- ~~No source sampling has been conducted at the R-A site; and~~
- No residential soil sampling has been conducted at the R-A site.

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5.0 SUMMARY

The R-A site is an inactive mining area which began operations over 100 years ago as a silver producer. In later periods of operation, base-metal production from sulfide ores and sulfuric acid from pyrite ores were the major goals of the mining operations. The site exists in ~~two~~ 3? three areas; The Rico-Argentine Mill, mines and associated tailings piles and ponds on Silver Creek; ~~and~~ a sulfuric acid plant, cyanide heap leach pads and settling ponds on the Dolores River; Cyanide heap leaching has been used in two lined ponds with at least one minor release of leachate. All mine water drainage has been routed through underground workings to discharge from the St. Louis Tunnel Adit on the Dolores River. The discharge is treated with slaked lime and is under a Colorado Pollutant Discharge Elimination System permit with input from the EPA's NPDES division. The permit limits have been continuously violated with at least two Notice of Violation and Cease and Desist Orders issued by CDH.

Tailings removed into town and tailings that have been moved into Rico for road cover.

Approximately 123 reside in the Rico area. Most of these residents ~~probably~~ are probably located on contaminated soils or within 200 feet of contaminated soils. ~~The nearest residents are approximately three-quarters of a mile from the site.~~ There are no restrictions to access to the site. Approximately six residents potentially use groundwater as a drinking water source. Several federally listed threatened and endangered species potentially use the area or exist within the specified target distance limits. ~~Harvestable game~~ Fish are taken from the Dolores River within the fifteen-mile downstream target distance limit, but the quantity of fish taken from the river is unknown.

Fig. 2 looks like the site includes the town.

During this evaluation, URS was able to identify the following significant data gaps which exist for the R-A site:

- ~~No~~ Source characterization has not been conducted; ~~(air, surface water and soil exposure pathways);~~
- ? ~~Confirmation of harvestable quantities of fish being collected from the Dolores River (surface water pathway);~~ 1st fish can get you there — not a signif. gap.
- ~~Determination of existence of~~ Location and sampling of proximal wetlands along the Dolores River (surface water pathway); and
- ~~No~~ Residential soil sampling has not been conducted at the R-A site.
- ~~T&E species confirmation~~ Confirmation of the presence of threatened and endangered species.

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PA WORKSHEET

Site Name Rico-Argentine City, State Rico, Colorado

CERCLIS ID # COD980952519

Reported by Michael V. Carr Date June 6, 1994

DRAFT

HIGHLIGHTS:

A) IS THERE QUALITATIVE OR QUANTITATIVE EVIDENCE OF A RELEASE TO AIR, SURFACE WATER, GROUNDWATER, OR SURFACE SOIL? DESCRIBE BRIEFLY.
More detail in items GW-1 (for groundwater pathway), SW-5 (for surface water pathway), A-1 (for air pathway), and SE-1 (for soil exposure pathway).

Yes, to surface water. Surface water samples collected for NPDES monitoring repeatedly detect violations of permit standards for several metals. Surface water and sediment samples collected from 1989 through 1993 by the Bureau of Reclamation show metals loading to the drainages.

B) IS THERE EVIDENCE OF AN IMPACTED TARGET POPULATION? DESCRIBE.

Pathway	Target	None/target Size	Brief Description	More Discussion In
Groundwater	Public drinking Water supply Domestic drinking Water supply	None *ND (6)	Three wells within a four-mile radius are listed as household use. No impacts noticed by users.	Section 4.3, 5.0
Surface Water	Drinking water Fishery Sens. env.	~~None~~ 123 ? *ND *ND	The upper Dolores River and upper Silver Creek are viable fisheries. CDOW improved aquatic habitat in the Dolores River below Rico 1982 which has increased trout populations to harvestable sizes. There have been several NPDES Violations on Dolores River	Section 4.4, 5.0
Soil Exposure	People within 200' ? Terrestrial sens. env.	~~None~~ 123 *ND	Federal candidate species and state species of concern potentially exist in site area. as well as several threatened and endangered species.	Section 4.5, 5.0
Air	Population	~~None~~ 123	No air monitoring has been conducted.	Section 4.2

*ND - Not Determined

see comments re: residential soil

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SITE INFORMATION

G-1. Directions to the site (from nearest easily recognized point).

From Telluride, Colorado, proceed south on State Highway 145, over Lizard Head Pass, approximately 30 miles.

G-2. Are there other potential sources in the neighborhood to be aware of as the site is evaluated? eg. Is the site in an industrial area, near a railroad, along a highway? Are sources with similar contaminants to this site in the vicinity?

Yes

~~No.~~ Site area is heavily mined, site sources are major sources in the area; however, there are several other historical mining sites in the area, unrelated to R-A, which may affect the environment. One example is the Mountain Springs/Spill Mine upstream near the headwaters of Silver Creek which is reported to have a low pH.

~~Mountain Spgs / Spill Mine upstream on Silver Cr~~ ___ mi.

Source of information: CDH Files; EPA Files; USGS 1900; USGS 1905; USGS 1974 EPA 1988

Background/Operating History

G-3. Describe the operating history of the site:

Early mining began ~~in 1861~~. Silver production peaked in the 1890s and base-metal ore production peaked in 1927. A sulfuric acid production plant operated from 1955 through 1964. All mining operations ceased in 1971. Cyanide heap leaching occurred from 1973 through the late 1970s. Anaconda Minerals Company owned the property from 1980 to 1988 and explored for molybdenum. Rico Development Corporation owned the property from 1988 to April 1994 when they sold their interests to Azure, Inc., from Phoenix, Arizona. A NPDES permit was obtained in 1976. Frequent violations of the permit have occurred. BOR sampling shows loading of heavy metals to the adjoining surface water drainages.

Source of information: AMC 1994; BOM 1915; BOM 1939a; BOM 1939b; BOM 1940; BOM 1942b; BOM 1943; BOM 1949a; BOM 1974; CDH 1988; DOM 1975a; DOM 1975b; DOM 1980; DOM 1981; DOM 1982; DOM 1983; E&E 1984a; E&E 1984b; E&E 1985; E&E 1991a; E&E 1991b.

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G-4. Describe site and nature of operations (property size, manufacturing, waste disposal, storage etc.):

Mills, tailings piles and settling ponds near the surface water bodies

Many other tailings piles are located in the site area. Some tailings have been moved into the town of Rico as gravel road cover with a reported effect of dying yards. ~~Rico~~ The town of Rico covers approximately 1280 acres.

See #G-3. Approximate site acreage is 2,500 acres. ~~Sources~~ cover approximately 75 acres. Tailings piles, tailings ponds and settling ponds typical of hardrock mining comprise the source areas. This does not include tailings alleged to have been moved into town.

Source of information: EPA 1984a; EPA 1984b; USGS 1905; USGS 1974; EMD 1994. EPA 1993

G-5. Describe any emergency or remedial actions that have occurred at the site:

None. Anaconda did some environmental work (plugged adits, maintained settling ponds, built water treatment plant) while they owned the property.

Source of information: AMC 1994, CDH files, EPA files.

G-6. Are there records or knowledge of accidents or spills involving site wastes? Are there Emergency Response Notification (ERNs) reports for this location?

None.

Source of information: EPA files.

G-7. Describe existing sampling data and briefly summarize data quality (e.g. sample objective, age/comparability, analytical methods, detection limits, QA/QC, validatability):

Sampling of surface water is conducted periodically for the NPDES permit. Methods and QA/QC are unknown. BOR sampling has been conducted yearly to trace mercury and other metals loading in the Dolores River and its tributaries.

Source of information: BOR 1994, WMD 1994.

DRAFT

G-8. Is there any other local, state or federal regulatory involvement? Describe. Include permits, and names of contact individuals within each government organization.

AGENCY	PROGRAM	CONTACT	PHONE	PERMIT
CDH	NPDES	Kathleen Kalamen	692-3603	CO-0029793

G-9. Attach site sketch or schematic. Include all pertinent features including wells, storage areas, underground storage tanks, source areas, buildings, access roads, areas of ponded water. Refer to figure(s) submitted with text of report if appropriate.

Refer to figures 1 and 2.

SOURCE CHARACTERIZATION

WC-1. Describe each source at the site, on Table 1, in terms of source type, containment, size/area/volume/quantity, and substances present. See HRS Tables 2-5 and 5-2 for source descriptions, Tables 3-2, 4-2, 4-8, 5-6, 6-3, and 6-9 for containment.

WC-2. Briefly describe how waste quantity was estimated (eg. historical records or manifests, permit applications, air photo measurements, etc.):

EPA's sampling team in 1984 estimated the total size and amount of source material on the site.

Source of information: EPA 1984a; EPA 1984b.

DRAFT

WC-3. Describe any restrictions or barriers to accessibility of on-site sources.

None.

Source of information: 1984b.

GROUNDWATER CHARACTERISTICS

GW-1. Any positive or circumstantial evidence of a release to groundwater? Describe.

Yes. Surface water and sediment sampling show metals loading to these media. Valley fill and alluvial material form an unconfined aquifer that potentially interacts with mine water discharge and surface water bodies. No specific groundwater sampling has been conducted other than mine discharge for NPDES monitoring.

Source of information: EPA 1984b; USGS 1900; USGS 1905; USGS 1974; WMD 1994.

GW-2. Any positive or circumstantial evidence of a release to drinking water users? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

None reported. Three household use wells are within the four-mile target distance limit and serve approximately six residents. Two of these wells are approximately three-quarters of a mile upgradient. The other is ~~approximately one and one-half miles downgradient~~ located within the town of Rico, potentially near tailings used as road cover. All other drinking water sources are surface water diversions from above the site area.

relative to tailings in town?

Source of information: CDH files; EPA files; WMD 1994.

GW-3. Briefly describe the geologic setting.

Alluvial material from wash and landslides masks the underlying geology. A shallow unconfined aquifer exists in the alluvial material. The Cutler Formation is the youngest formation exposed at the site and is at least 2,800 feet thick. Fractures in bedrock forms a deeper aquifer. Geothermal Springs are found in the site area.

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GW-4. Describe geologic/hydrogeologic units on Table 2. Give names, descriptions, and characteristics of consolidated and unconsolidated zones beneath the site.

GW-5. Is the site in an area of karst terrain or a karst aquifer?

No.

GW-6. Net Precipitation (per HRS section 3.1.2.2).

4.1 inches.

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SURFACE WATER CHARACTERISTICS

SW-1. Mean annual precipitation (per HRS section 4.0.2)= 12.8". If less than 20", then count intermittent channels as surface water.

SW-2. Discuss the probable surface water flow pattern from the site to surface waters:

The tailings piles from the Rico-Argentine Mill are in Silver Creek with tailing ponds apparently draining directly into Silver Creek. The St. Louis Tunnel Adit drains into a slaked lime treatment system and then a series of settling ponds before discharging into the Dolores River. This discharge has a NPDES permit.

Source of information: EPA 1984b; WMD 1994.

SW-3. If surface water exists within 2 miles of the site, describe surface water segments within the 15-mile distance limit.

Segment Name	River/Lake/Type	Fresh/Salt Water	Start (mi.)	End (mi.)	Flow In cfs
Dolores River	River	Fresh	0	15	136
Silver Creek	Creek	Fresh	0	.75	ND

Groundwater to surface water distance N/A Angle Θ ____

SW-4. Provide a schematic diagram or simple figure which describes surface water segments, locates targets, identifies flow direction, PPE(s), etc. Refer to figure(s) submitted with text of report if appropriate.

Refer to figures 1 and 2.

SW-5. Any positive or circumstantial evidence of a release to surface water? Evidence of a release by direct observation? Is the source located in surface water? Describe.

Yes. Tailing piles are placed in Silver Creek and tailings ponds are discharging to Silver Creek. Surface water and sediment samplings performed by BOR in Silver Creek and the Dolores River show metals loading occurring. The NPDES monitoring sampling show repeated exceedances of permit standards for metals.

Source of information: BOR 1994, WMD 1994.

we need a little evaluation of existing data to know if it's good enough or if we need to sample.

DRAFT

SW-6. Any positive or circumstantial evidence of a release to surface water target populations? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

No. An ACC contractor in the 1980s found decreased aquatic life in the Dolores River below the site but could not attribute the situation to the site. No target-specific sampling has been conducted at this site.

Source of information: EPA 1984b.

SW-8. Is the site or portions thereof located in surface water? Yes.

Is the site located in the 1 - ‹10 yr floodplain?

›10-100 yr?

›100-500 yr?

›500 yr?

SW-9. Two-year 24-hour rainfall 1.5"

DRAFT

TARGETS

T-1. Discuss groundwater usage within four miles of the site:

There are no municipal wells within the specified four-mile target distance limit. Five wells are listed by the CSE; one owned by the CDOT for wash water in a maintenance shop, one is listed as industrial use and three are listed as household use. Two of the household wells are approximately three-quarters of a mile upgradient and one is approximately three-quarters of a mile downgradient.

Source of information: CSE 1994, USDOC 1990.

T-2. Summarize the drinking water population served via groundwater within four miles of the site:

0 - 1/4 mi	~~0~~ 1
1/4 - 1/2 mi	~~8~~ 5
1/2 - 1 mi	~~76~~ 0
1 - 2 mi	~~18~~ 0
2 - 3 mi	~~10~~ 0
3 - 4 mi	~~11~~ 0

Attach calculations for population apportionment in blended systems.

T-3. Identify and locate any of the following surface water targets within 15 miles of the site: drinking water population(s) served by intakes, fisheries, sensitive environments described in Table 4-23 of the HRS, and wetlands as defined in the Federal Register.

Targets	Dist. From Site	SW Body	Flow In cfs	Population Served/Size (Incl. Units)	Contamination Known/Suspected
Montane riparian	4 miles	Dolores River	136	ND	Metals
Dolores Fishery	1 mile	Dolores River	136	ND	Metals

One surface water diversion is listed as multiple use including domestic. This diversion is the St. Louis Tunnel, actual domestic use is unknown.

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T-4. Summarize the population within a four-mile radius of the site:

	Total Pop.	Worker Pop.
on site	0	0
0 - 1/4 mi	0	
1/4 - 1/2 mi	8	
1/2 - 1 mi	76	
1 - 2 mi	18	
2 - 3 mi	10	
3 - 4 mi	11	

T-5. Identify and locate any terrestrial sensitive environments described in Table 5-5 of the HRS.

Potential habitat for federal candidates species, North American Wolverine and Northern Gas Hawk. Potential habitat for federally listed threatened and endangered Bald Eagle, Peregrine Falcon and Mexican Spotted Owl. Potential habitat for montane riparian forest that is ranked very rare globally and in Colorado.

T-6. Describe any positive or circumstantial evidence of a release to air target populations? Of a release by direct observation where target population exists within 1/4 mile of the site? Describe analytes, detection limits, background, hits, number of users, locations, QA/QC.

No air monitoring has been conducted at this site. No observations are available concerning dust from tailings or ponds blowing offsite.

T-7. Identify and locate any potential or known resident soil exposure populations, if present. Describe conditions which lead the researcher to suspect contaminated soil within 200' of residences, if this condition exists.

None known.

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TABLE 1
WASTE CONTAINMENT AND HAZARDOUS SUBSTANCE IDENTIFICATION[1]

SOURCE TYPE	SIZE (Volume/Area)	ESTIMATED WASTE QUANTITY	SPECIFIC COMPOUNDS	CONTAINMENT[2]	SOURCES OF INFORMATION
Tailing piles, ponds	75 acres	400,000 tons	Heavy metals, cyanide	None	CDH files; EPA files
Mine adits		1.5 million gallons per day	Heavy metals	Lime treatment system	WMD files

[1] Use additional sheets if necessary.

[2] Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - non-existent, natural or synthetic liner; corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.)

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TABLE 2
HYDROGEOLOGIC INFORMATION[1]

STRATA NAME/DESCRIPTION	THICKNESS (ft.)	HYDRAULIC CONDUCTIVITY (cm/sec)	TYPE OF DISCONTINUITY[2]	SOURCE OF INFORMATION
Alluvial Fill	10-40	10^{-2}	None	EPA 1984b; Office of the Federal Register 1990; USGS 1900; USGS 1905; USGS 1974
Bedrock (Cutler and older Formations)	> 2,800	10^{-5}	None	EPA 1984b; Office of the Federal Register 1990; USGS 1900; USGS 1905; USGS 1974

[1] Use additional sheets if necessary.

[2] Identify the type of aquifer discontinuity within four-miles from the site (e.g., river, strata "pinches out", etc.).

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