

SAFETY, HEALTH AND ENVIRONMENTAL
(Roger Ziehl)
C8

AMMONIUM PERFLUORO-OCTANOATE
FC-143
ANIONIC FLUORO-CHEMICAL SURFACTANT
MGF by 3M COMPANY

- o DuPONT AEL: 0.01 mg/M3 (0.56 ppb, 8 hr TWA)
- o IRRITANT via INHALATION, SKIN or EYE CONTACT
- o MODERATELY TOXIC (ORAL)
- o ACUTE OVER-EXPOSURE: LIVER INJURY
- o CHRONIC EXPOSURE
 - LIVER ENLARGEMENT
 - ELEVATED BLOOD FLUORINE LEVELS
- o NO KNOWN MEDICAL PROBLEMS FROM C8 (35 years)
- o C8 IS NOT:
 - A TERATOGEN
 - EMBRYOTOXIN
 - MUTAGEN

RJZ030291

DAS 10/24, 90

BACKGROUND**WHAT IS C-8?**

- 0 AMMONIUM PERFLUOROOCTANOATE - $\text{CF}_3(\text{CF}_2)_6\text{C}(=\text{O})\text{O}^-\text{NH}_4^+$
- 0 FC-143
- 0 FC-118 (20% SOLUTION)
- 0 CAS NO. 3825-26-1

WHAT IS IT USED FOR?

- 0 DISPERSING AGENT - POLYMERIZATION (USED SINCE LATE 1950'S
OR EARLY 1960'S)

WHERE IS IT USED?

- 0 TEFLON® POLYMERS - ALL POLYMERIZATION BATCHES
- 0 TEFLON® COPOLYMERS - FEP POLYMERIZATION
- 0 VITON®, KALREZ® FLUOROELASTOMERS

RJZ030292

3/17

C-8

CONTROL LEVELS

TLV - 0.1 MG/M³, LIVER EFFECTS

AEL - 0.01 MG/M³, LIVER EFFECTS
CANCER STUDY RESULTS
BIOPERSISTENCE

CEG_A - 0.0003 MG/M³

(CEGW - 1 PPB) PENDING FEB. 4 AEL

FUTURE ACTION

- RAT FEEDING STUDY RESULTS INTEGRATED INTO AEL PROCESS
(WHEN FINAL REPORT IS RECEIVED)

- FOLLOW C-8 RESEARCH

RJZ030293

EID112757

4/17

A Community Exposure Guideline ("CEG") is an exposure guideline established by Haskell Laboratory. The CEG assumes a 24-hour lifetime exposure by all, including the most sensitive individuals, in an exposed community population. Exposure above the CEG will not necessarily result in any adverse effects. Where data indicates that the CEG may be approached or exceeded, Haskell, the appropriate Business and Legal will evaluate, what action, if any should be taken. It is the Company's intent to maintain exposure below the CEG.

RJZ030294

EID112758

5/17

WASHINGTON WORKS

"TEFLON" AREA EMPLOYEE BLOOD LEVELS

<u>PERIOD</u>	<u>POPULATION</u>	<u>< =1PPM (%)</u>	<u>< =5PPM (%)</u>
1984-86	108	67	92
1987-88	58	50	90
1989	41	59	83
1990	21	90	100
1991	3	N/A	N/A

C:SLG
1/2/92

RJZ030295

EID112759

6/17

LIVER STUDY OF WASHINGTON WORKS EMPLOYEES

EXPOSED TO C-8. 1/15/81

OBJECTIVE: DETERMINE IF OCCUPATIONAL EXPOSURE TO C-8 ADVERSELY AFFECTS LIVER FUNCTION AS MEASURED BY BLOOD LEVELS OF SGOT, LDH, AP, AND BILIRIBIN.

COHORT: (88) "TEFLON" AREA EMPLOYEES IN ONE OF FIVE JOB ASSIGNMENTS TESTED IN 1979 FOR BLOOD FLUORIDE.

CONTROL: 10% OF ALL WW EMPLOYEES WHO HAD NEVER WORKED "TEFLON".

RESULTS: BLOOD FLUORIDE IN COHORT 16 HIGHEST (TOP 20%) RANGED FROM 5-21 PPM (AVERAGE 10 PPM).

CONCLUSION:

1. NO EVIDENCE OF OCCUPATIONALLY RELATED HEALTH PROBLEMS AMONG WORKERS EXPOSED TO C-8.
2. FEP WORKER AP LEVELS MAY HAVE RISEN FOLLOWING C-8 EXPOSURE.
3. NO SIGNIFICANT CHANGE IN TFE EMPLOYEE SGOT, LDH, AP, OR BILIRIBIN LEVELS FOLLOWING C-8 EXPOSURE.

PROPOSED STUDY UPDATE

ESTIMATED COST: \$45,000

ESTIMATED COMPLETION: FIRST HALF, 1992

REVIEWED WITH KARRH AND LIGO, 10/4, DECIDED NOT TO PURSUE

C:SLG
1/2/92

RJZ030296

7/17

C-8

BIOACCUMULATION IN FISH

BACKGROUND: BIOPERSISTENCE IN MAN, RODENTS

- NO DATA ON TISSUE BUILD-UP, STORAGE SITES IN ANIMALS;
- DISTRIBUTION OF C-8 DIFFERS AMONG SPECIES; WITHIN SPECIES (MALE VS. FEMALE)

WOULD C-8 BE EXPECTED IN BUILD-UP IN FISH?

- OCTANOL-WATER PARTITION COEFFICIENT ESTIMATES PREDICT VERY LITTLE TO ACCUMULATE IN FATTY TISSUES OF ORGANISMS
- IS THERE A STORAGE SITE IN FISH SIMILAR TO THAT IN MAN (FIND C-8 BOUND TO PLASMA)
- EXPERIMENT TO ANSWER PROPOSED TO POLYMERS BUSINESS

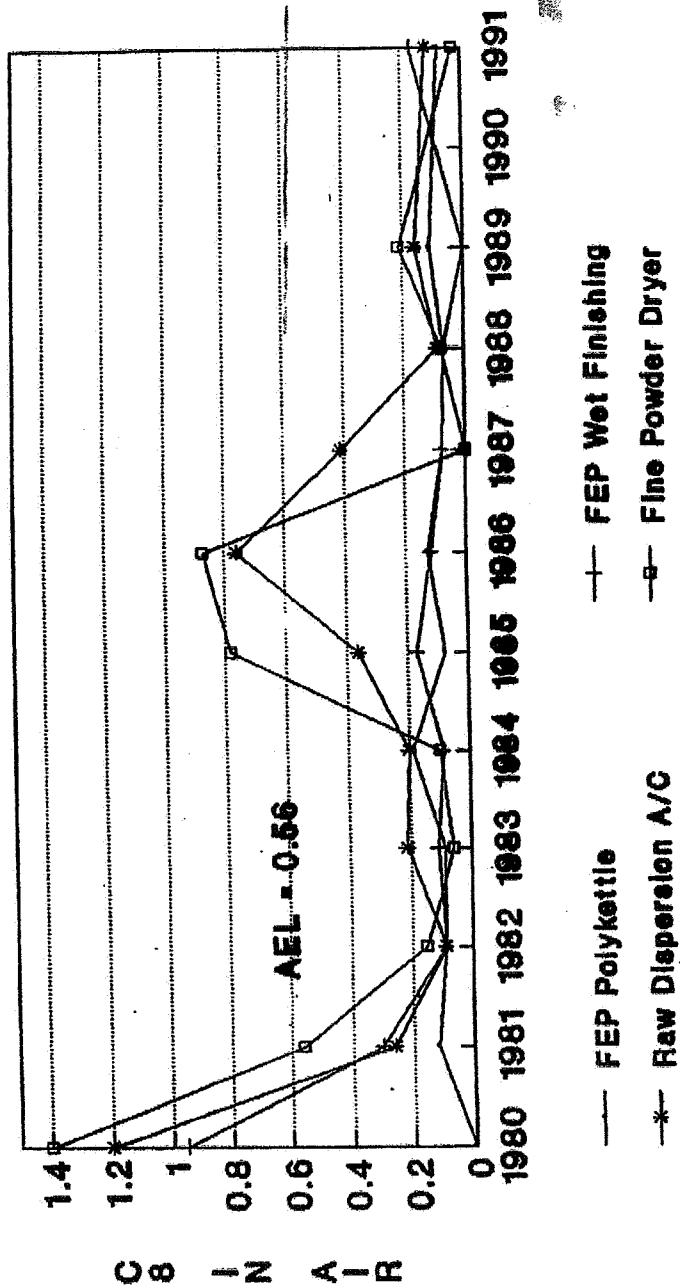
COST OF EXPERIMENT

APPROXIMATELY 1 YEAR, \$50,000

RJZ030297

EID112761

C-8 TRENDS IN AIR WASHINGTON WORKS



R.Zlpfel
rgc/11/91

RJZ030298

8/17

C-8 STRATEGIES

- I. WE WILL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS GOVERNING THE USE AND DISPOSAL OF C-8.
- II. WE WILL CONTROL C-8 EXPOSURE TO PERSONNEL BY BEING IN FULL COMPLIANCE WITH THE AEL (0.01 MG/M3) FOR EMPLOYEES AND WITH THE CEG (0.0003 MG/M3 IN AIR, AND 1 PPB IN DRINKING WATER) FOR THE GENERAL PUBLIC.
- III. WE WILL COMMUNICATE C-8 INFORMATION TO EMPLOYEES AS DETERMINED BY SPD & SITE MANAGEMENT AND TO THE GENERAL PUBLIC AS DETERMINED BY SPD & SITE MANAGEMENT WITH THE ADVICE OF CORPORATE EXTERNAL AFFAIRS AND LEGAL.
- IV. WE WILL CONTINUE TO USE C-8 FOR THE MANUFACTURE OF FLUOROPOLYMERS. WE WILL CONTINUE TO REDUCE C-8 EMISSIONS TO THE ENVIRONMENT BY UTILIZING GOOD MANAGEMENT PRACTICES AS REQUIRED BY CORPORATE POLICY.
- V. we will work to reach the goal of "zero" emissions to the environment.

RJZ030299

EID112763

9/17

10/17

GLOBAL C-8 USERS

<u>SITE</u>	<u>AMOUNT - LBS</u>
WASHINGTON WORKS	71,100
DORDRECHT WORKS	31,400
SHIMIZU	15,950
CHAMBERS WORKS	2,000
SPRUANCE	1,500
PARLIN	2,500
U.S. MAJOR CUSTOMERS	6,150
NON-U.S. MAJOR CUSTOMERS	4,060

RJZ030300

EID112764

11/17

GLOBAL C-8 ISSUES

WASHINGTON WORKS

- LAB DISCUSSION
- C-8 LEVELS IN AIR - RESOLVED
- OHIO & DELAWARE RIVER
- GROUNDWATER
- LANDFILL - LETART & DRY RUN

DORDRECHT WORKS

- C-8 LEVELS IN AIR - RESOLVED
- MERWEDE RIVER
- LANDFILL

SHIMIZU WORKS

- SUGURA BAY

CHAMBERS WORKS

- RECOVERY IN PACT UNIT

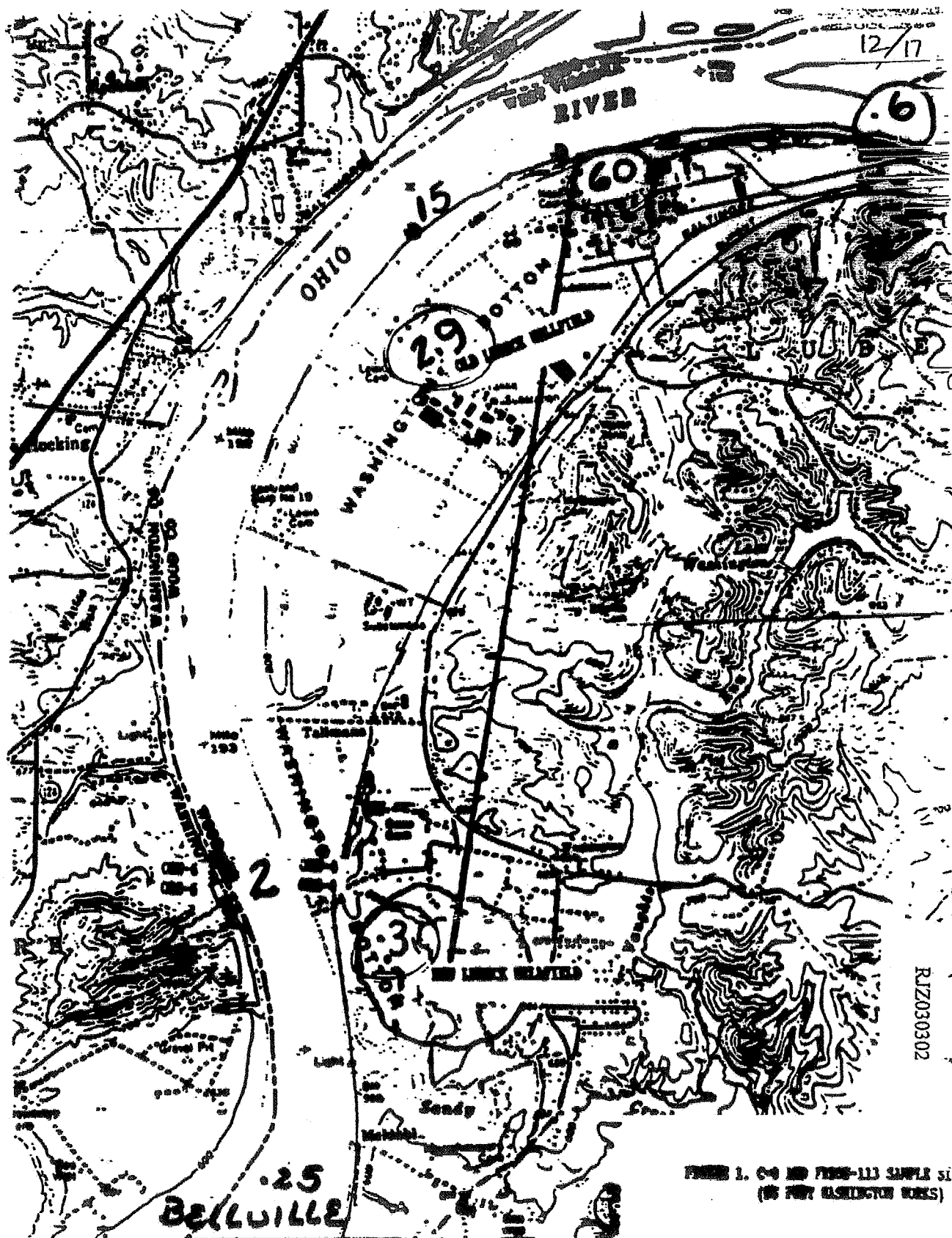
SPRUANCE

- JAMES RIVER

MAJOR CUSTOMERS

- AWARENESS OF HAZARD

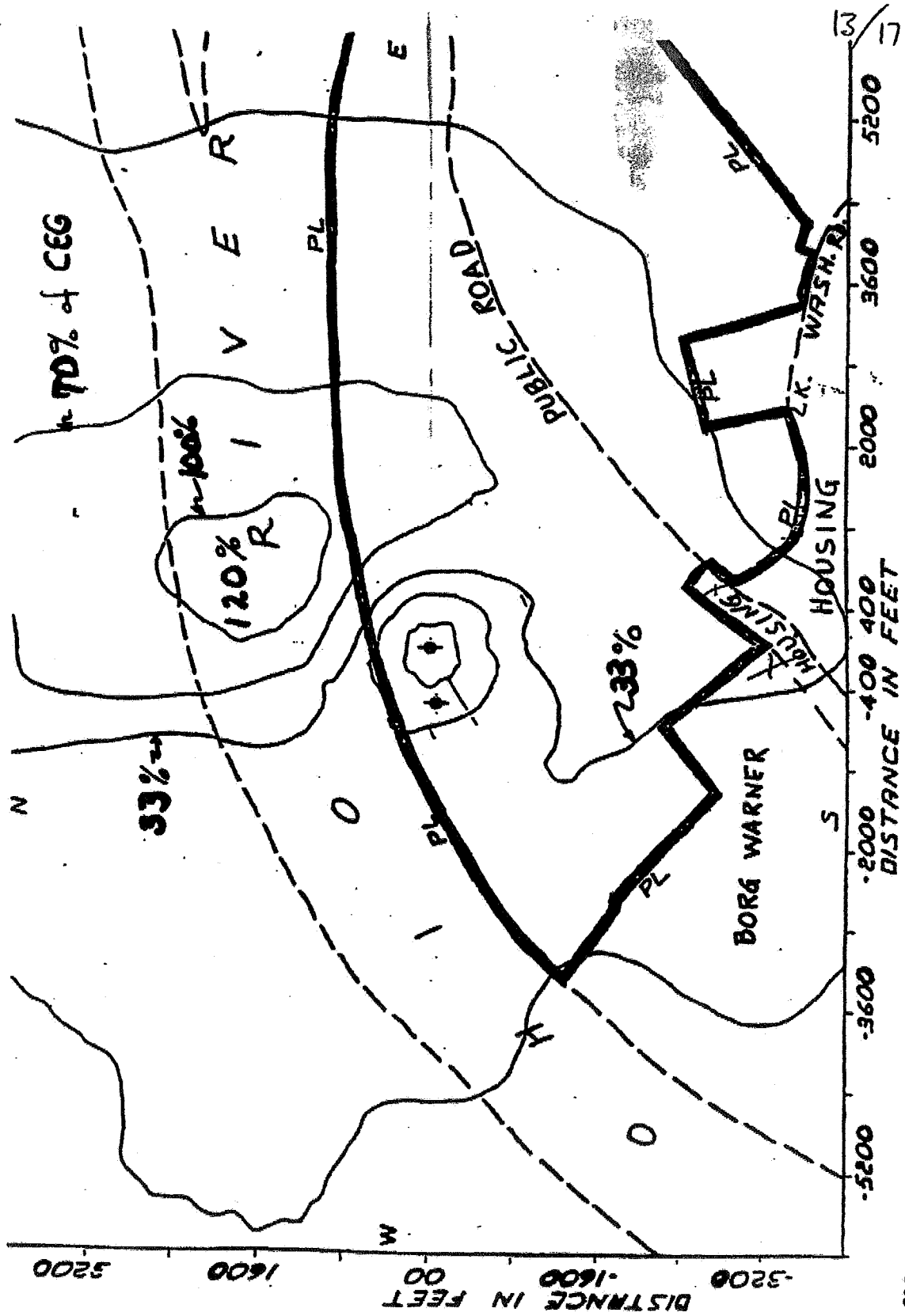
RJZ030301



CALC - 6

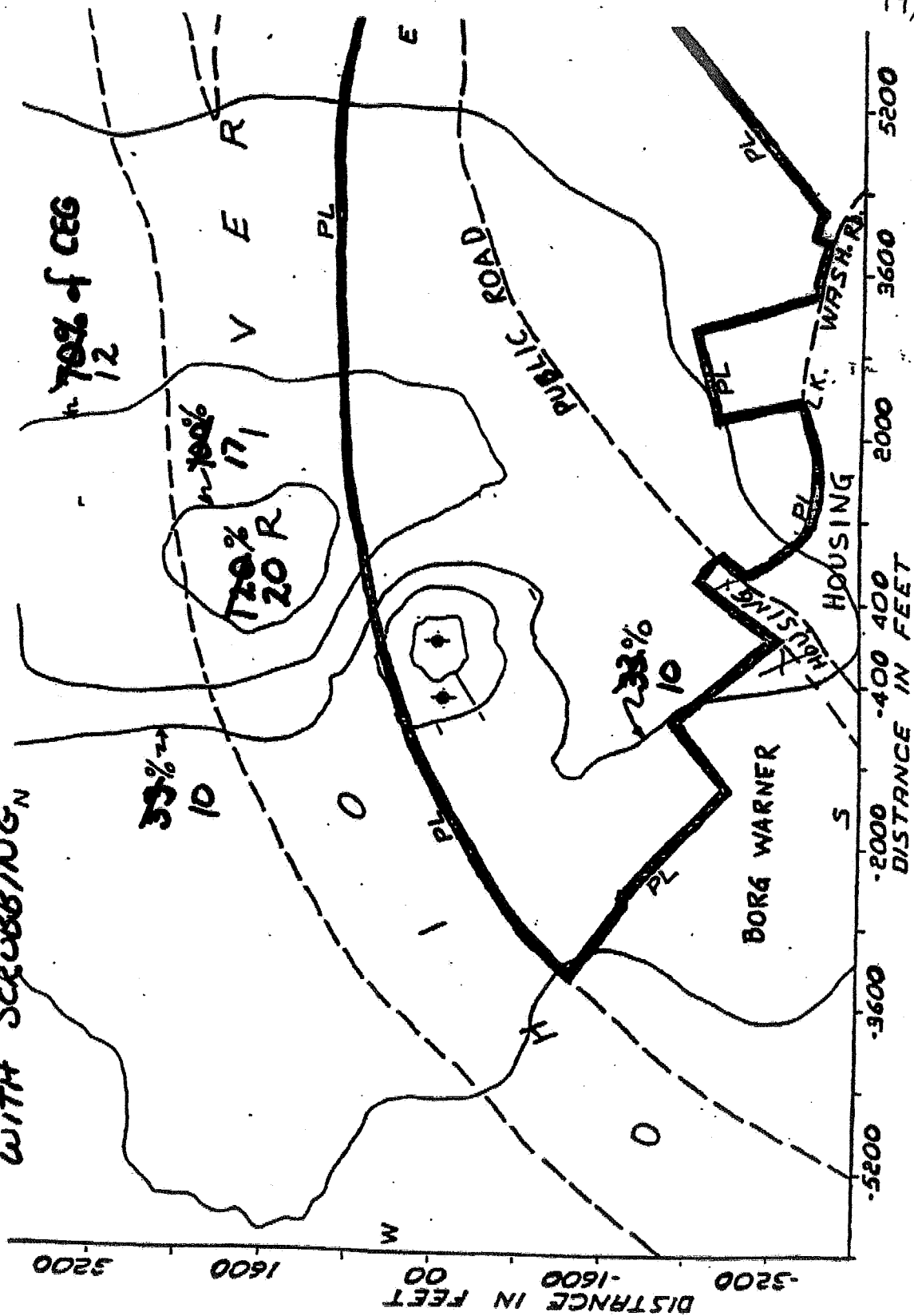
CEG - 1 PPB

WH- HINGTON WORKS C-B ANNUAL MEAN CONCENTRATION CASE 1



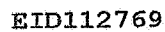
RJZ030303

WITH SC&WB/NG_N

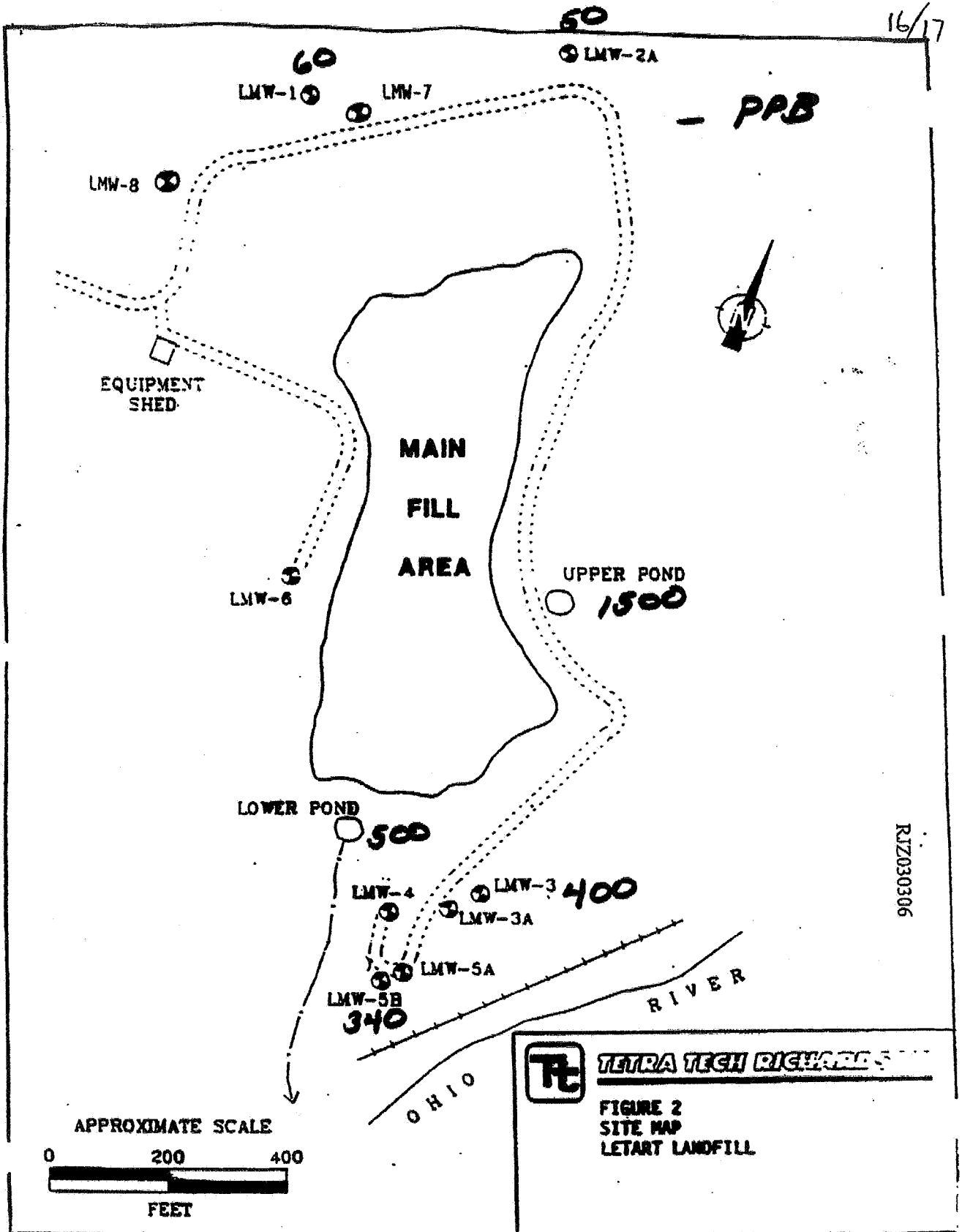


RJZ030304

RJZ030305



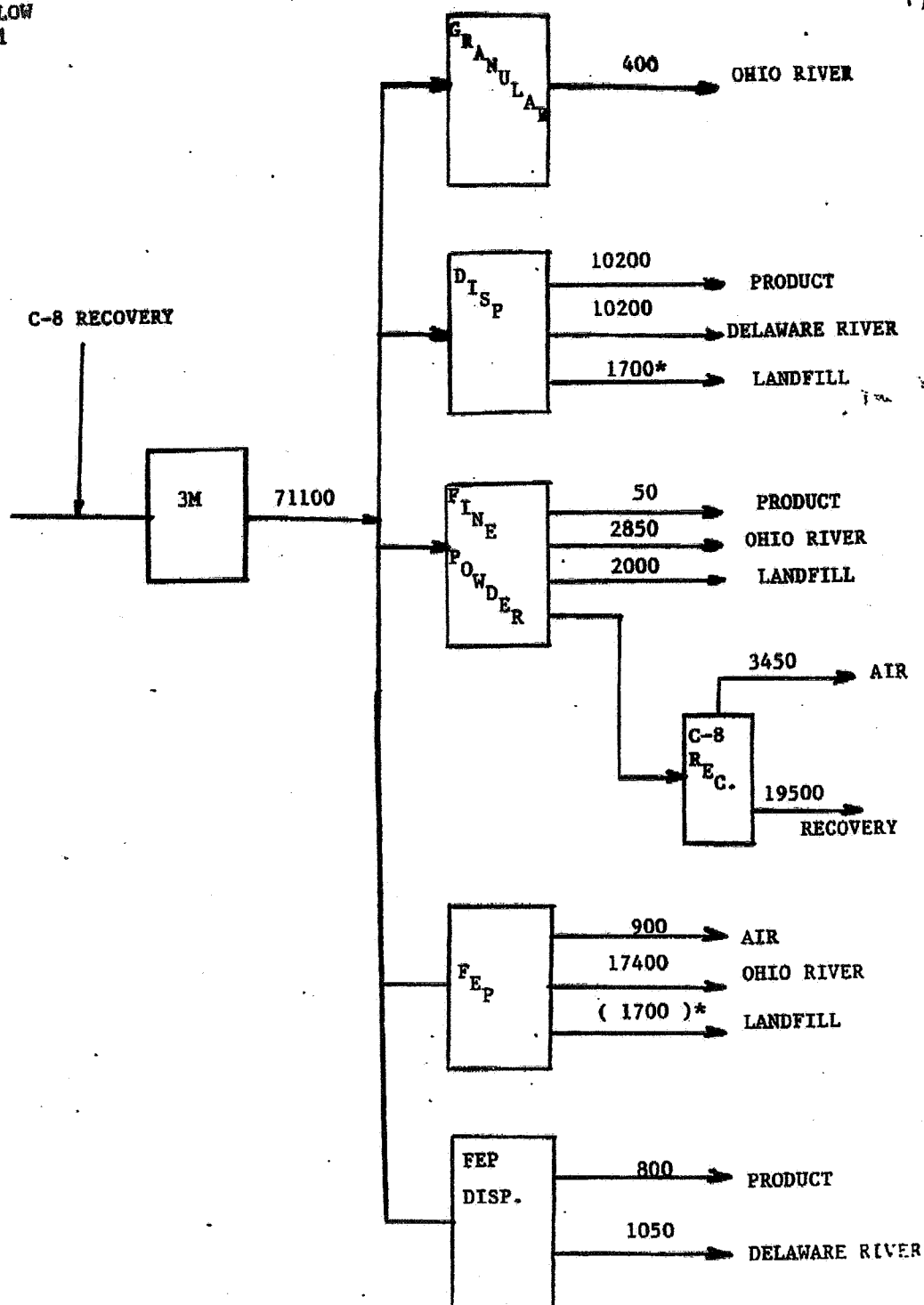
16/17



EID112770

WASHINGTON WORKS
C-8 FLOW
1991

17/17



* NUMBERS ARE LBS/YR

RJZ030307

EID112771