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ANALYTICAL RESULTS REPORT OF AIR SAMPLING AT RICHARDSON FLAT PARK CITY, UTAH

TDD R8-8608-05

EPA ID: UTD980952840

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DATE SUBMITTED: SEPTEMBER 19, 1986

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TABLE OF CONTENTS

PAGE

LIST OF TABLES AND FIGURES i

I. INTRODUCTION 1

II. SITE DESCRIPTION 2

III. SITE HISTORY 2

IV. METEOROLOLOGY. 3

V. METHODOLOGY. 4

VI. QUALITY ASSURANCE. 5

VII. ANALYTICAL RESULTS 5

VIII. DISCUSSION 6

IX. CONCLUSIONS AND RECOMMENDATIONS 10

APPENDICES

APPENDIX I FIGURES
APPENDIX II RAW RESULTS AND QA REPORT
APPENDIX III CALIBRATION DATA
APPENDIX IV UPDATED SITE INVESTIGATION FORMS
APPENDIX V QA VALIDATION CLARIFICAITON

LIST OF TABLES

TABLE 1 FILTER CONCENTRATIONS

TABLE 2 FLOW CALCULATIONS

TABLE 3 AIRBORNE CONCENTRATIONS

TABLE 4 COMPARISONS OF UPGRADIENT VS DOWNGRADIENT AND THREE SAMPLE LOCATIONS TO REMOTE BACKGROUND

TABLE 5 SOIL RESULTS

TABLE 6 SAMPLING START AND STOP TIMES

LIST OF FIGURES

FIGURE 1 AREA MAP OF PARK CITY

FIGURE 2 AIR SAMPLE LOCATION

FIGURE 3 SOIL SAMPLE LOCATIONS

FIGURE 4 WIND ROSE DAY 1

FIGURE 5 WIND ROSE DAY 2

FIGURE 6 WIND ROSE DAY 3

FIGURE 7 WIND ROSE DAY 4

FIGURE 8 WIND ROSE DAY 5

FIGURE 9 WIND SPEED DAY 1

FIGURE 10 WIND SPEED DAY 2

FIGURE 11 WIND SPEED DAY 3

FIGURE 12 WIND SPEED DAY 4

FIGURE 13 WIND SPEED DAY 5

ANALYTICAL RESULTS REPORT
FOR RICHARDSON FLAT TAILINGS
PARK CITY, UTAH
TDD #R8-8608-05

I. INTRODUCTION

This report was prepared to satisfy the requirements of Technical Directive Document (TDD) R8-8608-05 issued to Ecology and Environment's Field Investigation Team (E&E FIT) by Region VIII Environmental Protection Agency (EPA). This report addresses the analytical results for the air sampling activities conducted at the Richardson Flat Tailings site in Park City, Utah. FIT members conducting the air sampling during July 7-14, 1986 were Henry Schmelzer and Dave Franzen. Sampling procedures used in this investigation conform to the Region VIII FIT SOP for Hi-Vol Air Sampling at Hazardous Waste Site; the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II - Ambient Air Specific Methods; EPA-600/4-77-027A, May, 1977, U.S. EPA, Research Triangle Park, N.C.; and 40 CFR Part 58, July, 1983.

The overall scope of the project involved the set up and operation of a total of five high volume (hi-vol) air samplers at four sampling locations over a five day period. A total of twenty-nine samples were collected including four duplicates and five blanks. Site access was set up by Sue Kennedy of Ecology and Environment, and Kelcey Land and Matt Cohn of Region VIII EPA.

The objectives of this investigation were to determine if the migration of heavy metal contaminated suspended particulate matter exists and to further substantiate and complete the HRS air route score. This score was previously based on photo-documentation of wind blown tailings material.

On June 20, 1985, clouds of fugitive dust moving offsite as a result of strong winds from the west-northwest were photographed by the original EPA-FIT team doing the site investigation. Results of analyses of surface tailings samples showed concentrations as high as 3,600 ppm arsenic, 80 ppm cadmium, 8,530 ppm lead, and 6,360 ppm zinc. Mean soil concentrations for those metals in the western U.S. respectively are 5.5 ppm, 0.2 ppm, 17 ppm, and 55 ppm (Shacklette, 1984).

IV. METEOROLOGY

The Richardson Flat tailings lie in a small flat topographic basin of approximately 800 acres. The configuration of the basin was expected to have a pronounced effect on local air flow. The basin is situated at 6600 feet elevation and is surrounded by ridges of the Wasatch Mountains that range from 6700 feet to 7600 feet. Silver Creek enters the basin from the west-southwest then angles to the north. Daytime up valley air flows were anticipated to originate from the west northwest. This was found to be the case.

The data presented in the following section was acquired from The Climatic Atlas of the United States, U.S. Department of Commerce, Environmental Sciences Services Administration, Environmental Data Service, June 1968. The climate of the Park City area is characterized by moderate fluctuations in temperature and precipitation throughout the year. Mean monthly temperatures range from 10 degrees Fahrenheit (°F) in December, January, and February to 80°F in June, July and August. During the month of July the average temperature is approximately 60°F. Precipitation for the Park City area varies from a mean monthly amount of 1.00 inches in July to 2.22 inches in December. Prevailing wind direction at Park City is typically from a southeasterly direction throughout the year. Relative humidity for the Park City area varies from 40 percent in August to 80 percent in December and February. The average relative humidity in July is 50 percent. Barometric pressure ranges from 1022 millibars (30.18 inches of mercury) in December and January to approximately 1010 millibars (29.83 inches of mercury) in June.

VI. QUALITY ASSURANCE

The air samples were analyzed for arsenic, cadmium, lead and zinc only. Soil samples were analyzed for Task 1 and 2 metals. The inorganic analytical data were examined thoroughly for compliance with contract laboratory program quality assurance criteria. The data were found to be of good quality. In the air samples, spike recoveries for cadmium and zinc were 65% and 60% respectively and actual values in the tables may be higher than presented. The analytical results for lead in soils were also of good quality. Duplicates showed good agreement. A blank was submitted for each sampling day. The quality assurance reports and raw data are shown in Appendix II.

VII. ANALYTICAL RESULTS

The results of the inorganic analyses are noted in Table 1. Sample locations are noted in Figure 2.

Formulas used for determining the airborne concentrations are presented along with an explanation of terms with Table 2. Table 2 shows the calculations used to determine the total volume of air sampled corrected to standard conditions by each sampler on each sampling day. This information was used to create Table 3 which contains the average concentration per cubic meter for each of the four elements of concern. When combined with the wind speed and direction information from Figures 4-13, offsite migration of the contaminants can be determined. Table 4 shows the field increases for each days samples comparing upwind and downwind concentrations and downwind versus the remote background. Table 5 shows the Task 1 and 2 metal concentration in soils by the two major roadways by the site.

predominant winds are from the WNW and NW with 25% and 18% of the wind respectively from those vectors. The sample period started with light and variable winds from 0-10 mph. At 1430, the wind increased to 10-20 mph and stabilized from the WNW. At 1800 hours the wind dropped back to 5-10 mph and at 2000 the wind went calm and continued that way until the sample period ended.

Based on the wind rose, the upwind sample location would be AM-04 and the downwind location would be AM-02. Comparing upwind versus downwind sample locations reveals an 11 fold increase in lead, a 5 fold increase in zinc, and 7 fold increase in arsenic.

DAY 3

The sample period began at 1100 hours on July 10th and continued until 2300 hours. Figure 6 shows the wind rose for the site for this period of time. The predominant wind direction is WNW with 69% of the wind for this time period from that direction. Based on the wind rose and sampler locations, the upwind sampler would be AM-04 and the downwind location would be AM-02.

The wind at the start of the sampling period was from the NNW at 5-10 mph. At 1045, the wind picked up to 10-20 mph from the WNW and continued so until 1800 hours when the wind slowed to 5-10 and then went calm at 2000 hours.

Results from Table 4 show a 9 fold increase in lead, a three fold increase in zinc, a ten fold increase in arsenic and a two fold increase in cadmium when comparing upgradient versus downgradient.

DAY 4

Sampling was initiated at 1000 hours and continued until 2300 hours. Figure 7 shows the wind rose for this sampling period. The predominant wind direction is WNW with 55% of the sampling time followed by NW with 10%. Based on this information, the upgradient sample location is AM-04 and the downgradient is AM-02.

AM-01 to AM-04 there is a 3.5 fold increase in lead, 1.3 fold increase in zinc, and a 1.5 fold increase in arsenic at sample location AM-04. Comparing AM-05 to AM-01 there is a 2.4 fold increase in lead, a 1.5 fold increase in zinc, a 1.2 fold increase in arsenic and a 1.25 fold increase in cadmium at sample location AM-05.

Five soil samples were also taken on this day. The results are shown in Table 5. Of principle concern was the potential for interference with lead from vehicle emissions along U.S. 40 and the county road. Deposition of lead from vehicle emissions is most pronounced within the first 15 meters of the roadway. (40 CFR, Part 58, Appendix E, 7.3 and Daines, 1970). The samples taken 2 feet off of the asphalt edge of the roadway on U.S. 40 and the county road show lead at 477 and 418 mg/kg concentrations respectively. At 10 feet from the county road the concentration drops to 133 mg/kg. At 50 feet from U.S. 40 the concentration is 13 mg/kg which is within the range of the average lead in soil concentration for the Western U.S. of 9-3' mg/kg (Shacklette, 1984).

The air sampling location nearest to either U.S. 40 of the county road is over 200 yards. The concentration of lead in the tailings is 8530 mg/kg and the samplers were placed next to the tailings. Hence, based on the soil sampling and the air station placement, lead from vehicle emissions is not likely to be a major contributing factor to lead deposition in the air samples.

Sample SO-5, intended to be a background soil sample, was deemed unusable for comparison purposes due to elevated lead content.

TABLE 1
RICHARDSON FLATS
ARSENIC, CADMIUM, LEAD AND ZINC CONCENTRATIONS IN
TOTAL ug/filter BY SAMPLE DAY

	AM-06	AM-01	AM-04	AM-03	AM-02	AM-05A INITIAL LOCATION	AM-05B STATION MOVED
DAY 1				BLANK			
Arsenic	--	1.0u	54	1.0u	1.0u	17	
Cadmium	--	.5ur	4.8r	.5ur	.5u	5.2r	
Lead	--	3.4	959	.5u	8.3	348	
Zinc	--	17j	672j	.4uj	15j	527j	
DAY 2	BLANK						
Arsenic	1.0u	1.0u	1.5	1.4	6.8	1.0u	
Cadmium	.5ur	.5ur	.5ur	.5ur	.5ur	.5ur	
Lead	.5u	8.90	30	26	147	14	
Zinc	.4uj	21j	39j	34j	88j	17j	
DAY 3	BLANK						
Arsenic	1.0u	1.0u	1.5	1.0u	13	1.4	
Cadmium	.5ur	.5ur	.5ur	.5ur	.8r	.5ur	
Lead	.5u	12	36	25	264	30	
Zinc	.4uj	23j	43j	28j	169j	55j	
DAY 4	BLANK						
Arsenic	1.0u	1.0u	1.0u	1.2	6.6	--	1.1
Cadmium	.5ur	.5ur	.5ur	.5ur	.5ur	--	.5ur
Lead	.5u	29	64	40	131	--	35
Zinc	.4uj	43j	35j	36j	98j	--	43j
DAY 5	BLANK						
Arsenic	1.0u	1.0u	1.5	1.0u	1.8	--	1.0u
Cadmium	.5ur	.5ur	.5ur	.5ur	.5ur	--	.5ur
Lead	.5u	8.0	27	30	48	--	16
Zinc	.4uj	22j	27j	23j	51j	--	27j

u Element is undetected. Detection limit given.
j Matrix spike recovery was 65% for cadmium. Actual value may be higher. Duplicat relative percent of differences were out of CLP criteria for zinc.
r Matrix spike recovery for zinc was 60%. Values given are estimates.

EXPLANATION OF TABLE 2

FORMULAS:

$$\underset{\text{CFM}}{Qstd} = \underset{\text{CFM}}{QR} \times \frac{Pa\ in\ Hg \times 25.4}{TaK} \times \frac{298K}{760mm\ of\ Hg} \begin{matrix}(Tstd)\\(Pstd)\end{matrix}$$

$$\underset{\text{std } m^3}{Vol.} = \underset{\text{CFM}}{tmin \times Qstd} / 35.32$$

QRI CFM = Initial flow rate in cubic feet per minute.

QRF CFM = Final flow rate in cubic feet per minute.

QR CFM = Average flow rate in cubic feet per minute.

Ti F = Initial temperature in degrees Fahrenheit.

Tf F = Final temperature in degrees Fahrenheit.

Ta K = Average temperature converted to degrees Kelvin.

Pa in. Hg = average barometric pressure in inches of mercury.

Qstd CFM = Flow rate in cubic feet per minute at standard temperature and pressure.

t min = Total time in minutes that sampler ran.

Vol. std m^3 = Total volume of air sampled in cubic meters at standard temperature and pressure.

TABLE 3
AVERAGE AIRBORNE CONCENTRATIONS OF ARSENIC, CADMIUM, LEAD AND ZINC PER DAY IN ug/m^3

	BACKGROUND AM-01	DAM AM-04	DUPLICATE AM-03	SE AM-02	NW AM-05A	W AM-05
DAY 1						
Arsenic	.0019 u	.0928	--	.0019 u	.0467	--
Cadmium	.0009 ur	.0825 r	--	.0010 u	.0143 r	--
Lead	.0063	1.6478	--	.0161	.9560	--
Zinc	.0317 j	1.1546 j	--	.0292 j	1.4478 j	--
DAY 2						
Arsenic	.0015 u	.0026	.0027	.0110	.0015	--
Cadmium	.0007 ur	.0009 ur	.0009 ur	.0008 ur	.0008 ur	--
Lead	.0138	.0512	.0493	.2379	.0214	--
Zinc	.0325 j	.0666 j	.0645 j	.1424 j	.0260 j	--
DAY 3						
Arsenic	.0016 u	.0023	.0016 u	.0231	.0023	--
Cadmium	.0008 ur	.0008 ur	.0008 ur	.0014 r	.0008 ur	--
Lead	.0192	.0547	.0411	.4698	.0496	--
Zinc	.0368 j	.0653 j	.0461 j	.3007 j	.0909 j	--
DAY 4						
Arsenic	.0013 u	.0016 u	.0020	.0118	--	.0021
Cadmium	.0007 ur	.0008 ur	.0008 ur	.0009 ur	--	.0009
Lead	.0391	.1026	.0669	.2335	--	.0657
Zinc	.0580 j	.0561 j	.0602 j	.1747 j	--	.0807
DAY 5						
Arsenic	.0016 u	.0025	.0018 u	.0029	--	.0019
Cadmium	.0008 ur	.0008 ur	.0009 ur	.0008 ur	--	.0010
Lead	.0127	.0444	.0551	.0799	--	.0309
Zinc	.0350 j	.0444 j	.0423 j	.0849 j	--	.0522

-- Sample not run.

u Element is undetected.
j Matrix spike recovery was 65% for cadmium. Actual value may be higher. Duplicate relative percent of differences were out of CLP criteria for zinc.
r Matrix spike recovery for zinc was 60%. Values given are estimates.

TABLE 5
SOIL CONCENTRATION OF TASK 1 AND 2 METALS
IN RICHARDSON FLAT AREA

	CNTY RD 2' SO-01	CNTY RD 10' SO-02	US40 2' SO-03	US40 50' SO-04	HOTEL SO-05	WESTERN U.S. AVERAGE
Aluminum	3790*	11900*	11300*	10500*	13200*	58000
Antimony	18e	70e	89e	40e	104e	.47
Arsenic	87	7.7	7.5	2.1u	188	5.5
Barium	95	200	144	668	225	580
Beryllium	.4ue	5.2e	43e	1.4e	1.0e	.68
Cadmium	3.9*	12*	12*	4.5*	38*	.35
Calcium	46900*	14300*	12900*	6350*	14900*	--
Chromium	17*	443*	743*	4.3*	21*	41
Cobalt	[2.9]e	14e	159e	11e	21e	7.1
Copper	21	44	100	15	222	21
Iron	10600	94200	10300	33900	46100	21000
Lead	477*	133*	418*	13*	3479*	17
Magnesium	14200*	55800*	36700*	3560*	5550*	--
Manganese	284	8320	15400	112	1730	380
Mercury	1.0*	0.5*	0.2*	0.5*	3.9*	.05
Nickel	12	44	52	21	34	15
Potassium	[436]e	1480e	[965]e	1160e	1960e	--
Selenium	1.0u	1.0u	1.0u	1.0u	6.9	.23
Silver	2.0u	2.0u	2.0u	2.1u	18	.5
Sodium	[336]	5620	5130	[976]	1320	--
Thallium	2.4	2.0u	2.0u	2.1u	13	.2
Vanadium	11e	561e	1390e	81e	12e	70
Zinc	440*	331*	84*	96*	4630*	55

r Spike recovery beyond the ± 25% control limit.
* Duplicate results exceeded the relative percent difference limit of ±35%. Consider an estimate.
e An interference may be present for these elements.
[] Results is below CLP contract detection limit but above the detection limit for instrument.

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Daines, R.H., H. Moto, and D.M. Chilko. Atmospheric Lead: Its Relationship to Traffic Volume and Proximity to Highways. Environ. Sci. and Technol., 4:318, 1970.

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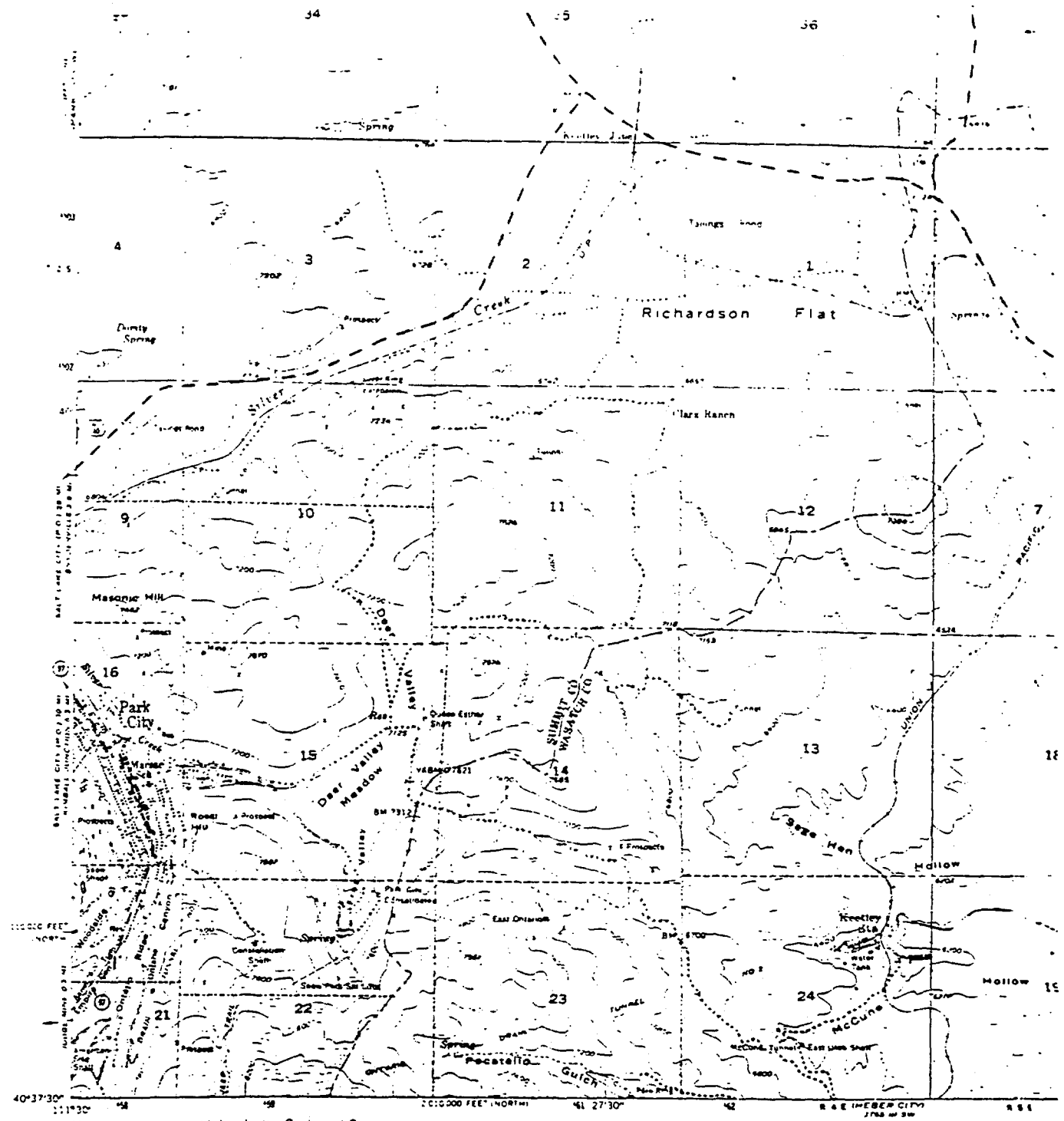
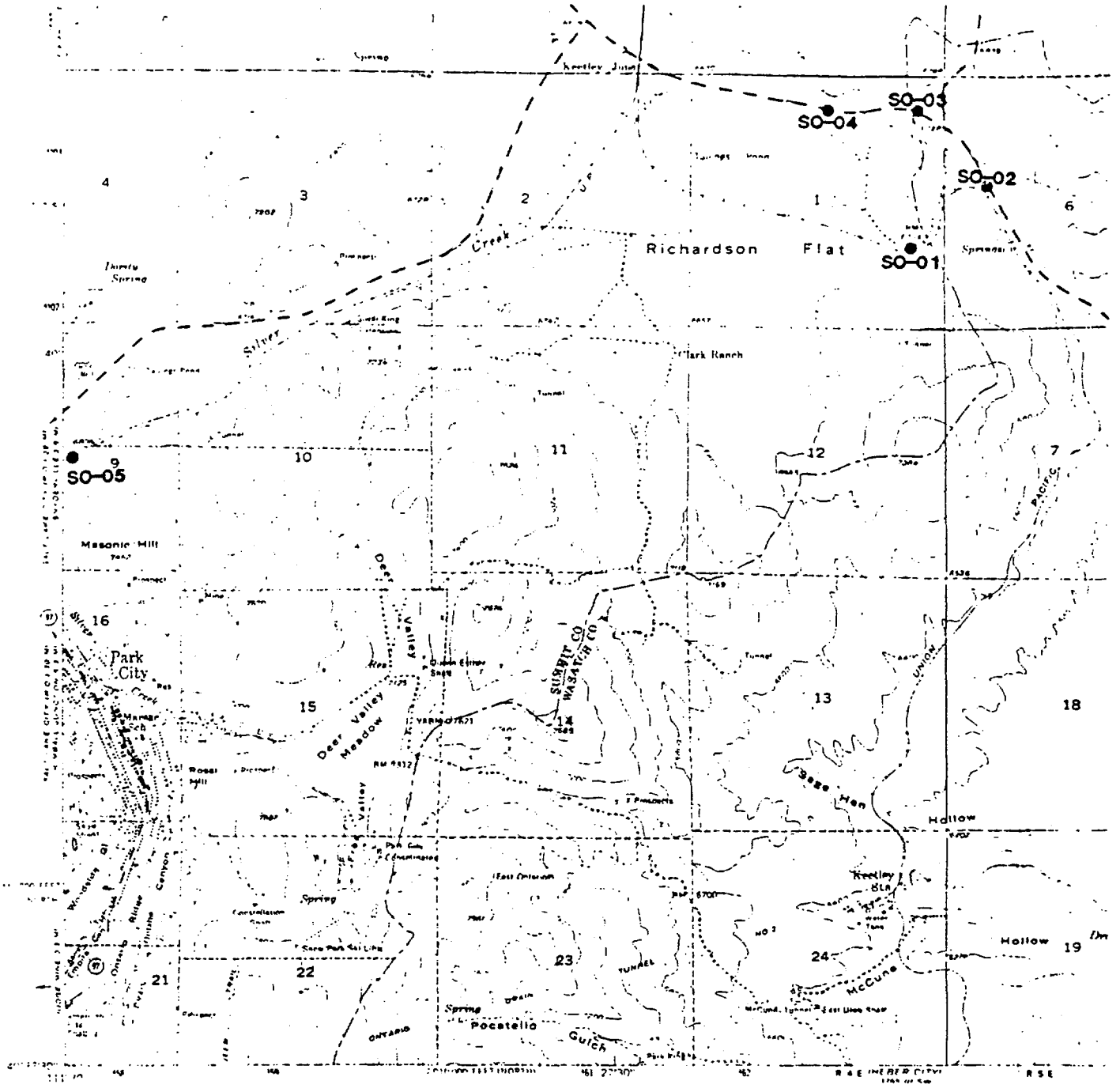
Lyman, D.R. The Atmospheric Diffusion of Carbon Monoxide and Lead from an Expressway. Ph.D. Dissertation, University of Cincinnati, Cincinnati, OH. 1972.

Shacklette, H.T., and Boerngen, J.G.; 1984: Element Concentrations in Soils and other Surficial Materials of the Conterminous United States. U.S. Geol. Surv. Professional Paper 1270. 105pp.

APPENDIX I

FIGURES


Richardson Flat
Clark Ranch
Masonic Hill
Park City
Deer Valley Meadow
Deer Valley
Silver Creek
Dumpy Spring
Tailings Pond
Spring
Keetley Jct.
Keetley Sta.
Sage Hen Hollow
Hollow
McCune
Pocatello Gulch
East Ontario
Ontario
Woodside
Ridge
Indiana
Spring
Conglomerate Shaft
Sewer Pipe Gas Line
Water Tank
Tunnel
Drain
Pipeline
Pipeline
Pipeline



SCALE 1:24000

CONTOUR INTERVAL 40 FEET

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES

TASK REPORT TO THE E.P.A.

TITLE: Richardson Flat

Soil Sample Locations

T.D.D R8-8605-12

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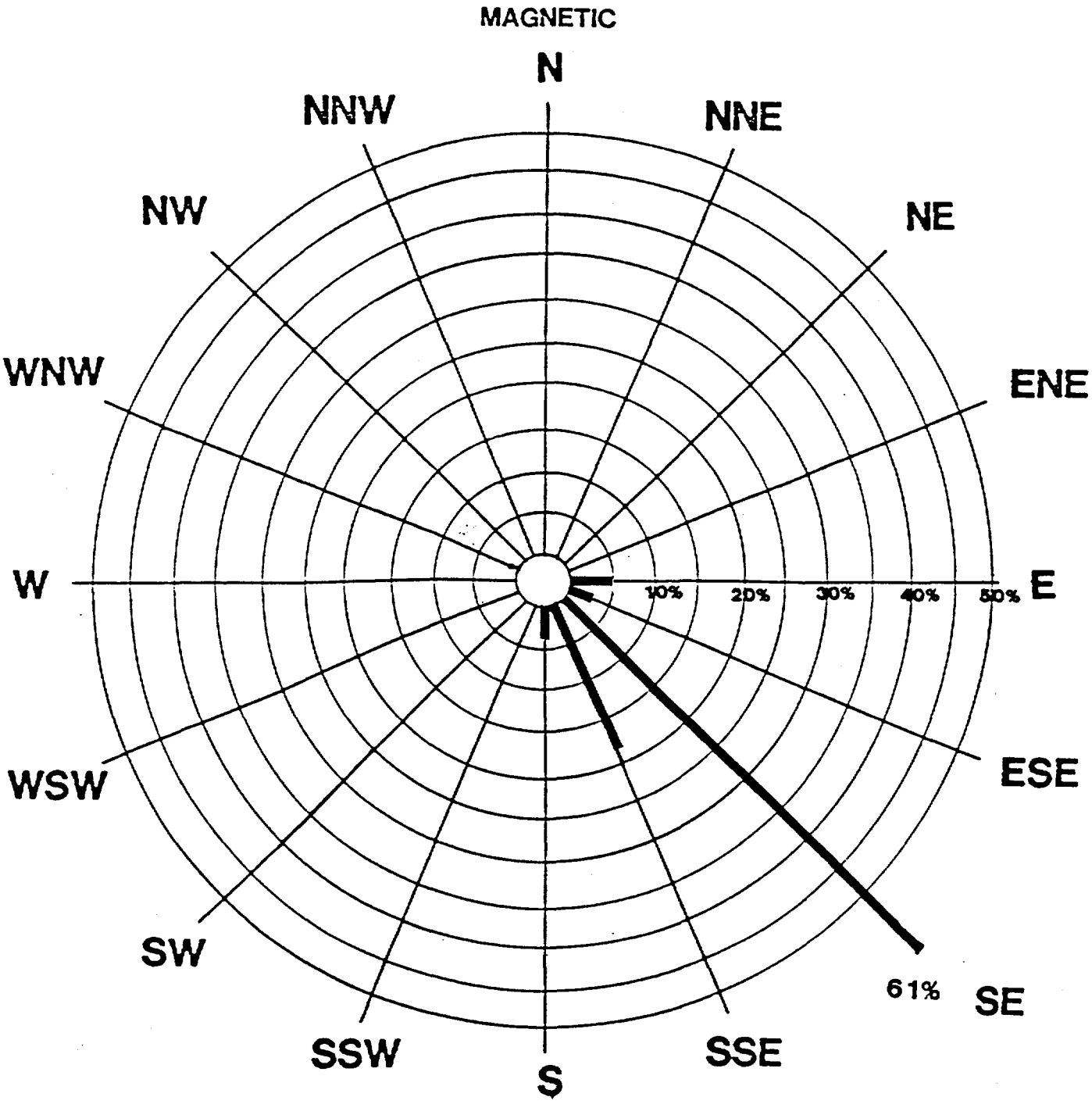
FIG.3

Date _____ Drawn by _____ Scale _____



9.6 % CALM

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

TITLE: Richardson Flats Wind Rose in % of Sample Time for DAY 1 1800 - 0700 Hours

July 8-9,1986

T.D.# R8-8605-12

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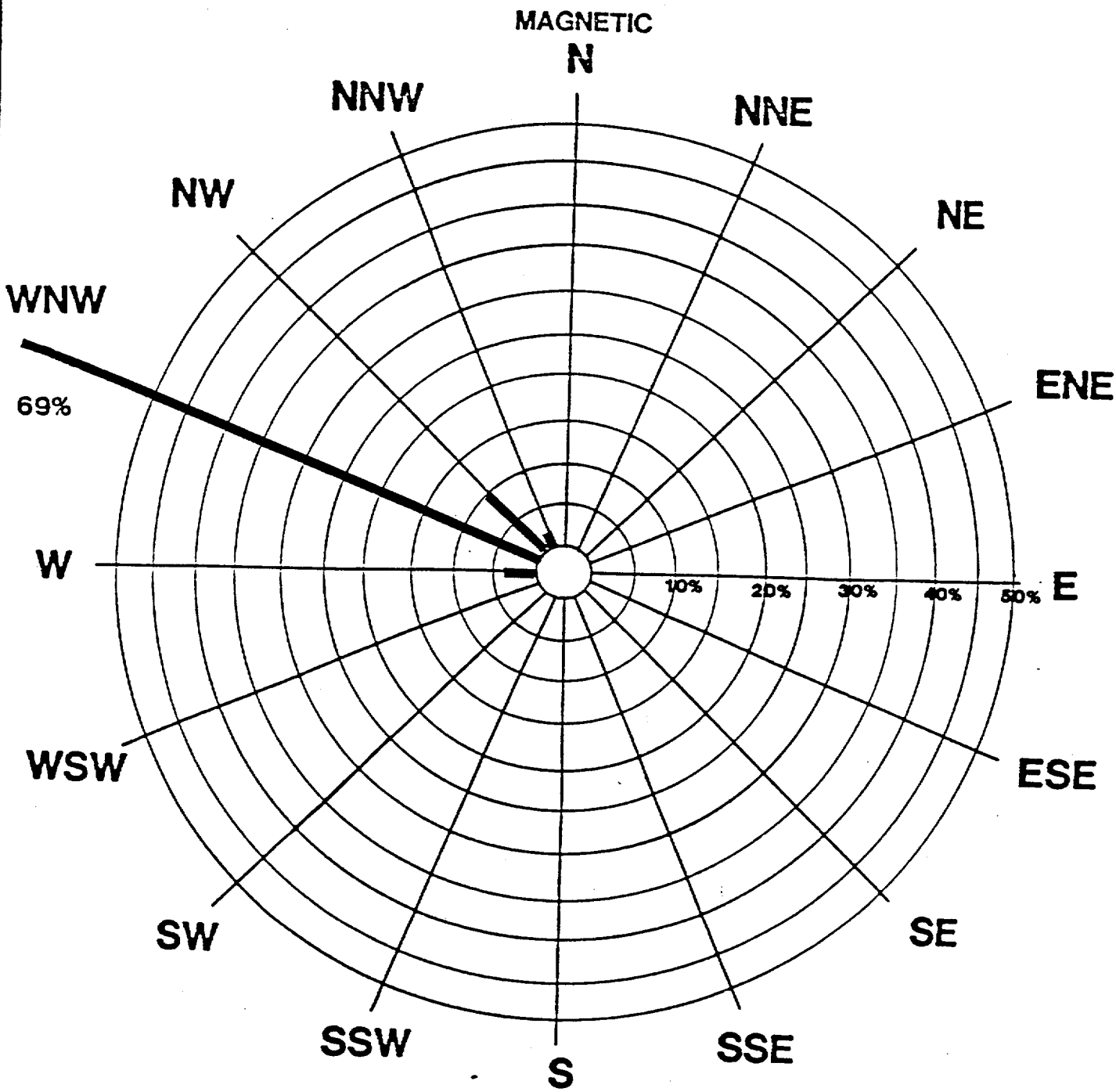
DENVER, COLORADO

FIG.4



17.3 % CALM

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

TITLE: Richardson Flats Wind Rose in % of Sample Time for DAY 3 1000-2300 Hours

July 10,1986

T.D.# R8-8605-12

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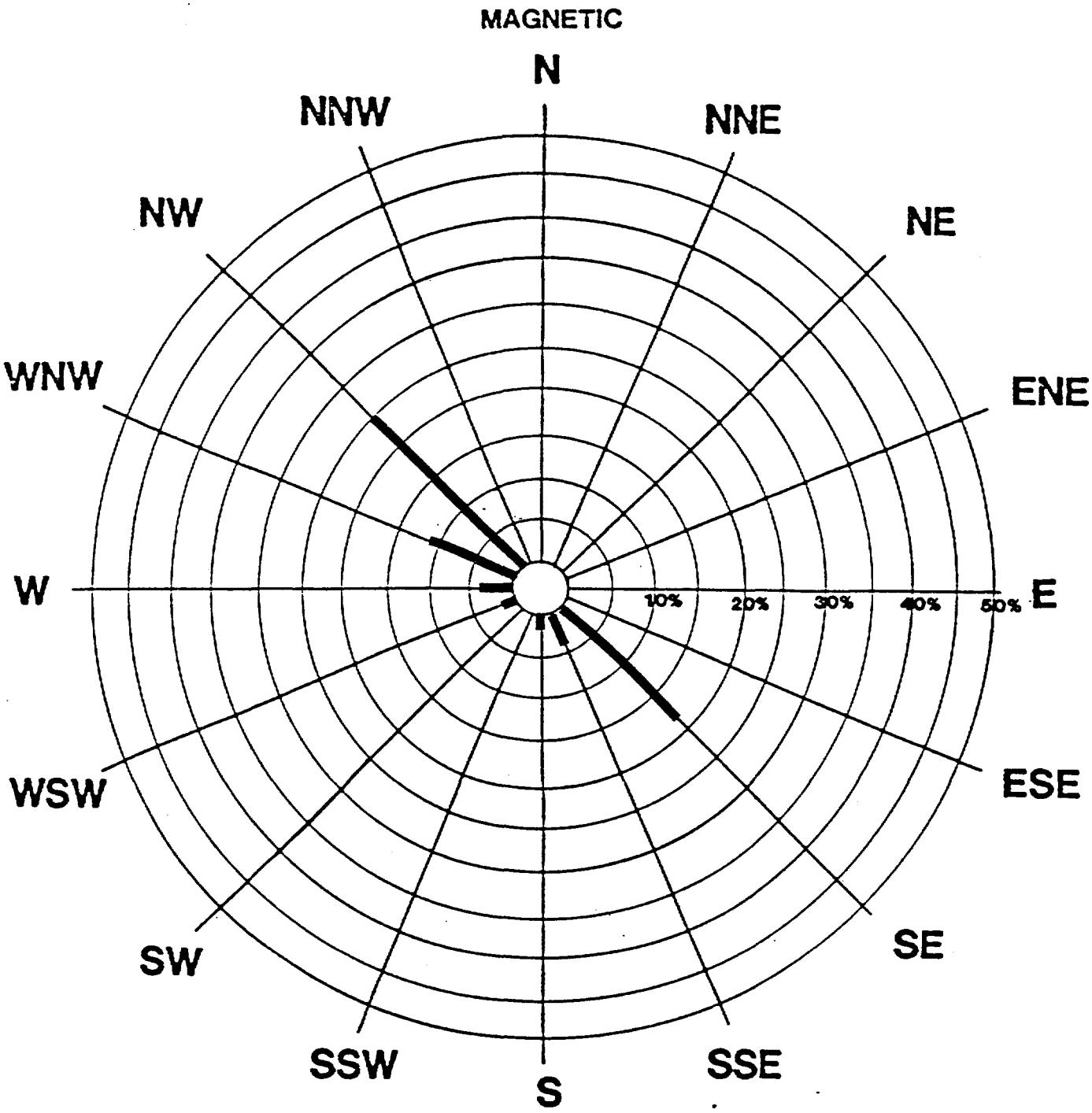
FIG.6



21.4 % CALM

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

TITLE: Richardson Flats Wind Rose in % of Sample Time for DAY 5 1000-2400 Hours July 12, 1986

T.D.# R8-8605-12

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DENVER, COLORADO

FIG.8

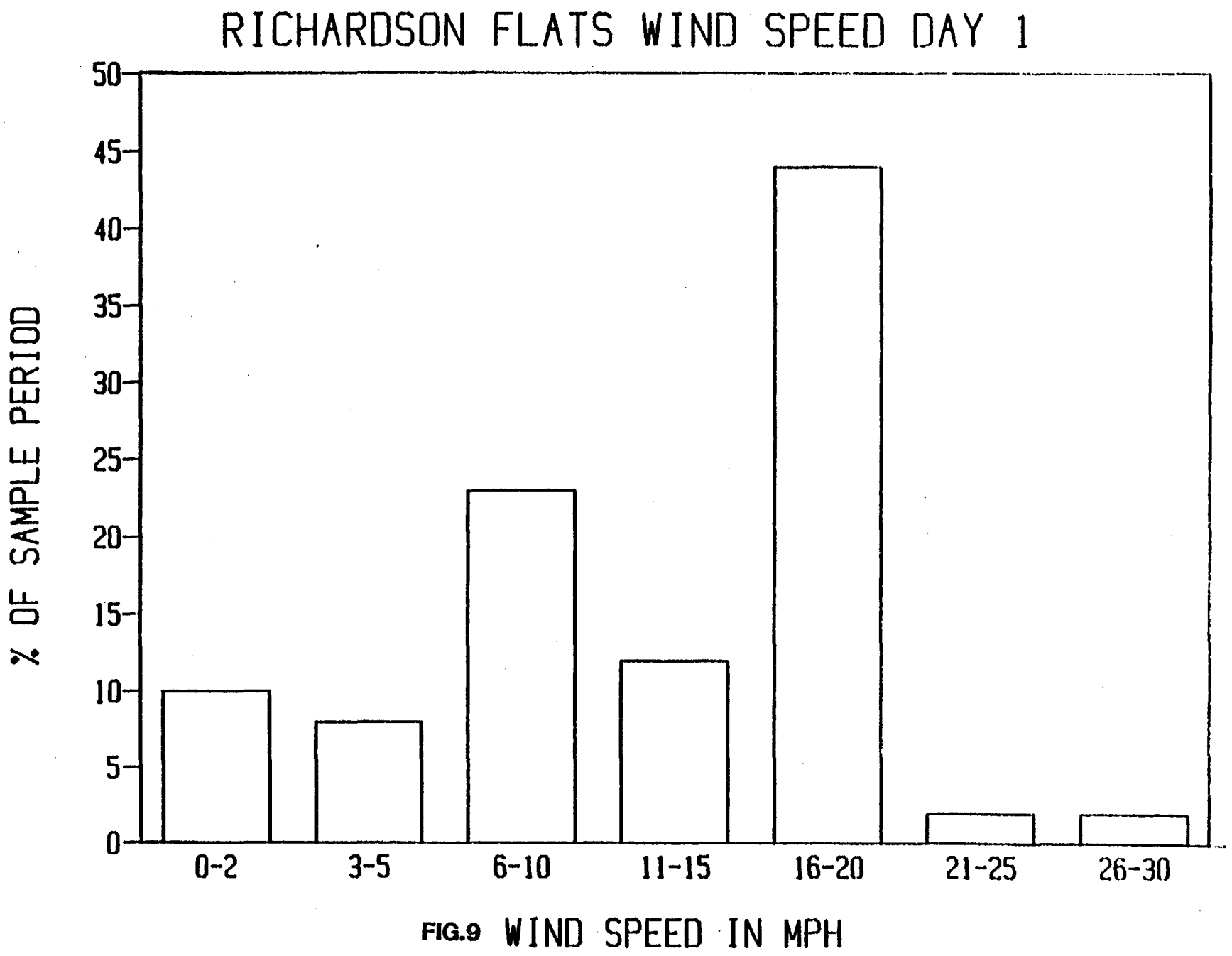
RICHARDSON FLATS WIND SPEED DAY 1
% OF SAMPLE PERIOD
50
45
40
35
30
25
20
15
10
5
0
0-2
3-5
6-10
11-15
16-20
21-25
26-30
WIND SPEED IN MPH

FIG.9

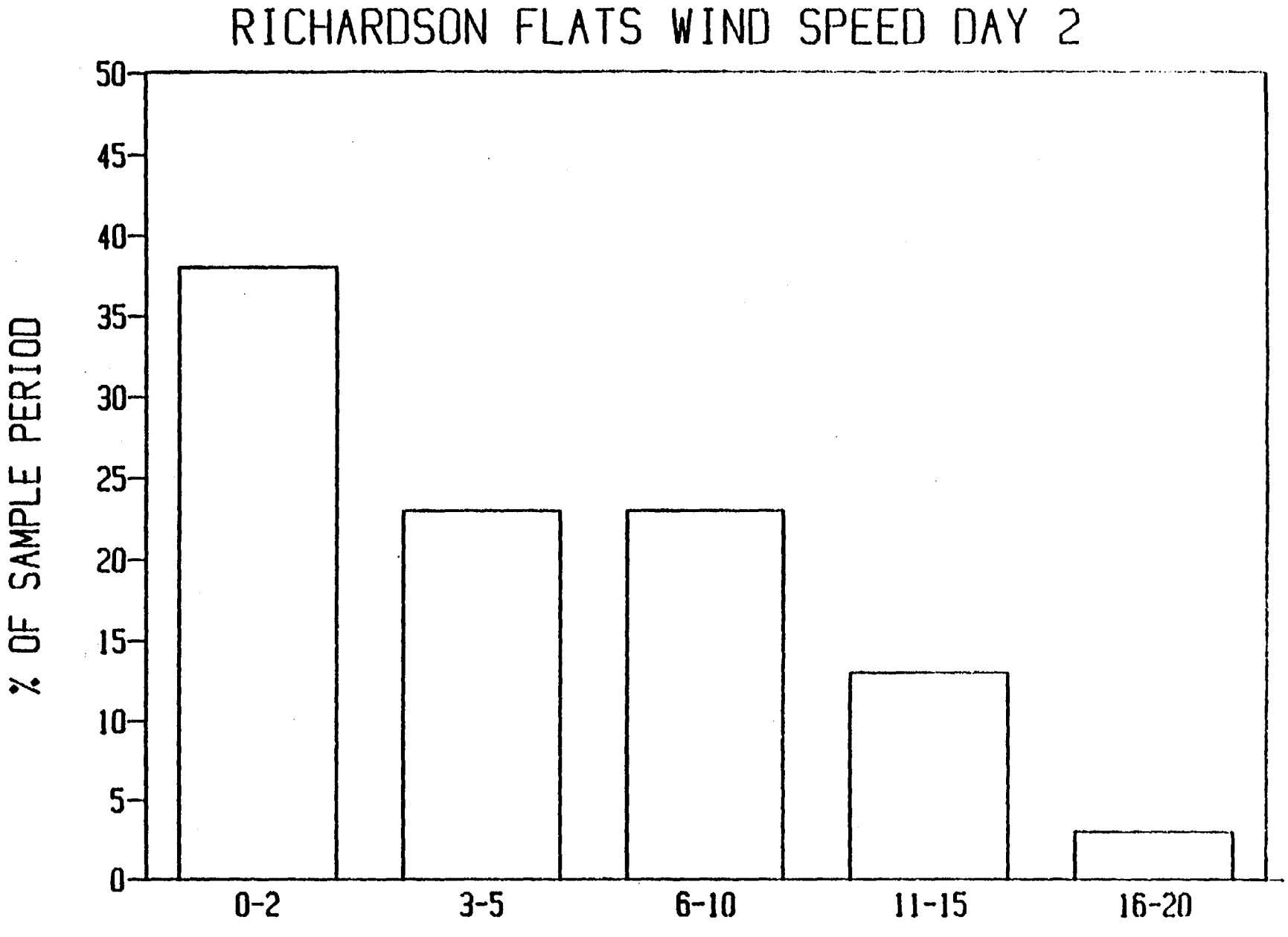
RICHARDSON FLATS WIND SPEED DAY 2
% OF SAMPLE PERIOD
50
45
40
35
30
25
20
15
10
5
0
0-2
3-5
6-10
11-15
16-20
WIND SPEED IN MPH

FIG.10

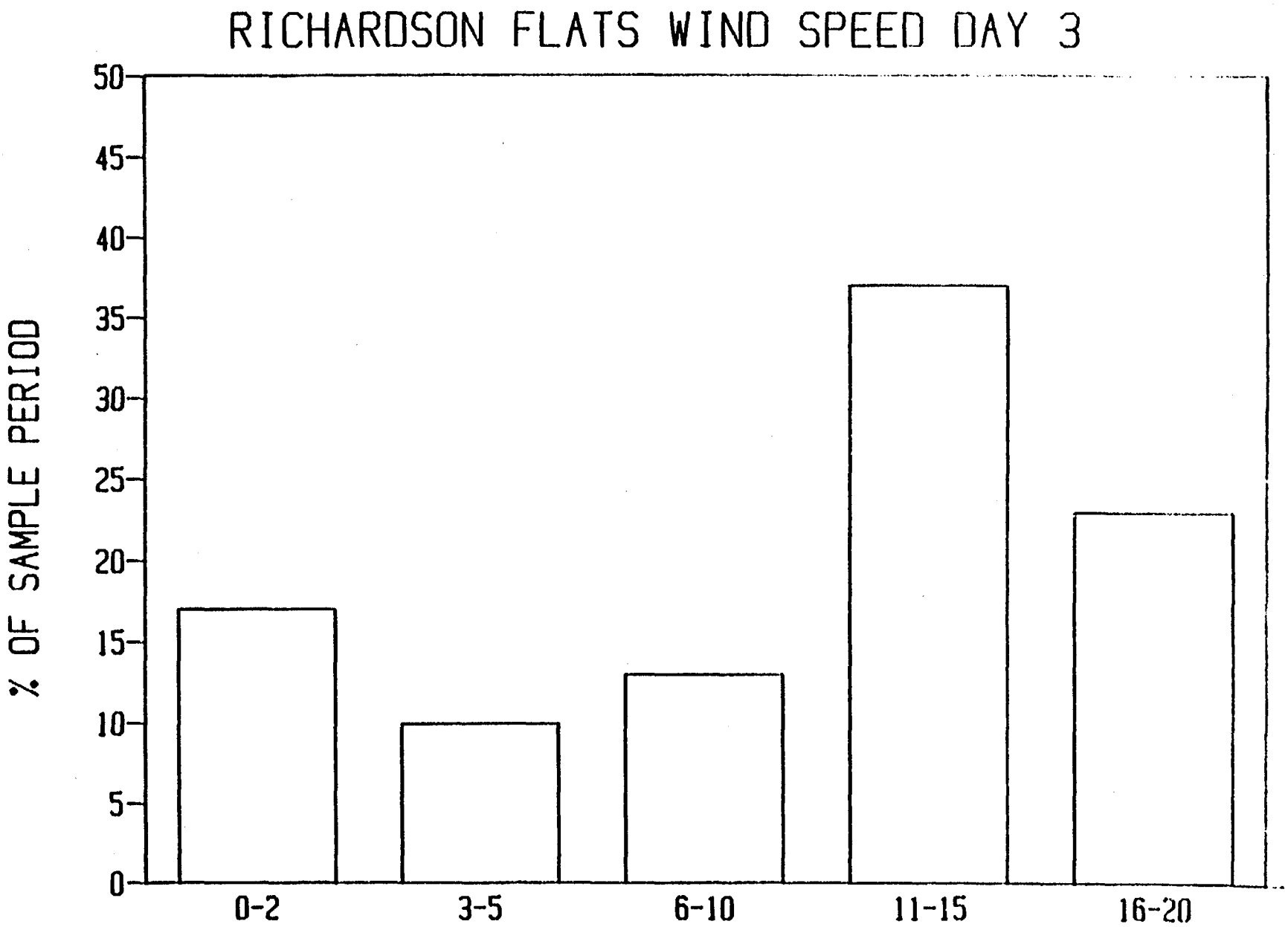
RICHARDSON FLATS WIND SPEED DAY 3
% OF SAMPLE PERIOD
50
45
40
35
30
25
20
15
10
5
0
0-2
3-5
6-10
11-15
16-20
WIND SPEED IN MPH

FIG.11

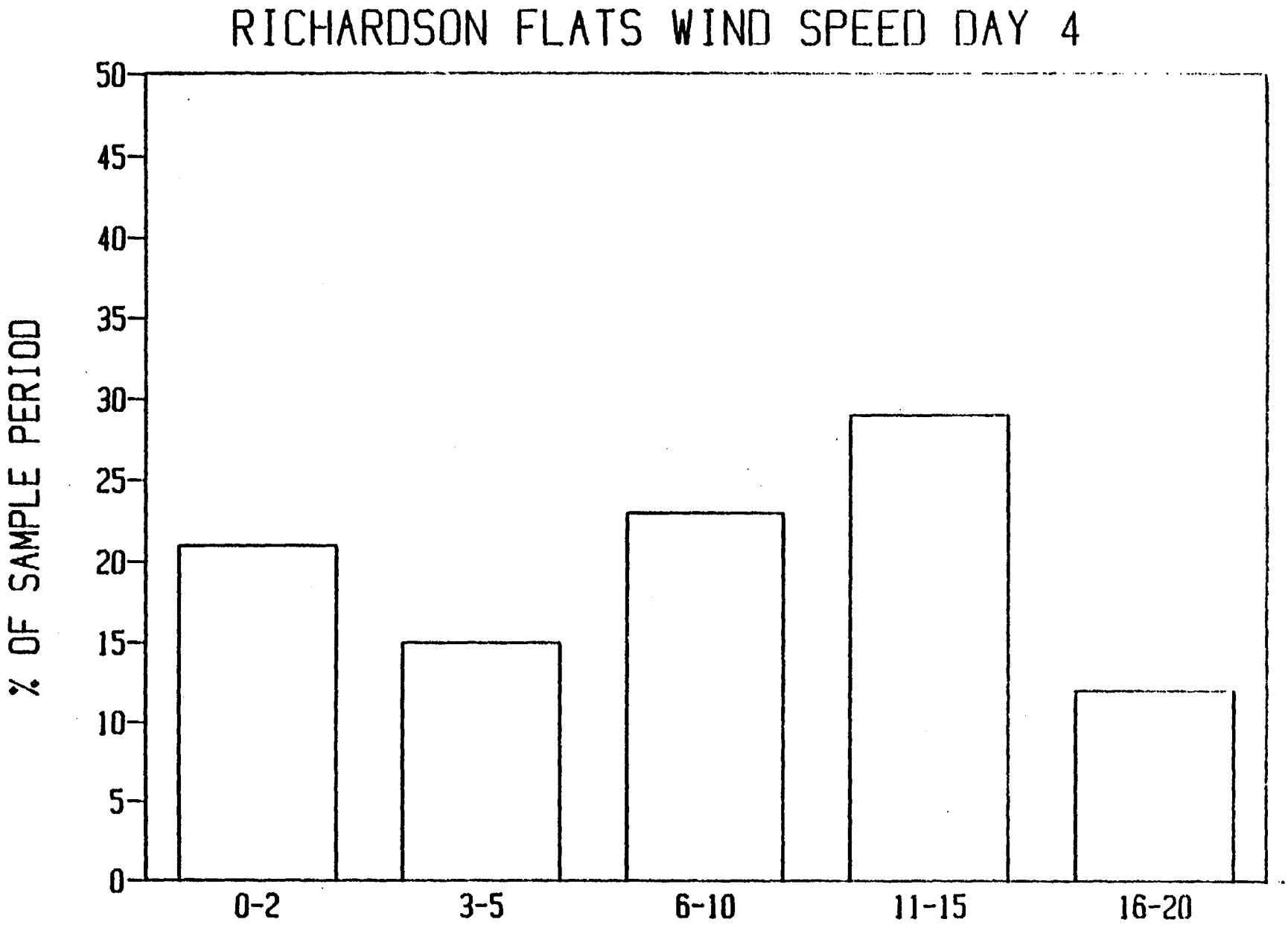

FIG.12 WIND SPEED IN MPH

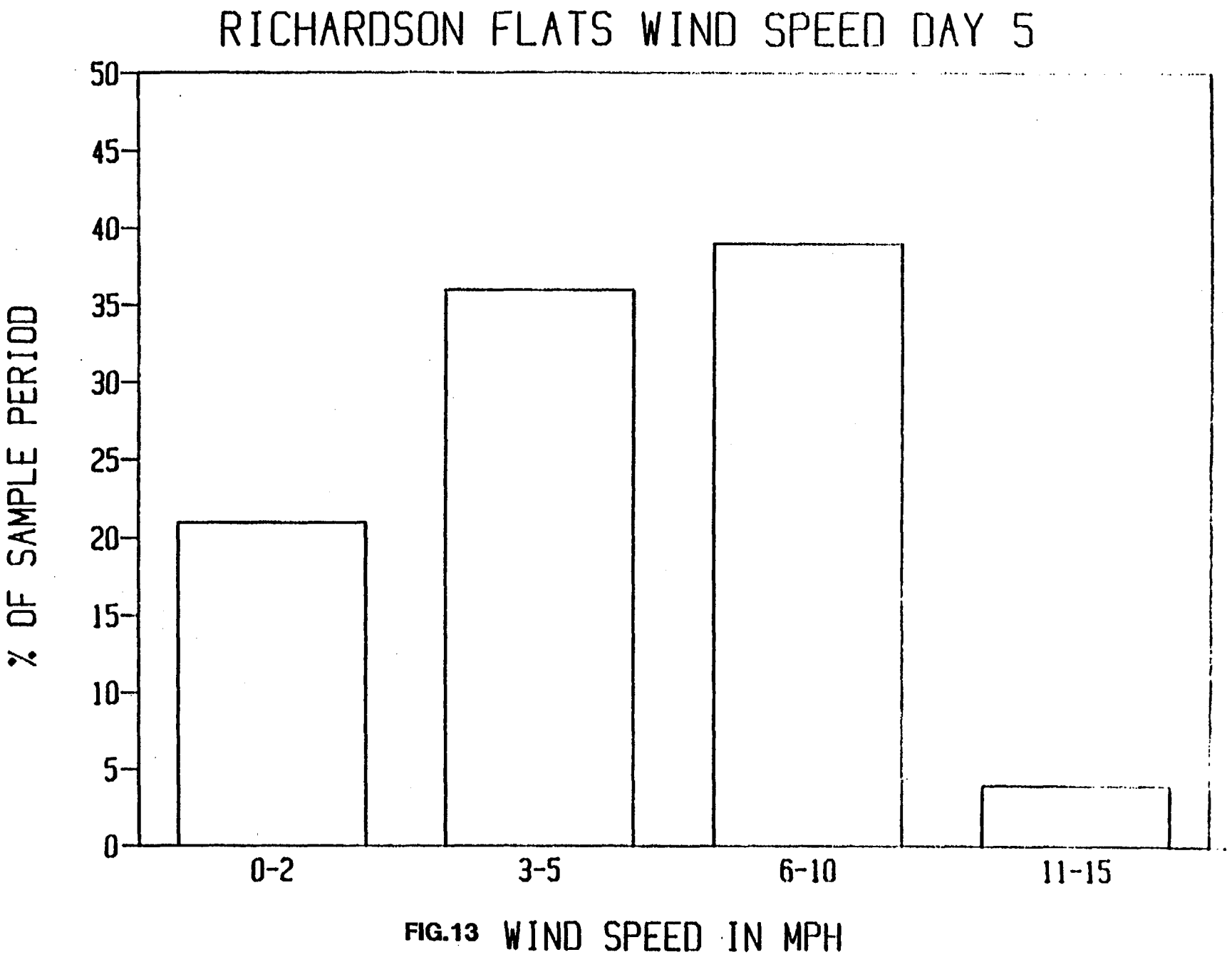
RICHARDSON FLATS WIND SPEED DAY 5
% OF SAMPLE PERIOD
50
45
40
35
30
25
20
15
10
5
0
0-2
3-5
6-10
11-15
WIND SPEED IN MPH

FIG.13

APPENDIX II

RAW RESULTS AND QA REPORT

REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

Case No. SAS 23564 Project No. _____

Site Richardson Flats

Contractor Laboratory Hittman Ebasco Assoc.

Data Reviewer L Roberts Date of Review 9/3/86

Sample Matrix Cellulose Filters

Sample No. See Laboratory Cover Sheet.

( ) Data are acceptable for use

( ) Data are acceptable for use with qualification noted ~~above~~ below

(✓) Data are preliminary - pending action or verification

( ) Data are unacceptable

Action required by DPO?

No ____ Yes ✓ Following items require action Detection limits requested by region were not met by the laboratory. Lab should resubmit furnace results with RSD values. **

Action required by Project Officer (PO)?

No ✓ Yes ____

** See Appendix V, Point 2, for clarification.

Following are our findings:

Cellulose air filters were submitted for analysis of arsenic, cadmium, lead and zinc. This was a SAS request.

The spike recovery for cadmium was 65%. The cadmium results, therefore, have been flagged with an "R". The zinc Laboratory Control Sample recovery result was only 60%. The zinc results may be biased low and have been flagged as estimated (J).

Two aspects of the contract were not fulfilled by the laboratory. Detection limits of 1 ug/L were specified by the SAS contract. However, the actual instrument detection limits for As, Cd, Pb and Zn were from 3.8 - 4.8 ug/L. Also, the RSD results for duplicate furnace injections were not reported. The duplicate results appear to agree well, however.

FORM A

Inorganic Data Completeness Checklist

✓ Inorganic analysis data sheets

✓ Initial calibration and calibration verification results

✓ Continuing calibration verification

✓ Instrument Detection limits

✓ Duplicate results

✓ Spike results

✓ ICP interference check sample

✓ Blank results

NR Serial Dilution Results

✓ Raw data for calibration standards

✓ Raw data for blanks

✓ Raw data for samples

✓ Raw data for duplicates

✓ Raw data for spikes

✓ Raw data for furnace AA

NR Percent solids calculation - soils only

✓ Traffic Reports

FORM B

Initial calibration data were reviewed. Initial calibration data were included in the package and met all contract requirements.

YES ✓ NO_____

Comments:

Continuing calibration data were reviewed and these data met all contract requirements.

YES ✓ NO_____

Comments:

A blank was run with every twenty samples or less per case.

YES ✓ NO_____

Comments:

two prep blanks were prepared

How many elements were detected above the required detection limit? 1

lead at 7 ug/L

How many elements were detected at greater than one half the amount detected in any sample? Ø

Comments:

FORM C

The interference check sample was run twice per eight hour shift. No massive interferences were present.

YES ✓ NO_____

Comments:

All matrix spike requirements were met.

YES ✓ NO_____

Comments:
Corrections made on form were difficult to read and not initialed.
a clean filter was spiked, all recoveries were within 65-120%.
Cadmium results are flagged due to a 65% spike recovery.

A duplicate sample was run with every twenty or fewer samples of a similar matrix, or one per case, whichever is more frequent.

YES ✓ NO_____

The RPD's were tabulated.

YES ✓ NO_____

Comments:

All inorganic detection limits met the contract requirements.

YES_____ NO ✓

Comments:
SAS request specified 1 ug/L detection limits for the four elements. The lab did not reach these limits.

FORM D

All Laboratory Control Samples met specified contract limits.

YES_____ NO ✓

Comments:

Zinc 60% Recovery – zinc results estimated.
LCS performed as required.

Serial Dilution requirements were met.

YES_____ NO_____

Not Required

The Furnace Atomic Absorption Analysis Scheme was followed correctly.

YES_____ NO ✓

RSD results are not reported. Duplicate injections appear to have good agreement. MSA were performed as required.

All holding times were met.

YES ✓ NO_____

Comments:

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

Date 8-14-86

COVER PAGE A
INORGANIC ANALYSES DATA PACKAGE

Lab Name HITTMAN ERASCO ASSOCIATES INC. Case No. SAS 2356H

SOW No. 7/84 Q.C. Report No. 53

Sample Numbers

EPA No.	Lab ID No.	EPA No.	Lab ID No.
AM-01-1	*	AM-01-3	*
AM-02-1		AM-02-3	
AM-04-1		AM-03-3	
AM-05-1		AM-04-3	
AM-01-2		AM-05-3	
AM-02-2		AM-01-4	
AM-03-2		AM-02-4	
AM-04-2		AM-03-4	
AM-05-2		AM-04-4	

Comments: * - Same as EPA number
Zn was analyzed by ICP, Region 8 and SMO approved this method change 8-13-86.

ICP Interelement and background corrections applied? Yes X No ___.

If yes, corrections applied before X or after ___ generation of raw data.

Footnotes:

NR - not required by contract at this time

Form I:

Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP/Flame AA) or F (for furnace).

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 10U).

E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.

S - Indicates value determined by Method of Standard Addition.

R - Indicates spike sample recovery is not within control limits.

* - Indicates duplicate analysis is not within control limits.

+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

Date 8-14-86

COVER PAGE B
INORGANIC ANALYSES DATA PACKAGE

Lab Name HITTMAN ERASCO ASSOCIATES INC. Case No. SAS 2356H

SOW No. 7/84 Q.C. Report No. 53

Sample Numbers

EPA No.	Lab ID No.	EPA No.	Lab ID No.
AM-05-4	☆	AM-06-4	☆
AM-01-5		AM-06-5	1
AM-02-5			
AM-03-5			
AM-04-5			
AM-05-5			
AM-03-1			
AM-06-2			
AM-06-3			

Comments: ☆ - same as CPA number

ICP Interelement and background corrections applied? Yes X No ___.

If yes, corrections applied before X or after ___ generation of raw data.

Footnotes:

NR - not required by contract at this time

Form I:

Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP/Flame AA) or F (for furnace).

U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 10U).

E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.

S - Indicates value determined by Method of Standard Addition.

R - Indicates spike sample recovery is not within control limits.

* - Indicates duplicate analysis is not within control limits.

+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-01-1

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	3.4F	24. Zinc	17P J
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/mc

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-01-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	8.9F	24. Zinc	21P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/pwc

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-01-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UPR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	12FS	24. Zinc	23P J
Cyanide	-	Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/pmk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-01-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	29FS	24. Zinc	43P J
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-01-5

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	8.0FS	24. Zinc	22P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-02-1

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFS	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	8.3FS	24. Zinc	15P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/[illegible]

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-02-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	6.8FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	147FS	24. Zinc	88P J
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/pwk

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U.S. EPA Contract Laboratory Program
Sample Management Office
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703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-02-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	13FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.8FR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	264FS	24. Zinc	169PJ
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/Jack

Form I

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Sample Management Office
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703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-02-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356 H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	6.6FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.54FR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	131F	24. Zinc	98P S

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/bmk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-02-5

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.8FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	48FS	24. Zinc	51P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/ouk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-03-1

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1.	Aluminum		13.	Magnesium	
2.	Antimony		14.	Manganese	
3.	Arsenic	1.0UF	15.	Mercury	
4.	Barium		16.	Nickel	
5.	Beryllium		17.	Potassium	
6.	Cadmium	0.5UFR	18.	Selenium	
7.	Calcium		19.	Silver	
8.	Chromium		20.	Sodium	
9.	Cobalt		21.	Thallium	
10.	Copper		22.	Tin	
11.	Iron		23.	Vanadium	
12.	Lead	0.5UFR KH	24.	Zinc	0.4UP S

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-03-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.4FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	26F	24. Zinc	34P S

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DUK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-03-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	25FS	24. Zinc	28P J
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/[illegible]

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-03-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.2FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	40FS	24. Zinc	36P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-03-5

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	30FS	24. Zinc	23PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Oril Solomon/mk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-04-1

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	54F	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	4.8FRS	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	959F	24. Zinc	672P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DWK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-04-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SDW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

Mg/filter ug/L or mg/kg dry weight (Circle One)

1.	Aluminum		13.	Magnesium	
2.	Antimony		14.	Manganese	
3.	Arsenic	1.5 FS	15.	Mercury	
4.	Barium		16.	Nickel	
5.	Beryllium		17.	Potassium	
6.	Cadmium	.50 UFR	18.	Selenium	
7.	Calcium		19.	Silver	
8.	Chromium		20.	Sodium	
9.	Cobalt		21.	Thallium	
10.	Copper		22.	Tin	
11.	Iron		23.	Vanadium	
12.	Lead	30F	24.	Zinc	39 P S

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-04-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

mg/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.5 FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	36 FS	24. Zinc	43 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-04-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

(ug/filter) ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	64 FS	24. Zinc	35 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-04-S

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

Mg/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.5 FS	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	27 F	24. Zinc	27 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon
DMF

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-05-1

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	13.	Magnesium
2.	Antimony	14.	Manganese
3.	Arsenic 17 ~~5~~* FS	15.	Mercury
4.	Barium	16.	Nickel
5.	Beryllium	17.	Potassium
6.	Cadmium 5.2 ~~0.5~~ U FRS	18.	Selenium
7.	Calcium	19.	Silver
8.	Chromium	20.	Sodium
9.	Cobalt	21.	Thallium
10.	Copper	22.	Tin
11.	Iron	23.	Vanadium
12.	Lead 348 ~~27~~ F	24.	Zinc 527 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-05-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/L (ug/filter) or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	14 FS	24. Zinc	17 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/mc

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-05-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.4 F	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	30 F	24. Zinc	55 P J

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-06-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/l filter ug/l or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.1 F	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	35 FS	24. Zinc	43 PJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Sdonosfuk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-05-5

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/L or mg/kg dry weight (Circle One)

mg/filter

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	16F	24. Zinc	27 PJ
Cyanide		Percent Solids (%)	

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/DMK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-06-2

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

Mg/filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	.50UF ~~16F~~ DK	24. Zinc	0.4 UF ~~27 PXS~~

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/DWK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-06-3

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

ug/filter ug/l or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	.50 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	.50 UF	24. Zinc	0.4 UPJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/mk

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-06-4

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

No filter ug/L or mg/kg dry weight (Circle One)

1. Aluminum		13. Magnesium	
2. Antimony		14. Manganese	
3. Arsenic	1.0 UF	15. Mercury	
4. Barium		16. Nickel	
5. Beryllium		17. Potassium	
6. Cadmium	0.5 UFR	18. Selenium	
7. Calcium		19. Silver	
8. Chromium		20. Sodium	
9. Cobalt		21. Thallium	
10. Copper		22. Tin	
11. Iron		23. Vanadium	
12. Lead	0.5 UF	24. Zinc	0.4 UPJ

Cyanide ____ Percent Solids (%) ____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: ____

Lab Manager Gail Solomon/MK

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. AM-06-5

Date 8-14-86

INORGANIC ANALYSIS DATA SHEET

LAB NAME Hittman Ebasco Assoc., Inc. CASE NO. SAS 2356H

SOW NO. 7/84

LAB SAMPLE ID. NO. NA QC REPORT NO. 53

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil ____ Sludge ____ Other X

no filter ug/L or mg/kg dry weight (Circle One)

1.	Aluminum		13.	Magnesium	
2.	Antimony		14.	Manganese	
3.	Arsenic	1.0 UF	15.	Mercury	
4.	Barium		16.	Nickel	
5.	Beryllium		17.	Potassium	
6.	Cadmium	0.5 UFR	18.	Selenium	
7.	Calcium		19.	Silver	
8.	Chromium		20.	Sodium	
9.	Cobalt		21.	Thallium	
10.	Copper		22.	Tin	
11.	Iron		23.	Vanadium	
12.	Lead	0.5 UF	24.	Zinc	0.4 UFJ

Cyanide - Percent Solids (%)

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments:

Lab Manager Gail Solomon/MK

REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

Case No. 6218 Project No. 8608-05

Site Richardson Flats

Contractor Laboratory Hittman Ebasco

Data Reviewer L Roberts Date of Review 9/5/86

Sample Matrix Soil - Inorganic

Sample No. MH0861

MH0862

MH0863

MH0864

MH0865

( ) Data are acceptable for use

(✓) Data are acceptable for use with qualification noted ~~above~~ below

( ) Data are preliminary - pending action or verification

( ) Data are unacceptable

Action required by DPO?

No ✓ Yes ____ Following items require action ____

Action required by Project Officer (PO)?

No ✓ Yes ____

Following are our findings:

The As, Hg, Sb, Se and Tl results are flagged with an R due to spike recoveries beyond the ± 25% control limit. The As, Hg and Tl matrix spike recoveries are very high, this may indicate a positive bias. The duplicate RPD results for Cr, Al, Ca, Mg, Hg and Zn were between 39 and 61%. These results should be considered quantitative estimates. The serial dilution results for Be, Co, K, Sb and V indicate that an interference may be present for these elements.

The laboratory submitted corrected Form I's because they had originally miscalculated the matrix spike recoveries. The new Form I's are different to read and confusing.

FORM A

Inorganic Data Completeness Checklist

✓ Inorganic analysis data sheets

✓ Initial calibration and calibration verification results

✓ Continuing calibration verification

✓ Instrument Detection limits

✓ Duplicate results

✓ Spike results

✓ ICP interference check sample

✓ Blank results

✓ Serial Dilution Results

✓ Raw data for calibration standards

✓ Raw data for blanks

✓ Raw data for samples

✓ Raw data for duplicates

✓ Raw data for spikes

✓ Raw data for furnace AA

✓ Percent solids calculation - soils only

✓ Traffic Reports

FORM B

Initial calibration data were reviewed. Initial calibration data were included in the package and met all contract requirements.

YES ✓ NO _____

Comments:

Continuing calibration data were reviewed and these data met all contract requirements.

YES ✓ NO _____

Comments:

A blank was run with every twenty samples or less per case.

YES ✓ NO _____

Comments:

How many elements were detected above the required detection limit? Ø

How many elements were detected at greater than one half the amount detected in any sample? Ø

Comments:

FORM C

The interference check sample was run twice per eight hour shift. No massive interferences were present.

YES_____ NO ✓

Comments:

Final ICS for antimony was not analyzed

All matrix spike requirements were met.

YES_____ NO ✓

Comments:

As 280% Sb 67%
Hg 150%
Se 55%
Tl 218%

As, Hg & Tl results may be biased high.
N flag applied to results.

Laboratory miscalculated spike recoveries and submitted new forms.

A duplicate sample was run with every twenty or fewer samples of a similar matrix, or one per case, whichever is more frequent.

YES ✓ NO_____

Cr 61% RPD
Al 39%
Ca 56%
Mg 58%
Hg 57%
Zn 42%

Limit - 35 RPD
+ flag applied

The RPD's were tabulated.

YES ✓ NO_____

Comments:

All inorganic detection limits met the contract requirements.

YES ✓ NO_____

Comments:

FORM D

All Laboratory Control Samples met specified contract limits.

YES ✓ NO _____

Comments:

Serial Dilution requirements were met.

YES _____ NO ✓

Results >±10%
Sb 34% V 68%
Co 14% Be 12%
K 15%

E flag applied
Laboratory did not flag data.

The Furnace Atomic Absorption Analysis Scheme was followed correctly.

YES ✓ NO _____

All holding times were met.

YES ✓ NO _____

Comments:

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

Date 8/22/86

COVER PAGE
INORGANIC ANALYSES DATA PACKAGE

Lab Name HITTMAN EBASCO ASSOC. INC. Case No. 6218

SOW No. 7/85 Q.C. Report No. 55

Lab Receipt Date 7/16/86

Sample Numbers

EPA No.	Lab ID No.	EPA No.	Lab ID No.
MHD 861	*		
862			
863			
864			
865			

Comments: * - same as EPA #. CV - cold Vapor
Sb - furnace spike levels used for ICAP analysis, ICS (final) not run. Analyst will be more careful in the future.

ICP interelement and background corrections applied? Yes X No ___.

If yes, corrections applied before X or after ___ generation of raw data.

Footnotes:

NR - Not required by contract at this time

Form I:

Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract-required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP), A (for Flame AA) or F (for Furnace AA).

U - Indicates element was analyzed for but not detected. Report with the instrument detection limit value (e.g., 10U).

E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.

s - Indicates value determined by Method of Standard Addition.

N - Indicates spike sample recovery is not within control limits.

* - Indicates duplicate analysis is not within control limits.

+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

M - Indicates duplicate injection results exceeded control limits.

Indicate method used: P for ICP; A for Flame AA and F for Furnace.

Corrected form

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MHD 861

Date 8/22/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. INC. CASE NO. 6218

SOW NO. 7/85

LAB SAMPLE ID. NO. N/A QC REPORT NO. 55

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil X Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	11300 P*	13.	Magnesium	36700P*
2.	Antimony	89PN E	14.	Manganese	15400P*N*H
3.	Arsenic	7.5FNS	15.	Mercury	0.2CVN*
4.	Barium	144P*N*H	16.	Nickel	52P*N*H
5.	Beryllium	~~41P*H~~ 43P*N*E E	17.	Potassium	[965] P E
6.	Cadmium	12P*	18.	Selenium	1.0UFN
7.	Calcium	129000P*	19.	Silver	2.0UF
8.	Chromium	743F*S	20.	Sodium	5130P
9.	Cobalt	159P*N*H E	21.	Thallium	2.0UFN
10.	Copper	100P*N*H	22.	Vanadium	1390P*N*H E
11.	Iron	103000P	23.	Zinc	84P*
12.	Lead	418F*		Precent Solids (%)	98.7
	Cyanide	NR			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Color - white; Clarity - opaque; texture medium

Lab Manager [signature]

Corrected Form

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MHD 862

Date 8/22/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. INC. CASE NO. 6218

SOW NO. 7/85

LAB SAMPLE ID. NO. N/A QC REPORT NO. 55

Elements Identified and Measured

Concentration: Low Y Medium ____

Matrix: Water ____ Soil Y Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	3790P*	13.	Magnesium	14200P*
2.	Antimony	18PN, E	14.	Manganese	284PA*KH
3.	Arsenic	87FN	15.	Mercury	1.0CVN*
4.	Barium	95PA*KH	16.	Nickel	12PA*KH
5.	Beryllium	0.4UPA*KH E	17.	Potassium	[436]P E
6.	Cadmium	3.9P*	18.	Selenium	1.0UFNS
7.	Calcium	46900P*	19.	Silver	2.0UF
8.	Chromium	17F*S	20.	Sodium	[336]P
9.	Cobalt	[2.9]PA*KH E	21.	Thallium	2.4FN
10.	Copper	21PA*KH	22.	Vanadium	11PA*KH E
11.	Iron	10600P	23.	Zinc	440P*
12.	Lead	477F*		Precent Solids (%)	98.2
	Cyanide	NR			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: color-white; clarity-opaque; texture coarse

Lab Manager [signature]

Corrected Form

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MHD863

Date 8/22/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. INC. CASE NO. 6218

SOW NO. 7/85

LAB SAMPLE ID. NO. N/A QC REPORT NO. 55

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil X Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	11900P*	13.	Magnesium	55800P*
2.	Antimony	70PNE	14.	Manganese	8320PN*KH
3.	Arsenic	7.7FN	15.	Mercury	0.5CVN*
4.	Barium	200PN*KH	16.	Nickel	44PN*KH
5.	Beryllium	5.2PN*KH E	17.	Potassium	1480PE
6.	Cadmium	~~5.2~~ KH 12P*	18.	Selenium	1.0UFN
7.	Calcium	143000P*	19.	Silver	2.0UF
8.	Chromium	443F*	20.	Sodium	5620P
9.	Cobalt	14PN*KH E	21.	Thallium	2.0UFN
10.	Copper	44PN*KH	22.	Vanadium	561PN*KH E
11.	Iron	94200P	23.	Zinc	331P*
12.	Lead	133F*		Precent Solids (%)	99.3

Cyanide NR

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample description: color-white; clarity-opaque; texture-medium

Lab Manager [signature]

Corrected Form

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MHD 864

Date 8/22/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. INC. CASE NO. 6218

SOW NO. 7/85

LAB SAMPLE ID. NO. N/A QC REPORT NO. 55

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil X Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	10500P*	13.	Magnesium	3560P*
2.	Antimony	40PN E	14.	Manganese	112P ~~A~~ KH
3.	Arsenic	2.1UFN	15.	Mercury	~~ND.4CV~~ 0.5CUN*
4.	Barium	668P ~~A~~ KH	16.	Nickel	21P ~~A~~ KH
5.	Beryllium	~~1.6P~~ KH 1.4PN KH E	17.	Potassium	1160 P E
6.	Cadmium	4.5P*	18.	Selenium	1.0 UFN
7.	Calcium	6350P*	19.	Silver	2.1UF
8.	Chromium	~~21F~~ KH 4.3F* S	20.	Sodium	~~1030 UP~~ KH [976]P
9.	Cobalt	11P ~~A~~ KH E	21.	Thallium	2.1UFN
10.	Copper	15P ~~A~~ KH	22.	Vanadium	81P ~~A~~ KH E
11.	Iron	33900P	23.	Zinc	96P*
12.	Lead	~~3500F~~ KH 13F*S		Precent Solids (%)	97.3

Cyanide NR

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: sample description: color-white; clarity-opaque; texture-coarse

Lab Manager [signature]

Corrected Form

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MHD 865

Date 8/22/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. INC. CASE NO. 6218

SOW NO. 7/85

LAB SAMPLE ID. NO. N/A QC REPORT NO. 55

Elements Identified and Measured

Concentration: Low X Medium ____

Matrix: Water ____ Soil X Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	13200P*	13.	Magnesium	5550P*
2.	Antimony	104PN E	14.	Manganese	1730PA*KH
3.	Arsenic	188FN	15.	Mercury	3.9CVN*
4.	Barium	225PA*KH	16.	Nickel	34PA*KH
5.	Beryllium	~~3.1P*KH~~ ~~3.1P*KH~~ 1.0PA*KH E	17.	Potassium	1960PE
6.	Cadmium	38P*	18.	Selenium	6.9FNS
7.	Calcium	14900P*	19.	Silver	18F
8.	Chromium	~~10F*KH~~ 21F*S	20.	Sodium	1320P
9.	Cobalt	21PA*KH E	21.	Thallium	13FN
10.	Copper	222PA*KH	22.	Vanadium	12PA*KH E
11.	Iron	46100P	23.	Zinc	4630P*
12.	Lead	3470F*S		Precent Solids (%)	98.1
	Cyanide	NR			

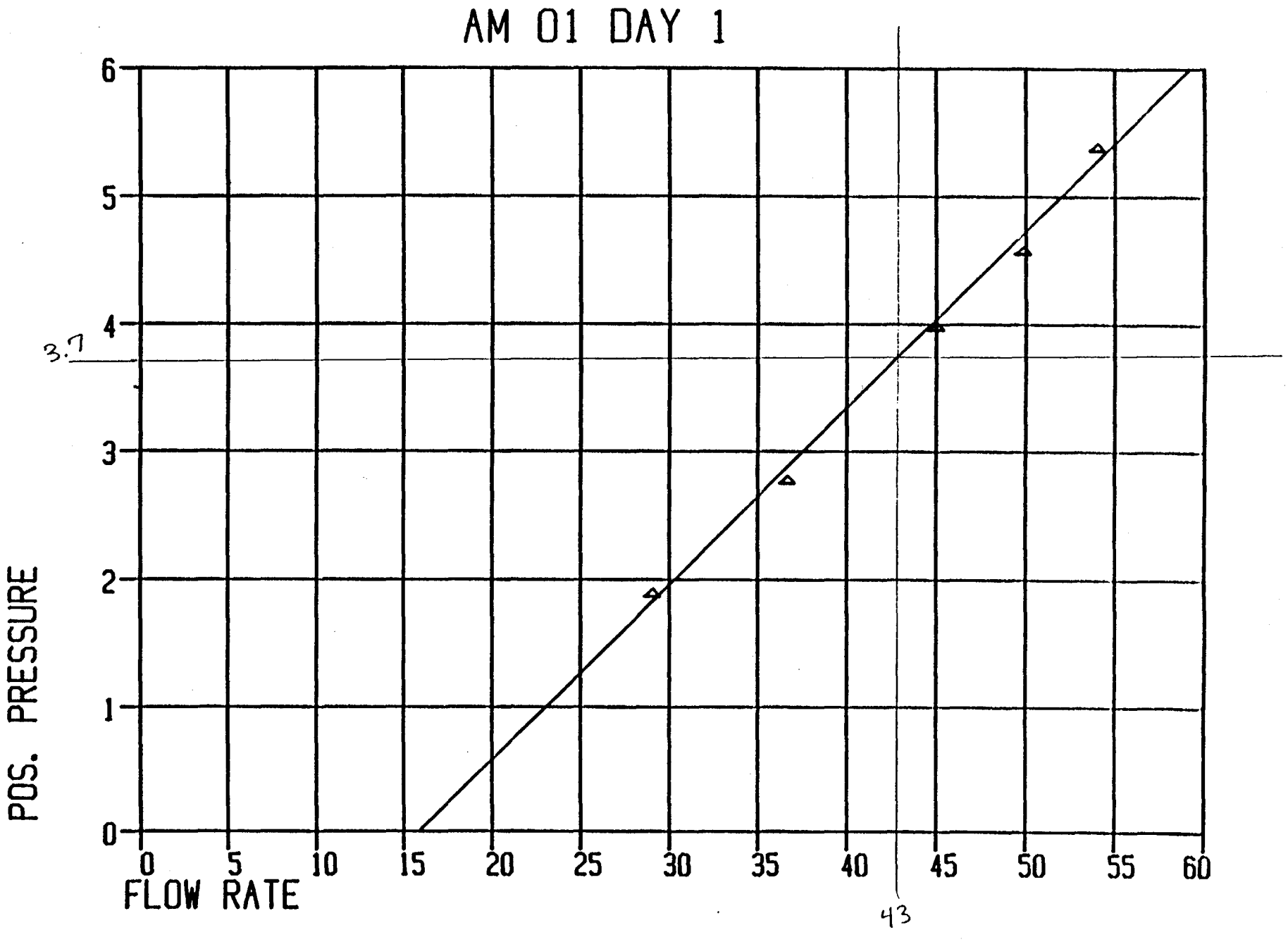
Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: sample description: color-white; clarity-opaque; texture-medium

Lab Manager [signature]

APPENDIX III

CALIBRATION DATA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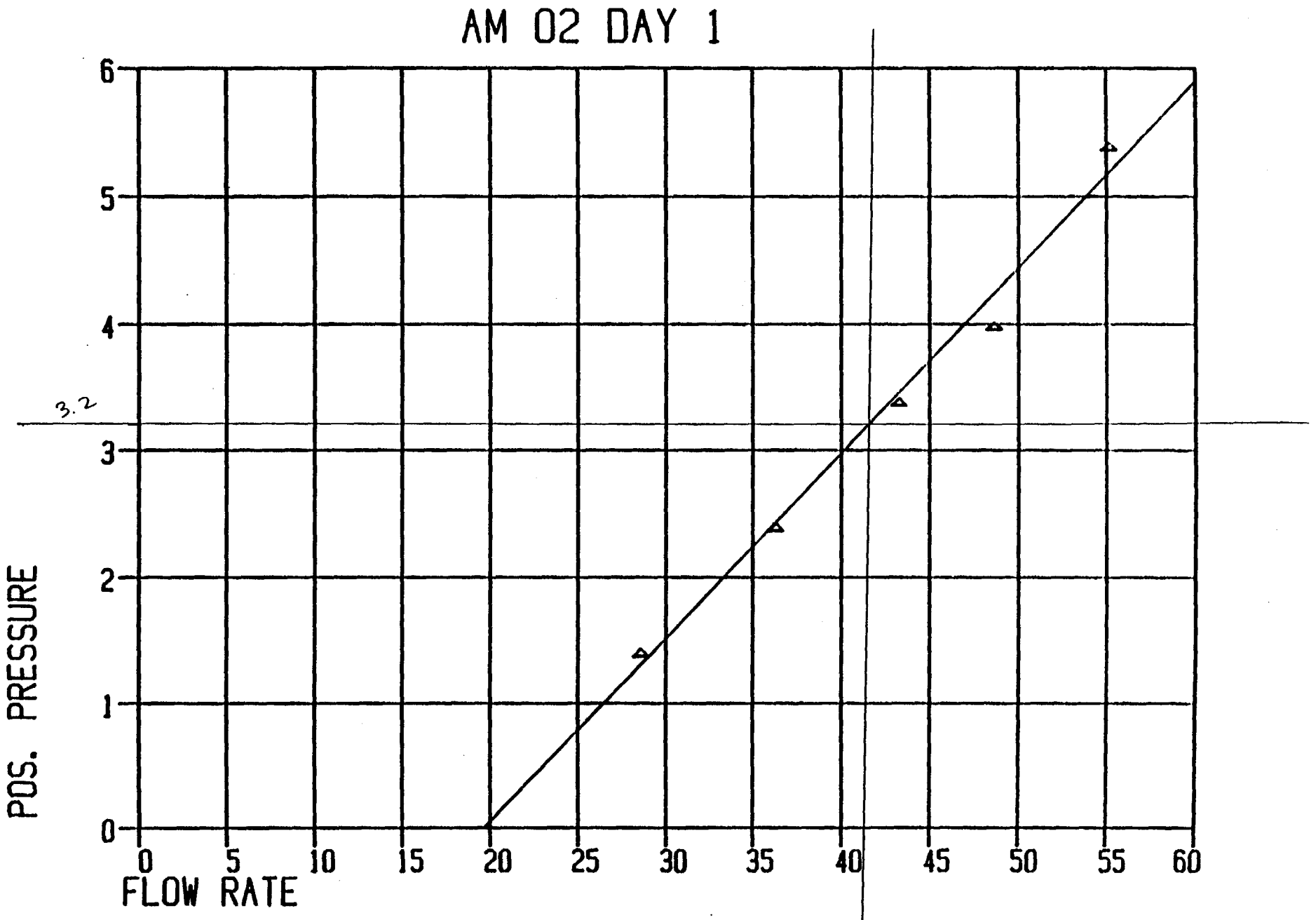
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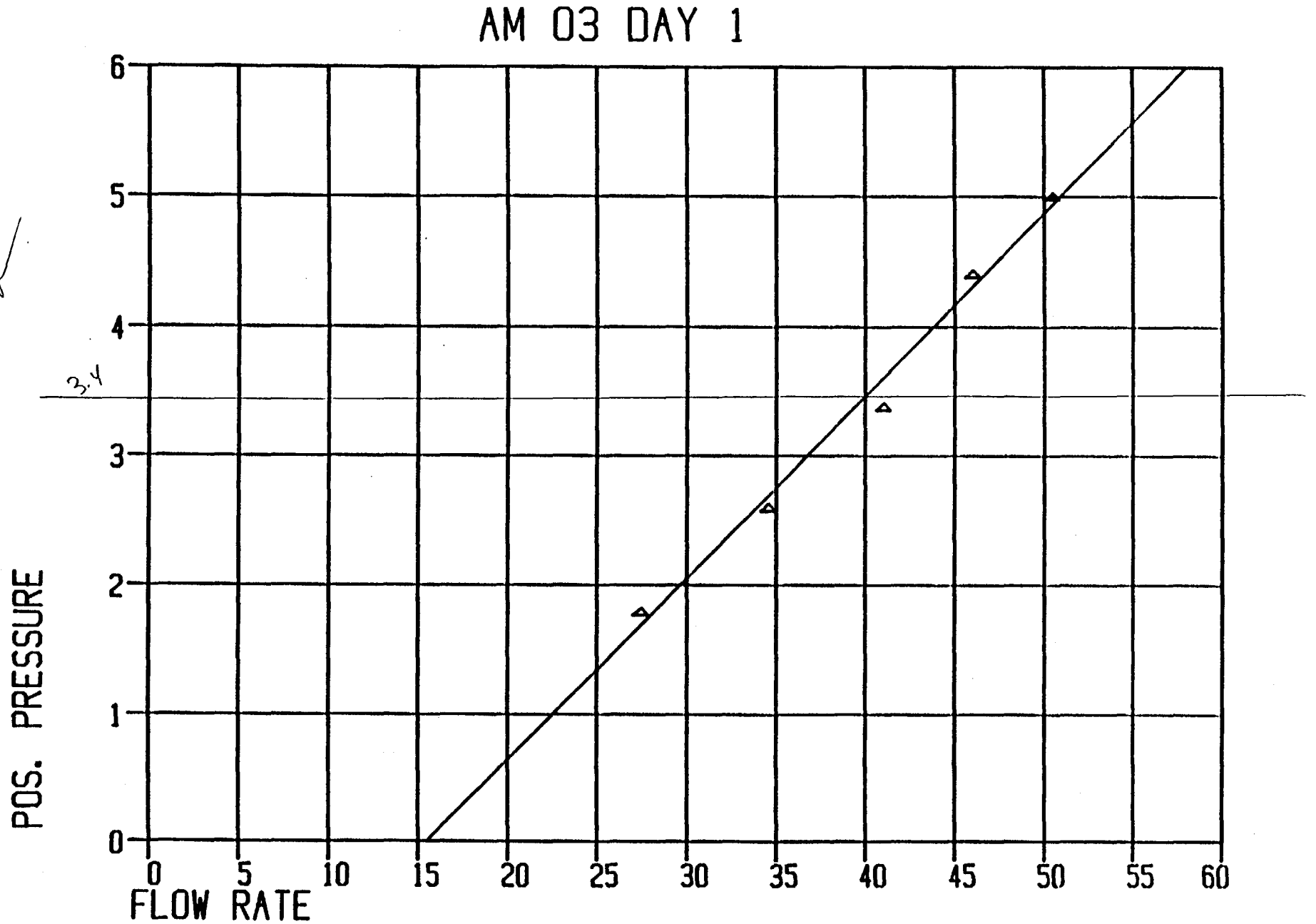
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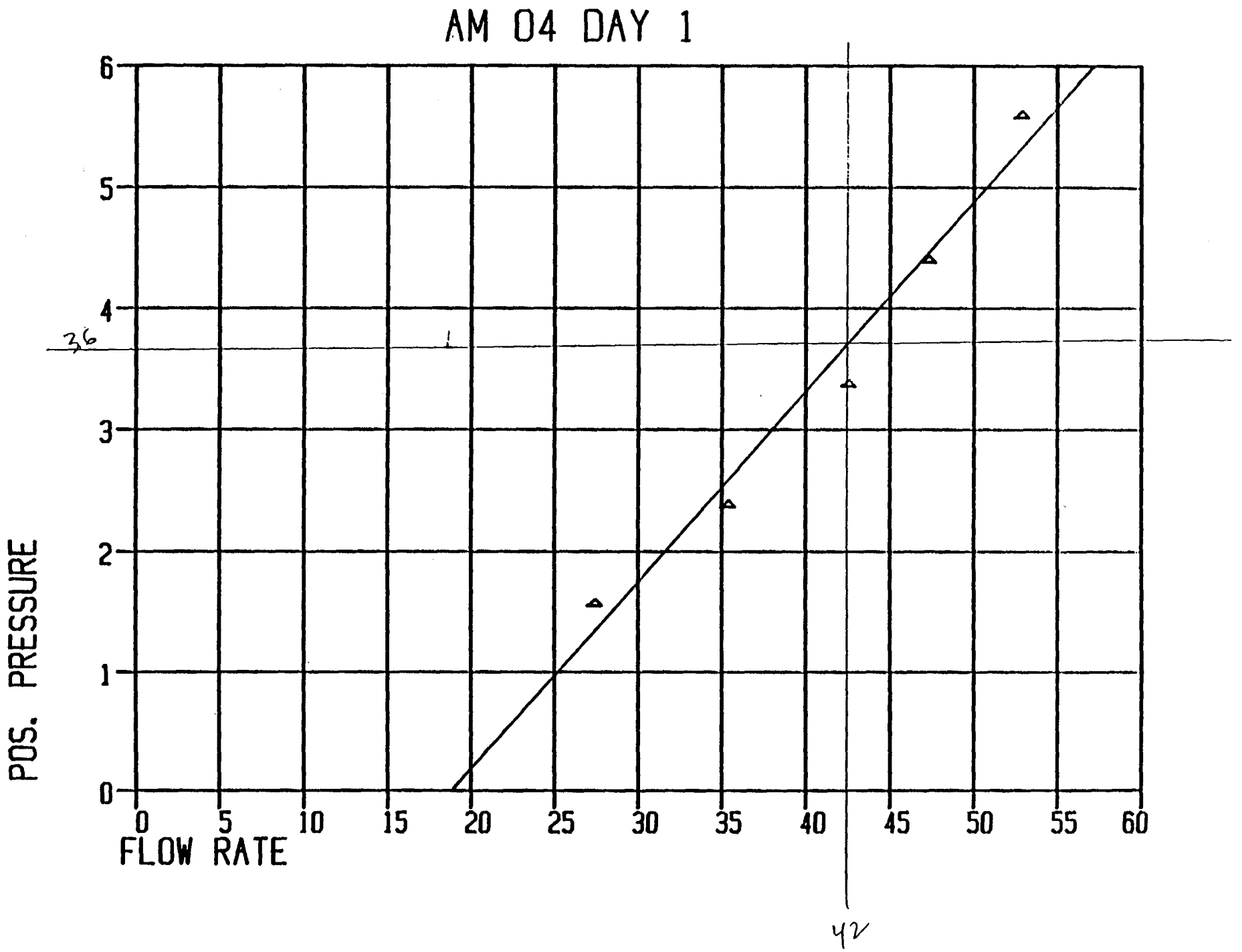
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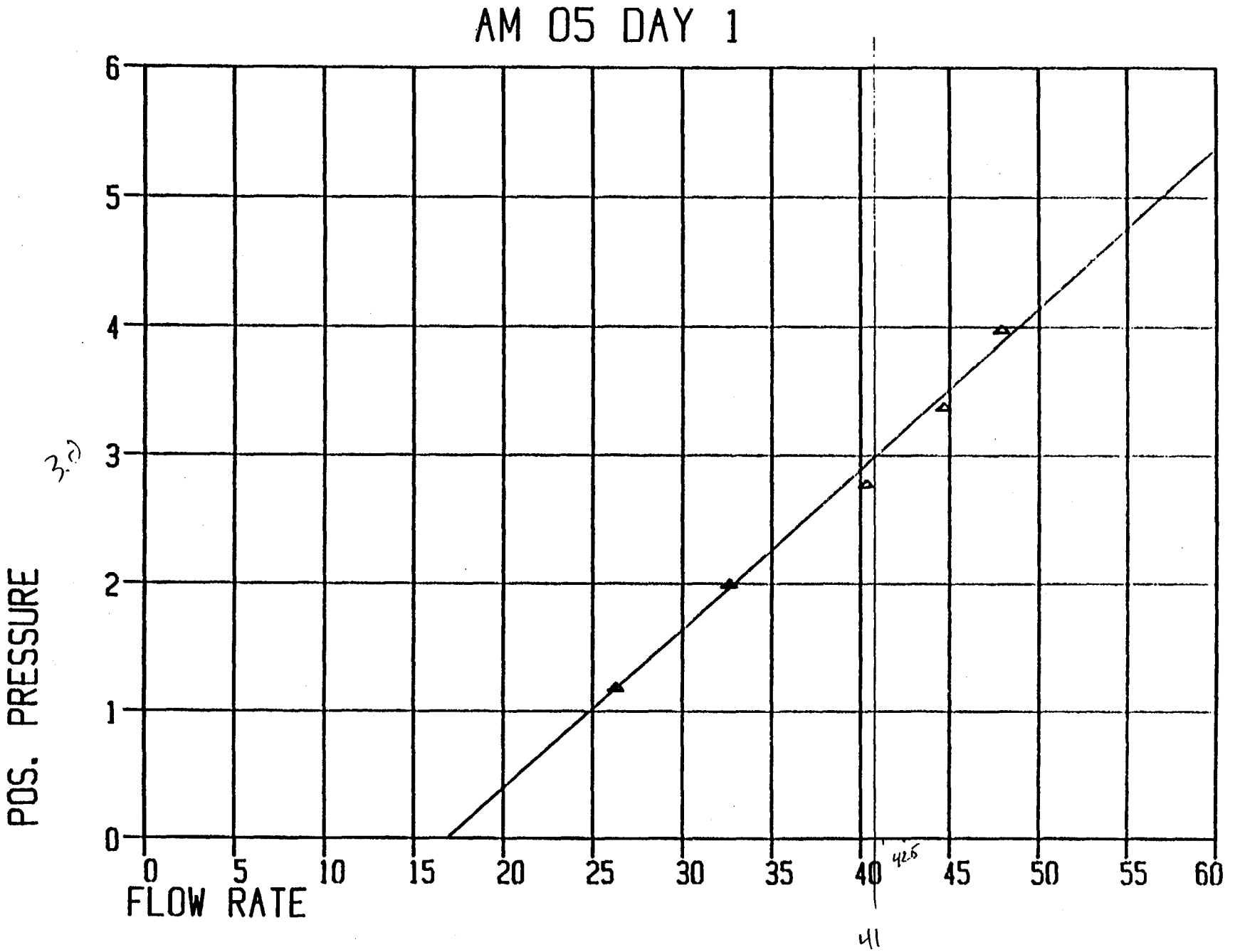
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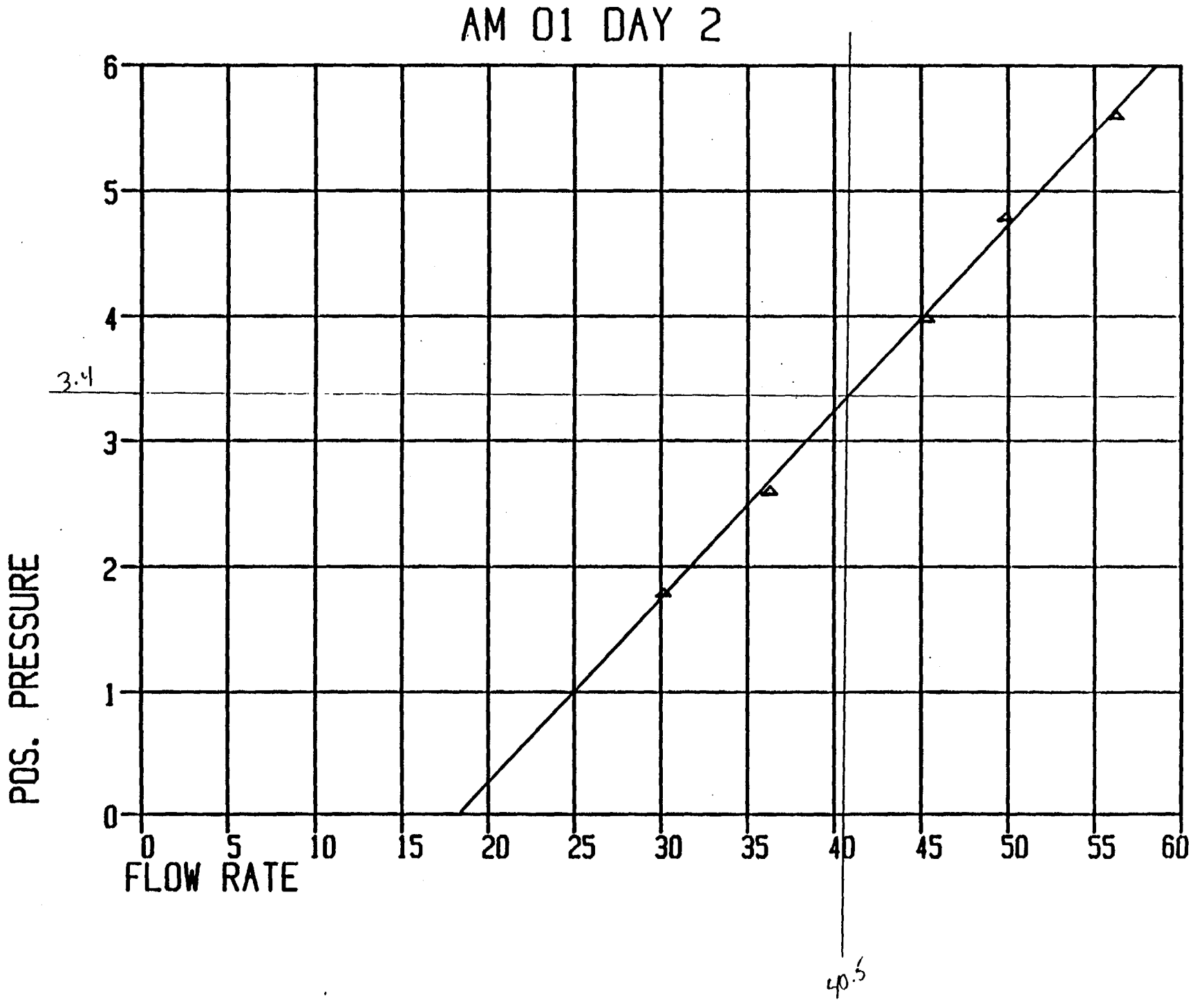
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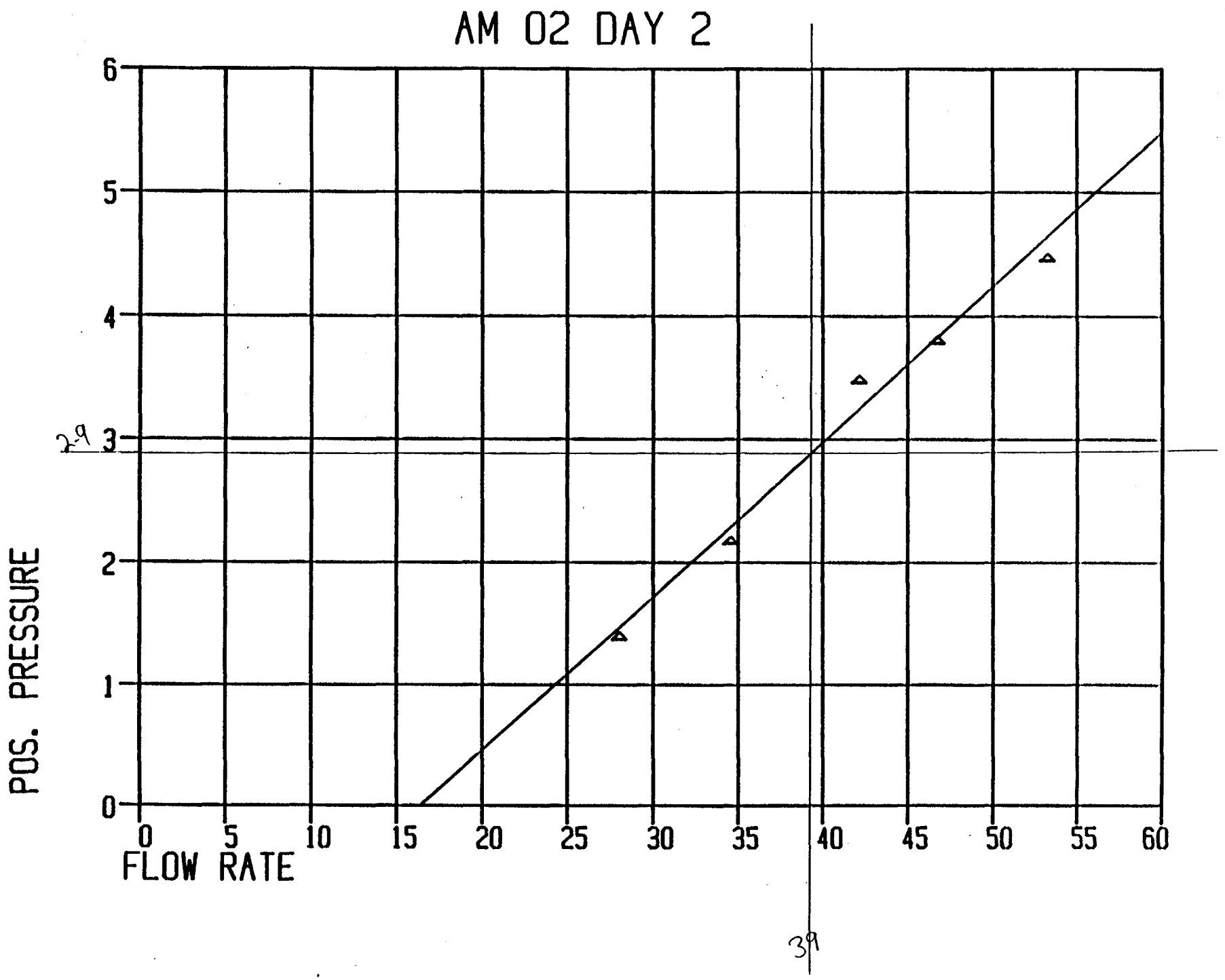
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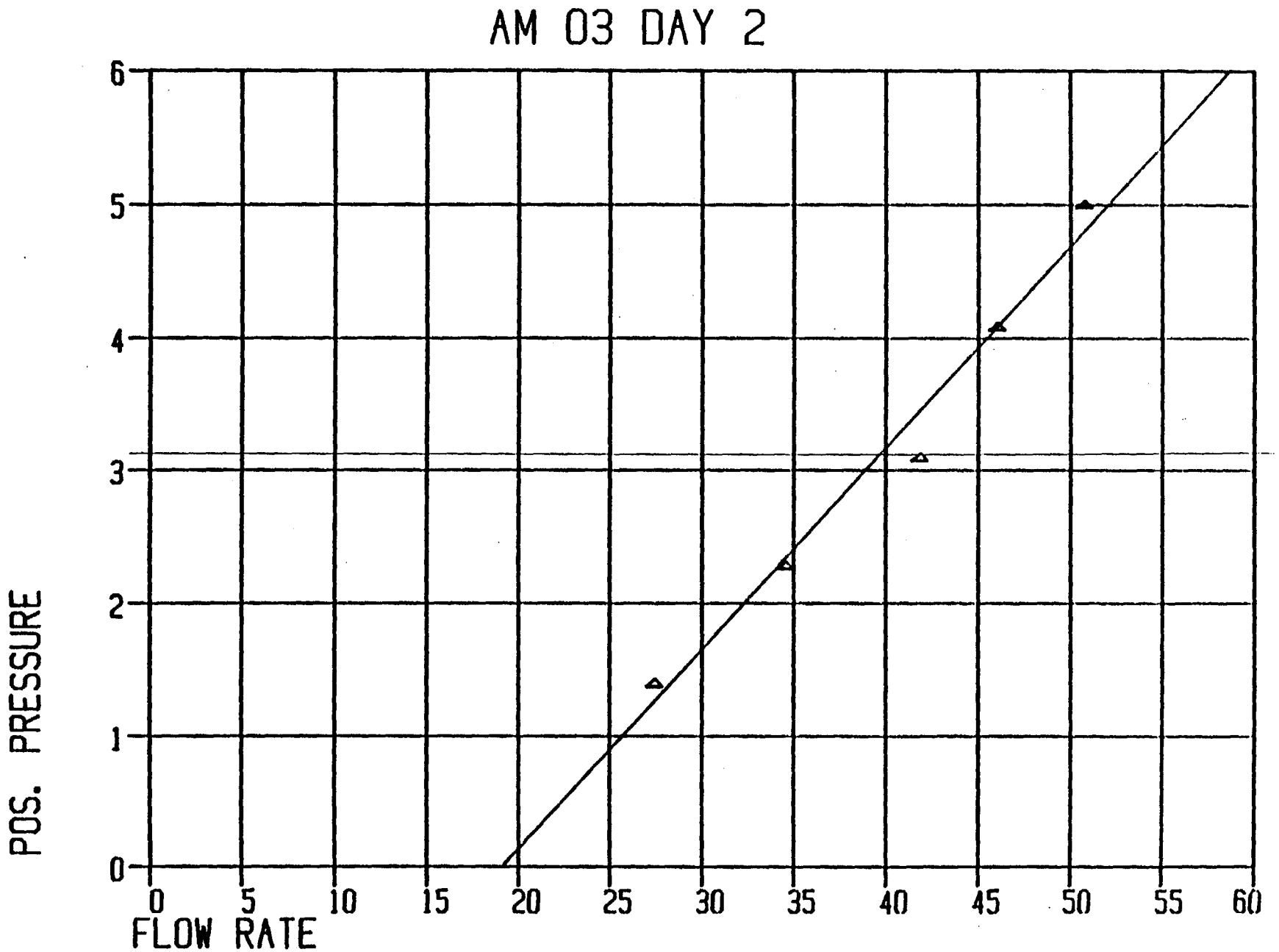
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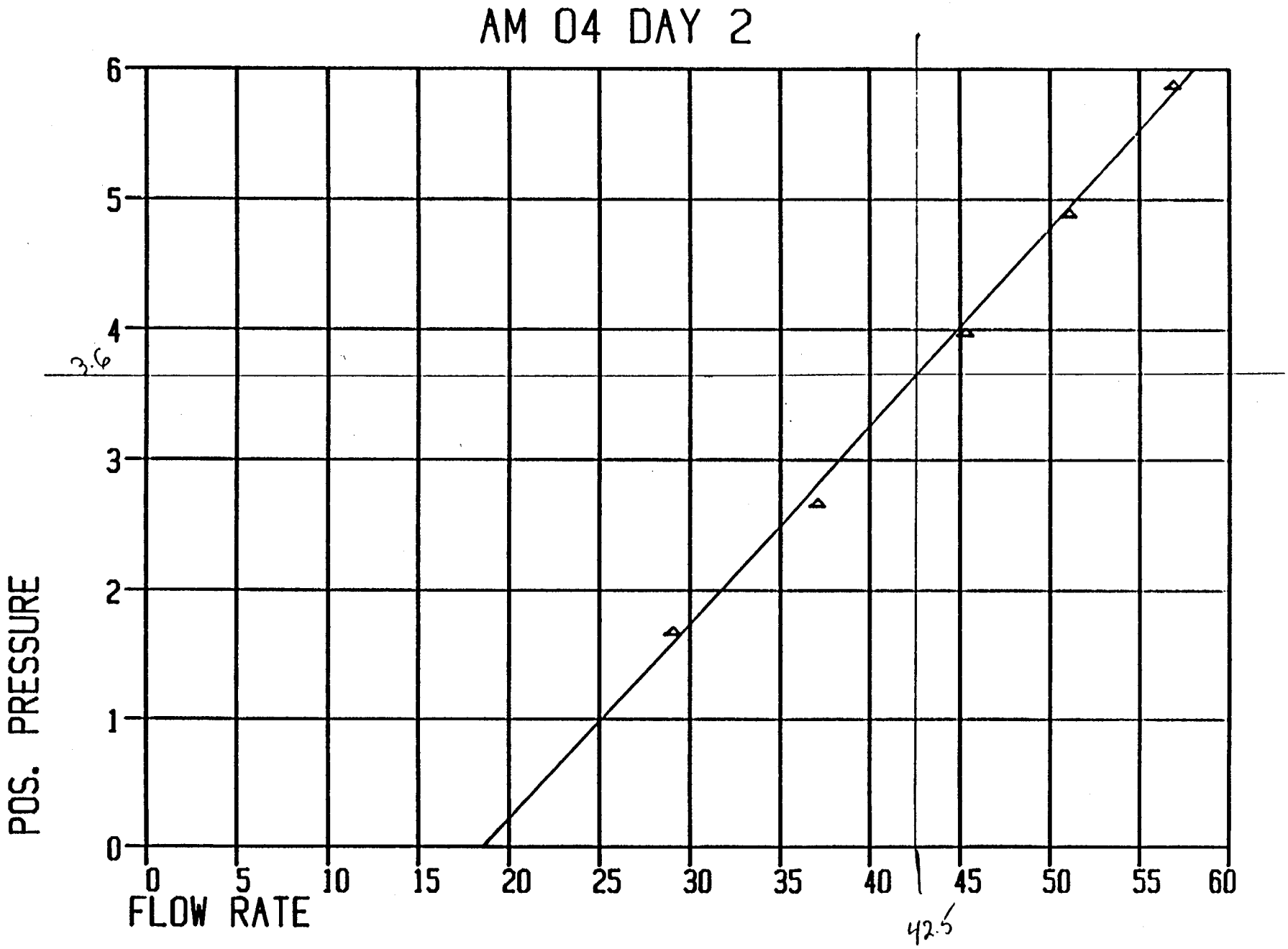
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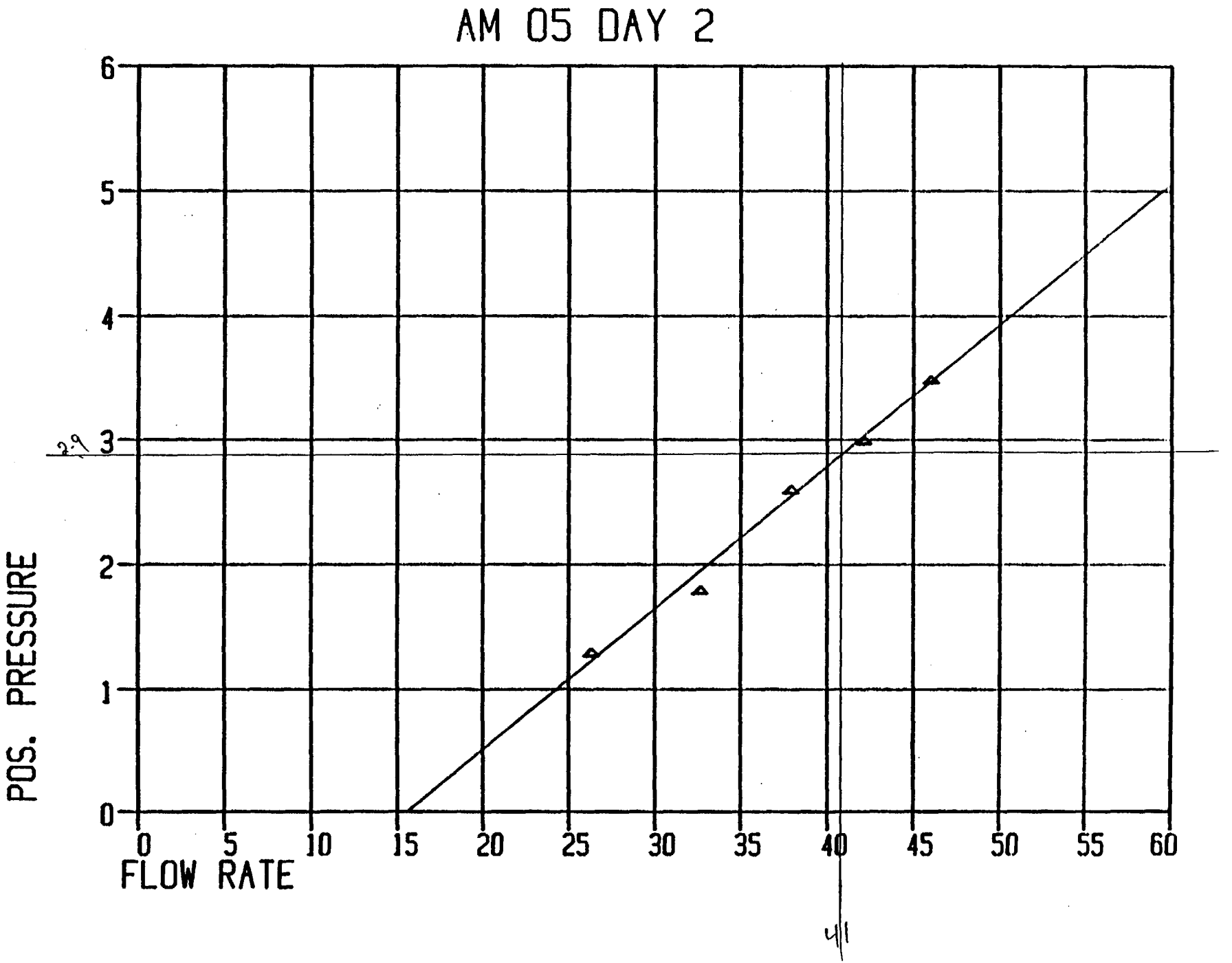
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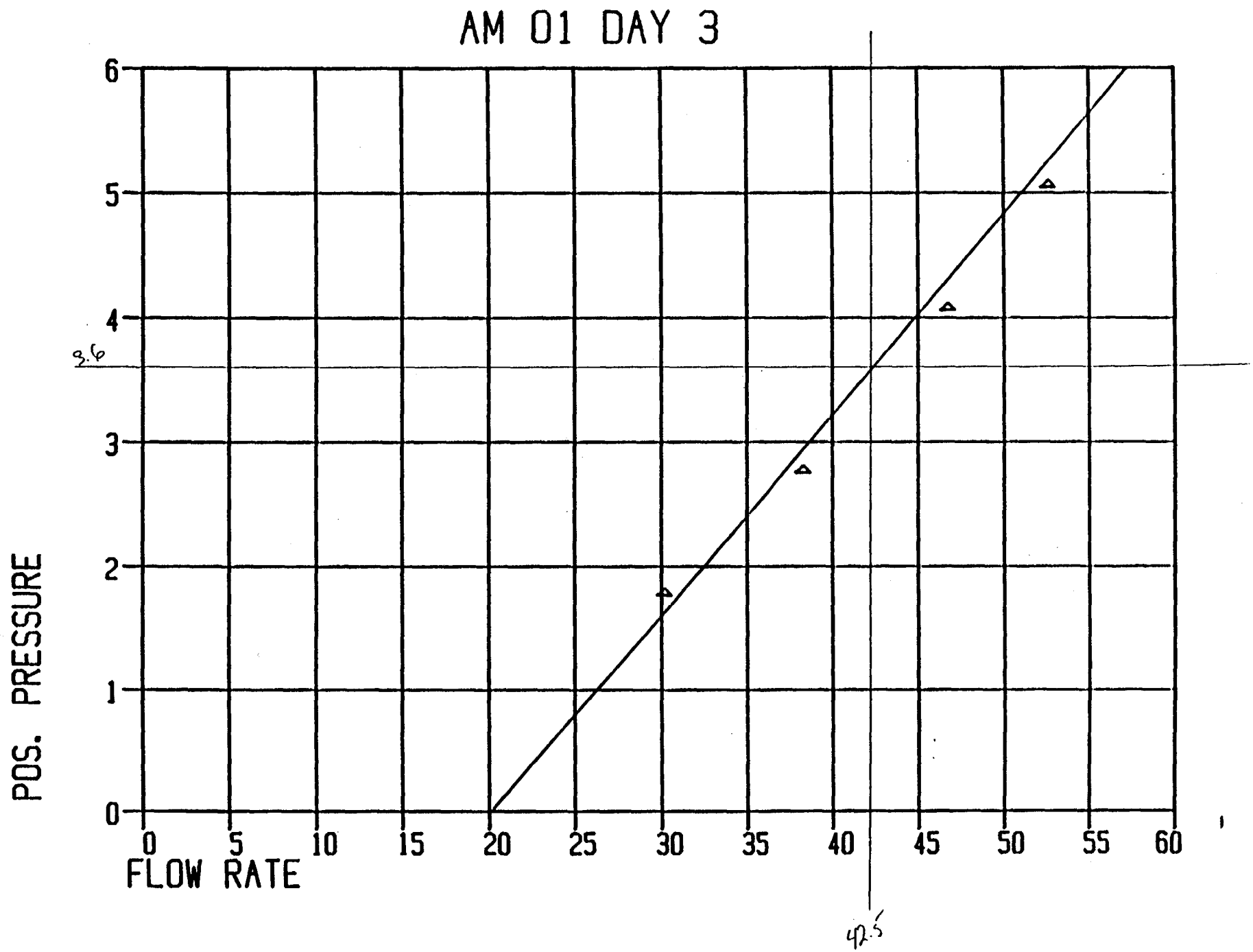
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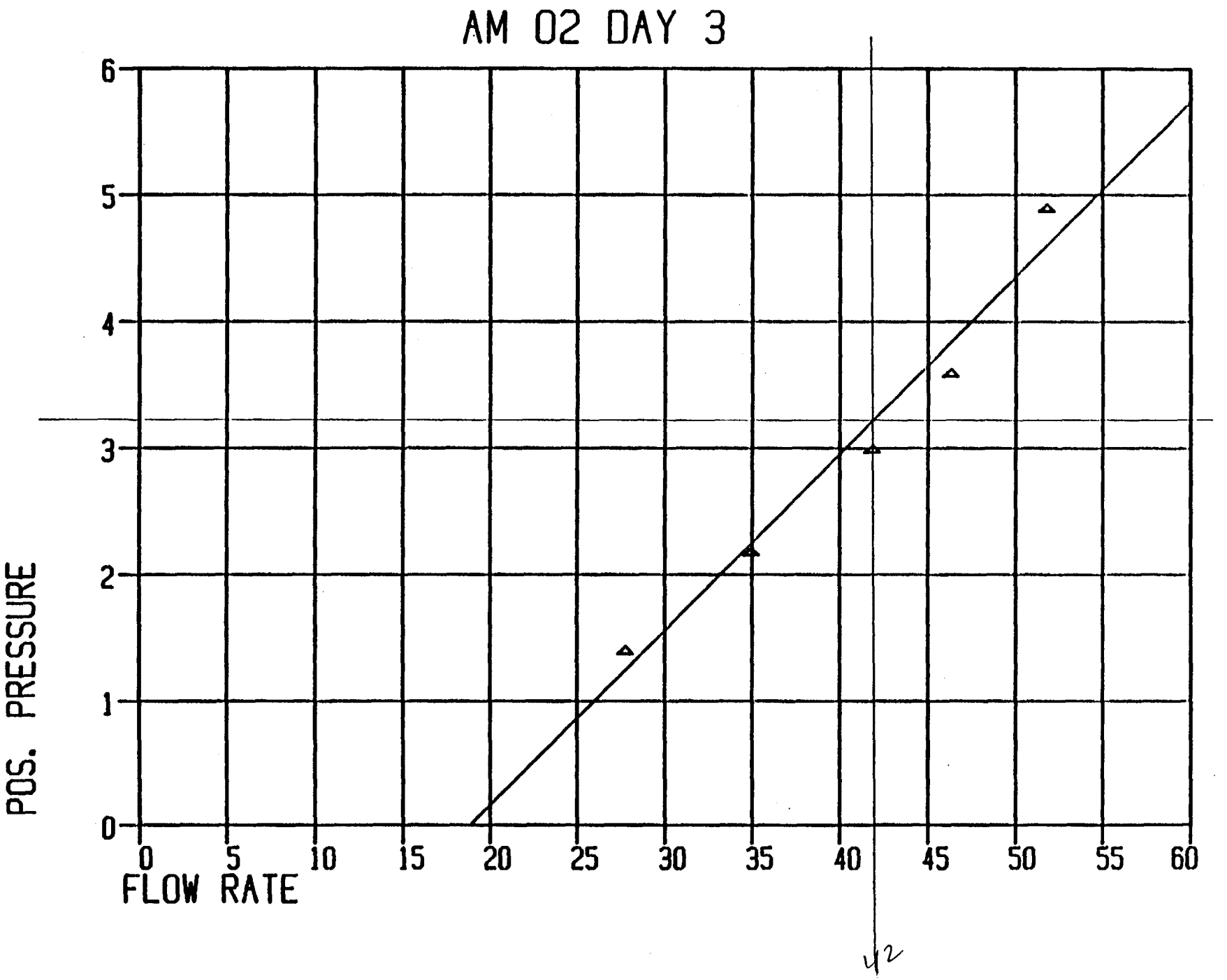
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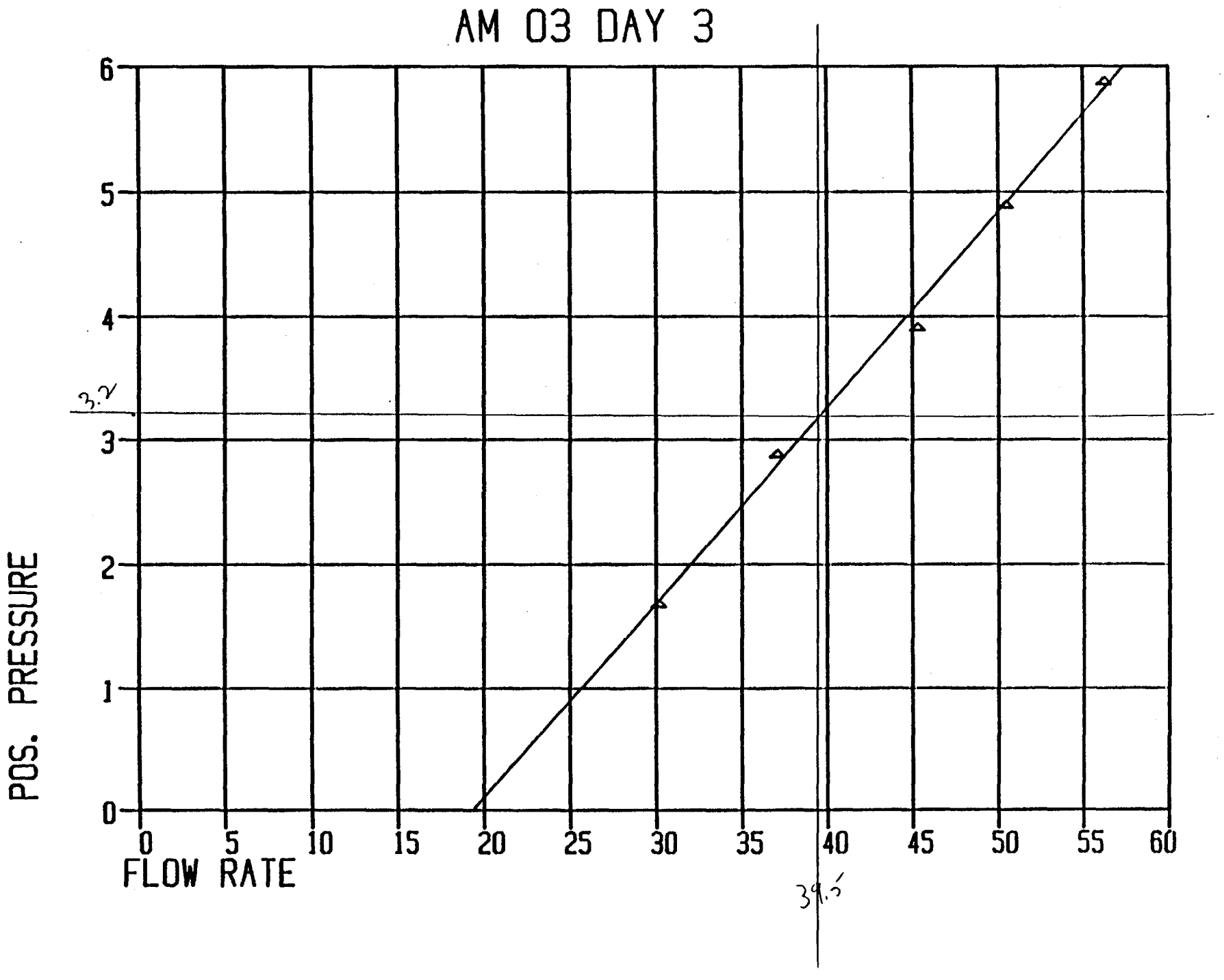
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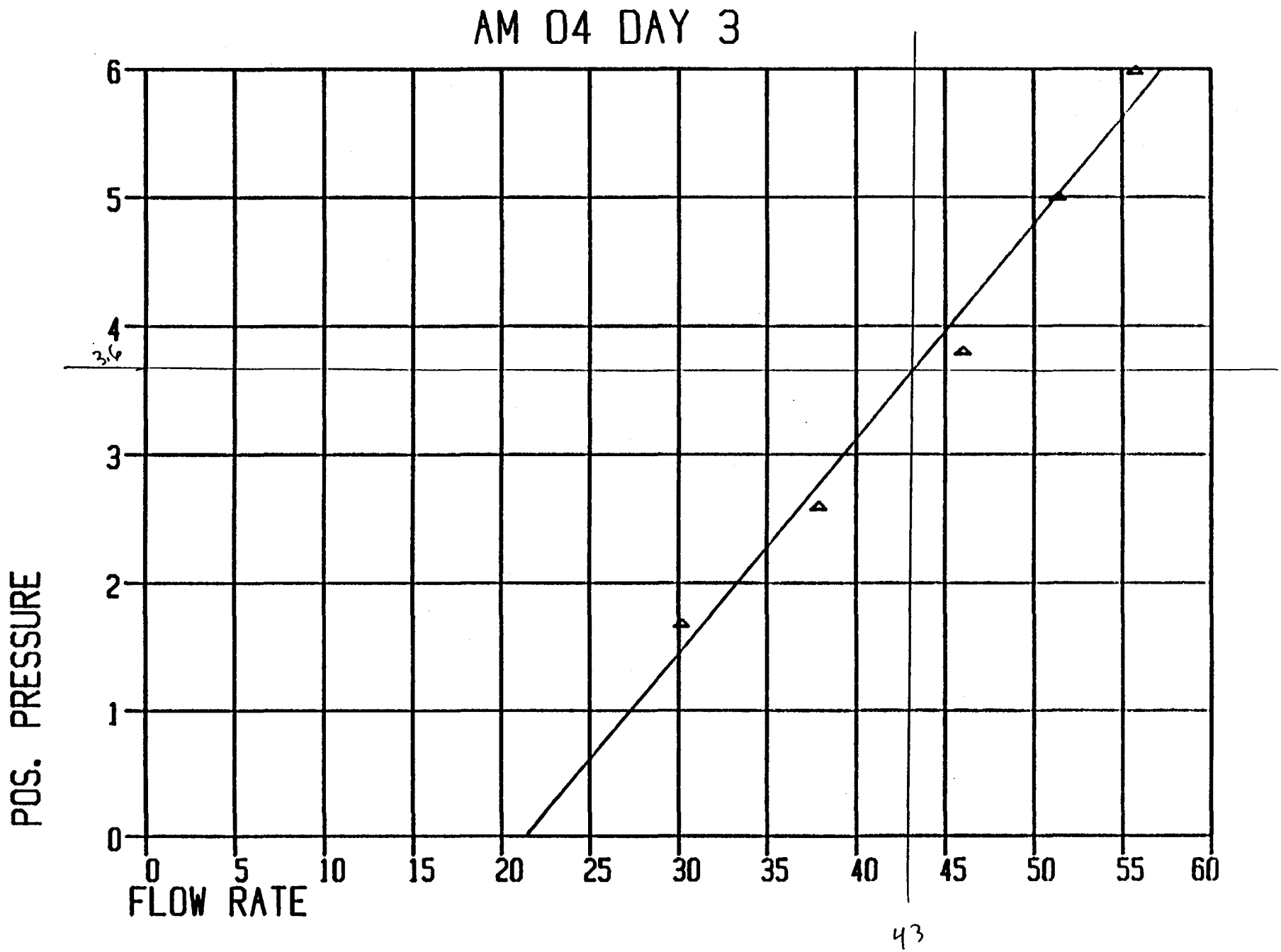
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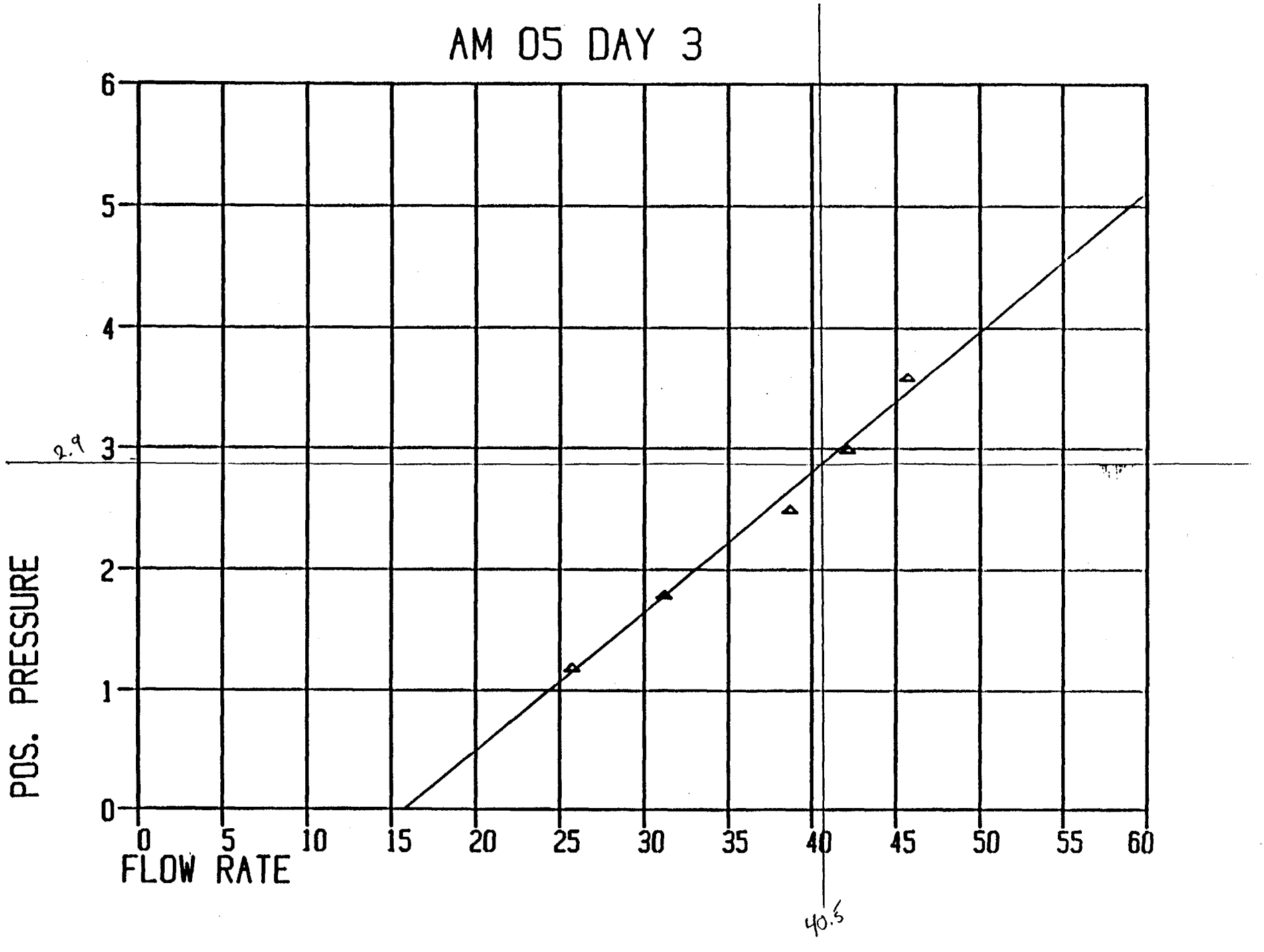
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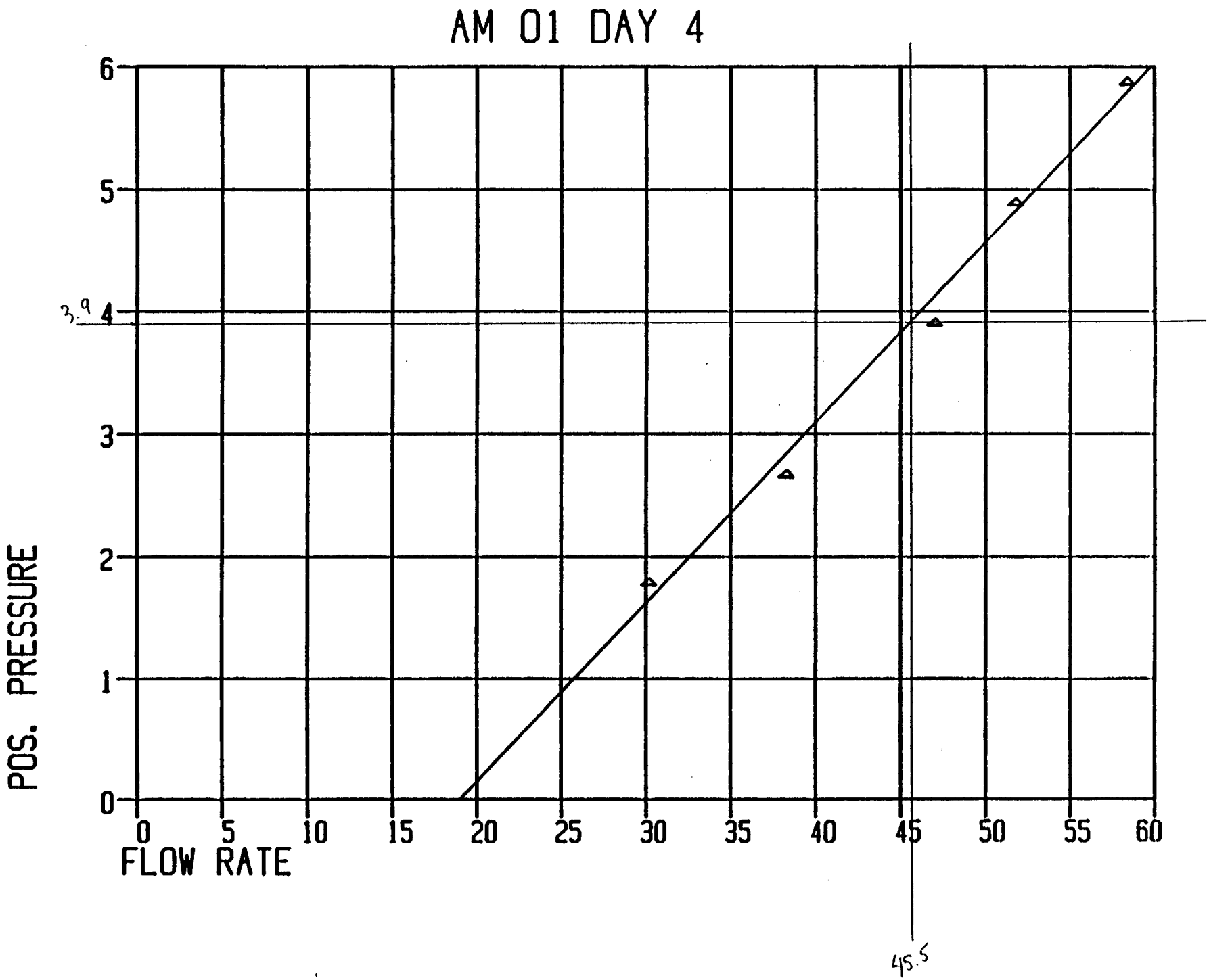
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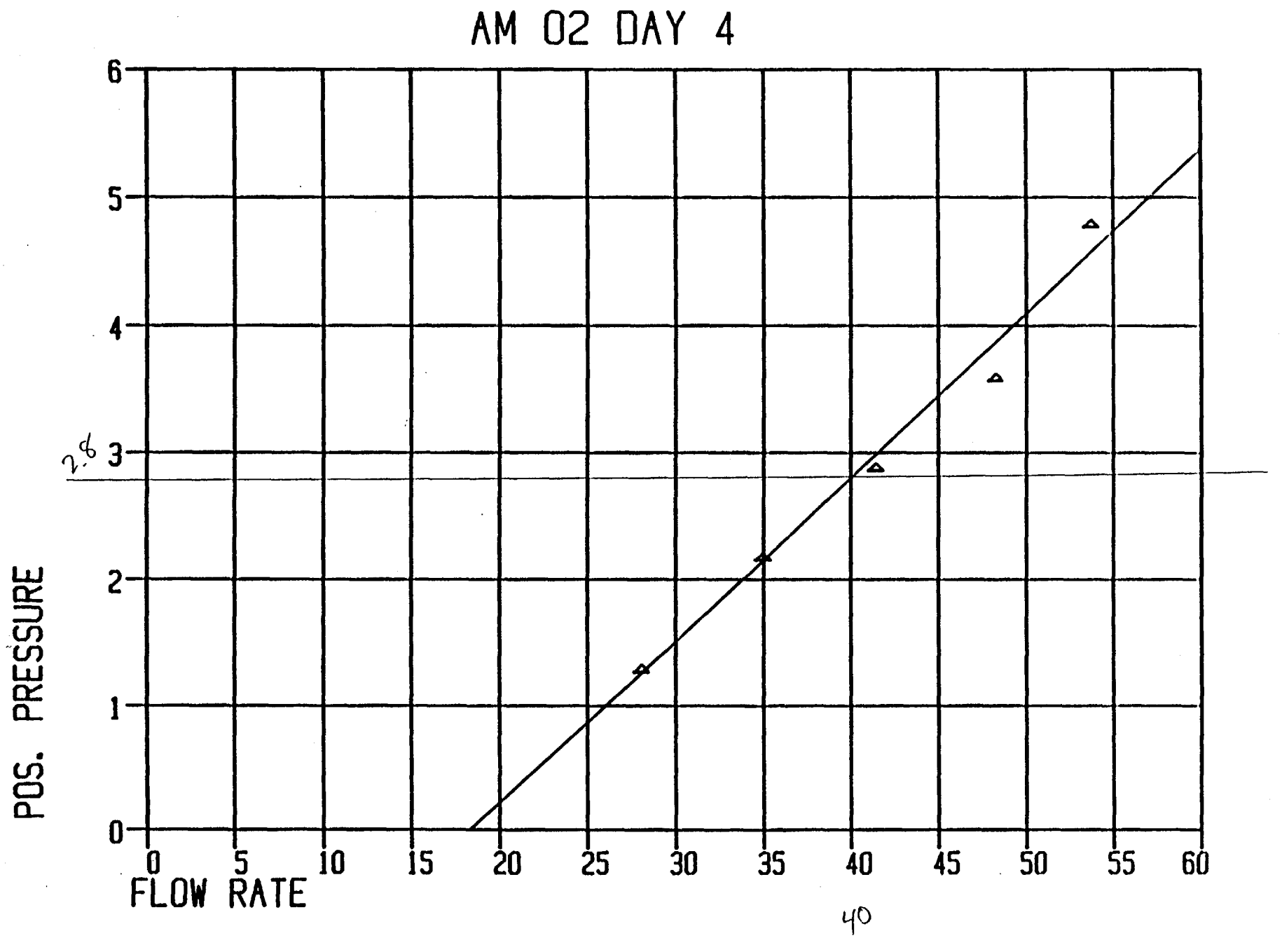
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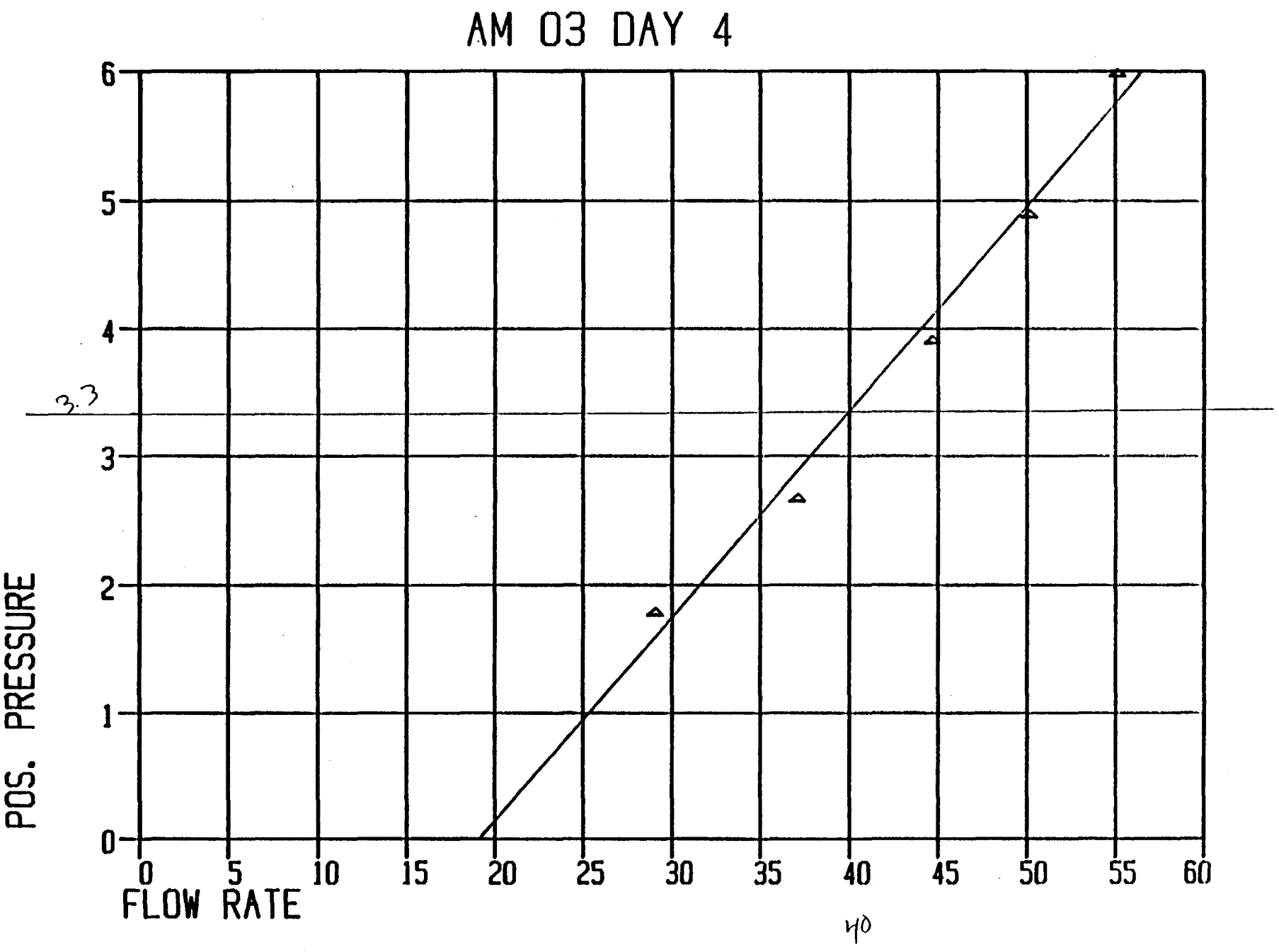
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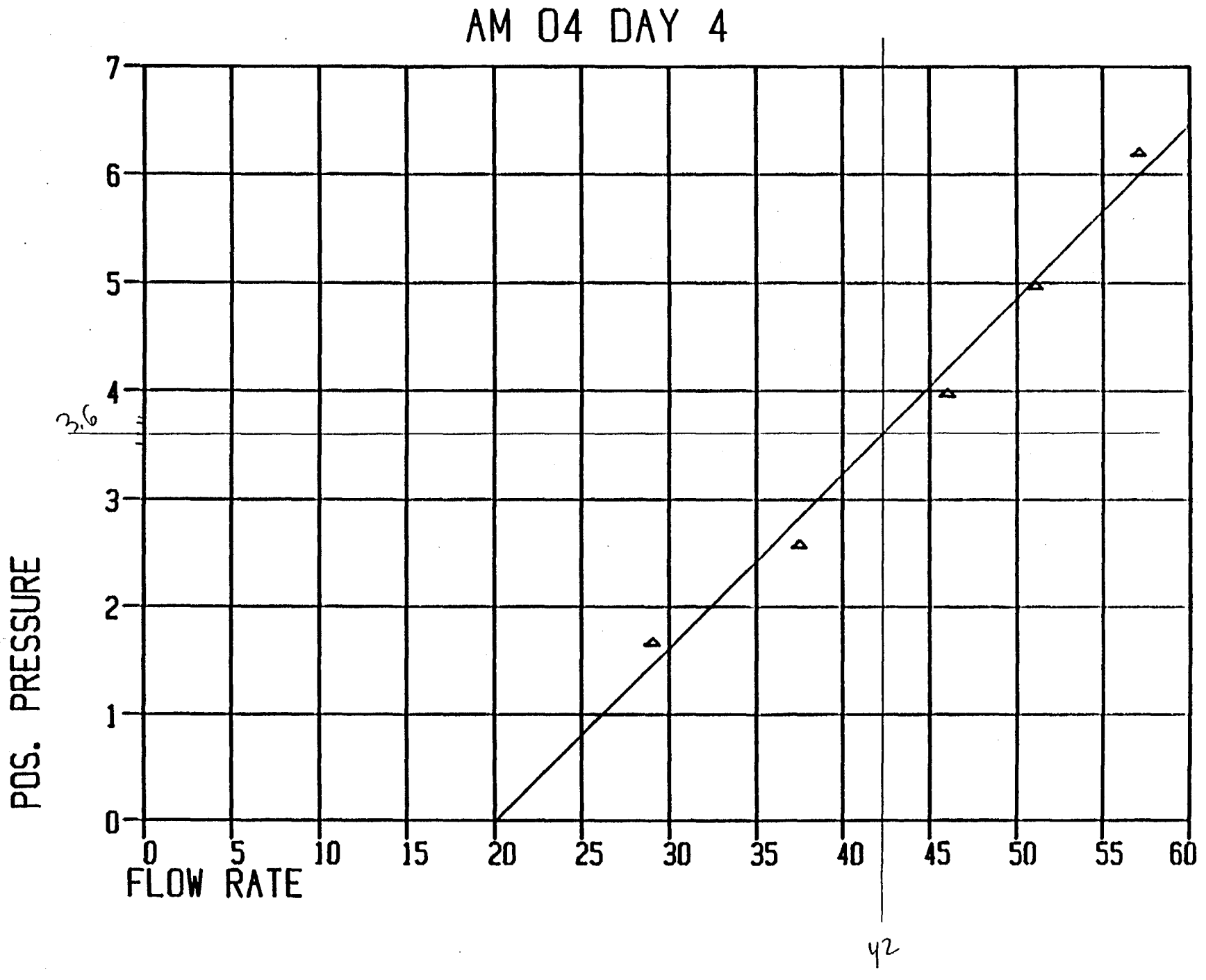
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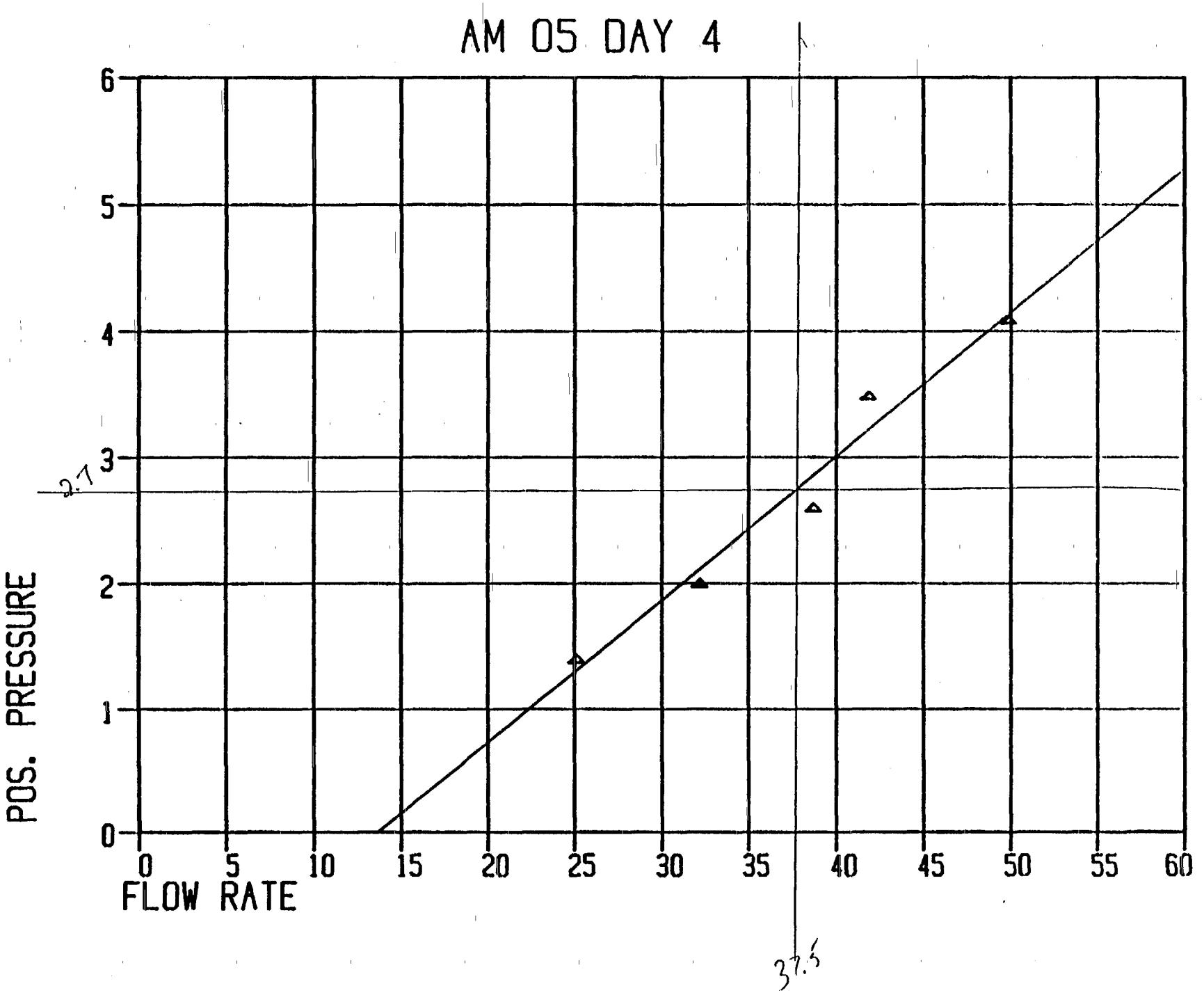
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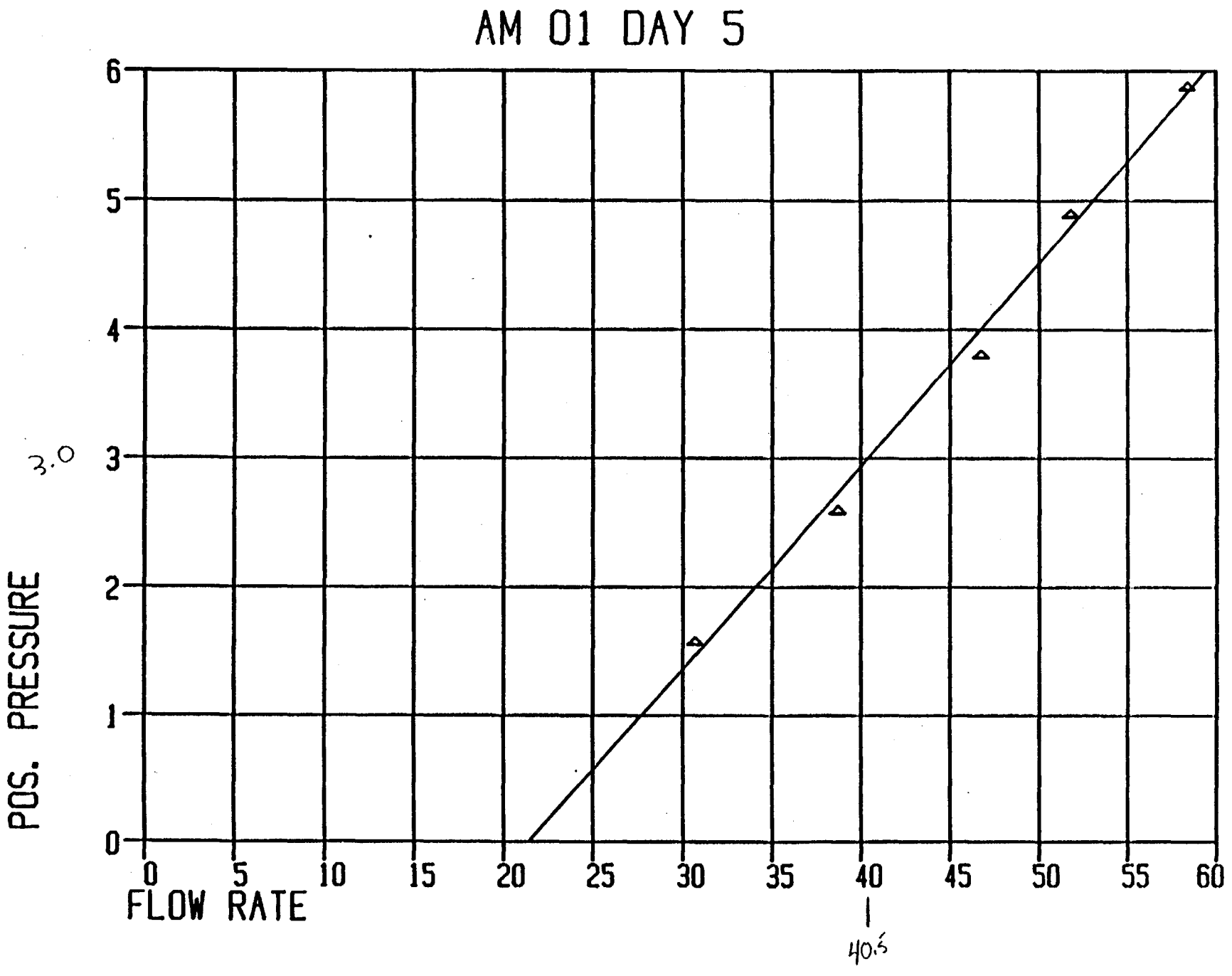
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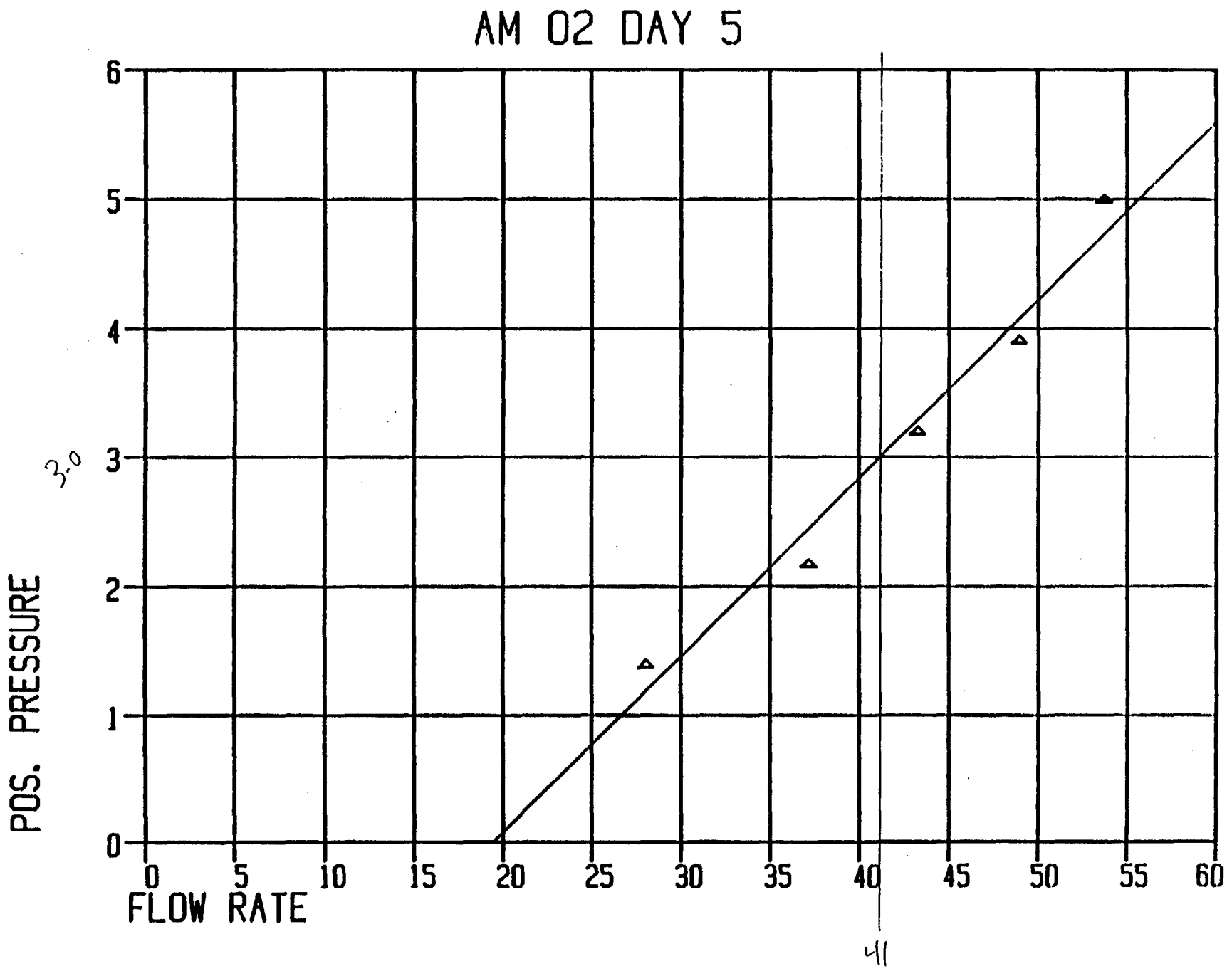
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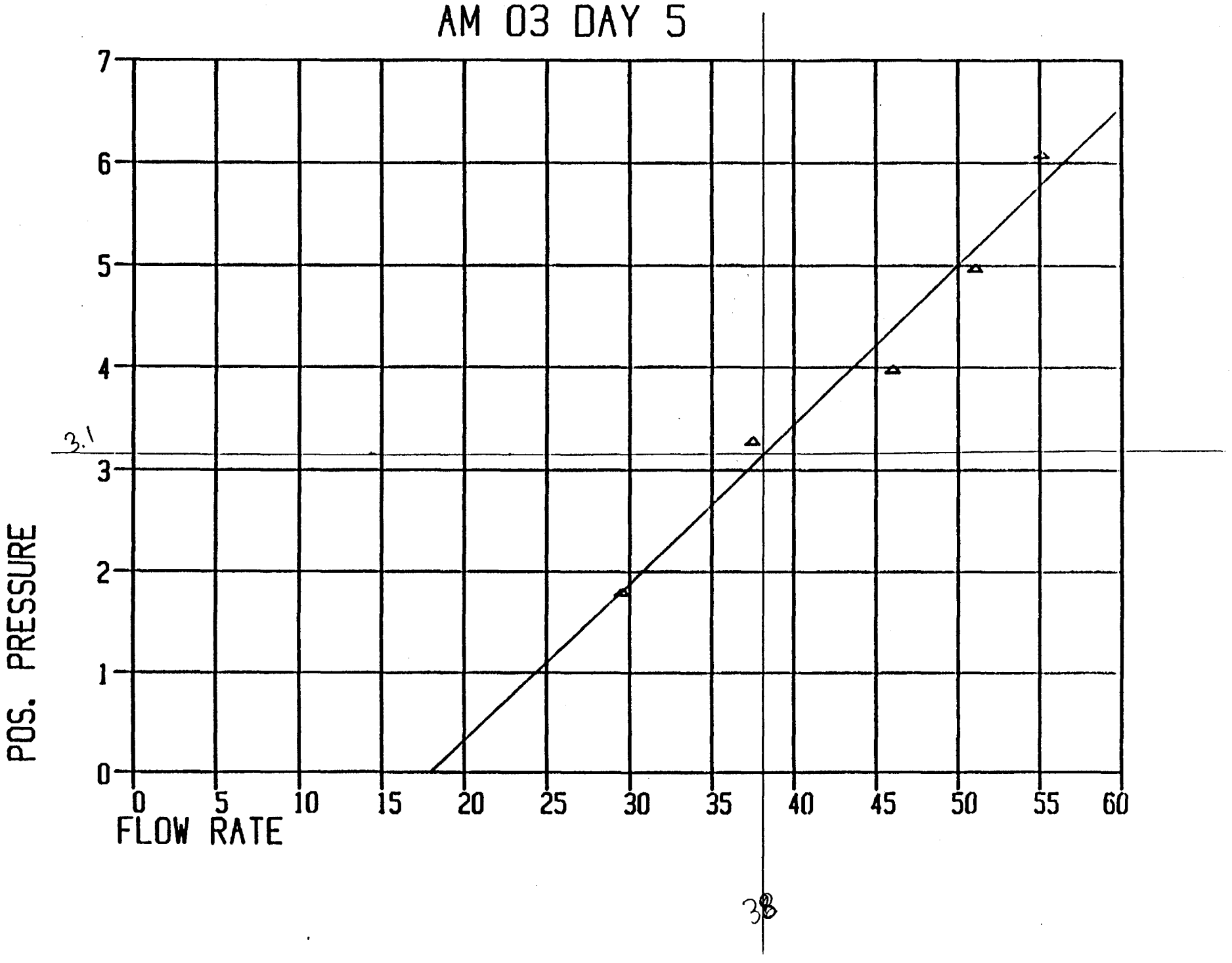
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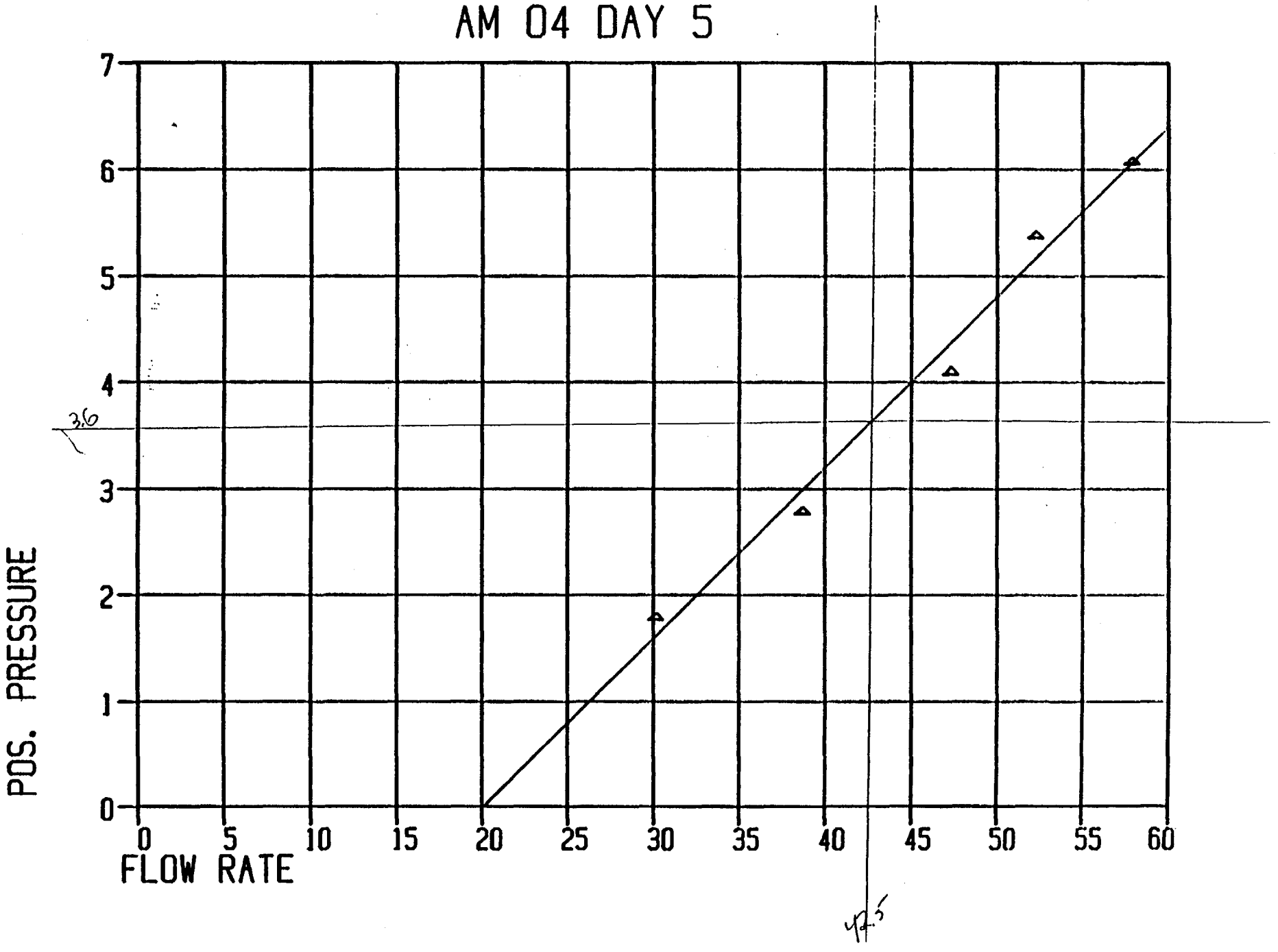
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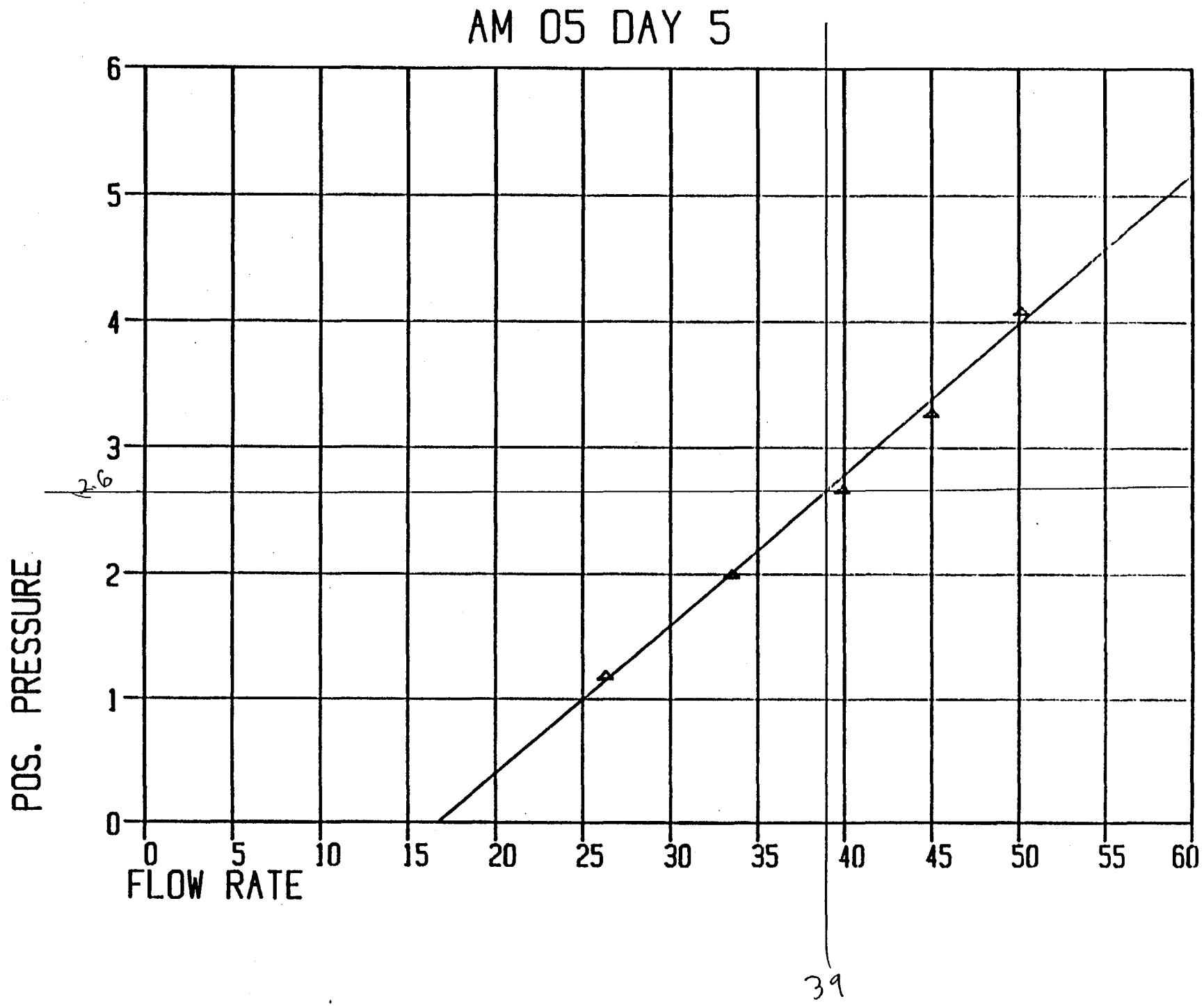
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39

APPENDIX IV

UPDATED SITE INVESTIGATION FORMS

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Richardson Flat Tailings	approx. 2.5 miles NE of Park City, Utah

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Park City	UT	84060	Summit	043	UT-03

09 COORDINATES: LATITUDE 40° 40' 50" | LONGITUDE 111° 26' 40"

10 TYPE OF OWNERSHIP (Check one): ☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 6, 19, 85 * (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☒ INACTIVE

03 YEARS OF OPERATION: late 1960's (BEGINNING YEAR) | 1981 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): E&E
☐ A. EPA ☒ B. EPA CONTRACTOR Ecology & Environment Inc (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ___ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR ___ (Name of firm) ☐ G. OTHER ___ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Susan Kennedy	Terrestrial Biologist	E&E	(303) 757-4984

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Eric Johnson	EPA Reg. Site Project Officer	EPA	(303) 293-1519
Jeff Holcomb	Chemical Engineer	E&E	(303) 757-4984
Tom Smith	Safety Officer	E&E	(303) 757-4984
Wade Hansen	Geologist	Utah Dept. Env. Health	(801) 533-4145
Rob Smith	Chief Hydrogeologist	E&E	303 757-4984
Dave Tuesday	Geochemist	E&E	(303) 757-4984

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
E.L. Osika, Jr.	Vice President	United Park City Mines 309 Kearns Bldg. Salt Lake City, UT	(801) 532-4031
Kerry C. Gee	Geologist/ Engineer	same as above	(801) 532-4031
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		varied

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Paula Schmittdiel	EPA - Region VIII Denver	(303) 293-1518

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Susan Kennedy	EPA	E&E FIT VIII	(303)757-4984	8, 27, 85 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

* 6/19,20/85; 7/30,31/85; 8/1,2/85; 7/7-14/86

Updated: 8/24/87

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A SOLID
- [X] B POWDER, FINES
- [ ] C SLUDGE
- [ ] D. OTHER _____ (Specify)
- [X] E SLURRY
- [ ] F LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS 2 million [1]

CUBIC YARDS _____

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A TOXIC
- [ ] B CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [X] E. SOLUBLE
- [ ] F INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	Elevated arsenic, sodium, cyanide.[2]		
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	Heavy metals in tailings material, at least 2 million tons of tailings.		

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Arsenic	999	Surface impoundment	1650	ug/g *
MES	Cadmium	999	(tailings)	56	ug/g
MES	Copper	999	"	435	ug/g
MES	Lead	999	"	538	ug/g
MES	Manganese	999	"	2280	ug/g
MES	Mercury	999	"	1.24	ug/g
MES	Nickel	7440-02-0	"	23	ug/g
MES	Silver	999	"	21	ug/g
IOC	Sodium	999	"	2998	ug/g
MES	Zinc	999	"	5353	ug/g
IOC	Cyanide	999	"	5.2	ug/g
	* Concentration figures are averages of 4 surface tailings samples (RT-SO-4,5,6 & 7). Total metals.[2]				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	none		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

[1] Memo to File; J. Holcomb; 7/12/85.

[2] Analytical Results Report for Richardson Flat Tailings; Ecology and Environment, Inc. (E&E); 10/25/85; TDD R8-8508-07.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D OTHER _____ (Specify)
- E SLURRY
- F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Arsenic	999	Surface Impoundment	.0928	ug/m^3
MES	Cadmium	999	(tailings)	.0825	ug/m^3
MES	Lead	999	"	1.6478	ug/m^3
MES	Zinc	999	"	1.4478	ug/m^3
	Ref.[3]				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

[3] Analytical Results Report of Air Sampling at Richardson Flat; E&E FIT; 9/19/86; TDD R8-8608-05, E&E Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE 8/2/85) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 8 — 04 NARRATIVE DESCRIPTION

Ground water samples from UPCM wells (RF-GW-2, RF-GW-3) were collected and analyzed. Dissolved metals analyses revealed elevated levels of arsenic, cobalt, iron, manganese, and zinc. Two domestic wells (210' and 222' deep) have been identified within one mile of the site.[4] The best information available[5] indicates the wells are completed in Tertiary volcanic rock composed primarily of andesitic pyroclastics. Wheather water-bearing units of unconsolidated deposits are hydraulically connected to underlying water-bearing unit of Tertiary orgin is not known.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE 6/20/85) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 414 — 04 NARRATIVE DESCRIPTION

Surface water samples from Silver Creek, collected downgradient of the site, contained elevated levels of lead. RT-SW-3 (downgradient) contained 1985 ug/l lead as compared to RT-SW-1 (upgradient) containing 147 ug/l lead. Arsenic levels were also elevated. Water diverted from Silver Creek is used for pasture-land irrigation (276 acres) within 3-stream miles of the site.[6,7]

01 ☒ C. CONTAMINATION OF AIR — 02 ☒ OBSERVED (DATE 7/7/86) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 4500 — 04 NARRATIVE DESCRIPTION

Hi-volume air sampling performed on July 7-14, 1986 verified the release of inorganic contaminants to the air route. A 100 fold increase in airborne lead concentration was detected when comparing upwind versus downwind sampling stations. Values for arsenic, cadmium and zinc are also highly elevated over the background samples.[3] Population residing within a 4-mile radius is approximately 4500.[8]

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 — 04 NARRATIVE DESCRIPTION

No recorded history -- fire and explosive conditions do not exist at the site.

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 4500 — 04 NARRATIVE DESCRIPTION

The site is not secured from public access or access by domestic livestock. On June 19 and 20, vehicles were observed driving near the tailings area along the access road. Sheep and cattle were observed walking on the tailings on June 19 and 20, 1985.

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE 8/2/85) ☐ POTENTIAL ☒ ALLEGED
03 AREA POTENTIALLY AFFECTED: 640 (Acres) — 04 NARRATIVE DESCRIPTION

Soil beneath the the tailings (RF-SS-6) contains elevated concentrations of antimony, arsenic, cadmium, copper, lead, magnesium, mercury, silver, sodium and zinc. Off site surface soil (RT-SO-1) contained elevated levels of arsenic, cadmium, lead, mercury and zinc probably due to wind deposition.[2]

01 ☒ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 8 — 04 NARRATIVE DESCRIPTION

Two domestic wells are located within one mile of the tailings.[4] Surface water from Silver Creek is not used for drinking water.[9]

01 ☒ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: 5 — 04 NARRATIVE DESCRIPTION

The tailings are being removed by Mr. Ray Wortley to be used as backfill for sewer lines and road base. In addition, FIT members observed heavy equipment operators dumping what appeared to be native soil on the tailings area. Observations were made on June 19 and 20, 1985.

01 ☒ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 4500 — 04 NARRATIVE DESCRIPTION

No recorded history of population exposure or injury, however, the site is not secured from public access or domestic livestock grazing. Population exposure of concern include airborne contaminants, food chain contamination associated with the surface water route, and threat to domestic wells.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 [X] J. DAMAGE TO FLORA — 02 [X] OBSERVED (DATE 6/19/85) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Peripheral tailings support vegetation including Juncus sp., Salix sp. and Verbascum thapsus, but most of the tailings are denuded due to high levels of soluble salts and metals.

01 [X] K. DAMAGE TO FAUNA — 02 [ ] OBSERVED (DATE: ____) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)
No apparent damage to area fauna. Two muskrats were observed swimming in the drainage ditch on site (near RT-SW-4). Fish in Silver Creek could potentially be affected by lead and arsenic released from the tailings.

01 [X] L. CONTAMINATION OF FOOD CHAIN — 02 [ ] OBSERVED (DATE ____) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION
The possibility exists for metals to move through the food chain 1) by domestic livestock grazing in areas where soil is contaminated; 2) by heavy metal concentration in local fish populations.

01 [X] M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 [ ] OBSERVED (DATE: ____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 4500 — 04 NARRATIVE DESCRIPTION
Tailings ponds are uncovered and therefore susceptible to gusty winds which carry fine-grain tailings material off-site. A dam constructed at the northwest end of the tailings prevents mass movement of solid material off-site.

01 [X] N. DAMAGE TO OFFSITE PROPERTY — 02 [ ] OBSERVED (DATE: ____) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION
The potential exists for damage to off-site property because the tailings material is allegedly being used as sewer line backfill and road base in the Park City area.

01 [X] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 [ ] OBSERVED (DATE: ____) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION
If tailings material is being used as sewer line backfill, the potential exists for sewer contamination by metals.

01 [ ] P. ILLEGAL/UNAUTHORIZED DUMPING — 02 [ ] OBSERVED (DATE ____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Dumping of native soil on to the tailings was observed by FIT members, but is under the supervision of United Park City Mines.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

No other hazards are known.

III. TOTAL POPULATION POTENTIALLY AFFECTED: 4500

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4 Well Logs (#34833 and #A-34356).
5 Water Resources of the Heber-Kamas - Park City Area North-Central Utah; Tech. Publ. No. 27.
6 Telecon; S. Kennedy to J. Anderson; 7/18/85.
7 Weber River Decree and Corresponding Plat.

8 Telecon; S. Kennedy to J. Harrington; 9/4/85.
9 Telecon; S. Kennedy to L. Mize; 7/17/85.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☒ A. SURFACE IMPOUNDMENT	2 million	tons
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ☐ A. BUILDINGS ON SITE

None

06 AREA OF SITE
160 (Acres)

07 COMMENTS
Slurry, generated from milling activities, was piped to the Richardson Flat area and currently covers approximately 160 acres. The metal sulfide, and carbonate-containing tailings material is presently a solid matrix. An ephemeral pond overlies a portion of the tailings.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.
A dam at the northwest extension of the tailings is the only form of artificial containment on site. The tailings material is uncovered, and no underlying liner is present.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS
The site is not secured from public access or domestic livestock grazing.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

See pages 2, 2A and 4.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☐
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☒	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 3/4 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 8

03 DISTANCE TO NEAREST DRINKING WATER WELL 3/4 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
50[4] (ft)	north	50 (ft)	unknown (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

According to State records, two private domestic wells are located approximately 4000 feet southwest of the site. One of the wells is 210 feet deep with a static water level of 42 feet. The second well is 222 feet deep with a static water level of 55 feet.

10 RECHARGE AREA		11 DISCHARGE AREA	
☒ YES	COMMENTS	☐ YES	COMMENTS
☐ NO		☒ NO	

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Silver Creek	☒	approx. 300' (mi)
GM Pace Ditch	☐	approx. 400' (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE A. 11 NO. OF PERSONS
TWO (2) MILES OF SITE B. 570 NO. OF PERSONS
THREE (3) MILES OF SITE C. 4500 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 3/4 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 150

04 DISTANCE TO NEAREST OFF-SITE BUILDING 3/4 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Park City, Utah is approximately 2.5 miles southwest of the site. The population fluctuates from 4500 to 10,000 during the winter ski season. The year-round permanent population is approximately 4500.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☒ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
25 (ft)	unknown (ft)	7.74

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-12 (in)	1.25 (in)	0-5 %	north northeast	0-5 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. N/A (mi)

OTHER (freshwater): B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A (mi)

ENDANGERED SPECIES: no endangered species in Park City area.[10]

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL: A. 1.5 (mi)

RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES: B. 2 (mi)
6 mi. National Forest
1.5 mi. Residential Area

AGRICULTURAL LANDS
PRIME AG LAND: C. N/A (mi)
AG LAND: D. <1 mile (mi)
adjacent to site
pastureland, hay

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Richardson Flat is a natural depression at the base of the Wasatch Range, adjacent to Silver Creek.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

[10] Telecon; S. Kennedy to Larry England; 9/4/85.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	3	EPA Region 8 Laboratory, Lakewood, CO	Rec'd 10/16/85
SURFACE WATER	6	" " "	Rec'd 7/12/85
WASTE Tailings Surface Subsurface	4 4	" " " EPA Region 8 Lab & Versar Inc. Springfield VA	Rec'd 7/12/85 Rec'd 10/16/85
AIR (High-vol)	29	Hittman-Ebasco, Columbia, MD	8/86
RUNOFF			
SPILL			
SOIL Surface Subsurface	1 2	EPA Region 8 Lab, Lakewood, CO EPA Region 8 Lab & Versar, Inc. Springfield VA	Rec'd 7/12/85 Rec'd 10/16/85
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
pH	Ground water samples ranged from 6.43 to 6.89 Surface water samples (Silver Cr. tailings ditch) ranged from 7.26 to 7.54
temperature	Ground water 9.5°C to 11°C Surface water 19°C to 20°C
conductivity	Ground water 350 to 1450 umhos/cm Surface water 550 to 1400 umhos/cm
volatile organics (HNu)	No readings greater than background
radiation	No readings greater than background

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Ecology and Environment FIT VIII Files
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Ecology and Environment FIT VIII Files

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See pages 2, 2A, 4 and 7.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. CURRENT OWNER(S) / PARENT COMPANY (If applicable)

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
United Park City Mines Co.		N/A	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE
309 Kearns Bldg.			

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
Salt Lake City	UT	84101			

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first.) / IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

See pages 2, 2A, 4 and 7.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. CURRENT OPERATOR *(Provide if different from owner)*

01 NAME	02 D+B NUMBER
United Park City Mines, Co	

03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE
309 Kearns Bldg.	

05 CITY	06 STATE	07 ZIP CODE
Salt Lake City	UT	84101

08 YEARS OF OPERATION	09 NAME OF OWNER
	same as above.

OPERATOR'S PARENT COMPANY *(If applicable)*

10 NAME	11 D+B NUMBER
N/A	

12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) *(List most recent first, provide only if different from owner)*

01 NAME	02 D+B NUMBER

03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES *(If applicable)*

10 NAME	11 D+B NUMBER

12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

See pages 2, 2A, 4 and 7.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
UT	D980952840

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
None	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Mr. Ray Wortley *			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
unknown			

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

* Allegedly removes tailings material for use as sewer line backfill and roadbase.

11 Site Inspection Report, Richardson Flat Tailings; Utah Bureau of Solid and Hazardous Waste; 9/4/84; in E&E files under TDD R8-8504-23.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No recorded history.

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☒ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
A dam was built at the northwestern extension of the tailings to contain the ponded water.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None observed or reported.

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

See pages 2, 2A, 4 and 7 and 11.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
UT	D980952840

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

- No agency enforcement action taken at this site.
- SI performed by State of Utah BSMW 12/21/84.
- SI performed by EPA FIT VIII, 6,7 & 8/85.
- Air sampling performed by EPA FIT VIII, 7/7-14/86.

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

See pages 2, 2A, 4 and 7 and 11.

APPENDIX V

QA VALIDATION CLARIFICATION

ecology and environment, inc.

1776 SOUTH JACKSON STREET, DENVER, COLORADO 80210, TEL. 303-757-4984

International Specialists in the Environment

TO : Les Sprenger, FIT-RPO
FROM : Susan Kennedy, E&E FIT
DATE : August 24, 1987
SUBJECT: Transmittal of Revised Analytical Results Report of Air Sampling at Richardson Flat Tailings, TDD R8-8608-05.

Attached is the revised Analytical Results Report of Air Sampling at Richardson Flat Tailings, TDD R8-8608-05. In response to Utah Bureau of Solid and Hazardous Waste comments on the Air ARR, dated February 24, 1987 (attached), the following adjustments have been made.

1. Table 3 has been amended to include data qualifiers.

2. Because the laboratory was required by contract to provide IDL (instrument detection limit) data in units of µg/filter, and did not, reference to "pending action or verification" was made in the SAS validation package. Appropriate unit conversions were made by FIT during the development of Tables 1 through 4 of the Air ARR. Secondly, the lab failed to include % RSD (relative standard deviation) values as required by contract. The values would further substantiate close agreement of duplicate sample results, but would not change data validity or interpretation.

3. The Site Inspection form has been updated based on current information.

If you have any questions or comments, please call me at 757-4984.

cc: David Schaller (1 copy)
Paula Schmittdiel (2 copies)

recycled paper

UTAH
DEPARTMENT OF HEALTH

Norman H. Bangerter
Governor

Suzanne Dandoy, M.D., M.P.H.
Executive Director

BSHW-9585-26

February 24, 1987

Paula Schmittdiel
U.S. EPA, Region VIII
One Denver Place, Suite 1300
999 18th Street
Denver, CO 80202-2413

Dear ~~Ms. Schmittdiel~~ Paula:

The following are the State's comments on the Analytical Results of Air Sampling, Richardson Flat, Park City, Utah. EPA verbally requested that these comments be prepared on February 19, 1987.

The majority of the State's comments on the sampling effort were prepared on December 30, 1986 in response to the Sampling Activities Report. These comments remain valid and are attached. Additional State comments follow.

E&E should have copy of this as well as response.

Text

-- Table 3 of the text should have the same data qualifiers as Table 1.

-- The data in Table 3 imply that the airborne concentrations of contaminants are at the laboratory's detection limit for analyses where the analyte was undetected. This portrayal is misleading.

-- The SAS data validation package states that the air data is preliminary, pending action or verification. Has the action or verification been performed?

SI Form

-- No population figures are given for ground water, direct contact, drinking water contamination, worker exposure/injury, population exposure/injury, or unstable containment of wastes.

-- The NPDES permit cited in Part 4 of the SI form is for the Ontario Tunnel. The Richardson Flat site is not permitted for discharge.

Kenneth L. Alkema, Director • Division of Environmental Health

288 North 1460 West • P.O. Box 16690 • Salt Lake City, Utah 84116-0690 • (801) 538-6121

-- The Silver Creek drainage just below the tailings dam is an important wetlands resource. The SI form, Part 5, should be updated to reflect this.

-- The demographics section of Part 5 should be updated to reflect the recent construction at Prospector Square.

-- While annually there is negative net precipitation at the site, there is positive net precipitation during the winter months.

If you have any questions regarding these comments, please call John Trepanowski of my staff at (801) 538-6170.

Respectfully yours,

Loretta Pickerell

Loretta Pickerell
Superfund Program Manager

LP/JT/pw