

Iron Mountain Mine

SECTION 1.0 INTRODUCTION

TABLE 1-1
Key Historical Events at Iron Mountain
Iron Mountain Mine Sediment Feasibility Study

Date	Event
1986	EPA issued the first ROD (ROD 1) for interim remedial action.
1988 through 1989	Brick Flat Pit and various caved ground areas on Iron Mountain were capped. Tailings from Minnesota Flats were removed, deposited in Brick Flat Pit, and capped. The Richmond adit was rehabilitated to access and evaluate the condition of the mine workings. Slickrock Creek was diverted around Big Seep and the overburden dump.
1989	A temporary emergency treatment plant began operation to handle the most concentrated discharges emanating from the Richmond and Lawson portals.
1990	Clean water from Upper Spring Creek was diverted to Flat Creek to decrease the volume of flow into Spring Creek Reservoir.
1992	EPA issued the second ROD (ROD 2), selecting construction of a treatment plant to treat discharges from the Richmond and Lawson portals.
1993	EPA issued the third ROD (ROD 3), selecting capture and treatment of discharges from the Old/No. 8 Mine Seep.
1994	A lime neutralization treatment process, consisting of an aerated simple mix (ASM), was completed at Minnesota Flats Treatment Plant (MFTP). The plant treated mine water and released it to Spring Creek at higher pH levels. Sludge was produced from the treated ASM discharges, discharged to drying beds, and hauled to Brick Flat Pit. This operation effectively removed more than 99 percent of all contaminants from the water.
1996	A high density sludge (HDS) treatment plant was completed at the MFTP site. The HDS process produced a denser sludge than the ASM process was capable of producing, thus prolonging the useful life of Brick Flat Pit as a final sludge disposal site, and reducing operating expenses.
1997	EPA issued the fourth ROD (ROD 4), providing for design and construction of a dam and reservoir in the Slickrock Creek Basin.
2004	Construction of the dam and associated facilities for Slickrock Creek Retention Reservoir (SCRR) is scheduled for completion. In conjunction with previous remedial actions at IMM, SCRR is expected to reduce contaminant discharge from SCDD to 5 percent of the discharge prior to 1994.

1.2.3 Remedial Actions

EPA initiated an RI for the IMM site in September 1983. Since that time, the area has been intensively studied. Four RODs have been signed; all projects authorized under the first three RODs are complete. Further cleanup efforts under ROD 4 are ongoing at IMM.

ROD 1 was signed in 1986 (EPA, 1986), authorizing several projects to begin to reduce and control AMD discharges at the site. These projects included the following:

- Capping Brick Flat Pit (a large open pit mine) and several areas of ground subsidence (completed in 1989). The project included removal of tailings from Minnesota Flats and placement in Brick Flat Pit.
- Diverting clean water in upper Slickrock Creek around waste rock piles and diverting Upper Spring Creek from Spring Creek Reservoir (completed in 1990 and 1991, respectively).
- Constructing and operating an emergency treatment plant to handle the most concentrated discharges – those coming from the Richmond and Lawson portals (completed in 1988). This plant treated portal discharges during the drought periods that occurred from 1988 through 1993.

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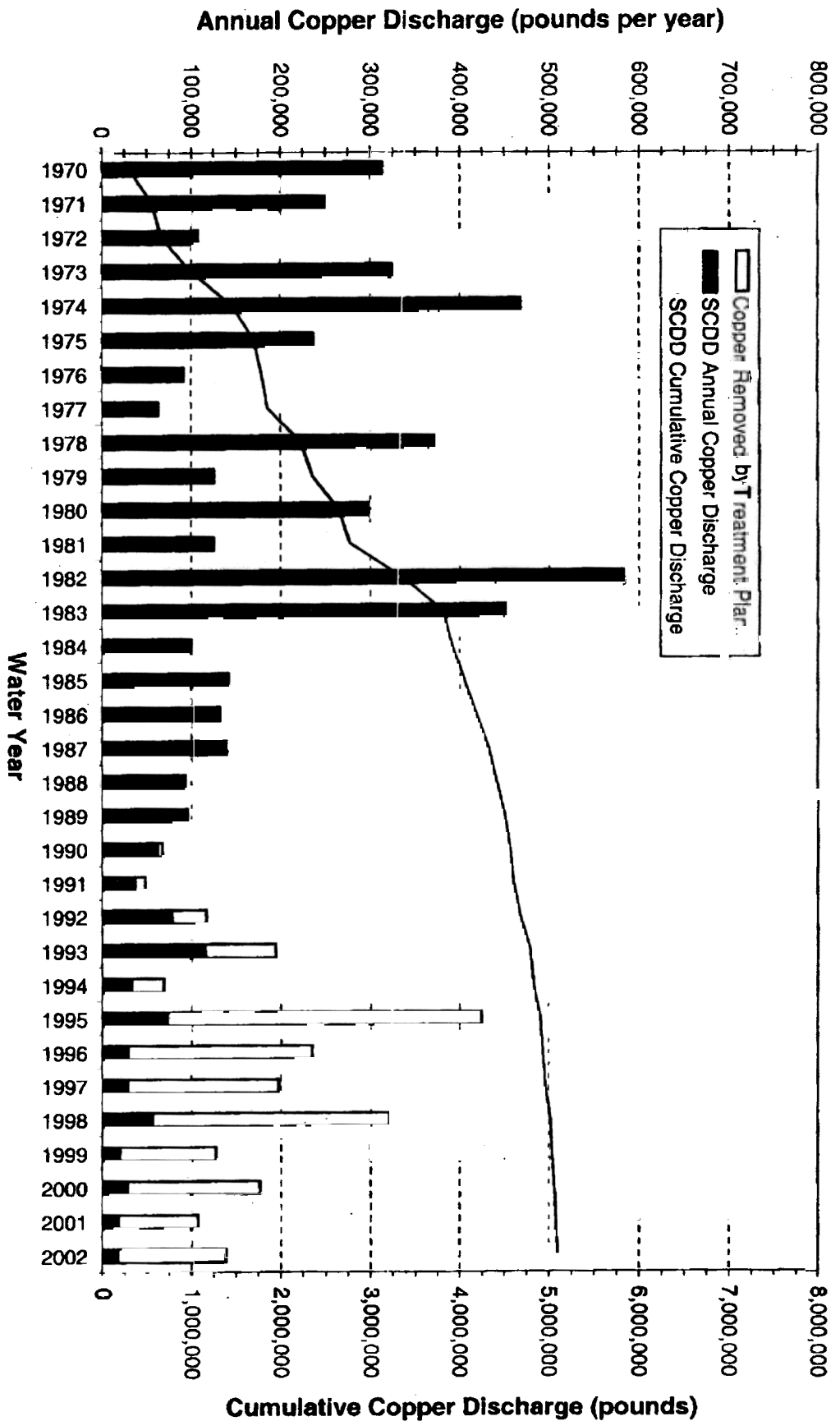
ROD 2 was signed in 1992 (EPA, 1992), authorizing the construction of a treatment plant capable of treating all AMD discharges from the Richmond and Lawson portals. An ASM plant was completed in 1994. Treated sludge was discharged to drying beds and then hauled to Brick Flat Pit. HDS facilities, which increase the efficiency of the ASM operation, were completed in December 1996. The HDS facilities produced sludge with a significantly increased solids content, which resulted in decreased sludge transportation and disposal costs. ROD 2 also authorized the removal and consolidation of numerous waste rock piles in a lined and capped waste cell. Remediation of the waste piles was completed in October 1994.

ROD 3 was signed in September 1993 (EPA, 1993), providing for the treatment of the Old/No. 8 Mine seep flow at the treatment plant. Construction of collection and conveyance facilities was completed in October 1994.

These remedial actions have significantly reduced the acidity and metals content in surface water from IMM. The annual reduction in copper load in water discharged from SCDD is shown on Figure 1-3. Other data demonstrate a corresponding increase in pH resulting from the upstream corrective actions at IMM, particularly the treatment of AMD by alkaline precipitation.

ROD 4 was signed September 30, 1997 (EPA, 1997), focusing on the Slickrock Creek watershed at Iron Mountain. Among other items, ROD 4 provided for design and construction of a 220-acre-foot (ac-ft)-capacity retention reservoir to collect area sources of AMD discharges in the Slickrock Creek Basin for treatment, surface-water diversion facilities, a hematite erosion control structure, an additional AMD conveyance pipeline, and a tunnel for gravity discharge of treated effluent to Spring Creek. The remedy will permit treatment of essentially all of the IMM AMD from the Slickrock Creek area sources, which comprise approximately 60 to 70 percent of the remaining uncontrolled copper and 40 to 50 percent of the remaining uncontrolled zinc and cadmium releases from IMM (EPA, 1997a). Completion of SCRR and associated facilities, in combination with completed remedial actions to control the sources of AMD, will result in a total reduction of contaminants discharged from SCDD to 5 percent of the pre-1994 discharge. Construction of the dam for SCRR is scheduled for completion in 2004.

The Spring Creek Arm has not been addressed in the previous 4 RODs. Following approval of this Sediment FS, a fifth ROD is expected.



1990 through 2002: Copper Removed by Treatment Plant = 1,630,000 pounds

FIGURE 1-3

DISCHARGED FROM SCDD

SEDDIMENT FEASIBILITY STUDY

IRON MOUNTAIN MINE

COPPER LOADS