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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 721

ANNUAL OPERATION AND MAINTENANCE SUMMARY REPORT FOR YEAR 2002 GROUNDWATER INTERIM REMEDIAL ACTION

DUNN FIELD

MEMPHIS DEFENSE DEPOT, TENNESSEE

PREPARED FOR

MOBILE DISTRICT US ARMY CORPS OF ENGINEERS

BY

JACOBS FEDERAL PROGRAMS

MARYLAND HEIGHTS, MISSOURI

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1.0 INTRODUCTION

This report summarizes the information contained in the monthly operation and maintenance reports for the groundwater recovery system on Dunn Field at the Memphis Depot. These monthly reports have been submitted to the Memphis Depot and the regulating government agencies during the calendar year 2002.

1.1 Site Description and Background

DDMT covers 642 acres in Shelby County, Tennessee. The facility is approximately four miles southeast of the central business district and one mile northwest of Memphis International Airport. Operations began in 1942 with the mission to inventory and supply materials for the United States Army. In 1964, its mission was expanded to serve as one of the principal distribution centers for a complete range of military commodities Past activities at DDMT included a wide range of storage, distribution, and maintenance practices DDMT has been closed since 1997 and is maintained by the Memphis Depot Caretaker Division, under the control of the Defense Depot, Susquehanna, Pennsylvania/Defense Logistics Agency (DLA) DDMT is currently undergoing Base Realignment and Closure (BRAC) activities

Dunn Field, also called OU-1, consists of 68 acres of land located north of the main installation. The northwestern quadrant of Dunn Field was used as a landfill area. The southwestern and southeastern quadrants were used as a storage area for mineral stockpiles The northeastern portion was used as a pistol range and later as a pesticide storage area. Until 1970, Army supplies, including hazardous and non-hazardous materials were burned or buried primarily in the northwest portion of Dunn Field. These materials potentially included oil and grease, paint, paint thinner, methyl bromide, pesticides, herbicides, and food supplies Disposal operations at Dunn Field have created a plume of contaminated groundwater, in the shallow fluvial aquifer, along the western and northern portion of Dunn Field Groundwater monitoring performed during the 1989 and 1990 remedial investigation/feasibility study (RI/FS) identified concentrations of dissolved volatile organic compounds (VOCs) and heavy metals above regulatory limits Identified VOCs included, but were not limited to tetrachloroethene, trichloroethene, dichloroethene, carbon tetrachloride, chloroform and 1,1,2,2 – trichloroethane The DDMT facility is classified as a Superfund Site under the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA) Section 120 (Federal Facilities).

1.2 Groundwater Recovery System Description

As part of the Record of Decision (ROD) for interim remedial action at Dunn Field, seven groundwater extraction wells, one pre-cast concrete building, an underground conveyance system, a flow measurement and control system, and associated components were installed in 1997. Four additional recovery wells were installed and brought online in 2001. Equipment, process controls, operational requirements, recovery well sizes and

depths, pumping rates, and construction drawings are defined in the Technical Specifications prepared by CH2M-Hill.

2.0 OPERATION AND MAINTENANCE SUMMARY

2.1 Recovery Wells

Seven of the eleven recovery wells were 100% operational in 2002. Four of the wells experienced equipment failures leading to significant down time. Three of the wells (RW-1, RW-6 and RW-8) experienced pump failures. In RW-6 and RW-8, the pump motor drive shaft wore out the pump spline, causing the motors to run continuously with no fluid being pumped RW-1 has not yet been inspected, but presents symptoms identical to RW-6 and RW-8 In order to facilitate the removal and inspection of pumps, all downhole rigid drop pipe will be replaced with a flexible hose system in early 2003.

Additionally, RW-1B experienced the failure of an electric valve actuator in May 2002 This actuator has been replaced.

RW-01

January – August – System was 100% operational The pump transducer did fail early in the year, however, the pump remained operable in manual mode The transducer will be replaced when the pump and motor are repaired.

September – December – The unit has experienced a pump failure Repair will be made in early 2003. It is anticipated that the pump failure is similar to occurrences in RW-6 and RW-8 earlier in the year.

RW-01A

The pump was 100% operational for the year.

RW-01B

January – April - System was 100% operational

May – August – The unit experienced failure of the electric valve actuator. A new actuator was procured and the unit was repaired.

September – December – Unit was brought back online in September and was 100% operational for the remainder of the year.

RW-02

The unit was 100% operational for the year

RW-03:

The unit was 100% operational for the year

RW-04

The unit was 100% operational for the year.

RW-05

The unit was 100% operational for the year.

RW-06

January – early February – well was 100% operational

mid-February – April - Unit experienced a pump failure. Pump was pulled and inspected and it was found that the motor drive shaft had worn the pump spline smooth, causing the pump motor to run continuously with no fluid being pumped The unit was replaced under warranty and brought back on-line.

April – December – Unit was 100% operational.

RW-07

The unit was 100% operational for the year

RW-08

January – May – Unit was 100% operational.

May – August - Unit experienced a pump failure. Pump was pulled and inspected and it was found that the motor drive shaft had worn the pump spline smooth, causing the pump motor to run continuously with no fluid being pumped The unit was replaced under warranty and brought back on-line

September – December – Unit was 100% operational after it was brought back online in early September.

RW-09

The unit was 100% operational for the year.

2.2 Telemetry System

Data from each of the recovery well is collected in a central processor in the pump control building and is accessible via a remote modem connection. The system was in-use and operating throughout the year.

3.0 SYSTEM PERFORMANCE

Monthly and cumulative extraction volumes for each well have been tabulated and are presented in Table 1. Graphical depictions of the recovery volumes have also been prepared and are presented as Figures 1 through 11

Overall, the system performed well. The significant exception was the failure of three well pumps, which caused down time in wells RW-1, RW-6 and RW-8.

Approximately 28.3 million gallons of water were removed from the ground in the calendar year 2002 (an increase of 4 1 million gallons over 2001), resulting in removal of approximately 30 7 pounds of TCE and 82 8 pounds of total volatile organic compounds

Figure 12 graphically shows the groundwater quality, measured at the effluent metering station for TCE and Total VOC concentrations over the past three years. Both concentrations showed an increasing trend in 2001 following the startup of the four new recovery wells These contaminant concentrations have been decreasing in 2002.

TABLES

TABLE 1

YEAR 2002
SUMMARY OF GROUNDWATER EXTRACTION VOLUMES

	RW-1 Extraction Volume (Gal)	RW-1A Extraction Volume (Gal)	RW-1B Extraction Volume (Gal)	RW-2 Extraction Volume (Gal)	RW-3 Extraction Volume (Gal)	RW-4 Extraction Volume (Gal)	RW-5 Extraction Volume (Gal)	RW-6 Extraction Volume (Gal)	RW-7 Extraction Volume (Gal)	RW-8 Extraction Volume (Gal)	RW-9 Extraction Volume (Gal)	Monthly Totals
JAN	35,424	116,208	49,104	82,800	55,728	43,344	140,688	299,088	190,944	662,832	640,368	2,316,528
FEB	48,384	116,928	47,808	74,304	57,600	62,784	129,024	33,366	216,000	596,736	576,000	1,958,934
MAR	53,568	142,560	58,752	83,952	92,304	82,368	141,840	0	279936	660672	648288	2,244,240
APR	44,064	122,976	49,824	75,744	80,352	88,704	136,224	191,352	285,408	639,360	626,400	2,340,408
MAY	48,672	151,056	28,296	84,528	115,344	90,864	136,368	323,856	322,992	662,976	656,640	2,621,592
JUN	47,520	148,176	0	79,920	121,824	92,880	133,920	347,328	381,888	64,368	633,312	2,051,136
JUL	44,640	164,880	0	80,352	147,744	118,656	142,704	379,584	415,152	0	660,384	2,154,096
AUG	44,640	169,488	0	80,352	140,976	123,408	138,960	433,440	410,256	0	664,560	2,206,080
SEP	5,760	165,024	28,512	77,760	150,336	118,944	133,920	399,168	357,552	544,248	642,096	2,623,320
OCT	17,280	147,024	57,744	80,352	146,736	108,000	138,384	401,040	312,768	649,440	663,120	2,721,888
NOV	0	141,840	53,856	80,064	86,976	89,712	136,224	350,064	287,568	628,416	642,096	2,496,816
DEC	0	147,888	56,016	84,528	103,104	85,680	140,400	317,664	295,344	677,376	660,672	2,568,672
Totals	389,952	1,734,048	429,912	964,656	1,299,024	1,105,344	1,648,656	3,475,950	3,755,808	5,786,424	7,713,936	28,303,710

FIGURES

Figure 1
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-1 in Gallons

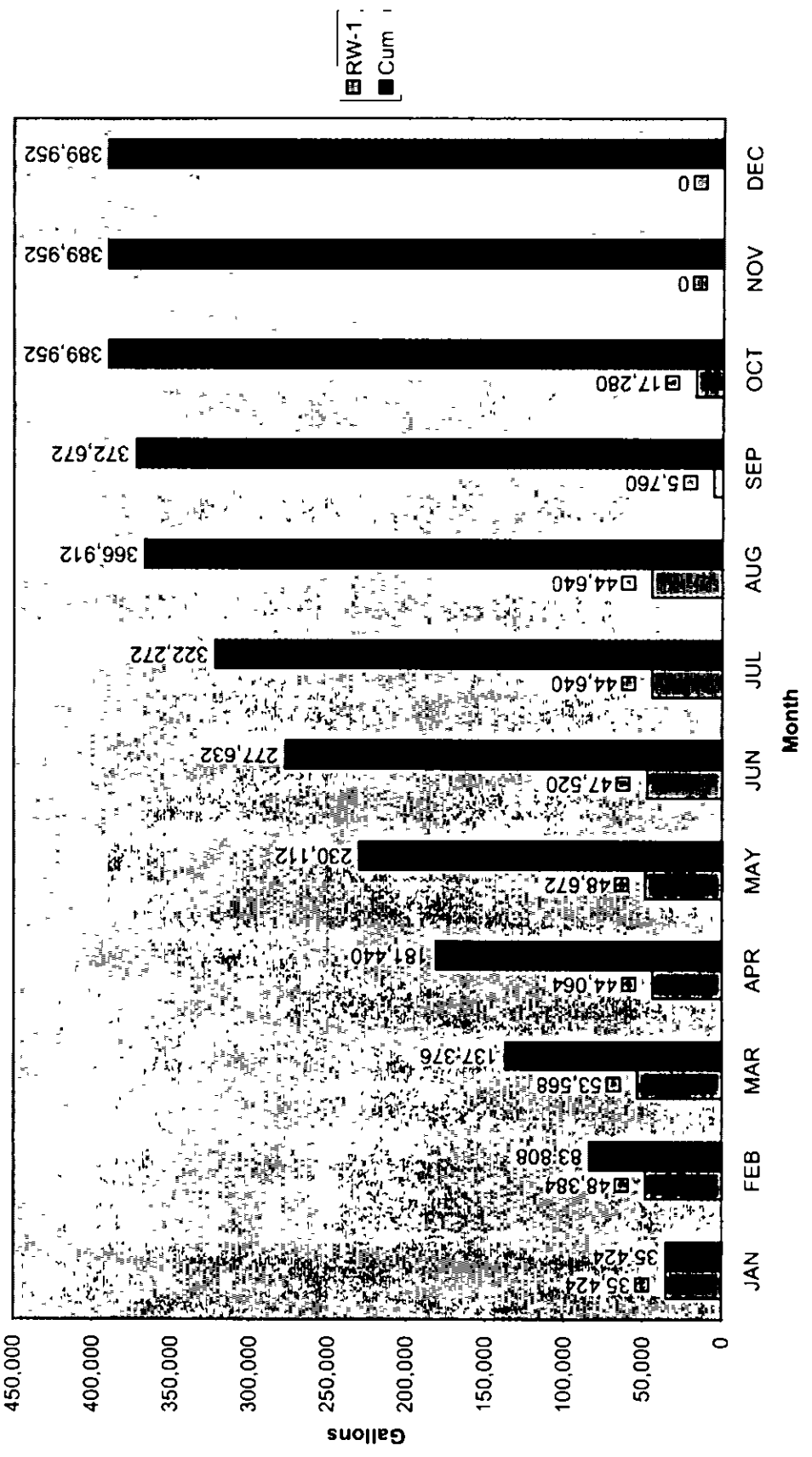
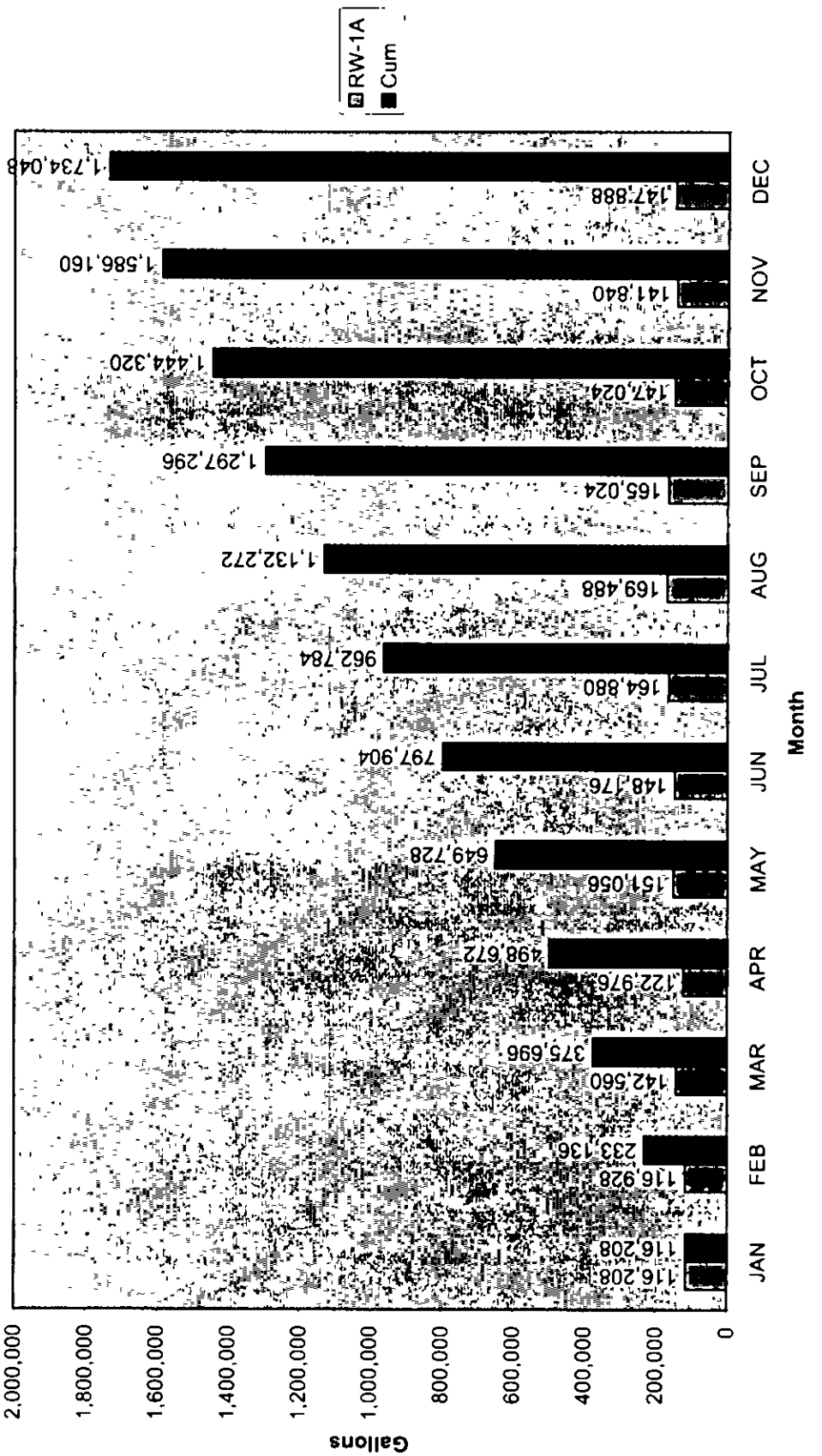


Figure 2
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-1A in Gallons



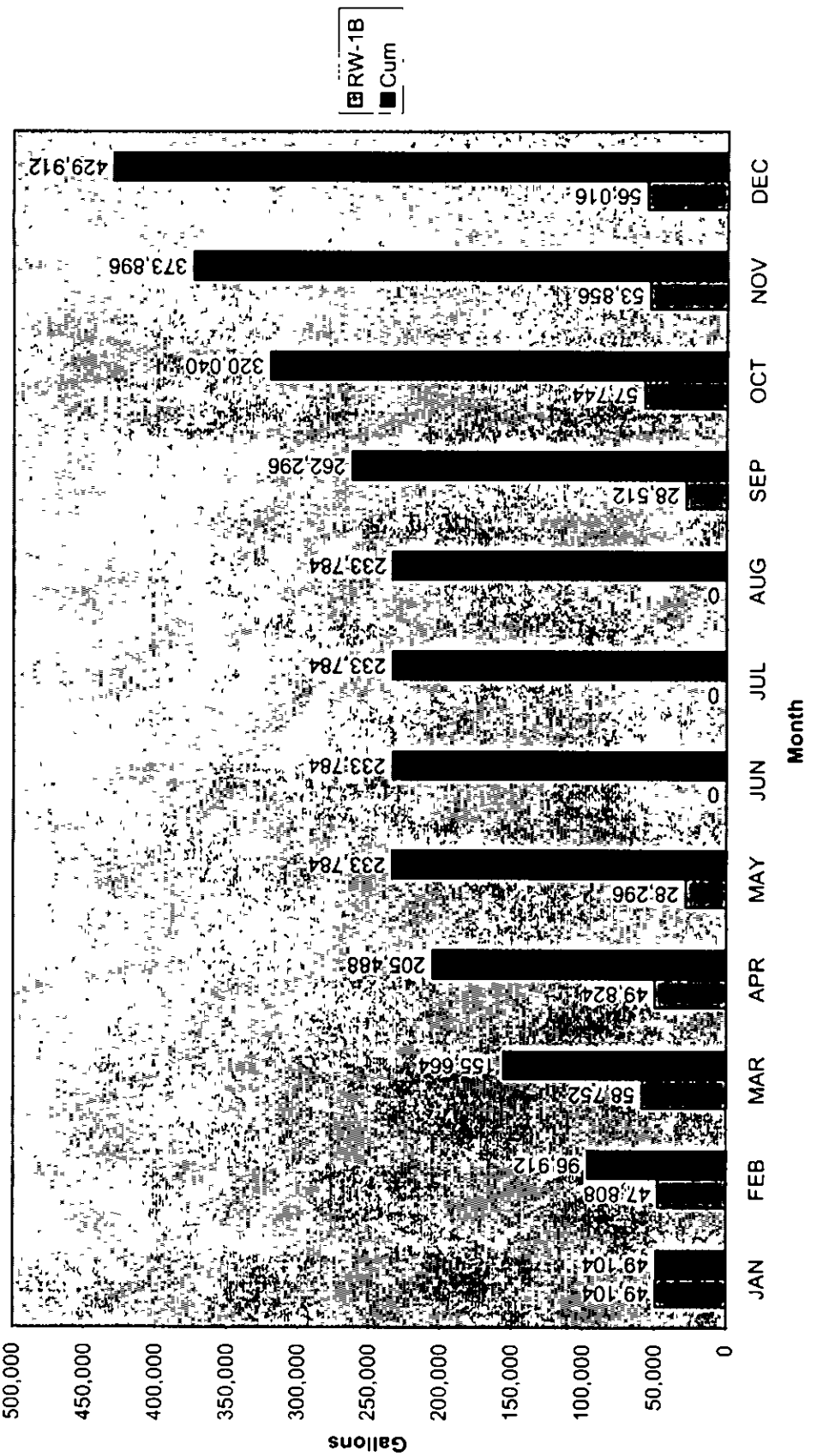


Figure 3
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-1B in Gallons

Figure 4
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-2 in Gallons

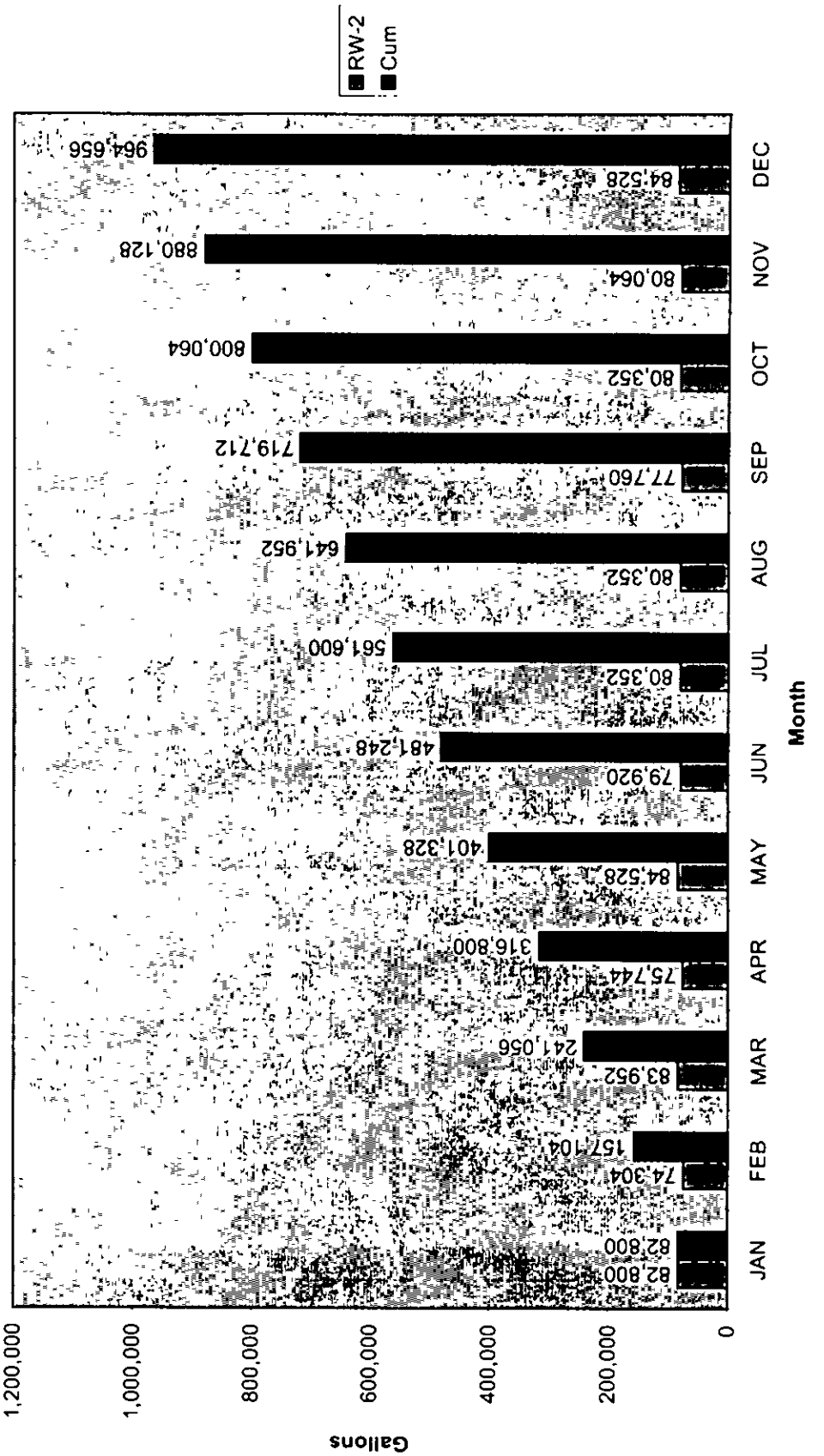


Figure 5
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-3 in Gallons

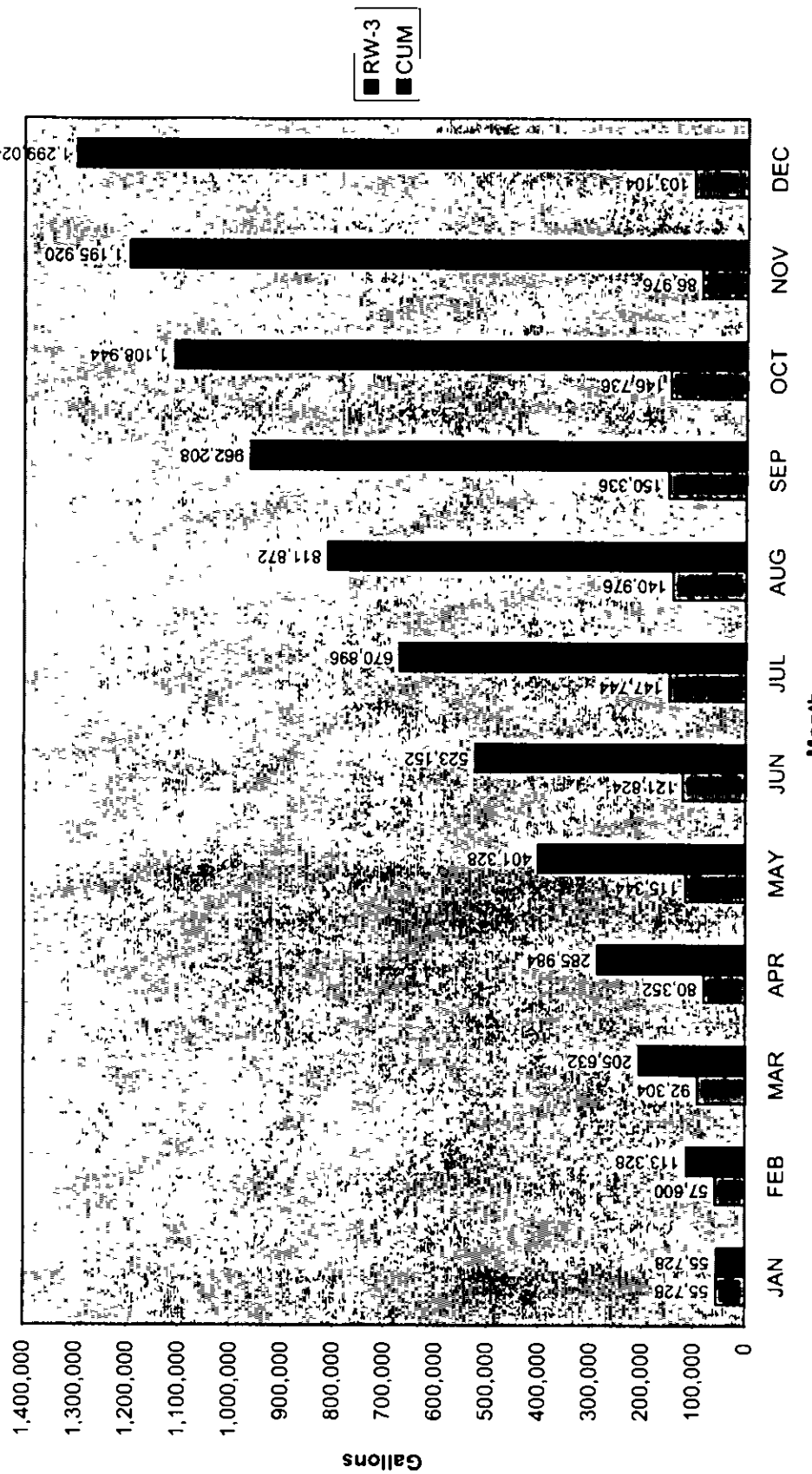


Figure 6
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-4 in Gallons

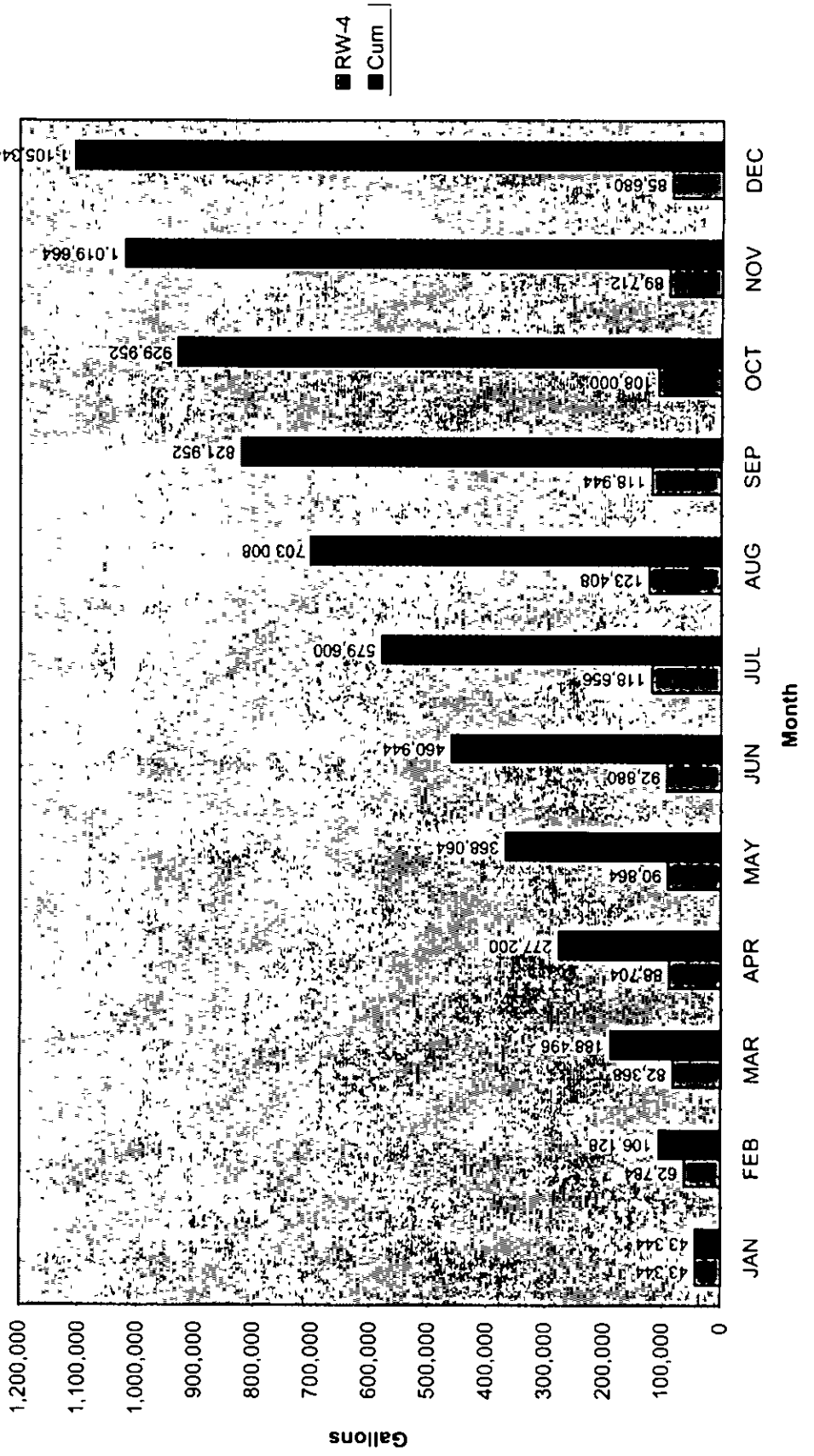


Figure 7
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery well RW-5 in Gallons

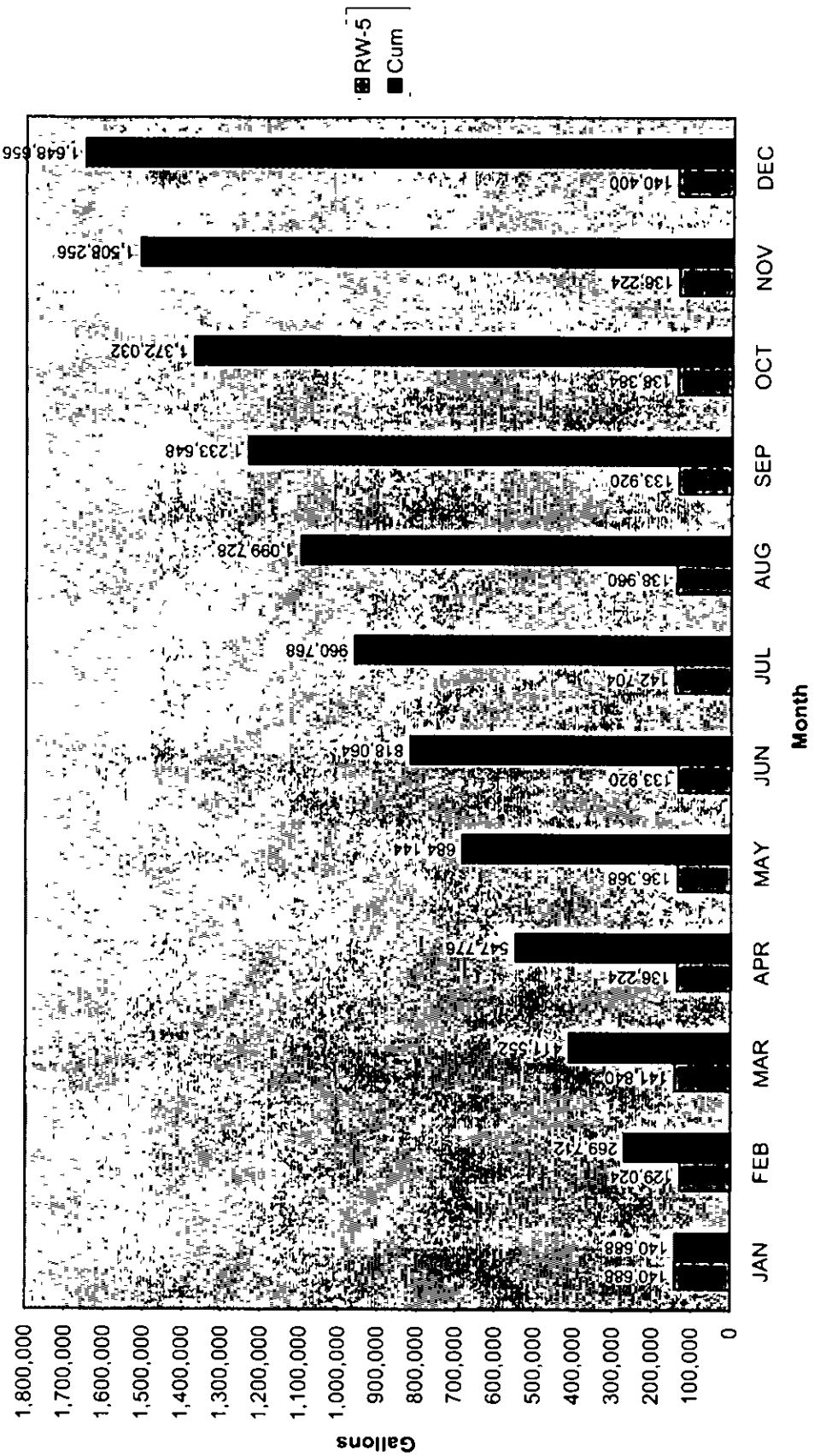


Figure 8
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-6 in Gallons

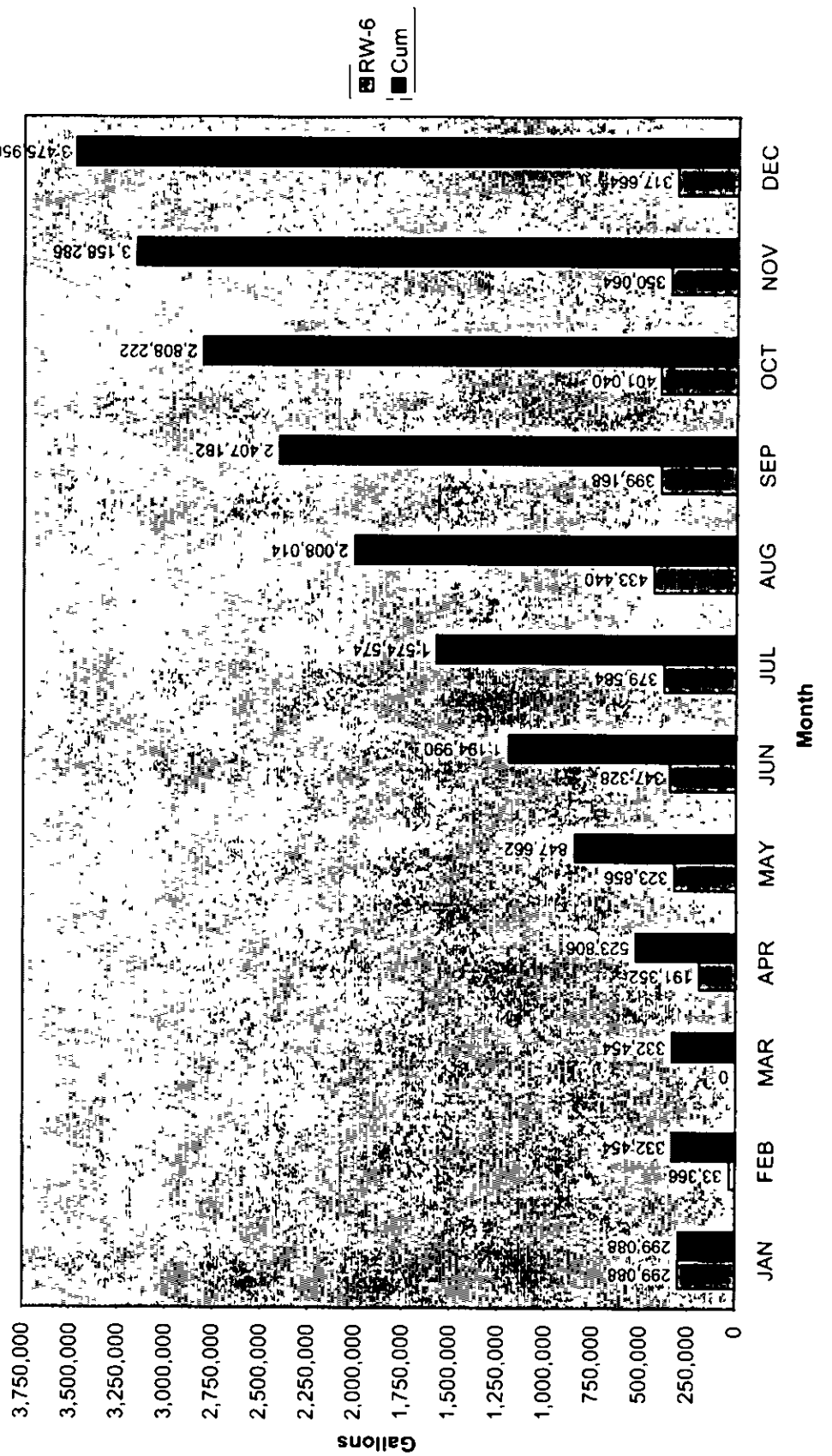


Figure 9
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-7 in Gallons

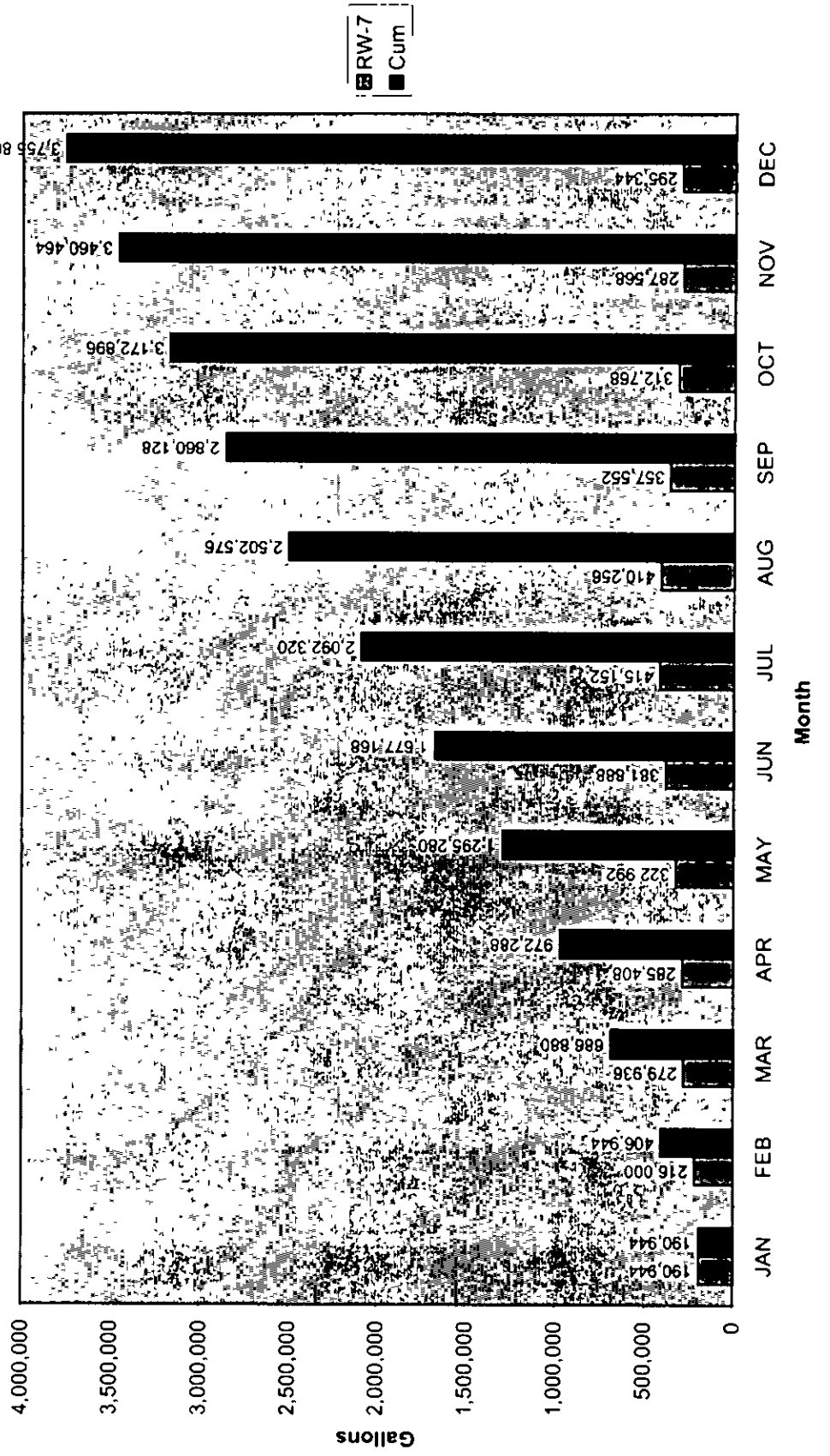


Figure 10
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-8 in Gallons

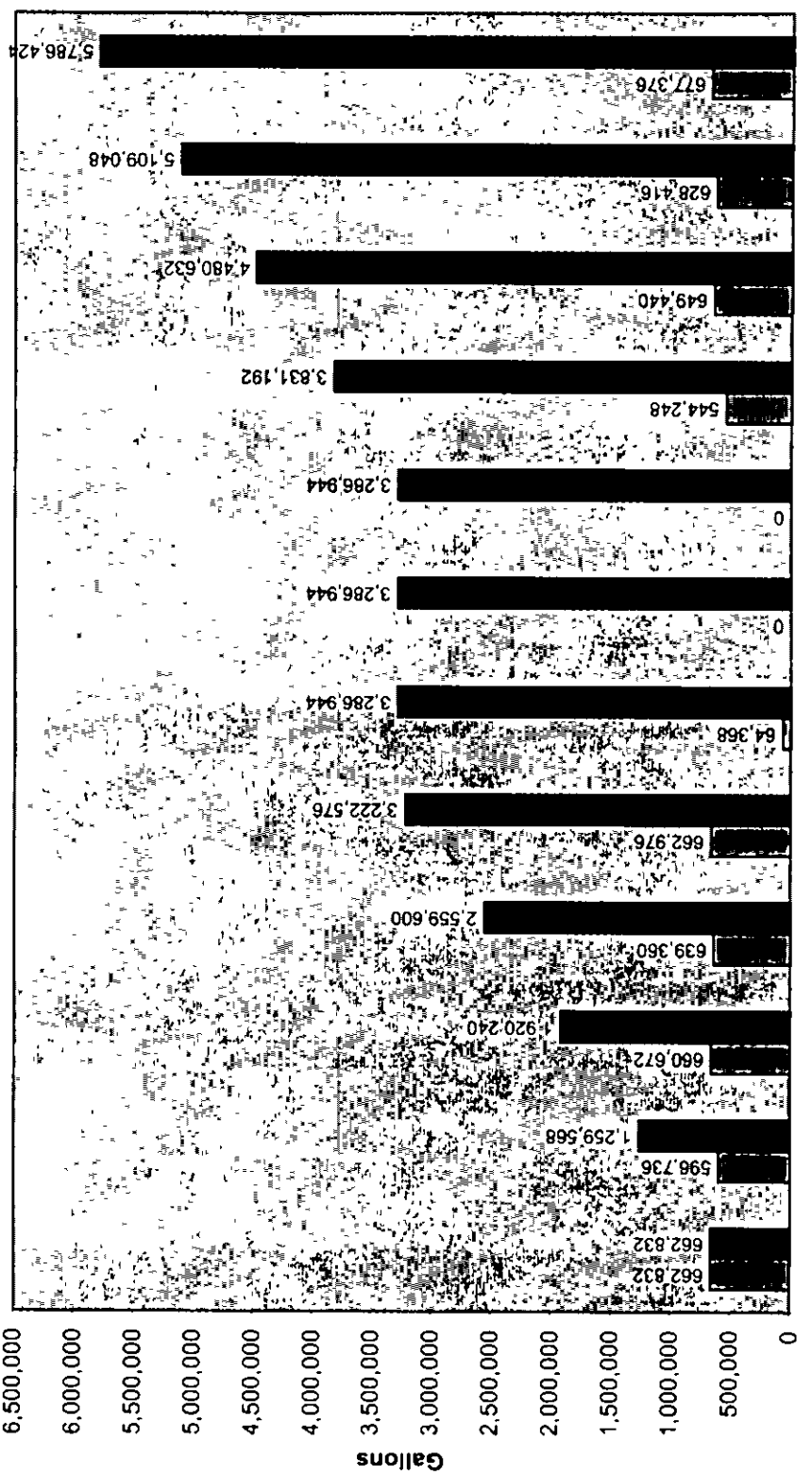
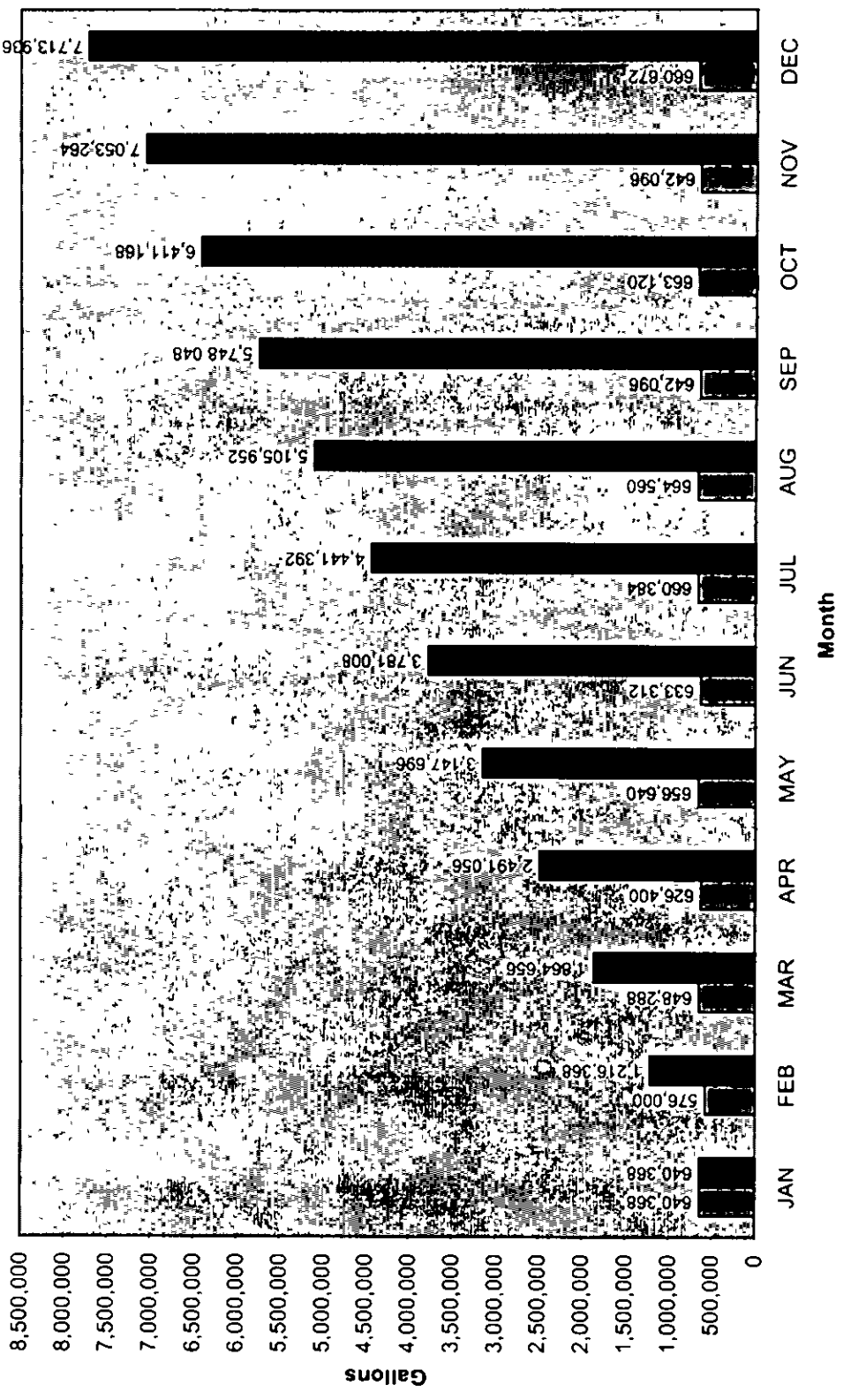


Figure 11
Year 2002 Monthly and Cumulative Groundwater Extraction Volume for Recovery Well RW-9 in Gallons



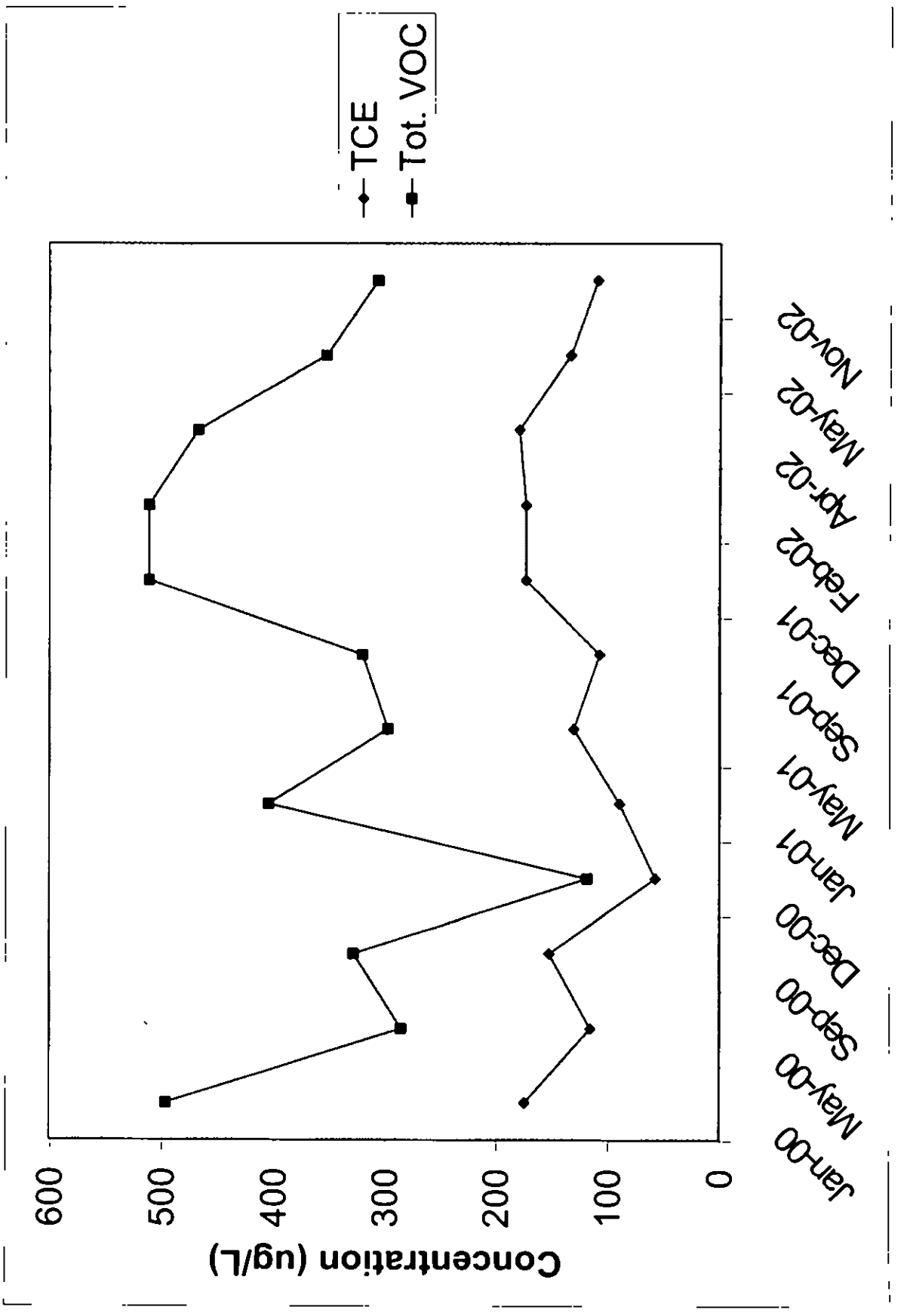


FIGURE 12
TCE and Total VOC Concentrations in Effluent

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