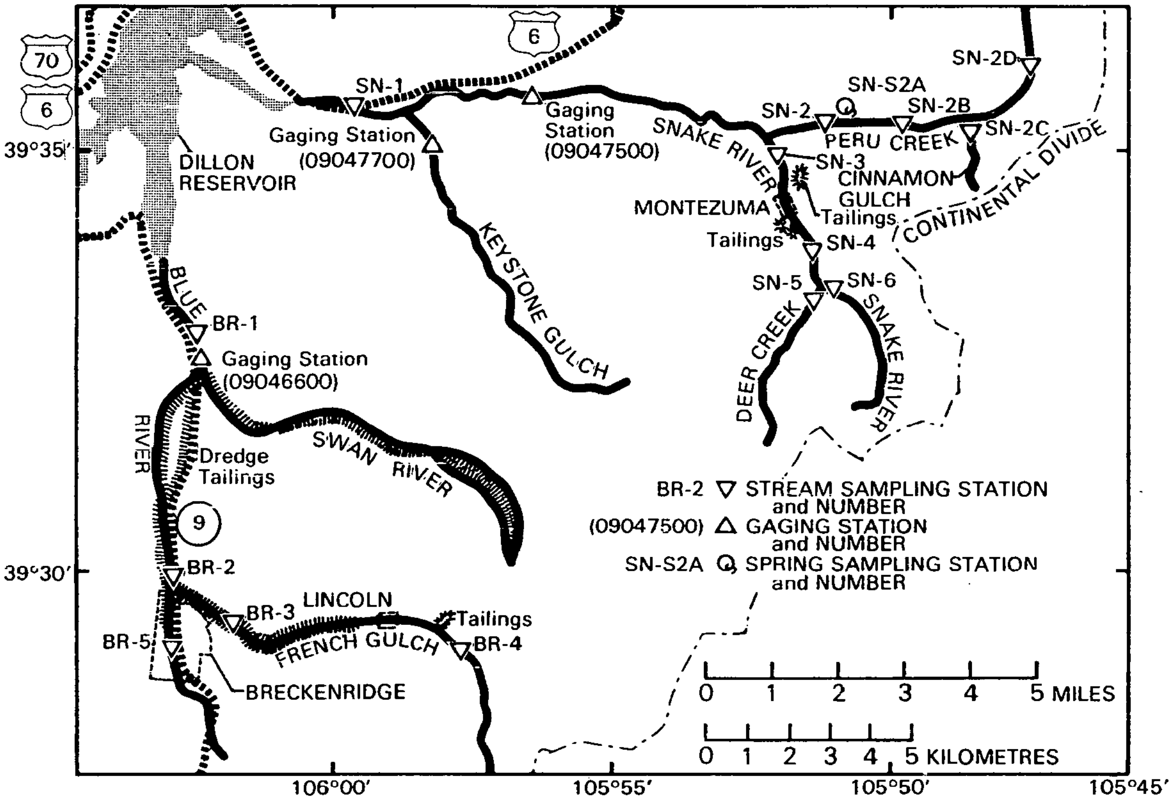

Figure 19.--Sampling sites in the Snake River and French Gulch areas, Colorado.

Some exploratory work has been done on the bog-iron deposit, but the question of whether or not the iron can or should be mined is still the subject of much controversy (see, for example, U.S. Forest Service, 1971; The Denver Post, Sept. 1, 1971; Sept. 3, 1971; Sept. 14, 1971; Sept. 15, 1971; Oct. 22, 1971; Nov. 21, 1971).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Peru Creek (draining mines and tailings, including Cinnamon Gulch)---------	X	X		X		X		X	X	X	X	X	X		X
Snake River above Peru Creek (draining mines and tailings, and natural drainage from bog-iron ore deposit)---	X			X		X		X			X		X		X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

Specific sources of metals and acid in the Snake River area are difficult to pinpoint. Several abandoned, draining mines are known to exist on Peru Creek and on the Snake River above Peru Creek, but the names of these mines are not known. As indicated in the Summary, problems in the Peru Creek drainage are more severe than in the Snake River drainage above Peru Creek. Not only do more metals exceed their drinking water standards and biological criteria in Peru Creek and its tributaries, but the metal concentrations also are generally higher.

The Bog-Iron Ore Deposit

The bog-iron ore deposit in the headwaters of the Snake River is believed to be the major contributor of acid to the stream. Iron bogs commonly form in poorly drained, glaciated areas in the presence of an iron source. The iron source, in this case, is disseminated pyrite in the country rock (Theobald and others, 1963). Pyrite is first oxidized, and the ferrous iron (Fe^{+2}) is transported via the ground-water system to the bog:

$$FeS_{2\,(s)} + \frac{7}{2}O_2 + H_2O \rightleftarrows Fe^{+2} + 2SO_4^{-2} + 2H^{+1}. \qquad (3)$$

Reducing conditions and humic materials in the bulk of the bog keep the iron mobile in the dissolved ferrous form or as colloidal iron-humate complexes (Rankama and Sahama, 1950, p. 664-665). In the oxidizing zone near the surface of the bog, the iron precipitates as ferric hydroxide [$Fe(OH)_3$]:

$$Fe^{+2} + \frac{1}{4}O_2 + \frac{5}{2}H_2O \rightleftarrows Fe(OH)_{3\,(s)} + 2H^{+1}. \qquad (4)$$

This can occur chemically or with the aid of micro-organisms such as *Leptothrix* and *Gallionella* (Brock, 1970).

Most of the acid generated by reaction 3 is probably consumed by solution of minerals in the country rock (weathering) as the water passes through the ground to the bog. The acid contributed by reaction 4, on the other hand, is released directly into the Snake River. This sequence of acid production from pyrite oxidation, subsequent untilization of the acid in normal chemical weathering, additional acid production from ferrous iron oxidation in downslope bogs, and eventual release of this acid to streams has also been postulated for an actively forming goethite deposit in southwestern Colorado (B. B. Hanshaw, written commun., 1974).

Values of pH at station SN-6 are on the order of 4. The pH's at this site probably do not go any lower, since *Leptothrix* and *Gallionella* are known to exist in the bog (Deul, 1947), and these micro-organisms can exist only at near neutral pH's (Brock, 1970). A possible explanation for the lack of pH's less than 4 might be a buffering effect due to the large amount of organic material in the bog.

Downstream and Seasonal Variations

Downstream variations of water quality in Peru Creek and the Snake River are represented in table 16 for low flow in October 1972. Although acidity

Table 16.--*Downstream change of water quality in Peru Creek and the Snake River, October 1972, as indicated by parameters that exceed biological criteria*[1,2]

Peru Creek		
SN-2C	SN-2B	SN-2
pH	pH	pH
--	Cd	--
Cu	Cu	Cu
--	Fe	--
Pb	Pb	--
Mn	Mn	--
Zn	Zn	Zn
Snake River above Peru Creek		
SN-6	SN-4	SN-3
pH	--	--
Fe	--	--
Mn	--	--
Zn	Zn	Zn
Snake River below Peru Creek		
		SN-1
		Zn

[1]Based on filtered samples.
[2]See table 5 for biological standards.

and several metals are contributed by Cinnamon Gulch (SN-2C), additional metals (notably Cd and Fe) are contributed to Peru Creek either above or below Cinnamon Gulch. Concentrations are diluted by the time SN-2 is reached so that only pH, Cu, and Zn exceed their respective biological standards. The major source of acidity and metals on the Snake River is upstream from station SN-6 (probably the bog-iron ore deposit). Additions downstream from this point, if any, are minor and only Zn exceeds its biological limit at station SN-3. The confluence of Peru Creek and the Snake River is just below stations SN-2 and SN-3. Dilution of Peru Creek water as a result of this junction and from side streams decrease metal concentrations further. Only Zn exceeds its biological criterion at SN-1, just upstream from Dillon Reservoir.

The effect of spring runoff in the Snake River area can be seen in table 17. This table shows the pH and metal concentrations in June 1973 relative to October 1972. Most concentrations decrease as a result of dilution from the relatively unmineralized snowmelt. This would be expected for dissolved metals based solely on pH changes: pH goes up in Peru Creek and stays about the same in Snake River above Peru Creek. In actuality, dissolved Fe and Ni increase at SN-2 in June, whereas dissolved Cd, Cu, and Fe increase at SN-3. None of these latter changes, however, is very significant.

Table 17.--*Seasonal variation of water quality in Peru Creek and the Snake River*

Water-quality parameter	Concentration in June 1973 relative to December 1972[1] (+ = increase, 0 = no change, - = decrease[2]) SN-2	SN-3
pH	+	0
Cd	0/-	+/-
Cu	[3]**-/-**	+/+
Fe	+/**+**	+/**+**
Pb	-/**-**	-/-
Mn	-/-	-/-
Ni	+/-	-/-
Ag	0/-	-/-
Zn	-/**-**	**-/++**[4]

[1]Dissolved/total, except for pH.

[2]Values between 90 and 110 percent are considered as "no change."

[3]Heavy symbol indicates that the parameter exceeds its biological criterion (table 5).

[4]The double plus (**++**) indicates an increase by a factor greater than 10.

Total metal concentrations might be expected to increase in June because of suspended matter added when chemical precipitates are scoured from the stream bottom. This effect is much more noticeable at station SN-3 than at SN-2. Only total Fe increases at SN-2, and the increase is very slight. On the other hand, Fe, Cu, and Zn increase at SN-3. Total Zn increases by 1,600 percent and may be primarily from tailings washed into the stream near Montezuma.

Creede

The only established mining district in Mineral County is at Creede (figs. 1 and 20). Most of its production has been from veins along faults in Miocene volcanic rocks.

Economic value of the ore has been primarily due to silver, with lead, zinc, gold, and copper being of secondary importance (Del Rio, 1960).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Willow Creek															
Mill tailings south of Creede (inactive, June 1973)------------						X						X	X		X
Effluent from mill on Windy Gulch (active)--	--------([2])---------							----------([2])----------							
West Willow Creek (minor contribution from draining mines and tailings piles)-----						X						X			X
East Willow Creek (minor contribution from draining mines and tailings piles)-----												X			X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

[2]Only one unfiltered sample collected; see Overview for discussion.

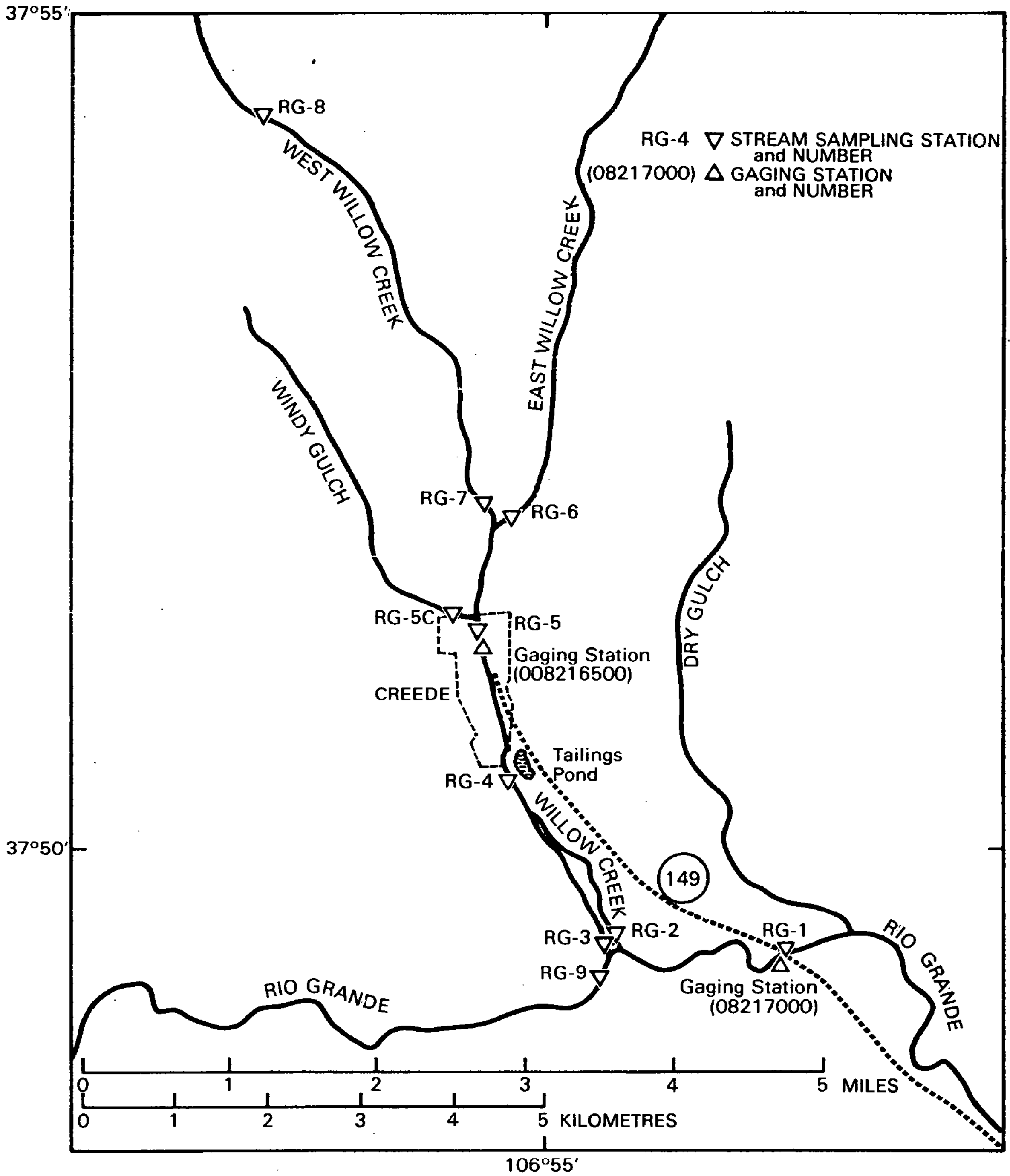

Figure 20.--Sampling sites in the Creede area, Colorado.

Overview

Instances of acute toxicity to trout have been noted in Willow Creek and the Rio Grande downstream from Willow Creek (The Denver Post, Sept. 15, 1971; Sept. 24, 1971; Oct. 21, 1971; Nov. 10, 1971; Jan. 13, 1972). According to Goettl, Sinley, and Davies (1972) the 1971 fish kill followed a period of hard rain in which large amounts of sediment were washed into Willow Creek. Subsequently, a break in a ditch carrying effluent from a mill just upstream from RG-4 was discovered.

At this date (1973), the mill is not active, thus mill effluent is not presently a hazard. However, tailings accumulations located between Creede and the Rio Grande River were probably responsible for some of the damage in the 1971 fish kill, and these tailings still represent a potential hazard during periods of high flow.

In addition, an unfiltered sample (at RG-5C) contaminated by effluent from another mill contained concentrations of Cd, Cu, Fe, Pb, Mn, Ni, and Zn that exceeded biological criteria and Cd, Fe, Pb, and Mn concentrations that exceed drinking water standards.

Although Ag was not determined during this study at Willow Creek, the Colorado Division of Wildlife reports finding up to 12 μg/l in the mill effluent (John Goettl, Jr., oral commun., 1974). Since this mill processes gold and silver, it is possible that cyanide may also be present in the effluent. The presence of cyanide was not tested for during the present study.

Downstream Variations

Aquatic invertebrates at the control station on West Willow Creek (RG-8) were numerous, with considerable species diversity represented. Not surprisingly, all metal concentrations were well below drinking water standards and biological criteria at this station. Downstream, at the mouths of East and West Willow Creeks (RG-6, RG-7), the numbers and diversity of macroinvertebrates were greatly reduced. Here Pb, Mn, and Zn concentrations exceeded biological criteria. Farther downstream at RG-5, below the point at which effluent from the mill on Windy Gulch enters, the Mn concentration increases significantly. Concentrations of Zn increase even more between RG-5 and RG-2, apparently due to additions from tailings. Caddisfly larvae were the only macroinvertebrates observed at stations RG-2 and RG-3.

Metal concentrations in the Rio Grande River downstream from Willow Creek (RG-1) were not seriously affected by additions from Willow Creek. Only Mn and Zn showed significant increases between stations RG-9 and RG-1, and Zn was the only metal to exceed biologic criteria at RG-1. Despite this relatively minor increase in the dissolved metal concentration of the Rio Grande between RG-9 and RG-1, the diversity of macroinvertebrates observed at RG-1 was greatly reduced in October 1972.

Ouray

The Ouray study area (figs. 1 and 21) is composed of three mining districts: Red Mountain, Sneffels, and Uncompahgre (Vanderwilt, 1947). Most of the metal production in these districts has been from Tertiary veins and from plugs and pipes in Tertiary volcanic rocks, but some veins have been followed into the underlying sedimentary beds (Fischer and others, 1968). Copper, lead, zinc, silver, gold, and minor amounts of bismuth, fluoride, tungsten, and bog iron have been commercially mined in the area.

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Red Mountain Creek															
Active Idarado Mine and tailings and several abandoned draining mines and tunnels, including the American Girl, Joker, Genessee, and Rouville Tunnels, and mines whose names are not known--------	X	X	X	X	X	X		X	X	X	X	X	X		X
Canyon Creek															
Active Camp Bird Mine, mill, and tailings---						X						X			X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

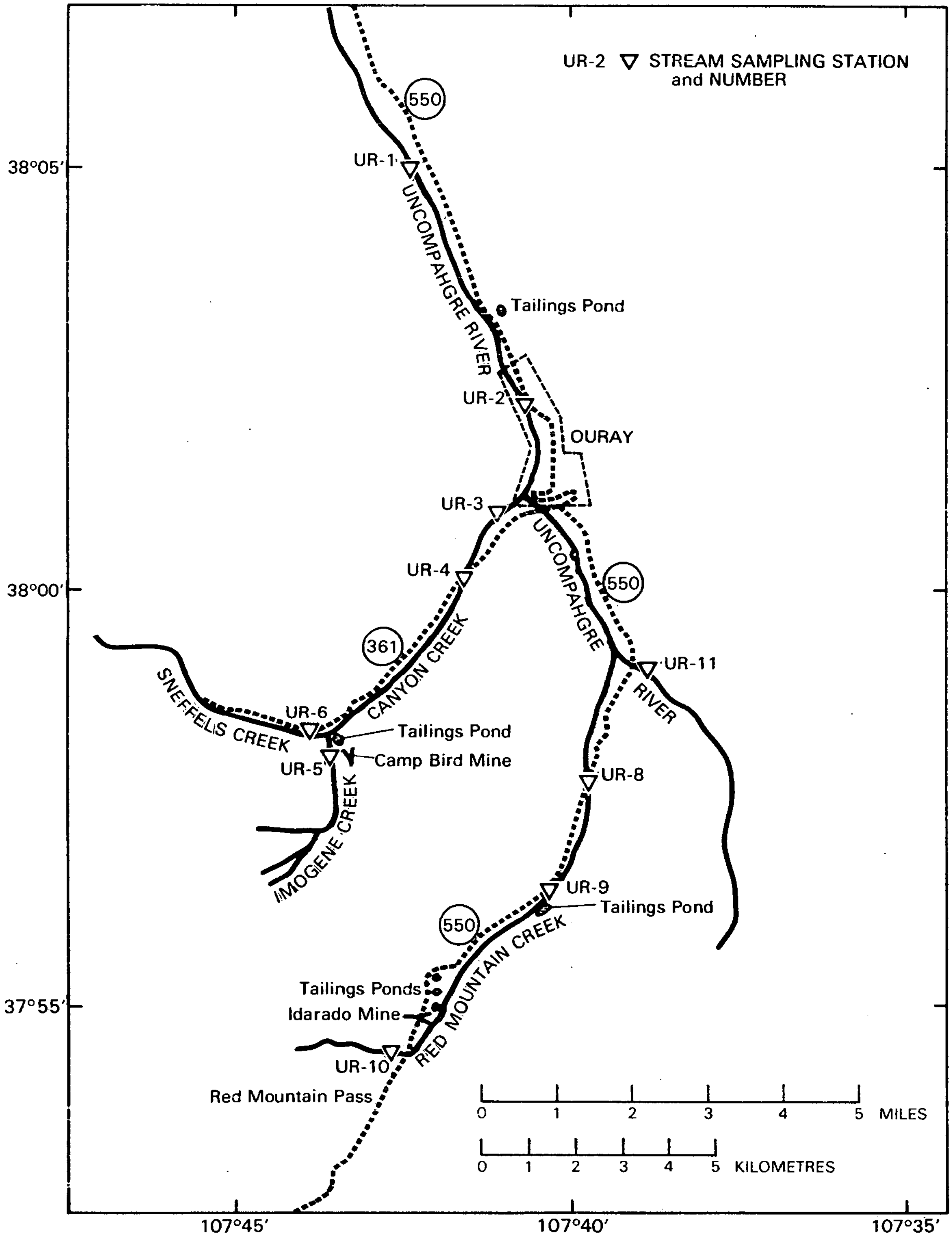

Figure 21.--Sampling sites in the Ouray area, Colorado.

Overview

In the Red Mountain district, drainage from several abandoned mines and tunnels, together with drainage from the Idarado Mine (active) and tailings contribute to the degradation of Red Mountain Creek. Natural runoff from highly mineralized rocks in the district often contains metals in excess of U.S. Public Health Service drinking water standards (1962). However, this degradation is less significant than pollution resulting from mine drainage (Rouse, 1970). Fish and macroinvertebrates have been eliminated from Red Mountain Creek below the mines due to the very high metal concentrations, low pH, large amounts of suspended iron hydroxide and sediment, and, possibly, low dissolved oxygen.

Canyon Creek in the Sneffels district has concentrations of Pb and Zn that exceed biological criteria. Chemical analyses indicate that most of the Pb probably originates from the active Camp Bird operation--mines, mill, and tailings ponds. The relatively high Zn concentrations result from additions of Imogene and Sneffels Creek waters to Canyon Creek. Such concentrations may be due to mine drainage, natural runoff, or a combination of both. Unlike streams in the Red Mountain district, Canyon Creek does not suffer from highly acid or iron-stained conditions. Because gold and silver are extracted at the Camp Bird mill, there is a possibility that cyanide is present in Canyon Creek; however, water samples were not analyzed for this constituent.

No significant additional mine drainage was noted in the Ouray district. Although the quality of the Uncompahgre River is relatively poor for several miles downstream from the town of Ouray, this condition is primarily due to metals and acid from Red Mountain and Canyon Creeks. During high-flow periods, erosion of tailings from abandoned mills located along the Uncompahgre River may present a problem.

Downstream Variations

"The Uncompahgre River, which is a trout stream above Red Mountain Creek, contains no aquatic life from the mouth of Red Mountain Creek to the mouth of Canyon Creek at Ouray, and supports only a limited fishery for several miles downstream of this point" (Rouse, 1970). The reasons for such degradation become apparent when one examines the pH and metal concentrations reported from sites along the stream. Table 18 lists the parameters which exceed various criteria at stations UR-9 and UR-2, and gives an indication of chemical recovery within this reach (approximately 7 stream miles or 11 km). Indirectly, these data also help to explain the biologic recovery noted in this reach. However, much of the harm to fish and invertebrates is probably attributable to the relatively large amounts of suspended iron hydroxide particles, which are not represented in the dissolved iron concentrations.

Table 18.--*Recovery of Red Mountain Creek and the Uncompahgre River, as indicated by water-quality parameters that exceed drinking water standards and biological criteria*[1,2]

UR-9		UR-2	
Exceed drinking water standards	Exceed biological criteria	Exceed drinking water standards	Exceed biological criteria
pH	pH	--	--
Cd	Cd	--	--
Cu	Cu	--	Cu
Fe	Fe	--	--
Pb	Pb	--	--
Mn	Mn	Mn	--
--	Zn	--	Zn

[1]Based on filtered samples.
[2]See table 5 for drinking water standards and biological criteria.

Alamosa Creek

Alamosa Creek, in the area of the Summitville mining district (figs. 1 and 22), drains volcanic and related shallow intrusive rocks of Tertiary age. The district has produced (as of 1960) approximately $7.5 million worth of gold, silver, copper, and lead (Steven and Ratté, 1960).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Wightman Fork (Summitville mines, mill, and tailings)-----						X				X					X
Alum Creek (natural drainage)---------------	X	X		X		X		X	X	X	X		X	X	X
Bitter Creek (natural drainage)---------------	X			X		X		X		X	X		X		X
Iron Creek (natural and mine drainage)------	X			X		X		X			X				

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

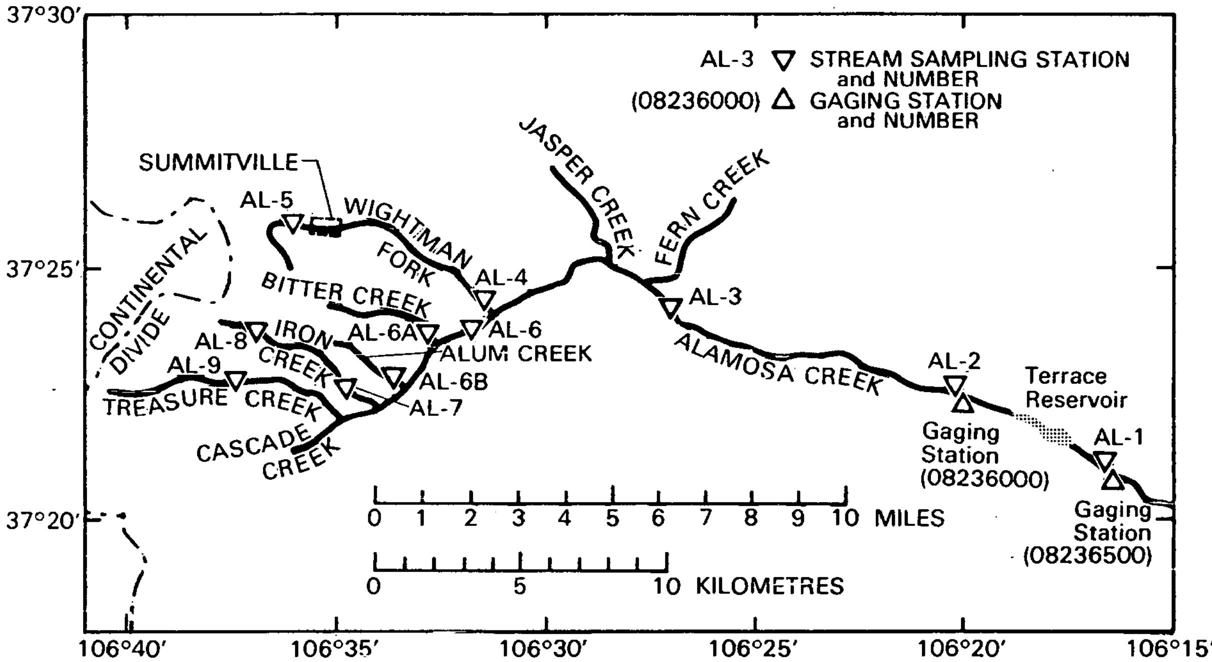

Figure 22.--Sampling sites in the Alamosa Creek area, Colorado.

Overview

Alum, Bitter, and Iron Creeks are tributaries to Alamosa Creek that flow through a zone of hydrothermally altered rock. This rock contributes significant quantities of acid, metals, and suspended sediment to the surface water. Iron Creek also receives minor amounts of drainage from abandoned mines. The Wightman Fork drains Summitville, a mining district with many abandoned mines, extensive tailings piles, and an active (as of 1971) mining and milling operation.

Water quality of Alamosa Creek is adversely affected from the mouth of Iron Creek to Terrace Reservoir. Although mining activities have aggravated the situation, it seems that most of this effect is due to natural erosion of highly mineralized and weathered rock.

Downstream Variations

Based on examinations of stream biota, chemical analyses, and information obtained from the U.S. Forest Service (U.S. Forest Service, Rio Grande National Forest, written commun., 1972), Alamosa Creek above the mouth of Iron Creek is known to be biologically healthy. Excellent fishing is reported in the area. Between Iron Creek and station AL-3, Alamosa Creek receives acid, metals, and suspended sediment that render the stream virtually devoid of macroinvertebrates and fish. Between stations AL-3 and AL-2 the stream "recovers" biologically and chemically because of additions from Jasper and Fern Creeks. Table 19 documents this recovery, but also shows that the stream at station AL-2 still contains concentrations of Cu and Zn that, because of potential synergistic effects, may be injurious to aquatic life.

Table 19.--*Recovery of Alamosa Creek, as indicated by water-quality parameters that exceed drinking water standards and biological criteria*[1,2]

AL-3		AL-2	
Exceed drinking water standards	Exceed biological criteria	Exceed drinking water standards	Exceed biological criteria
pH	pH	--	--
--	Cu	--	Cu[3]
Fe	Fe	--	--
Mn	--	Mn	--
--	Zn	--	Zn[3]

[1]Based on filtered samples.

[2]See table 5 for drinking water standards and biological criteria.

[3]Although neither Cu nor Zn concentrations exceed the maximum value in table 5, both fall within the range listed in this table. They are cited because combinations of Cu and Zn are known to act synergistically.

Terrace Reservoir seems to be acting as a "metal sink" as evidenced by the lower concentrations of most metals at station AL-1 than at AL-2 (see discussion under Lake Creek, p. 63). Downstream from the reservoir, no chemical parameters exceed either the drinking water standards or the biological criteria.

The great amounts of suspended sediment in Alamosa Creek above Terrace Reservoir are harmful to fish and invertebrates because of physical, as well as toxicological, considerations. This material can clog the gills of fish, and render the substrate unsuitable for invertebrates.

Erosion is one of the major processes responsible for the degradation of Alamosa Creek water quality. For this reason, it can be expected that chemical and sediment load conditions of the stream will change markedly with rainfall.

Lake Creek

Once-active mining districts drained by Lake Creek (figs. 1 and 23) are known for high-grade gold samples but small overall production. Such production was from relatively small, Laramide gold veins (Tweto, 1968) in Precambrian igneous rocks. Some veins also contain lead, silver, and zinc (Vanderwilt, 1947).

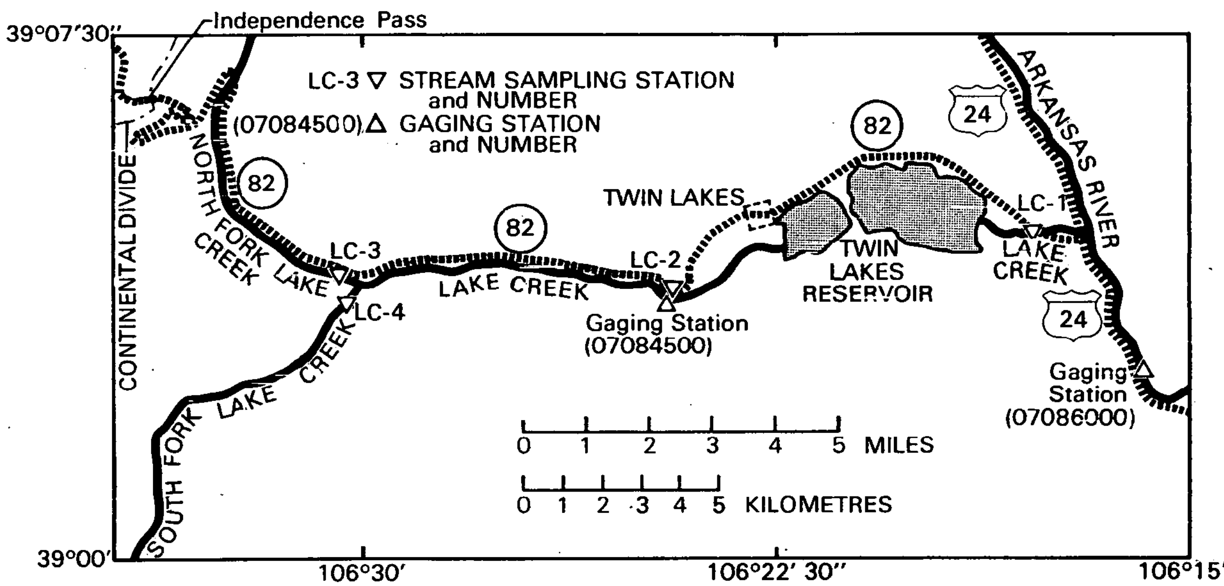

Figure 23.--Sampling sites in the Lake Creek area, Colorado.

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
South Fork of Lake Creek (abandoned draining mines and tailings piles)-	X			X		X		X			X	X			

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

In October 1972, the South Fork of Lake Creek had a pH of 5.1, and contained relatively large amounts of suspended iron hydroxide that gave the water and rocks a characteristic orange-red color. The South Fork also contained excessive amounts of Cu and Mn (see Summary table). No chemical parameters exceeded water-quality criteria at any stations on Lake Creek, either upstream or downstream from Twin Lakes Reservoir.

Downstream Variations

Merger of the North Fork with the South Fork of Lake Creek greatly dilutes the original high acid and metal concentrations in the South Fork. No stations downstream from the confluence of these two streams were chemically affected. Concentrations of several metals (Cu, Fe, Mn, Ni, Zn) were found to be lower downstream from Twin Lakes Reservoir (LC-1) than immediately upstream from the reservoir (LC-2).

Lakes as Metal Sinks

Data collected from both the Alamosa Creek and Lake Creek study areas provide good evidence that lakes act as sinks for trace metals. The lakes involved are Terrace Reservoir (Alamosa Creek study area) and Twin Lakes Reservoir (Lake Creek study area).

Table 20 shows, for several water-quality parameters, the ratios of chemical concentrations in the streams below lakes to those above the lakes. For the major cations and anions--represented by specific conductance and dissolved Ca, Mg, and HCO_3--the ratios are ≤ 1 during low flows and >1 during high flows. This indicates that the lakes are acting as sinks for these parameters during low flows, whereas they contribute them during high flows. The reason for the latter is that during high flows the streams above the lakes are diluted by relatively unmineralized snowmelt runoff, whereas the water in the lake (and thus the water immediately downstream) reflects the previous year's low-flow contribution.

On the other hand, the lakes never act as contributors of trace metals: the ratios for total and dissolved Cd, Cu, Fe, Pb, Mn, Ni, and Zn are always ≤ 1. It seems to matter little whether (1) total and dissolved metals are considered separately (57 and 80 percent, respectively, of the ratios are <1 or (2) low and high flows are considered separately (68 and 64 percent, respectively, of the ratios are <1). The trend is most obvious in the cases of Cu and Fe, as seen from table 20.

The mechanisms by which metals are lost to the lakes can only be postulated at this time. It is not difficult to imagine the lake acting as a settling basin for suspended metals. In addition, dissolved metals are probably taken up biologically (by plankton) and physically (by adsorption onto detritus or by precipitation); they could then be readily deposited in the lake sediments.

Table 20.--*Effect of lakes on stream quality*

[t = Total; d = dissolved]

Water-quality parameter	Ratio of concentration in stream below lake to concentration in stream above lake		
	Low flow		High flow
	AL-1/AL-2 (10-5-72)	LC-1/LC-2 (10-29-72)	LC-1/LC-2 (6-22-73)
Specific conductance--	1	0.67	>1.6
HCO_3------------------	1	.85	1.5
Ca-------------------	.87	.71	1.3
Mg-------------------	.90	.65	1.7
t Cd-----------------	.67	1	[1]∿1
d Cd-----------------	([2])	([2])	([2])
t Cu-----------------	.50	.50	.50
d Cu-----------------	.47	.86	.44
t Fe-----------------	.58	.44	.16
d Fe-----------------	1	.50	.38
t Pb-----------------	1	1	[1]∿1
d Pb-----------------	1	0	([2])
t Mn-----------------	.38	1	.50
d Mn-----------------	.26	0	([2])
t Ni-----------------	.75	1	[1]∿1
d Ni-----------------	.46	.50	.50
t Zn-----------------	.57	1	.28
d Zn-----------------	.60	([3])	1

[1]Qualified value divided by the same qualified value (example: <50/<50).

[2]0/0.

[3]10/0.

North Clear Creek

Tertiary veins and small stocks in Precambrian schist and gneiss are the sources of ores in the Blackhawk and Central City districts (Vanderwilt, 1947) drained by North Clear Creek (figs. 1 and 24). Sims, Drake, and Tooker (1963) have estimated mineral production between 1859 and 1963 at $100 million, of which gold amounted to 85 percent, silver about 10 percent, with the remainder being due to copper, lead, zinc, and uranium. Several small mining operations and one mill were active in 1972 (Colorado Div. Mines, 1973).

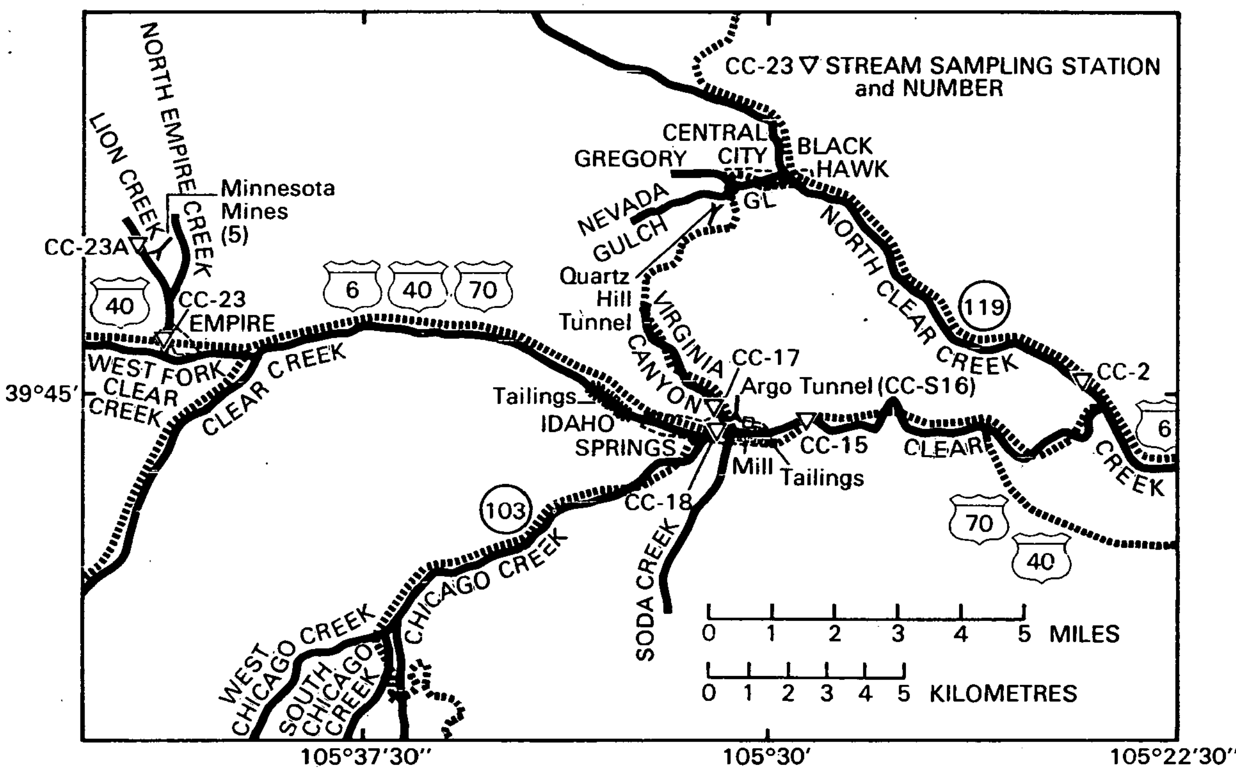

Figure 24.--Sampling sites in the North Clear Creek, Lion Creek, and Idaho Springs areas, Colorado.

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)															
	Drinking water standards								Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Se	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Gregory Gulch and Nevada Gulch (draining mines and tailings piles; Quartz Hill Tunnel)-----				X		X	X		X	X		X		X		X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

North Clear Creek receives drainage from several draining mines and tailings piles in Gregory and Nevada Gulches. The streambed is heavily coated with iron hydroxide, and the overall quantity and diversity of aquatic invertebrates at CC-2 (fig. 24) is greatly reduced compared to areas upstream from Blackhawk. The summary table shows that several metals and pH exceed water-quality criteria. In addition to metals that commonly are high in surface waters of Colorado mining districts, selenium was found to exceed the drinking water standard.

Lion Creek

Tertiary stocks, dikes, and veins in Precambrian granite are the source of the ore deposits at the Empire district drained by Lion Creek (figs. 1 and 24). Total output of the area has probably amounted to more than $5 million worth of gold and silver (Vanderwilt, 1947).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Minnesota Mines and other abandoned mines and tailings------	X			X		X		X		X	X		X	X	X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

Several abandoned adits and tailings piles drain into Lion Creek, a tributary of Clear Creek. The Minnesota Mines are the predominant source of drainage. Station CC-23, almost 2 miles (3 km) downstream from the drainage sources, was one of the most acid sites noted during the entire mine drainage project (pH 3.2 in January 1973; 3.3 in June 1973). Lion Creek is judged to be adversely affected downstream to its confluence with the West Fork of Clear Creek.

Idaho Springs

Like ores of the Central City and Blackhawk districts, Idaho Springs (figs. 1 and 24) ores are mined predominantly from Tertiary veins in Precambrian gneiss and schist. Ore shipped from the district owed its value mainly to gold and silver (Vanderwilt, 1947). Less than a half dozen small mining operations were active in the district in 1972 (Colorado Div. Mines, oral commun., 1974).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Argo Tunnel (and associated tailings)----	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Virginia Canyon (adits, tunnels, and tailings piles)------------------	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Several draining adits and tailings piles upstream from Idaho Springs on Clear Creek-------------				X		X				X	X				X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

Clear Creek in the vicinity of Idaho Springs, receives polluted effluent from three major sources. The most important of these is the Argo Tunnel (CC-S16), which discharges approximately 1 ft^3/s (0.03 m^3/s) of highly acid (pH 2.7) and metalliferous water. In June 1973, dissolved metals in the tunnel discharge exceeded drinking water standards by the following factors: Cd, 32 X; Cu, 12 X; Fe, 730 X; Pb, 4.0 X; Mn, 2,800 X; Zn, 16 X.

Unlike effluent from the Argo Tunnel and most other acid mine-drainage sites, the relatively small flow (normally less than 0.1 ft^3/s or 0.003 m^3/s) from Virginia Canyon Creek (station CC-17), shows no signs of iron staining. It is, however, very acid (pH 2.8 in June 1972) and metal laden (see Appendix, p. 214). Virginia Canyon Creek represents a relatively minor metal source for Clear Creek due to its small flow.

Additional draining mines and tailings piles are located along Clear Creek, upstream from the Argo Tunnel. Data from station CC-18 show that these sources contribute amounts of Cu, Fe, Mn, and Zn that may be harmful to aquatic organisms, but which are relatively insignificant when compared to the impact of the Argo Tunnel drainage.

Downstream and Seasonal Variations

Water-quality data from stations on Clear Creek, both upstream (CC-18) and downstream (CC-15) from the Argo Tunnel (see table 21), show that drainage from the tunnel does increase concentrations of several parameters. Similar data from June 1973 show that fewer parameters increase in concentration between CC-18 and CC-15, suggesting that the Argo Tunnel has a greater relative impact on Clear Creek during periods of low flow. Such a conclusion is consistent with the findings of a detailed study done by Boyles, Alley, Cain, Gladfelter, and Rising (1973). Part of this increase is due to secondary drainage from the tailings immediately downstream from the tunnel. The

Table 21.--*Impact of Argo Tunnel drainage, as indicated by concentrations in Clear Creek upstream and downstream from the tunnel in January 1973*

[Concentrations in micrograms per litre unless otherwise specified; d = dissolved; t = total]

Water-quality parameter[1]	CC-18 (upstream from tunnel)	CC-15 (downstream from tunnel)
pH (units)----	7.0	6.8
d Cd---------	1	2
t Cd---------	<10	10
t Cu---------	60	170
t Fe---------	440	6,900
d Mn---------	760	1,400
t Mn---------	410	1,400
d Ni---------	15	20
d Zn---------	410	660
t Zn---------	360	1,000

[1]Concentrations of d Cu, d Fe, d Pb, t Pb, t Ni, d Ag, and t Ag all remain the same or decrease between stations CC-18 and CC-15.

report states, "The effect on Clear Creek of heavy metals from the tailings appears to be minor except during heavy rainstorms when rainwater runoff from the tailings is detrimental to the water quality of the creek."

Despite the impact of the Argo Tunnel, the only dissolved parameters to exceed either drinking water standards or biological criteria at CC-15 (approximately 1 mile or 1.6 km downstream from the tunnel) are Zn and Mn.

Detectable concentrations of Ag (both dissolved and total) were noted at all stations in the Idaho Springs area. While the biological criterion for Ag listed in table 5 is 0.1 µg/l, the Ag detection limit at the U.S. Geological Survey's laboratory in Salt Lake City, Utah, is 1 µg/l. For this reason, Ag was not listed in the Summary tables unless the concentration exceeded 1 µg/l.

French Gulch

Production in the Breckenridge district has generally been from placer deposits. Lode ores have been mined from veins in Precambrian schist, gneiss, and granite, and from Paleozoic and Mesozoic sedimentary rocks (Vanderwilt, 1947). The chief mineral products of the district have been gold, silver, lead, and zinc (Tweto, 1968). One mine was reported to be active on French Gulch (fig. 1) in 1972 (Colorado Div. Mines, 1973).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
French Gulch (draining mines and tailings piles--names unknown)----------------				X		X	X	X			X		X		X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

Overview

The Blue River near Breckenridge is affected by drainage from several mines in French Gulch (fig. 19). Extensive tailings are also located in this area, but most are the result of placer activity and probably do not significantly contribute to the degradation of the surface water. Fe, Mn, and Zn exceeded water-quality criteria during certain times of the year in French Gulch (station BR-3).

No chemical parameters were found to exceed acceptable criteria in the Blue River upstream from French Gulch (stations BR-4 and BR-5). Likewise, the Blue River 4 miles (6 km) downstream from French Gulch (station BR-1) had cleansed itself such that all chemical parameters tested were within acceptable limits.

Downstream and Seasonal Variations

Total Fe and dissolved Pb concentrations increased between stations BR-3 and BR-2 in November 1972, indicating that an unnoticed source of drainage may exist in this reach. The Blue River at station BR-2 had a dissolved Zn concentration that might be harmful to aquatic life (620 µg/l). Despite these conditions at BR-2, no parameters tested exceeded water-quality criteria for approximately 4 miles (6 km) downstream.

Station BR-3 on French Gulch generally had the highest metal concentrations of any station in this study area. Nevertheless, mayfly and stonefly nymphs and midge larvae were observed at this station in November 1972, indicating that effects on aquatic organisms were only moderate. On the other hand, a similar search for organisms in January 1973 failed to reveal any macroinvertebrates. January was also the month in which acid and metal concentrations were the most severe at station BR-3. Reasons for these increased concentrations in January are unknown.

Climax

The largest known molybdenum deposit in the United States, and perhaps in the world, occurs at Climax (see fig. 1) (King, 1964). Here, Precambrian granite, schist, and gneiss are intruded by dikes and at least one large stock of Tertiary age (Vanderwilt, 1947; Del Rio, 1960). Mineralization is associated with and surrounds the porphyry stock. Molybdenite (MoS_2) occurs in veinlets and is associated with huebnerite ($MnWO_4$), cassiterite (SnO_2), pyrite, and monazite (a rare earth phosphate) (Wallace and others, 1968).

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1,2] (based on filtered samples)														
	Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Tenmile Creek															
Tailings ponds and drainage at Climax----				X		X				X	X		X	X	X
Searle Gulch (abandoned, draining mines)----------------						X									X
East Fork Eagle River (tailings ponds and drainage)---------------						X		----------------------							
East Fork Arkansas River (specific sources unknown)----------------						X									X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

[2]Dissolved Mo exceeds the proposed irrigation limit of 150 µg/l (see text) in 28 percent (5 of 18) of the surface-water samples. None of these occurred on the East Fork Arkansas River.

Overview

The molybdenum mining operation at Climax is located at the headwaters of three separate drainage systems--The Arkansas and Eagle Rivers, and Tenmile Creek (fig. 25). Under low-flow conditions most of the process water is recycled. However, the operation is unable to recycle much of this water during the spring and early summer due to the greatly increased amounts of runoff entering the tailings ponds. Consequently, much of this water eventually is discharged into Tenmile Creek.

Abandoned, draining mines in Searle Gulch, downstream from the molybdenum mining operation, also contribute minor amounts of metals to Tenmile Creek. Despite obvious iron staining of the rocks, pH values along Tenmile Creek were not low. Also, except for the station immediately downstream from the Tenmile tailings pond (TM-6), only Mn exceeded the drinking water standard, and only Zn consistently exceeded the biological criterion. Dissolved Mn concentrations were excessive as far downstream as station TM-2. Dissolved Zn concentrations exceeded the biological criterion throughout the entire reach of Tenmile Creek (from TM-6 below the Tenmile tailings pond to TM-1 at Frisco, a distance of approximately 13 stream miles or 21 km).

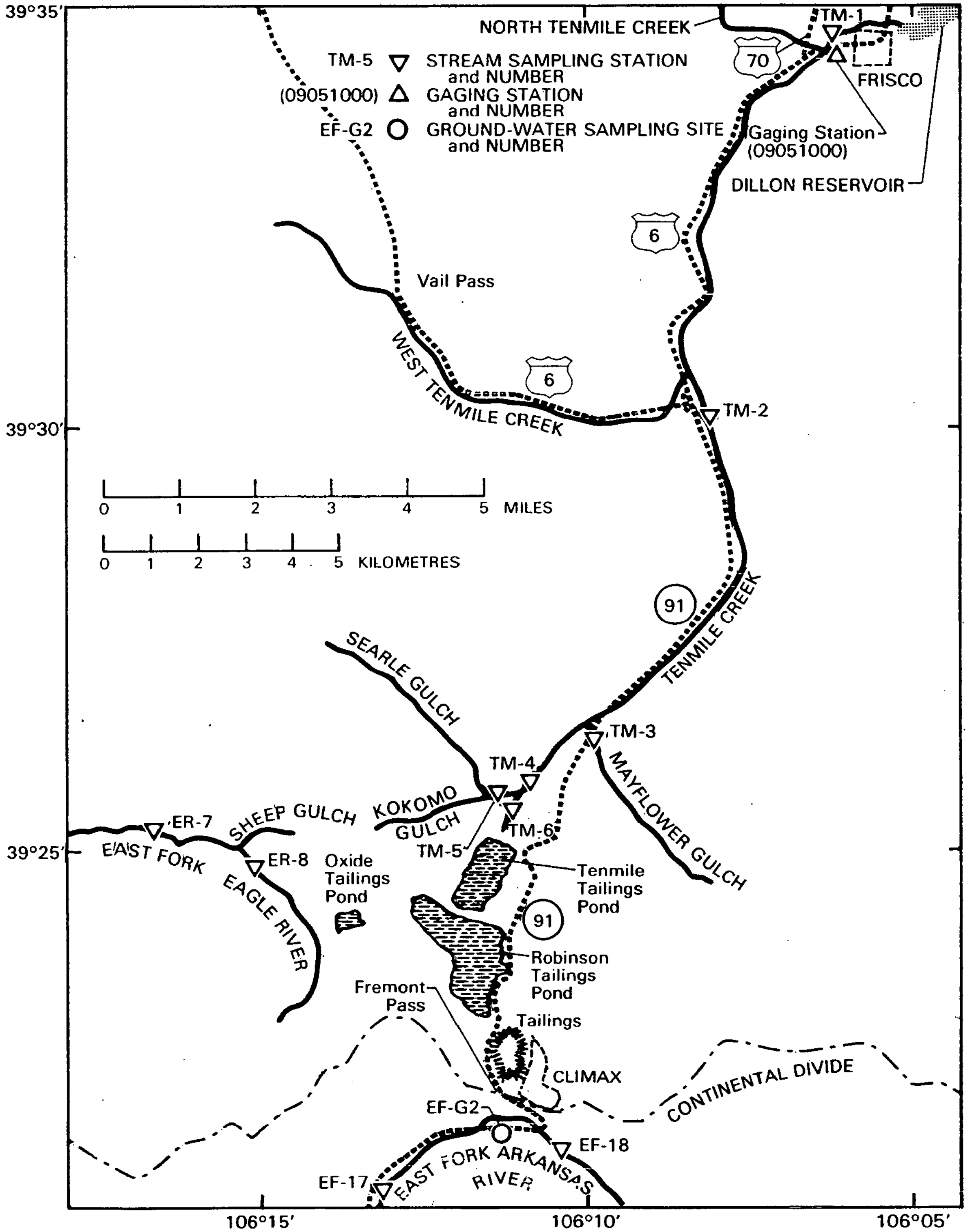

Figure 25.--Sampling sites in the Climax area, Colorado.

Since Mo is the major metal mined at Climax, it is not surprising to find very high dissolved Mo concentrations in Tenmile Creek--at TM-6, about 1,400 times the concentrations at the control station (TM-3). The significance of such Mo concentrations is uncertain since no drinking water standards or biological criteria are available. However, researchers working on the National Science Foundation's molybdenum project at the University of Colorado have recently recommended a limit of 150 μg/l Mo in irrigation water. This limit is based on effects on cattle and sheep (molybdenosis) grazing on irrigated forage (The Rocky Mountain News, March 4, 1974).

The East Fork of the Eagle River receives drainage from the Robinson tailings pond. Like Tenmile Creek, Mo concentrations at stations on the Eagle River are considerably higher than at control stations in the Climax area. However, the Mo concentrations decrease markedly between stations ER-8 and ER-7--from 400 to 45 μg/l, respectively, for the dissolved form. No metals tested exceeded biological criteria at ER-7 or ER-8 in November 1972. In June, only Mn exceeded the drinking water standard.

Mining activities at Climax also have minor effects on the quality of the East Fork of the Arkansas River, though the exact source of the contaminants is not known. Using station EF-18 as a control site, hardness and several metal concentrations showed increases downstream. These increases were generally slight, with only Mn exceeding the drinking water standard, and Zn exceeding the biological criterion.

Downstream and Seasonal Variations

Table 22 lists the dissolved Mo concentrations at sampling stations along Tenmile Creek in November 1972 and June 1973. The data illustrate two important phenomena. First, as previously mentioned, maximum Mo concentrations occur in June, and are the result of increased runoff that flows onto the tailings ponds, with the excess being purged into Tenmile Creek. Second, the table indicates that although Mo concentrations are very high immediately downstream from the Tenmile tailings pond (TM-6), they decline significantly in less than 1 mile (1.6 km) at TM-4. Between stations TM-4 and TM-1, Mo concentrations showed no further decline. In fact, there was actually a slight increase in this reach, which may be due to ground-water inflow.

Table 22.--*Downstream variations of dissolved molybdenum concentrations along Tenmile Creek*

Sampling station	Dissolved molybdenum (μg/l)	
	November 1972	June 1973
TM-6	2,800	19,000
TM-4	150	------
TM-2	150	4,000
TM-1	200	------

Based on laboratory studies and analysis of samples collected along Clear Creek downstream from the Urad mine, Runnells, LeGendre, and Meglen (1973) have stated that Mo may be removed from solution by adsorbtion onto ferric hydroxide particles and by precipitation as ferrimolybdite [$Fe_2(MoO_4)_3 \cdot 8H_2O$(?)]. Precipitated iron is apparent along Tenmile Creek, suggesting that the drastic decrease in dissolved Mo between stations TM-6 and TM-4 may result from such processes.

The presence of organic compounds added to the water during milling processes may also be a factor in the transport of metals at Climax. Such compounds are known to form soluble complexes with many metals, including Mo (Dean and others, 1959), thereby increasing the potential mobility of the metals (Theis and Singer, 1973).

Urad-Henderson

The Urad district (fig. 1) has produced molybdenum from an ore body in a small porphyry stock of Oligocene age and in bordering Precambrian rocks. "As at Climax, molybdenite occurs in myriad veinlets in shattered silicified and sericitized rock." (Tweto, 1968.)

Summary

Sources of metals and acid	Water-quality parameters that exceed indicated criteria[1,2] (based on filtered samples): Drinking water standards							Biological criteria							
	pH	Cd	Cu	Fe	Pb	Mn	Zn	pH	Cd	Cu	Fe	Pb	Mn	Ni	Zn
Urad Mine (tailings and mine drainage on Woods Creek)------------------						X							X		X
Henderson shaft West Fork Clear Creek----						X							X		X
Williams Fork------------				X		X		X		X	X				X

[1]See table 5; unless otherwise stated, X under pH means value is less than lower value in table 5.

[2]Dissolved Mo exceeds the proposed irrigation limit of 150 µg/l (see text under "Climax") in 22 percent (2 of 9) of the surface-water samples. All occurred on Woods Creek below the Urad Mine.

Overview

This study area actually encompasses drainages on both sides of the Continental Divide (see fig. 26). On the east, the West Fork of Clear Creek receives drainage from the active[2] Urad Mine and mill located on Woods Creek. In addition, water-quality data show that excavation activities at the Henderson shafts are beginning to affect this drainage. The Williams Fork, on the western side of the Divide, also seems to exhibit effects from excavation of a tunnel that is intended to connect the Henderson shafts near Berthoud falls on the eastern slope with the projected mill and tailings in the Williams Fork drainage above Keyser Creek.

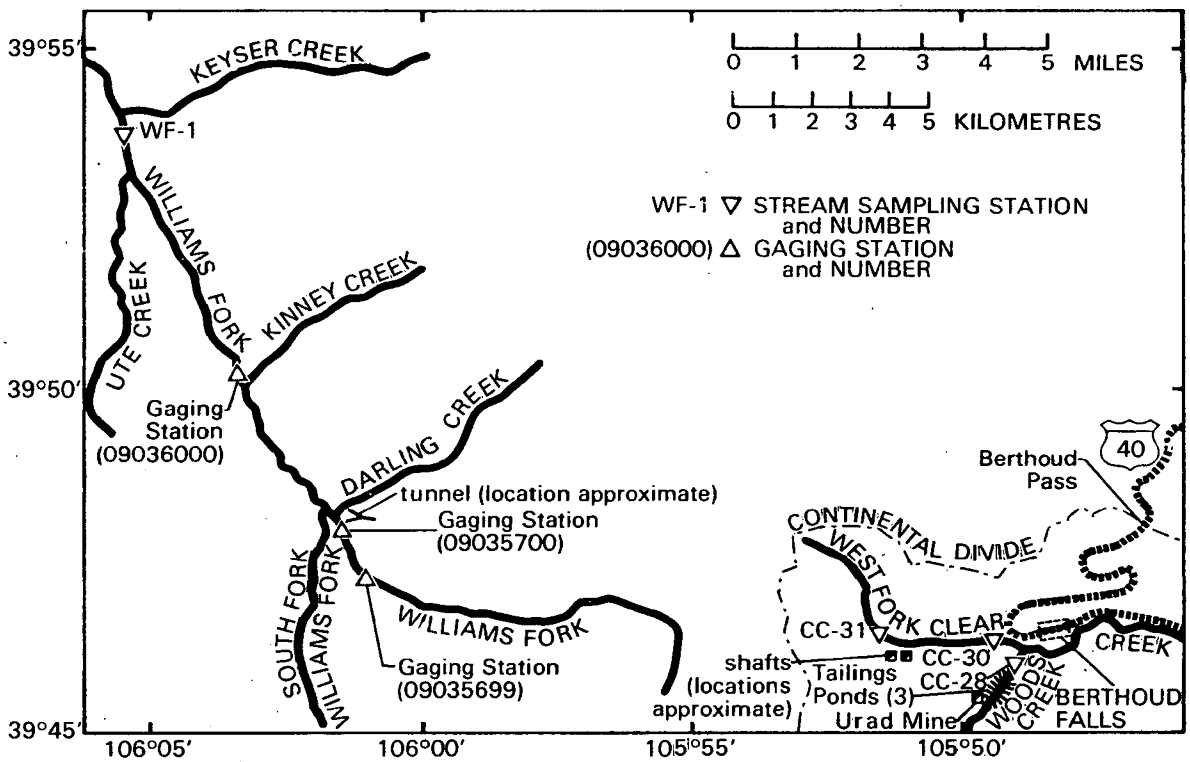

Figure 26.--Sampling sites in the Urad-Henderson area, Colorado.

[2]The Urad Mine was shut down on November 29, 1974 (Denver Post, Dec. 1, 1974).

Downstream and Seasonal Variations

Comparison of data above and below the Henderson shafts (stations CC-31 and CC-30, respectively) reveals that pH, specific conductance, hardness, Mn, Mo, and Zn increase markedly in this reach during low-flow periods. The significantly higher Fe at CC-31 is probably due to the presence of at least one abandoned draining mine above this station. Most of this Fe would be expected to precipitate readily at such high pH's (7.1-8.5), thereby explaining the decrease in Fe concentrations between CC-31 and CC-30.

Samples collected on the Williams Fork (station WF-1) show a distinct increase in the concentrations of most metals between October 1972 and February 1973 (see fig. 27), with Cu, Fe, and Zn exceeding their biological criteria in February. It is probable that this increase is the result of

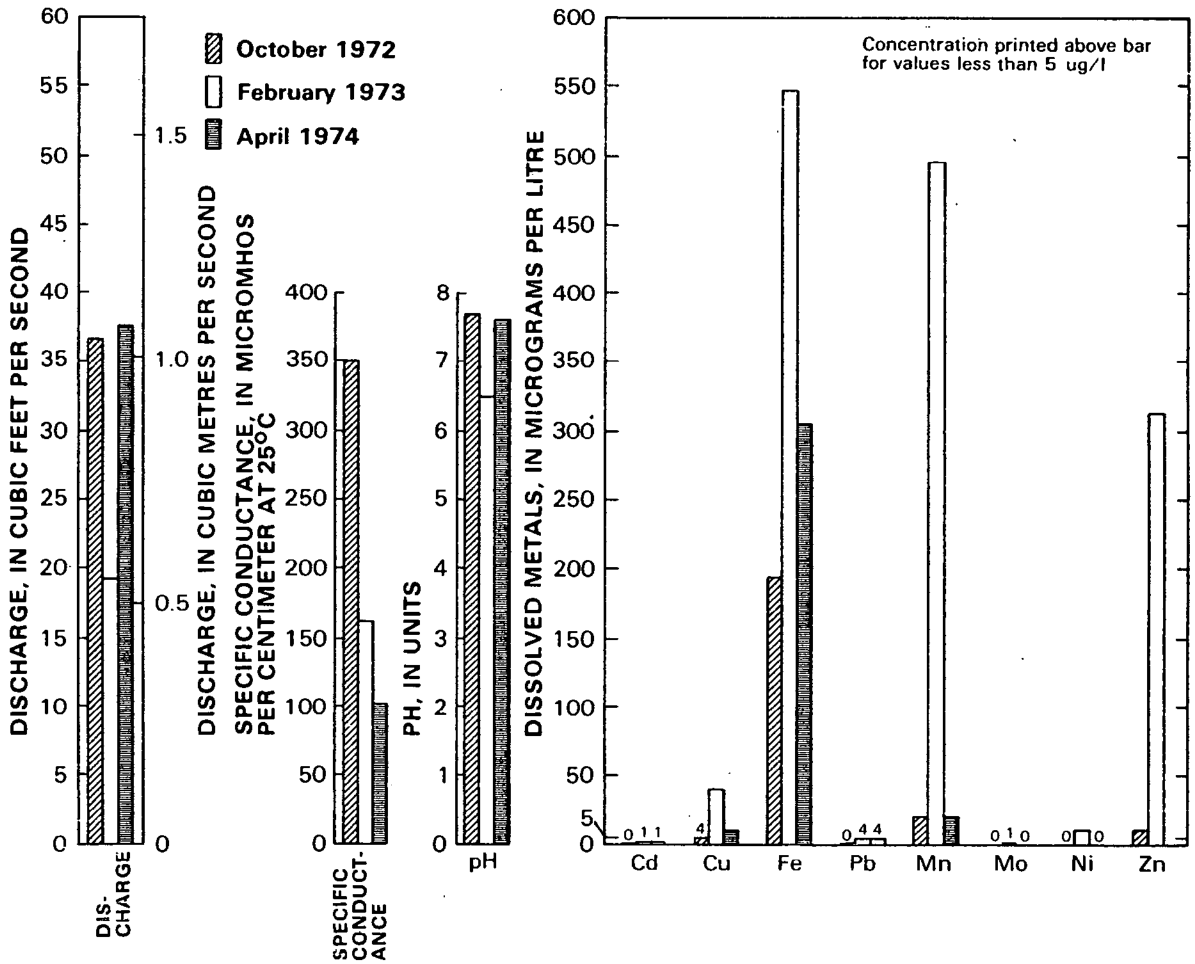

Figure 27.--Variation of chemical quality in the Williams Fork, Colo., October 1972 to April 1974.

activities associated with excavation of the tunnel, upstream from the sampling site, though a continuous monitoring program would be necessary to establish this in fact. Concentrations declined somewhat between February 1973 and April 1974. However, the 1974 sample was collected later into spring runoff than previous samples, and concentrations may reflect dilution from the higher discharge associated with this sample.

Compared to the West Fork of Clear Creek, concentrations of Mn, Mo, Ni, and V are considerably greater in Woods Creek below the Urad tailings. As a matter of fact, V occurs at higher levels here than at any other location sampled throughout the study.

Fourmile Creek

In the Fourmile Creek area (fig. 1), gold- and silver-rich veins are largely confined to a volcanic subsidence basin that is surrounded by Precambrian granite, gneiss, and schist. The basin is filled with fragmental volcanic and clastic non-volcanic rocks of Miocene age (Gott and others, 1969).

Overview

Fourmile Creek receives drainage from the Roosevelt and Carleton Tunnels of the Cripple Creek district (fig. 28). Despite such contributions, only Mn exceeded the drinking water standard during February and May 1973. A wide variety of aquatic invertebrates was observed at station FC-1, and no dissolved chemical constituents tested were found to exceed biological criteria.

Increased mineral exploration activity has occurred in the district due to recent rises in the price of gold. Local surface-water quality may be affected by this increased activity and, therefore, this area warrants future monitoring.

Uravan

Production of uranium and vanadium in the Uravan district (fig. 1) has largely been from Mesozoic sandstone (Del Rio, 1960). The Colorado Division of Mines (1973) lists uranium and vanadium production figures for Montrose County in 1972 at greater than $4 million.

Overview

Based on preliminary observations, the mining operation at Uravan was recognized as a relatively minor source of metals for the San Miguel River. Nevertheless, this area was briefly investigated because it represented an entirely different type of geology and mining than the other study areas.

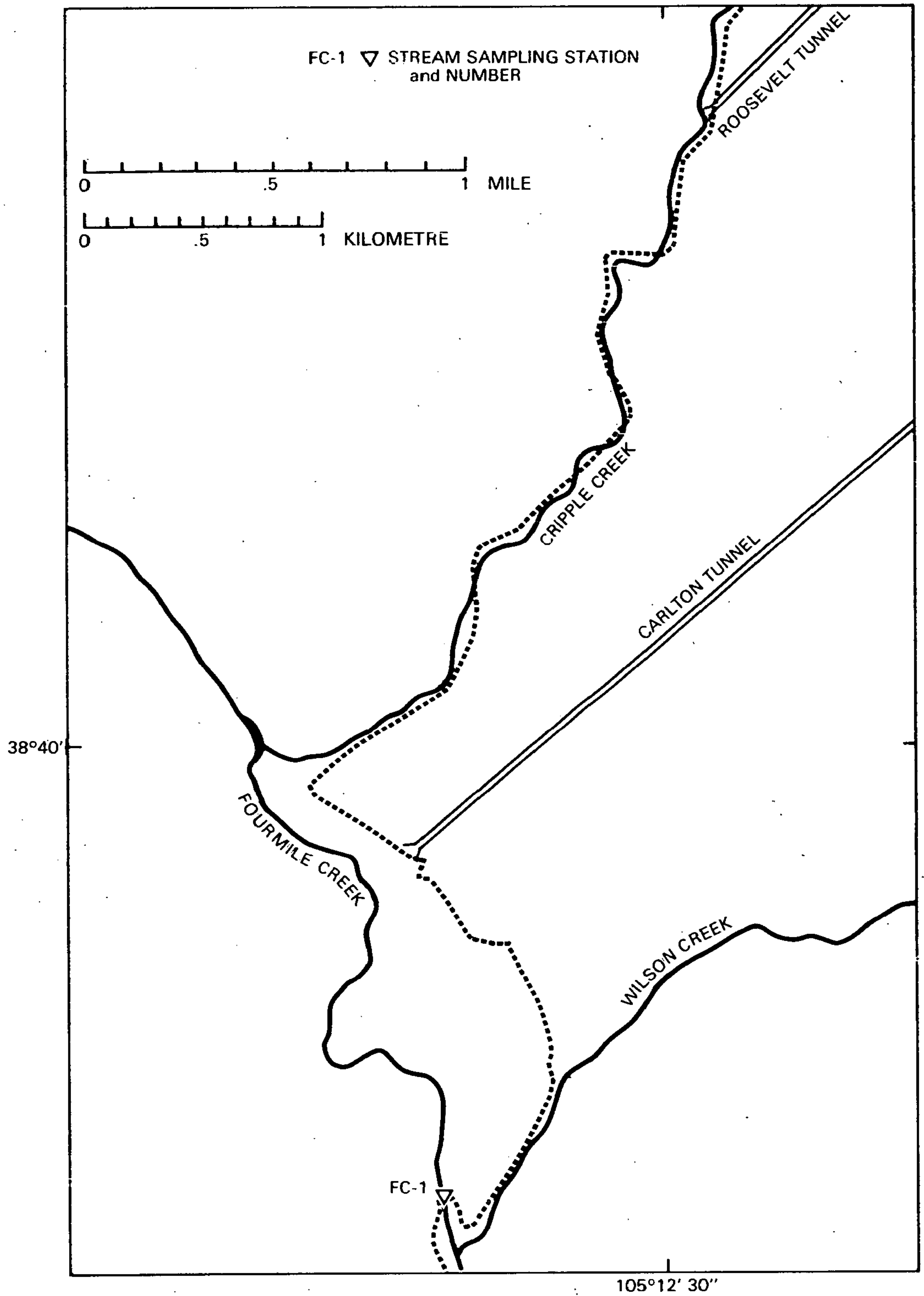

Figure 28.--Sampling sites in the Fourmile Creek area, Colorado.

Potential problem sources are settling ponds and tailings piles associated with the mining operation (see fig. 29). These sources did not contribute acid to the river; or if they did, it was in such small quantities that the pH was not affected. Whereas dissolved concentrations of Cu, Fe, Mn, Ni, V, and Zn increased downstream from the mining operation, only Mn exceeded the drinking water standard. No metal concentrations exceeded biological criteria, but the combined concentrations of Cu and Zn detected at station SM-1 may be harmful to aquatic organisms due to synergistic action of these two metals.

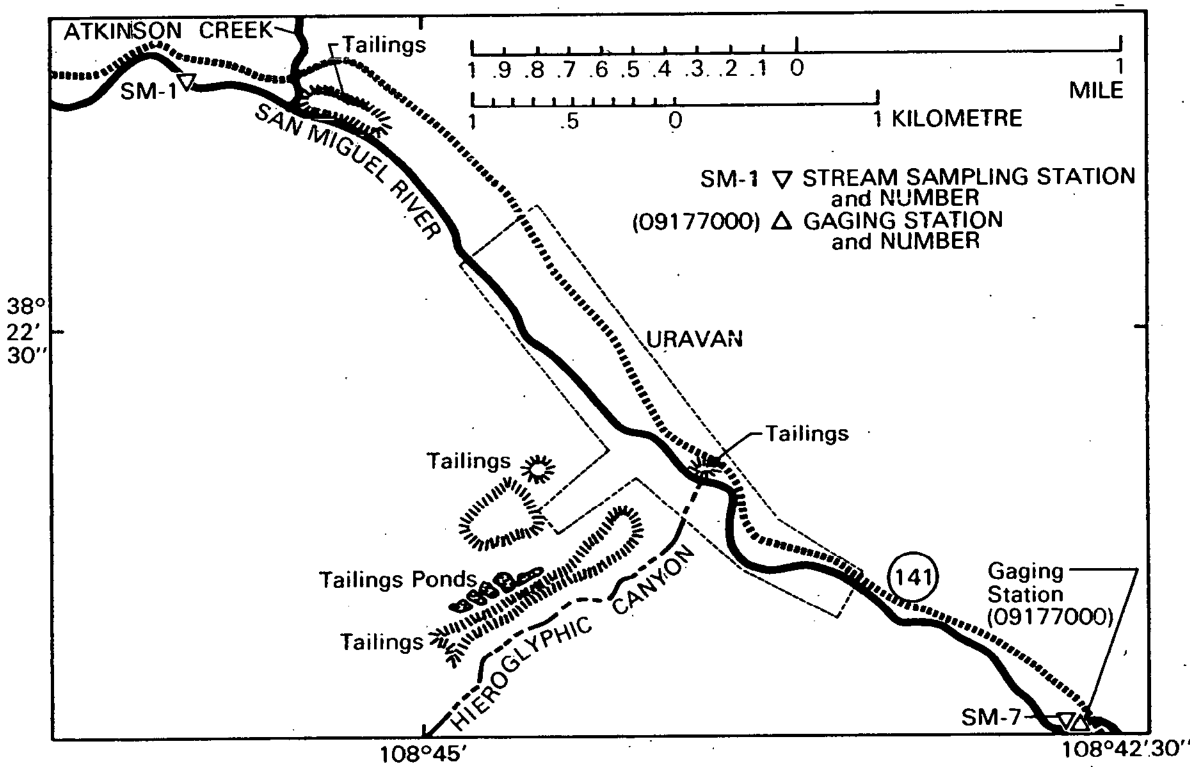

Figure 29.--Sampling sites in the Uravan area, Colorado.

During December 1972, high-alkalinity (pH 6.8 and 3,300 mg/l HCO_3) water was noticed seeping from the tailings into Atkinson Creek, a tributary to the San Miguel River. The source of the bicarbonate was probably from solution, by water containing dissolved CO_2, of host rock calcite and dolomite (Motica, 1968) concentrated in the tailings. At this time of year, the seepage was less than 0.1 ft^3/s (0.003 m^3/s) and had little effect on the quality of the San Miguel. However, tailings drainage may be a water-quality hazard during periods of high flow.

Oak Creek

Mining activity in the Oak Creek study area (fig. 1) has been connected primarily with the extraction of coal (Bass and others, 1955). The coal is bituminous and is associated with the Mesaverde Group, which is composed of sandstone and shale of Cretaceous age. Copper has been reported in the district, but the nature of its occurrence is not known (Vanderwilt, 1947).

Overview

Approximately 0.2 to 0.6 ft^3/s (0.006 to 0.02 m^3/s) of drainage, apparently from an abandoned coal mine, enters Oak Creek near station OC-S3 (see fig. 30). Although this drainage has very little effect on the water quality of Oak Creek, it was chosen as a study area because none of the other areas dealt with drainage from coal deposits. Comparison of concentrations above and below the drain (OC-4 and OC-2, respectively) shows that hardness, Pb, and Mn increase slightly below the drain, but only Mn exceeds the drinking water standard at OC-2. No parameters exceeded biological criteria in Oak Creek downstream from the drain. Drainage from the mine itself (OC-S3) produces considerable iron staining of the channel up to the point where it enters Oak Creek. Nevertheless, dissolved Fe concentrations at OC-2 are not increased by the addition of this drainage. The dissolved Pb concentration of 50 µg/l in the June sample collected at the drain (OC-S3) indicates additional work in this area may be warranted.

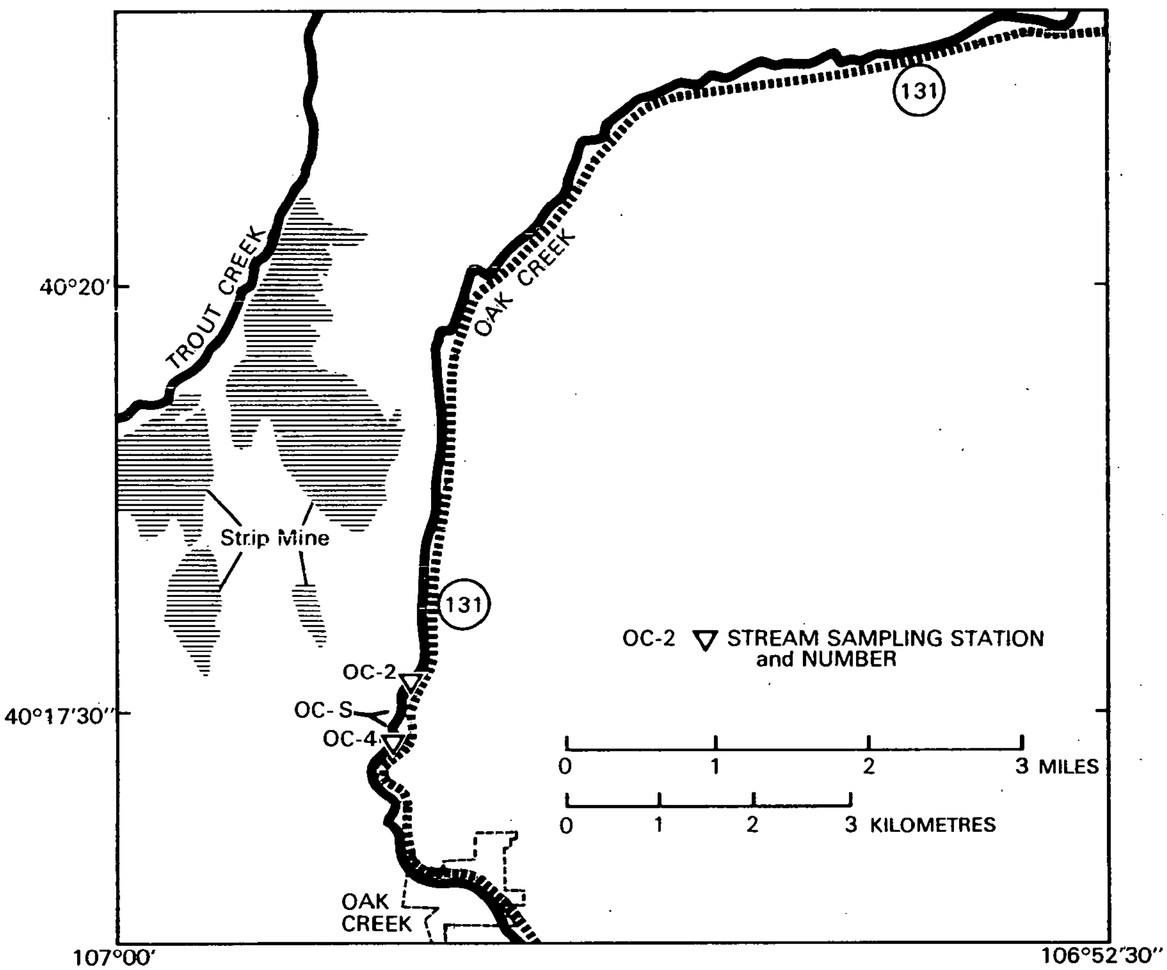

Figure 30.--Sampling sites in the Oak Creek area, Colorado.

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APPENDIX

Chemical Quality of Surface and Ground Water at Sites Sampled to Determine the Effects of Metal Mining in Colorado, 1972-73

[The station identification at the top of each page consists of three parts: the first is an 8- or 15-digit U.S. Geological Survey number; the second is a station description (surface-water stations) or well location (ground-water stations); the third is the letter-number designation (example, SL-1) given on the location maps in the text. Stations are listed in numerical order within each study area according to the letter-number designation. Study areas are listed in numerical order according to figure 1, p. 3.

STATION DESCRIPTION: AB, above; BL, below; CALIF, California; CO, Colorado; C, Creek; DI, distributary; E, East; F, Fork; FLS, Falls; GL, Gulch; HWY, Highway; LK, Lake; L, Little; MO, mouth; MTN, Mountain; NR, near; N, North; NO., Number; O-B-J, Oh-Be-Joyful; RE, Reservoir; R, River; ST., Saint; STP, sewage treatment plant; S, South; SPGS, Springs; TR, tributary; W, West.

WELL LOCATION: The well locations are based on the U.S. Bureau of Land Management system of land subdivision and locate the well within a 10-acre (0.04-km^2) tract. The locations are described proceeding from the largest to the smallest land subdivision. This is in contrast to the legal description, which proceeds from the smallest to the largest land subdivision.

The largest subdivision is the *survey*. Colorado is governed by three surveys, the Sixth Principal Meridian Survey (S), the New Mexico Survey (N), and the Ute Survey (U) (fig. 31*A*). Costilla County was not included in any of the above official surveys. No wells in this report fall within the boundaries of the Ute Survey or within the boundaries of Costilla County. The first letter of the well location designates the survey.

A survey is subdivided into four *quadrants* formed by the intersection of the baseline and the principal meridian. The second letter of the well location designates the quadrant: A indicates the northeast quadrant, B the northwest, C the southwest, and D the southeast.

A quadrant is subdivided in the north-south direction every 6 miles by *townships* and is subdivided in the east-west direction every 6 miles by *ranges* (fig. 31*B*). The first three numbers of the well location designate the township and the fourth through sixth numbers designate the range.

The 36-square-mile (93-km^2) area described by the township and range designation is subdivided into 1-square-mile (2.59-km^2) areas called *sections*. The sections are numbered sequentially in the manner shown in figure 31*B*. The seventh and eighth numbers of the well location designate the section.

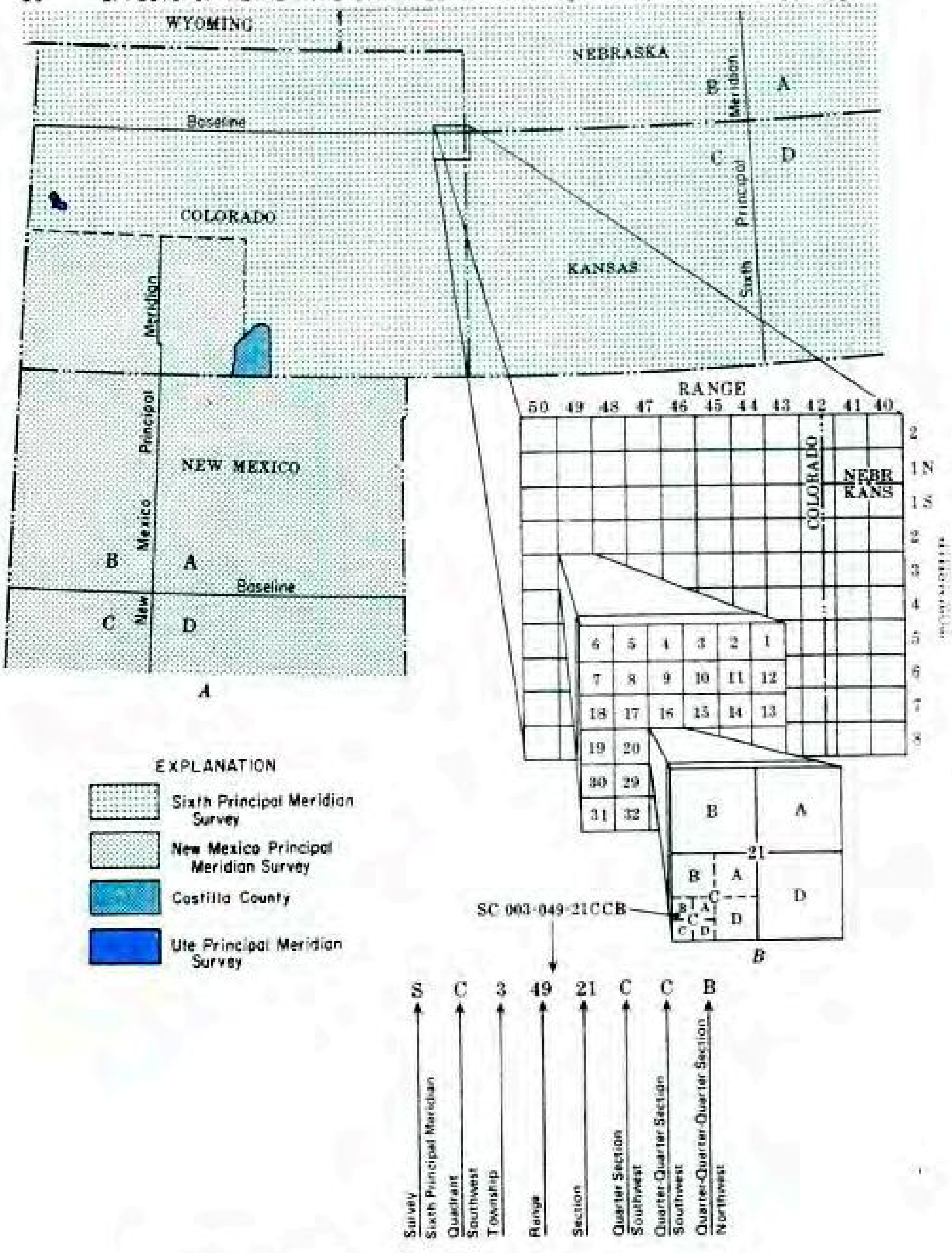

Figure 31.--System of well locations used in Colorado.

The section, which contains 640 acres (2.59 km^2), is subdivided into *quarter sections*. The 160-acre (0.65-km^2) area is designated by the first letter following the section: A indicates the northeast quarter, B the northwest, C the southwest, and D the southeast. The quarter section is subdivided into *quarter-quarter sections*. The 40-acre (0.16-km^2) area is designated in the same manner by the second letter following the section. The quarter-quarter section is subdivided into *quarter-quarter-quarter sections*. The 10-acre (0.04-km^2) area is designated in the same manner by the third letter following the section.

Specific conductance, pH, alkalinity, and temperature are field measurements; bicarbonate, carbonate, and carbon dioxide are calculated from pH and alkalinity; noncarbonate hardness is calculated from hardness and alkalinity; all other parameters are laboratory determinations.

DISCHARGE: E, estimated instantaneous value; AD, computed average daily value; all others are measured instantaneous values.

CARBON DIOXIDE: Concentrations at pH's less than 4.5 are listed as zero because of the procedure used to calculate values for carbon dioxide. Actual concentrations may be greater than zero]

KERBER CREEK STUDY AREA

381533105550400 - SAN LUIS C BL KERBER C NR VILLA GROVE, CO - SL-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
03...	1540	--	275	8.1	120	0	98	1.5	19.5
DEC.									
09...	1255	--	270	7.5	120	0	98	6.1	.0
FEB., 1973									
10...	0945	--	280	6.9	127	0	104	26	.5
JUNE									
05...	1205	--	320	7.5	74	0	61	3.7	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
03...	20	29	8.4	110	12	--	3	0	30
DEC.									
09...	18	32	8.4	110	12	--	--	--	30
FEB., 1973									
10...	19	37	8.4	130	26	--	--	--	<10
JUNE									
05...	19	38	8.6	130	69	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
03...	0	--	--	--	--	80	24	1900	40
DEC.									
09...	0	--	--	--	--	20	8	380	60
FEB., 1973									
10...	0	--	--	--	--	60	10	430	50
JUNE									
05...	2	--	--	--	--	150	30	4000	180

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
03...	200	2	690	220	--	--	--	--	100
DEC.									
09...	200	4	340	280	--	--	--	--	100
FEB., 1973									
10...	<100	0	300	290	--	--	--	--	50
JUNE									
05...	<100	4	1400	1200	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
03...	0	3	0	--	--	--	--	260	30
DEC.									
09...	2	--	--	--	--	--	--	130	10
FEB., 1973									
10...	4	--	--	--	--	--	--	120	120
JUNE									
05...	8	--	--	--	--	--	--	930	420

381500105565900 - KERBER C NR MOUTH AT VILLA GROVE, CO - SL-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
09...	1040	2.2	480	7.0	41	0	34	6.6	.0
FEB., 1973									
11...	1300	--	480	6.7	36	0	30	11	1.0
JUNE									
05...	1245	56	250	7.4	50	0	41	3.2	11.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
09...	18	67	12	220	190	--	--	--	30
FEB., 1973									
11...	18	75	13	240	210	--	--	--	<10
JUNE									
05...	17	31	5.8	100	59	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
09...	6	--	--	--	--	20	10	260	40
FEB., 1973									
11...	1	--	--	--	--	70	20	120	80
JUNE									
05...	1	--	--	--	--	160	20	4100	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
09...	200	3	3360	3530	--	--	--	--	150
FEB., 1973									
11...	<100	0	700	780	--	--	--	--	<25
JUNE									
05...	<100	4	1400	1300	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
09...	4	--	--	--	--	--	--	3400	3500
FEB., 1973									
11...	9	--	--	--	--	--	--	1600	1600
JUNE									
05...	8	--	--	--	--	--	--	1000	500

381254106044500 - KERBER C AB L KERBER C NR BONANZA, CO - SL-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972 03...	1410	--	400	7.0	24	0	20	3.8	17.0
DEC. 07...	1140	--	400	5.9	7	0	6	15	.0
FEB., 1973 09...	1030	--	340	6.1	12	0	10	15	.0
MAY 01...	1130	--	360	5.3	7	0	6	56	6.0
JUNE 05...	1310	--	200	7.2	26	0	21	2.6	15.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972 03...	19	49	7.4	150	130	--	7	2	60
DEC. 07...	18	50	7.9	160	150	--	--	--	40
FEB., 1973 09...	17	46	7.0	140	130	--	--	--	40
MAY 01...	--	44	7.3	140	130	--	--	--	--
JUNE 05...	16	21	3.1	65	44	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972 03...	40	--	--	--	--	270	170	3200	1900
DEC. 07...	20	--	--	--	--	290	150	4000	1300
FEB., 1973 09...	17	--	--	--	--	400	60	4200	610
MAY 01...	30	--	--	--	--	--	220	--	1900
JUNE 05...	3	--	--	--	--	200	30	2500	220

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972 03...	100	18	5600	5900	--	--	--	--	100
DEC. 07...	200	3	5900	5900	--	--	--	--	180
FEB., 1973 09...	<100	1	5600	5600	--	--	--	--	75
MAY 01...	--	1	--	5200	--	--	--	--	--
JUNE 05...	<100	6	1500	1500	--	--	--	--	25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972 03...	50	4	2	--	--	--	--	5300	5000
DEC. 07...	23	--	--	--	--	--	--	6200	6300
FEB., 1973 09...	23	--	--	--	--	--	--	5700	5700
MAY 01...	50	--	--	--	--	--	--	--	5600
JUNE 05...	13	--	--	--	--	--	--	1700	1200

08224500 - KERBER C @ ASHLEY RANCH NR VILLA GROVE, CO - SL-3A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
09...	1445	2.5	330	6.7	22	0	18	7.0	.0
FEB., 1973									
09...	1140	2.1	300	6.5	22	0	18	11	.5
JUNE									
05...	1440	81	160	7.0	29	0	24	4.6	16.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
09...	16	41	6.3	130	110	--	--	--	50
FEB., 1973									
09...	17	41	6.4	130	110	--	--	--	20
JUNE									
05...	15	18	2.7	56	32	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
09...	30	--	--	--	--	440	110	6000	2400
FEB., 1973									
09...	14	--	--	--	--	410	30	5700	2000
JUNE									
05...	2	--	--	--	--	210	40	2200	280

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
09...	100	3	5400	5600	--	--	--	--	75
FEB., 1973									
09...	<100	1	5400	5500	--	--	--	--	50
JUNE									
05...	<100	6	1400	1400	--	--	--	--	25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
09...	24	--	--	--	--	--	--	6200	5800
FEB., 1973									
09...	37	--	--	--	--	--	--	5400	5400
JUNE									
05...	4	--	--	--	--	--	--	1600	1200

381638106085600 - KERBER C AB BREWERY C NR BONANZA, CO - SL-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
01...	1000	1.8	500	6.6	13	0	11	5.2	5.0
DEC.									
10...	1145	1.6	400	6.0	17	0	14	27	.0
FEB., 1973									
09...	1400	1.6	380	6.0	10	0	8	16	.0
MAY									
01...	1625	10	420	5.0	--	--	--	--	3.0
JUNE									
05...	1540	32	300	6.9	22	0	18	4.4	13.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
01...	20	58	8.6	180	170	--	2	1	90
DEC.									
10...	18	49	7.2	150	140	--	--	--	70
FEB., 1973									
09...	18	56	7.7	170	160	--	--	--	50
MAY									
01...	--	47	8.0	150	--	--	--	--	40
JUNE									
05...	17	19	2.9	59	41	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
01...	40	--	--	--	--	750	560	3400	2300
DEC.									
10...	32	--	--	--	--	730	400	4000	1500
FEB., 1973									
09...	30	--	--	--	--	970	410	7600	1500
MAY									
01...	40	--	--	--	--	1900	1700	11000	1600
JUNE									
05...	8	--	--	--	--	360	80	1500	90

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
01...	100	39	10000	11000	--	--	--	--	100
DEC.									
10...	300	2	8200	8500	--	--	--	--	100
FEB., 1973									
09...	100	2	9400	9400	--	--	--	--	100
MAY									
01...	100	16	--	7200	--	--	--	--	<50
JUNE									
05...	<100	5	2200	2200	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
01...	50	2	0	--	--	--	--	11900	12500
DEC.									
10...	32	--	--	--	--	--	--	10000	11000
FEB., 1973									
09...	64	--	--	--	--	--	--	11000	11000
MAY									
01...	50	--	--	--	--	--	--	9400	9100
JUNE									
05...	13	--	--	--	--	--	--	2600	2200

381735106083000 - COPPER GULCH AT MOUTH AT BONANZA, CO - SL-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
01...	1505	E<1	300	6.5	18	0	15	9.1	9.0
DEC.									
06...	1500	E .5	300	7.0	17	0	14	2.7	.0
FEB., 1973									
08...	1445	E .6	280	6.2	7	0	6	7.1	1.0
MAY									
01...	1530	1.5	340	6.8	34	0	28	8.6	1.0
JUNE									
05...	1655	2.6	180	6.9	31	0	25	6.2	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
01...	16	39	5.0	120	100	--	2	3	40
DEC.									
06...	14	38	4.8	110	96	--	--	--	30
FEB., 1973									
08...	13	39	4.7	120	110	--	--	--	<10
MAY									
01...	--	16	4.4	58	30	--	--	--	<10
JUNE									
05...	12	22	2.4	65	40	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
01...	1	--	--	--	--	20	5	180	40
DEC.									
06...	1	--	--	--	--	10	2	80	20
FEB., 1973									
08...	1	--	--	--	--	70	21	250	50
MAY									
01...	0	--	--	--	--	40	2	470	20
JUNE									
05...	3	--	--	--	--	70	20	390	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
01...	200	0	130	90	--	--	--	--	75
DEC.									
06...	200	3	70	70	--	--	--	--	150
FEB., 1973									
08...	<100	1	90	200	--	--	--	--	50
MAY									
01...	100	0	570	460	--	--	--	--	<50
JUNE									
05...	<100	4	730	710	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
01...	1	2	2	--	--	--	--	750	800
DEC.									
06...	0	--	--	--	--	--	--	800	800
FEB., 1973									
08...	4	--	--	--	--	--	--	[illegible]30	910
MAY									
01...	1	--	--	--	--	--	--	1200	930
JUNE									
05...	2	--	--	--	--	--	--	1400	1200

381825106084500 - RAWLEY GULCH AT MOUTH NR BONANZA, CO - SL-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
02...	0900	E .2	600	4.5	0	0	0	.0	4.0
MAY , 1973									
01...	1400	.72	700	4.5	0	0	0	.0	2.0
JUNE									
04...	1730	4.7	560	4.0	0	0	0	.0	11.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
02...	25	70	10	220	220	--	1	0	80
MAY , 1973									
01...	--	85	13	270	270	--	--	--	110
JUNE									
04...	17	49	7.3	150	150	--	--	--	60

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
02...	90	--	--	--	--	1800	1900	120	70
MAY , 1973									
01...	100	--	--	--	--	1600	1400	1300	250
JUNE									
04...	60	--	--	--	--	1900	2100	1900	1000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
02...	200	42	12000	12000	--	--	--	--	100
MAY , 1973									
01...	100	33	14000	15000	--	--	--	--	<50
JUNE									
04...	100	100	9600	9600	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
02...	25	1	0	--	--	--	--	17000	18000
MAY , 1973									
01...	50	--	--	--	--	--	--	24000	25000
JUNE									
04...	32	--	--	--	--	--	--	12000	13000

381835106084000 - SQUIRREL C AT MOUTH NR BONANZA, CO - SL-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
02...	1450	.58	1000	3.9	0	0	0	.0	12.5
DEC.									
06...	1045	1.4	900	4.3	0	0	0	.0	.0
FEB., 1973									
07...	1405	.57	700	4.3	0	0	0	.0	4.0
MAY									
02...	1400	1.5	950	3.1	0	0	0	.0	9.5
JUNE									
06...	0915	9.6	260	6.3	24	0	20	19	3.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
02...	20	110	16	340	340	--	10	4	150
DEC.									
06...	19	--	14	--	--	--	--	--	150
FEB., 1973									
07...	18	100	14	310	310	--	--	--	100
MAY									
02...	--	87	17	290	290	--	--	--	90
JUNE									
06...	15	30	5.3	97	77	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
02...	160	--	--	--	--	1700	1800	11000	11000
DEC.									
06...	120	--	--	--	--	1850	1800	16000	11000
FEB., 1973									
07...	10	--	--	--	--	1400	1300	11000	7700
MAY									
02...	80	--	--	--	--	6300	6500	35000	18000
JUNE									
06...	13	--	--	--	--	700	100	3000	180

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
02...	300	65	29000	29000	--	--	--	--	150
DEC.									
06...	300	56	25000	25000	--	--	--	--	180
FEB., 1973									
07...	<100	43	23000	23000	--	--	--	--	75
MAY									
02...	200	53	20000	21000	--	--	--	--	50
JUNE									
06...	100	3	4200	4500	--	--	--	--	25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
02...	25	0	0	--	--	--	--	31000	32000
DEC.									
06...	50	--	--	--	--	--	--	27000	27000
FEB., 1973									
07...	77	--	--	--	--	--	--	24000	25000
MAY									
02...	50	--	--	--	--	--	--	21000	21000
JUNE									
06...	23	--	--	--	--	--	--	4500	4500

381849106083200 - RAWLEY MINE NR BONANZA, CO - SL-S7A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
06...	1300	E.5	--	3.6	0	0	0	.0	--
FEB., 1973									
12...	1100	--	900	3.4	0	0	0	.0	--
MAY									
02...	1610	E.5	1050	3.5	0	0	0	.0	9.5
JUNE									
06...	1330	.38	1250	3.5	0	0	0	.0	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
06...	17	130	15	390	390	--	--	5	--
FEB., 1973									
12...	16	130	15	390	390	--	--	--	100
MAY									
02...	--	120	15	360	360	--	--	--	110
JUNE									
06...	19	150	19	450	450	--	--	--	260

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
06...	200	--	--	--	--	--	670	--	--
FEB., 1973									
12...	13	--	--	--	--	500	570	12000	5400
MAY									
02...	110	--	--	--	--	420	420	4800	4300
JUNE									
06...	260	--	--	--	--	4400	4200	7400	6900

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
06...	--	32	--	32000	--	--	--	--	--
FEB., 1973									
12...	<100	26	29000	29000	--	--	--	--	50
MAY									
02...	<100	18	29000	29000	--	--	--	--	50
JUNE									
06...	100	100	42000	41000	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
06...	50	--	0	--	--	--	--	--	34000
FEB., 1973									
12...	48	--	--	--	--	--	--	31000	32000
MAY									
02...	50	--	--	--	--	--	--	29000	28000
JUNE									
06...	50	--	--	--	--	--	--	48000	48000

381900106083400 - SQUIRREL C AT WINTER STATION NR BONANZA, CO - SL-7B

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
07...	1245	E .9	320	7.9	96	0	79	1.9	.0
FEB., 1973									
12...	1130	--	320	7.3	96	0	79	7.7	.0
MAY									
02...	1735	E1.0	320	6.8	67	0	55	17	1.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
07...	14	47	8.8	150	71	--	--	--	20
FEB., 1973									
12...	14	51	9.0	160	81	--	--	--	<10
MAY									
02...	--	46	8.7	150	95	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
07...	1	--	--	--	--	20	2	70	30
FEB., 1973									
12...	0	--	--	--	--	20	5	70	50
MAY									
02...	1	--	--	--	--	30	17	270	130

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
07...	200	3	40	20	--	--	--	--	75
FEB., 1973									
12...	<100	0	40	10	--	--	--	--	50
MAY									
02...	100	0	800	740	--	--	--	--	<50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
07...	1	--	--	--	--	--	--	310	300
FEB., 1973									
12...	2	--	--	--	--	--	--	300	270
MAY									
02...	3	--	--	--	--	--	--	1300	1200

381948106084700 - SQUIRREL C AB BEAR C NR BONANZA, CO - SL-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
02...	1330	E .25	280	8.5	130	0	107	.7	10.0
JUNE, 1973									
06...	1410	5.1	170	6.7	41	0	34	13	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
02...	16	34	9.3	120	13	--	2	1	20
JUNE, 1973									
06...	17	11	2.3	37	3	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
02...	0	--	--	--	--	10	7	90	30
JUNE, 1973									
06...	1	--	--	--	--	<10	12	460	90

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
02...	100	3	30	40	--	--	--	--	130
JUNE, 1973									
06...	<100	4	200	100	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
02...	0	0	0	--	--	--	--	40	20
JUNE, 1973									
06...	0	--	--	--	--	--	--	20	10

381832106084800 - KERBER C AB SQUIRREL C NR BONANZA, CO - SL-9

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
02...	1630	E .75	130	7.4	62	0	51	3.9	9.0
DEC.									
06...	0915	--	200	7.0	55	0	45	8.8	.0
FEB., 1973									
07...	1300	--	130	7.0	58	0	48	9.3	.0
JUNE									
06...	1010	12	140	6.7	26	0	21	8.3	5.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
02...	16	15	2.2	47	0	--	1	0	30
DEC.									
06...	17	14	2.2	44	0	--	--	--	20
FEB., 1973									
07...	18	15	2.2	47	0	--	--	--	<10
JUNE									
06...	19	8.4	1.0	25	4	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
02...	1	--	--	--	--	20	24	490	220
DEC.									
06...	0	--	--	--	--	10	9	390	190
FEB., 1973									
07...	0	--	--	--	--	70	20	350	110
JUNE									
06...	2	--	--	--	--	10	20	490	170

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
02...	200	9	210	240	--	--	--	--	100
DEC.									
06...	100	3	170	170	--	--	--	--	100
FEB., 1973									
07...	<100	1	170	180	--	--	--	--	50
JUNE									
06...	<100	8	100	110	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
02...	0	1	0	--	--	--	--	210	190
DEC.									
06...	1	--	--	--	--	--	--	190	160
FEB., 1973									
07...	4	--	--	--	--	--	--	180	160
JUNE									
06...	0	--	--	--	--	--	--	170	160

381915106093200 - KERBER C AB MOSQUITO C NR BONANZA, CO - SL-10

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
03...	1100	E1.0	120	7.5	62	0	51	3.1	6.5
FEB., 1973									
12...	1330	--	120	6.5	58	0	48	29	.0
JUNE									
06...	1125	--	120	6.8	29	0	24	7.4	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
03...	16	14	2.1	44	0	--	1	0	40
FEB., 1973									
12...	16	15	1.7	44	0	--	--	--	<10
JUNE									
06...	20	7.6	.8	22	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
03...	0	--	--	--	--	10	3	320	130
FEB., 1973									
12...	0	--	--	--	--	60	10	890	210
JUNE									
06...	0	--	--	--	--	<10	16	620	190

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
03...	100	2	40	0	--	--	--	--	130
FEB., 1973									
12...	<100	0	200	120	--	--	--	--	50
JUNE									
06...	<100	2	20	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
03...	0	0	0	--	--	--	--	40	20
FEB., 1973									
12...	2	--	--	--	--	--	--	30	70
JUNE									
06...	7	--	--	--	--	--	--	30	0

381710105573300 - SAN LUIS C AB KERBER C NR VILLA GROVE, CO - SL-11

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
05...	1110	E.4	1150	8.1	312	0	256	4.0	15.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
05...	33	55	18	210	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
05...	0	--	--	--	--	<10	10	500	200

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
05...	<100	3	40	30	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
05...	6	--	--	--	--	--	--	20	20

381734106083000 - NA04700725DCD - SL-G1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
01...	1435	--	325	6.4	--	--	--	--	12.0
DEC.									
06...	1440	--	310	6.6	19	0	16	7.6	6.0
FEB., 1973									
08...	1600	--	300	6.1	10	0	8	13	2.5
JUNE									
05...	1635	--	350	6.4	24	0	20	15	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
01...	16	41	4.9	120	--	--	--	6	--
DEC.									
06...	14	41	4.9	120	100	--	--	--	--
FEB., 1973									
08...	14	44	5.1	130	120	--	--	--	<10
JUNE									
05...	15	49	5.9	150	130	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
01...	0	--	--	--	--	--	2	--	--
DEC.									
06...	0	--	--	--	--	--	4	--	--
FEB., 1973									
08...	0	--	--	--	--	10	10	250	70
JUNE									
05...	1	--	--	--	--	--	11	--	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
01...	--	3	--	10	--	--	--	--	--
DEC.									
06...	--	2	--	10	--	--	--	--	--
FEB., 1973									
08...	<100	1	20	10	--	--	--	--	25
JUNE									
05...	--	4	--	10	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
01...	0	--	0	--	--	--	--	--	50
DEC.									
06...	0	--	--	--	--	--	--	--	60
FEB., 1973									
08...	2	--	--	--	--	--	--	50	50
JUNE									
05...	0	--	--	--	--	--	--	--	90

381457105565800 - NA04600911CDB - SL-G2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
FEB., 1973									
11...	1400	--	460	6.8	101	0	83	26	6.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
FEB., 1973									
11...	22	69	13	230	150	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
FEB., 1973									
11...	0	--	--	--	--	70	30	120	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
FEB., 1973									
11...	<100	0	20	10	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
FEB., 1973									
11...	0	--	--	--	--	--	--	500	500

381741106083000 - NA04700725DCA - SL-G3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
FEB., 1973									
12...	1545	--	300	6.5	24	0	20	12	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
FEB., 1973									
12...	16	43	4.5	130	110	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
FEB., 1973									
12...	0	--	--	--	--	280	120	350	110

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
FEB., 1973									
12...	<100	2	20	20	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
FEB., 1973									
12...	0	--	--	--	--	--	--	770	710

381746106083000 - NA04700725DBD - SL-G4

DATE	TIME	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPERATURE (DEG C)
FEB., 1973									
12...	1600	--	380	6.7	70	0	57	22	1.5

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DISSOLVED ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)
FEB., 1973									
12...	--	--	--	--	--	--	--	--	<10

DATE	DISSOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)
FEB., 1973									
12...	--	--	--	--	--	60	--	610	--

DATE	TOTAL LEAD (PB) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
FEB., 1973									
12...	<100	--	120	--	--	--	--	--	25

DATE	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
FEB., 1973									
12...	--	--	--	--	--	--	--	1500	--

LEADVILLE STUDY AREA

390618106175400 - ARKANSAS R AB TWOBIT GULCH NR GRANITE, CO - EF-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
01...	1105	--	180	7.4	61	0	50	3.9	1.5
JUNE, 1973									
24...	1620	--	125	7.1	50	0	41	6.4	12.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
01...	7.7	17	6.2	68	18	--	--	6	--
JUNE, 1973									
24...	--	12	4.5	49	8	--	--	3	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
01...	2	--	--	--	--	--	10	--	160
JUNE, 1973									
24...	2	--	--	--	--	--	21	--	190

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
01...	--	2	--	280	--	--	--	--	--
JUNE, 1973									
24...	--	6	--	180	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
01...	2	--	0	--	--	--	--	--	440
JUNE, 1973									
24...	2	--	4	--	--	--	--	--	540

07083700 - ARKANSAS R NR MALTA, CO - EF-1A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
01...	1210	--	170	7.5	55	0	45	2.8	3.0
JAN., 1973									
06...	1130	--	180	7.0	65	0	53	10	.0
MAR.									
03...	1130	60	320	7.3	67	0	55	5.4	2.0
MAY									
08...	1630	--	150	7.2	46	0	38	4.6	10.5
JUNE									
24...	1535	--	120	7.1	50	0	41	6.4	12.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
01...	7.0	16	5.8	64	19	--	0	0	40
JAN., 1973									
06...	8.5	20	7.3	80	27	--	0	0	30
MAR.									
03...	--	22	8.2	89	34	--	0	0	0
MAY									
08...	--	16	5.6	63	25	--	3	6	10
JUNE									
24...	--	12	4.4	48	7	--	0	2	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
01...	1	--	--	--	--	20	5	2200	150
JAN., 1973									
06...	1	--	--	--	--	20	10	420	130
MAR.									
03...	1	--	--	--	--	10	1	680	110
MAY									
08...	1	--	--	--	--	10	10	1200	590
JUNE									
24...	2	--	--	--	--	20	21	770	180

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
01...	200	2	300	310	--	--	--	--	75
JAN., 1973									
06...	100	4	470	520	--	--	--	--	75
MAR.									
03...	<100	0	530	500	--	--	--	--	<50
MAY									
08...	300	1	430	430	--	--	--	--	<50
JUNE									
24...	<50	8	200	180	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
01...	0	2	4	--	--	--	--	540	460
JAN., 1973									
06...	2	4	0	--	--	--	--	860	790
MAR.									
03...	1	5	5	--	--	--	--	850	610
MAY									
08...	2	0	2	--	--	--	--	1500	560
JUNE									
24...	9	10	1	--	--	--	--	860	550

391120106194900 - IOWA GULCH AT MOUTH NR MALTA, CO - EF-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
21...	1655	2.2	340	7.7	199	0	163	6.4	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
21...	--	54	21	220	57	--	2	1	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
21...	1	--	--	--	--	10	6	40	9

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
21...	<50	3	10	10	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
21...	0	10	0	--	--	--	--	100	90

391321106143300 - IOWA GULCH BYPASS NR LEADVILLE, CO - EF-2AA

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAY, 1973									
09...	1705	E2	700	7.5	89	0	73	4.5	8.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAY, 1973									
09...	--	--	--	--	--	--	5	--	60

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAY, 1973									
09...	--	--	--	--	--	470	--	3200	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAY, 1973									
09...	600	--	2500	--	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAY, 1973									
09...	--	14	--	--	--	--	--	13000	--

391320106143300 - IOWA GULCH NR LEADVILLE, CO - EF-2A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
06...	1520	--	1100	10.0	52	41	111	.0	3.0
MAY , 1973									
09...	1630	E .5	1100	10.8	0	29	84	.0	8.0
JUNE									
21...	1445	E25	220	7.5	89	0	73	4.5	9.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
06...	1.6	170	14	480	370	--	--	0	--
MAY , 1973									
09...	--	210	9.8	560	480	--	7	2	10
JUNE									
21...	--	22	7.9	87	14	--	0	1	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
06...	10	--	--	--	--	--	10000	--	30
MAY , 1973									
09...	0	--	--	--	--	3600	3300	610	40
JUNE									
21...	1	--	--	--	--	90	90	330	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
06...	--	1	--	1200	--	--	--	--	--
MAY , 1973									
09...	900	18	340	10	--	--	--	--	<50
JUNE									
21...	50	5	120	90	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
06...	12	--	0	--	--	--	--	--	1200
MAY , 1973									
09...	50	5	8	--	--	--	--	160	30
JUNE									
21...	7	12	0	--	--	--	--	300	180

391332106130300 - IOWA GL AT UPPER STATION NR LEADVILLE, CO - EF-2B

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
07...	1015	--	220	7.8	122	0	100	3.1	.0
JUNE, 1973									
21...	1405	E20	150	7.4	91	0	75	5.8	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
07...	3.7	25	11	110	10	--	--	5	--
JUNE, 1973									
21...	--	18	7.6	76	1	--	--	0	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
07...	0	--	--	--	--	--	20	--	9
JUNE, 1973									
21...	1	--	--	--	--	--	6	--	60

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
07...	--	1	--	10	--	--	--	--	--
JUNE, 1973									
21...	--	18	--	10	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
07...	1	--	0	--	--	--	--	--	70
JUNE, 1973									
21...	6	--	2	--	--	--	--	--	50

391341106103200 - IOWA GL TR NR LEADVILLE, CO - EF-S2C

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
07...	1120	--	340	7.7	110	0	90	3.5	.0
JUNE, 1973									
21...	1340	E.05	170	7.5	94	0	77	4.8	4.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
07...	4.0	37	15	150	60	--	--	1	--
JUNE, 1973									
21...	--	--	--	--	--	--	0	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
07...	0	--	--	--	--	--	7	--	--
JUNE, 1973									
21...	--	--	--	--	--	10	--	290	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
07...	--	12	--	30	--	--	--	--	--
JUNE, 1973									
21...	<50	--	10	--	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
07...	0	--	0	--	--	--	--	--	70
JUNE, 1973									
21...	--	0	--	--	--	--	--	40	--

07083000 - HALFMOON C NR MALTA, CO - EF-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
01...	1350	13	100	7.4	47	0	39	3.0	.0
JUNE, 1973									
21...	1740	88	70	7.5	34	0	28	1.7	10.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
01...	5.3	9.4	3.7	39	0	--	--	0	--
JUNE, 1973									
21...	--	6.6	2.1	25	0	--	--	0	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
01...	0	--	--	--	--	--	3	--	50
JUNE, 1973									
21...	0	--	--	--	--	--	3	--	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
01...	--	3	--	0	--	--	--	--	--
JUNE, 1973									
21...	--	0	--	0	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
01...	1	--	0	--	--	--	--	--	0
JUNE, 1973									
21...	2	--	0	--	--	--	--	--	10

07081800 - CALIFORNIA GULCH AT MALTA, CO - EF-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BCNATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
06...	0845	2.6	1100	6.7	36	0	30	11	.0
MAR., 1973									
03...	1340	2.4	900	6.8	77	0	63	20	3.5
MAY									
08...	1740	5.0	1050	5.9	5	0	4	10	11.5
JUNE									
25...	1150	4.9	1350	5.4	--	--	--	--	14.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
06...	13	110	49	480	450	--	6	1	120
MAR., 1973									
03...	--	110	43	450	390	--	7	0	70
MAY									
08...	--	120	49	500	500	--	30	2	200
JUNE									
25...	--	120	57	530	--	--	14	0	480

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
06...	100	--	--	--	--	700	40	33000	3200
MAR., 1973									
03...	30	--	--	--	--	220	10	22000	4600
MAY									
08...	190	--	--	--	--	620	80	35000	8200
JUNE									
25...	460	--	--	--	--	1600	900	43000	15000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
06...	300	9	17000	18000	--	--	--	--	130
MAR., 1973									
03...	100	0	15000	15000	--	--	--	--	<50
MAY									
08...	800	2	19000	1900	--	--	--	--	<50
JUNE									
25...	400	20	23000	23000	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
06...	50	3	0	--	--	--	--	33000	30000
MAR., 1973									
03...	50	0	0	--	--	--	--	25000	18000
MAY									
08...	50	19	0	--	--	--	--	42000	40000
JUNE									
25...	50	10	0	--	--	--	--	82000	83000

391420106180400 - CALIFORNIA GL AB STP AT LEADVILLE, CO - EF-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
06...	1130	--	1700	3.8	0	0	0	.0	6.0
JUNE, 1973									
25...	1015	E3.5	1500	4.0	0	0	0	.0	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
06...	18	180	74	750	750	--	10	0	190
JUNE, 1973									
25...	--	150	66	650	650	--	16	9	620

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
06...	170	--	--	--	--	1100	1100	47000	25000
JUNE, 1973									
25...	560	--	--	--	--	2000	2000	50000	20000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
06...	300	61	28000	28000	--	--	--	--	180
JUNE, 1973									
25...	450	250	28000	29000	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
06...	50	0	0	--	--	--	--	56000	54000
JUNE, 1973									
25...	50	48	0	--	--	--	--	100000	110000

391409106161300 - YAK TUNNEL NR LEADVILLE, CO - EF-S6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
06...	1310	1.6	1600	3.9	0	0	0	.0	9.0
MAY , 1973									
09...	0920	1.2	1300	5.5	7	0	6	35	10.0
JUNE									
25...	0940	3.4	1500	3.8	0	0	0	.0	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
06...	17	160	68	680	680	--	20	1	160
MAY , 1973									
09...	--	160	65	670	660	--	4	0	110
JUNE									
25...	--	140	59	590	590	--	20	1	720

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
06...	170	--	--	--	--	1000	1100	67000	39000
MAY , 1973									
09...	100	--	--	--	--	630	160	66000	35000
JUNE									
25...	690	--	--	--	--	2400	2500	72000	26000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
06...	200	11	28000	28000	--	--	--	--	180
MAY , 1973									
09...	<100	0	23000	23000	--	--	--	--	50
JUNE									
25...	300	250	29000	30000	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
06...	75	0	0	--	--	--	--	51000	54000
MAY , 1973									
09...	100	0	0	--	--	--	--	42000	40000
JUNE									
25...	50	9	0	--	--	--	--	110000	120000

391400106155800 - CALIF GULCH AB YAK TUNNEL NR LEADVILLE, CO - EF-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
25...	0800	E.01	1350	3.1	0	0	0	.0	4.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
25...	--	100	45	440	440	--	10	0	960

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
25...	910	--	--	--	--	1200	1300	8900	7800

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
25...	1900	1900	23000	23000	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
25...	25	0	0	--	--	--	--	120000	120000

391353106142600 - CALIFORNIA GULCH AB LEADVILLE CO - EF-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
24...	1720	E<1	925	2.9	0	0	0	.0	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
24...	--	26	8.1	98	98	--	5	6	100

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
24...	100	--	--	--	--	1200	1200	21000	19000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
24...	100	57	11000	11000	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
24...	42	34	0	--	--	--	--	17000	18000

391321106211700 - ARKANSAS R AT MALTA, CO - EF-9

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
01...	1510	--	290	7.7	98	0	80	3.1	.5
JUNE, 1973									
24...	1430	--	95	7.1	41	0	34	5.2	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
01...	7.7	31	13	130	50	--	1	2	20
JUNE, 1973									
24...	--	10	3.8	41	7	--	0	2	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
01...	1	--	--	--	--	50	6	360	210
JUNE, 1973									
24...	0	--	--	--	--	10	10	480	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
01...	200	2	200	200	--	--	--	--	75
JUNE, 1973									
24...	<50	2	80	20	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
01...	1	3	0	--	--	--	--	460	390
JUNE, 1973									
24...	0	60	0	--	--	--	--	150	90

391550106202500 - TENNESSEE C NR LEADVILLE, CO - EF-10

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER- ATURE (DEG C)
NOV., 1972									
07...	1320	--	100	7.5	47	0	39	2.4	.0
JUNE, 1973									
24...	1320	E220	<50	7.4	26	0	21	1.7	10.5

DATE	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)
NOV., 1972									
07...	9.4	8.7	3.2	35	0	--	--	0	--
JUNE, 1973									
24...	--	4.2	1.1	15	0	--	--	1	--

DATE	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV., 1972									
07...	0	--	--	--	--	--	15	--	150
JUNE, 1973									
24...	1	--	--	--	--	--	20	--	130

DATE	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
07...	--	1	--	20	--	--	--	--	--
JUNE, 1973									
24...	--	4	--	50	--	--	--	--	--

DATE	DIS- SOLVED NICKEL (NI) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL VANA- DIUM (V) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
07...	50	--	0	--	--	--	--	--	30
JUNE, 1973									
24...	1	--	1	--	--	--	--	--	110

391727106215800 - ST. KEVIN GULCH AT MOUTH NR LEADVILLE, CO - EF-11

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
07...	1415	.52	320	3.7	0	0	0	.0	.0
JUNE, 1973									
24...	1240	E2	120	5.2	--	--	--	--	11.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
07...	17	14	5.2	56	56	--	--	4	--
JUNE, 1973									
24...	--	4.9	1.7	19	--	--	--	0	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
07...	70	--	--	--	--	--	90	--	1800
JUNE, 1973									
24...	18	--	--	--	--	--	50	--	1100

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
07...	--	21	--	5500	--	--	--	--	--
JUNE, 1973									
24...	--	3	--	1100	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
07...	50	--	0	--	--	--	--	--	9400
JUNE, 1973									
24...	17	--	0	--	--	--	--	--	2900

391906106201300 - TENNESSEE C AB LONGS GL NR LEADVILLE, CO - EF-12

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	0900	--	100	7.2	31	0	25	3.1	.0
JUNE, 1973									
24...	1050	E120	<50	7.3	24	0	20	1.9	6.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	8.1	6.8	2.4	27	2	--	--	0	--
JUNE, 1973									
24...	--	3.4	.7	11	0	--	--	0	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	0	--	--	--	--	--	2	--	190
JUNE, 1973									
24...	0	--	--	--	--	--	5	--	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	--	3	--	20	--	--	--	--	--
JUNE, 1973									
24...	--	1	--	20	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	1	--	0	--	--	--	--	--	10
JUNE, 1973									
24...	1	--	2	--	--	--	--	--	20

07079500 - E F ARKANSAS R NR LEADVILLE, CO - EF-13

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	1030	E 30	460	7.6	34	0	28	1.4	.0
MAR., 1973									
03...	1500	9.2	400	7.7	134	0	110	4.3	2.5
MAY									
09...	1220	12	340	7.7	125	0	103	4.0	9.0
JUNE									
21...	1050	E250	170	7.4	60	0	49	3.8	5.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	8.0	52	21	220	190	--	3	1	30
MAR., 1973									
03...	--	54	22	230	120	--	0	0	0
MAY									
09...	--	44	19	190	90	--	2	0	0
JUNE									
21...	--	15	6.0	62	13	--	2	0	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	1	--	--	--	--	20	0	400	20
MAR., 1973									
03...	1	--	--	--	--	10	3	290	40
MAY									
09...	1	--	--	--	--	10	3	440	170
JUNE									
21...	0	--	--	--	--	10	8	450	60

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	100	2	520	530	--	--	--	--	75
MAR., 1973									
03...	<100	0	470	520	--	--	--	--	<50
MAY									
09...	<100	0	400	460	--	--	--	--	<50
JUNE									
21...	<50	2	150	70	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	0	3	0	--	--	--	--	1100	1100
MAR., 1973									
03...	2	0	0	--	--	--	--	1100	1100
MAY									
09...	2	0	2	--	--	--	--	780	790
JUNE									
21...	6	0	0	--	--	--	--	380	190

391558106172300 - EVANS GULCH AT LEADVILLE, CO - EF-14

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	1150	--	230	7.6	131	0	107	5.3	.0
JUNE, 1973									
21...	0900	29	130	7.4	79	0	65	5.0	3.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	3.8	25	12	110	3	--	--	0	--
JUNE, 1973									
21...	--	16	7.8	72	7	--	2	4	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	1	--	--	--	--	--	8	--	50
JUNE, 1973									
21...	1	--	--	--	--	10	8	180	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	--	4	--	0	--	--	--	--	--
JUNE, 1973									
21...	<50	2	20	30	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	1	--	2	--	--	--	--	--	90
JUNE, 1973									
21...	0	8	0	--	--	--	--	380	210

07079200 - LEADVILLE DRAIN AT LEADVILLE, CO - EF-15

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	1235	3.6	850	6.9	168	0	138	34	6.5
MAY, 1973									
09...	1350	3.2	775	6.7	166	0	136	53	7.0
JUNE									
21...	0815	E3.4	980	6.5	137	0	112	69	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	11	110	46	460	320	--	3	0	30
MAY, 1973									
09...	--	110	46	460	320	--	10	0	20
JUNE									
21...	--	110	47	470	360	--	9	0	80

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	9	--	--	--	--	30	2	2500	100
MAY, 1973									
09...	20	--	--	--	--	10	10	3200	370
JUNE									
21...	8	--	--	--	--	30	10	2800	130

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	100	1	2000	2300	--	--	--	--	130
MAY, 1973									
09...	<100	0	2500	2500	--	--	--	--	<50
JUNE									
21...	<50	1	5400	5700	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	2	2	0	--	--	--	--	4500	4600
MAY, 1973									
09...	50	2	1	--	--	--	--	4800	4600
JUNE									
21...	26	0	0	--	--	--	--	13000	13000

391709106164600 - E F ARKANSAS R AT HWY 91 NR LEADVILLE, CO - EF-16

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	1445	--	230	7.3	118	0	97	9.5	.0
JUNE, 1973									
24...	1005	E250	120	7.4	50	0	41	3.2	5.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	5.6	25	9.9	100	3	--	0	0	30
JUNE, 1973									
24...	--	12	4.0	46	5	--	1	2	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	0	--	--	--	--	10	3	190	100
JUNE, 1973									
24...	0	--	--	--	--	20	18	470	130

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	200	4	60	50	--	--	--	--	100
JUNE, 1973									
24...	<50	0	50	40	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	0	3	1	--	--	--	--	30	30
JUNE, 1973									
24...	10	12	2	--	--	--	--	70	30

391628106171400 - SC00908012CCD - EF-G1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
08...	1410	--	300	7.3	156	0	127	13	6.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
08...	10	35	13	140	13	--	--	0	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
08...	0	--	--	--	--	--	8	--	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
08...	--	3	--	10	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
08...	0	--	0	--	--	--	--	--	200

BOULDER STUDY AREA

400608105203000 - JAMES C AT MOUTH NR JAMESTOWN, CO - JC-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
30...	1250	--	200	7.4	19	0	16	1.2	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
30...	--	13	3.0	45	29	--	--	--	20

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
30...	1	--	--	70	2	20	1	70	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
30...	100	1	150	140	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
30...	2	--	--	--	--	--	--	390	360

400640105222600 - JAMES C AB JENKS GULCH NR JAMESTOWN, CO - JC-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
30...	1425	--	200	7.1	20	0	16	2.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
30...	--	13	3.0	45	29	--	--	--	40

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
30...	2	--	--	120	2	50	0	460	260

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
30...	200	1	190	220	--	--	--	--	130

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
30...	1	--	--	--	--	--	--	570	550

400659105232700 - L JAMES C AT MOUTH AT JAMESTOWN, CO - JC-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
01...	1100	E .5	1500	7.0	36	0	30	5.8	1.0
FEB., 1973									
02...	1030	E .6	1050	6.8	82	0	67	21	2.0
JUNE									
28...	1715	E .8	950	6.1	26	0	21	33	20.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
01...	--	85	23	310	280	--	--	--	100
FEB., 1973									
02...	--	58	17	210	140	--	--	--	50
JUNE									
28...	--	62	18	230	210	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
01...	50	--	--	100	25	150	60	2700	480
FEB., 1973									
02...	40	--	--	100	17	110	10	2100	190
JUNE									
28...	30	--	--	20	15	110	30	2800	180

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
01...	400	7	3400	3600	--	--	--	--	150
FEB., 1973									
02...	100	2	2300	2500	--	--	--	--	75
JUNE									
28...	100	1	2900	3000	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
01...	60	--	--	--	--	--	--	9300	9300
FEB., 1973									
02...	50	--	--	--	--	--	--	5300	5000
JUNE									
28...	25	--	--	--	--	--	--	4500	4300

400745105240700 - L JAMES C AB JAMESTOWN, CO - JC-4

DATE	TIME	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPERATURE (DEG C)
DEC., 1972									
01...	1245	--	160	6.9	17	0	14	3.4	.5
JUNE, 1973									
28...	1645	E .25	110	6.8	29	0	24	7.4	17.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DISSOLVED ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)
DEC., 1972									
01...	--	15	3.2	51	37	--	--	--	30
JUNE, 1973									
28...	--	9.7	2.6	35	11	--	--	--	<10

DATE	DISSOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)
DEC., 1972									
01...	1	--	--	80	2	70	50	360	150
JUNE, 1973									
28...	1	--	--	<20	0	30	10	320	110

DATE	TOTAL LEAD (PB) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
01...	200	2	320	30	--	--	--	--	100
JUNE, 1973									
28...	<100	3	40	50	--	--	--	--	<25

DATE	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
DEC., 1972									
01...	1	--	--	--	--	--	--	420	420
JUNE, 1973									
28...	3	--	--	--	--	--	--	90	70

400656105232800 - JAMES C AB L JAMES C AT JAMESTOWN, CO - JC-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
01...	1155	--	65	7.6	19	0	16	.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
01...	--	5.2	1.0	17	1	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
01...	0	--	--	70	1	20	4	120	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
01...	100	0	20	10	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
01...	2	--	--	--	--	--	--	20	30

CRESTED BUTTE STUDY AREA

384853106541500 - SLATE R AT MOUTH NR CRESTED BUTTE, CO - SR-1A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
27...	1045	--	85	7.0	36	0	30	5.8	8.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
27...	--	12	1.8	37	7	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
27...	1	--	--	--	--	10	6	1500	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
27...	100	2	100	30	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
27...	2	--	--	--	--	--	--	160	110

385107106571000 - SLATE R AB BAXTER GULCH NR CRESTED BUTTE, CO - SR-1B

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
27...	1005	--	75	6.9	29	0	24	5.8	6.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
27...	--	10	1.6	32	8	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
27...	1	--	--	--	--	10	6	2000	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
27...	<100	2	250	40	--	--	--	--	25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
27...	1	--	--	--	--	--	--	230	100

385231106583200 - SLATE R BL COAL C AT CRESTED BUTTE, CO - SR-1C

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
05...	1210	--	200	6.6	46	0	38	18	2.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
05...	--	23	4.0	74	36	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
05...	20	--	--	--	--	--	20	--	110

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
05...	--	0	--	4000	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
05...	4	--	--	--	--	--	--	--	3000

385235106584200 - COAL C AT MOUTH AT CRESTED BUTTE, CO - SR-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
05...	1115	--	260	6.6	34	0	28	14	1.0
JUNE									
25...	1630	E 150	65	6.6	19	0	16	7.6	12.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
05...	--	26	5.7	88	60	--	--	--	40
JUNE									
25...	--	6.5	.8	20	4	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
05...	30	--	--	--	--	130	10	3700	60
JUNE									
25...	1	--	--	--	--	420	16	400	120

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
05...	100	0	9200	9000	--	--	--	--	<50
JUNE									
25...	<100	4	480	300	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
05...	6	--	--	--	--	--	--	7100	6300
JUNE									
25...	0	--	--	--	--	--	--	9000	460

385208107004000 - COAL C AB WILDCAT C NR CRESTED BUTTE, CO - SR-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
05...	1550	1.9	380	5.2	2	0	2	20	1.0
JUNE									
26...	1035	E130	70	6.3	22	0	18	18	6.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
05...	--	34	7.6	120	120	--	--	--	70
JUNE									
26...	--	7.1	.9	21	3	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
05...	60	--	--	--	--	240	210	5700	1200
JUNE									
26...	2	--	--	--	--	30	30	320	140

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
05...	100	22	22000	22000	--	--	--	--	<50
JUNE									
26...	<100	4	390	860	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
05...	50	--	--	--	--	--	--	14000	14000
JUNE									
26...	8	--	--	--	--	--	--	550	970

385207107021400 - KEYSTONE MINE NR CRESTED BUTTE, CO - SR-S4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
06...	0945	.38	925	3.3	0	0	0	.0	10.5
JUNE									
26...	0950	E 1.5	1050	3.3	0	0	0	.0	13.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
06...	--	63	18	230	230	--	--	--	320
JUNE									
26...	--	68	18	240	240	--	--	--	430

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
06...	350	--	--	--	--	970	980	11000	11000
JUNE									
26...	440	--	--	--	--	2000	2000	16000	14000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
06...	800	640	61000	66000	--	--	--	--	150
JUNE									
26...	800	800	70000	69000	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
06...	150	--	--	--	--	--	--	65000	69000
JUNE									
26...	75	--	--	--	--	--	--	80000	82000

385122107032900 - COAL C BL ELK C NR CRESTED BUTTE, CO - SR-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
07...	1315	--	90	6.6	36	0	30	14	1.0
JUNE									
26...	0835	EBC	60	6.6	19	0	16	7.6	4.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
07...	--	14	1.6	42	12	--	--	--	<10
JUNE									
26...	--	6.7	.7	20	4	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
07...	10	--	--	--	--	<10	5	170	60
JUNE									
26...	0	--	--	--	--	<10	9	260	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
07...	<100	1	80	90	--	--	--	--	<50
JUNE									
26...	<100	2	70	50	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
07...	1	--	--	--	--	--	--	230	180
JUNE									
26...	0	--	--	--	--	--	--	290	190

385219107054000 - COAL CREEK AT IRWIN, CO - SR-5A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
26...	1700	E 20	<50	6.9	17	0	14	3.4	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
26...	--	5.0	.7	15	1	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
26...	1	--	--	--	--	10	2	1400	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
26...	<100	2	70	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
26...	3	--	--	--	--	--	--	30	20

385239106583700 - SLATE R AB COAL C AT CRESTED BUTTE, CO - SR-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
05...	1240	12	160	6.7	46	0	38	15	1.5
JUNE									
27...	0845	--	65	6.8	24	0	20	6.1	4.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
05...	--	21	2.9	64	26	--	--	--	--
JUNE									
27...	--	9.6	.9	28	8	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
05...	0	--	--	--	--	--	10	--	140
JUNE									
27...	1	--	--	--	--	20	9	3800	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
05...	--	1	--	120	--	--	--	--	--
JUNE									
27...	<100	2	120	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
05...	2	--	--	--	--	--	--	--	120
JUNE									
27...	0	--	--	--	--	--	--	210	50

385437107015600 - OH-BE-JOYFUL C AT MC NR CRESTED BUTTE, CO - SR-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
06...	1600	--	150	6.8	48	0	39	12	.0
JUNE									
26...	1445	E70	55	6.7	19	0	16	6.1	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
06...	--	22	2.1	64	25	--	--	--	--
JUNE									
26...	--	6.0	.4	17	1	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
06...	10	--	--	--	--	--	2	--	50
JUNE									
26...	1	--	--	--	--	20	10	270	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
06...	--	3	--	480	--	--	--	--	--
JUNE									
26...	<100	14	50	30	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
06...	2	--	--	--	--	--	--	--	620
JUNE									
26...	1	--	--	--	--	--	--	250	210

385450107015700 - SLATE R AB O-B-J C NR CRESTED BUTTE, CO - SR-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
MAR., 1973									
06...	1545	--	480	8.0	230	0	189	3.7	.0
JUNE									
26...	1300	E170	55	6.5	29	0	24	15	10.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
MAR., 1973									
06...	--	64	17	230	41	--	--	--	--
JUNE									
26...	--	12	.8	33	9	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
MAR., 1973									
06...	0	--	--	--	--	--	10	--	50
JUNE									
26...	0	--	--	--	--	<10	3	760	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
MAR., 1973									
06...	--	3	--	20	--	--	--	--	--
JUNE									
26...	<100	1	30	20	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR., 1973									
06...	4	--	--	--	--	--	--	--	50
JUNE									
26...	0	--	--	--	--	--	--	70	20

SNAKE RIVER STUDY AREA

393607105594500 - SNAKE R AT KEYSTONE, CO - SN-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
26...	1235	E 26	140	7.0	29	0	24	4.6	2.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
26...	--	14	2.8	47	23	30	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
26...	0	--	--	--	--	20	2	300	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
26...	200	3	190	180	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
26...	2	--	--	30	0	--	--	320	270

393557105512400 - PERU C AT MOUTH NR MONTEZUMA, CO - SN-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
26...	1600	--	140	5.9	5	0	4	10	3.0
MAR., 1973									
02...	1215	--	190	5.5	5	0	4	25	3.0
JUNE									
19...	1330	E105	120	7.0	24	0	20	3.8	6.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
26...	--	12	2.9	42	38	220	--	--	40
MAR., 1973									
02...	--	17	3.8	58	54	420	--	--	<10
JUNE									
19...	--	8.8	1.7	29	9	30	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
26...	1	--	--	--	--	60	60	310	130
MAR., 1973									
02...	1	--	--	--	--	70	70	270	50
JUNE									
19...	1	--	--	--	--	50	35	350	160

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
26...	200	7	570	600	--	--	--	--	100
MAR., 1973									
02...	<100	2	670	700	--	--	--	--	<50
JUNE									
19...	50	1	430	440	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
26...	7	--	--	30	0	--	--	1000	1100
MAR., 1973									
02...	10	--	--	<10	0	--	--	1700	1700
JUNE									
19...	9	--	--	<10	0	--	--	840	630

393601105511700 - PERU C TR NR MONTEZUMA, CO - SN-S2A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
26...	1730	--	--	6.6	--	--	--	--	2.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
26...	--	7.9	1.3	25	--	0	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
26...	0	--	--	--	--	--	1	--	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
26...	--	1	--	0	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
26...	1	--	--	--	0	--	--	--	30

393600105495900 - PERU C AB WARDEN GULCH NR MONTEZUMA, CO - SN-2B

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
27...	1255	--	180	4.9	2	0	2	40	.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
27...	--	14	3.6	50	48	1900	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
27...	4	--	--	--	--	--	110	--	530

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
27...	--	25	--	1100	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
27...	24	--	--	--	0	--	--	--	1500

393600105485900 - CINNAMON GULCH AT MOUTH NR MONTEZUMA, CO - SN-2C

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
27...	1410	--	210	4.3	0	0	0	.0	.0
JUNE, 1973									
19...	0935	E2.5	140	4.1	0	0	0	.0	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
27...	--	13	3.9	49	49	3300	--	--	--
JUNE, 1973									
19...	--	7.7	2.0	27	27	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
27...	4	--	--	--	--	--	140	--	120
JUNE, 1973									
19...	4	--	--	--	--	120	120	670	500

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
27...	--	17	--	1900	--	--	--	--	--
JUNE, 1973									
19...	<50	9	1000	1000	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
27...	25	--	--	--	1	--	--	--	1400
JUNE, 1973									
19...	11	--	--	<10	0	--	--	1100	1200

393704105474200 - PERU C TR NO. 2 NR MONTEZUMA, CO - SN-2D

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
27...	1150	--	120	6.9	11	0	9	2.2	.0
JUNE, 1973									
19...	0850	E1.5	115	6.8	29	0	24	7.4	.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
27...	--	12	2.9	42	33	30	--	--	40
JUNE, 1973									
19...	--	13	2.5	43	19	10	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
27...	1	--	--	--	--	20	1	60	9
JUNE, 1973									
19...	0	--	--	--	--	10	10	180	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
27...	300	1	160	160	--	--	--	--	100
JUNE, 1973									
19...	<50	0	50	10	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
27...	10	--	--	30	0	--	--	190	190
JUNE, 1973									
19...	2	--	--	<10	0	--	--	200	20

393530105521600 - SNAKE R AB PERU C NR MONTEZUMA, CO - SN-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
27...	1500	--	180	7.0	17	0	14	2.7	1.0
JAN., 1973									
03...	0940	--	170	6.5	40	0	33	20	.0
MAR.									
02...	1100	--	200	6.2	17	0	14	17	.5
JUNE									
19...	1405	E120	260	6.8	12	0	10	3.0	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
27...	--	17	3.9	59	45	30	--	--	20
JAN., 1973									
03...	--	19	5.2	69	36	30	--	--	40
MAR.									
02...	--	20	4.5	68	54	50	--	--	<10
JUNE									
19...	--	9.0	1.9	30	20	30	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
27...	0	--	--	--	--	10	1	310	50
JAN., 1973									
03...	0	--	--	--	--	20	6	240	50
MAR.									
02...	0	--	--	--	--	10	1	410	90
JUNE									
19...	1	--	--	--	--	20	6	530	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
27...	100	2	360	400	--	--	--	--	50
JAN., 1973									
03...	200	2	370	380	--	--	--	--	50
MAR.									
02...	<100	1	390	390	--	--	--	--	<50
JUNE									
19...	<50	0	260	180	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
27...	8	--	--	20	1	--	--	370	340
JAN., 1973									
03...	4	--	--	30	0	--	--	470	440
MAR.									
02...	7	--	--	<10	0	--	--	520	460
JUNE									
19...	6	--	--	<10	0	--	--	6500	230

393414105513800 - SNAKE R AB MONTEZUMA, CO - SN-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
27...	1620	--	140	6.4	4	0	3	2.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
27...	--	11	3.7	43	40	170	--	--	20

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
27...	1	--	--	--	--	30	12	380	120

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
27...	200	1	430	480	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
27...	17	--	--	20	1	--	--	220	190

393334105513700 - DEER C AT MOUTH NR MONTEZUMA, CO - SN-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
28...	0945	2.5	100	6.9	36	0	30	7.3	.0
JUNE, 1973									
19...	1045	E12	65	7.2	26	0	21	2.6	2.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
28...	--	12	2.0	38	8	10	--	--	30
JUNE, 1973									
19...	--	9.1	1.3	28	7	30	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
28...	0	--	--	--	--	20	3	120	60
JUNE, 1973									
19...	0	--	--	--	--	10	19	270	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
28...	100	3	40	30	--	--	--	--	100
JUNE, 1973									
19...	<50	8	10	10	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
28...	1	--	--	20	0	--	--	20	20
JUNE, 1973									
19...	6	--	--	<10	0	--	--	20	10

393345105511300 - SNAKE R AB DEER C NR MONTEZUMA, CO - SN-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
28...	1200	3.1	240	4.0	0	0	0	.0	.5
JUNE, 1973									
19...	1135	--	115	4.3	0	0	0	.0	2.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
28...	--	9.5	5.0	44	44	4400	--	--	30
JUNE, 1973									
19...	--	5.0	2.0	21	21	--	--	--	20

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
28...	2	--	--	--	--	30	10	770	690
JUNE, 1973									
19...	1	--	--	--	--	20	20	830	520

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
28...	100	8	980	1100	--	--	--	--	150
JUNE, 1973									
19...	<50	4	340	340	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
28...	25	--	--	20	0	--	--	410	440
JUNE, 1973									
19...	25	--	--	<10	0	--	--	220	170

CREEDE STUDY AREA

08217000 - RIO GRANDE AT WASON BL CREEDE, CO - RG-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
11...	1345	--	100	7.9	40	--	33	.8	10.5
DEC.									
13...	1030	--	100	7.2	48	0	39	4.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
11...	--	9.7	1.4	29	0	--	--	--	--
DEC.									
13...	--	12	2.3	39	0	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
11...	0	--	--	--	--	--	2	--	80
DEC.									
13...	1	--	--	--	--	--	4	--	60

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
11...	--	2	--	70	--	.0	--	--	--
DEC.									
13...	--	3	--	100	--	.0	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
11...	0	--	--	--	--	--	--	--	40
DEC.									
13...	1	--	--	--	--	--	--	--	210

374923106543200 - WILLOW C DI NO. 2 AT MOUTH NR CREEDE, CO - RG-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972 11...	1100	E 5	270	8.2	43	0	35	.4	12.0
DEC. 12...	1440	11	240	7.3	40	0	33	3.2	3.5
FEB., 1973 13...	1150	8.2	230	6.7	46	0	38	15	3.0
JUNE 07...	0650	16	140	6.6	24	--	20	9.6	3.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972 11...	--	22	1.4	60	25	--	--	--	--
DEC. 12...	--	20	1.3	55	22	--	--	--	--
FEB., 1973 13...	--	23	1.3	62	24	--	--	--	<10
JUNE 07...	--	7.7	.7	22	2	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972 11...	2	--	--	--	--	--	1	--	30
DEC. 12...	3	--	--	--	--	--	1	--	20
FEB., 1973 13...	2	--	--	--	--	50	9	310	70
JUNE 07...	5	--	--	--	--	10	9	260	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972 11...	--	10	--	1700	--	.0	--	--	--
DEC. 12...	--	6	--	1300	--	.0	--	--	--
FEB., 1973 13...	100	4	1300	1400	.0	.0	--	--	75
JUNE 07...	<100	7	170	170	--	.2	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972 11...	0	--	--	--	--	--	--	--	310
DEC. 12...	0	--	--	--	--	--	--	--	1600
FEB., 1973 13...	4	--	--	--	--	--	--	1700	1500
JUNE 07...	8	--	--	--	--	--	--	1300	1200

374923106543800 - WILLOW C DI AT MOUTH NR CREEDE, CO - RG-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
11...	0850	E 1.5	260	7.0	70	0	57	11	6.5
DEC.									
12...	1600	.95	200	7.2	72	0	59	7.3	4.5
FEB., 1973									
13...	1400	.90	210	6.7	72	0	59	23	5.0
JUNE									
07...	0805	E45	80	6.6	26	0	21	10	4.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
11...	--	25	2.4	72	15	--	--	--	--
DEC.									
12...	--	26	2.7	76	17	--	--	--	--
FEB., 1973									
13...	--	26	2.7	76	17	--	--	--	10
JUNE									
07...	--	7.8	.7	22	1	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
11...	4	--	--	--	--	--	0	--	20
DEC.									
12...	6	--	--	--	--	--	2	--	20
FEB., 1973									
13...	7	--	--	--	--	30	6	--	50
JUNE									
07...	4	--	--	--	--	10	9	230	160

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
11...	--	4	--	80	--	.0	--	--	--
DEC.									
12...	--	5	--	0	--	.0	--	--	--
FEB., 1973									
13...	<100	1	--	20	.0	.1	--	--	75
JUNE									
07...	<100	14	180	170	--	.1	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
11...	1	--	--	--	--	--	--	--	2600
DEC.									
12...	2	--	--	--	--	--	--	--	2400
FEB., 1973									
13...	0	--	--	--	--	--	--	2500	2400
JUNE									
07...	8	--	--	--	--	--	--	1000	950

375023106552300 - WILLOW C BL CREEDE, CO - RG-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
11...	1255	E4.5	240	8.5	57	0	47	.3	14.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
11...	--	22	1.3	60	13	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
11...	3	--	--	--	--	--	4	--	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
11...	--	13	--	1900	--	.0	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
11...	1	--	--	--	--	--	--	--	210

08216500 - WILLOW C AT CREEDE, CO - RG-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
10...	1100	9.8	280	8.0	41	0	34	.7	9.0
DEC.									
12...	1200	5.0	260	7.3	50	--	41	4.0	3.5
JUNE, 1973									
07...	1000	105	90	6.6	24	0	20	9.6	5.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
10...	--	17	1.2	47	13	--	--	--	--
DEC.									
12...	--	--	--	--	--	--	--	--	--
JUNE, 1973									
07...	--	8.6	.8	25	5	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
10...	2	--	--	--	--	--	1	--	20
DEC.									
12...	3	--	--	--	--	--	2	--	90
JUNE, 1973									
07...	3	--	--	--	--	30	10	530	60

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
10...	--	9	--	1300	--	.0	--	--	--
DEC.									
12...	--	5	--	2900	--	.0	--	--	--
JUNE, 1973									
07...	<100	10	390	350	--	.2	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
10...	2	--	--	--	--	--	--	--	330
DEC.									
12...	1	--	--	--	--	--	--	--	880
JUNE, 1973									
07...	8	--	--	--	--	--	--	900	540

375123106554500 - WINDY GULCH AT MOUTH AT CREEDE, CO - RG-5C

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
12...	1255	--	390	7.6	65	0	53	2.6	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
12...	--	--	--	--	--	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
12...	--	--	--	--	--	50	--	1200	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
12...	1400	--	7100	--	0.6	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
12...	--	--	--	--	--	--	--	2000	--

375157106551900 - E WILLOW C AT MOUTH AT NORTH CREEDE, CO - RG-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
10...	1235	--	120	8.0	34	0	28	.5	9.0
DEC.									
12...	1040	--	70	6.9	29	0	24	5.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
10...	--	7.8	.8	22	0	--	--	--	--
DEC.									
12...	--	7.5	1.2	23	0	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
10...	1	--	--	--	--	--	2	--	60
DEC.									
12...	3	--	--	--	--	--	2	--	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
10...	--	16	--	10	--	.0	--	--	--
DEC.									
12...	--	10	--	10	--	.0	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
10...	0	--	--	--	--	--	--	--	260
DEC.									
12...	2	--	--	--	--	--	--	--	640

375202106553400 - W WILLOW C AT MOUTH AT NORTH CREEDE, CO - RG-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
10...	1315	--	130	7.9	36	0	30	.7	8.0
DEC.									
12...	1115	--	110	6.9	34	0	28	6.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
10...	--	13	1.4	38	8	--	--	--	--
DEC.									
12...	--	11	1.5	33	5	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
10...	4	--	--	--	--	--	2	--	20
DEC.									
12...	6	--	--	--	--	--	3	--	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
10...	--	12	--	70	--	.0	--	--	--
DEC.									
12...	--	13	--	50	--	.0	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
10...	0	--	--	--	--	--	--	--	890
DEC.									
12...	1	--	--	--	--	--	--	--	1600

375424106571600 - W WILLOW C AB NORTH CREEDE, CO - RG-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
10...	1530	--	140	7.8	43	0	35	1.1	9.0
JUNE, 1973									
07...	0920	--	70	7.0	26	0	21	4.2	2.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
10...	--	13	1.3	37	2	--	--	--	--
JUNE, 1973									
07...	--	7.9	.9	23	2	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
10...	0	--	--	--	--	--	1	--	40
JUNE, 1973									
07...	0	--	--	--	--	<10	9	190	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
10...	--	0	--	0	--	.0	--	--	--
JUNE, 1973									
07...	<100	2	10	0	--	.4	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
10...	1	--	--	--	--	--	--	--	20
JUNE, 1973									
07...	7	--	--	--	--	--	--	20	20

374900106545100 - RIO GRANDE AB DEEP C NR CREEDE, CO - RG-9

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
10...	1705	--	100	7.9	46	0	38	.9	9.5
DEC.									
12...	1335	--	100	7.1	48	0	39	6.1	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
10...	--	8.9	1.4	28	0	--	--	--	--
DEC.									
12...	--	12	2.0	38	0	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
10...	0	--	--	--	--	--	1	--	70
DEC.									
12...	0	--	--	--	--	--	3	--	70

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
10...	--	2	--	10	--	.1	--	--	--
DEC.									
12...	--	2	--	20	--	.1	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
10...	0	--	--	--	--	--	--	--	10
DEC.									
12...	2	--	--	--	--	--	--	--	30

OURAY STUDY AREA

380448107420800 - UNCOMPAHGRE R AB CUTLER C NR OURAY, CO - UR-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
14...	1130	--	700	6.5	50	0	41	25	2.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
14...	--	120	4.9	320	280	--	--	--	40

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
14...	2	--	--	--	--	160	7	3800	9

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
14...	300	3	610	530	--	--	--	--	130

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
14...	23	--	--	--	--	--	--	630	250

380148107402400 - UNCOMPAHGRE R AB SKYROCKET C AT OURAY, CO - UR-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
14...	1245	--	800	7.0	55	0	45	8.8	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
14...	--	140	5.3	370	320	--	--	--	50

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
14...	1	--	--	--	--	150	40	3700	60

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
14...	300	4	580	540	--	--	--	--	150

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
14...	16	--	--	--	--	--	--	590	460

09145500 - CANYON C AT OURAY, CO - UR-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
14...	1420	--	650	7.6	77	0	63	3.1	1.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
14...	--	130	3.5	340	280	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
14...	1	--	--	--	--	--	4	--	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
14...	--	29	--	150	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
14...	2	--	--	--	--	--	--	--	190

380007107413600 - CANYON C BL SQUAW GULCH NR OURAY, CO - UR-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
15...	1220	16	500	7.4	67	0	55	4.3	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
15...	--	130	3.0	340	280	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
15...	1	--	--	--	--	--	2	--	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
15...	--	48	--	160	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
15...	1	--	--	--	--	--	--	--	220

375808107433600 - IMOGENE C AT MOUTH AT CAMP BIRD, CO - UR-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
14...	1600	--	170	7.3	43	0	35	3.4	--

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
14...	--	25	1.5	69	34	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
14...	1	--	--	--	--	--	8	--	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
14...	--	6	--	0	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
14...	2	--	--	--	--	--	--	--	420

375818107434000 - SNEFFELS C AT MOUTH AT CAMP BIRD, CO - UR-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
15...	1130	--	200	7.3	48	0	39	3.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
15...	--	37	2.8	100	61	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
15...	0	--	--	--	--	--	4	--	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
15...	--	2	--	10	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
15...	1	--	--	--	--	--	--	--	170

375732107394000 - RED MOUNTAIN C AB CRYSTAL LK NR IRONTON, CO - UR-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
15...	1540	--	950	3.4	0	0	0	.0	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
15...	--	--	--	--	--	--	--	--	50

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
15...	--	--	--	--	--	800	--	24000	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
15...	300	--	250D	--	--	--	--	--	180

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
15...	--	--	--	--	--	--	--	2500	--

375623107401200 - RED MTN C AB GRAY COPPER GL NR IRONTON, CO - UR-9

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
15...	1445	--	950	3.3	0	0	0	.0	1.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
15...	--	120	9.2	340	340	--	--	--	60

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
15...	30	--	--	--	--	1300	1400	49000	32000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
15...	400	140	2600	2700	--	--	--	--	180

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
15...	50	--	--	--	--	--	--	3500	3500

375422107422600 - RED MTN C NR SOURCE AT RED MOUNTAIN, CO - UR-10

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
16...	1020	--	110	7.2	31	0	25	3.1	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
16...	--	16	.8	43	18	--	--	--	50

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
16...	0	--	--	--	--	20	19	60	190

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
16...	200	3	20	10	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
16...	2	--	--	--	--	--	--	20	30

375916107385400 - UNCOMPAHGRE R AB RED MTN C NR OURAY, CO - UR-11

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972 16...	0825	--	230	7.0	53	--	43	8.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972 16...	--	44	2.9	120	77	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972 16...	1	--	--	--	--	20	10	160	120

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972 16...	200	7	120	120	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972 16...	2	--	--	--	--	--	--	240	280

ALAMOSA CREEK STUDY AREA

08236500 - ALAMOSA C BL TERRACE RE, CO - AL-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1015	--	320	6.9	22	0	18	4.4	11.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	33	5.3	100	82	--	--	--	20

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	20	8	140	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	200	2	80	50	--	--	--	--	75

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	6	--	--	--	--	--	--	40	30

08236000 - ALAMOSA C AB TERRACE RE, CO - AL-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
04...	1320	12	320	7.2	22	0	18	2.2	12.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
04...	--	38	5.9	120	100	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
04...	0	--	--	--	--	40	17	240	20

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
04...	200	2	210	190	--	--	--	--	100

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
04...	13	--	--	--	--	--	--	70	50

372418106270600 - ALAMOSA C AB CASTLEMAN GL NR JASPER, CO - AL-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS (CACO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
04...	1620	--	380	5.2	4	0	3	40	11.0
05...	1140	--	160	6.2	2	0	2	2.4	7.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
04...	--	44	6.8	140	140	--	--	--	--
05...	--	--	--	--	--	--	--	--	30

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
04...	10	--	--	--	--	--	200	--	3200
05...	--	--	--	--	--	180	--	1700	--

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
04...	--	4	--	460	--	--	--	--	--
05...	200	--	490	--	--	--	--	--	150

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
04...	25	--	--	--	--	--	--	--	140
05...	--	--	--	--	--	--	--	100	--

372415106311600 - WIGHTMAN F ALAMOSA C AT MO NR JASPER, CO - AL-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1220	--	260	5.3	4	0	3	32	8.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	30	4.6	94	91	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	3	--	--	--	--	--	1300	--	320

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	2	--	470	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	50	--	--	--	--	--	--	--	540

372553106355600 - WIGHTMAN F ALAMOSA C AT SUMMITVILLE, CO - AL-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1815	--	130	6.7	11	0	9	3.5	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	8.0	2.0	28	19	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	--	90	--	100

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	1	--	190	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	3	--	--	--	--	--	--	--	140

3724041063126C0 - ALAMOSA C AB WIGHTMAN F NR JASPER, CO - AL-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1310	--	140	6.6	10	--	8	4.0	8.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	12	2.2	39	31	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	--	14	--	620

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	1	--	170	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	3	--	--	--	--	--	--	--	20

372341106330500 - BITTER C AT MOUTH NR JASPER, CO - AL-6A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1355	--	600	3.3	0	0	0	.0	9.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	32	9.7	120	120	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	1	--	--	--	--	--	60	--	17000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	8	--	1300	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	50	--	--	--	--	--	--	--	130

372306106335700 - ALUM C AT MOUTH NR JASPER, CO - AL-6B

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1440	--	2000	2.7	0	0	0	.0	12.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	63	28	270	270	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	20	--	--	--	--	--	270	--	170000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	1	--	5700	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	100	--	--	--	--	--	--	--	940

372253106360800 - IRON C NR MOUTH NR JASPER, CO - AL-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1520	--	180	4.4	0	0	0	.0	10.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	12	2.7	41	41	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	10	--	--	--	--	--	10	--	1200

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	6	--	360	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	8	--	--	--	--	--	--	--	50

372413106384800 - IRON C NR SOURCE NR JASPER, CO - AL-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1710	--	90	7.0	22	0	18	3.5	8.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	5.7	.6	17	0	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	--	4	--	200

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	3	--	40	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	--	--	--	0

372213106383300 - TREASURE C AB PROSPECT C NR JASPER, CO - AL-9

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
05...	1610	--	85	7.1	28	0	23	3.6	8.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
05...	--	7.0	1.0	22	0	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
05...	0	--	--	--	--	--	6	--	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
05...	--	4	--	10	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
05...	3	--	--	--	--	--	--	--	10

LAKE CREEK STUDY AREA

390444106174900 - LAKE C @ STATE HWY 82 BL TWIN LAKES RE, CO - LC-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
29...	1110	10	80	7.0	29	0	24	4.6	6.0
JUNE, 1973									
22...	0900	--	80	7.2	26	0	21	2.6	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
29...	--	10	1.3	30	6	--	--	--	30
JUNE, 1973									
22...	--	11	1.4	33	12	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
29...	0	--	--	--	--	20	6	240	30
JUNE, 1973									
22...	0	--	--	--	--	10	8	180	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
29...	200	0	20	0	--	--	--	--	100
JUNE, 1973									
22...	<50	0	10	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
29...	1	--	--	--	--	--	--	30	10
JUNE, 1973									
22...	1	--	--	--	--	--	--	40	20

07084500 - LAKE C AB TWIN LAKES RE, CO - LC-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
29...	1345	31	120	7.1	34	0	28	4.3	1.5
JAN., 1973									
06...	0930	13	80	7.0	31	--	25	5.0	.0
MAR.									
03...	1030	12	160	6.8	31	0	25	7.9	.0
JUNE									
22...	1000	777	<50	7.6	19	0	16	.8	4.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
29...	--	14	2.0	43	15	--	--	--	30
JAN., 1973									
06...	--	16	2.6	51	26	--	--	--	40
MAR.									
03...	--	19	2.7	59	34	--	--	--	<10
JUNE									
22...	--	8.3	.9	24	--	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
29...	0	--	--	--	--	40	7	550	60
JAN., 1973									
06...	0	--	--	--	--	40	14	240	30
MAR.									
03...	0	--	--	--	--	20	10	280	70
JUNE									
22...	0	--	--	--	--	20	18	1100	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
29...	200	1	20	20	--	--	--	--	100
JAN., 1973									
06...	200	2	30	0	--	--	--	--	50
MAR.									
03...	<100	0	20	20	--	--	--	--	<50
JUNE									
22...	<50	0	20	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
29...	2	--	--	--	--	--	--	30	0
JAN., 1973									
06...	2	--	--	--	--	--	--	40	20
MAR.									
03...	7	--	--	--	--	--	--	30	30
JUNE									
22...	2	--	--	--	--	--	--	140	20

390402106301800 - N F LAKE C AT MOUTH NR TWIN LAKES, CO - LC-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
01...	0940	--	120	7.4	34	0	28	2.2	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
01...	--	9.7	1.6	31	3	--	--	--	20

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
01...	0	--	--	--	--	20	6	110	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
01...	100	2	0	10	--	--	--	--	150

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
01...	1	--	--	--	--	--	--	30	0

390402106300900 - S F LAKE C AT MOUTH NR TWIN LAKES, CO - LC-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
31...	1415	8.5	200	5.1	2	0	2	25	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
31...	--	17	3.4	56	54	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
31...	10	--	--	--	--	170	140	4400	1100

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
31...	200	2	90	90	--	--	--	--	130

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
31...	25	--	--	--	--	--	--	80	60

NORTH CLEAR CREEK STUDY AREA

394450105235100 - N CLEAR C AT MOUTH NR IDAHO SPRINGS, CO - CC-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
24...	1620	3.3	520	6.1	--	--	--	--	.0
JUNE									
28...	0750	56	130	6.5	17	0	14	8.6	9.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
24...	--	52	16	200	--	--	9	2	10
JUNE									
28...	--	11	3.2	41	27	--	4	0	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
24...	8	--	--	--	--	300	150	9600	5000
JUNE									
28...	1	--	--	--	--	130	90	1900	1000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
24...	100	2	5000	4900	--	--	--	--	75
JUNE									
28...	<100	6	750	710	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
24...	50	6	3	--	--	--	--	2900	2800
JUNE									
28...	13	67	27	--	--	--	--	580	490

LION CREEK STUDY AREA

394542105410200 - LION C AT MOUTH AT EMPIRE, CO - CC-23

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
29...	0945	.20	900	3.2	0	0	0	.0	.0
JUNE									
28...	1345	3.3	420	3.3	0	0	0	.0	14.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
29...	--	75	25	290	290	--	--	--	10
JUNE									
28...	--	19	7.1	77	77	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
29...	6	--	--	--	--	800	850	4400	4300
JUNE									
28...	2	--	--	--	--	570	600	5800	4900

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
29...	<100	8	11000	12000	--	--	--	--	180
JUNE									
28...	<100	7	2900	3000	--	--	--	--	25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
29...	150	--	--	--	--	--	--	860	980
JUNE									
28...	25	--	--	--	--	--	--	310	310

394650105412500 - LION C NR SOURCE NR EMPIRE, CO - CC-23A

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
29...	1215	--	140	6.7	12	0	10	3.8	3.0
JUNE									
28...	1245	E1.5	<50	6.8	12	0	10	3.0	7.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
29...	--	8.9	1.5	28	18	--	--	--	10
JUNE									
28...	--	2.3	.4	7	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
29...	0	--	--	--	--	40	26	530	40
JUNE									
28...	0	--	--	--	--	10	8	140	100

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
29...	<100	0	50	60	--	--	--	--	50
JUNE									
28...	<100	3	10	20	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
29...	4	--	--	--	--	--	--	30	20
JUNE									
28...	2	--	--	--	--	--	--	50	10

IDAHO SPRINGS STUDY AREA

394442105291500 - CLEAR C AB STP OUTFALL @ IDAHO SPRINGS, CO - CC-15

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973 24...	1340	--	350	6.8	98	0	80	25	.0
JUNE 28...	1040	E 550	90	6.9	24	0	20	4.8	8.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973 24...	--	32	7.2	110	30	--	--	--	10
JUNE 28...	--	7.8	1.7	26	6	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973 24...	2	--	--	60	3	170	10	6900	40
JUNE 28...	1	--	--	<25	0	40	20	1600	150

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973 24...	<100	0	1400	1400	--	--	--	--	50
JUNE 28...	<100	2	480	300	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973 24...	20	--	--	<10	0	--	--	1000	660
JUNE 28...	4	--	--	<10	1	--	--	280	190

394433105302100 - ARGO TUNNEL @ IDAHO SPGS, CO - CC-S16

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
24...	1455	--	3000	2.8	0	0	0	.0	14.0
JUNE									
28...	1020	E1.0	3400	2.6	0	0	0	.0	15.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
24...	--	340	110	1300	1300	--	--	--	160
JUNE									
28...	--	320	130	1300	1300	--	--	--	320

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
24...	140	--	--	220	75	4900	4800	140000	140000
JUNE									
28...	300	--	--	330	330	11000	12000	380000	220000

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
24...	100	30	95000	94000	--	--	--	--	300
JUNE									
28...	200	200	150000	140000	--	--	--	--	430

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
24...	300	--	--	<10	0	--	--	45000	45000
JUNE									
28...	450	--	--	20	0	--	--	76000	81000

394444105304700 - VIRGINIA CANYON C AT MO AT IDAHO SPGS, CO - CC-17

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JUNE, 1973									
28...	1050	--	2100	2.8	0	0	0	.0	14.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JUNE, 1973									
28...	--	150	71	670	670	--	--	--	350

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JUNE, 1973									
28...	350	--	--	225	230	8200	8400	8900	9500

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JUNE, 1973									
28...	<100	22	52000	53000	--	--	--	--	580

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUNE, 1973									
28...	600	--	--	10	1	--	--	57000	63000

394434105304500 - CLEAR C AB VIRGINIA CANYON C @ IDAHO SPGS, CO - CC-18

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER- ATURE (DEG C)
JAN., 1973									
24...	1545	--	240	7.0	108	0	89	17	.0
JUNE									
28...	1120	E550	90	6.6	26	0	21	10	9.5

DATE	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)
JAN., 1973									
24...	--	30	6.7	100	11	--	--	--	<10
JUNE									
28...	--	8.1	2.0	28	7	--	--	--	<10

DATE	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
JAN., 1973									
24...	1	--	--	60	2	60	30	440	400
JUNE									
28...	2	--	--	<25	0	20	40	1600	150

DATE	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
24...	<100	3	410	760	--	--	--	--	50
JUNE									
28...	<100	2	340	300	--	--	--	--	<25

DATE	DIS- SOLVED NICKEL (NI) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL VANA- DIUM (V) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
24...	15	--	--	<10	0	--	--	360	410
JUNE									
28...	11	--	--	<10	1	--	--	210	290

FRENCH GULCH STUDY AREA

09046600 - BLUE R NR DILLON, CO - BR-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
14...	1610	25	170	7.3	70	0	57	5.6	4.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
14...	--	21	4.6	71	14	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
14...	1	--	--	--	--	<10	2	90	10

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
14...	<100	1	10	0	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
14...	4	--	--	--	--	--	--	50	60

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NCV., 1972									
14...	0930	--	280	6.7	58	0	48	19	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
14...	--	31	5.8	100	52	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
14...	2	--	--	--	--	10	3	1800	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
14...	<100	26	150	50	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
14...	6	--	--	--	--	--	--	750	620

392908106013900 - FRENCH GULCH NR MOUTH AT BRECKENRIDGE, CO - BR-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
14...	1100	--	230	7.0	64	0	52	10	.0
JAN., 1973									
19...	1200	--	480	6.4	38	0	31	24	2.5
MAR.									
22...	1300	E 1.5	260	6.5	67	0	55	34	1.0
JUNE									
19...	1625	18	200	6.6	46	0	38	18	5.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
14...	--	32	4.5	98	46	--	--	--	30
JAN., 1973									
19...	--	62	13	210	180	--	--	--	50
MAR.									
22...	--	38	5.7	120	65	--	--	--	20
JUNE									
19...	--	27	4.0	84	46	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
14...	3	--	--	--	--	10	1	160	120
JAN., 1973									
19...	3	--	--	--	--	10	9	530	570
MAR.									
22...	10	--	--	--	--	<10	1	200	70
JUNE									
19...	7	--	--	--	--	10	5	820	200

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
14...	200	3	780	900	--	--	--	--	75
JAN., 1973									
19...	300	7	7100	7200	--	--	--	--	75
MAR.									
22...	<100	0	1300	1200	--	--	--	--	<50
JUNE									
19...	<100	3	930	1100	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
14...	2	--	--	--	--	--	--	2400	2400
JAN., 1973									
19...	39	--	--	--	--	--	--	15000	15000
MAR.									
22...	3	--	--	--	--	--	--	3800	3500
JUNE									
19...	0	--	--	--	--	--	--	3700	4000

392848106574800 - FRENCH GL BL BLACK GL NR BRECKENRIDGE, CO - BR-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
14...	1345	--	140	7.1	50	0	41	6.4	.5
JUNE, 1973									
19...	1700	E50	95	7.1	36	0	30	4.6	5.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
14...	--	19	1.4	53	12	--	--	--	30
JUNE, 1973									
19...	--	13	.9	36	6	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
14...	0	--	--	--	--	10	3	60	40
JUNE, 1973									
19...	0	--	--	--	--	10	3	270	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
14...	100	3	30	10	--	--	--	--	100
JUNE, 1973									
19...	<100	2	20	10	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
14...	0	--	--	--	--	--	--	40	40
JUNE, 1973									
19...	0	--	--	--	--	--	--	50	30

392845106024600 - BLUE R AB SAWMILL GL NR BRECKENRIDGE, CO - BR-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
14...	1510	--	180	7.1	101	0	83	13	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
14...	--	23	5.9	82	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
14...	1	--	--	--	--	<10	1	260	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
14...	<100	2	30	10	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
14...	2	--	--	--	--	--	--	20	30

CLIMAX STUDY AREA

392056106131000 - E F ARKANSAS R AB CHALK C NR CLIMAX, CO - EF-17

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
15...	0900	2.3	180	7.7	50	--	41	1.6	.0
JUNE, 1973									
20...	1530	34	85	7.4	36	0	30	2.3	10.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
15...	--	21	5.1	73	32	--	--	--	30
JUNE, 1973									
20...	--	10	2.3	34	4	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	2	--	--	--	--	30	14	120	20
JUNE, 1973									
20...	0	--	--	--	--	20	15	1500	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	100	3	410	440	--	--	19	20	130
JUNE, 1973									
20...	<100	2	170	70	--	--	27	16	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	2	--	--	--	--	--	--	220	200
JUNE, 1973									
20...	2	--	--	--	--	--	--	160	40

392024106103200 - E F ARKANSAS R AT CLIMAX, CO - EF-18

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
15...	1145	--	110	7.8	43	--	35	1.1	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
15...	--	12	3.0	42	7	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	0	--	--	--	--	<10	2	110	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	<100	4	90	100	--	--	2	2	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	0	--	--	--	--	--	--	180	180

392143106114100 - SC00807910DDD - EF-G2

DATE	TIME	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPERATURE (DEG C)
NOV., 1972									
15...	0830	--	240	6.7	22	0	18	7.2	4.5

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DISSOLVED ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)
NOV., 1972									
15...	--	24	5.7	83	42	--	--	--	--

DATE	DISSOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	5	--	--	--	--	--	10	--	--

DATE	TOTAL LEAD (PB) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	--	6	--	140	--	--	--	54	--

DATE	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	13	--	--	--	--	--	--	--	200

392514106165800 - CATARACT C AT MOUTH NR CAMP HALE, CO - ER-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
17...	1500	--	340	8.2	166	0	136	1.7	4.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
17...	--	37	16	160	24	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
17...	0	--	--	--	--	<10	2	70	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
17...	<100	3	0	10	--	--	38	45	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
17...	1	--	--	--	--	--	--	10	0

392440106150400 - E F EAGLE R AB SHEEP GL NR CAMP HALE, CO - ER-8

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
17...	1300	1.2	300	8.1	96	0	79	1.2	.0
JUNE, 1973									
20...	1420	33	160	7.6	65	0	53	2.6	9.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
17...	--	32	11	130	51	--	--	--	30
JUNE, 1973									
20...	--	19	7.5	78	25	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
17...	0	--	--	--	--	20	2	150	30
JUNE, 1973									
20...	0	--	--	--	--	10	5	920	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
17...	200	0	20	0	--	--	360	400	100
JUNE, 1973									
20...	<100	2	220	200	--	--	110	130	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
17...	2	--	--	--	--	--	--	20	20
JUNE, 1973									
20...	7	--	--	--	--	--	--	30	0

09050100 - TENMILE C BL N F AT FRISCO, CO - TM-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
16...	1355	18	170	8.2	67	0	55	.7	.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
16...	--	20	3.7	65	10	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
16...	1	--	--	--	--	<10	3	190	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
16...	<100	4	30	10	--	--	180	200	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
16...	0	--	--	--	--	--	--	110	100

393015106082300 - TENMILE C AB W TENMILE C NR KOKOMO, CO - TM-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
16...	1230	--	180	8.1	55	0	45	.7	.0
JAN., 1973									
19...	1330	--	200	7.2	60	0	49	6.1	.0
MAR.									
22...	1035	--	180	7.1	60	0	49	7.6	1.5
JUNE									
20...	0810	E180	540	7.0	38	0	31	6.1	3.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
16...	--	22	3.7	70	25	--	--	--	30
JAN., 1973									
19...	--	25	4.0	79	30	--	--	--	30
MAR.									
22...	--	28	4.1	87	38	--	--	--	--
JUNE									
20...	--	77	6.3	220	190	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
16...	1	--	--	--	--	10	2	220	20
JAN., 1973									
19...	2	--	--	--	--	10	8	40	20
MAR.									
22...	1	--	--	--	--	--	10	--	60
JUNE									
20...	2	--	--	--	--	30	30	840	190

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
16...	100	2	80	70	--	--	170	150	100
JAN., 1973									
19...	200	2	50	80	--	--	150	150	75
MAR.									
22...	--	1	--	40	--	--	--	150	--
JUNE									
20...	<100	3	930	920	--	--	4000	4400	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
16...	0	--	--	--	--	--	--	310	320
JAN., 1973									
19...	3	--	--	--	--	--	--	350	430
MAR.									
22...	4	--	--	--	--	--	--	--	320
JUNE									
20...	34	--	--	--	--	--	--	470	420

392621106095800 - MAYFLOWER GULCH AT MOUTH NR KOKOMO, CO - TM-3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
15...	1300	--	160	7.9	72	0	59	1.5	.0
JUNE, 1973									
20...	0910	E7	80	7.2	34	0	28	3.4	1.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
15...	--	20	4.5	68	9	--	--	--	30
JUNE, 1973									
20...	--	9.7	1.7	31	3	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	0	--	--	--	--	20	4	50	20
JUNE, 1973									
20...	0	--	--	--	--	10	7	120	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	300	1	10	0	--	--	1	2	75
JUNE, 1973									
20...	<100	3	10	10	--	--	5	13	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	2	--	--	--	--	--	--	60	50
JUNE, 1973									
20...	1	--	--	--	--	--	--	100	60

392540106110300 - TENMILE C BL SEARLE GULCH AT KOKOMO, CO - TM-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
16...	0835	0.93	300	7.9	91	0	75	1.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
16...	--	41	8.1	140	65	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
16...	10	--	--	--	--	10	9	370	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
16...	100	4	340	350	--	--	120	150	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
16...	3	--	--	--	--	--	--	2400	2200

392539106111700 - SEARLE GULCH AT MOUTH NR KOKOMO, CO - TM-5

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
15...	1445	--	250	8.1	91	0	75	1.2	.0
JUNE, 1973									
20...	0945	E50	140	7.2	65	0	53	6.6	3.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
15...	--	32	7.1	110	35	--	--	--	10
JUNE, 1973									
20...	--	19	5.0	68	15	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	6	--	--	--	--	10	4	250	60
JUNE, 1973									
20...	2	--	--	--	--	20	8	610	240

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	<100	5	340	300	--	--	13	0	<25
JUNE, 1973									
20...	<100	4	180	160	--	--	0	3	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	3	--	--	--	--	--	--	2400	2100
JUNE, 1973									
20...	0	--	--	--	--	--	--	1300	1200

392529106111000 - TENMILE C AT KOKOMO, CO - TM-6

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
NOV., 1972									
15...	1535	--	1050	7.9	160	0	131	3.2	.0
JUNE, 1973									
20...	1020	E75	1600	6.8	46	0	38	12	9.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
NOV., 1972									
15...	--	170	20	510	380	--	--	--	10
JUNE, 1973									
20...	--	290	19	800	760	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV., 1972									
15...	3	--	--	--	--	10	9	840	150
JUNE, 1973									
20...	4	--	--	--	--	100	90	3800	2100

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
NOV., 1972									
15...	<100	1	540	510	--	--	2300	2800	<25
JUNE, 1973									
20...	<50	0	3700	3700	--	--	86000	19000	130

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV., 1972									
15...	6	--	--	--	--	--	--	330	270
JUNE, 1973									
20...	100	--	--	--	--	--	--	700	640

URAD-HENDERSON STUDY AREA

394557105490400 - WOODS C AT MOUTH AT BERTHOUD FALLS, CO - CC-28

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
31...	1040	E.3	850	7.2	170	--	139	17	1.0
JUNE									
22...	1720	--	180	7.5	29	0	24	1.5	5.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
31...	--	120	8.5	330	190	--	--	--	<10
JUNE									
22...	--	20	1.4	56	32	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
31...	1	--	--	--	--	80	10	460	50
JUNE									
22...	1	--	--	--	--	20	20	200	40

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
31...	<100	1	16000	16000	--	--	4600	4500	50
JUNE									
22...	<50	5	1100	920	--	--	2300	1900	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
31...	22	--	--	--	--	32	29	180	140
JUNE									
22...	12	--	--	--	--	--	25	230	170

394616105491300 - W F CLEAR C AB WOODS C @ BERTHOUD FALLS, CO - CC-30

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973 31...	1130	5.9	950	8.5	427	24	388	2.1	3.5
JUNE 22...	1440	E90	140	7.7	53	0	43	1.7	6.5

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973 31...	--	100	9.4	288	0	--	--	--	<10
JUNE 22...	--	11	1.4	33	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973 31...	0	--	--	--	--	50	20	70	40
JUNE 22...	0	--	--	--	--	10	10	380	80

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973 31...	<100	0	6300	6500	--	--	--	52	25
JUNE 22...	<50	0	580	450	--	--	1	2	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973 31...	5	--	--	--	--	15	.0	240	190
JUNE 22...	4	--	--	--	--	3.1	.2	90	40

394622105513800 - W F CLEAR C AB BUTLER GL NR BERTHOUD FLS, CO - CC-31

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
JAN., 1973									
31...	1315	--	110	7.1	24	0	20	3.1	.5
JUNE									
22...	1600	E50	<50	7.8	17	0	14	.4	3.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
JAN., 1973									
31...	--	9.5	1.3	29	9	--	--	--	<10
JUNE									
22...	--	2.8	.5	9	0	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN., 1973									
31...	0	--	--	--	--	40	20	340	200
JUNE									
22...	0	--	--	--	--	10	7	400	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
JAN., 1973									
31...	<100	0	--	110	--	--	--	9	50
JUNE									
22...	<50	4	30	20	--	--	0	0	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN., 1973									
31...	4	--	--	--	--	110	.0	110	60
JUNE									
22...	3	--	--	--	--	3.1	.0	70	20

395339106053300 - WILLIAMS FORK AB KEYSER C NR LEAL, CO - WF-1

DATE	TIME	DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPERATURE (DEG C)
OCT., 1972									
18...	1525	AD 36	350	7.6	79	0	65	3.2	8.0
FEB., 1973									
27...	1215	AD 19	160	6.4	62	0	51	39	.0
JUNE									
22...	1400	AD469	60	7.8	29	0	24	.7	9.0
APR., 1974									
23...	1800	37	100	7.5	--	--	--	--	1.5

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DISSOLVED ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)
OCT., 1972									
18...	--	17	3.6	57	0	--	--	--	--
FEB., 1973									
27...	--	16	3.7	55	4	--	--	--	<10
JUNE									
22...	--	6.3	1.1	20	0	--	--	--	10
APR., 1974									
23...	--	12	2.7	41	--	--	--	--	<10

DATE	DISSOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)
OCT., 1972									
18...	0	--	--	--	--	--	4	--	190
FEB., 1973									
27...	1	--	--	--	--	--	40	410	540
JUNE									
22...	0	--	--	--	--	10	3	460	50
APR., 1974									
23...	1	--	--	--	--	<10	11	960	300

DATE	TOTAL LEAD (PB) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
18...	--	0	--	20	--	--	--	0	--
FEB., 1973									
27...	<100	4	--	490	--	--	1	0	<50
JUNE									
22...	<50	0	10	10	--	--	0	1	<25
APR., 1974									
23...	<100	4	50	20	--	--	1	0	50

DATE	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
OCT., 1972									
18...	0	--	--	--	--	--	--	--	10
FEB., 1973									
27...	10	--	--	--	--	--	--	310	310
JUNE									
22...	0	--	--	--	--	--	--	40	10
APR., 1974									
23...	0	--	--	--	--	--	--	--	--

FOURMILE CREEK STUDY AREA

383857105130900 - FOURMILE C AB WILSON C NR VICTOR, CO - FC-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
FEB., 1973									
10...	1600	7.0	990	8.2	180	0	148	1.8	8.5
MAY									
25...	1100	E430	250	7.4	96	0	79	6.1	11.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
FEB., 1973									
10...	--	180	15	510	360	--	--	--	<10
MAY									
25...	--	29	6.6	100	21	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
FEB., 1973									
10...	0	--	--	--	--	20	10	940	20
MAY									
25...	0	--	--	--	--	20	12	7300	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
FEB., 1973									
10...	<100	1	380	130	--	--	--	--	<50
MAY									
25...	<50	2	670	300	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
FEB., 1973									
10...	50	7	2	--	--	--	--	170	10
MAY									
25...	9	0	2	--	--	--	--	100	20

URAVAN STUDY AREA

382310108454600 - SAN MIGUEL R BL ATKINSON C NR URAVAN, CO - SM-1

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
17...	0835	--	1150	8.1	199	0	163	2.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
17...	--	110	52	490	330	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
17...	1	--	--	--	--	--	20	--	30

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
17...	--	4	--	240	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
17...	11	--	0	--	--	--	4.0	--	60

09177000 - SAN MIGUEL R AT URAVAN, CO - SM-7

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
DEC., 1972									
17...	1100	--	850	8.1	187	5	162	2.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
DEC., 1972									
17...	--	110	48	470	310	--	--	--	--

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC., 1972									
17...	0	--	--	--	--	--	8	--	9

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
DEC., 1972									
17...	--	3	--	190	--	--	--	--	--

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC., 1972									
17...	3	--	0	--	--	--	.7	--	50

OAK CREEK STUDY AREA

401741106574600 - OAK C AB ROUTT, CO- OC-2

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
17...	1245	--	630	8.0	215	0	176	3.4	8.5
MAR., 1973									
01...	1200	2.4	560	7.5	233	0	191	12	3.0
JUNE									
18...	1420	E55	680	7.8	228	0	187	5.8	10.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
17...	--	52	20	210	34	--	--	--	30
MAR., 1973									
01...	--	67	29	290	99	--	--	--	<10
JUNE									
18...	--	65	26	270	83	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
17...	0	--	--	--	--	10	3	700	60
MAR., 1973									
01...	0	--	--	--	--	10	10	630	50
JUNE									
18...	1	--	--	--	--	10	8	1100	50

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
17...	100	2	90	80	--	--	--	--	75
MAR., 1973									
01...	<100	3	220	200	--	--	--	--	<50
JUNE									
18...	<50	9	150	130	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
17...	2	--	--	--	--	--	--	40	20
MAR., 1973									
01...	7	--	--	--	--	--	--	120	20
JUNE									
18...	10	--	--	--	--	--	--	50	10

401729106575400 - OAK C DRAIN NR OAK C, CO- OC-S3

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
17...	1430	.17	3500	7.6	372	0	305	15	12.0
MAR., 1973									
01...	1115	E.5	3200	7.6	372	0	305	15	11.0
JUNE									
18...	1325	E.5	2800	6.6	413	0	339	166	12.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
17...	--	400	160	1700	1400	--	--	--	20
MAR., 1973									
01...	--	380	150	1600	1300	--	--	--	10
JUNE									
18...	--	340	140	1400	1100	--	--	--	10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
17...	0	30	10	--	--	20	3	11000	5700
MAR., 1973									
01...	10	10	0	--	--	20	23	8200	2600
JUNE									
18...	1	30	0	--	--	20	20	10000	9500

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
17...	300	4	1600	1800	--	--	1	1	75
MAR., 1973									
01...	100	0	1800	1800	--	--	--	--	50
JUNE									
18...	50	50	1700	1700	--	--	--	--	50

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
17...	16	0	0	--	--	38	2.6	60	30
MAR., 1973									
01...	50	--	--	--	--	3.6	.3	40	20
JUNE									
18...	26	--	--	--	--	4.9	4.4	30	40

401725106575600 - OAK C AB OAK C DRAIN NR OAK C, CO - OC-4

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TEMPER-ATURE (DEG C)
OCT., 1972									
17...	1150	--	510	7.8	192	0	158	4.9	8.5
MAR., 1973									
01...	0950	--	500	7.8	235	0	193	6.0	.0
JUNE									
18...	1340	--	480	8.1	214	0	176	2.7	10.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)
OCT., 1972									
17...	--	40	15	160	2	--	--	--	30
MAR., 1973									
01...	--	52	23	220	27	--	--	--	<10
JUNE									
18...	--	46	18	190	14	--	--	--	<10

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT., 1972									
17...	0	--	--	--	--	20	7	770	120
MAR., 1973									
01...	0	--	--	--	--	10	10	1100	50
JUNE									
18...	0	--	--	--	--	10	12	860	110

DATE	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)
OCT., 1972									
17...	200	4	50	20	--	--	--	--	75
MAR., 1973									
01...	<100	0	220	220	--	--	--	--	<50
JUNE									
18...	<50	0	60	50	--	--	--	--	<25

DATE	DIS-SOLVED NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL VANA-DIUM (V) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT., 1972									
17...	3	--	--	--	--	--	--	40	20
MAR., 1973									
01...	6	--	--	--	--	--	--	50	20
JUNE									
18...	7	--	--	--	--	--	--	30	20

COLORADO WATER RESOURCES CIRCULARS

1. Ground water in the Julesburg area, Colorado. 1948.

2. Ground water in the vicinity of Brush, Colorado. 1950.

3. Ground water in the vicinity of Trinidad, Colorado. 1952.

4. Ground water in Colorado and the status of investigations. 1953.

5. Ground water in the Ogallala and several consolidated formations in Colorado. 1960.

6. Legal and management problems related to the development of an artesian ground-water reservoir. 1962.

7. Ground water - Prospects for irrigation in eastern Cheyenne and Kiowa Counties, Colorado. 1963.

8. Potential ground-water development in the northern part of the Colorado High Plains. 1963.

9. Ground water in Colorado - Its importance during an emergency. 1963.

10. Effects of water management on a reach of the Arkansas Valley, La Junta to Las Animas, Colorado. 1963.

11. Pumping tests in Colorado. 1965.

12. Geohydrologic data from the Piceance Creek basin between the White and Colorado Rivers, northwestern Colorado. 1968.

13. Availability of water for artificial recharge, Plains Ground Water Management District, Colorado. 1970.

14. Electric analog model evaluation of a water-salvage plan, San Luis Valley, Colorado. 1970.

15. Ground-water occurrence in northern and central parts of western Colorado. 1972.

16. Extent of development and hydrologic conditions of the alluvial aquifer, Fountain and Jimmy Camp Valleys, Colorado, 1972. 1973.

17. Simulation of hydrologic and chemical-quality variations in an irrigated stream-aquifer system - A preliminary report. 1973.

18. Water in the San Luis Valley, south-central Colorado. 1973.

19. Digital model of the hydrologic system, northern High Plains of Colorado - A preliminary report. 1973.

20. Transit losses and travel times for reservoir releases, upper Arkansas River basin, Colorado. 1973 [1974].

21. Effect of mine drainage on the quality of streams in Colorado, 1971-72. 1974.

22. Appraisal of water resources of northwestern El Paso County, Colorado. [In press.]

23. Water-level declines and ground-water quality, upper Black Squirrel Creek basin, Colorado. 1973.

24. Digital model of the Ogallala aquifer of the northern part of the northern High Plains of Colorado. 1974.

25. Effects of metal-mine drainage on water quality in selected areas of Colorado, 1972-73. 1974.

EXPLANATION OF PHOTOGRAPHS ON FRONT COVER

[Clockwise from upper left]

ABANDONED MILL ALONG KERBER CREEK NEAR BONANZA (upstream from station SL-9).

ABANDONED MINE AND "DEAD" BEAVER POND IN COPPER GULCH NEAR BONANZA (upstream from station SL-5).

TENMILE CREEK NEAR CLIMAX SHOWING IRON STAIN DEPOSITED DURING HIGH FLOW (upstream from station TM-2).

RED MOUNTAIN CREEK NEAR OURAY SHOWING TURBIDITY DUE TO SUSPENDED FERRIC HYDROXIDE (downstream from station UR-8).