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DRAFT FEASIBILITY STUDY

VOLUME III OF III

APPENDICES C THROUGH I

eder associates
consulting engineers, p.c.

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

DRAFT FEASIBILITY STUDY
VOLUME III OF III
APPENDICES C THROUGH I

PROJECT #497-8

SEPTEMBER 1992

EDER ASSOCIATES
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APPENDIX C

CALCULATION OF TOTAL VOCs IN WASTES

by ______ date ______

chkd. by ______ date ______

subject NATIONAL PRESTO

sheet no. 1 of ______

job no. ______

WEIGHT OF VOC IN FORGE COMPOUND AND FORGE COMPOUND/SOIL MIXTURE (gallons)

VOC	LAGOON 1	MELBY ROAD DISPOSAL SITE		EAST DISPOSAL SITE	DITCH 3		DRY WELLS 2 & 5	
	FORGE COMPOUND	FORGE COMPOUND		FORGE COMPOUND	FORGE COMPOUND		SEDIMENT	
							MAX	AVG
1,1,1-Trichloroethane	189.4	0.8		14.5	—		0.01	0.005
1,1-Dichloroethane	6.5	1.4		—	—		—	—
Tetrachloroethene	6.2	0.55		—	—		—	—
Xylenes	2.6	4.3		0.6	—		—	—
1,1-Dichloroethene	—	0.4		—	—		0.01	0.005
Trichloroethene	—	0.3		0.71	—		—	—
Benzene	—	—		0.22	—		—	—
Toluene	—	—		0.45	—		—	—
Trans-1,2 Dichloroethe…	—	—		—	—		0.01	0.005
Methylene chloride	—	—		—	—		0.03	0.015
	SOIL/FORGE	SOIL/FORGE		SOIL/FORGE	SOIL/FORGE		SOIL/FORGE	
1,1,1-Trichloroethane	46.3	1.9	1.5	0.53	59.7	28.0	—	—
1,1-Dichloroethane	1.6	0.05	0.05	—	11.6	7.7	—	—
Tetrachloroethane	1.5	0.11	0.08	0.015	—	—	—	—
Xylene	0.63	0.09	0.07	—	—	—	—	—
Trichloroethene	—	0.06	0.05	28.4	—	—	—	—
1,1-Dichloroethene	—	0.05	0.05	—	—	—	—	—
Toluene	—	—	—	—	5.9	4.4	—	—

Lagoon 1

Forge compound volume 5000 cy
Soil / Forge compound 1200 cy

Waste Forge Compound Samples (μg/Kg)

	LG1-01-02	LG-1-02-02	April 1992
1,1,1-Trichloroethane	10,000	110,000	2300
1,1-Dichloroethane	3,800	<3500	<1200 (E 790)
Tetrachloroethene	3600	<1,800	
Xylene			1,500
1,2-Dichloroethene			<1200 (E 820)
Toluene			< 1200 (E 630)
Ethylbenzene			<1200 (E 330)

VOC's weight in forge compounds

$5000 \text{ cy} \times 202 \frac{\text{gal}}{\text{cy}} \times 17 \frac{\text{lbs}}{\text{gal}} \times \frac{\text{Kg}}{2.2 \text{ lbs}} = 7.8 \times 10^6 \text{ Kg}$.

- Based on maximum concentrations

1,1,1-Trichloroethane: $110{,}000 \times 7.8\times10^6 \times \frac{1}{453\times10^6} =$ **1894 lbs**

1,1-Dichloroethane: $3800 \times 7.8\times10^6 \times \frac{1}{453\times10^6} =$ **65.4 lbs**

Tetrachloroethene: $3{,}600 \times 7.8\times10^6 \times \frac{1}{453\times10^6} =$ **62 lbs**

Xylene: $1500 \times 7.8\times10^6 \times \frac{1}{453\times10^6} =$ **25.8 lbs**

Soil / Forge compound

Never sampled

Assume **maximum** concentration of the forge compound

1,1,1 - Trichloroethane	110,000 mg/Kg
1,1 - Dichloroethane	3800 mg/Kg
Tetrachloroethene	3600 mg/Kg
Xylene	1500 mg/Kg

VOC's weight in soil / forge compound

$1000\ yd^3 \times 27 \frac{ft^3}{yd^3} \times 130 \frac{lbs}{ft^3} \times \frac{Kg}{2.2\ lbs} = 1.91 \times 10^6\ Kg$

1,1,1 - Trichloroethane: $110,000 \frac{mg}{Kg} \times 1.91 \times 10^6\ Kg \times \frac{1\ lb}{453 \times 10^6\ mg} = \boxed{463\ lbs}$

1,1 - Dichloroethane: $3800 \frac{mg}{Kg} \times 1.91 \times 10^6 \times \frac{1}{453 \times 10^6} = \boxed{16\ lbs}$

Tetrachloroethene: $3600 \frac{mg}{Kg} \times 1.91 \times 10^6 \times \frac{1}{453 \times 10^6} = \boxed{15.2\ lbs}$

Xylene: $1500\ mg/Kg \times 1.91 \times 10^6 \times \frac{1}{453 \times 10^6} = \boxed{6.3\ lbs}$

Melby Road

Forge Compound Volume 1600 cy
Soil + Forge Compound 29,000 cy

Waste forge compound samples (μg/Kg)

Xylenes	7,800
1,1 - Dichloroethene	<700
1,1 - Dichloroethane	2,500
1,1,1 - Trichloroethane	1,500
Tetrachloroethene	<1,000
Trichloroethene	<500

VOC's weight in forge compound

$1600\ cy \times 202\ \frac{gal}{cy} \times 17\ \frac{lbs}{gal} \times \frac{Kg}{2.2\ lbs} = 2.497 \times 10^6\ Kg$

- Based on measured concentrations

Xylenes: $7800\ \frac{\mu g}{Kg} \times 2.497 \times 10^6\ Kg \times \frac{lb}{453 \times 10^6\ \mu g} =$ **43 lbs**

1,1 - Dichloroethene: $700\ \frac{\mu g}{Kg} \times 2.497 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **3.9 lbs**

1,1 - Dichloroethane: $2500\ \frac{\mu g}{Kg} \times 2.497 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **14 lbs**

1,1,1 - Trichloroethane: $1500\ \frac{\mu g}{Kg} \times 2.497 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **8.3 lbs**

Tetrachloroethene: $1000\ \frac{\mu g}{Kg} \times 2.497 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **5.5 lbs**

Trichloroethene: $500\ \frac{\mu g}{Kg} \times 2.497 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **2.8 lbs**

Soil + Force compound samples (mg/Kg)

	M-2-SS-05	M-13-SS-05	M-23-SS-05
Xylene	5	–	9
Trichloroethene	2	<5	<5
Tetrachloroethene	<5	7	11
1,1,1-Trichloroethane	170	98	190
1,1-Dichloroethane	<5	<5	5
1,1-Dichloroethene	4	<5	<5

VOC's weight in soil/Force compound

$37000\ cy \times \frac{27\ ft^3}{cy} \times 130\ \frac{lbs}{ft^3} \times \frac{Kg}{2.2\ lbs} = 46.27 \times 10^6\ Kg$

– Based on maximum concentrations

Xylene: $9\ \frac{\mu g}{Kg} \times 46.27 \times 10^6\ Kg \times \frac{lb}{453 \times 10^6\ \mu g} =$ **0.9 lbs**

Trichloroethene: $6\ \frac{\mu g}{Kg} \times 46.27 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **0.6 lbs**

Tetrachloroethene: $11\ \frac{\mu g}{Kg} \times 46.27 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **1.1 lbs**

1,1,1-Trichloroethane: $190\ \frac{\mu g}{Kg} \times 46.27 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **19.4 lbs**

1,1-Dichloroethane: $5\ \frac{\mu g}{Kg} \times 46.27 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **0.5 lbs**

1,1-Dichloroethene: $5\ \frac{\mu g}{Kg} \times 46.27 \times 10^6 \times \frac{1}{453 \times 10^6} :$ **0.5 lbs**

– Based on average concentrations

Xylene: 7 µg/Kg × 0.102 = **0.7 lbs**
Trichloroethene: 4.33 µg/Kg × 0.102 = **0.5 lbs**
Tetrachloroethene: 7.7 µg/Kg × 0.102 = **0.8 lbs**
1,1,1-Trichloroethane: 150 µg/Kg × 0.102 = **15.3 lbs**
1,1-Dichloroethane: 5 µg/Kg × 0.102 = **0.5 lbs**
1,1-Dichloroethene: 4.7 µg/Kg × 0.102 = **0.5 lbs**

EAST DISPOSAL SITE

FORGE COMPOUND Volume 300 CY
SOIL / FORGE COMPOUND 1000 CY

WASTE FORGE COMPOUND SAMPLES (mg/kg)

	1989 SAMPLES (mg/kg)		1990 SAMPLES (mg/kg)
1,1,1 - TCA	4500	140,000	52,200
TRICHLOROETHYLENE	6800	<1,000	
BENZENE	<600	2100	
TOLUENE	1,900	4300	
XYLENE			6000

VOC's WEIGHT IN FORGE COMPOUND

$$300 \text{ CY} \times 202 \frac{\text{gal.}}{\text{CY}} \times 17 \frac{\text{lbs}}{\text{gal.}} \times \frac{\text{Kg}}{2.2 \text{ lbs}} = 0.47 \times 10^6 \text{ Kg}$$

VOC's WEIGHT

1,1,1 - TCA $140{,}000 \times 0.47 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **145 lbs.**

TRICHLOROETHYLENE $6800 \times 0.47 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **7.1 lbs.**

BENZENE $2{,}100 \times 0.47 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **2.2 lbs.**

TOLUENE $4{,}300 \times 0.47 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **4.5 lbs.**

XYLENE $6000 \times 0.47 \times 10^6 \times \frac{1}{453 \times 10^3} =$ **6.2 lbs.**

VOC's weight ____ compounds

From RI Report (Fig 4-5 & 4-6)

1,1,1 - Trichloroethane 1,500 μg/kg
Trichloroethene 81,000 μg/kg
Tetrachloroethene 39 μg/kg

$1000 \text{ cy} \times 27 \frac{ft^3}{cy} \times 120 \frac{lbs}{ft^3} \times \frac{kg}{2.2 \text{ lbs}} = 1.59 \times 10^6 \text{ kg}$

1,1,1 - Trichloroethane $1500 \frac{\mu g}{kg} \times 1.59 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **5.3 lbs**

Trichloroethene : $81000 \times 1.59 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **284 lbs**

Tetrachloroethene: $39 \times 1.59 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **0.14 lbs**

eder associates consulting engineers, p.c.

by S.S.J. date [illegible] sheet no. 8 of ______

chkd. by ______ date ______ job no. 4[illegible]-5

subject [illegible] — Ditch ③ VOC's [illegible]

Ditch ③

Soil / Epoxy compound volume = 3000 cy

Ditch ③ samples (µg/kg):

	D3-01-02 (0-2')	D3-03-02 (5-6.5')
1,1-Dichloroethane	11,000	< 3,500
1,1,1-Trichloroethane	48,000	< 5,000
Toluene	2,800	5,600

VOC's weight in the mixture

Assume the weight of soil / epoxy compound mixture = 130 lbs/ft³

$3000\ cy \times \frac{27\ ft^3}{cy} \times \frac{130\ lbs}{ft^3} \times \frac{Kg}{2.2\ lbs} = 4.786 \times 10^6\ Kg$

– Based on maximum VOC concentrations

1,1-Dichloroethane: $11,000\ \frac{\mu g}{Kg} \times 4.786 \times 10^6\ Kg \times \frac{lb}{453 \times 10^6\ \mu g} =$ **116 lbs**

1,1,1-Trichloroethane: $48000\ \frac{\mu g}{Kg} \times 4.786 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **507 lbs**

Toluene: $5600\ \frac{\mu g}{Kg} \times 4.786 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **59 lbs**

– Based on average VOC concentrations

1,1-Dichloroethane: $7250\ \frac{\mu g}{Kg} \times 4.786 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **77 lbs**

1,1,1-Trichloroethane: $26500\ \frac{\mu g}{Kg} \times 4.786 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **280 lbs**

Toluene: $4200\ \frac{\mu g}{Kg} \times 4.786 \times 10^6 \times \frac{1}{453 \times 10^6} =$ **44 lbs**

eder associates consulting engineers, p.c.

by ______ date [illegible]

chkd. by ______ date ______

sheet no. 2 of ______

job no. [illegible]

subject [illegible]

[illegible] ② [illegible]

[illegible] volume 50 cy.

[illegible] samples (mg/kg)

	[illegible]	[illegible]
1,1 - Dichloroethane	13	<620
Trans -1,2 Dichloroethene	11	<620
1,1,1 - Trichloroethane	38	<620
Methylene chloride	13	1880

[illegible]

$50\ cy \times 27 \frac{ft^3}{cy} \times \ldots \frac{\ldots}{m^3} \times \frac{kg}{2.2\ lb} = 79800\ Kg$

- Based on maximum concentrations

1,1-Dichloroethane: $620 \frac{mg}{Kg} \times 79800\ Kg \times \frac{1\ lb}{453 \times 10^6} =$ **0.1 lb**

Trans-1,2 Dichloroethene: $620 \frac{mg}{Kg} \times 79800\ Kg \times \frac{1}{453 \times 10^6} =$ **0.1 lb**

1,1,1-Trichloroethane: $620 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.1 lb**

Methylene chloride: $1880 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.3 lbs**

- Based on average concentrations

1,1-Dichloroethane: $316 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.05 lbs**

Trans-1,2 Dichloroethene: $315 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.05 lbs**

1,1,1-Trichloroethane: $329 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.05 lbs**

Methylene chloride: $946 \frac{mg}{Kg} \times 79800 \times \frac{1}{453 \times 10^6} =$ **0.15 lbs**

WEIGHT OF VOC IN FORGE COMPOUND AND FORGE COMPOUND/SOIL MIXTURE (LBS)

VOC	LAGOON I	MELBY ROAD DISPOSAL SITE		LAST DISPOSAL SITE	DITCH 3		DRY WELLS 2 & 5	
	FORGE COMPOUND	FORGE COMPOUND		FORGE COMPOUND	FORGE COMPOUND		SEDIMENT	
							MAX	AVG
1,1,1-Trichloroethane	1894	8		145	—		0.1	0.05
1,1-Dichloroethane	65	14		—	—		—	—
Tetrachloroethene	62	5.5		—	—		—	—
Xylenes	26	43		6	—		—	—
1,1-Dichloroethene	—	4		—	—		0.1	0.05
Trichloroethene	—	3		7.1	—		—	—
Benzene	—	—		2.2	—		—	—
Toluene	—	—		4.5	—		—	—
Trans-1,2 Dichloroethylene	—	—		—	—		0.1	0.05
Methylene chloride	—	—		—	—		0.3	0.15
	SOIL/FORGE	SOIL/FORGE		SOIL/FORGE	SOIL/FORGE		SOIL/FORGE	
1,1,1-Trichloroethane	463	19	15	5.3	507	280	—	—
1,1-Dichloroethane	16	0.5	0.5	—	116	77	—	—
Tetrachloroethane	15	1.1	0.8	0.15	—	—	—	—
Xylene	6.3	0.9	0.7	—	—	—	—	—
Trichloroethene	—	0.6	0.5	284	—	—	—	—
1,1-Dichloroethene	—	0.5	0.5	—	—	—	—	—
Toluene	—	—	—	—	59	44	—	—

Note: Density of VOCs assumed to be 10 pounds per gallon

APPENDIX D

"EVALUATION OF POTENTIAL GROUNDWATER IMPACT ASSOCIATED WITH AFFECTED SOIL AT THE EAST DISPOSAL AREA AND THE MELBY ROAD SITE"

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

DRAFT FEASIBILITY STUDY
EVALUATION OF POTENTIAL GROUNDWATER IMPACT ASSOCIATED WITH AFFECTED SOIL AT THE EAST DISPOSAL SITE AND THE MELBY ROAD SITE

PROJECT #497-8
AUGUST 1992

EDER ASSOCIATES
CONSULTING ENGINEERS, P.C.
Locust Valley, New York
Madison, Wisconsin
Ann Arbor, Michigan
Augusta, Georgia
Jacksonville, Florida

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EXECUTIVE SUMMARY

Several remedial alternatives developed for the National Presto Industries, Inc. (NPI) site FS involve excavation of waste forge compound and other waste at the Melby Road and East Disposal Sites (EDS). Remedial Investigation (RI) data indicate that soil beneath and around the waste forge compound contains low levels of 1,1,1-trichloroethane (TCA) and trichloroethylene (TCE). This affected soil could likely be left in place if it does not pose an unacceptable risk to human health and the environment. Contaminant transport modelling was performed to predict whether the affected soil, if left in place without a cap, would result in unacceptable concentrations of TCA and TCE in groundwater.

Modelling was performed using conservative assumptions for soil characteristics, contaminant mass loading, and fate/transport processes to ensure that the predictions are "worst case" in nature. The RI database was used wherever possible in development of the model, and these data were supplemented with information from published literature sources. The concentrations of TCE and TCA in groundwater predicted by the models were compared with Wisconsin groundwater standards. Model predictions indicate that, if waste is removed and affected soil is left in place, maximum concentrations of TCE and TCA in groundwater would be less than the Wisconsin Enforcement Standards and Preventative Action Limits (PALs) for both the EDS and Melby Road sites.

Post-remediation groundwater monitoring could be implemented to ensure that applicable groundwater quality standards are not exceeded after the forge compound is excavated, and to determine if any further action is warranted.

Concentrations of TCE and TCA in affected soil were compared with action levels representing 10^{-6} excess lifetime cancer risk to assess potential health risks posed by the affected soil if left in place after waste excavation. Concentrations of TCE and TCA in affected surface soil were assumed to be those used in the model simulations. The TCE and TCA health risk-based action levels used for this comparison were obtained from USEPA's July 1990 proposed RCRA corrective action rule (55 FR 145). Based on these data, affected soil which is left in place should not pose a health risk through principal (direct contact and ingestion) exposure routes.

I. INTRODUCTION

Several remedial alternatives for the NPI site involve excavation of waste forge compound and other waste at the Melby Road and East Disposal Sites (EDS). One scenario would involve excavation of waste forge compound and other waste from the two sites. RI data indicate that soil beneath and around the waste forge compound contains low levels of 1,1,1-trichloroethane (TCA) and trichloroethylene (TCE). This soil, referred to herein as "affected soil", could be left in place if it does not pose an unacceptable threat to human health and the environment. Contaminant transport modelling was performed to predict whether the affected soil, if left in place without a cap, would result in unacceptable concentrations of TCA and TCE in groundwater.

The Seasonal Soil Compartment Model (SESOIL) and AT123D were the two models used in this analysis. The models are well documented, publicly available, and the model codes were developed for USEPA and USDOE, respectively.

SESOIL simulates long-term contaminant transport in the unsaturated zone. The model was first developed by Bonazountas and Wagner for USEPA in 1982, and was modified extensively by Hetrick in 1986. SESOIL simulates the hydrologic cycle of the unsaturated zone, contaminant concentrations in solid, liquid, and gas phases, contaminant migration to groundwater, and contaminant volatilization. SESOIL can retrieve climate data for 262 weather stations in the United States and soil data for 14 different soil types. Chemical data required by SESOIL can automatically be taken from AUTOEST, a chemical property estimation model. The unsaturated soil column between the ground surface and the water table is simulated as a column consisting of one or more compartments, each with distinct physical characteristics and contaminant mass. The user can select the number of compartments to be simulated, and the characteristics of the soil within each compartment. Processes simulated in the SESOIL model are categorized in hydrologic, sediment, and pollution cycles, and each cycle is a separate submodel in the SESOIL code. The hydrologic cycle includes convective transport, volatilization, adsorption/desorption, and degradation/decay. SESOIL predicts the vertical flux of contaminant mass into the water table. The model does not predict pollutant concentrations in groundwater, but the results can be input into another model to accomplish this.

AT123D is an analytical, transient, groundwater solute transport model which can predict the time-dependent spread of constituents through an aquifer. The code was developed by G.T. Yeh in 1981 for the USDOE. Advection, hydrodynamic dispersion, molecular diffusion, adsorption, and chemical decay are included in the model, and AT123D can accept input files created by SESOIL.

AT123D was used in this analysis to predict the maximum concentration of contaminants which would be expected in groundwater due to vertical flux into the saturated zone.

II. SOURCE AREA ASSUMPTIONS

The model code calculates mass loading as a product of contaminant concentration, soil density, and thickness of the contaminated soil layer. RI data were reviewed to characterize the extent of waste and affected soil at EDS and Melby Road. Based on RI data, affected soil is present beneath and laterally adjacent to waste forge compound. The affected soil would be a potential contaminant source area after waste excavation and the modelling is being conducted to assess the impact these potential source areas might have on groundwater.

One way to simulate source area concentrations is to use RI data mean average TCE and TCA concentrations in affected soil. A second possible approach is to simulate the source area as multiple compartments with decreasing concentrations with depth. This was rejected in favor of a more conservative scenario. For modelling purposes, the source area was simulated as a single compartment with contaminant concentrations in soil equal to the highest reliable TCE and TCA concentrations found in affected soil samples collected in the RI. This strategy should provide worst case groundwater concentration predictions.

Table 1 summarizes the contaminant concentrations and thickness/extent of the source area used in the SESOIL model simulations. The decision criteria used in the source area characterization process and the justification for the assumptions used in the model are provided below.

II.A East Disposal Site

The RI data indicate the potential presence of waste forge compound and other waste in an area of approximately 100 ft by 40 ft at the EDS (Figure 1). The forge compound was found to extend to a maximum depth of 8 ft below grade (RI Report, Figure 4-5). The depth of affected soil was assumed to be seven feet for modelling purposes based on RI data, as described in Section II.A.1.

II.A.1 TCE

Most of the soil samples collected under and adjacent to buried waste at EDS exhibited concentrations at or below the detection limit (typically 5 µg/kg). Two soil samples exhibited higher concentrations.

The TCE concentration of sample B-8-10 was 1200 ppb. This sample was collected from 10 feet below grade at a location where forge compound was observed at 0-2 feet below grade. Headspace screening data were found to be useful for estimating actual concentrations in soil. The headspace data were, therefore, used in conjunction with laboratory analytical data to define the extent of waste and affected soil. The low concentration of TCE measured by portable gas chromatograph (PGC) in the headspace of sample B-8-10 does not support the 1200 ppb soil concentration determined by lab analysis. The validity of the lab analytical datum for this sample is suspect and the anomalous data point was rejected for modelling purposes. The second highest measured TCE concentration in soil is 38 ppb at 5 feet below grade (sample B-9-5) and this concentration was selected to represent the worst case soil concentration of the source area.

The EDS post-remediation source area is assumed to be 100 ft by 40 ft as a worst case scenario for modelling purposes. Based on RI data, affected soil is limited to this area. Analytical data for headspace samples measured by PGC and soil samples analyzed in the laboratory indicate that affected soil extends to a depth of between five and ten feet below grade at EDS. TCE concentrations in soil generally decrease rapidly with depth at most sampling locations. TCE concentrations in the headspace of samples collected from soil boring B-9 (the location of the sample exhibiting 38 ppb TCE) decrease rapidly from five ft to ten ft. The depth of affected soil was assumed to be seven feet for modelling purposes.

II.A.2 TCA

Based on RI data, TCA is not a contaminant ubiquitous to the EDS. TCA is not a component of the groundwater plume ("Plume #5") associated with the EDS, nor was it detected above 0.5 ug/l in 1988 at the monitoring well cluster (#17) closest to the EDS. Only one soil sample from EDS exhibited TCA at a significant concentration (sample B-3-25 collected from 25 feet below grade). This soil sample was collected outside the trench area where forge compound and affected soil is known to exist. TCA was detected at 110 ppb but TCA was not detected in a duplicate sample from the same location. Since none of the other soil samples collected from EDS, including the area under the forge compound trench, exhibited TCA at concentrations greater than 7 ppb, the 110 ppb concentration was considered an outlier. TCA is evidently not widely present in soil at EDS and fate and transport were, therefore, not modelled.

II.B Melby Road

Field data and historic aerial photographs were used to define the source area for modelling purposes. Based on RI data, waste forge compound is present in trenches and disseminated in soil to about 8 feet below grade in a relatively well defined area (100 ft by 200 ft). Historic aerial photographs show a cleared area larger than 100 by 200 ft, but it is not possible to discern whether the clearing is an effect of waste disposal activities. For modelling purposes, the potential source area is assumed to be 415 x 575 ft., which is the extent of the cleared area plus the area where residual contamination was detected in soil. Based on RI data, the potential source area depth is assumed to be ten ft., since concentrations generally decreased dramatically from five to ten feet depth.

A second scenario (scenario B) was developed to determine groundwater concentrations if affected soil were present to the twenty foot depth.

II.B.1 TCA

The highest concentration of TCA measured in soil samples from Melby Road was 190 ppb at a depth of 5 ft below grade (sample M-23-SS-05). The concentration of the potential source area soil was assumed to be 190 ppb for modelling purposes.

II.B.2 TCE

TCE was not detected above the detection limit (typically about 5 ppb) in soil samples collected during the RI. However, based on RI groundwater data, the Melby Road site is a suspected source of TCE to groundwater. The detection limit concentration was, therefore, assumed to be typical of soil throughout the conservatively estimated source area.

Table 1 summarizes source area contaminant loading assumptions used in the model simulations.

III. GENERAL INPUT PARAMETERS

Soil characteristics required for the model include; soil density, soil pH, intrinsic permeability, porosity, soil disconnectedness index, organic carbon content, clay content, cation exchange capacity, and sorption potential parameters. Some of these characteristics easily are measured and others are difficult to define empirically. SESOIL contains a database of these soil characteristics for fourteen U.S. Department of Agriculture soil types. The USDA "loamy sand" soil type is representative of the site based on RI subsurface data (lithologic descriptions of soil samples) and according to Soil Conservation Service information. Climate data used in the SESOIL and AT123D models were obtained from the La Crosse FAA weather station. Soil and hydrogeologic characteristics used in the SESOIL model are summarized in Tables 2 and 3. Table 4 summarizes the input parameters for the AT123D model.

Volatilization was included in the simulation because of the relatively high Henry's Law constants for TCA and TCE. Biodegradation half-lives were obtained from published literature. Reported values for TCA in soil and water ranged from 20 to 39 weeks. The reported half-lives for TCE ranged from 6 months to one year. Most of the literature data where estimated based on unacclimated/acclimated aqueous samples in a laboratory setting or in anaerobic/aerobic conditions. Since we have no data on the significance and rate of site specific biodegradation processes, biodegradation was omitted from the model to provide worst case predictions. Surface runoff was similarly assumed to be zero. Hydrolysis was not included due to lack of site specific and literature data. Table 5 summarizes pollutant migration/fate processes simulated in the model scenarios.

III.A Uncertainty Analysis

The uncertainty of the model predictions is most directly controlled by soil and chemical parameters input to the model.

Chemical factors such as adsorption coefficients, hydrolysis rate, biodegradation rate and solubility vary with different sources of literature and contribute uncertainties in the model predictions. The use of loamy sand soil characteristics ensures that worst case contaminant migration predictions will be achieved relative to most other soil types.

Soil characteristics may differ from those of the loamy sand type used in the model. RI data indicate that soil at the site is relatively homogeneous in physical characteristics.

IV. CONTAMINANT LOADING SENSITIVITY ANALYSIS

The models were used to simulate a scenario whereby the total mass of TCE and TCA in waste forge compound at the two sites was allowed to migrate to the groundwater table. These additional scenarios utilized analytical data for waste samples, as compared with the data for affected soil used in the previously described model simulations. The objective was to assess the variation in predicted groundwater concentration with a change in source area contaminant concentration assumptions, and to determine the potential effects of biodegradation on the model predictions. Maximum TCA and TCE concentrations exhibited by RI waste forge compound samples from the EDS and Melby Road sites were assumed to be representative of the entire area of waste and affected soil at the two sites for modelling purposes. The depth of waste was assumed to be 8 and 10 feet for the Melby Road site and EDS, respectively. The models were run with and without biodegradation and all other model input parameters were the same as those used in the previously described scenarios. The results are presented in Table 6.

This simulation is useful in assessing the sensitivity of mass loading terms and biodegradation on model predictions. The limited nature of the model input database (e.g., the geochemical behavior of forge compound; the importance of biodegradation in contaminant reduction) does not, however, permit a technically justifiable comparison of model results with current groundwater concentrations.

V. MODEL PREDICTIONS

The maximum groundwater concentrations predicted by the model are shown in Table 7. The model predictions indicate that the affected soil beneath and around waste forge compound and other waste can be left in place at EDS and the Melby Road site without resulting in an exceedance of State groundwater enforcement standards or PALs.

The maximum predicted concentrations in groundwater occurred within two years after the start of the simulation (i.e., the point at which waste is excavated) for the EDS, and within thirty years after the start of the Scenario A simulation for the Melby Road site, as indicated in Table 8. For the second Melby Road scenario in which a twenty foot column of affected soil was present, the maximum predicted concentration in groundwater occurred within seven years after the start of the simulation. Plots of predicted groundwater concentration versus time are contained in Attachment A. Documentation of the model results is contained in Attachment B.

Chapter 160.23 of the Wisconsin Groundwater Act states that an exceedance of a PAL should trigger action designed to regain and maintain compliance with the PAL, and ensure that the enforcement standard is not attained or exceeded. Post-remediation groundwater monitoring could be implemented to ensure that PALs are not exceeded after the waste forge compound is excavated, and to determine if any further action is warranted.

Concentrations of TCE and TCA in affected soil were compared with action levels representing 10^{-6} excess lifetime cancer risk to assess potential health risks posed by the affected soil if left in place after waste excavation. Concentrations of TCE and TCA in affected surface soil were assumed to be those used in the model simulations. The TCE and TCA health risk-based action levels used for this comparison were obtained from USEPA's July 1990 proposed RCRA corrective action rule (55 FR 145). Based on these data, affected soil which is left in place should not pose a health risk through principal (direct contact and ingestion) exposure routes.

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TABLE 1

SOURCE AREA ASSUMPTIONS

	Source Thickness (ft)[1]	Concentration in Soil (ppb)	
		TCE	TCA
Melby Road			
Scenario A	10	5	190
Scenario B	20	5	190
EDS	7	38	0

NOTES:

1. Depth of affected soil.

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TABLE 2

SUMMARY OF SITE-SPECIFIC PARAMETERS

Parameter	Melby Road		East Disposal Site
Area of Contamination (ft^2)	240,000		4,200
Residual Soil Concentration (ppb)	Scenario A (0-10 feet)	Scenario B (0-20 feet)	(0-7 feet)
1,1,1-TCA	190	190	0
TCE	5	5	38
Depth to Groundwater (ft) (after excavation)	60	60	13
Organic Carbon Content (%)	2.5	2.5	2.6
Soil Type	Loamy Sand	Loamy Sand	Loamy Sand
Soil Porosity	0.25	0.25	0.25
Aquifer Characteristics			
Type	Sand/Gravel	Sand/Gravel	Sandstone
Hydraulic Conductivity (ft/day)	270	270	6
Hydraulic Gradient	0.001	0.001	0.02
Soil Porosity	0.25	0.25	0.25
Longitudal Dispersivity (m)	50	50	50
Lateral Dispersivity (m)	5	5	5
Vertical Dispersivity (m)	5	5	5

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TABLE 3

SUMMARY OF INPUT PARAMETERS FOR SESOIL MODELS

Parameters	Melby Road		East Disposal Site
Source Area (cm^2)	222,967,296		3,901,927.68
Distance to water table (cm) (after excavation)	1,828.8		396.24
Mass Loading (ug/cm^2)*	Scenario A (0-10 feet)	Scenario B (0-20 feet)	(0-7 feet)
1,1,1-TCA	76.44	152.88	0
TCE	2.01	4.02	10.7
Soil Input Data			
Soil Density (g/cm^3)	1.32		1.32
Soil pH	7		7
Intrinsic permeability (cm^2)	5.0E-08		5.0E-08
Porosity	0.25		0.25
Soil Disconnected Index	3.9		3.9
Organic Carbon Content (%)	2.5		2.5
Clay Content (%)	1		1
Cation Ion Exchange Capacity	5		5
Freundlich Exponent	1		1
Chemical Input Data			
Solubility (ug/ml)			
1,1,1-TCA	1,034.91		1,034.91
TCE	1,100		1,100
Henry's Law Constant (m^3-ATM/mole)			
1,1,1-TCA	1.72E-02		1.72E-02
TCE	1.03E-02		1.03E-02
Adsorption Coefficient on Organic Carbon (Koc)			
1,1,1-TCA	152		152
TCE	126		126

NOTES:

* Estimated based on depth of soil sublayer, soil density and contaminant concentration.

Mass loading (ug/cm^2) = concentration (ug/g) x soil density (g/cm^3) x thickness of soil sublayer (cm).

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TABLE 4

SUMMARY OF INPUT PARAMETERS FOR AT123D MODELS

Parameter	Melby Road	East Disposal Site
Porosity	0.25	0.25
Hydraulic Conductivity (m/hour)	3.429	0.0762
Hydraulic Gradient	0.001	0.02
Longitudal Despersivity (m)	50	50
Lateral Despersivity (m)	5	5
Vertical Despersivity (m)	5	5
Bulk Density of Soil (kg/m^3)	1.32E+03	1.32E+03
Accuracy Tolerance for Reaching Steady State	1.00E-02	1.00E-02
Density of Water (kg/m^3)	1.00E+03	1.00E+03
Time Interval Size for the Desired Solution (hour)	730	730
Discharge Time (hour)	175,200	131,400
Waste Release Rate (kg/hour)	from SESOIL	from SESOIL

NOTES:

All other chemical and soil parameters needed for AT123D and not listed were assumed to be 0.0.

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TABLE 5

SUMMARY OF POLLUTANT LOADING OPTIONS FOR SESOIL MODELS

Options	Applied in the Simulation
Ligand Complexing	No
Volatilization	Yes
Surface Runoff	No
Pollutant in the Rain	No
Other Mechanisms	No
Chemical Specific Options	
Hydrolysis	No
Biodegradation in Soil	No

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TABLE 6

RESULTS OF AT123D MODEL SIMULATION FOR SENSITIVITY ANALYSIS

Scenario	Melby Road		East Disposal Site	
	TCE	TCA	TCE	TCA
Source Area Concentration (ppb)	2	1,500	18,000	140,000
Source Area Depth (ft)	8		10	
Without Biodegradation				
Maximum Concentration at Water Table (ppb)				
1,1,1-TCA	106		2,320	
TCE	0.167		371	
With Biodegradation				
Maximum Concentration at Water Table (ppb)				
1,1,1-TCA	2.75E-08		5.67E-09	
TCE	2.76E-08		1.99E-04	

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TABLE 7

COMPARISON OF MODEL PREDICTIONS
WITH GROUNDWATER STANDARDS

	Wisconsin Groundwater Standards (ppb)		Predicted Maximum Concentration in Groundwater (ppb)		
			EDS	Melby Road	
	ES[1]	PAL[2]	0-7 ft. source depth	0-10 ft. source depth	0-20 ft. source depth
TCE	5	0.18	0.087	2.58E-04	0.09
TCA	200	40	0	1.52E-04	1.66

NOTES:

1. ES = Enforcement Standard
2. PAL = Preventative Action Level

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TABLE 8

RESULTS OF AT123D MODEL SIMULATION

Year of Simulation	Maximum Groundwater Concentration (ppb)				
	Melby Road				East Disposal Site
	Scenario A (Residual at 0-10')		Scenario B (Residual at 0-20')		(Residual at 0-7')
	1,1,1-TCA	TCE	1,1,1-TCA	TCE	TCE
1					8.70E-02
2					2.38E-02
3					5.86E-03
4				9.96E-02	2.61E-03
5			1.08E+00	9.87E-02	1.68E-03
6			1.66E+00	8.13E-02	1.13E-03
7			1.37E+00	6.40E-02	8.90E-04
8			1.05E+00	4.96E-02	6.84E-04
9			7.85E-01	3.80E-02	5.70E-04
10			5.77E-01	2.89E-02	4.56E-04
11			4.21E-01	2.20E-02	
12			3.05E-01	1.66E-02	
13			2.21E-01	1.26E-02	
14			1.60E-01	9.52E-03	
15			1.15E-01	7.20E-03	
16			8.31E-02	5.45E-03	
17			5.99E-02	4.12E-03	
18			4.32E-02	3.12E-03	
19			3.12E-02	2.35E-03	
20			2.25E-02	1.78E-03	
21					
22		2.23E-05			
23		2.58E-04			

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Table 8 Continued . . .

Year of Simulation	Maximum Groundwater Concentration (ppb)				
	Melby Road				East Disposal Site
	Scenario A (Residual at 0-10')		Scenario B (Residual at 0-20')		(Residual at 0-7')
	1,1,1-TCA	TCE	1,1,1-TCA	TCE	TCE
24		2.36E-04			
25		1.91E-04			
26		1.50E-04			
27		1.15E-04			
28	1.30E-04	8.77E-05			
29	1.52E-04	6.60E-05			
30	1.23E-04	4.94E-05			
31	9.32E-05	3.69E-05			
32	6.89E-05	2.74E-05			
33	5.00E-05	2.03E-05			
34	3.57E-05	1.59E-05			
35	2.55E-05	1.30E-05			

ATTACHMENT A

PREDICTED MAXIMUM CONCENTRATIONS VERSUS TIME

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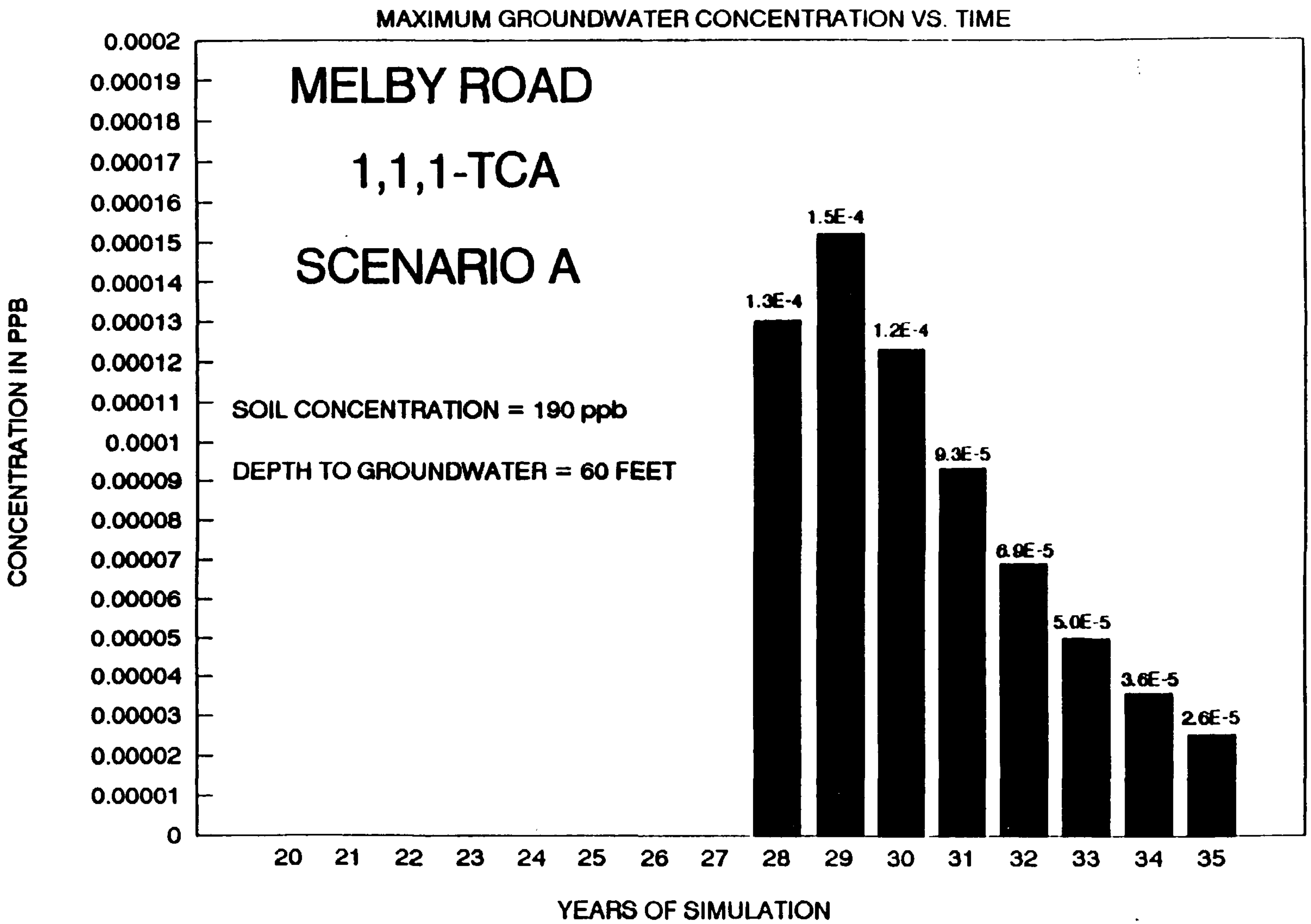

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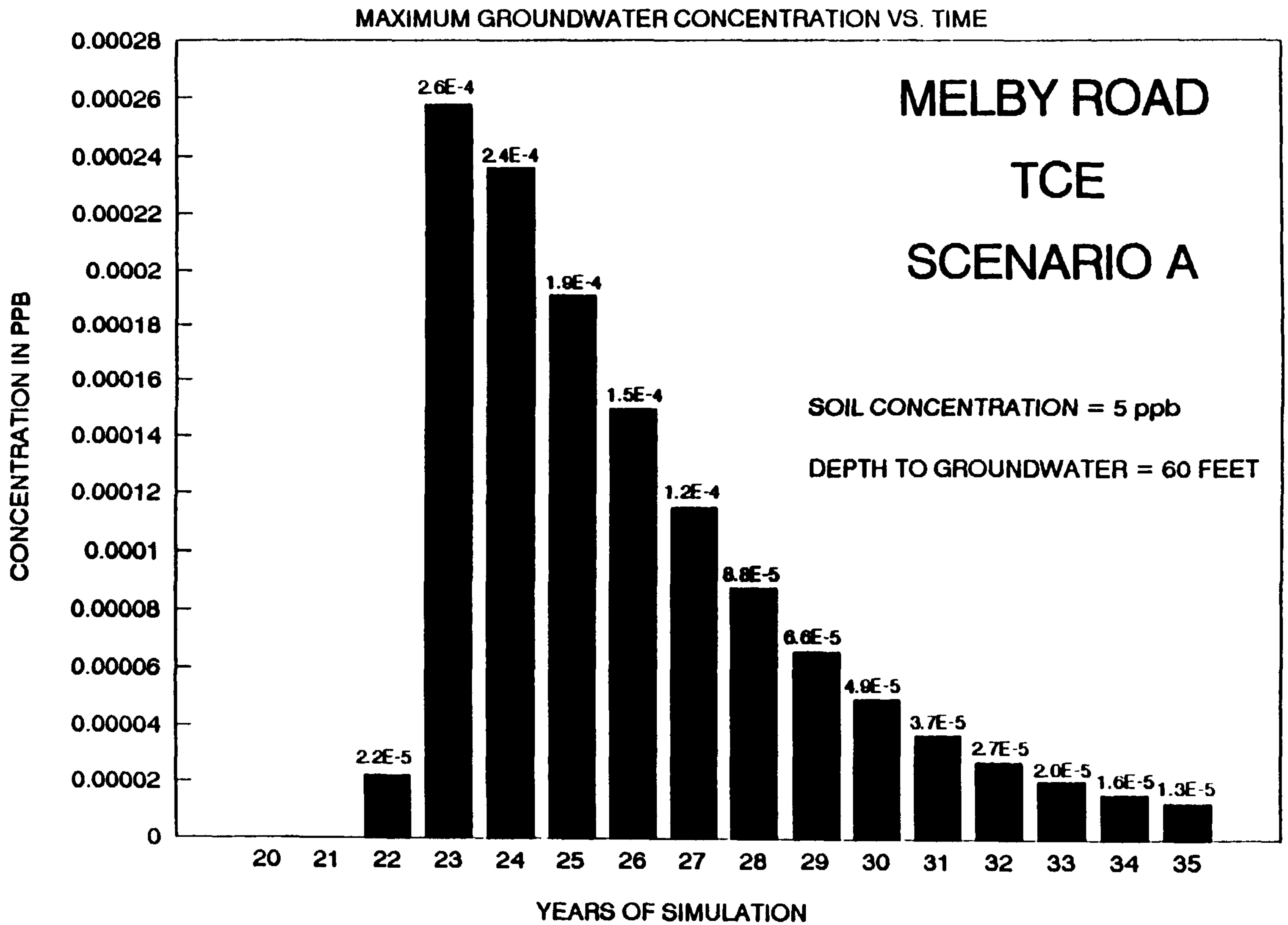

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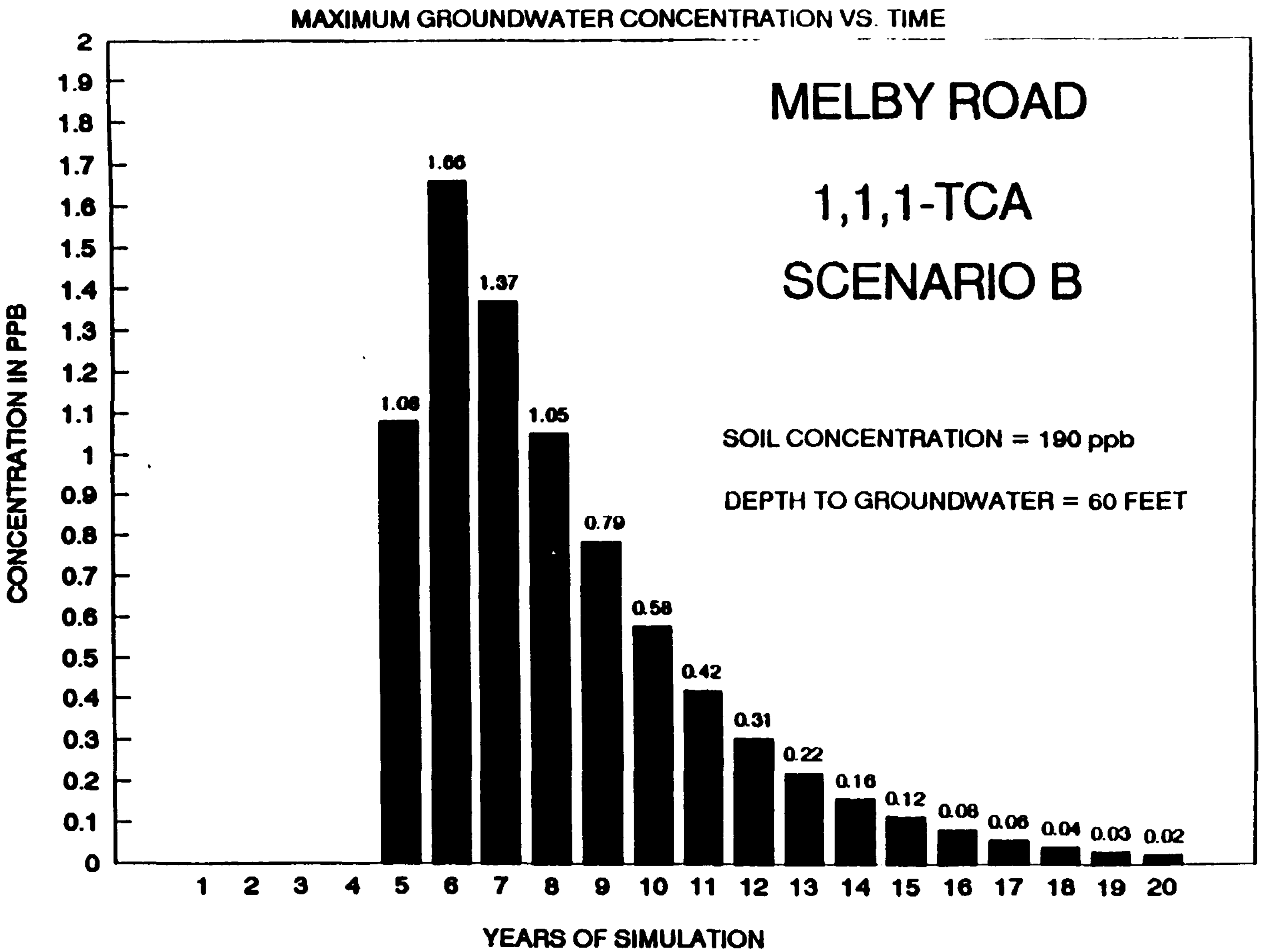

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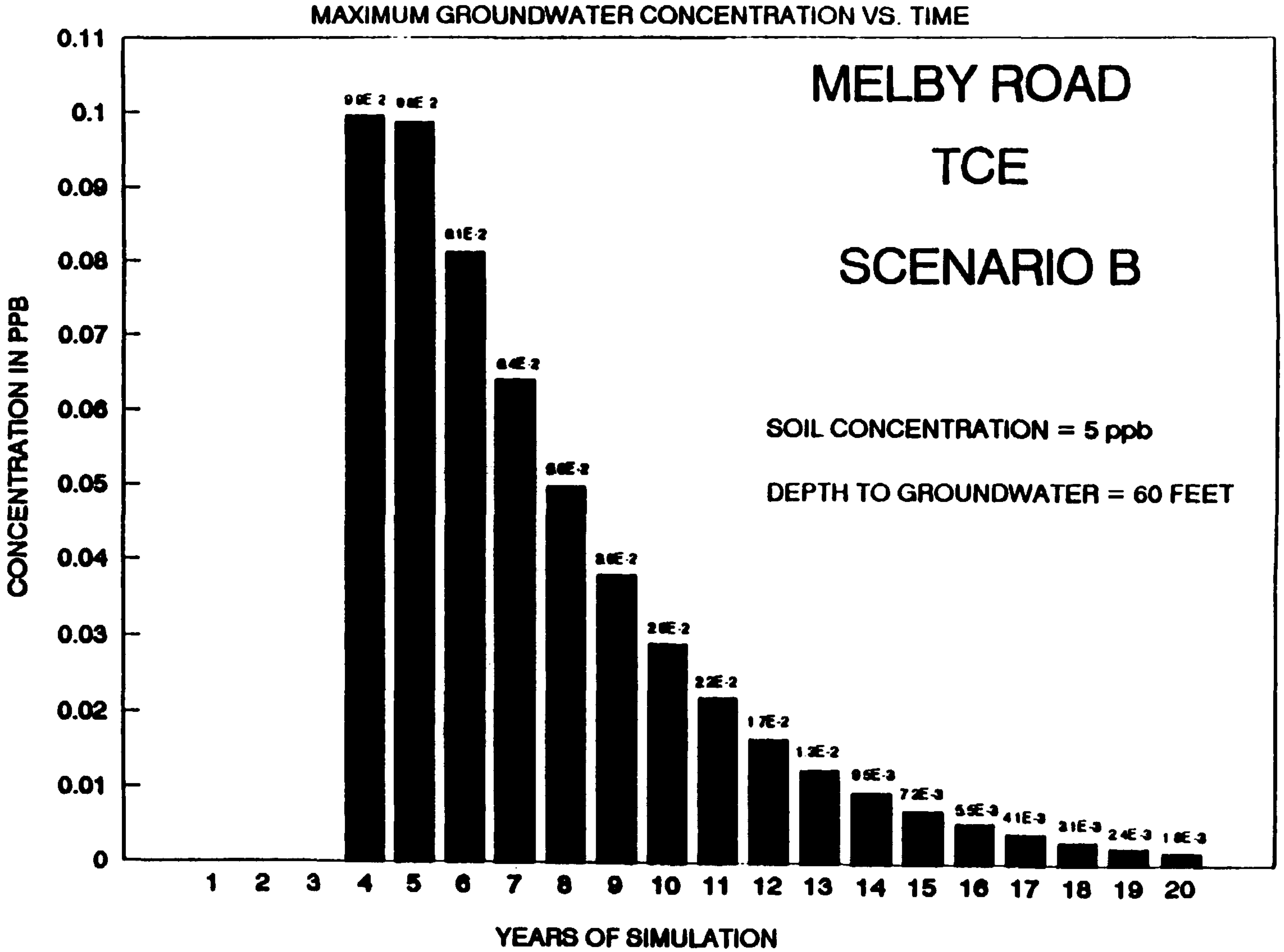

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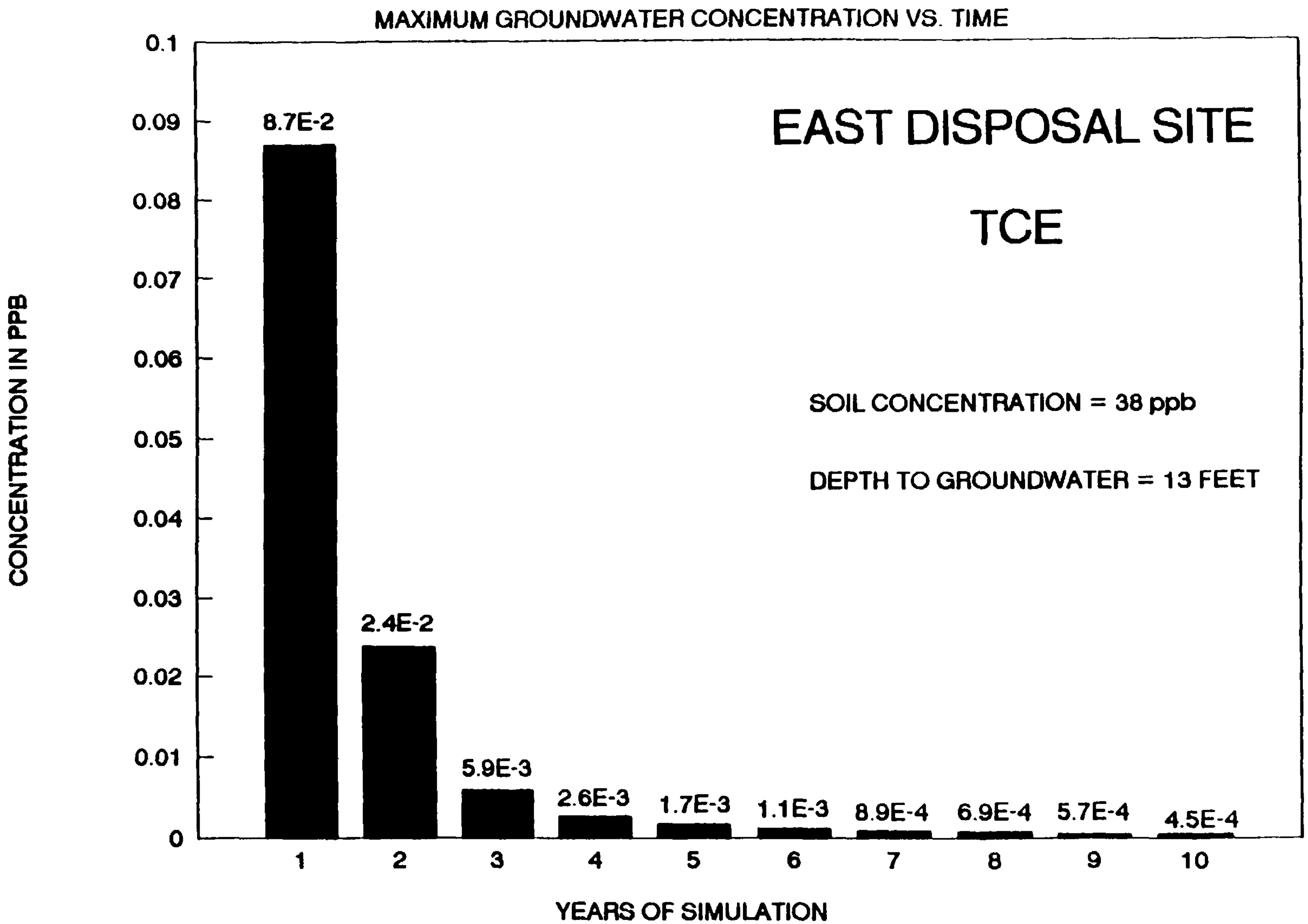

ATTACHMENT B

MODEL SIMULATION RESULTS

EAST DISPOSAL (TCE) (0-7 FEET)

```
NO. OF POINTS IN X-DIRECTION .......................   15
NO. OF POINTS IN Y-DIRECTION .......................    9
NO. OF POINTS IN Z-DIRECTION .......................    1
NO. OF ROOTS: NO. OF SERIES TERMS ..................  400
NO. OF BEGINNING TIME STEP .........................   13
NO. OF ENDING TIME STEP ............................  241
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION ....   12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE    1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE ....  480
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT ....    1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD     2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...  0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...  0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ......... -0.6096E+01
END POINT OF X-SOURCE LOCATION (METERS) ...........  0.6096E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ......... -0.1584E+02
END POINT OF Y-SOURCE LOCATION (METERS) ...........  0.1584E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS) .........  0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ...........  0.0000E+00

POROSITY ..........................................  0.2500E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) ...............  0.7620E-01
HYDRAULIC GRADIENT ................................  0.2000E-01
LONGITIDUNAL DESPERSIVITY (METER) .................  0.5000E+02
LATERAL DISPERSIVITY (METER) ......................  0.5000E+01
VERTICAL DISPERSIVITY (METER) .....................  0.5000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) ............  0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..  0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)   0.0000E+00
DECAY CONSTANT (PER HOUR) .........................  0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3) ................  0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE ......  0.1000E-01
DENSITY OF WATER (KG/M**3) ........................  0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..  0.7300E+03
DISCHARGE TIME (HR) ...............................  0.3504E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .  0.0000E+00
```

LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.700E-07
0.301E-06	0.243E-06	0.122E-06	0.745E-07	0.477E-07	0.363E-07	0.255E-07	0.473E-07	0.576E-07	0.569E-07
0.674E-07	0.499E-07	0.333E-07	0.270E-07	0.136E-07	0.830E-08	0.531E-08	0.404E-08	0.284E-08	0.527E-08
0.641E-08	0.633E-08	0.751E-08	0.556E-08	0.371E-08	0.300E-08	0.151E-08	0.923E-09	0.591E-09	0.449E-09
0.316E-09	0.587E-09	0.714E-09	0.705E-09	0.836E-09	0.619E-09	0.413E-09	0.334E-09	0.168E-09	0.103E-09
0.658E-10	0.500E-10	0.352E-10	0.653E-10	0.794E-10	0.784E-10	0.929E-10	0.688E-10	0.460E-10	0.372E-10
0.187E-10	0.114E-10	0.733E-11	0.558E-11	0.390E-11	0.725E-11	0.883E-11	0.877E-11	0.102E-10	0.759E-11
0.513E-11	0.411E-11	0.200E-11	0.119E-11	0.769E-12	0.589E-12	0.421E-12	0.847E-12	0.102E-11	0.111E-11
0.126E-11	0.107E-11	0.812E-12	0.593E-12	0.353E-12	0.252E-12	0.162E-12	0.135E-12	0.106E-12	0.237E-12
0.338E-12	0.395E-12	0.558E-12	0.490E-12	0.394E-12	0.360E-12	0.219E-12	0.151E-12	0.108E-12	0.984E-13
0.832E-13	0.187E-12	0.266E-12	0.310E-12	0.439E-12	0.385E-12	0.310E-12	0.277E-12	0.168E-12	0.126E-12
0.886E-13	0.805E-13	0.680E-13	0.153E-12	0.217E-12	0.254E-12	0.359E-12	0.315E-12	0.253E-12	0.249E-12
0.151E-12	0.101E-12	0.788E-13	0.715E-13	0.605E-13	0.136E-12	0.193E-12	0.225E-12	0.319E-12	0.280E-12
0.225E-12	0.221E-12	0.135E-12	0.883E-13	0.689E-13	0.626E-13	0.529E-13	0.119E-12	0.169E-12	0.197E-12
0.279E-12	0.245E-12	[illegible].197E-12	0.194E-12	0.118E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.[illegible]15E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.[illegible]E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12
0.101E-12	0.757E-13	0.[illegible]E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12
0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12
0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12
0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12
0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12
0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12
0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12
0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12
0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12
0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12
0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12
0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12

0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12
0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12
0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13	0.454E-13	0.102E-12
0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13	0.591E-13	0.537E-13
0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12	0.101E-12	0.757E-13
0.591E-13	0.537E-13	0.454E-13	0.102E-12	0.145E-12	0.169E-12	0.239E-12	0.210E-12	0.169E-12	0.166E-12

RETARDATION FACTOR .... 0.1000E+01
RETARDED DARCY VELOCITY (M/HR) 0.6096E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.3048E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.3048E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.3048E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.818E-14	0.532E-13	0.217E-12	0.558E-12	0.901E-12	0.915E-12	0.585E-12
50.	0.000E+00	0.000E+00	0.000E+00	0.897E-10	0.617E-09	0.271E-08	0.744E-08	0.123E-07	0.122E-07	0.730E-08
25.	0.000E+00	0.000E+00	0.000E+00	0.166E-07	0.152E-06	0.104E-05	0.481E-05	0.101E-04	0.785E-05	0.277E-05
0.	0.000E+00	0.000E+00	0.000E+00	0.723E-07	0.743E-06	0.652E-05	0.384E-04	0.870E-04	0.626E-04	0.174E-04
-25.	0.000E+00	0.000E+00	0.000E+00	0.166E-07	0.152E-06	0.104E-05	0.481E-05	0.101E-04	0.785E-05	0.277E-05
-50.	0.000E+00	0.000E+00	0.000E+00	0.897E-10	0.617E-09	0.271E-08	0.744E-08	0.123E-07	0.122E-07	0.730E-08
-75.	0.000E+00	0.000E+00	0.000E+00	0.818E-14	0.532E-13	0.217E-12	0.558E-12	0.901E-12	0.915E-12	0.585E-12
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.235E-12	0.594E-13	0.217E-17	0.000E+00	0.000E+00
50.	0.272E-08	0.651E-09	0.226E-13	0.000E+00	0.000E+00
25.	0.667E-06	0.120E-06	0.311E-11	0.000E+00	0.000E+00
0.	0.326E-05	0.523E-06	0.121E-10	0.000E+00	0.000E+00
-25.	0.667E-06	0.120E-06	0.311E-11	0.000E+00	0.000E+00
-50.	0.272E-08	0.651E-09	0.226E-13	0.000E+00	0.000E+00
-75.	0.235E-12	0.594E-13	0.217E-17	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.822E-13	0.127E-10	0.405E-09	0.746E-09	0.124E-08	0.186E-08	0.252E-08	0.307E-08	0.337E-08
75.	0.000E+00	0.196E-11	0.324E-09	0.110E-07	0.206E-07	0.347E-07	0.524E-07	0.710E-07	0.863E-07	0.940E-07
50.	0.000E+00	0.189E-10	0.333E-08	0.126E-06	0.244E-06	0.425E-06	0.660E-06	0.904E-06	0.109E-05	0.115E-05
25.	0.000E+00	0.733E-10	0.136E-07	0.617E-06	0.134E-05	0.271E-05	0.498E-05	0.745E-05	0.820E-05	0.735E-05
0.	0.000E+00	0.115E-09	0.218E-07	0.111E-05	0.262E-05	0.611E-05	0.140E-04	0.238E-04	0.230E-04	0.165E-04
-25.	0.000E+00	0.733E-10	0.136E-07	0.617E-06	0.134E-05	0.271E-05	0.498E-05	0.745E-05	0.820E-05	0.735E-05
-50.	0.000E+00	0.189E-10	0.333E-08	0.126E-06	0.244E-06	0.425E-06	0.660E-06	0.904E-06	0.109E-05	0.115E-05
-75.	0.000E+00	0.196E-11	0.324E-09	0.110E-07	0.206E-07	0.347E-07	0.524E-07	0.710E-07	0.863E-07	0.940E-07
-100.	0.000E+00	0.822E-13	0.127E-10	0.405E-09	0.746E-09	0.124E-08	0.186E-08	0.252E-08	0.307E-08	0.337E-08

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.333E-08	0.298E-08	0.687E-09	0.330E-10	0.352E-12
75.	0.921E-07	0.811E-07	0.175E-07	0.787E-09	0.787E-11
50.	0.109E-05	0.925E-06	0.180E-06	0.758E-08	0.720E-10
25.	0.598E-05	0.454E-05	0.736E-06	0.294E-07	0.270E-09
0.	0.117E-04	0.814E-05	0.118E-05	0.462E-07	0.418E-09
-25.	0.598E-05	0.454E-05	0.736E-06	0.294E-07	0.270E-09
-50.	0.109E-05	0.925E-06	0.180E-06	0.758E-08	0.720E-10
-75.	0.921E-07	0.811E-07	0.175E-07	0.787E-09	0.787E-11
-100.	0.333E-08	0.298E-08	0.687E-09	0.330E-10	0.352E-12

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.338E-12	0.208E-10	0.547E-09	0.598E-08	0.943E-08	0.140E-07	0.197E-07	0.260E-07	0.325E-07	0.381E-07
75.	0.208E-11	0.132E-09	0.365E-08	0.425E-07	0.680E-07	0.102E-06	0.144E-06	0.191E-06	0.238E-06	0.277E-06
50.	0.765E-11	0.503E-09	0.148E-07	0.188E-06	0.306E-06	0.468E-06	0.668E-06	0.889E-06	0.110E-05	0.127E-05
25.	0.167E-10	0.113E-08	0.352E-07	0.491E-06	0.833E-06	0.134E-05	0.203E-05	0.278E-05	0.334E-05	0.363E-05
0.	0.218E-10	0.148E-08	0.473E-07	0.695E-06	0.122E-05	0.209E-05	0.356E-05	0.531E-05	0.586E-05	0.566E-05
-25.	0.167E-10	0.113E-08	0.352E-07	0.491E-06	0.833E-06	0.134E-05	0.203E-05	0.278E-05	0.334E-05	0.363E-05
-50.	0.765E-11	0.503E-09	0.148E-07	0.188E-06	0.306E-06	0.468E-06	0.668E-06	0.889E-06	0.110E-05	0.127E-05
-75.	0.208E-11	0.132E-09	0.365E-08	0.425E-07	0.680E-07	0.102E-06	0.144E-06	0.191E-06	0.238E-06	0.277E-06
-100.	0.338E-12	0.208E-10	0.547E-09	0.598E-08	0.943E-08	0.140E-07	0.197E-07	0.260E-07	0.325E-07	0.381E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.422E-07	0.441E-07	0.297E-07	0.835E-08	0.100E-08
75.	0.304E-06	0.313E-06	0.199E-06	0.530E-07	0.617E-08
50.	0.137E-05	0.138E-05	0.804E-06	0.201E-06	0.227E-07
25.	0.372E-05	0.362E-05	0.191E-05	0.453E-06	0.496E-07
0.	0.544E-05	0.512E-05	0.257E-05	0.595E-06	0.644E-07
-25.	0.372E-05	0.362E-05	0.191E-05	0.453E-06	0.496E-07
-50.	0.137E-05	0.138E-05	0.804E-06	0.201E-06	0.227E-07
-75.	0.304E-06	0.313E-06	0.199E-06	0.530E-07	0.617E-08
-100.	0.422E-07	0.441E-07	0.297E-07	0.835E-08	0.100E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.561E-11	0.136E-09	0.181E-08	0.131E-07	0.194E-07	0.276E-07	0.377E-07	0.494E-07	0.621E-07	0.749E-07
75.	0.205E-10	0.509E-09	0.703E-08	0.523E-07	0.781E-07	0.112E-06	0.153E-06	0.201E-06	0.252E-06	0.303E-06
50.	0.519E-10	0.133E-08	0.190E-07	0.147E-06	0.221E-06	0.318E-06	0.438E-06	0.575E-06	0.722E-06	0.864E-06
25.	0.911E-10	0.237E-08	0.349E-07	0.282E-06	0.430E-06	0.630E-06	0.882E-06	0.117E-05	0.145E-05	0.171E-05
0.	0.110E-09	0.288E-08	0.429E-07	0.354E-06	0.547E-06	0.818E-06	0.120E-05	0.164E-05	0.197E-05	0.222E-05

-25.	0.911E-10	0.237E-08	0.349E-07	0.282E-06	0.430E-06	0.630E-06	0.882E-06	0.117E-05	0.145E-05	0.171E-05
-50.	0.519E-10	0.133E-08	0.190E-07	0.147E-06	0.221E-06	0.318E-06	0.438E-06	0.575E-06	0.722E-06	0.864E-06
-75.	0.205E-10	0.509E-09	0.703E-08	0.523E-07	0.781E-07	0.112E-06	0.153E-06	0.201E-06	0.252E-06	0.303E-06
-100.	0.561E-11	0.136E-09	0.181E-08	0.131E-07	0.194E-07	0.276E-07	0.377E-07	0.494E-07	0.621E-07	0.749E-07

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.867E-07	0.964E-07	0.987E-07	0.545E-07	0.166E-07
75.	0.349E-06	0.386E-06	0.383E-06	0.204E-06	0.607E-07
50.	0.989E-06	0.108E-05	0.103E-05	0.532E-06	0.154E-06
25.	0.192E-05	0.208E-05	0.190E-05	0.952E-06	0.270E-06
0.	0.245E-05	0.261E-05	0.233E-05	0.116E-05	0.326E-06
-25.	0.192E-05	0.208E-05	0.190E-05	0.952E-06	0.270E-06
-50.	0.989E-06	0.108E-05	0.103E-05	0.532E-06	0.154E-06
-75.	0.349E-06	0.386E-06	0.383E-06	0.204E-06	0.607E-07
-100.	0.867E-07	0.964E-07	0.987E-07	0.545E-07	0.166E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.207E-10	0.300E-09	0.276E-08	0.157E-07	0.225E-07	0.313E-07	0.421E-07	0.549E-07	0.694E-07	0.850E-07
75.	0.565E-10	0.835E-09	0.782E-08	0.453E-07	0.651E-07	0.905E-07	0.122E-06	0.159E-06	0.201E-06	0.246E-06
50.	0.117E-09	0.175E-08	0.167E-07	0.984E-07	0.142E-06	0.198E-06	0.267E-06	0.349E-06	0.440E-06	0.537E-06
25.	0.180E-09	0.273E-08	0.264E-07	0.159E-06	0.230E-06	0.322E-06	0.437E-06	0.572E-06	0.721E-06	0.875E-06
0.	0.209E-09	0.318E-08	0.309E-07	0.187E-06	0.272E-06	0.383E-06	0.526E-06	0.695E-06	0.867E-06	0.104E-05
-25.	0.180E-09	0.273E-08	0.264E-07	0.159E-06	0.230E-06	0.322E-06	0.437E-06	0.572E-06	0.721E-06	0.875E-06
-50.	0.117E-09	0.175E-08	0.167E-07	0.984E-07	0.142E-06	0.198E-06	0.267E-06	0.349E-06	0.440E-06	0.537E-06
-75.	0.565E-10	0.835E-09	0.782E-08	0.453E-07	0.651E-07	0.905E-07	0.122E-06	0.159E-06	0.201E-06	0.246E-06
-100.	0.207E-10	0.300E-09	0.276E-08	0.157E-07	0.225E-07	0.313E-07	0.421E-07	0.549E-07	0.694E-07	0.850E-07

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.101E-06	0.116E-06	0.150E-06	0.121E-06	0.611E-07
75.	0.291E-06	0.335E-06	0.426E-06	0.336E-06	0.167E-06
50.	0.635E-06	0.726E-06	0.908E-06	0.703E-06	0.345E-06
25.	0.103E-05	0.117E-05	0.144E-05	0.110E-05	0.534E-06
0.	0.122E-05	0.138E-05	0.168E-05	0.128E-05	0.617E-06
-25.	0.103E-05	0.117E-05	0.144E-05	0.110E-05	0.534E-06
-50.	0.635E-06	0.726E-06	0.908E-06	0.703E-06	0.345E-06
-75.	0.291E-06	0.335E-06	0.426E-06	0.336E-06	0.167E-06
-100.	0.101E-06	0.116E-06	0.150E-06	0.121E-06	0.611E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.393E-10	0.414E-09	0.300E-08	0.148E-07	0.207E-07	0.282E-07	0.376E-07	0.489E-07	0.620E-07	0.767E-07
75.	0.892E-10	0.949E-09	0.694E-08	0.344E-07	0.483E-07	0.661E-07	0.881E-07	0.115E-06	0.145E-06	0.180E-06
50.	0.161E-09	0.172E-08	0.127E-07	0.637E-07	0.895E-07	0.122E-06	0.163E-06	0.213E-06	0.269E-06	0.333E-06
25.	0.229E-09	0.247E-08	0.184E-07	0.926E-07	0.130E-06	0.179E-06	0.239E-06	0.311E-06	0.394E-06	0.485E-06
0.	0.258E-09	0.279E-08	0.208E-07	0.105E-06	0.148E-06	0.203E-06	0.272E-06	0.355E-06	0.449E-06	0.552E-06
-25.	0.229E-09	0.247E-08	0.184E-07	0.926E-07	0.130E-06	0.179E-06	0.239E-06	0.311E-06	0.394E-06	0.485E-06
-50.	0.161E-09	0.172E-08	0.127E-07	0.637E-07	0.895E-07	0.122E-06	0.163E-06	0.213E-06	0.269E-06	0.333E-06
-75.	0.892E-10	0.949E-09	0.694E-08	0.344E-07	0.483E-07	0.661E-07	0.881E-07	0.115E-06	0.145E-06	0.180E-06
-100.	0.393E-10	0.414E-09	0.300E-08	0.148E-07	0.207E-07	0.282E-07	0.376E-07	0.489E-07	0.620E-07	0.767E-07

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.925E-07	0.109E-06	0.163E-06	0.167E-06	0.117E-06
75.	0.216E-06	0.254E-06	0.378E-06	0.382E-06	0.265E-06
50.	0.401E-06	0.470E-06	0.694E-06	0.694E-06	0.477E-06
25.	0.583E-06	0.683E-06	0.100E-05	0.995E-06	0.679E-06
0.	0.663E-06	0.775E-06	0.113E-05	0.112E-05	0.765E-06
-25.	0.583E-06	0.683E-06	0.100E-05	0.995E-06	0.679E-06
-50.	0.401E-06	0.470E-06	0.694E-06	0.694E-06	0.477E-06
-75.	0.216E-06	0.254E-06	0.378E-06	0.382E-06	0.265E-06

-100.	0.925E-07	0.109E-06	0.163E-06	0.167E-06	0.117E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.532E-10	0.449E-09	0.276E-08	0.123E-07	0.169E-07	0.229E-07	0.303E-07	0.393E-07	0.500E-07	0.622E-07
75.	0.106E-09	0.899E-09	0.556E-08	0.248E-07	0.343E-07	0.464E-07	0.614E-07	0.797E-07	0.101E-06	0.126E-06
50.	0.173E-09	0.148E-08	0.919E-08	0.412E-07	0.570E-07	0.771E-07	0.102E-06	0.133E-06	0.168E-06	0.210E-06
25.	0.233E-09	0.200E-08	0.125E-07	0.561E-07	0.775E-07	0.105E-06	0.139E-06	0.181E-06	0.229E-06	0.285E-06
0.	0.258E-09	0.221E-08	0.138E-07	0.621E-07	0.859E-07	0.116E-06	0.154E-06	0.200E-06	0.255E-06	0.316E-06
-25.	0.233E-09	0.200E-08	0.125E-07	0.561E-07	0.775E-07	0.105E-06	0.139E-06	0.181E-06	0.229E-06	0.285E-06
-50.	0.173E-09	0.148E-08	0.919E-08	0.412E-07	0.570E-07	0.771E-07	0.102E-06	0.133E-06	0.168E-06	0.210E-06
-75.	0.106E-09	0.899E-09	0.556E-08	0.248E-07	0.343E-07	0.464E-07	0.614E-07	0.797E-07	0.101E-06	0.126E-06
-100.	0.532E-10	0.449E-09	0.276E-08	0.123E-07	0.169E-07	0.229E-07	0.303E-07	0.393E-07	0.500E-07	0.622E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.758E-07	0.906E-07	0.150E-06	0.181E-06	0.158E-06
75.	0.154E-06	0.183E-06	0.303E-06	0.362E-06	0.315E-06
50.	0.255E-06	0.304E-06	0.501E-06	0.596E-06	0.516E-06
25.	0.347E-06	0.414E-06	0.679E-06	0.805E-06	0.694E-06
0.	0.385E-06	0.459E-06	0.752E-06	0.890E-06	0.766E-06
-25.	0.347E-06	0.414E-06	0.679E-06	0.805E-06	0.694E-06
-50.	0.255E-06	0.304E-06	0.501E-06	0.596E-06	0.516E-06
-75.	0.154E-06	0.183E-06	0.303E-06	0.362E-06	0.315E-06
-100.	0.758E-07	0.906E-07	0.150E-06	0.181E-06	0.158E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.592E-10	0.425E-09	0.232E-08	0.959E-08	0.131E-07	0.176E-07	0.232E-07	0.300E-07	0.382E-07	0.477E-07
75.	0.107E-09	0.771E-09	0.422E-08	0.175E-07	0.239E-07	0.321E-07	0.423E-07	0.548E-07	0.697E-07	0.872E-07
50.	0.164E-09	0.118E-08	0.649E-08	0.270E-07	0.368E-07	0.495E-07	0.652E-07	0.845E-07	0.107E-06	0.134E-06
25.	0.211E-09	0.153E-08	0.841E-08	0.350E-07	0.478E-07	0.642E-07	0.847E-07	0.110E-06	0.140E-06	0.174E-06
0.	0.230E-09	0.167E-08	0.917E-08	0.382E-07	0.522E-07	0.701E-07	0.925E-07	0.120E-06	0.152E-06	0.190E-06
-25.	0.211E-09	0.153E-08	0.841E-08	0.350E-07	0.478E-07	0.642E-07	0.847E-07	0.110E-06	0.140E-06	0.174E-06
-50.	0.164E-09	0.118E-08	0.649E-08	0.270E-07	0.368E-07	0.495E-07	0.652E-07	0.845E-07	0.107E-06	0.134E-06
-75.	0.107E-09	0.771E-09	0.422E-08	0.175E-07	0.239E-07	0.321E-07	0.423E-07	0.548E-07	0.697E-07	0.872E-07
-100.	0.592E-10	0.425E-09	0.232E-08	0.959E-08	0.131E-07	0.176E-07	0.232E-07	0.300E-07	0.382E-07	0.477E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.587E-07	0.708E-07	0.126E-06	0.171E-06	0.176E-06
75.	0.107E-06	0.129E-06	0.230E-06	0.310E-06	0.318E-06
50.	0.165E-06	0.199E-06	0.354E-06	0.476E-06	0.487E-06
25.	0.214E-06	0.258E-06	0.458E-06	0.615E-06	0.628E-06
0.	0.234E-06	0.282E-06	0.500E-06	0.671E-06	0.684E-06
-25.	0.214E-06	0.258E-06	0.458E-06	0.615E-06	0.628E-06
-50.	0.165E-06	0.199E-06	0.354E-06	0.476E-06	0.487E-06
-75.	0.107E-06	0.129E-06	0.230E-06	0.310E-06	0.318E-06
-100.	0.587E-07	0.708E-07	0.126E-06	0.171E-06	0.176E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.

100.	0.584E-10	0.371E-09	0.185E-08	0.725E-08	0.982E-08	0.131E-07	0.172E-07	0.223E-07	0.284E-07	0.356E-07
75.	0.981E-10	0.624E-09	0.312E-08	0.122E-07	0.166E-07	0.221E-07	0.291E-07	0.376E-07	0.479E-07	0.602E-07
50.	0.142E-09	0.907E-09	0.454E-08	0.178E-07	0.242E-07	0.323E-07	0.424E-07	0.548E-07	0.699E-07	0.877E-07
25.	0.178E-09	0.113E-08	0.569E-08	0.224E-07	0.303E-07	0.405E-07	0.532E-07	0.688E-07	0.877E-07	0.110E-06
0.	0.192E-09	0.122E-08	0.614E-08	0.241E-07	0.327E-07	0.437E-07	0.574E-07	0.743E-07	0.946E-07	0.119E-06
-25.	0.178E-09	0.113E-08	0.569E-08	0.224E-07	0.303E-07	0.405E-07	0.532E-07	0.688E-07	0.877E-07	0.110E-06
-50.	0.142E-09	0.907E-09	0.454E-08	0.178E-07	0.242E-07	0.323E-07	0.424E-07	0.548E-07	0.699E-07	0.877E-07
-75.	0.981E-10	0.624E-09	0.312E-08	0.122E-07	0.166E-07	0.221E-07	0.291E-07	0.376E-07	0.479E-07	0.602E-07
-100.	0.584E-10	0.371E-09	0.185E-08	0.725E-08	0.982E-08	0.131E-07	0.172E-07	0.223E-07	0.284E-07	0.356E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.440E-07	0.535E-07	0.101E-06	0.149E-06	0.174E-06
75.	0.743E-07	0.905E-07	0.170E-06	0.251E-06	0.292E-06
50.	0.108E-06	0.132E-06	0.248E-06	0.365E-06	0.423E-06
25.	0.136E-06	0.165E-06	0.310E-06	0.457E-06	0.529E-06
0.	0.146E-06	0.178E-06	0.335E-06	0.493E-06	0.570E-06
-25.	0.136E-06	0.165E-06	0.310E-06	0.457E-06	0.529E-06
-50.	0.108E-06	0.132E-06	0.248E-06	0.365E-06	0.423E-06
-75.	0.743E-07	0.905E-07	0.170E-06	0.251E-06	0.292E-06
-100.	0.440E-07	0.535E-07	0.101E-06	0.149E-06	0.174E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.533E-10	0.307E-09	0.143E-08	0.537E-08	0.723E-08	0.961E-08	0.126E-07	0.163E-07	0.208E-07	0.261E-07
75.	0.846E-10	0.488E-09	0.228E-08	0.856E-08	0.115E-07	0.153E-07	0.200E-07	0.259E-07	0.330E-07	0.416E-07
50.	0.118E-09	0.680E-09	0.317E-08	0.119E-07	0.161E-07	0.213E-07	0.280E-07	0.362E-07	0.461E-07	0.580E-07
25.	0.144E-09	0.829E-09	0.387E-08	0.146E-07	0.196E-07	0.261E-07	0.342E-07	0.442E-07	0.564E-07	0.709E-07
0.	0.153E-09	0.886E-09	0.414E-08	0.156E-07	0.210E-07	0.279E-07	0.366E-07	0.474E-07	0.604E-07	0.758E-07
-25.	0.144E-09	0.829E-09	0.387E-08	0.146E-07	0.196E-07	0.261E-07	0.342E-07	0.442E-07	0.564E-07	0.709E-07
-50.	0.118E-09	0.680E-09	0.317E-08	0.119E-07	0.161E-07	0.213E-07	0.280E-07	0.362E-07	0.461E-07	0.580E-07
-75.	0.846E-10	0.488E-09	0.228E-08	0.856E-08	0.115E-07	0.153E-07	0.200E-07	0.259E-07	0.330E-07	0.416E-07
-100.	0.533E-10	0.307E-09	0.143E-08	0.537E-08	0.723E-08	0.961E-08	0.126E-07	0.163E-07	0.208E-07	0.261E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.324E-07	0.397E-07	0.780E-07	0.124E-06	0.158E-06
75.	0.516E-07	0.632E-07	0.124E-06	0.197E-06	0.251E-06
50.	0.720E-07	0.882E-07	0.173E-06	0.274E-06	0.350E-06
25.	0.880E-07	0.108E-06	0.211E-06	0.334E-06	0.426E-06
0.	0.941E-07	0.115E-06	0.226E-06	0.357E-06	0.456E-06
-25.	0.880E-07	0.108E-06	0.211E-06	0.334E-06	0.426E-06
-50.	0.720E-07	0.882E-07	0.173E-06	0.274E-06	0.350E-06
-75.	0.516E-07	0.632E-07	0.124E-06	0.197E-06	0.251E-06
-100.	0.324E-07	0.397E-07	0.780E-07	0.124E-06	0.158E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.461E-10	0.246E-09	0.108E-08	0.394E-08	0.528E-08	0.699E-08	0.914E-08	0.118E-07	0.151E-07	0.190E-07
75.	0.699E-10	0.373E-09	0.165E-08	0.598E-08	0.802E-08	0.106E-07	0.139E-07	0.179E-07	0.229E-07	0.288E-07
50.	0.941E-10	0.503E-09	0.222E-08	0.807E-08	0.108E-07	0.143E-07	0.187E-07	0.242E-07	0.308E-07	0.389E-07
25.	0.112E-09	0.601E-09	0.265E-08	0.965E-08	0.129E-07	0.171E-07	0.224E-07	0.289E-07	0.369E-07	0.465E-07
0.	0.119E-09	0.638E-09	0.282E-08	0.103E-07	0.137E-07	0.182E-07	0.238E-07	0.308E-07	0.393E-07	0.494E-07
-25.	0.112E-09	0.601E-09	0.265E-08	0.965E-08	0.129E-07	0.171E-07	0.224E-07	0.289E-07	0.369E-07	0.465E-07
-50.	0.941E-10	0.503E-09	0.222E-08	0.807E-08	0.108E-07	0.143E-07	0.187E-07	0.242E-07	0.308E-07	0.389E-07
-75.	0.699E-10	0.373E-09	0.165E-08	0.598E-08	0.802E-08	0.106E-07	0.139E-07	0.179E-07	0.229E-07	0.288E-07
-100.	0.461E-10	0.246E-09	0.108E-08	0.394E-08	0.528E-08	0.699E-08	0.914E-08	0.118E-07	0.151E-07	0.190E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.237E-07	0.291E-07	0.592E-07	0.992E-07	0.137E-06
75.	0.359E-07	0.442E-07	0.898E-07	0.150E-06	0.208E-06
50.	0.484E-07	0.596E-07	0.121E-06	0.202E-06	0.280E-06

25.	0.580E-07	0.713E-07	0.145E-06	0.242E-06	0.334E-06
0.	0.615E-07	0.757E-07	0.154E-06	0.257E-06	0.355E-06
-25.	0.580E-07	0.713E-07	0.145E-06	0.242E-06	0.334E-06
-50.	0.484E-07	0.596E-07	0.121E-06	0.202E-06	0.280E-06
-75.	0.359E-07	0.442E-07	0.898E-07	0.150E-06	0.208E-06
-100.	0.237E-07	0.291E-07	0.592E-07	0.992E-07	0.137E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.385E-10	0.193E-09	0.812E-09	0.287E-08	0.383E-08	0.506E-08	0.660E-08	0.852E-08	0.109E-07	0.137E-07
75.	0.562E-10	0.281E-09	0.119E-08	0.420E-08	0.560E-08	0.739E-08	0.964E-08	0.124E-07	0.159E-07	0.201E-07
50.	0.735E-10	0.369E-09	0.155E-08	0.550E-08	0.734E-08	0.969E-08	0.126E-07	0.163E-07	0.208E-07	0.263E-07
25.	0.865E-10	0.434E-09	0.183E-08	0.647E-08	0.864E-08	0.114E-07	0.149E-07	0.192E-07	0.246E-07	0.310E-07
0.	0.913E-10	0.458E-09	0.193E-08	0.684E-08	0.913E-08	0.121E-07	0.158E-07	0.204E-07	0.260E-07	0.328E-07
-25.	0.865E-10	0.434E-09	0.183E-08	0.647E-08	0.864E-08	0.114E-07	0.149E-07	0.192E-07	0.246E-07	0.310E-07
-50.	0.735E-10	0.369E-09	0.155E-08	0.550E-08	0.734E-08	0.969E-08	0.126E-07	0.163E-07	0.208E-07	0.263E-07
-75.	0.562E-10	0.281E-09	0.119E-08	0.420E-08	0.560E-08	0.739E-08	0.964E-08	0.124E-07	0.159E-07	0.201E-07
-100.	0.385E-10	0.193E-09	0.812E-09	0.287E-08	0.383E-08	0.506E-08	0.660E-08	0.852E-08	0.109E-07	0.137E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.172E-07	0.212E-07	0.443E-07	0.777E-07	0.114E-06
75.	0.251E-07	0.310E-07	0.647E-07	0.113E-06	0.167E-06
50.	0.329E-07	0.406E-07	0.848E-07	0.149E-06	0.219E-06
25.	0.387E-07	0.478E-07	0.998E-07	0.175E-06	0.257E-06
0.	0.409E-07	0.505E-07	0.105E-06	0.184E-06	0.271E-06
-25.	0.387E-07	0.478E-07	0.998E-07	0.175E-06	0.257E-06
-50.	0.329E-07	0.406E-07	0.848E-07	0.149E-06	0.219E-06
-75.	0.251E-07	0.310E-07	0.647E-07	0.113E-06	0.167E-06
-100.	0.172E-07	0.212E-07	0.443E-07	0.777E-07	0.114E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.312E-10	0.149E-09	0.603E-09	0.209E-08	0.277E-08	0.365E-08	0.476E-08	0.614E-08	0.785E-08	0.993E-08
75.	0.441E-10	0.210E-09	0.853E-09	0.295E-08	0.392E-08	0.517E-08	0.673E-08	0.869E-08	0.111E-07	0.140E-07
50.	0.565E-10	0.269E-09	0.109E-08	0.378E-08	0.503E-08	0.662E-08	0.863E-08	0.111E-07	0.142E-07	0.180E-07
25.	0.655E-10	0.312E-09	0.127E-08	0.439E-08	0.584E-08	0.769E-08	0.100E-07	0.129E-07	0.165E-07	0.209E-07
0.	0.688E-10	0.328E-09	0.133E-08	0.461E-08	0.614E-08	0.809E-08	0.106E-07	0.137E-07	0.174E-07	0.220E-07
-25.	0.655E-10	0.312E-09	0.127E-08	0.439E-08	0.584E-08	0.769E-08	0.100E-07	0.129E-07	0.165E-07	0.209E-07
-50.	0.565E-10	0.269E-09	0.109E-08	0.378E-08	0.503E-08	0.662E-08	0.863E-08	0.111E-07	0.142E-07	0.180E-07
-75.	0.441E-10	0.210E-09	0.853E-09	0.295E-08	0.392E-08	0.517E-08	0.673E-08	0.869E-08	0.111E-07	0.140E-07
-100.	0.312E-10	0.149E-09	0.603E-09	0.209E-08	0.277E-08	0.365E-08	0.476E-08	0.614E-08	0.785E-08	0.993E-08

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.124E-07	0.154E-07	0.329E-07	0.599E-07	0.930E-07
75.	0.176E-07	0.218E-07	0.465E-07	0.847E-07	0.131E-06
50.	0.225E-07	0.279E-07	0.596E-07	0.108E-06	0.168E-06
25.	0.262E-07	0.324E-07	0.692E-07	0.126E-06	0.195E-06
0.	0.275E-07	0.341E-07	0.727E-07	0.132E-06	0.205E-06
-25.	0.262E-07	0.324E-07	0.692E-07	0.126E-06	0.195E-06
-50.	0.225E-07	0.279E-07	0.596E-07	0.108E-06	0.168E-06
-75.	0.176E-07	0.218E-07	0.465E-07	0.847E-07	0.131E-06
-100.	0.124E-07	0.154E-07	0.329E-07	0.599E-07	0.930E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.249E-10	0.113E-09	0.446E-09	0.151E-08	0.201E-08	0.264E-08	0.343E-08	0.443E-08	0.566E-08	0.716E-08
75.	0.343E-10	0.156E-09	0.614E-09	0.208E-08	0.276E-08	0.363E-08	0.472E-08	0.609E-08	0.779E-08	0.986E-08
50.	0.430E-10	0.196E-09	0.771E-09	0.262E-08	0.347E-08	0.456E-08	0.594E-08	0.766E-08	0.979E-08	0.124E-07
25.	0.493E-10	0.225E-09	0.884E-09	0.300E-08	0.398E-08	0.524E-08	0.682E-08	0.880E-08	0.112E-07	0.142E-07
0.	0.516E-10	0.235E-09	0.926E-09	0.314E-08	0.417E-08	0.549E-08	0.718E-08	0.929E-08	0.118E-07	0.149E-07
-25.	0.493E-10	0.225E-09	0.884E-09	0.300E-08	0.398E-08	0.524E-08	0.682E-08	0.880E-08	0.112E-07	0.142E-07
-50.	0.430E-10	0.196E-09	0.771E-09	0.262E-08	0.347E-08	0.456E-08	0.594E-08	0.766E-08	0.979E-08	0.124E-07
-75.	0.343E-10	0.156E-09	0.614E-09	0.208E-08	0.276E-08	0.363E-08	0.472E-08	0.609E-08	0.779E-08	0.986E-08
-100.	0.249E-10	0.113E-09	0.446E-09	0.151E-08	0.201E-08	0.264E-08	0.343E-08	0.443E-08	0.566E-08	0.716E-08

CONTINUE

Y	75.	100.	200.	300.	400.
100.	0.899E-08	0.112E-07	0.243E-07	0.457E-07	0.741E-07
75.	0.124E-07	0.154E-07	0.335E-07	0.629E-07	0.102E-06
50.	0.155E-07	0.193E-07	0.421E-07	0.790E-07	0.128E-06
25.	0.178E-07	0.222E-07	0.482E-07	0.906E-07	0.147E-06
0.	0.187E-07	0.232E-07	0.505E-07	0.948E-07	0.154E-06
-25.	0.178E-07	0.222E-07	0.482E-07	0.906E-07	0.147E-06
-50.	0.155E-07	0.193E-07	0.421E-07	0.790E-07	0.128E-06
-75.	0.124E-07	0.154E-07	0.335E-07	0.629E-07	0.102E-06
-100.	0.899E-08	0.112E-07	0.243E-07	0.457E-07	0.741E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.195E-10	0.858E-10	0.328E-09	0.110E-08	0.145E-08	0.190E-08	0.247E-08	0.319E-08	0.408E-08	0.517E-08
75.	0.263E-10	0.115E-09	0.442E-09	0.147E-08	0.195E-08	0.256E-08	0.333E-08	0.429E-08	0.549E-08	0.695E-08
50.	0.324E-10	0.143E-09	0.546E-09	0.182E-08	0.241E-08	0.316E-08	0.411E-08	0.531E-08	0.678E-08	0.860E-08
25.	0.368E-10	0.162E-09	0.620E-09	0.207E-08	0.274E-08	0.360E-08	0.468E-08	0.604E-08	0.772E-08	0.978E-08
0.	0.384E-10	0.169E-09	0.647E-09	0.216E-08	0.286E-08	0.376E-08	0.492E-08	0.638E-08	0.812E-08	0.102E-07
-25.	0.368E-10	0.162E-09	0.620E-09	0.207E-08	0.274E-08	0.360E-08	0.468E-08	0.604E-08	0.772E-08	0.978E-08
-50.	0.324E-10	0.143E-09	0.546E-09	0.182E-08	0.241E-08	0.316E-08	0.411E-08	0.531E-08	0.678E-08	0.860E-08
-75.	0.263E-10	0.115E-09	0.442E-09	0.147E-08	0.195E-08	0.256E-08	0.333E-08	0.429E-08	0.549E-08	0.695E-08
-100.	0.195E-10	0.858E-10	0.328E-09	0.110E-08	0.145E-08	0.190E-08	0.247E-08	0.319E-08	0.408E-08	0.517E-08

CONTINUE

Y	75.	100.	200.	300.	400.
100.	0.650E-08	0.809E-08	0.179E-07	0.346E-07	0.582E-07
75.	0.874E-08	0.109E-07	0.241E-07	0.465E-07	0.783E-07
50.	0.108E-07	0.135E-07	0.298E-07	0.574E-07	0.967E-07
25.	0.123E-07	0.153E-07	0.338E-07	0.652E-07	0.110E-06
0.	0.128E-07	0.160E-07	0.353E-07	0.680E-07	0.115E-06
-25.	0.123E-07	0.153E-07	0.338E-07	0.652E-07	0.110E-06
-50.	0.108E-07	0.135E-07	0.298E-07	0.574E-07	0.967E-07
-75.	0.874E-08	0.109E-07	0.241E-07	0.465E-07	0.783E-07
-100.	0.650E-08	0.809E-08	0.179E-07	0.346E-07	0.582E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.152E-10	0.645E-10	0.241E-09	0.794E-09	0.105E-08	0.137E-08	0.178E-08	0.230E-08	0.294E-08	0.373E-08
75.	0.201E-10	0.850E-10	0.318E-09	0.105E-08	0.138E-08	0.181E-08	0.235E-08	0.303E-08	0.388E-08	0.492E-08
50.	0.244E-10	0.104E-09	0.387E-09	0.128E-08	0.169E-08	0.221E-08	0.287E-08	0.370E-08	0.473E-08	0.600E-08
25.	0.275E-10	0.117E-09	0.436E-09	0.144E-08	0.190E-08	0.249E-08	0.324E-08	0.418E-08	0.534E-08	0.677E-08
0.	0.286E-10	0.121E-09	0.454E-09	0.150E-08	0.198E-08	0.260E-08	0.341E-08	0.442E-08	0.562E-08	0.707E-08
-25.	0.275E-10	0.117E-09	0.436E-09	0.144E-08	0.190E-08	0.249E-08	0.324E-08	0.418E-08	0.534E-08	0.677E-08
-50.	0.244E-10	0.104E-09	0.387E-09	0.128E-08	0.169E-08	0.221E-08	0.287E-08	0.370E-08	0.473E-08	0.600E-08
-75.	0.201E-10	0.850E-10	0.318E-09	0.105E-08	0.138E-08	0.181E-08	0.235E-08	0.303E-08	0.388E-08	0.492E-08
-100.	0.152E-10	0.645E-10	0.241E-09	0.794E-09	0.105E-08	0.137E-08	0.178E-08	0.230E-08	0.294E-08	0.373E-08

CONTINUE

Y	75.	100.	200.	300.	400.

100.	0.470E-08	0.587E-08	0.132E-07	0.260E-07	0.452E-07
75.	0.619E-08	0.773E-08	0.174E-07	0.343E-07	0.596E-07
50.	0.755E-08	0.943E-08	0.211E-07	0.418E-07	0.726E-07
25.	0.851E-08	0.106E-07	0.238E-07	0.470E-07	0.817E-07
0.	0.887E-08	0.111E-07	0.248E-07	0.489E-07	0.850E-07
-25.	0.851E-08	0.106E-07	0.238E-07	0.470E-07	0.817E-07
-50.	0.755E-08	0.943E-08	0.211E-07	0.418E-07	0.726E-07
-75.	0.619E-08	0.773E-08	0.174E-07	0.343E-07	0.596E-07
-100.	0.470E-08	0.587E-08	0.132E-07	0.260E-07	0.452E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.117E-10	0.483E-10	0.177E-09	0.576E-09	0.759E-09	0.993E-09	0.129E-08	0.166E-08	0.213E-08	0.270E-08
75.	0.151E-10	0.626E-10	0.229E-09	0.746E-09	0.983E-09	0.129E-08	0.167E-08	0.215E-08	0.275E-08	0.350E-08
50.	0.182E-10	0.753E-10	0.276E-09	0.898E-09	0.118E-08	0.155E-08	0.201E-08	0.259E-08	0.332E-08	0.421E-08
25.	0.204E-10	0.841E-10	0.309E-09	0.100E-08	0.133E-08	0.174E-08	0.226E-08	0.292E-08	0.373E-08	0.472E-08
0.	0.211E-10	0.873E-10	0.320E-09	0.104E-08	0.138E-08	0.181E-08	0.238E-08	0.310E-08	0.393E-08	0.493E-08
-25.	0.204E-10	0.841E-10	0.309E-09	0.100E-08	0.133E-08	0.174E-08	0.226E-08	0.292E-08	0.373E-08	0.472E-08
-50.	0.182E-10	0.753E-10	0.276E-09	0.898E-09	0.118E-08	0.155E-08	0.201E-08	0.259E-08	0.332E-08	0.421E-08
-75.	0.151E-10	0.626E-10	0.229E-09	0.746E-09	0.983E-09	0.129E-08	0.167E-08	0.215E-08	0.275E-08	0.350E-08
-100.	0.117E-10	0.483E-10	0.177E-09	0.576E-09	0.759E-09	0.993E-09	0.129E-08	0.166E-08	0.213E-08	0.270E-08

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.340E-08	0.425E-08	0.966E-08	0.195E-07	0.349E-07
75.	0.441E-08	0.551E-08	0.125E-07	0.252E-07	0.452E-07
50.	0.530E-08	0.663E-08	0.151E-07	0.304E-07	0.543E-07
25.	0.594E-08	0.742E-08	0.168E-07	0.339E-07	0.607E-07
0.	0.618E-08	0.771E-08	0.175E-07	0.352E-07	0.630E-07
-25.	0.594E-08	0.742E-08	0.168E-07	0.339E-07	0.607E-07
-50.	0.530E-08	0.663E-08	0.151E-07	0.304E-07	0.543E-07
-75.	0.441E-08	0.551E-08	0.125E-07	0.252E-07	0.452E-07
-100.	0.340E-08	0.425E-08	0.966E-08	0.195E-07	0.349E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.897E-11	0.361E-10	0.130E-09	0.418E-09	0.550E-09	0.718E-09	0.932E-09	0.120E-08	0.154E-08	0.195E-08
75.	0.114E-10	0.461E-10	0.166E-09	0.533E-09	0.702E-09	0.917E-09	0.119E-08	0.153E-08	0.196E-08	0.249E-08
50.	0.136E-10	0.548E-10	0.197E-09	0.635E-09	0.836E-09	0.109E-08	0.142E-08	0.183E-08	0.234E-08	0.297E-08
25.	0.151E-10	0.608E-10	0.219E-09	0.706E-09	0.930E-09	0.122E-08	0.159E-08	0.205E-08	0.261E-08	0.331E-08
0.	0.156E-10	0.630E-10	0.227E-09	0.732E-09	0.966E-09	0.127E-08	0.168E-08	0.219E-08	0.277E-08	0.346E-08
-25.	0.151E-10	0.608E-10	0.219E-09	0.706E-09	0.930E-09	0.122E-08	0.159E-08	0.205E-08	0.261E-08	0.331E-08
-50.	0.136E-10	0.548E-10	0.197E-09	0.635E-09	0.836E-09	0.109E-08	0.142E-08	0.183E-08	0.234E-08	0.297E-08
-75.	0.114E-10	0.461E-10	0.166E-09	0.533E-09	0.702E-09	0.917E-09	0.119E-08	0.153E-08	0.196E-08	0.249E-08
-100.	0.897E-11	0.361E-10	0.130E-09	0.418E-09	0.550E-09	0.718E-09	0.932E-09	0.120E-08	0.154E-08	0.195E-08

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.246E-08	0.309E-08	0.709E-08	0.145E-07	0.267E-07
75.	0.314E-08	0.394E-08	0.904E-08	0.186E-07	0.341E-07
50.	0.374E-08	0.469E-08	0.108E-07	0.221E-07	0.405E-07
25.	0.417E-08	0.522E-08	0.119E-07	0.245E-07	0.450E-07
0.	0.433E-08	0.541E-08	0.124E-07	0.254E-07	0.466E-07
-25.	0.417E-08	0.522E-08	0.119E-07	0.245E-07	0.450E-07
-50.	0.374E-08	0.469E-08	0.108E-07	0.221E-07	0.405E-07
-75.	0.314E-08	0.394E-08	0.904E-08	0.186E-07	0.341E-07
-100.	0.246E-08	0.309E-08	0.709E-08	0.145E-07	0.267E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.684E-11	0.269E-10	0.953E-10	0.304E-09	0.399E-09	0.521E-09	0.675E-09	0.870E-09	0.111E-08	0.142E-08
75.	0.861E-11	0.339E-10	0.120E-09	0.382E-09	0.502E-09	0.656E-09	0.850E-09	0.110E-08	0.140E-08	0.178E-08
50.	0.101E-10	0.399E-10	0.141E-09	0.451E-09	0.593E-09	0.774E-09	0.100E-08	0.129E-08	0.165E-08	0.210E-08
25.	0.112E-10	0.441E-10	0.156E-09	0.499E-09	0.657E-09	0.860E-09	0.112E-08	0.145E-08	0.185E-08	0.234E-08
0.	0.116E-10	0.455E-10	0.161E-09	0.516E-09	0.682E-09	0.899E-09	0.119E-08	0.157E-08	0.197E-08	0.244E-08
-25.	0.112E-10	0.441E-10	0.156E-09	0.499E-09	0.657E-09	0.860E-09	0.112E-08	0.145E-08	0.185E-08	0.234E-08
-50.	0.101E-10	0.399E-10	0.141E-09	0.451E-09	0.593E-09	0.774E-09	0.100E-08	0.129E-08	0.165E-08	0.210E-08
-75.	0.861E-11	0.339E-10	0.120E-09	0.382E-09	0.502E-09	0.656E-09	0.850E-09	0.110E-08	0.140E-08	0.178E-08
-100.	0.684E-11	0.269E-10	0.953E-10	0.304E-09	0.399E-09	0.521E-09	0.675E-09	0.870E-09	0.111E-08	0.142E-08

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.179E-08	0.224E-08	0.520E-08	0.108E-07	0.203E-07
75.	0.225E-08	0.282E-08	0.654E-08	0.136E-07	0.256E-07
50.	0.266E-08	0.333E-08	0.771E-08	0.161E-07	0.302E-07
25.	0.294E-08	0.368E-08	0.851E-08	0.177E-07	0.333E-07
0.	0.305E-08	0.381E-08	0.880E-08	0.183E-07	0.344E-07
-25.	0.294E-08	0.368E-08	0.851E-08	0.177E-07	0.333E-07
-50.	0.266E-08	0.333E-08	0.771E-08	0.161E-07	0.302E-07
-75.	0.225E-08	0.282E-08	0.654E-08	0.136E-07	0.256E-07
-100.	0.179E-08	0.224E-08	0.520E-08	0.108E-07	0.203E-07

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

MELBY ROAD (0-20 FEET)(1,1,1-TCA)

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NO. OF POINTS IN X-DIRECTION ......................   15
NO. OF POINTS IN Y-DIRECTION ......................    9
NO. OF POINTS IN Z-DIRECTION ......................    1
NO. OF ROOTS: NO. OF SERIES TERMS .................  400
NO. OF BEGINNING TIME STEP ........................   25
NO. OF ENDING TIME STEP ...........................  277
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION ....   12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE    1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE ....  540
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT ....    1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD     2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...  0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...  0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ......... -0.6270E+02
END POINT OF X-SOURCE LOCATION (METERS) ...........  0.6270E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ......... -0.8717E+02
END POINT OF Y-SOURCE LOCATION (METERS) ...........  0.8717E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS) .........  0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ...........  0.0000E+00

POROSITY ..........................................  0.2500E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) ...............  0.3429E+01
HYDRAULIC GRADIENT ................................  0.1000E-02
LONGITIDUNAL DESPERSIVITY (METER) .................  0.5000E+02
LATERAL DISPERSIVITY (METER) ......................  0.5000E+01
VERTICAL DISPERSIVITY (METER) .....................  0.5000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) ............  0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..  0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)   0.0000E+00
DECAY CONSTANT (PER HOUR) .........................  0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3) ................  0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE ......  0.1000E-01
DENSITY OF WATER (KG/M**3) ........................  0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..  0.7300E+03
DISCHARGE TIME (HR) ...............................  0.3942E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .  0.0000E+00
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LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.800E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.224E-04	0.585E-04	0.532E-04
0.336E-04	0.251E-04	0.185E-04	0.179E-04	0.146E-04	0.252E-04	0.359E-04	0.429E-04	0.585E-04	0.534E-04
0.419E-04	0.384E-04	0.243E-04	0.183E-04	0.135E-04	0.130E-04	0.106E-04	0.183E-04	0.261E-04	0.312E-04
0.425E-04	0.388E-04	0.304E-04	0.278E-04	0.176E-04	0.132E-04	0.977E-05	0.943E-05	0.769E-05	0.133E-04
0.189E-04	0.226E-04	0.307E-04	0.281E-04	0.220E-04	0.201E-04	0.127E-04	0.956E-05	0.706E-05	0.681E-05
0.555E-05	0.958E-05	0.136E-04	0.163E-04	0.222E-04	0.202E-04	0.159E-04	0.145E-04	0.919E-05	0.690E-05
0.510E-05	0.492E-05	0.401E-05	0.691E-05	0.984E-05	0.118E-04	0.160E-04	0.146E-04	0.114E-04	0.105E-04
0.663E-05	0.498E-05	0.368E-05	0.355E-05	0.289E-05	0.499E-05	0.710E-05	0.848E-05	0.115E-04	0.105E-04
0.825E-05	0.755E-05	0.478E-05	0.359E-05	0.265E-05	0.256E-05	0.209E-05	0.360E-05	0.512E-05	0.611E-05
0.832E-05	0.760E-05	0.595E-05	0.544E-05	0.345E-05	0.259E-05	0.191E-05	0.184E-05	0.150E-05	0.259E-05
0.369E-05	0.440E-05	0.599E-05	0.547E-05	0.429E-05	0.392E-05	0.248E-05	0.186E-05	0.138E-05	0.133E-05
0.108E-05	0.187E-05	0.265E-05	0.317E-05	0.432E-05	0.394E-05	0.309E-05	0.282E-05	0.179E-05	0.134E-05
0.991E-06	0.956E-06	0.779E-06	0.134E-05	0.191E-05	0.228E-05	0.311E-05	0.284E-05	0.222E-05	0.203E-05
0.129E-05	0.967E-06	0.714E-06	0.688E-06	0.561E-06	0.968E-06	0.138E-05	0.164E-05	0.224E-05	0.204E-05
0.160E-05	0.146E-05	0.928E-06	0.697E-06	0.515E-06	0.496E-06	0.405E-06	0.698E-06	0.993E-06	0.119E-05
0.161E-05	0.147E-05	0.115E-05	0.106E-05	0.669E-06	0.502E-06	0.371E-06	0.358E-06	0.292E-06	0.503E-06
0.716E-06	0.855E-06	0.116E-05	0.106E-05	0.832E-06	0.762E-06	0.482E-06	0.362E-06	0.267E-06	0.258E-06
0.210E-06	0.363E-06	0.516E-06	0.616E-06	0.839E-06	0.766E-06	0.600E-06	0.549E-06	0.348E-06	0.261E-06
0.193E-06	0.186E-06	0.152E-06	0.261E-06	0.372E-06	0.444E-06	0.604E-06	0.552E-06	0.432E-06	0.395E-06
0.250E-06	0.188E-06	0.139E-06	0.134E-06	0.109E-06	0.188E-06	0.268E-06	0.320E-06	0.435E-06	0.398E-06
0.311E-06	0.285E-06	0.180E-06	0.135E-06	0.100E-06	0.964E-07	0.786E-07	0.136E-06	0.193E-06	0.230E-06
0.314E-06	0.286E-06	0.224E-06	0.205E-06	0.130E-06	0.975E-07	0.720E-07	0.694E-07	0.566E-07	0.976E-07
0.139E-06	0.166E-06	0.226E-06	0.206E-06	0.161E-06	0.148E-06	0.936E-07	0.703E-07	0.519E-07	0.501E-07
0.408E-07	0.704E-07	0.100E-06	0.120E-06	0.163E-06	0.149E-06	0.116E-06	0.107E-06	0.675E-07	0.507E-07
0.374E-07	0.361E-07	0.294E-07	0.507E-07	0.722E-07	0.862E-07	0.117E-06	0.107E-06	0.839E-07	0.768E-07
0.487E-07	0.365E-07	0.270E-07	0.260E-07	0.212E-07	0.366E-07	0.520E-07	0.622E-07	0.846E-07	0.773E-07
0.605E-07	0.554E-07	0.351E-07	0.263E-07	0.194E-07	0.187E-07	0.153E-07	0.263E-07	0.375E-07	0.448E-07
0.610E-07	0.557E-07	0.436E-07	0.399E-07	0.253E-07	0.190E-07	0.140E-07	0.135E-07	0.110E-07	0.190E-07
0.270E-07	0.323E-07	0.439E-07	0.401E-07	0.314E-07	0.287E-07	0.182E-07	0.137E-07	0.101E-07	0.973E-08
0.793E-08	0.137E-07	0.195E-07	0.232E-07	0.316E-07	0.289E-07	0.226E-07	0.207E-07	0.131E-07	0.984E-08
0.726E-08	0.701E-08	0.571E-08	0.985E-08	0.140E-07	0.167E-07	0.228E-07	0.208E-07	0.163E-07	0.149E-07
0.944E-08	0.709E-08	0.523E-08	0.505E-08	0.411E-08	0.709E-08	0.101E-07	0.121E-07	0.164E-07	0.150E-07
0.117E-07	0.107E-07	0.680E-08	0.510E-08	0.377E-08	0.364E-08	0.296E-08	0.511E-08	0.727E-08	0.868E-08
0.118E-07	0.108E-07	0.845E-08	0.773E-08	0.490E-08	0.368E-08	0.271E-08	0.262E-08	0.213E-08	0.368E-08
0.524E-08	0.625E-08	0.851E-08	0.777E-08	0.609E-08	0.557E-08	0.352E-08	0.265E-08	0.195E-08	0.188E-08
0.154E-08	0.265E-08	0.377E-08	0.450E-08	0.613E-08	0.560E-08	0.438E-08	0.401E-08	0.254E-08	0.190E-08
0.141E-08	0.136E-08	0.110E-08	0.190E-08	0.271E-08	0.324E-08	0.441E-08	0.402E-08	0.315E-08	0.288E-08

0.182E-08	0.137E-08	0.101E-08	0.975E-09	0.795E-09	0.137E-08	0.195E-08	0.233E-08	0.317E-08	0.289E-08
0.226E-08	0.207E-08	0.131E-08	0.983E-09	0.726E-09	0.700E-09	0.571E-09	0.983E-09	0.140E-08	0.167E-08
0.227E-08	0.207E-08	0.162E-08	0.148E-08	0.936E-09	0.703E-09	0.519E-09	0.500E-09	0.408E-09	0.702E-09
0.998E-09	0.119E-08	0.162E-08	0.148E-08	0.116E-08	0.106E-08	0.672E-09	0.504E-09	0.372E-09	0.358E-09
0.292E-09	0.504E-09	0.715E-09	0.851E-09	0.115E-08	0.105E-08	0.823E-09	0.752E-09	0.475E-09	0.356E-09
0.263E-09	0.253E-09	0.206E-09	0.355E-09	0.505E-09	0.603E-09	0.821E-09	0.748E-09	0.583E-09	0.533E-09
0.337E-09	0.253E-09	0.187E-09	0.180E-09	0.146E-09	0.251E-09	0.358E-09	0.428E-09	0.581E-09	0.527E-09
0.411E-09	0.376E-09	0.238E-09	0.179E-09	0.132E-09	0.127E-09	0.103E-09	0.177E-09	0.250E-09	0.296E-09
0.401E-09	0.364E-09	0.283E-09	0.258E-09	0.162E-09	0.122E-09	0.907E-10	0.881E-10	0.722E-10	0.125E-09
0.178E-09	0.213E-09	0.291E-09	0.266E-09	0.209E-09	0.192E-09	0.122E-09	0.924E-10	0.683E-10	0.664E-10
0.553E-10	0.969E-10	0.140E-09	0.168E-09	0.228E-09	0.208E-09	0.163E-09	0.150E-09	0.964E-10	0.730E-10
0.549E-10	0.543E-10	0.452E-10	0.792E-10	0.114E-09	0.139E-09	0.190E-09	0.174E-09	0.136E-09	0.127E-09

RETARDATION FACTOR .... 0.1000E+01
RETARDED DARCY VELOCITY (M/HR) 0.1372E-01
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.6858E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.6858E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.6858E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.213E-10	0.595E-07	0.151E-04	0.399E-04	0.791E-04	0.118E-03	0.142E-03	0.146E-03	0.128E-03
75.	0.000E+00	0.705E-10	0.210E-06	0.841E-04	0.247E-03	0.512E-03	0.770E-03	0.914E-03	0.923E-03	0.788E-03
50.	0.000E+00	0.914E-10	0.270E-06	0.999E-04	0.290E-03	0.597E-03	0.896E-03	0.107E-02	0.108E-02	0.924E-03
25.	0.000E+00	0.929E-10	0.273E-06	0.100E-03	0.291E-03	0.598E-03	0.899E-03	0.107E-02	0.108E-02	0.927E-03
0.	0.000E+00	0.929E-10	0.273E-06	0.100E-03	0.291E-03	0.598E-03	0.899E-03	0.107E-02	0.108E-02	0.927E-03
-25.	0.000E+00	0.929E-10	0.273E-06	0.100E-03	0.291E-03	0.598E-03	0.899E-03	0.107E-02	0.108E-02	0.927E-03
-50.	0.000E+00	0.914E-10	0.270E-06	0.999E-04	0.290E-03	0.597E-03	0.896E-03	0.107E-02	0.108E-02	0.924E-03
-75.	0.000E+00	0.705E-10	0.210E-06	0.841E-04	0.247E-03	0.512E-03	0.770E-03	0.914E-03	0.923E-03	0.788E-03
-100.	0.000E+00	0.213E-10	0.595E-07	0.151E-04	0.399E-04	0.791E-04	0.118E-03	0.142E-03	0.146E-03	0.128E-03

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.911E-04	0.519E-04	0.130E-05	0.331E-08	0.000E+00
75.	0.533E-03	0.274E-03	0.456E-05	0.110E-07	0.000E+00
50.	0.629E-03	0.328E-03	0.585E-05	0.142E-07	0.000E+00
25.	0.632E-03	0.330E-03	0.592E-05	0.145E-07	0.000E+00
0.	0.632E-03	0.330E-03	0.592E-05	0.145E-07	0.000E+00
-25.	0.632E-03	0.330E-03	0.592E-05	0.145E-07	0.000E+00
-50.	0.629E-03	0.328E-03	0.585E-05	0.142E-07	0.000E+00
-75.	0.533E-03	0.274E-03	0.456E-05	0.110E-07	0.000E+00
-100.	0.911E-04	0.519E-04	0.130E-05	0.331E-08	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.471E-08	0.155E-06	0.338E-05	0.585E-04	0.109E-03	0.179E-03	0.256E-03	0.320E-03	0.358E-03	0.362E-03
75.	0.823E-08	0.280E-06	0.680E-05	0.173E-03	0.371E-03	0.670E-03	0.977E-03	0.120E-02	0.128E-02	0.122E-02
50.	0.110E-07	0.376E-06	0.913E-05	0.222E-03	0.466E-03	0.830E-03	0.121E-02	0.148E-02	0.160E-02	0.153E-02
25.	0.124E-07	0.421E-06	0.999E-05	0.232E-03	0.482E-03	0.854E-03	0.124E-02	0.152E-02	0.165E-02	0.159E-02
0.	0.128E-07	0.432E-06	0.102E-04	0.233E-03	0.484E-03	0.857E-03	0.125E-02	0.153E-02	0.166E-02	0.159E-02
-25.	0.124E-07	0.421E-06	0.999E-05	0.232E-03	0.482E-03	0.854E-03	0.124E-02	0.152E-02	0.165E-02	0.159E-02
-50.	0.110E-07	0.376E-06	0.913E-05	0.222E-03	0.466E-03	0.830E-03	0.121E-02	0.148E-02	0.160E-02	0.153E-02
-75.	0.823E-08	0.280E-06	0.680E-05	0.173E-03	0.371E-03	0.670E-03	0.977E-03	0.120E-02	0.128E-02	0.122E-02
-100.	0.471E-08	0.155E-06	0.338E-05	0.585E-04	0.109E-03	0.179E-03	0.256E-03	0.320E-03	0.358E-03	0.362E-03

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.333E-03	0.284E-03	0.116E-03	0.368E-04	0.750E-05
75.	0.101E-02	0.758E-03	0.226E-03	0.657E-04	0.131E-04
50.	0.129E-02	0.986E-03	0.303E-03	0.883E-04	0.176E-04
25.	0.135E-02	0.104E-02	0.334E-03	0.990E-04	0.198E-04
0.	0.135E-02	0.105E-02	0.340E-03	0.102E-03	0.204E-04
-25.	0.135E-02	0.104E-02	0.334E-03	0.990E-04	0.198E-04
-50.	0.129E-02	0.986E-03	0.303E-03	0.883E-04	0.176E-04
-75.	0.101E-02	0.758E-03	0.226E-03	0.657E-04	0.131E-04
-100.	0.333E-03	0.284E-03	0.116E-03	0.368E-04	0.750E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.324E-07	0.484E-06	0.561E-05	0.594E-04	0.103E-03	0.163E-03	0.229E-03	0.288E-03	0.329E-03	0.346E-03
75.	0.508E-07	0.784E-06	0.992E-05	0.152E-03	0.307E-03	0.538E-03	0.778E-03	0.956E-03	0.104E-02	0.102E-02
50.	0.664E-07	0.103E-05	0.132E-04	0.196E-03	0.388E-03	0.671E-03	0.967E-03	0.119E-02	0.131E-02	0.129E-02
25.	0.759E-07	0.118E-05	0.147E-04	0.208E-03	0.406E-03	0.697E-03	0.100E-02	0.124E-02	0.136E-02	0.135E-02
0.	0.789E-07	0.122E-05	0.152E-04	0.211E-03	0.410E-03	0.703E-03	0.101E-02	0.125E-02	0.137E-02	0.136E-02
-25.	0.759E-07	0.118E-05	0.147E-04	0.208E-03	0.406E-03	0.697E-03	0.100E-02	0.124E-02	0.136E-02	0.135E-02
-50.	0.664E-07	0.103E-05	0.132E-04	0.196E-03	0.388E-03	0.671E-03	0.967E-03	0.119E-02	0.131E-02	0.129E-02
-75.	0.508E-07	0.784E-06	0.992E-05	0.152E-03	0.307E-03	0.538E-03	0.778E-03	0.956E-03	0.104E-02	0.102E-02
-100.	0.324E-07	0.484E-06	0.561E-05	0.594E-04	0.103E-03	0.163E-03	0.229E-03	0.288E-03	0.329E-03	0.346E-03

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.338E-03	0.315E-03	0.218E-03	0.132E-03	0.618E-04

75.	0.888E-03	0.724E-03	0.375E-03	0.212E-03	0.963E-04
50.	0.114E-02	0.944E-03	0.498E-03	0.279E-03	0.126E-03
25.	0.121E-02	0.102E-02	0.559E-03	0.318E-03	0.144E-03
0.	0.122E-02	0.103E-02	0.576E-03	0.330E-03	0.149E-03
-25.	0.121E-02	0.102E-02	0.559E-03	0.318E-03	0.144E-03
-50.	0.114E-02	0.944E-03	0.498E-03	0.279E-03	0.126E-03
-75.	0.888E-03	0.724E-03	0.375E-03	0.212E-03	0.963E-04
-100.	0.338E-03	0.315E-03	0.218E-03	0.132E-03	0.618E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.610E-07	0.633E-06	0.565E-05	0.496E-04	0.832E-04	0.130E-03	0.181E-03	0.228E-03	0.263E-03	0.281E-03
75.	0.901E-07	0.971E-06	0.945E-05	0.120E-03	0.235E-03	0.406E-03	0.585E-03	0.720E-03	0.789E-03	0.779E-03
50.	0.115E-06	0.126E-05	0.124E-04	0.154E-03	0.297E-03	0.507E-03	0.728E-03	0.898E-03	0.990E-03	0.986E-03
25.	0.132E-06	0.143E-05	0.139E-04	0.164E-03	0.312E-03	0.529E-03	0.758E-03	0.937E-03	0.104E-02	0.104E-02
0.	0.137E-06	0.149E-05	0.144E-04	0.167E-03	0.316E-03	0.534E-03	0.765E-03	0.946E-03	0.105E-02	0.105E-02
-25.	0.132E-06	0.143E-05	0.139E-04	0.164E-03	0.312E-03	0.529E-03	0.758E-03	0.937E-03	0.104E-02	0.104E-02
-50.	0.115E-06	0.126E-05	0.124E-04	0.154E-03	0.297E-03	0.507E-03	0.728E-03	0.898E-03	0.990E-03	0.986E-03
-75.	0.901E-07	0.971E-06	0.945E-05	0.120E-03	0.235E-03	0.406E-03	0.585E-03	0.720E-03	0.789E-03	0.779E-03
-100.	0.610E-07	0.633E-06	0.565E-05	0.496E-04	0.832E-04	0.130E-03	0.181E-03	0.228E-03	0.263E-03	0.281E-03

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.283E-03	0.273E-03	0.232E-03	0.186E-03	0.127E-03
75.	0.696E-03	0.588E-03	0.377E-03	0.282E-03	0.187E-03
50.	0.892E-03	0.765E-03	0.494E-03	0.365E-03	0.239E-03
25.	0.952E-03	0.828E-03	0.557E-03	0.416E-03	0.273E-03
0.	0.966E-03	0.844E-03	0.576E-03	0.432E-03	0.284E-03
-25.	0.952E-03	0.828E-03	0.557E-03	0.416E-03	0.273E-03
-50.	0.892E-03	0.765E-03	0.494E-03	0.365E-03	0.239E-03
-75.	0.696E-03	0.588E-03	0.377E-03	0.282E-03	0.187E-03
-100.	0.283E-03	0.273E-03	0.232E-03	0.186E-03	0.127E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.725E-07	0.621E-06	0.484E-05	0.386E-04	0.639E-04	0.987E-04	0.137E-03	0.173E-03	0.200E-03	0.216E-03
75.	0.103E-06	0.922E-06	0.785E-05	0.902E-04	0.175E-03	0.300E-03	0.431E-03	0.531E-03	0.584E-03	0.580E-03
50.	0.130E-06	0.118E-05	0.102E-04	0.116E-03	0.221E-03	0.374E-03	0.536E-03	0.662E-03	0.732E-03	0.734E-03
25.	0.148E-06	0.134E-05	0.115E-04	0.124E-03	0.233E-03	0.391E-03	0.559E-03	0.692E-03	0.768E-03	0.775E-03
0.	0.154E-06	0.139E-05	0.119E-04	0.126E-03	0.236E-03	0.395E-03	0.565E-03	0.699E-03	0.777E-03	0.785E-03
-25.	0.148E-06	0.134E-05	0.115E-04	0.124E-03	0.233E-03	0.391E-03	0.559E-03	0.692E-03	0.768E-03	0.775E-03
-50.	0.130E-06	0.118E-05	0.102E-04	0.116E-03	0.221E-03	0.374E-03	0.536E-03	0.662E-03	0.732E-03	0.734E-03
-75.	0.103E-06	0.922E-06	0.785E-05	0.902E-04	0.175E-03	0.300E-03	0.431E-03	0.531E-03	0.584E-03	0.580E-03
-100.	0.725E-07	0.621E-06	0.484E-05	0.386E-04	0.639E-04	0.987E-04	0.137E-03	0.173E-03	0.200E-03	0.216E-03

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.220E-03	0.217E-03	0.204E-03	0.190E-03	0.160E-03
75.	0.525E-03	0.451E-03	0.322E-03	0.279E-03	0.226E-03
50.	0.671E-03	0.585E-03	0.418E-03	0.355E-03	0.284E-03
25.	0.717E-03	0.634E-03	0.471E-03	0.404E-03	0.322E-03
0.	0.729E-03	0.647E-03	0.488E-03	0.420E-03	0.336E-03
-25.	0.717E-03	0.634E-03	0.471E-03	0.404E-03	0.322E-03
-50.	0.671E-03	0.585E-03	0.418E-03	0.355E-03	0.284E-03
-75.	0.525E-03	0.451E-03	0.322E-03	0.279E-03	0.226E-03
-100.	0.220E-03	0.217E-03	0.204E-03	0.190E-03	0.160E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS

(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.701E-07	0.536E-06	0.386E-05	0.291E-04	0.478E-04	0.734E-04	0.102E-03	0.129E-03	0.149E-03	0.162E-03
75.	0.974E-07	0.778E-06	0.614E-05	0.667E-04	0.128E-03	0.219E-03	0.315E-03	0.388E-03	0.427E-03	0.426E-03
50.	0.121E-06	0.986E-06	0.794E-05	0.856E-04	0.162E-03	0.273E-03	0.391E-03	0.484E-03	0.536E-03	0.539E-03
25.	0.137E-06	0.112E-05	0.891E-05	0.917E-04	0.171E-03	0.286E-03	0.409E-03	0.506E-03	0.563E-03	0.570E-03
0.	0.143E-06	0.116E-05	0.921E-05	0.932E-04	0.173E-03	0.289E-03	0.413E-03	0.511E-03	0.569E-03	0.577E-03
-25.	0.137E-06	0.112E-05	0.891E-05	0.917E-04	0.171E-03	0.286E-03	0.409E-03	0.506E-03	0.563E-03	0.570E-03
-50.	0.121E-06	0.986E-06	0.794E-05	0.856E-04	0.162E-03	0.273E-03	0.391E-03	0.484E-03	0.536E-03	0.539E-03
-75.	0.974E-07	0.778E-06	0.614E-05	0.667E-04	0.128E-03	0.219E-03	0.315E-03	0.388E-03	0.427E-03	0.426E-03
-100.	0.701E-07	0.536E-06	0.386E-05	0.291E-04	0.478E-04	0.734E-04	0.102E-03	0.129E-03	0.149E-03	0.162E-03

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.166E-03	0.165E-03	0.166E-03	0.168E-03	0.159E-03
75.	0.388E-03	0.337E-03	0.256E-03	0.241E-03	0.220E-03
50.	0.496E-03	0.436E-03	0.329E-03	0.304E-03	0.273E-03
25.	0.530E-03	0.473E-03	0.371E-03	0.344E-03	0.309E-03
0.	0.539E-03	0.483E-03	0.384E-03	0.358E-03	0.321E-03
-25.	0.530E-03	0.473E-03	0.371E-03	0.344E-03	0.309E-03
-50.	0.496E-03	0.436E-03	0.329E-03	0.304E-03	0.273E-03
-75.	0.388E-03	0.337E-03	0.256E-03	0.241E-03	0.220E-03
-100.	0.166E-03	0.165E-03	0.166E-03	0.168E-03	0.159E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.607E-07	0.432E-06	0.296E-05	0.216E-04	0.352E-04	0.539E-04	0.749E-04	0.944E-04	0.110E-03	0.119E-03
75.	0.830E-07	0.618E-06	0.465E-05	0.489E-04	0.935E-04	0.159E-03	0.229E-03	0.282E-03	0.311E-03	0.311E-03
50.	0.102E-06	0.778E-06	0.598E-05	0.626E-04	0.118E-03	0.199E-03	0.284E-03	0.351E-03	0.390E-03	0.392E-03
25.	0.115E-06	0.879E-06	0.671E-05	0.671E-04	0.124E-03	0.208E-03	0.297E-03	0.368E-03	0.409E-03	0.415E-03
0.	0.120E-06	0.912E-06	0.693E-05	0.682E-04	0.126E-03	0.210E-03	0.300E-03	0.371E-03	0.414E-03	0.421E-03
-25.	0.115E-06	0.879E-06	0.671E-05	0.671E-04	0.124E-03	0.208E-03	0.297E-03	0.368E-03	0.409E-03	0.415E-03
-50.	0.102E-06	0.778E-06	0.598E-05	0.626E-04	0.118E-03	0.199E-03	0.284E-03	0.351E-03	0.390E-03	0.392E-03
-75.	0.830E-07	0.618E-06	0.465E-05	0.489E-04	0.935E-04	0.159E-03	0.229E-03	0.282E-03	0.311E-03	0.311E-03
-100.	0.607E-07	0.432E-06	0.296E-05	0.216E-04	0.352E-04	0.539E-04	0.749E-04	0.944E-04	0.110E-03	0.119E-03

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.123E-03	0.124E-03	0.128E-03	0.137E-03	0.141E-03
75.	0.284E-03	0.248E-03	0.196E-03	0.194E-03	0.192E-03
50.	0.362E-03	0.320E-03	0.251E-03	0.243E-03	0.235E-03
25.	0.388E-03	0.348E-03	0.282E-03	0.275E-03	0.265E-03
0.	0.394E-03	0.355E-03	0.292E-03	0.285E-03	0.275E-03
-25.	0.388E-03	0.348E-03	0.282E-03	0.275E-03	0.265E-03
-50.	0.362E-03	0.320E-03	0.251E-03	0.243E-03	0.235E-03
-75.	0.284E-03	0.248E-03	0.196E-03	0.194E-03	0.192E-03
-100.	0.123E-03	0.124E-03	0.128E-03	0.137E-03	0.141E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.493E-07	0.335E-06	0.222E-05	0.158E-04	0.258E-04	0.394E-04	0.546E-04	0.688E-04	0.802E-04	0.874E-04
75.	0.667E-07	0.474E-06	0.345E-05	0.356E-04	0.678E-04	0.115E-03	0.166E-03	0.204E-03	0.225E-03	0.226E-03
50.	0.818E-07	0.594E-06	0.443E-05	0.455E-04	0.854E-04	0.144E-03	0.206E-03	0.254E-03	0.282E-03	0.285E-03
25.	0.917E-07	0.669E-06	0.497E-05	0.488E-04	0.903E-04	0.151E-03	0.215E-03	0.266E-03	0.297E-03	0.301E-03
0.	0.952E-07	0.694E-06	0.514E-05	0.496E-04	0.915E-04	0.152E-03	0.217E-03	0.269E-03	0.300E-03	0.305E-03
-25.	0.917E-07	0.669E-06	0.497E-05	0.488E-04	0.903E-04	0.151E-03	0.215E-03	0.266E-03	0.297E-03	0.301E-03
-50.	0.818E-07	0.594E-06	0.443E-05	0.455E-04	0.854E-04	0.144E-03	0.206E-03	0.254E-03	0.282E-03	0.285E-03
-75.	0.667E-07	0.474E-06	0.345E-05	0.356E-04	0.678E-04	0.115E-03	0.166E-03	0.204E-03	0.225E-03	0.226E-03
-100.	0.493E-07	0.335E-06	0.222E-05	0.158E-04	0.258E-04	0.394E-04	0.546E-04	0.688E-04	0.802E-04	0.874E-04

CONTINUE

Y	75.	100.	200.	300.	400.
100.	0.904E-04	0.910E-04	0.968E-04	0.108E-03	0.116E-03
75.	0.207E-03	0.182E-03	0.146E-03	0.151E-03	0.156E-03
50.	0.263E-03	0.234E-03	0.187E-03	0.187E-03	0.190E-03
25.	0.282E-03	0.254E-03	0.210E-03	0.211E-03	0.213E-03
0.	0.287E-03	0.259E-03	0.217E-03	0.219E-03	0.221E-03
-25.	0.282E-03	0.254E-03	0.210E-03	0.211E-03	0.213E-03
-50.	0.263E-03	0.234E-03	0.187E-03	0.187E-03	0.190E-03
-75.	0.207E-03	0.182E-03	0.146E-03	0.151E-03	0.156E-03
-100.	0.904E-04	0.910E-04	0.968E-04	0.108E-03	0.116E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.386E-07	0.253E-06	0.164E-05	0.115E-04	0.187E-04	0.286E-04	0.396E-04	0.500E-04	0.583E-04	0.636E-04
75.	0.517E-07	0.356E-06	0.254E-05	0.258E-04	0.491E-04	0.835E-04	0.120E-03	0.148E-03	0.163E-03	0.163E-03
50.	0.630E-07	0.444E-06	0.325E-05	0.330E-04	0.618E-04	0.104E-03	0.149E-03	0.184E-03	0.204E-03	0.206E-03
25.	0.706E-07	0.500E-06	0.364E-05	0.353E-04	0.653E-04	0.109E-03	0.155E-03	0.192E-03	0.214E-03	0.218E-03
0.	0.732E-07	0.518E-06	0.376E-05	0.360E-04	0.662E-04	0.110E-03	0.157E-03	0.194E-03	0.217E-03	0.221E-03
-25.	0.706E-07	0.500E-06	0.364E-05	0.353E-04	0.653E-04	0.109E-03	0.155E-03	0.192E-03	0.214E-03	0.218E-03
-50.	0.630E-07	0.444E-06	0.325E-05	0.330E-04	0.618E-04	0.104E-03	0.149E-03	0.184E-03	0.204E-03	0.206E-03
-75.	0.517E-07	0.356E-06	0.254E-05	0.258E-04	0.491E-04	0.835E-04	0.120E-03	0.148E-03	0.163E-03	0.163E-03
-100.	0.386E-07	0.253E-06	0.164E-05	0.115E-04	0.187E-04	0.286E-04	0.396E-04	0.500E-04	0.583E-04	0.636E-04

CONTINUE

Y	75.	100.	200.	300.	400.
100.	0.659E-04	0.665E-04	0.719E-04	0.819E-04	0.919E-04
75.	0.150E-03	0.132E-03	0.108E-03	0.114E-03	0.122E-03
50.	0.191E-03	0.170E-03	0.138E-03	0.141E-03	0.148E-03
25.	0.204E-03	0.184E-03	0.155E-03	0.159E-03	0.166E-03
0.	0.208E-03	0.188E-03	0.160E-03	0.165E-03	0.172E-03
-25.	0.204E-03	0.184E-03	0.155E-03	0.159E-03	0.166E-03
-50.	0.191E-03	0.170E-03	0.138E-03	0.141E-03	0.148E-03
-75.	0.150E-03	0.132E-03	0.108E-03	0.114E-03	0.122E-03
-100.	0.659E-04	0.665E-04	0.719E-04	0.819E-04	0.919E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.294E-07	0.188E-06	0.120E-05	0.838E-05	0.136E-04	0.207E-04	0.287E-04	0.362E-04	0.422E-04	0.461E-04
75.	0.391E-07	0.264E-06	0.185E-05	0.187E-04	0.355E-04	0.603E-04	0.864E-04	0.107E-03	0.118E-03	0.118E-03
50.	0.475E-07	0.328E-06	0.237E-05	0.238E-04	0.446E-04	0.750E-04	0.107E-03	0.133E-03	0.147E-03	0.149E-03
25.	0.531E-07	0.369E-06	0.266E-05	0.256E-04	0.472E-04	0.786E-04	0.112E-03	0.139E-03	0.155E-03	0.157E-03
0.	0.550E-07	0.382E-06	0.274E-05	0.260E-04	0.478E-04	0.795E-04	0.113E-03	0.140E-03	0.157E-03	0.160E-03
-25.	0.531E-07	0.369E-06	0.266E-05	0.256E-04	0.472E-04	0.786E-04	0.112E-03	0.139E-03	0.155E-03	0.157E-03
-50.	0.475E-07	0.328E-06	0.237E-05	0.238E-04	0.446E-04	0.750E-04	0.107E-03	0.133E-03	0.147E-03	0.149E-03
-75.	0.391E-07	0.264E-06	0.185E-05	0.187E-04	0.355E-04	0.603E-04	0.864E-04	0.107E-03	0.118E-03	0.118E-03
-100.	0.294E-07	0.188E-06	0.120E-05	0.838E-05	0.136E-04	0.207E-04	0.287E-04	0.362E-04	0.422E-04	0.461E-04

CONTINUE

Y	75.	100.	200.	300.	400.
100.	0.479E-04	0.484E-04	0.529E-04	0.613E-04	0.705E-04
75.	0.108E-03	0.956E-04	0.792E-04	0.846E-04	0.930E-04
50.	0.138E-03	0.123E-03	0.101E-03	0.105E-03	0.113E-03
25.	0.148E-03	0.133E-03	0.113E-03	0.118E-03	0.125E-03
0.	0.150E-03	0.136E-03	0.117E-03	0.122E-03	0.130E-03
-25.	0.148E-03	0.133E-03	0.113E-03	0.118E-03	0.125E-03
-50.	0.138E-03	0.123E-03	0.101E-03	0.105E-03	0.113E-03
-75.	0.108E-03	0.956E-04	0.792E-04	0.846E-04	0.930E-04
-100.	0.479E-04	0.484E-04	0.529E-04	0.613E-04	0.705E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.220E-07	0.139E-06	0.876E-06	0.607E-05	0.982E-05	0.150E-04	0.207E-04	0.261E-04	0.305E-04	0.334E-04
75.	0.292E-07	0.193E-06	0.135E-05	0.135E-04	0.256E-04	0.435E-04	0.623E-04	0.768E-04	0.849E-04	0.852E-04
50.	0.353E-07	0.240E-06	0.172E-05	0.172E-04	0.322E-04	0.541E-04	0.773E-04	0.956E-04	0.106E-03	0.107E-03
25.	0.394E-07	0.270E-06	0.193E-05	0.184E-04	0.340E-04	0.567E-04	0.808E-04	0.100E-03	0.112E-03	0.114E-03
0.	0.408E-07	0.280E-06	0.199E-05	0.188E-04	0.345E-04	0.573E-04	0.816E-04	0.101E-03	0.113E-03	0.115E-03
-25.	0.394E-07	0.270E-06	0.193E-05	0.184E-04	0.340E-04	0.567E-04	0.808E-04	0.100E-03	0.112E-03	0.114E-03
-50.	0.353E-07	0.240E-06	0.172E-05	0.172E-04	0.322E-04	0.541E-04	0.773E-04	0.956E-04	0.106E-03	0.107E-03
-75.	0.292E-07	0.193E-06	0.135E-05	0.135E-04	0.256E-04	0.435E-04	0.623E-04	0.768E-04	0.849E-04	0.852E-04
-100.	0.220E-07	0.139E-06	0.876E-06	0.607E-05	0.982E-05	0.150E-04	0.207E-04	0.261E-04	0.305E-04	0.334E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.346E-04	0.351E-04	0.386E-04	0.453E-04	0.531E-04
75.	0.783E-04	0.691E-04	0.577E-04	0.623E-04	0.697E-04
50.	0.996E-04	0.888E-04	0.732E-04	0.769E-04	0.840E-04
25.	0.107E-03	0.965E-04	0.821E-04	0.863E-04	0.936E-04
0.	0.108E-03	0.985E-04	0.849E-04	0.894E-04	0.969E-04
-25.	0.107E-03	0.965E-04	0.821E-04	0.863E-04	0.936E-04
-50.	0.996E-04	0.888E-04	0.732E-04	0.769E-04	0.840E-04
-75.	0.783E-04	0.691E-04	0.577E-04	0.623E-04	0.697E-04
-100.	0.346E-04	0.351E-04	0.386E-04	0.453E-04	0.531E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.163E-07	0.101E-06	0.636E-06	0.439E-05	0.710E-05	0.108E-04	0.150E-04	0.189E-04	0.220E-04	0.241E-04
75.	0.215E-07	0.141E-06	0.976E-06	0.972E-05	0.185E-04	0.313E-04	0.449E-04	0.554E-04	0.612E-04	0.614E-04
50.	0.260E-07	0.175E-06	0.125E-05	0.124E-04	0.232E-04	0.390E-04	0.557E-04	0.689E-04	0.766E-04	0.774E-04
25.	0.290E-07	0.197E-06	0.140E-05	0.133E-04	0.245E-04	0.409E-04	0.583E-04	0.722E-04	0.805E-04	0.819E-04
0.	0.300E-07	0.204E-06	0.144E-05	0.135E-04	0.249E-04	0.413E-04	0.588E-04	0.729E-04	0.814E-04	0.831E-04
-25.	0.290E-07	0.197E-06	0.140E-05	0.133E-04	0.245E-04	0.409E-04	0.583E-04	0.722E-04	0.805E-04	0.819E-04
-50.	0.260E-07	0.175E-06	0.125E-05	0.124E-04	0.232E-04	0.390E-04	0.557E-04	0.689E-04	0.766E-04	0.774E-04
-75.	0.215E-07	0.141E-06	0.976E-06	0.972E-05	0.185E-04	0.313E-04	0.449E-04	0.554E-04	0.612E-04	0.614E-04
-100.	0.163E-07	0.101E-06	0.636E-06	0.439E-05	0.710E-05	0.108E-04	0.150E-04	0.189E-04	0.220E-04	0.241E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.250E-04	0.254E-04	0.281E-04	0.332E-04	0.394E-04
75.	0.565E-04	0.499E-04	0.418E-04	0.456E-04	0.516E-04
50.	0.719E-04	0.641E-04	0.530E-04	0.562E-04	0.621E-04
25.	0.770E-04	0.696E-04	0.595E-04	0.630E-04	0.690E-04
0.	0.783E-04	0.711E-04	0.615E-04	0.652E-04	0.714E-04
-25.	0.770E-04	0.696E-04	0.595E-04	0.630E-04	0.690E-04
-50.	0.719E-04	0.641E-04	0.530E-04	0.562E-04	0.621E-04
-75.	0.565E-04	0.499E-04	0.418E-04	0.456E-04	0.516E-04
-100.	0.250E-04	0.254E-04	0.281E-04	0.332E-04	0.394E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.120E-07	0.739E-07	0.461E-06	0.317E-05	0.512E-05	0.780E-05	0.108E-04	0.136E-04	0.159E-04	0.174E-04
75.	0.157E-07	0.103E-06	0.706E-06	0.702E-05	0.133E-04	0.226E-04	0.324E-04	0.400E-04	0.442E-04	0.443E-04
50.	0.190E-07	0.127E-06	0.901E-06	0.896E-05	0.168E-04	0.281E-04	0.402E-04	0.497E-04	0.552E-04	0.558E-04
25.	0.212E-07	0.143E-06	0.101E-05	0.960E-05	0.177E-04	0.295E-04	0.420E-04	0.521E-04	0.581E-04	0.591E-04
0.	0.219E-07	0.148E-06	0.104E-05	0.977E-05	0.179E-04	0.298E-04	0.424E-04	0.526E-04	0.587E-04	0.599E-04

-25.	0.212E-07	0.143E-06	0.101E-05	0.960E-05	0.177E-04	0.295E-04	0.420E-04	0.521E-04	0.581E-04	0.591E-04
-50.	0.190E-07	0.127E-06	0.901E-06	0.896E-05	0.168E-04	0.281E-04	0.402E-04	0.497E-04	0.552E-04	0.558E-04
-75.	0.157E-07	0.103E-06	0.706E-06	0.702E-05	0.133E-04	0.226E-04	0.324E-04	0.400E-04	0.442E-04	0.443E-04
-100.	0.120E-07	0.739E-07	0.461E-06	0.317E-05	0.512E-05	0.780E-05	0.108E-04	0.136E-04	0.159E-04	0.174E-04

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.181E-04	0.183E-04	0.204E-04	0.242E-04	0.290E-04
75.	0.408E-04	0.360E-04	0.303E-04	0.332E-04	0.379E-04
50.	0.519E-04	0.463E-04	0.384E-04	0.408E-04	0.455E-04
25.	0.555E-04	0.503E-04	0.430E-04	0.457E-04	0.506E-04
0.	0.565E-04	0.513E-04	0.445E-04	0.474E-04	0.523E-04
-25.	0.555E-04	0.503E-04	0.430E-04	0.457E-04	0.506E-04
-50.	0.519E-04	0.463E-04	0.384E-04	0.408E-04	0.455E-04
-75.	0.408E-04	0.360E-04	0.303E-04	0.332E-04	0.379E-04
-100.	0.181E-04	0.183E-04	0.204E-04	0.242E-04	0.290E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.873E-08	0.536E-07	0.333E-06	0.229E-05	0.370E-05	0.563E-05	0.780E-05	0.983E-05	0.115E-04	0.126E-04
75.	0.115E-07	0.743E-07	0.510E-06	0.506E-05	0.960E-05	0.163E-04	0.234E-04	0.288E-04	0.318E-04	0.320E-04
50.	0.138E-07	0.921E-07	0.651E-06	0.646E-05	0.121E-04	0.203E-04	0.290E-04	0.359E-04	0.398E-04	0.403E-04
25.	0.154E-07	0.103E-06	0.728E-06	0.693E-05	0.128E-04	0.213E-04	0.303E-04	0.375E-04	0.419E-04	0.426E-04
0.	0.160E-07	0.107E-06	0.752E-06	0.705E-05	0.129E-04	0.215E-04	0.306E-04	0.379E-04	0.423E-04	0.432E-04
-25.	0.154E-07	0.103E-06	0.728E-06	0.693E-05	0.128E-04	0.213E-04	0.303E-04	0.375E-04	0.419E-04	0.426E-04
-50.	0.138E-07	0.921E-07	0.651E-06	0.646E-05	0.121E-04	0.203E-04	0.290E-04	0.359E-04	0.398E-04	0.403E-04
-75.	0.115E-07	0.743E-07	0.510E-06	0.506E-05	0.960E-05	0.163E-04	0.234E-04	0.288E-04	0.318E-04	0.320E-04
-100.	0.873E-08	0.536E-07	0.333E-06	0.229E-05	0.370E-05	0.563E-05	0.780E-05	0.983E-05	0.115E-04	0.126E-04

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.131E-04	0.133E-04	0.147E-04	0.176E-04	0.212E-04
75.	0.294E-04	0.260E-04	0.219E-04	0.241E-04	0.276E-04
50.	0.374E-04	0.334E-04	0.277E-04	0.296E-04	0.332E-04
25.	0.401E-04	0.363E-04	0.311E-04	0.332E-04	0.368E-04
0.	0.407E-04	0.370E-04	0.322E-04	0.344E-04	0.381E-04
-25.	0.401E-04	0.363E-04	0.311E-04	0.332E-04	0.368E-04
-50.	0.374E-04	0.334E-04	0.277E-04	0.296E-04	0.332E-04
-75.	0.294E-04	0.260E-04	0.219E-04	0.241E-04	0.276E-04
-100.	0.131E-04	0.133E-04	0.147E-04	0.176E-04	0.212E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.635E-08	0.388E-07	0.241E-06	0.165E-05	0.267E-05	0.406E-05	0.562E-05	0.709E-05	0.828E-05	0.906E-05
75.	0.834E-08	0.538E-07	0.369E-06	0.365E-05	0.692E-05	0.118E-04	0.168E-04	0.208E-04	0.230E-04	0.230E-04
50.	0.101E-07	0.666E-07	0.470E-06	0.466E-05	0.871E-05	0.146E-04	0.209E-04	0.259E-04	0.287E-04	0.290E-04
25.	0.112E-07	0.747E-07	0.526E-06	0.499E-05	0.920E-05	0.153E-04	0.218E-04	0.271E-04	0.302E-04	0.307E-04
0.	0.116E-07	0.774E-07	0.543E-06	0.508E-05	0.932E-05	0.155E-04	0.221E-04	0.273E-04	0.305E-04	0.312E-04
-25.	0.112E-07	0.747E-07	0.526E-06	0.499E-05	0.920E-05	0.153E-04	0.218E-04	0.271E-04	0.302E-04	0.307E-04
-50.	0.101E-07	0.666E-07	0.470E-06	0.466E-05	0.871E-05	0.146E-04	0.209E-04	0.259E-04	0.287E-04	0.290E-04
-75.	0.834E-08	0.538E-07	0.369E-06	0.365E-05	0.692E-05	0.118E-04	0.168E-04	0.208E-04	0.230E-04	0.230E-04
-100.	0.635E-08	0.388E-07	0.241E-06	0.165E-05	0.267E-05	0.406E-05	0.562E-05	0.709E-05	0.828E-05	0.906E-05

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.942E-05	0.956E-05	0.107E-04	0.128E-04	0.155E-04
75.	0.212E-04	0.188E-04	0.158E-04	0.174E-04	0.201E-04
50.	0.270E-04	0.241E-04	0.200E-04	0.214E-04	0.241E-04
25.	0.289E-04	0.262E-04	0.225E-04	0.240E-04	0.268E-04
0.	0.294E-04	0.267E-04	0.232E-04	0.249E-04	0.277E-04
-25.	0.289E-04	0.262E-04	0.225E-04	0.240E-04	0.268E-04
-50.	0.270E-04	0.241E-04	0.200E-04	0.214E-04	0.241E-04
-75.	0.212E-04	0.188E-04	0.158E-04	0.174E-04	0.201E-04

-100.	0.942E-05	0.956E-05	0.107E-04	0.128E-04	0.155E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.461E-08	0.281E-07	0.174E-06	0.119E-05	0.192E-05	0.293E-05	0.405E-05	0.511E-05	0.597E-05	0.653E-05
75.	0.604E-08	0.389E-07	0.266E-06	0.263E-05	0.499E-05	0.847E-05	0.121E-04	0.150E-04	0.165E-04	0.166E-04
50.	0.728E-08	0.481E-07	0.339E-06	0.336E-05	0.628E-05	0.105E-04	0.151E-04	0.186E-04	0.207E-04	0.209E-04
25.	0.810E-08	0.540E-07	0.379E-06	0.360E-05	0.663E-05	0.110E-04	0.157E-04	0.195E-04	0.218E-04	0.222E-04
0.	0.838E-08	0.559E-07	0.392E-06	0.366E-05	0.672E-05	0.112E-04	0.159E-04	0.197E-04	0.220E-04	0.225E-04
-25.	0.810E-08	0.540E-07	0.379E-06	0.360E-05	0.663E-05	0.110E-04	0.157E-04	0.195E-04	0.218E-04	0.222E-04
-50.	0.728E-08	0.481E-07	0.339E-06	0.336E-05	0.628E-05	0.105E-04	0.151E-04	0.186E-04	0.207E-04	0.209E-04
-75.	0.604E-08	0.389E-07	0.266E-06	0.263E-05	0.499E-05	0.847E-05	0.121E-04	0.150E-04	0.165E-04	0.166E-04
-100.	0.461E-08	0.281E-07	0.174E-06	0.119E-05	0.192E-05	0.293E-05	0.405E-05	0.511E-05	0.597E-05	0.653E-05

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.680E-05	0.690E-05	0.770E-05	0.924E-05	0.112E-04
75.	0.153E-04	0.135E-04	0.114E-04	0.126E-04	0.146E-04
50.	0.194E-04	0.174E-04	0.145E-04	0.155E-04	0.175E-04
25.	0.208E-04	0.189E-04	0.162E-04	0.173E-04	0.194E-04
0.	0.212E-04	0.193E-04	0.168E-04	0.180E-04	0.201E-04
-25.	0.208E-04	0.189E-04	0.162E-04	0.173E-04	0.194E-04
-50.	0.194E-04	0.174E-04	0.145E-04	0.155E-04	0.175E-04
-75.	0.153E-04	0.135E-04	0.114E-04	0.126E-04	0.146E-04
-100.	0.680E-05	0.690E-05	0.770E-05	0.924E-05	0.112E-04

MELBY ROAD (0-20 FEET)(TCE)

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NO. OF POINTS IN X-DIRECTION .......................   15
NO. OF POINTS IN Y-DIRECTION .......................    9
NO. OF POINTS IN Z-DIRECTION .......................    1
NO. OF ROOTS: NO. OF SERIES TERMS ..................  400
NO. OF BEGINNING TIME STEP .........................   25
NO. OF ENDING TIME STEP ............................  277
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION ....   12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE    1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE ....  540
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT ....    1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD     2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...  0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...  0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ......... -0.6270E+02
END POINT OF X-SOURCE LOCATION (METERS) ...........  0.6270E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ......... -0.8717E+02
END POINT OF Y-SOURCE LOCATION (METERS) ...........  0.8717E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS) .........  0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ...........  0.0000E+00

POROSITY ..........................................  0.2500E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) ...............  0.3429E+01
HYDRAULIC GRADIENT ................................  0.1000E-02
LONGITIDUNAL DESPERSIVITY (METER) .................  0.5000E+02
LATERAL DISPERSIVITY (METER) ......................  0.5000E+01
VERTICAL DISPERSIVITY (METER) .....................  0.5000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) ............  0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..  0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)   0.0000E+00
DECAY CONSTANT (PER HOUR) .........................  0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3) ................  0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE ......  0.1000E-01
DENSITY OF WATER (KG/M**3) ........................  0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..  0.7300E+03
DISCHARGE TIME (HR) ...............................  0.3942E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .  0.0000E+00
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LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.219E-05	0.314E-05	0.426E-05	0.391E-05	0.309E-05	0.284E-05	0.177E-05	0.123E-05
0.887E-06	0.789E-06	0.702E-06	0.133E-05	0.200E-05	0.240E-05	0.326E-05	0.300E-05	0.237E-05	0.218E-05
0.136E-05	0.941E-06	0.679E-06	0.604E-06	0.537E-06	0.101E-05	0.153E-05	0.183E-05	0.249E-05	0.229E-05
0.181E-05	0.166E-05	0.103E-05	0.716E-06	0.517E-06	0.460E-06	0.409E-06	0.772E-06	0.116E-05	0.139E-05
0.189E-05	0.174E-05	0.138E-05	0.126E-05	0.786E-06	0.544E-06	0.392E-06	0.349E-06	0.310E-06	0.586E-06
0.881E-06	0.106E-05	0.143E-05	0.132E-05	0.104E-05	0.956E-06	0.596E-06	0.412E-06	0.297E-06	0.264E-06
0.235E-06	0.443E-06	0.667E-06	0.799E-06	0.109E-05	0.998E-06	0.788E-06	0.723E-06	0.451E-06	0.312E-06
0.225E-06	0.200E-06	0.178E-06	0.336E-06	0.505E-06	0.604E-06	0.821E-06	0.755E-06	0.596E-06	0.547E-06
0.341E-06	0.236E-06	0.170E-06	0.151E-06	0.134E-06	0.254E-06	0.382E-06	0.457E-06	0.621E-06	0.570E-06
0.451E-06	0.414E-06	0.258E-06	0.178E-06	0.129E-06	0.114E-06	0.101E-06	0.192E-06	0.288E-06	0.345E-06
0.469E-06	0.431E-06	0.341E-06	0.312E-06	0.195E-06	0.135E-06	0.971E-07	0.863E-07	0.767E-07	0.145E-06
0.218E-06	0.261E-06	0.354E-06	0.326E-06	0.257E-06	0.236E-06	0.147E-06	0.102E-06	0.733E-07	0.652E-07
0.579E-07	0.109E-06	0.164E-06	0.197E-06	0.268E-06	0.246E-06	0.194E-06	0.178E-06	0.111E-06	0.768E-07
0.554E-07	0.493E-07	0.438E-07	0.827E-07	0.124E-06	0.149E-06	0.202E-06	0.186E-06	0.147E-06	0.135E-06
0.840E-07	0.581E-07	0.419E-07	0.373E-07	0.331E-07	0.625E-07	0.941E-07	0.113E-06	0.153E-06	0.141E-06
0.111E-06	0.102E-06	0.635E-07	0.439E-07	0.317E-07	0.282E-07	0.250E-07	0.473E-07	0.711E-07	0.852E-07
0.116E-06	0.106E-06	0.840E-07	0.771E-07	0.480E-07	0.332E-07	0.240E-07	0.213E-07	0.189E-07	0.357E-07
0.538E-07	0.644E-07	0.875E-07	0.804E-07	0.635E-07	0.583E-07	0.363E-07	0.251E-07	0.181E-07	0.161E-07
0.143E-07	0.270E-07	0.406E-07	0.487E-07	0.661E-07	0.608E-07	0.480E-07	0.440E-07	0.274E-07	0.190E-07
0.137E-07	0.122E-07	0.108E-07	0.204E-07	0.307E-07	0.368E-07	0.499E-07	0.459E-07	0.363E-07	0.333E-07
0.207E-07	0.143E-07	0.103E-07	0.919E-08	0.817E-08	0.154E-07	0.232E-07	0.278E-07	0.377E-07	0.347E-07
0.274E-07	0.251E-07	0.157E-07	0.108E-07	0.781E-08	0.694E-08	0.617E-08	0.117E-07	0.175E-07	0.210E-07
0.285E-07	0.262E-07	0.207E-07	0.190E-07	0.118E-07	0.818E-08	0.590E-08	0.524E-08	0.466E-08	0.880E-08
0.132E-07	0.159E-07	0.215E-07	0.198E-07	0.156E-07	0.143E-07	0.893E-08	0.618E-08	0.446E-08	0.396E-08
0.352E-08	0.665E-08	0.100E-07	0.120E-07	0.163E-07	0.150E-07	0.118E-07	0.108E-07	0.675E-08	0.467E-08
0.337E-08	0.299E-08	0.266E-08	0.502E-08	0.755E-08	0.904E-08	0.123E-07	0.113E-07	0.892E-08	0.818E-08
0.510E-08	0.352E-08	0.254E-08	0.226E-08	0.201E-08	0.379E-08	0.570E-08	0.683E-08	0.927E-08	0.852E-08
0.673E-08	0.617E-08	0.385E-08	0.266E-08	0.192E-08	0.170E-08	0.151E-08	0.286E-08	0.430E-08	0.515E-08
0.700E-08	0.643E-08	0.508E-08	0.466E-08	0.290E-08	0.201E-08	0.145E-08	0.129E-08	0.114E-08	0.216E-08
0.325E-08	0.389E-08	0.527E-08	0.485E-08	0.383E-08	0.351E-08	0.219E-08	0.151E-08	0.109E-08	0.969E-09
0.861E-09	0.163E-08	0.245E-08	0.294E-08	0.398E-08	0.366E-08	0.289E-08	0.265E-08	0.165E-08	0.114E-08
0.823E-09	0.731E-09	0.650E-09	0.123E-08	0.184E-08	0.220E-08	0.299E-08	0.275E-08	0.218E-08	0.200E-08
0.125E-08	0.862E-09	0.622E-09	0.552E-09	0.490E-09	0.924E-09	0.139E-08	0.166E-08	0.225E-08	0.207E-08
0.163E-08	0.150E-08	0.931E-09	0.643E-09	0.463E-09	0.412E-09	0.365E-09	0.689E-09	0.103E-08	0.124E-08
0.168E-08	0.155E-08	0.122E-08	0.112E-08	0.696E-09	0.480E-09	0.346E-09	0.307E-09	0.273E-09	0.515E-09
0.772E-09	0.923E-09	0.125E-08	0.114E-08	0.903E-09	0.827E-09	0.514E-09	0.354E-09	0.255E-09	0.227E-09
0.201E-09	0.380E-09	0.570E-09	0.682E-09	0.926E-09	0.852E-09	0.673E-09	0.618E-09	0.384E-09	0.266E-09
0.191E-09	0.170E-09	0.151E-09	0.285E-09	0.427E-09	0.510E-09	0.690E-09	0.634E-09	0.500E-09	0.458E-09

0.285E-09	0.197E-09	0.142E-09	0.126E-09	0.112E-09	0.213E-09	0.322E-09	0.385E-09	0.520E-09	0.477E-09
0.376E-09	0.344E-09	0.214E-09	0.148E-09	0.107E-09	0.969E-10	0.870E-10	0.166E-09	0.255E-09	0.307E-09
0.414E-09	0.378E-09	0.296E-09	0.273E-09	0.172E-09	0.120E-09	0.889E-10	0.807E-10	0.732E-10	0.141E-09
0.215E-09	0.259E-09	0.347E-09	0.314E-09	0.246E-09	0.228E-09	0.145E-09	0.103E-09	0.756E-10	0.686E-10
0.623E-10	0.120E-09	0.183E-09	0.221E-09	0.297E-09	0.267E-09	0.211E-09	0.198E-09	0.125E-09	0.881E-10
0.645E-10	0.585E-10	0.532E-10	0.102E-09	0.155E-09	0.189E-09	0.257E-09	0.233E-09	0.186E-09	0.175E-09
0.111E-09	0.780E-10	0.572E-10	0.520E-10	0.473E-10	0.906E-10	0.138E-09	0.167E-09	0.228E-09	0.208E-09
0.167E-09	0.156E-09	0.990E-10	0.698E-10	0.511E-10	0.464E-10	0.419E-10	0.801E-10	0.122E-09	0.148E-09
0.204E-09	0.189E-09	0.152E-09	0.142E-09	0.899E-10	0.632E-10	0.467E-10	0.424E-10	0.382E-10	0.730E-10
0.111E-09	0.135E-09	0.186E-09	0.175E-09	0.141E-09	0.131E-09	0.837E-10	0.595E-10	0.439E-10	0.399E-10
0.359E-10	0.686E-10	0.105E-09	0.127E-09	0.175E-09	0.164E-09	0.132E-09	0.124E-09	0.787E-10	0.558E-10
0.411E-10	0.374E-10	0.337E-10	0.642E-10	0.981E-10	0.119E-09	0.164E-09	0.152E-09	0.123E-09	0.114E-09

RETARDATION FACTOR .... 0.1000E+01
RETARDED DARCY VELOCITY (M/HR) 0.1372E-01
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.6858E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.6858E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.6858E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

3

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

4

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.227E-12	0.283E-09	0.521E-07	0.259E-05	0.541E-05	0.951E-05	0.139E-04	0.171E-04	0.186E-04	0.177E-04
75.	0.522E-12	0.693E-09	0.139E-06	0.950E-05	0.224E-04	0.423E-04	0.625E-04	0.760E-04	0.799E-04	0.729E-04
50.	0.708E-12	0.934E-09	0.185E-06	0.120E-04	0.277E-04	0.517E-04	0.762E-04	0.928E-04	0.981E-04	0.901E-04
25.	0.752E-12	0.983E-09	0.193E-06	0.122E-04	0.282E-04	0.524E-04	0.773E-04	0.942E-04	0.996E-04	0.916E-04
0.	0.756E-12	0.986E-09	0.193E-06	0.122E-04	0.282E-04	0.525E-04	0.773E-04	0.942E-04	0.996E-04	0.917E-04
-25.	0.752E-12	0.983E-09	0.193E-06	0.122E-04	0.282E-04	0.524E-04	0.773E-04	0.942E-04	0.996E-04	0.916E-04
-50.	0.708E-12	0.934E-09	0.185E-06	0.120E-04	0.277E-04	0.517E-04	0.762E-04	0.928E-04	0.981E-04	0.901E-04
-75.	0.522E-12	0.693E-09	0.139E-06	0.950E-05	0.224E-04	0.423E-04	0.625E-04	0.760E-04	0.799E-04	0.729E-04
-100.	0.227E-12	0.283E-09	0.521E-07	0.259E-05	0.541E-05	0.951E-05	0.139E-04	0.171E-04	0.186E-04	0.177E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.148E-04	0.109E-04	0.134E-05	0.482E-07	0.475E-09
75.	0.562E-04	0.370E-04	0.354E-05	0.118E-06	0.112E-08
50.	0.703E-04	0.472E-04	0.473E-05	0.159E-06	0.152E-08
25.	0.717E-04	0.483E-04	0.493E-05	0.167E-06	0.161E-08
0.	0.718E-04	0.484E-04	0.494E-05	0.168E-06	0.161E-08
-25.	0.717E-04	0.483E-04	0.493E-05	0.167E-06	0.161E-08
-50.	0.703E-04	0.472E-04	0.473E-05	0.159E-06	0.152E-08
-75.	0.562E-04	0.370E-04	0.354E-05	0.118E-06	0.112E-08
-100.	0.148E-04	0.109E-04	0.134E-05	0.482E-07	0.475E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

5

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.775E-09	0.181E-07	0.284E-06	0.381E-05	0.684E-05	0.111E-04	0.157E-04	0.197E-04	0.223E-04	0.229E-04
75.	0.130E-08	0.310E-07	0.534E-06	0.106E-04	0.221E-04	0.394E-04	0.573E-04	0.702E-04	0.758E-04	0.727E-04
50.	0.173E-08	0.414E-07	0.714E-06	0.136E-04	0.278E-04	0.489E-04	0.710E-04	0.872E-04	0.947E-04	0.917E-04
25.	0.197E-08	0.468E-07	0.791E-06	0.143E-04	0.289E-04	0.506E-04	0.732E-04	0.901E-04	0.981E-04	0.955E-04
0.	0.203E-08	0.483E-07	0.810E-06	0.144E-04	0.291E-04	0.509E-04	0.736E-04	0.906E-04	0.987E-04	0.962E-04
-25.	0.197E-08	0.468E-07	0.791E-06	0.143E-04	0.289E-04	0.506E-04	0.732E-04	0.901E-04	0.981E-04	0.955E-04
-50.	0.173E-08	0.414E-07	0.714E-06	0.136E-04	0.278E-04	0.489E-04	0.710E-04	0.872E-04	0.947E-04	0.917E-04
-75.	0.130E-08	0.310E-07	0.534E-06	0.106E-04	0.221E-04	0.394E-04	0.573E-04	0.702E-04	0.758E-04	0.727E-04
-100.	0.775E-09	0.181E-07	0.284E-06	0.381E-05	0.684E-05	0.111E-04	0.157E-04	0.197E-04	0.223E-04	0.229E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.217E-04	0.193E-04	0.104E-04	0.456E-05	0.132E-05
75.	0.617E-04	0.480E-04	0.190E-04	0.777E-05	0.220E-05
50.	0.789E-04	0.626E-04	0.254E-04	0.104E-04	0.293E-05
25.	0.829E-04	0.666E-04	0.283E-04	0.117E-04	0.333E-05
0.	0.837E-04	0.674E-04	0.290E-04	0.121E-04	0.345E-05
-25.	0.829E-04	0.666E-04	0.283E-04	0.117E-04	0.333E-05
-50.	0.789E-04	0.626E-04	0.254E-04	0.104E-04	0.293E-05
-75.	0.617E-04	0.480E-04	0.190E-04	0.777E-05	0.220E-05
-100.	0.217E-04	0.193E-04	0.104E-04	0.456E-05	0.132E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.278E-08	0.350E-07	0.360E-06	0.357E-05	0.614E-05	0.970E-05	0.136E-04	0.171E-04	0.196E-04	0.207E-04
75.	0.425E-08	0.553E-07	0.622E-06	0.905E-05	0.182E-04	0.319E-04	0.461E-04	0.566E-04	0.617E-04	0.602E-04
50.	0.551E-08	0.724E-07	0.822E-06	0.116E-04	0.230E-04	0.397E-04	0.573E-04	0.705E-04	0.773E-04	0.761E-04
25.	0.629E-08	0.824E-07	0.921E-06	0.124E-04	0.241E-04	0.413E-04	0.594E-04	0.733E-04	0.806E-04	0.799E-04
0.	0.655E-08	0.856E-07	0.949E-06	0.125E-04	0.243E-04	0.416E-04	0.599E-04	0.739E-04	0.813E-04	0.808E-04
-25.	0.629E-08	0.824E-07	0.921E-06	0.124E-04	0.241E-04	0.413E-04	0.594E-04	0.733E-04	0.806E-04	0.799E-04
-50.	0.551E-08	0.724E-07	0.822E-06	0.116E-04	0.230E-04	0.397E-04	0.573E-04	0.705E-04	0.773E-04	0.761E-04
-75.	0.425E-08	0.553E-07	0.622E-06	0.905E-05	0.182E-04	0.319E-04	0.461E-04	0.566E-04	0.617E-04	0.602E-04
-100.	0.278E-08	0.350E-07	0.360E-06	0.357E-05	0.614E-05	0.970E-05	0.136E-04	0.171E-04	0.196E-04	0.207E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.203E-04	0.192E-04	0.143E-04	0.990E-05	0.553E-05
75.	0.528E-04	0.433E-04	0.241E-04	0.155E-04	0.839E-05
50.	0.676E-04	0.563E-04	0.317E-04	0.202E-04	0.109E-04
25.	0.717E-04	0.606E-04	0.357E-04	0.231E-04	0.124E-04
0.	0.727E-04	0.617E-04	0.369E-04	0.239E-04	0.129E-04
-25.	0.717E-04	0.606E-04	0.357E-04	0.231E-04	0.124E-04
-50.	0.676E-04	0.563E-04	0.317E-04	0.202E-04	0.109E-04
-75.	0.528E-04	0.433E-04	0.241E-04	0.155E-04	0.839E-05
-100.	0.203E-04	0.192E-04	0.143E-04	0.990E-05	0.553E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.420E-08	0.404E-07	0.343E-06	0.299E-05	0.503E-05	0.787E-05	0.110E-04	0.138E-04	0.159E-04	0.170E-04
75.	0.611E-08	0.611E-07	0.570E-06	0.726E-05	0.144E-04	0.249E-04	0.359E-04	0.442E-04	0.483E-04	0.476E-04
50.	0.778E-08	0.787E-07	0.746E-06	0.933E-05	0.181E-04	0.310E-04	0.446E-04	0.550E-04	0.605E-04	0.601E-04
25.	0.886E-08	0.896E-07	0.837E-06	0.995E-05	0.190E-04	0.324E-04	0.464E-04	0.573E-04	0.633E-04	0.633E-04
0.	0.922E-08	0.931E-07	0.864E-06	0.101E-04	0.192E-04	0.327E-04	0.468E-04	0.578E-04	0.639E-04	0.640E-04
-25.	0.886E-08	0.896E-07	0.837E-06	0.995E-05	0.190E-04	0.324E-04	0.464E-04	0.573E-04	0.633E-04	0.633E-04
-50.	0.778E-08	0.787E-07	0.746E-06	0.933E-05	0.181E-04	0.310E-04	0.446E-04	0.550E-04	0.605E-04	0.601E-04
-75.	0.611E-08	0.611E-07	0.570E-06	0.726E-05	0.144E-04	0.249E-04	0.359E-04	0.442E-04	0.483E-04	0.476E-04
-100.	0.420E-08	0.404E-07	0.343E-06	0.299E-05	0.503E-05	0.787E-05	0.110E-04	0.138E-04	0.159E-04	0.170E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.170E-04	0.165E-04	0.142E-04	0.120E-04	0.898E-05

75.	0.423E-04	0.355E-04	0.229E-04	0.180E-04	0.130E-04
50.	0.541E-04	0.461E-04	0.299E-04	0.232E-04	0.165E-04
25.	0.576E-04	0.498E-04	0.337E-04	0.264E-04	0.188E-04
0.	0.585E-04	0.508E-04	0.349E-04	0.274E-04	0.195E-04
-25.	0.576E-04	0.498E-04	0.337E-04	0.264E-04	0.188E-04
-50.	0.541E-04	0.461E-04	0.299E-04	0.232E-04	0.165E-04
-75.	0.423E-04	0.355E-04	0.229E-04	0.180E-04	0.130E-04
-100.	0.170E-04	0.165E-04	0.142E-04	0.120E-04	0.898E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.461E-08	0.382E-07	0.294E-06	0.239E-05	0.398E-05	0.618E-05	0.862E-05	0.108E-04	0.125E-04	0.135E-04
75.	0.652E-08	0.564E-07	0.477E-06	0.567E-05	0.111E-04	0.192E-04	0.276E-04	0.340E-04	0.372E-04	0.368E-04
50.	0.818E-08	0.720E-07	0.620E-06	0.727E-05	0.140E-04	0.239E-04	0.343E-04	0.423E-04	0.466E-04	0.465E-04
25.	0.927E-08	0.816E-07	0.696E-06	0.776E-05	0.147E-04	0.249E-04	0.357E-04	0.441E-04	0.488E-04	0.490E-04
0.	0.964E-08	0.848E-07	0.718E-06	0.788E-05	0.149E-04	0.252E-04	0.360E-04	0.445E-04	0.493E-04	0.496E-04
-25.	0.927E-08	0.816E-07	0.696E-06	0.776E-05	0.147E-04	0.249E-04	0.357E-04	0.441E-04	0.488E-04	0.490E-04
-50.	0.818E-08	0.720E-07	0.620E-06	0.727E-05	0.140E-04	0.239E-04	0.343E-04	0.423E-04	0.466E-04	0.465E-04
-75.	0.652E-08	0.564E-07	0.477E-06	0.567E-05	0.111E-04	0.192E-04	0.276E-04	0.340E-04	0.372E-04	0.368E-04
-100.	0.461E-08	0.382E-07	0.294E-06	0.239E-05	0.398E-05	0.618E-05	0.862E-05	0.108E-04	0.125E-04	0.135E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.136E-04	0.133E-04	0.124E-04	0.118E-04	0.103E-04
75.	0.330E-04	0.281E-04	0.196E-04	0.172E-04	0.144E-04
50.	0.421E-04	0.363E-04	0.253E-04	0.218E-04	0.180E-04
25.	0.449E-04	0.393E-04	0.285E-04	0.247E-04	0.204E-04
0.	0.456E-04	0.401E-04	0.295E-04	0.257E-04	0.213E-04
-25.	0.449E-04	0.393E-04	0.285E-04	0.247E-04	0.204E-04
-50.	0.421E-04	0.363E-04	0.253E-04	0.218E-04	0.180E-04
-75.	0.330E-04	0.281E-04	0.196E-04	0.172E-04	0.144E-04
-100.	0.136E-04	0.133E-04	0.124E-04	0.118E-04	0.103E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.435E-08	0.330E-07	0.239E-06	0.186E-05	0.309E-05	0.477E-05	0.665E-05	0.837E-05	0.969E-05	0.104E-04
75.	0.602E-08	0.479E-07	0.382E-06	0.436E-05	0.850E-05	0.146E-04	0.211E-04	0.259E-04	0.284E-04	0.282E-04
50.	0.749E-08	0.606E-07	0.494E-06	0.559E-05	0.107E-04	0.182E-04	0.261E-04	0.323E-04	0.356E-04	0.356E-04
25.	0.845E-08	0.686E-07	0.554E-06	0.597E-05	0.113E-04	0.190E-04	0.272E-04	0.337E-04	0.373E-04	0.375E-04
0.	0.878E-08	0.712E-07	0.572E-06	0.606E-05	0.114E-04	0.192E-04	0.275E-04	0.340E-04	0.377E-04	0.380E-04
-25.	0.845E-08	0.686E-07	0.554E-06	0.597E-05	0.113E-04	0.190E-04	0.272E-04	0.337E-04	0.373E-04	0.375E-04
-50.	0.749E-08	0.606E-07	0.494E-06	0.559E-05	0.107E-04	0.182E-04	0.261E-04	0.323E-04	0.356E-04	0.356E-04
-75.	0.602E-08	0.479E-07	0.382E-06	0.436E-05	0.850E-05	0.146E-04	0.211E-04	0.259E-04	0.284E-04	0.282E-04
-100.	0.435E-08	0.330E-07	0.239E-06	0.186E-05	0.309E-05	0.477E-05	0.665E-05	0.837E-05	0.969E-05	0.104E-04

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.106E-04	0.105E-04	0.102E-04	0.103E-04	0.994E-05
75.	0.254E-04	0.217E-04	0.159E-04	0.148E-04	0.137E-04
50.	0.324E-04	0.281E-04	0.204E-04	0.187E-04	0.169E-04
25.	0.346E-04	0.304E-04	0.230E-04	0.211E-04	0.191E-04
0.	0.351E-04	0.310E-04	0.238E-04	0.220E-04	0.198E-04
-25.	0.346E-04	0.304E-04	0.230E-04	0.211E-04	0.191E-04
-50.	0.324E-04	0.281E-04	0.204E-04	0.187E-04	0.169E-04
-75.	0.254E-04	0.217E-04	0.159E-04	0.148E-04	0.137E-04
-100.	0.106E-04	0.105E-04	0.102E-04	0.103E-04	0.994E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS

(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.377E-08	0.270E-07	0.189E-06	0.144E-05	0.237E-05	0.365E-05	0.509E-05	0.641E-05	0.742E-05	0.802E-05
75.	0.516E-08	0.388E-07	0.299E-06	0.333E-05	0.647E-05	0.111E-04	0.160E-04	0.197E-04	0.216E-04	0.215E-04
50.	0.636E-08	0.489E-07	0.385E-06	0.426E-05	0.814E-05	0.138E-04	0.199E-04	0.245E-04	0.271E-04	0.271E-04
25.	0.716E-08	0.552E-07	0.432E-06	0.456E-05	0.858E-05	0.145E-04	0.207E-04	0.256E-04	0.284E-04	0.286E-04
0.	0.743E-08	0.573E-07	0.446E-06	0.463E-05	0.868E-05	0.146E-04	0.209E-04	0.258E-04	0.287E-04	0.289E-04
-25.	0.716E-08	0.552E-07	0.432E-06	0.456E-05	0.858E-05	0.145E-04	0.207E-04	0.256E-04	0.284E-04	0.286E-04
-50.	0.636E-08	0.489E-07	0.385E-06	0.426E-05	0.814E-05	0.138E-04	0.199E-04	0.245E-04	0.271E-04	0.271E-04
-75.	0.516E-08	0.388E-07	0.299E-06	0.333E-05	0.647E-05	0.111E-04	0.160E-04	0.197E-04	0.216E-04	0.215E-04
-100.	0.377E-08	0.270E-07	0.189E-06	0.144E-05	0.237E-05	0.365E-05	0.509E-05	0.641E-05	0.742E-05	0.802E-05

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.819E-05	0.812E-05	0.814E-05	0.858E-05	0.877E-05
75.	0.194E-04	0.167E-04	0.125E-04	0.122E-04	0.119E-04
50.	0.247E-04	0.215E-04	0.160E-04	0.152E-04	0.146E-04
25.	0.264E-04	0.233E-04	0.180E-04	0.172E-04	0.164E-04
0.	0.268E-04	0.238E-04	0.186E-04	0.178E-04	0.170E-04
-25.	0.264E-04	0.233E-04	0.180E-04	0.172E-04	0.164E-04
-50.	0.247E-04	0.215E-04	0.160E-04	0.152E-04	0.146E-04
-75.	0.194E-04	0.167E-04	0.125E-04	0.122E-04	0.119E-04
-100.	0.819E-05	0.812E-05	0.814E-05	0.858E-05	0.877E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.311E-08	0.215E-07	0.147E-06	0.110E-05	0.181E-05	0.278E-05	0.388E-05	0.488E-05	0.566E-05	0.612E-05
75.	0.422E-08	0.306E-07	0.231E-06	0.253E-05	0.491E-05	0.844E-05	0.121E-04	0.149E-04	0.164E-04	0.163E-04
50.	0.518E-08	0.385E-07	0.297E-06	0.324E-05	0.618E-05	0.105E-04	0.150E-04	0.186E-04	0.205E-04	0.205E-04
25.	0.581E-08	0.434E-07	0.332E-06	0.346E-05	0.651E-05	0.110E-04	0.157E-04	0.194E-04	0.215E-04	0.217E-04
0.	0.603E-08	0.450E-07	0.343E-06	0.352E-05	0.659E-05	0.111E-04	0.158E-04	0.196E-04	0.217E-04	0.220E-04
-25.	0.581E-08	0.434E-07	0.332E-06	0.346E-05	0.651E-05	0.110E-04	0.157E-04	0.194E-04	0.215E-04	0.217E-04
-50.	0.518E-08	0.385E-07	0.297E-06	0.324E-05	0.618E-05	0.105E-04	0.150E-04	0.186E-04	0.205E-04	0.205E-04
-75.	0.422E-08	0.306E-07	0.231E-06	0.253E-05	0.491E-05	0.844E-05	0.121E-04	0.149E-04	0.164E-04	0.163E-04
-100.	0.311E-08	0.215E-07	0.147E-06	0.110E-05	0.181E-05	0.278E-05	0.388E-05	0.488E-05	0.566E-05	0.612E-05

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.626E-05	0.623E-05	0.635E-05	0.688E-05	0.732E-05
75.	0.147E-04	0.127E-04	0.969E-05	0.967E-05	0.983E-05
50.	0.188E-04	0.164E-04	0.124E-04	0.121E-04	0.120E-04
25.	0.201E-04	0.178E-04	0.139E-04	0.136E-04	0.135E-04
0.	0.204E-04	0.181E-04	0.144E-04	0.141E-04	0.140E-04
-25.	0.201E-04	0.178E-04	0.139E-04	0.136E-04	0.135E-04
-50.	0.188E-04	0.164E-04	0.124E-04	0.121E-04	0.120E-04
-75.	0.147E-04	0.127E-04	0.969E-05	0.967E-05	0.983E-05
-100.	0.626E-05	0.623E-05	0.635E-05	0.688E-05	0.732E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.249E-08	0.168E-07	0.113E-06	0.836E-06	0.137E-05	0.211E-05	0.294E-05	0.370E-05	0.430E-05	0.465E-05
75.	0.336E-08	0.238E-07	0.177E-06	0.192E-05	0.372E-05	0.639E-05	0.918E-05	0.113E-04	0.124E-04	0.124E-04
50.	0.410E-08	0.298E-07	0.227E-06	0.246E-05	0.468E-05	0.794E-05	0.114E-04	0.141E-04	0.155E-04	0.156E-04
25.	0.460E-08	0.336E-07	0.254E-06	0.263E-05	0.493E-05	0.830E-05	0.119E-04	0.147E-04	0.163E-04	0.164E-04
0.	0.477E-08	0.348E-07	0.262E-06	0.267E-05	0.499E-05	0.838E-05	0.120E-04	0.148E-04	0.165E-04	0.166E-04
-25.	0.460E-08	0.336E-07	0.254E-06	0.263E-05	0.493E-05	0.830E-05	0.119E-04	0.147E-04	0.163E-04	0.164E-04
-50.	0.410E-08	0.298E-07	0.227E-06	0.246E-05	0.468E-05	0.794E-05	0.114E-04	0.141E-04	0.155E-04	0.156E-04
-75.	0.336E-08	0.238E-07	0.177E-06	0.192E-05	0.372E-05	0.639E-05	0.918E-05	0.113E-04	0.124E-04	0.124E-04
-100.	0.249E-08	0.168E-07	0.113E-06	0.836E-06	0.137E-05	0.211E-05	0.294E-05	0.370E-05	0.430E-05	0.465E-05

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.477E-05	0.475E-05	0.490E-05	0.541E-05	0.591E-05
75.	0.112E-04	0.967E-05	0.744E-05	0.755E-05	0.788E-05
50.	0.142E-04	0.125E-04	0.950E-05	0.940E-05	0.959E-05
25.	0.152E-04	0.135E-04	0.107E-04	0.106E-04	0.107E-04
0.	0.155E-04	0.138E-04	0.110E-04	0.110E-04	0.111E-04
-25.	0.152E-04	0.135E-04	0.107E-04	0.106E-04	0.107E-04
-50.	0.142E-04	0.125E-04	0.950E-05	0.940E-05	0.959E-05
-75.	0.112E-04	0.967E-05	0.744E-05	0.755E-05	0.788E-05
-100.	0.477E-05	0.475E-05	0.490E-05	0.541E-05	0.591E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.196E-08	0.130E-07	0.861E-07	0.634E-06	0.104E-05	0.160E-05	0.223E-05	0.281E-05	0.326E-05	0.353E-05
75.	0.262E-08	0.183E-07	0.135E-06	0.146E-05	0.282E-05	0.483E-05	0.694E-05	0.855E-05	0.940E-05	0.935E-05
50.	0.320E-08	0.229E-07	0.173E-06	0.186E-05	0.354E-05	0.601E-05	0.861E-05	0.106E-04	0.118E-04	0.118E-04
25.	0.358E-08	0.258E-07	0.193E-06	0.199E-05	0.373E-05	0.628E-05	0.898E-05	0.111E-04	0.123E-04	0.124E-04
0.	0.371E-08	0.267E-07	0.200E-06	0.202E-05	0.378E-05	0.634E-05	0.906E-05	0.112E-04	0.125E-04	0.126E-04
-25.	0.358E-08	0.258E-07	0.193E-06	0.199E-05	0.373E-05	0.628E-05	0.898E-05	0.111E-04	0.123E-04	0.124E-04
-50.	0.320E-08	0.229E-07	0.173E-06	0.186E-05	0.354E-05	0.601E-05	0.861E-05	0.106E-04	0.118E-04	0.118E-04
-75.	0.262E-08	0.183E-07	0.135E-06	0.146E-05	0.282E-05	0.483E-05	0.694E-05	0.855E-05	0.940E-05	0.935E-05
-100.	0.196E-08	0.130E-07	0.861E-07	0.634E-06	0.104E-05	0.160E-05	0.223E-05	0.281E-05	0.326E-05	0.353E-05

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.362E-05	0.361E-05	0.375E-05	0.419E-05	0.467E-05
75.	0.847E-05	0.733E-05	0.568E-05	0.583E-05	0.620E-05
50.	0.108E-04	0.944E-05	0.725E-05	0.724E-05	0.752E-05
25.	0.115E-04	0.102E-04	0.814E-05	0.814E-05	0.839E-05
0.	0.117E-04	0.104E-04	0.842E-05	0.844E-05	0.870E-05
-25.	0.115E-04	0.102E-04	0.814E-05	0.814E-05	0.839E-05
-50.	0.108E-04	0.944E-05	0.725E-05	0.724E-05	0.752E-05
-75.	0.847E-05	0.733E-05	0.568E-05	0.583E-05	0.620E-05
-100.	0.362E-05	0.361E-05	0.375E-05	0.419E-05	0.467E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.152E-08	0.995E-08	0.655E-07	0.481E-06	0.789E-06	0.121E-05	0.169E-05	0.212E-05	0.247E-05	0.267E-05
75.	0.203E-08	0.140E-07	0.102E-06	0.110E-05	0.213E-05	0.365E-05	0.525E-05	0.646E-05	0.711E-05	0.707E-05
50.	0.247E-08	0.175E-07	0.131E-06	0.141E-05	0.268E-05	0.454E-05	0.651E-05	0.804E-05	0.889E-05	0.891E-05
25.	0.276E-08	0.197E-07	0.147E-06	0.150E-05	0.282E-05	0.475E-05	0.679E-05	0.839E-05	0.932E-05	0.940E-05
0.	0.286E-08	0.204E-07	0.152E-06	0.153E-05	0.286E-05	0.479E-05	0.685E-05	0.847E-05	0.942E-05	0.952E-05
-25.	0.276E-08	0.197E-07	0.147E-06	0.150E-05	0.282E-05	0.475E-05	0.679E-05	0.839E-05	0.932E-05	0.940E-05
-50.	0.247E-08	0.175E-07	0.131E-06	0.141E-05	0.268E-05	0.454E-05	0.651E-05	0.804E-05	0.889E-05	0.891E-05
-75.	0.203E-08	0.140E-07	0.102E-06	0.110E-05	0.213E-05	0.365E-05	0.525E-05	0.646E-05	0.711E-05	0.707E-05
-100.	0.152E-08	0.995E-08	0.655E-07	0.481E-06	0.789E-06	0.121E-05	0.169E-05	0.212E-05	0.247E-05	0.267E-05

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.274E-05	0.274E-05	0.286E-05	0.322E-05	0.364E-05
75.	0.641E-05	0.555E-05	0.432E-05	0.447E-05	0.481E-05
50.	0.816E-05	0.714E-05	0.551E-05	0.554E-05	0.582E-05
25.	0.871E-05	0.774E-05	0.618E-05	0.623E-05	0.649E-05
0.	0.885E-05	0.789E-05	0.639E-05	0.646E-05	0.672E-05
-25.	0.871E-05	0.774E-05	0.618E-05	0.623E-05	0.649E-05
-50.	0.816E-05	0.714E-05	0.551E-05	0.554E-05	0.582E-05
-75.	0.641E-05	0.555E-05	0.432E-05	0.447E-05	0.481E-05
-100.	0.274E-05	0.274E-05	0.286E-05	0.322E-05	0.364E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.117E-08	0.759E-08	0.497E-07	0.364E-06	0.597E-06	0.918E-06	0.128E-05	0.161E-05	0.187E-05	0.202E-05
75.	0.156E-08	0.107E-07	0.775E-07	0.833E-06	0.161E-05	0.276E-05	0.397E-05	0.489E-05	0.538E-05	0.535E-05
50.	0.189E-08	0.133E-07	0.994E-07	0.107E-05	0.203E-05	0.344E-05	0.492E-05	0.608E-05	0.672E-05	0.674E-05
25.	0.211E-08	0.150E-07	0.111E-06	0.114E-05	0.213E-05	0.359E-05	0.513E-05	0.635E-05	0.705E-05	0.711E-05
0.	0.219E-08	0.155E-07	0.115E-06	0.116E-05	0.216E-05	0.363E-05	0.518E-05	0.641E-05	0.712E-05	0.720E-05
-25.	0.211E-08	0.150E-07	0.111E-06	0.114E-05	0.213E-05	0.359E-05	0.513E-05	0.635E-05	0.705E-05	0.711E-05
-50.	0.189E-08	0.133E-07	0.994E-07	0.107E-05	0.203E-05	0.344E-05	0.492E-05	0.608E-05	0.672E-05	0.674E-05
-75.	0.156E-08	0.107E-07	0.775E-07	0.833E-06	0.161E-05	0.276E-05	0.397E-05	0.489E-05	0.538E-05	0.535E-05
-100.	0.117E-08	0.759E-08	0.497E-07	0.364E-06	0.597E-06	0.918E-06	0.128E-05	0.161E-05	0.187E-05	0.202E-05

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.208E-05	0.207E-05	0.217E-05	0.246E-05	0.280E-05
75.	0.485E-05	0.420E-05	0.328E-05	0.341E-05	0.370E-05
50.	0.617E-05	0.540E-05	0.418E-05	0.422E-05	0.447E-05
25.	0.659E-05	0.585E-05	0.469E-05	0.474E-05	0.498E-05
0.	0.670E-05	0.597E-05	0.485E-05	0.492E-05	0.516E-05
-25.	0.659E-05	0.585E-05	0.469E-05	0.474E-05	0.498E-05
-50.	0.617E-05	0.540E-05	0.418E-05	0.422E-05	0.447E-05
-75.	0.485E-05	0.420E-05	0.328E-05	0.341E-05	0.370E-05
-100.	0.208E-05	0.207E-05	0.217E-05	0.246E-05	0.280E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.894E-09	0.577E-08	0.377E-07	0.276E-06	0.452E-06	0.695E-06	0.966E-06	0.122E-05	0.141E-05	0.153E-05
75.	0.119E-08	0.811E-08	0.587E-07	0.631E-06	0.122E-05	0.209E-05	0.300E-05	0.370E-05	0.407E-05	0.405E-05
50.	0.144E-08	0.101E-07	0.752E-07	0.806E-06	0.153E-05	0.260E-05	0.372E-05	0.460E-05	0.508E-05	0.510E-05
25.	0.161E-08	0.114E-07	0.842E-07	0.861E-06	0.161E-05	0.272E-05	0.388E-05	0.480E-05	0.533E-05	0.538E-05
0.	0.167E-08	0.118E-07	0.869E-07	0.875E-06	0.163E-05	0.274E-05	0.392E-05	0.485E-05	0.539E-05	0.545E-05
-25.	0.161E-08	0.114E-07	0.842E-07	0.861E-06	0.161E-05	0.272E-05	0.388E-05	0.480E-05	0.533E-05	0.538E-05
-50.	0.144E-08	0.101E-07	0.752E-07	0.806E-06	0.153E-05	0.260E-05	0.372E-05	0.460E-05	0.508E-05	0.510E-05
-75.	0.119E-08	0.811E-08	0.587E-07	0.631E-06	0.122E-05	0.209E-05	0.300E-05	0.370E-05	0.407E-05	0.405E-05
-100.	0.894E-09	0.577E-08	0.377E-07	0.276E-06	0.452E-06	0.695E-06	0.966E-06	0.122E-05	0.141E-05	0.153E-05

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.157E-05	0.157E-05	0.165E-05	0.187E-05	0.215E-05
75.	0.367E-05	0.318E-05	0.249E-05	0.259E-05	0.283E-05
50.	0.467E-05	0.409E-05	0.316E-05	0.321E-05	0.341E-05
25.	0.499E-05	0.443E-05	0.355E-05	0.360E-05	0.380E-05
0.	0.506E-05	0.452E-05	0.367E-05	0.373E-05	0.394E-05
-25.	0.499E-05	0.443E-05	0.355E-05	0.360E-05	0.380E-05
-50.	0.467E-05	0.409E-05	0.316E-05	0.321E-05	0.341E-05
-75.	0.367E-05	0.318E-05	0.249E-05	0.259E-05	0.283E-05
-100.	0.157E-05	0.157E-05	0.165E-05	0.187E-05	0.215E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.681E-09	0.438E-08	0.286E-07	0.208E-06	0.342E-06	0.526E-06	0.731E-06	0.920E-06	0.107E-05	0.116E-05
75.	0.904E-09	0.615E-08	0.444E-07	0.477E-06	0.922E-06	0.158E-05	0.227E-05	0.280E-05	0.308E-05	0.306E-05
50.	0.110E-08	0.766E-08	0.570E-07	0.609E-06	0.116E-05	0.197E-05	0.282E-05	0.348E-05	0.384E-05	0.385E-05
25.	0.122E-08	0.861E-08	0.637E-07	0.651E-06	0.122E-05	0.205E-05	0.294E-05	0.363E-05	0.403E-05	0.407E-05
0.	0.127E-08	0.892E-08	0.658E-07	0.662E-06	0.124E-05	0.207E-05	0.296E-05	0.367E-05	0.407E-05	0.412E-05

-25.	0.122E-08	0.861E-08	0.637E-07	0.651E-06	0.122E-05	0.205E-05	0.294E-05	0.363E-05	0.403E-05	0.407E-05
-50.	0.110E-08	0.766E-08	0.570E-07	0.609E-06	0.116E-05	0.197E-05	0.282E-05	0.348E-05	0.384E-05	0.385E-05
-75.	0.904E-09	0.615E-08	0.444E-07	0.477E-06	0.922E-06	0.158E-05	0.227E-05	0.280E-05	0.308E-05	0.306E-05
-100.	0.681E-09	0.438E-08	0.286E-07	0.208E-06	0.342E-06	0.526E-06	0.731E-06	0.920E-06	0.107E-05	0.116E-05

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.119E-05	0.119E-05	0.125E-05	0.142E-05	0.164E-05
75.	0.278E-05	0.240E-05	0.188E-05	0.197E-05	0.215E-05
50.	0.353E-05	0.309E-05	0.240E-05	0.243E-05	0.260E-05
25.	0.377E-05	0.335E-05	0.269E-05	0.273E-05	0.289E-05
0.	0.383E-05	0.342E-05	0.278E-05	0.283E-05	0.299E-05
-25.	0.377E-05	0.335E-05	0.269E-05	0.273E-05	0.289E-05
-50.	0.353E-05	0.309E-05	0.240E-05	0.243E-05	0.260E-05
-75.	0.278E-05	0.240E-05	0.188E-05	0.197E-05	0.215E-05
-100.	0.119E-05	0.119E-05	0.125E-05	0.142E-05	0.164E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.518E-09	0.332E-08	0.216E-07	0.158E-06	0.259E-06	0.398E-06	0.553E-06	0.696E-06	0.808E-06	0.876E-06
75.	0.687E-09	0.466E-08	0.336E-07	0.361E-06	0.697E-06	0.119E-05	0.172E-05	0.211E-05	0.233E-05	0.231E-05
50.	0.833E-09	0.580E-08	0.431E-07	0.461E-06	0.876E-06	0.149E-05	0.213E-05	0.263E-05	0.291E-05	0.291E-05
25.	0.929E-09	0.652E-08	0.482E-07	0.492E-06	0.923E-06	0.155E-05	0.222E-05	0.274E-05	0.305E-05	0.308E-05
0.	0.962E-09	0.676E-08	0.498E-07	0.500E-06	0.934E-06	0.157E-05	0.224E-05	0.277E-05	0.308E-05	0.312E-05
-25.	0.929E-09	0.652E-08	0.482E-07	0.492E-06	0.923E-06	0.155E-05	0.222E-05	0.274E-05	0.305E-05	0.308E-05
-50.	0.833E-09	0.580E-08	0.431E-07	0.461E-06	0.876E-06	0.149E-05	0.213E-05	0.263E-05	0.291E-05	0.291E-05
-75.	0.687E-09	0.466E-08	0.336E-07	0.361E-06	0.697E-06	0.119E-05	0.172E-05	0.211E-05	0.233E-05	0.231E-05
-100.	0.518E-09	0.332E-08	0.216E-07	0.158E-06	0.259E-06	0.398E-06	0.553E-06	0.696E-06	0.808E-06	0.876E-06

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.900E-06	0.899E-06	0.946E-06	0.108E-05	0.125E-05
75.	0.210E-05	0.182E-05	0.143E-05	0.149E-05	0.164E-05
50.	0.267E-05	0.234E-05	0.181E-05	0.184E-05	0.197E-05
25.	0.285E-05	0.253E-05	0.203E-05	0.207E-05	0.220E-05
0.	0.290E-05	0.259E-05	0.210E-05	0.214E-05	0.227E-05
-25.	0.285E-05	0.253E-05	0.203E-05	0.207E-05	0.220E-05
-50.	0.267E-05	0.234E-05	0.181E-05	0.184E-05	0.197E-05
-75.	0.210E-05	0.182E-05	0.143E-05	0.149E-05	0.164E-05
-100.	0.900E-06	0.899E-06	0.946E-06	0.108E-05	0.125E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.393E-09	0.252E-08	0.164E-07	0.119E-06	0.196E-06	0.301E-06	0.418E-06	0.526E-06	0.611E-06	0.663E-06
75.	0.521E-09	0.353E-08	0.254E-07	0.273E-06	0.527E-06	0.903E-06	0.130E-05	0.160E-05	0.176E-05	0.175E-05
50.	0.631E-09	0.439E-08	0.326E-07	0.348E-06	0.662E-06	0.112E-05	0.161E-05	0.199E-05	0.220E-05	0.220E-05
25.	0.704E-09	0.493E-08	0.365E-07	0.372E-06	0.698E-06	0.117E-05	0.168E-05	0.207E-05	0.230E-05	0.233E-05
0.	0.729E-09	0.511E-08	0.377E-07	0.378E-06	0.706E-06	0.119E-05	0.169E-05	0.209E-05	0.233E-05	0.235E-05
-25.	0.704E-09	0.493E-08	0.365E-07	0.372E-06	0.698E-06	0.117E-05	0.168E-05	0.207E-05	0.230E-05	0.233E-05
-50.	0.631E-09	0.439E-08	0.326E-07	0.348E-06	0.662E-06	0.112E-05	0.161E-05	0.199E-05	0.220E-05	0.220E-05
-75.	0.521E-09	0.353E-08	0.254E-07	0.273E-06	0.527E-06	0.903E-06	0.130E-05	0.160E-05	0.176E-05	0.175E-05
-100.	0.393E-09	0.252E-08	0.164E-07	0.119E-06	0.196E-06	0.301E-06	0.418E-06	0.526E-06	0.611E-06	0.663E-06

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.681E-06	0.680E-06	0.716E-06	0.818E-06	0.946E-06
75.	0.159E-05	0.138E-05	0.108E-05	0.113E-05	0.124E-05
50.	0.202E-05	0.177E-05	0.137E-05	0.140E-05	0.150E-05
25.	0.215E-05	0.192E-05	0.154E-05	0.157E-05	0.167E-05
0.	0.219E-05	0.195E-05	0.159E-05	0.162E-05	0.172E-05
-25.	0.215E-05	0.192E-05	0.154E-05	0.157E-05	0.167E-05
-50.	0.202E-05	0.177E-05	0.137E-05	0.140E-05	0.150E-05
-75.	0.159E-05	0.138E-05	0.108E-05	0.113E-05	0.124E-05

-100.	0.681E-06	0.680E-06	0.716E-06	0.818E-06	0.946E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.298E-09	0.190E-08	0.124E-07	0.901E-07	0.148E-06	0.227E-06	0.316E-06	0.398E-06	0.462E-06	0.501E-06
75.	0.394E-09	0.267E-08	0.192E-07	0.206E-06	0.398E-06	0.682E-06	0.980E-06	0.121E-05	0.133E-05	0.132E-05
50.	0.478E-09	0.332E-08	0.246E-07	0.263E-06	0.500E-06	0.848E-06	0.122E-05	0.150E-05	0.166E-05	0.166E-05
25.	0.533E-09	0.373E-08	0.276E-07	0.281E-06	0.527E-06	0.887E-06	0.127E-05	0.157E-05	0.174E-05	0.176E-05
0.	0.552E-09	0.387E-08	0.285E-07	0.286E-06	0.534E-06	0.896E-06	0.128E-05	0.158E-05	0.176E-05	0.178E-05
-25.	0.533E-09	0.373E-08	0.276E-07	0.281E-06	0.527E-06	0.887E-06	0.127E-05	0.157E-05	0.174E-05	0.176E-05
-50.	0.478E-09	0.332E-08	0.246E-07	0.263E-06	0.500E-06	0.848E-06	0.122E-05	0.150E-05	0.166E-05	0.166E-05
-75.	0.394E-09	0.267E-08	0.192E-07	0.206E-06	0.398E-06	0.682E-06	0.980E-06	0.121E-05	0.133E-05	0.132E-05
-100.	0.298E-09	0.190E-08	0.124E-07	0.901E-07	0.148E-06	0.227E-06	0.316E-06	0.398E-06	0.462E-06	0.501E-06

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.514E-06	0.514E-06	0.542E-06	0.619E-06	0.718E-06
75.	0.120E-05	0.104E-05	0.815E-06	0.854E-06	0.941E-06
50.	0.153E-05	0.134E-05	0.104E-05	0.106E-05	0.113E-05
25.	0.163E-05	0.145E-05	0.116E-05	0.119E-05	0.126E-05
0.	0.165E-05	0.148E-05	0.120E-05	0.123E-05	0.131E-05
-25.	0.163E-05	0.145E-05	0.116E-05	0.119E-05	0.126E-05
-50.	0.153E-05	0.134E-05	0.104E-05	0.106E-05	0.113E-05
-75.	0.120E-05	0.104E-05	0.815E-06	0.854E-06	0.941E-06
100.	0.514E-06	0.514E-06	0.542E-06	0.619E-06	0.718E-06

MELBY ROAD (1,1,1-TCA)(0 - 10 FEET)(YEAR 20 TO YEAR 35)

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NO. OF POINTS IN X-DIRECTION ......................  15
NO. OF POINTS IN Y-DIRECTION ......................   9
NO. OF POINTS IN Z-DIRECTION ......................   1
NO. OF ROOTS: NO. OF SERIES TERMS ................. 400
NO. OF BEGINNING TIME STEP ........................ 241
NO. OF ENDING TIME STEP ........................... 421
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION ....  12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE   1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE .... 420
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT ....   1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD    2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...  0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...  0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ......... -0.6270E+02
END POINT OF X-SOURCE LOCATION (METERS) ...........  0.6270E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ......... -0.8717E+02
END POINT OF Y-SOURCE LOCATION (METERS) ...........  0.8717E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS) .........  0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ...........  0.0000E+00

POROSITY ..........................................  0.2500E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) ...............  0.3429E+01
HYDRAULIC GRADIENT ................................  0.1000E-02
LONGITIDUNAL DESPERSIVITY (METER) .................  0.5000E+02
LATERAL DISPERSIVITY (METER) ......................  0.5000E+01
VERTICAL DISPERSIVITY (METER) .....................  0.5000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) ............  0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..  0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)   0.0000E+00
DECAY CONSTANT (PER HOUR) .........................  0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3) ................  0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE ......  0.1000E-01
DENSITY OF WATER (KG/M**3) ........................  0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..  0.7300E+03
DISCHARGE TIME (HR) ...............................  0.3066E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .  0.0000E+00
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LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.196E-08	0.673E-08	0.522E-08	0.475E-08	0.292E-08	0.200E-08	0.144E-08	0.127E-08
0.112E-08	0.214E-08	0.322E-08	0.385E-08	0.525E-08	0.480E-08	0.376E-08	0.345E-08	0.212E-08	0.146E-08
0.104E-08	0.927E-09	0.818E-09	0.156E-08	0.234E-08	0.280E-08	0.381E-08	0.348E-08	0.273E-08	0.249E-08
0.153E-08	0.105E-08	0.754E-09	0.668E-09	0.590E-09	0.112E-08	0.169E-08	0.201E-08	0.274E-08	0.251E-08
0.196E-08	0.180E-08	0.110E-08	0.758E-09	0.544E-09	0.482E-09	0.424E-09	0.807E-09	0.121E-08	0.145E-08
0.197E-08	0.179E-08	0.140E-08	0.128E-08	0.787E-09	0.540E-09	0.387E-09	0.343E-09	0.302E-09	0.575E-09
0.864E-09	0.103E-08	0.140E-08	0.128E-08	0.100E-08	0.914E-09	0.561E-09	0.384E-09	0.275E-09	0.243E-09
0.214E-09	0.405E-09	0.609E-09	0.725E-09	0.986E-09	0.900E-09	0.703E-09	0.643E-09	0.395E-09	0.271E-09
0.193E-09	0.171E-09	0.151E-09	0.287E-09	0.431E-09	0.513E-09	0.697E-09	0.636E-09	0.499E-09	0.456E-09

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RETARDATION FACTOR ................................ 0.1000E+01
RETARDED DARCY VELOCITY (M/HR) .................... 0.1372E-01
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.6858E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.6858E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.6858E-01
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DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1840E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1927E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2015E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.

100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2102E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2190E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2278E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2365E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2453E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.170E-13	0.200E-10	0.252E-08	0.588E-08	0.110E-07	0.162E-07	0.198E-07	0.209E-07	0.190E-07
75.	0.000E+00	0.509E-13	0.650E-10	0.113E-07	0.295E-07	0.583E-07	0.870E-07	0.105E-06	0.108E-06	0.949E-07
50.	0.000E+00	0.670E-13	0.844E-10	0.138E-07	0.356E-07	0.697E-07	0.104E-06	0.125E-06	0.129E-06	0.114E-06
25.	0.000E+00	0.687E-13	0.860E-10	0.140E-07	0.359E-07	0.701E-07	0.104E-06	0.126E-06	0.130E-06	0.115E-06
0.	0.000E+00	0.687E-13	0.860E-10	0.140E-07	0.359E-07	0.701E-07	0.104E-06	0.126E-06	0.130E-06	0.115E-06
-25.	0.000E+00	0.687E-13	0.860E-10	0.140E-07	0.359E-07	0.701E-07	0.104E-06	0.126E-06	0.130E-06	0.115E-06
-50.	0.000E+00	0.670E-13	0.844E-10	0.138E-07	0.356E-07	0.697E-07	0.104E-06	0.125E-06	0.129E-06	0.114E-06
-75.	0.000E+00	0.509E-13	0.650E-10	0.113E-07	0.295E-07	0.583E-07	0.870E-07	0.105E-06	0.108E-06	0.949E-07

Y										
-100.	0.000E+00	0.170E-13	0.200E-10	0.252E-08	0.588E-08	0.110E-07	0.162E-07	0.198E-07	0.209E-07	0.190E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.146E-07	0.944E-08	0.452E-09	0.265E-11	0.239E-14
75.	0.684E-07	0.399E-07	0.146E-08	0.792E-11	0.666E-14
50.	0.833E-07	0.494E-07	0.190E-08	0.104E-10	0.886E-14
25.	0.840E-07	0.499E-07	0.194E-08	0.107E-10	0.914E-14
0.	0.840E-07	0.499E-07	0.194E-08	0.107E-10	0.915E-14
-25.	0.840E-07	0.499E-07	0.194E-08	0.107E-10	0.914E-14
-50.	0.833E-07	0.494E-07	0.190E-08	0.104E-10	0.886E-14
-75.	0.684E-07	0.399E-07	0.146E-08	0.792E-11	0.666E-14
-100.	0.146E-07	0.944E-08	0.452E-09	0.265E-11	0.239E-14

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2540E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.689E-12	0.194E-10	0.361E-09	0.557E-08	0.102E-07	0.167E-07	0.238E-07	0.298E-07	0.334E-07	0.341E-07
75.	0.118E-11	0.342E-10	0.703E-09	0.160E-07	0.340E-07	0.611E-07	0.890E-07	0.109E-06	0.117E-06	0.112E-06
50.	0.158E-11	0.459E-10	0.943E-09	0.206E-07	0.427E-07	0.758E-07	0.110E-06	0.135E-06	0.146E-06	0.141E-06
25.	0.179E-11	0.516E-10	0.104E-08	0.216E-07	0.443E-07	0.781E-07	0.113E-06	0.139E-06	0.151E-06	0.146E-06
0.	0.185E-11	0.531E-10	0.106E-08	0.217E-07	0.446E-07	0.785E-07	0.114E-06	0.140E-06	0.152E-06	0.147E-06
-25.	0.179E-11	0.516E-10	0.104E-08	0.216E-07	0.443E-07	0.781E-07	0.113E-06	0.139E-06	0.151E-06	0.146E-06
-50.	0.158E-11	0.459E-10	0.943E-09	0.206E-07	0.427E-07	0.758E-07	0.110E-06	0.135E-06	0.146E-06	0.141E-06
-75.	0.118E-11	0.342E-10	0.703E-09	0.160E-07	0.340E-07	0.611E-07	0.890E-07	0.109E-06	0.117E-06	0.112E-06
-100.	0.689E-12	0.194E-10	0.361E-09	0.557E-08	0.102E-07	0.167E-07	0.238E-07	0.298E-07	0.334E-07	0.341E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.317E-07	0.275E-07	0.127E-07	0.473E-08	0.113E-08
75.	0.937E-07	0.713E-07	0.241E-07	0.828E-08	0.193E-08
50.	0.120E-06	0.928E-07	0.323E-07	0.111E-07	0.258E-08
25.	0.125E-06	0.982E-07	0.358E-07	0.125E-07	0.292E-08
0.	0.126E-06	0.993E-07	0.366E-07	0.129E-07	0.302E-08
-25.	0.125E-06	0.982E-07	0.358E-07	0.125E-07	0.292E-08
-50.	0.120E-06	0.928E-07	0.323E-07	0.111E-07	0.258E-08
-75.	0.937E-07	0.713E-07	0.241E-07	0.828E-08	0.193E-08
-100.	0.317E-07	0.275E-07	0.127E-07	0.473E-08	0.113E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.347E-11	0.479E-10	0.523E-09	0.536E-08	0.923E-08	0.146E-07	0.206E-07	0.258E-07	0.295E-07	0.311E-07
75.	0.538E-11	0.767E-10	0.915E-09	0.137E-07	0.275E-07	0.482E-07	0.696E-07	0.856E-07	0.932E-07	0.910E-07
50.	0.701E-11	0.101E-09	0.121E-08	0.176E-07	0.347E-07	0.600E-07	0.865E-07	0.107E-06	0.117E-06	0.115E-06
25.	0.800E-11	0.115E-09	0.136E-08	0.187E-07	0.364E-07	0.624E-07	0.898E-07	0.111E-06	0.122E-06	0.121E-06
0.	0.832E-11	0.119E-09	0.140E-08	0.189E-07	0.367E-07	0.629E-07	0.905E-07	0.112E-06	0.123E-06	0.122E-06
-25.	0.800E-11	0.115E-09	0.136E-08	0.187E-07	0.364E-07	0.624E-07	0.898E-07	0.111E-06	0.122E-06	0.121E-06
-50.	0.701E-11	0.101E-09	0.121E-08	0.176E-07	0.347E-07	0.600E-07	0.865E-07	0.107E-06	0.117E-06	0.115E-06
-75.	0.538E-11	0.767E-10	0.915E-09	0.137E-07	0.275E-07	0.482E-07	0.696E-07	0.856E-07	0.932E-07	0.910E-07
-100.	0.347E-11	0.479E-10	0.523E-09	0.536E-08	0.923E-08	0.146E-07	0.206E-07	0.258E-07	0.295E-07	0.311E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.305E-07	0.286E-07	0.206E-07	0.133E-07	0.674E-08
75.	0.796E-07	0.652E-07	0.350E-07	0.211E-07	0.104E-07
50.	0.102E-06	0.849E-07	0.463E-07	0.277E-07	0.135E-07
25.	0.108E-06	0.913E-07	0.521E-07	0.315E-07	0.154E-07
0.	0.110E-06	0.929E-07	0.537E-07	0.327E-07	0.161E-07
-25.	0.108E-06	0.913E-07	0.521E-07	0.315E-07	0.154E-07
-50.	0.102E-06	0.849E-07	0.463E-07	0.277E-07	0.135E-07
-75.	0.796E-07	0.652E-07	0.350E-07	0.211E-07	0.104E-07
-100.	0.305E-07	0.286E-07	0.206E-07	0.133E-07	0.674E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2716E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.587E-11	0.586E-10	0.507E-09	0.439E-08	0.737E-08	0.115E-07	0.161E-07	0.202E-07	0.233E-07	0.249E-07
75.	0.861E-11	0.892E-10	0.844E-09	0.106E-07	0.208E-07	0.360E-07	0.519E-07	0.639E-07	0.700E-07	0.691E-07
50.	0.110E-10	0.115E-09	0.111E-08	0.136E-07	0.263E-07	0.449E-07	0.646E-07	0.797E-07	0.878E-07	0.873E-07
25.	0.125E-10	0.131E-09	0.124E-08	0.145E-07	0.277E-07	0.469E-07	0.672E-07	0.831E-07	0.919E-07	0.921E-07
0.	0.130E-10	0.136E-09	0.128E-08	0.148E-07	0.280E-07	0.474E-07	0.678E-07	0.838E-07	0.928E-07	0.932E-07
-25.	0.125E-10	0.131E-09	0.124E-08	0.145E-07	0.277E-07	0.469E-07	0.672E-07	0.831E-07	0.919E-07	0.921E-07
-50.	0.110E-10	0.115E-09	0.111E-08	0.136E-07	0.263E-07	0.449E-07	0.646E-07	0.797E-07	0.878E-07	0.873E-07
-75.	0.861E-11	0.892E-10	0.844E-09	0.106E-07	0.208E-07	0.360E-07	0.519E-07	0.639E-07	0.700E-07	0.691E-07
-100.	0.587E-11	0.586E-10	0.507E-09	0.439E-08	0.737E-08	0.115E-07	0.161E-07	0.202E-07	0.233E-07	0.249E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.250E-07	0.242E-07	0.209E-07	0.174E-07	0.124E-07
75.	0.617E-07	0.521E-07	0.339E-07	0.262E-07	0.181E-07
50.	0.790E-07	0.676E-07	0.442E-07	0.337E-07	0.230E-07
25.	0.842E-07	0.732E-07	0.499E-07	0.384E-07	0.263E-07
0.	0.855E-07	0.746E-07	0.517E-07	0.399E-07	0.273E-07
-25.	0.842E-07	0.732E-07	0.499E-07	0.384E-07	0.263E-07
-50.	0.790E-07	0.676E-07	0.442E-07	0.337E-07	0.230E-07
-75.	0.617E-07	0.521E-07	0.339E-07	0.262E-07	0.181E-07
-100.	0.250E-07	0.242E-07	0.209E-07	0.174E-07	0.124E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2803E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.667E-11	0.559E-10	0.427E-09	0.338E-08	0.560E-08	0.865E-08	0.120E-07	0.152E-07	0.176E-07	0.190E-07
75.	0.946E-11	0.825E-10	0.690E-09	0.791E-08	0.153E-07	0.263E-07	0.379E-07	0.467E-07	0.513E-07	0.509E-07
50.	0.119E-10	0.105E-09	0.897E-09	0.101E-07	0.193E-07	0.328E-07	0.471E-07	0.582E-07	0.643E-07	0.643E-07
25.	0.135E-10	0.120E-09	0.101E-08	0.109E-07	0.204E-07	0.343E-07	0.491E-07	0.608E-07	0.674E-07	0.680E-07
0.	0.140E-10	0.124E-09	0.104E-08	0.110E-07	0.207E-07	0.347E-07	0.496E-07	0.613E-07	0.681E-07	0.689E-07
-25.	0.135E-10	0.120E-09	0.101E-08	0.109E-07	0.204E-07	0.343E-07	0.491E-07	0.608E-07	0.674E-07	0.680E-07
-50.	0.119E-10	0.105E-09	0.897E-09	0.101E-07	0.193E-07	0.328E-07	0.471E-07	0.582E-07	0.643E-07	0.643E-07
-75.	0.946E-11	0.825E-10	0.690E-09	0.791E-08	0.153E-07	0.263E-07	0.379E-07	0.467E-07	0.513E-07	0.509E-07
-100.	0.667E-11	0.559E-10	0.427E-09	0.338E-08	0.560E-08	0.865E-08	0.120E-07	0.152E-07	0.176E-07	0.190E-07

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.193E-07	0.190E-07	0.181E-07	0.172E-07	0.148E-07
75.	0.460E-07	0.395E-07	0.284E-07	0.251E-07	0.208E-07
50.	0.588E-07	0.512E-07	0.368E-07	0.319E-07	0.261E-07
25.	0.628E-07	0.555E-07	0.415E-07	0.362E-07	0.296E-07
0.	0.638E-07	0.566E-07	0.430E-07	0.377E-07	0.308E-07
-25.	0.628E-07	0.555E-07	0.415E-07	0.362E-07	0.296E-07
-50.	0.588E-07	0.512E-07	0.368E-07	0.319E-07	0.261E-07
-75.	0.460E-07	0.395E-07	0.284E-07	0.251E-07	0.208E-07
-100.	0.193E-07	0.190E-07	0.181E-07	0.172E-07	0.148E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2891E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.630E-11	0.474E-10	0.336E-09	0.252E-08	0.414E-08	0.636E-08	0.884E-08	0.111E-07	0.129E-07	0.140E-07
75.	0.873E-11	0.686E-10	0.533E-09	0.578E-08	0.111E-07	0.190E-07	0.273E-07	0.337E-07	0.371E-07	0.370E-07
50.	0.108E-10	0.868E-10	0.688E-09	0.740E-08	0.140E-07	0.237E-07	0.340E-07	0.420E-07	0.465E-07	0.467E-07
25.	0.122E-10	0.982E-10	0.773E-09	0.793E-08	0.148E-07	0.248E-07	0.354E-07	0.439E-07	0.488E-07	0.493E-07

0.	0.127E-10	0.102E-09	0.799E-09	0.806E-08	0.150E-07	0.251E-07	0.358E-07	0.443E-07	0.493E-07	0.500E-07
-25.	0.122E-10	0.982E-10	0.773E-09	0.793E-08	0.148E-07	0.248E-07	0.354E-07	0.439E-07	0.488E-07	0.493E-07
-50.	0.108E-10	0.868E-10	0.688E-09	0.740E-08	0.140E-07	0.237E-07	0.340E-07	0.420E-07	0.465E-07	0.467E-07
-75.	0.873E-11	0.686E-10	0.533E-09	0.578E-08	0.111E-07	0.190E-07	0.273E-07	0.337E-07	0.371E-07	0.370E-07
-100.	0.630E-11	0.474E-10	0.336E-09	0.252E-08	0.414E-08	0.636E-08	0.884E-08	0.111E-07	0.129E-07	0.140E-07

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.144E-07	0.143E-07	0.145E-07	0.149E-07	0.144E-07
75.	0.336E-07	0.292E-07	0.223E-07	0.213E-07	0.198E-07
50.	0.429E-07	0.377E-07	0.287E-07	0.269E-07	0.245E-07
25.	0.459E-07	0.409E-07	0.323E-07	0.304E-07	0.277E-07
0.	0.466E-07	0.418E-07	0.334E-07	0.316E-07	0.288E-07
-25.	0.459E-07	0.409E-07	0.323E-07	0.304E-07	0.277E-07
-50.	0.429E-07	0.377E-07	0.287E-07	0.269E-07	0.245E-07
-75.	0.336E-07	0.292E-07	0.223E-07	0.213E-07	0.198E-07
-100.	0.144E-07	0.143E-07	0.145E-07	0.149E-07	0.144E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2978E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.537E-11	0.377E-10	0.254E-09	0.184E-08	0.300E-08	0.459E-08	0.637E-08	0.803E-08	0.934E-08	0.102E-07
75.	0.732E-11	0.538E-10	0.398E-09	0.415E-08	0.795E-08	0.136E-07	0.194E-07	0.240E-07	0.264E-07	0.264E-07
50.	0.902E-11	0.676E-10	0.512E-09	0.532E-08	0.100E-07	0.169E-07	0.241E-07	0.299E-07	0.331E-07	0.333E-07
25.	0.102E-10	0.763E-10	0.575E-09	0.570E-08	0.106E-07	0.177E-07	0.252E-07	0.312E-07	0.348E-07	0.353E-07
0.	0.105E-10	0.792E-10	0.594E-09	0.579E-08	0.107E-07	0.179E-07	0.255E-07	0.315E-07	0.352E-07	0.357E-07
-25.	0.102E-10	0.763E-10	0.575E-09	0.570E-08	0.106E-07	0.177E-07	0.252E-07	0.312E-07	0.348E-07	0.353E-07
-50.	0.902E-11	0.676E-10	0.512E-09	0.532E-08	0.100E-07	0.169E-07	0.241E-07	0.299E-07	0.331E-07	0.333E-07
-75.	0.732E-11	0.538E-10	0.398E-09	0.415E-08	0.795E-08	0.136E-07	0.194E-07	0.240E-07	0.264E-07	0.264E-07
-100.	0.537E-11	0.377E-10	0.254E-09	0.184E-08	0.300E-08	0.459E-08	0.637E-08	0.803E-08	0.934E-08	0.102E-07

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.105E-07	0.105E-07	0.111E-07	0.120E-07	0.125E-07
75.	0.241E-07	0.211E-07	0.168E-07	0.170E-07	0.169E-07
50.	0.308E-07	0.272E-07	0.215E-07	0.212E-07	0.208E-07
25.	0.329E-07	0.296E-07	0.242E-07	0.239E-07	0.234E-07
0.	0.335E-07	0.302E-07	0.251E-07	0.249E-07	0.243E-07
-25.	0.329E-07	0.296E-07	0.242E-07	0.239E-07	0.234E-07
-50.	0.308E-07	0.272E-07	0.215E-07	0.212E-07	0.208E-07
-75.	0.241E-07	0.211E-07	0.168E-07	0.170E-07	0.169E-07
-100.	0.105E-07	0.105E-07	0.111E-07	0.120E-07	0.125E-07

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3066E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.431E-11	0.288E-10	0.188E-09	0.133E-08	0.215E-08	0.329E-08	0.456E-08	0.575E-08	0.670E-08	0.731E-08
75.	0.580E-11	0.407E-10	0.291E-09	0.297E-08	0.567E-08	0.964E-08	0.138E-07	0.171E-07	0.188E-07	0.188E-07
50.	0.711E-11	0.509E-10	0.373E-09	0.380E-08	0.713E-08	0.120E-07	0.172E-07	0.212E-07	0.236E-07	0.238E-07
25.	0.797E-11	0.573E-10	0.419E-09	0.407E-08	0.753E-08	0.126E-07	0.179E-07	0.222E-07	0.247E-07	0.251E-07
0.	0.827E-11	0.595E-10	0.433E-09	0.414E-08	0.763E-08	0.127E-07	0.181E-07	0.224E-07	0.250E-07	0.255E-07
-25.	0.797E-11	0.573E-10	0.419E-09	0.407E-08	0.753E-08	0.126E-07	0.179E-07	0.222E-07	0.247E-07	0.251E-07
-50.	0.711E-11	0.509E-10	0.373E-09	0.380E-08	0.713E-08	0.120E-07	0.172E-07	0.212E-07	0.236E-07	0.238E-07
-75.	0.580E-11	0.407E-10	0.291E-09	0.297E-08	0.567E-08	0.964E-08	0.138E-07	0.171E-07	0.188E-07	0.188E-07
-100.	0.431E-11	0.288E-10	0.188E-09	0.133E-08	0.215E-08	0.329E-08	0.456E-08	0.575E-08	0.670E-08	0.731E-08

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.757E-08	0.763E-08	0.824E-08	0.930E-08	0.102E-07
75.	0.173E-07	0.152E-07	0.124E-07	0.130E-07	0.136E-07
50.	0.220E-07	0.195E-07	0.158E-07	0.161E-07	0.166E-07

25.	0.235E-07	0.212E-07	0.178E-07	0.181E-07	0.186E-07
0.	0.239E-07	0.217E-07	0.184E-07	0.188E-07	0.193E-07
-25.	0.235E-07	0.212E-07	0.178E-07	0.181E-07	0.186E-07
-50.	0.220E-07	0.195E-07	0.158E-07	0.161E-07	0.166E-07
-75.	0.173E-07	0.152E-07	0.124E-07	0.130E-07	0.136E-07
-100.	0.757E-08	0.763E-08	0.824E-08	0.930E-08	0.102E-07

MELBY ROAD (TCE)(0-10 FEET)(YEAR 20 TO YEAR 35)

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NO. OF POINTS IN X-DIRECTION ......................   15
NO. OF POINTS IN Y-DIRECTION ......................    9
NO. OF POINTS IN Z-DIRECTION ......................    1
NO. OF ROOTS: NO. OF SERIES TERMS .................  400
NO. OF BEGINNING TIME STEP ........................  241
NO. OF ENDING TIME STEP ...........................  421
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION ....   12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE    1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE ....  420
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT ....    1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD     2


AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...  0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...  0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ......... -0.6270E+02
END POINT OF X-SOURCE LOCATION (METERS) ...........  0.6270E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ......... -0.8717E+02
END POINT OF Y-SOURCE LOCATION (METERS) ...........  0.8717E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS) .........  0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ...........  0.0000E+00


POROSITY ..........................................  0.2500E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) ...............  0.3429E+01
HYDRAULIC GRADIENT ................................  0.1000E-02
LONGITIDUNAL DESPERSIVITY (METER) .................  0.5000E+02
LATERAL DISPERSIVITY (METER) ......................  0.5000E+01
VERTICAL DISPERSIVITY (METER) .....................  0.5000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) ............  0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..  0.0000E+00


MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)   0.0000E+00
DECAY CONSTANT (PER HOUR) .........................  0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3) ................  0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE ......  0.1000E-01
DENSITY OF WATER (KG/M**3) ........................  0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..  0.7300E+03
DISCHARGE TIME (HR) ...............................  0.3066E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .  0.0000E+00
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LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.000E+00	0.000E+00	0.000E+00	0.167E-08	0.522E-08	0.360E-08	0.260E-08	0.231E-08	0.206E-08	0.390E-08
0.590E-08	0.710E-08	0.969E-08	0.895E-08	0.710E-08	0.654E-08	0.408E-08	0.283E-08	0.204E-08	0.182E-08
0.162E-08	0.306E-08	0.462E-08	0.554E-08	0.755E-08	0.696E-08	0.551E-08	0.506E-08	0.316E-08	0.218E-08
0.157E-08	0.140E-08	0.124E-08	0.235E-08	0.354E-08	0.425E-08	0.578E-08	0.532E-08	0.421E-08	0.387E-08
0.241E-08	0.167E-08	0.120E-08	0.107E-08	0.947E-09	0.179E-08	0.269E-08	0.323E-08	0.439E-08	0.404E-08
0.319E-08	0.293E-08	0.182E-08	0.126E-08	0.909E-09	0.808E-09	0.718E-09	0.135E-08	0.203E-08	0.244E-08
0.331E-08	0.305E-08	0.241E-08	0.221E-08	0.138E-08	0.953E-09	0.688E-09	0.611E-09	0.543E-09	0.102E-08
0.154E-08	0.184E-08	0.250E-08	0.229E-08	0.181E-08	0.166E-08	0.103E-08	0.710E-09	0.511E-09	0.454E-09
0.403E-09	0.760E-09	0.114E-08	0.137E-08	0.186E-08	0.171E-08	0.135E-08	0.124E-08	0.770E-09	0.532E-09
0.383E-09	0.340E-09	0.302E-09	0.569E-09	0.853E-09	0.102E-08	0.138E-08	0.127E-08	0.100E-08	0.921E-09
0.574E-09	0.397E-09	0.285E-09	0.252E-09	0.224E-09	0.422E-09	0.635E-09	0.759E-09	0.103E-08	0.946E-09
0.745E-09	0.684E-09	0.425E-09	0.294E-09	0.212E-09	0.188E-09	0.167E-09	0.314E-09	0.470E-09	0.562E-09
0.762E-09	0.700E-09	0.551E-09	0.505E-09	0.314E-09	0.217E-09	0.156E-09	0.139E-09	0.123E-09	0.233E-09
0.354E-09	0.422E-09	0.569E-09	0.519E-09	0.409E-09	0.373E-09	0.232E-09	0.161E-09	0.118E-09	0.108E-09
0.969E-10	0.185E-09	0.282E-09	0.340E-09	0.456E-09	0.414E-09	0.325E-09	0.303E-09	0.190E-09	0.134E-09
0.984E-10	0.893E-10	0.810E-10	0.156E-09	0.237E-09	0.284E-09	0.380E-09	0.342E-09	0.269E-09	0.251E-09

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RETARDATION FACTOR ................................. 0.1000E+01
RETARDED DARCY VELOCITY (M/HR) ..................... 0.1372E-01
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.6858E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.6858E-01
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.6858E-01
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DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y \ X	75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1840E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-25.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-75.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1927E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.000E+00	0.000E+00	0.381E-14	0.160E-09	0.569E-09	0.126E-08	0.191E-08	0.223E-08	0.219E-08	0.181E-08
75.	0.000E+00	0.000E+00	0.339E-13	0.142E-08	0.506E-08	0.112E-07	0.170E-07	0.198E-07	0.195E-07	0.161E-07
50.	0.000E+00	0.000E+00	0.381E-13	0.160E-08	0.570E-08	0.126E-07	0.192E-07	0.223E-07	0.220E-07	0.181E-07
25.	0.000E+00	0.000E+00	0.381E-13	0.160E-08	0.570E-08	0.127E-07	0.192E-07	0.223E-07	0.220E-07	0.181E-07
0.	0.000E+00	0.000E+00	0.381E-13	0.160E-08	0.570E-08	0.127E-07	0.192E-07	0.223E-07	0.220E-07	0.181E-07
-25.	0.000E+00	0.000E+00	0.381E-13	0.160E-08	0.570E-08	0.127E-07	0.192E-07	0.223E-07	0.220E-07	0.181E-07
-50.	0.000E+00	0.000E+00	0.381E-13	0.160E-08	0.570E-08	0.126E-07	0.192E-07	0.223E-07	0.220E-07	0.181E-07
-75.	0.000E+00	0.000E+00	0.339E-13	0.142E-08	0.506E-08	0.112E-07	0.170E-07	0.198E-07	0.195E-07	0.161E-07
-100.	0.000E+00	0.000E+00	0.381E-14	0.160E-09	0.569E-09	0.126E-08	0.191E-08	0.223E-08	0.219E-08	0.181E-08

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.112E-08	0.460E-09	0.681E-13	0.000E+00	0.000E+00
75.	0.992E-08	0.409E-08	0.605E-12	0.000E+00	0.000E+00
50.	0.112E-07	0.460E-08	0.682E-12	0.000E+00	0.000E+00
25.	0.112E-07	0.460E-08	0.682E-12	0.000E+00	0.000E+00
0.	0.112E-07	0.460E-08	0.682E-12	0.000E+00	0.000E+00
-25.	0.112E-07	0.460E-08	0.682E-12	0.000E+00	0.000E+00
-50.	0.112E-07	0.460E-08	0.682E-12	0.000E+00	0.000E+00
-75.	0.992E-08	0.409E-08	0.605E-12	0.000E+00	0.000E+00
-100.	0.112E-08	0.460E-09	0.681E-13	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2015E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.192E-12	0.966E-11	0.331E-09	0.810E-08	0.157E-07	0.266E-07	0.383E-07	0.477E-07	0.527E-07	0.521E-07
75.	0.350E-12	0.184E-10	0.727E-09	0.260E-07	0.580E-07	0.107E-06	0.156E-06	0.191E-06	0.203E-06	0.190E-06
50.	0.472E-12	0.249E-10	0.977E-09	0.332E-07	0.724E-07	0.131E-06	0.192E-06	0.235E-06	0.252E-06	0.237E-06
25.	0.527E-12	0.275E-10	0.105E-08	0.343E-07	0.743E-07	0.134E-06	0.196E-06	0.241E-06	0.258E-06	0.243E-06
0.	0.540E-12	0.281E-10	0.106E-08	0.344E-07	0.745E-07	0.135E-06	0.197E-06	0.241E-06	0.258E-06	0.244E-06
-25.	0.527E-12	0.275E-10	0.105E-08	0.343E-07	0.743E-07	0.134E-06	0.196E-06	0.241E-06	0.258E-06	0.243E-06
-50.	0.472E-12	0.249E-10	0.977E-09	0.332E-07	0.724E-07	0.131E-06	0.192E-06	0.235E-06	0.252E-06	0.237E-06
-75.	0.350E-12	0.184E-10	0.727E-09	0.260E-07	0.580E-07	0.107E-06	0.156E-06	0.191E-06	0.203E-06	0.190E-06
-100.	0.192E-12	0.966E-11	0.331E-09	0.810E-08	0.157E-07	0.266E-07	0.383E-07	0.477E-07	0.527E-07	0.521E-07

CONTINUE

Y	X 75.	100.	200.	300.	400.

100.	0.460E-07	0.371E-07	0.104E-07	0.213E-08	0.289E-09
75.	0.153E-06	0.109E-06	0.221E-07	0.402E-08	0.526E-09
50.	0.194E-06	0.141E-06	0.298E-07	0.543E-08	0.709E-09
25.	0.200E-06	0.146E-06	0.322E-07	0.602E-08	0.792E-09
0.	0.201E-06	0.147E-06	0.327E-07	0.615E-08	0.812E-09
-25.	0.200E-06	0.146E-06	0.322E-07	0.602E-08	0.792E-09
-50.	0.194E-06	0.141E-06	0.298E-07	0.543E-08	0.709E-09
-75.	0.153E-06	0.109E-06	0.221E-07	0.402E-08	0.526E-09
-100.	0.460E-07	0.371E-07	0.104E-07	0.213E-08	0.289E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2102E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.340E-11	0.608E-10	0.801E-09	0.953E-08	0.168E-07	0.270E-07	0.382E-07	0.479E-07	0.544E-07	0.565E-07
75.	0.547E-11	0.101E-09	0.146E-08	0.256E-07	0.527E-07	0.933E-07	0.135E-06	0.166E-06	0.180E-06	0.174E-06
50.	0.721E-11	0.134E-09	0.194E-08	0.329E-07	0.664E-07	0.116E-06	0.168E-06	0.207E-06	0.225E-06	0.219E-06
25.	0.822E-11	0.152E-09	0.216E-08	0.347E-07	0.693E-07	0.120E-06	0.174E-06	0.214E-06	0.234E-06	0.229E-06
0.	0.853E-11	0.157E-09	0.222E-08	0.351E-07	0.698E-07	0.121E-06	0.175E-06	0.215E-06	0.236E-06	0.231E-06
-25.	0.822E-11	0.152E-09	0.216E-08	0.347E-07	0.693E-07	0.120E-06	0.174E-06	0.214E-06	0.234E-06	0.229E-06
-50.	0.721E-11	0.134E-09	0.194E-08	0.329E-07	0.664E-07	0.116E-06	0.168E-06	0.207E-06	0.225E-06	0.219E-06
-75.	0.547E-11	0.101E-09	0.146E-08	0.256E-07	0.527E-07	0.933E-07	0.135E-06	0.166E-06	0.180E-06	0.174E-06
-100.	0.340E-11	0.608E-10	0.801E-09	0.953E-08	0.168E-07	0.270E-07	0.382E-07	0.479E-07	0.544E-07	0.565E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.543E-07	0.494E-07	0.303E-07	0.160E-07	0.618E-08
75.	0.149E-06	0.118E-06	0.536E-07	0.264E-07	0.991E-08
50.	0.191E-06	0.154E-06	0.714E-07	0.350E-07	0.131E-07
25.	0.202E-06	0.165E-06	0.800E-07	0.398E-07	0.149E-07
0.	0.204E-06	0.167E-06	0.823E-07	0.412E-07	0.155E-07
-25.	0.202E-06	0.165E-06	0.800E-07	0.398E-07	0.149E-07
-50.	0.191E-06	0.154E-06	0.714E-07	0.350E-07	0.131E-07
-75.	0.149E-06	0.118E-06	0.536E-07	0.264E-07	0.991E-08
-100.	0.543E-07	0.494E-07	0.303E-07	0.160E-07	0.618E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2190E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.829E-11	0.943E-10	0.904E-09	0.856E-08	0.146E-07	0.230E-07	0.323E-07	0.406E-07	0.466E-07	0.493E-07
75.	0.124E-10	0.147E-09	0.154E-08	0.214E-07	0.429E-07	0.748E-07	0.108E-06	0.133E-06	0.145E-06	0.142E-06
50.	0.160E-10	0.191E-09	0.203E-08	0.275E-07	0.541E-07	0.932E-07	0.134E-06	0.165E-06	0.181E-06	0.179E-06
25.	0.183E-10	0.217E-09	0.228E-08	0.293E-07	0.567E-07	0.970E-07	0.139E-06	0.172E-06	0.189E-06	0.188E-06
0.	0.190E-10	0.226E-09	0.235E-08	0.297E-07	0.573E-07	0.978E-07	0.141E-06	0.173E-06	0.191E-06	0.190E-06
-25.	0.183E-10	0.217E-09	0.228E-08	0.293E-07	0.567E-07	0.970E-07	0.139E-06	0.172E-06	0.189E-06	0.188E-06
-50.	0.160E-10	0.191E-09	0.203E-08	0.275E-07	0.541E-07	0.932E-07	0.134E-06	0.165E-06	0.181E-06	0.179E-06
-75.	0.124E-10	0.147E-09	0.154E-08	0.214E-07	0.429E-07	0.748E-07	0.108E-06	0.133E-06	0.145E-06	0.142E-06
-100.	0.829E-11	0.943E-10	0.904E-09	0.856E-08	0.146E-07	0.230E-07	0.323E-07	0.406E-07	0.466E-07	0.493E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.488E-07	0.464E-07	0.365E-07	0.272E-07	0.169E-07
75.	0.125E-06	0.103E-06	0.604E-07	0.419E-07	0.252E-07
50.	0.160E-06	0.134E-06	0.794E-07	0.544E-07	0.325E-07
25.	0.170E-06	0.145E-06	0.895E-07	0.620E-07	0.371E-07
0.	0.172E-06	0.147E-06	0.925E-07	0.644E-07	0.386E-07
-25.	0.170E-06	0.145E-06	0.895E-07	0.620E-07	0.371E-07
-50.	0.160E-06	0.134E-06	0.794E-07	0.544E-07	0.325E-07
-75.	0.125E-06	0.103E-06	0.604E-07	0.419E-07	0.252E-07
-100.	0.488E-07	0.464E-07	0.365E-07	0.272E-07	0.169E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2278E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.111E-10	0.101E-09	0.830E-09	0.706E-08	0.118E-07	0.185E-07	0.258E-07	0.325E-07	0.374E-07	0.400E-07
75.	0.159E-10	0.152E-09	0.137E-08	0.170E-07	0.336E-07	0.581E-07	0.838E-07	0.103E-06	0.113E-06	0.111E-06
50.	0.202E-10	0.195E-09	0.178E-08	0.218E-07	0.423E-07	0.724E-07	0.104E-06	0.128E-06	0.141E-06	0.140E-06
25.	0.230E-10	0.221E-09	0.200E-08	0.233E-07	0.445E-07	0.755E-07	0.108E-06	0.134E-06	0.148E-06	0.148E-06
0.	0.239E-10	0.230E-09	0.207E-08	0.237E-07	0.450E-07	0.762E-07	0.109E-06	0.135E-06	0.149E-06	0.150E-06
-25.	0.230E-10	0.221E-09	0.200E-08	0.233E-07	0.445E-07	0.755E-07	0.108E-06	0.134E-06	0.148E-06	0.148E-06
-50.	0.202E-10	0.195E-09	0.178E-08	0.218E-07	0.423E-07	0.724E-07	0.104E-06	0.128E-06	0.141E-06	0.140E-06
-75.	0.159E-10	0.152E-09	0.137E-08	0.170E-07	0.336E-07	0.581E-07	0.838E-07	0.103E-06	0.113E-06	0.111E-06
-100.	0.111E-10	0.101E-09	0.830E-09	0.706E-08	0.118E-07	0.185E-07	0.258E-07	0.325E-07	0.374E-07	0.400E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.402E-07	0.390E-07	0.346E-07	0.305E-07	0.240E-07
75.	0.991E-07	0.836E-07	0.553E-07	0.452E-07	0.343E-07
50.	0.127E-06	0.108E-06	0.720E-07	0.579E-07	0.434E-07
25.	0.135E-06	0.117E-06	0.812E-07	0.658E-07	0.493E-07
0.	0.137E-06	0.119E-06	0.840E-07	0.684E-07	0.513E-07
-25.	0.135E-06	0.117E-06	0.812E-07	0.658E-07	0.493E-07
-50.	0.127E-06	0.108E-06	0.720E-07	0.579E-07	0.434E-07
-75.	0.991E-07	0.836E-07	0.553E-07	0.452E-07	0.343E-07
-100.	0.402E-07	0.390E-07	0.346E-07	0.305E-07	0.240E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2365E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.115E-10	0.926E-10	0.698E-09	0.558E-08	0.928E-08	0.144E-07	0.201E-07	0.253E-07	0.292E-07	0.314E-07
75.	0.161E-10	0.136E-09	0.113E-08	0.132E-07	0.258E-07	0.445E-07	0.640E-07	0.788E-07	0.864E-07	0.855E-07
50.	0.202E-10	0.173E-09	0.146E-08	0.169E-07	0.325E-07	0.554E-07	0.795E-07	0.981E-07	0.108E-06	0.108E-06
25.	0.229E-10	0.196E-09	0.164E-08	0.181E-07	0.342E-07	0.578E-07	0.828E-07	0.102E-06	0.113E-06	0.114E-06
0.	0.238E-10	0.204E-09	0.169E-08	0.183E-07	0.346E-07	0.584E-07	0.836E-07	0.103E-06	0.114E-06	0.115E-06
-25.	0.229E-10	0.196E-09	0.164E-08	0.181E-07	0.342E-07	0.578E-07	0.828E-07	0.102E-06	0.113E-06	0.114E-06
-50.	0.202E-10	0.173E-09	0.146E-08	0.169E-07	0.325E-07	0.554E-07	0.795E-07	0.981E-07	0.108E-06	0.108E-06
-75.	0.161E-10	0.136E-09	0.113E-08	0.132E-07	0.258E-07	0.445E-07	0.640E-07	0.788E-07	0.864E-07	0.855E-07
-100.	0.115E-10	0.926E-10	0.698E-09	0.558E-08	0.928E-08	0.144E-07	0.201E-07	0.253E-07	0.292E-07	0.314E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.318E-07	0.313E-07	0.296E-07	0.287E-07	0.258E-07
75.	0.768E-07	0.655E-07	0.464E-07	0.416E-07	0.360E-07
50.	0.980E-07	0.847E-07	0.599E-07	0.527E-07	0.449E-07
25.	0.105E-06	0.917E-07	0.675E-07	0.597E-07	0.508E-07
0.	0.106E-06	0.935E-07	0.699E-07	0.621E-07	0.528E-07
-25.	0.105E-06	0.917E-07	0.675E-07	0.597E-07	0.508E-07
-50.	0.980E-07	0.847E-07	0.599E-07	0.527E-07	0.449E-07
-75.	0.768E-07	0.655E-07	0.464E-07	0.416E-07	0.360E-07
-100.	0.318E-07	0.313E-07	0.296E-07	0.287E-07	0.258E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2453E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.105E-10	0.785E-10	0.561E-09	0.433E-08	0.715E-08	0.111E-07	0.154E-07	0.194E-07	0.224E-07	0.242E-07
75.	0.145E-10	0.113E-09	0.893E-09	0.101E-07	0.196E-07	0.337E-07	0.485E-07	0.597E-07	0.656E-07	0.651E-07
50.	0.180E-10	0.143E-09	0.115E-08	0.129E-07	0.247E-07	0.420E-07	0.602E-07	0.743E-07	0.821E-07	0.821E-07
25.	0.203E-10	0.162E-09	0.129E-08	0.138E-07	0.260E-07	0.439E-07	0.627E-07	0.776E-07	0.860E-07	0.866E-07
0.	0.211E-10	0.168E-09	0.134E-08	0.140E-07	0.263E-07	0.443E-07	0.633E-07	0.783E-07	0.869E-07	0.877E-07
-25.	0.203E-10	0.162E-09	0.129E-08	0.138E-07	0.260E-07	0.439E-07	0.627E-07	0.776E-07	0.860E-07	0.866E-07
-50.	0.180E-10	0.143E-09	0.115E-08	0.129E-07	0.247E-07	0.420E-07	0.602E-07	0.743E-07	0.821E-07	0.821E-07
-75.	0.145E-10	0.113E-09	0.893E-09	0.101E-07	0.196E-07	0.337E-07	0.485E-07	0.597E-07	0.656E-07	0.651E-07

-100.	0.105E-10	0.785E-10	0.561E-09	0.433E-08	0.715E-08	0.111E-07	0.154E-07	0.194E-07	0.224E-07	0.242E-07

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.247E-07	0.244E-07	0.241E-07	0.247E-07	0.242E-07
75.	0.587E-07	0.504E-07	0.372E-07	0.353E-07	0.332E-07
50.	0.749E-07	0.651E-07	0.478E-07	0.444E-07	0.410E-07
25.	0.799E-07	0.705E-07	0.538E-07	0.501E-07	0.461E-07
0.	0.812E-07	0.719E-07	0.557E-07	0.521E-07	0.479E-07
-25.	0.799E-07	0.705E-07	0.538E-07	0.501E-07	0.461E-07
-50.	0.749E-07	0.651E-07	0.478E-07	0.444E-07	0.410E-07
-75.	0.587E-07	0.504E-07	0.372E-07	0.353E-07	0.332E-07
-100.	0.247E-07	0.244E-07	0.241E-07	0.247E-07	0.242E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2540E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.898E-11	0.636E-10	0.439E-09	0.330E-08	0.543E-08	0.837E-08	0.116E-07	0.147E-07	0.170E-07	0.184E-07
75.	0.122E-10	0.910E-10	0.692E-09	0.762E-08	0.148E-07	0.253E-07	0.364E-07	0.448E-07	0.493E-07	0.490E-07
50.	0.151E-10	0.114E-09	0.892E-09	0.975E-08	0.186E-07	0.315E-07	0.452E-07	0.558E-07	0.616E-07	0.617E-07
25.	0.170E-10	0.129E-09	0.100E-08	0.104E-07	0.196E-07	0.329E-07	0.471E-07	0.582E-07	0.646E-07	0.652E-07
0.	0.176E-10	0.134E-09	0.103E-08	0.106E-07	0.198E-07	0.333E-07	0.475E-07	0.588E-07	0.653E-07	0.660E-07
-25.	0.170E-10	0.129E-09	0.100E-08	0.104E-07	0.196E-07	0.329E-07	0.471E-07	0.582E-07	0.646E-07	0.652E-07
-50.	0.151E-10	0.114E-09	0.892E-09	0.975E-08	0.186E-07	0.315E-07	0.452E-07	0.558E-07	0.616E-07	0.617E-07
-75.	0.122E-10	0.910E-10	0.692E-09	0.762E-08	0.148E-07	0.253E-07	0.364E-07	0.448E-07	0.493E-07	0.490E-07
-100.	0.898E-11	0.636E-10	0.439E-09	0.330E-08	0.543E-08	0.837E-08	0.116E-07	0.147E-07	0.170E-07	0.184E-07

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.188E-07	0.187E-07	0.190E-07	0.202E-07	0.210E-07
75.	0.443E-07	0.383E-07	0.290E-07	0.286E-07	0.283E-07
50.	0.565E-07	0.493E-07	0.372E-07	0.358E-07	0.348E-07
25.	0.603E-07	0.534E-07	0.418E-07	0.403E-07	0.390E-07
0.	0.613E-07	0.545E-07	0.433E-07	0.419E-07	0.405E-07
-25.	0.603E-07	0.534E-07	0.418E-07	0.403E-07	0.390E-07
-50.	0.565E-07	0.493E-07	0.372E-07	0.358E-07	0.348E-07
-75.	0.443E-07	0.383E-07	0.290E-07	0.286E-07	0.283E-07
-100.	0.188E-07	0.187E-07	0.190E-07	0.202E-07	0.210E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-400.	-300.	-200.	-100.	X -75.	-50.	-25.	0.	25.	50.
100.	0.733E-11	0.500E-10	0.337E-09	0.249E-08	0.409E-08	0.628E-08	0.874E-08	0.110E-07	0.128E-07	0.138E-07
75.	0.990E-11	0.711E-10	0.528E-09	0.571E-08	0.110E-07	0.189E-07	0.272E-07	0.335E-07	0.368E-07	0.366E-07
50.	0.121E-10	0.891E-10	0.679E-09	0.730E-08	0.139E-07	0.235E-07	0.337E-07	0.416E-07	0.460E-07	0.462E-07
25.	0.136E-10	0.100E-09	0.761E-09	0.781E-08	0.146E-07	0.246E-07	0.351E-07	0.435E-07	0.483E-07	0.487E-07
0.	0.141E-10	0.104E-09	0.786E-09	0.794E-08	0.148E-07	0.248E-07	0.355E-07	0.439E-07	0.488E-07	0.494E-07
-25.	0.136E-10	0.100E-09	0.761E-09	0.781E-08	0.146E-07	0.246E-07	0.351E-07	0.435E-07	0.483E-07	0.487E-07
-50.	0.121E-10	0.891E-10	0.679E-09	0.730E-08	0.139E-07	0.235E-07	0.337E-07	0.416E-07	0.460E-07	0.462E-07
-75.	0.990E-11	0.711E-10	0.528E-09	0.571E-08	0.110E-07	0.189E-07	0.272E-07	0.335E-07	0.368E-07	0.366E-07
-100.	0.733E-11	0.500E-10	0.337E-09	0.249E-08	0.409E-08	0.628E-08	0.874E-08	0.110E-07	0.128E-07	0.138E-07

CONTINUE

Y	75.	100.	200.	300.	X 400.
100.	0.142E-07	0.142E-07	0.147E-07	0.161E-07	0.173E-07
75.	0.332E-07	0.288E-07	0.223E-07	0.225E-07	0.231E-07
50.	0.423E-07	0.371E-07	0.285E-07	0.280E-07	0.282E-07
25.	0.452E-07	0.402E-07	0.320E-07	0.316E-07	0.316E-07
0.	0.459E-07	0.410E-07	0.331E-07	0.328E-07	0.328E-07
-25.	0.452E-07	0.402E-07	0.320E-07	0.316E-07	0.316E-07
-50.	0.423E-07	0.371E-07	0.285E-07	0.280E-07	0.282E-07
-75.	0.332E-07	0.288E-07	0.223E-07	0.225E-07	0.231E-07
-100.	0.142E-07	0.142E-07	0.147E-07	0.161E-07	0.173E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2716E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.580E-11	0.387E-10	0.256E-09	0.187E-08	0.306E-08	0.471E-08	0.654E-08	0.824E-08	0.957E-08	0.104E-07
75.	0.779E-11	0.546E-10	0.399E-09	0.427E-08	0.823E-08	0.141E-07	0.203E-07	0.249E-07	0.275E-07	0.273E-07
50.	0.951E-11	0.683E-10	0.513E-09	0.546E-08	0.104E-07	0.175E-07	0.251E-07	0.310E-07	0.343E-07	0.345E-07
25.	0.106E-10	0.769E-10	0.574E-09	0.584E-08	0.109E-07	0.183E-07	0.262E-07	0.324E-07	0.360E-07	0.364E-07
0.	0.110E-10	0.797E-10	0.593E-09	0.593E-08	0.111E-07	0.185E-07	0.265E-07	0.327E-07	0.364E-07	0.369E-07
-25.	0.106E-10	0.769E-10	0.574E-09	0.584E-08	0.109E-07	0.183E-07	0.262E-07	0.324E-07	0.360E-07	0.364E-07
-50.	0.951E-11	0.683E-10	0.513E-09	0.546E-08	0.104E-07	0.175E-07	0.251E-07	0.310E-07	0.343E-07	0.345E-07
-75.	0.779E-11	0.546E-10	0.399E-09	0.427E-08	0.823E-08	0.141E-07	0.203E-07	0.249E-07	0.275E-07	0.273E-07
-100.	0.580E-11	0.387E-10	0.256E-09	0.187E-08	0.306E-08	0.471E-08	0.654E-08	0.824E-08	0.957E-08	0.104E-07

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.107E-07	0.107E-07	0.112E-07	0.125E-07	0.138E-07
75.	0.248E-07	0.216E-07	0.169E-07	0.174E-07	0.183E-07
50.	0.316E-07	0.278E-07	0.215E-07	0.216E-07	0.223E-07
25.	0.338E-07	0.301E-07	0.242E-07	0.243E-07	0.249E-07
0.	0.343E-07	0.307E-07	0.250E-07	0.252E-07	0.258E-07
-25.	0.338E-07	0.301E-07	0.242E-07	0.243E-07	0.249E-07
-50.	0.316E-07	0.278E-07	0.215E-07	0.216E-07	0.223E-07
-75.	0.248E-07	0.216E-07	0.169E-07	0.174E-07	0.183E-07
-100.	0.107E-07	0.107E-07	0.112E-07	0.125E-07	0.138E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2803E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.451E-11	0.295E-10	0.193E-09	0.140E-08	0.228E-08	0.350E-08	0.487E-08	0.613E-08	0.713E-08	0.774E-08
75.	0.602E-11	0.415E-10	0.300E-09	0.318E-08	0.611E-08	0.105E-07	0.150E-07	0.185E-07	0.204E-07	0.203E-07
50.	0.733E-11	0.518E-10	0.385E-09	0.406E-08	0.769E-08	0.130E-07	0.186E-07	0.230E-07	0.255E-07	0.256E-07
25.	0.819E-11	0.582E-10	0.431E-09	0.434E-08	0.811E-08	0.136E-07	0.194E-07	0.240E-07	0.267E-07	0.270E-07
0.	0.849E-11	0.604E-10	0.445E-09	0.441E-08	0.821E-08	0.137E-07	0.196E-07	0.243E-07	0.270E-07	0.274E-07
-25.	0.819E-11	0.582E-10	0.431E-09	0.434E-08	0.811E-08	0.136E-07	0.194E-07	0.240E-07	0.267E-07	0.270E-07
-50.	0.733E-11	0.518E-10	0.385E-09	0.406E-08	0.769E-08	0.130E-07	0.186E-07	0.230E-07	0.255E-07	0.256E-07
-75.	0.602E-11	0.415E-10	0.300E-09	0.318E-08	0.611E-08	0.105E-07	0.150E-07	0.185E-07	0.204E-07	0.203E-07
-100.	0.451E-11	0.295E-10	0.193E-09	0.140E-08	0.228E-08	0.350E-08	0.487E-08	0.613E-08	0.713E-08	0.774E-08

CONTINUE

X

Y	75.	100.	200.	300.	400.
100.	0.797E-08	0.798E-08	0.844E-08	0.955E-08	0.108E-07
75.	0.185E-07	0.161E-07	0.127E-07	0.132E-07	0.143E-07
50.	0.235E-07	0.207E-07	0.162E-07	0.164E-07	0.173E-07
25.	0.251E-07	0.224E-07	0.182E-07	0.185E-07	0.193E-07
0.	0.255E-07	0.229E-07	0.188E-07	0.191E-07	0.200E-07
-25.	0.251E-07	0.224E-07	0.182E-07	0.185E-07	0.193E-07
-50.	0.235E-07	0.207E-07	0.162E-07	0.164E-07	0.173E-07
-75.	0.185E-07	0.161E-07	0.127E-07	0.132E-07	0.143E-07
-100.	0.797E-08	0.798E-08	0.844E-08	0.955E-08	0.108E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2891E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

Y	-400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.345E-11	0.223E-10	0.145E-09	0.104E-08	0.170E-08	0.261E-08	0.362E-08	0.457E-08	0.531E-08	0.577E-08
75.	0.459E-11	0.313E-10	0.224E-09	0.236E-08	0.454E-08	0.776E-08	0.111E-07	0.137E-07	0.151E-07	0.151E-07
50.	0.558E-11	0.390E-10	0.287E-09	0.302E-08	0.571E-08	0.966E-08	0.138E-07	0.171E-07	0.189E-07	0.190E-07
25.	0.623E-11	0.438E-10	0.322E-09	0.323E-08	0.602E-08	0.101E-07	0.144E-07	0.179E-07	0.198E-07	0.201E-07

0.	0.646E-11	0.454E-10	0.332E-09	0.328E-08	0.610E-08	0.102E-07	0.146E-07	0.180E-07	0.201E-07	0.203E-07
-25.	0.623E-11	0.438E-10	0.322E-09	0.323E-08	0.602E-08	0.101E-07	0.144E-07	0.179E-07	0.198E-07	0.201E-07
-50.	0.558E-11	0.390E-10	0.287E-09	0.302E-08	0.571E-08	0.966E-08	0.138E-07	0.171E-07	0.189E-07	0.190E-07
-75.	0.459E-11	0.313E-10	0.224E-09	0.236E-08	0.454E-08	0.776E-08	0.111E-07	0.137E-07	0.151E-07	0.151E-07
-100.	0.345E-11	0.223E-10	0.145E-09	0.104E-08	0.170E-08	0.261E-08	0.362E-08	0.457E-08	0.531E-08	0.577E-08

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.594E-08	0.596E-08	0.633E-08	0.723E-08	0.828E-08
75.	0.137E-07	0.120E-07	0.953E-08	0.100E-07	0.109E-07
50.	0.175E-07	0.154E-07	0.121E-07	0.124E-07	0.132E-07
25.	0.187E-07	0.167E-07	0.136E-07	0.139E-07	0.147E-07
0.	0.190E-07	0.170E-07	0.141E-07	0.144E-07	0.152E-07
-25.	0.187E-07	0.167E-07	0.136E-07	0.139E-07	0.147E-07
-50.	0.175E-07	0.154E-07	0.121E-07	0.124E-07	0.132E-07
-75.	0.137E-07	0.120E-07	0.953E-08	0.100E-07	0.109E-07
-100.	0.594E-08	0.596E-08	0.633E-08	0.723E-08	0.828E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2978E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.262E-11	0.168E-10	0.109E-09	0.799E-09	0.131E-08	0.202E-08	0.282E-08	0.355E-08	0.411E-08	0.445E-08
75.	0.347E-11	0.235E-10	0.169E-09	0.184E-08	0.357E-08	0.613E-08	0.882E-08	0.109E-07	0.119E-07	0.118E-07
50.	0.421E-11	0.292E-10	0.216E-09	0.235E-08	0.448E-08	0.762E-08	0.109E-07	0.135E-07	0.149E-07	0.149E-07
25.	0.470E-11	0.328E-10	0.242E-09	0.251E-08	0.472E-08	0.796E-08	0.114E-07	0.141E-07	0.156E-07	0.157E-07
0.	0.487E-11	0.340E-10	0.250E-09	0.255E-08	0.478E-08	0.804E-08	0.115E-07	0.142E-07	0.158E-07	0.159E-07
-25.	0.470E-11	0.328E-10	0.242E-09	0.251E-08	0.472E-08	0.796E-08	0.114E-07	0.141E-07	0.156E-07	0.157E-07
-50.	0.421E-11	0.292E-10	0.216E-09	0.235E-08	0.448E-08	0.762E-08	0.109E-07	0.135E-07	0.149E-07	0.149E-07
-75.	0.347E-11	0.235E-10	0.169E-09	0.184E-08	0.357E-08	0.613E-08	0.882E-08	0.109E-07	0.119E-07	0.118E-07
-100.	0.262E-11	0.168E-10	0.109E-09	0.799E-09	0.131E-08	0.202E-08	0.282E-08	0.355E-08	0.411E-08	0.445E-08

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.456E-08	0.454E-08	0.475E-08	0.545E-08	0.630E-08
75.	0.107E-07	0.924E-08	0.716E-08	0.752E-08	0.828E-08
50.	0.136E-07	0.119E-07	0.910E-08	0.930E-08	0.999E-08
25.	0.145E-07	0.128E-07	0.102E-07	0.104E-07	0.111E-07
0.	0.148E-07	0.131E-07	0.106E-07	0.108E-07	0.115E-07
-25.	0.145E-07	0.128E-07	0.102E-07	0.104E-07	0.111E-07
-50.	0.136E-07	0.119E-07	0.910E-08	0.930E-08	0.999E-08
-75.	0.107E-07	0.924E-08	0.716E-08	0.752E-08	0.828E-08
-100.	0.456E-08	0.454E-08	0.475E-08	0.545E-08	0.630E-08

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3066E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -400.	-300.	-200.	-100.	-75.	-50.	-25.	0.	25.	50.
100.	0.198E-11	0.127E-10	0.839E-10	0.637E-09	0.106E-08	0.163E-08	0.228E-08	0.286E-08	0.331E-08	0.357E-08
75.	0.263E-11	0.178E-10	0.131E-09	0.149E-08	0.291E-08	0.502E-08	0.723E-08	0.890E-08	0.976E-08	0.966E-08
50.	0.318E-11	0.222E-10	0.169E-09	0.190E-08	0.366E-08	0.624E-08	0.896E-08	0.111E-07	0.122E-07	0.122E-07
25.	0.355E-11	0.250E-10	0.188E-09	0.203E-08	0.385E-08	0.651E-08	0.932E-08	0.115E-07	0.128E-07	0.128E-07
0.	0.368E-11	0.259E-10	0.194E-09	0.206E-08	0.389E-08	0.657E-08	0.940E-08	0.116E-07	0.129E-07	0.130E-07
-25.	0.355E-11	0.250E-10	0.188E-09	0.203E-08	0.385E-08	0.651E-08	0.932E-08	0.115E-07	0.128E-07	0.128E-07
-50.	0.318E-11	0.222E-10	0.169E-09	0.190E-08	0.366E-08	0.624E-08	0.896E-08	0.111E-07	0.122E-07	0.122E-07
-75.	0.263E-11	0.178E-10	0.131E-09	0.149E-08	0.291E-08	0.502E-08	0.723E-08	0.890E-08	0.976E-08	0.966E-08
-100.	0.198E-11	0.127E-10	0.839E-10	0.637E-09	0.106E-08	0.163E-08	0.228E-08	0.286E-08	0.331E-08	0.357E-08

CONTINUE

Y	X 75.	100.	200.	300.	400.
100.	0.364E-08	0.359E-08	0.365E-08	0.413E-08	0.477E-08
75.	0.868E-08	0.742E-08	0.553E-08	0.571E-08	0.626E-08
50.	0.110E-07	0.954E-08	0.704E-08	0.706E-08	0.755E-08

25.	C.118E-07	0.103E-07	0.790E-08	0.792E-08	0.840E-08
0.	0.119E-07	0.105E-07	0.816E-08	0.821E-08	0.870E-08
-25.	0.118E-07	0.103E-07	0.790E-08	0.792E-08	0.840E-08
-50.	0.110E-07	0.954E-08	0.704E-08	0.706E-08	0.755E-08
-75.	0.868E-08	0.742E-08	0.553E-08	0.571E-08	0.626E-08
-100.	0.364E-08	0.359E-08	0.365E-08	0.413E-08	0.477E-08

APPENDIX E

EDER ASSOCIATES' COMMENTS ON THE DRAFT BASELINE RISK ASSESSMENT

eder associates
consulting engineers, p. c.

OFFICES
Locust Valley
Madison
Ann Arbor
Augusta, GA

July 10, 1992
File #497-08

Linda Nachowicz
United States Department of
Environmental Protection Agency
Waste Management Branch Region V
77 W. Jackson, HSR W6J
Chicago, Illinois 60604

Dear Ms. Nachowicz:

We have reviewed the USEPA's draft November 1990 Baseline Risk Assessment Report for National Presto Industries (NPI) and have enclosed comments for your consideration. We have identified unrealistic exposure scenarios, unrealistic and/or incorrect assumptions and calculation errors which, if used, result in overly conservative risk estimates for the NPI site. Additionally, the Baseline Risk Assessment does not provide the sampling dates for the analyses or the monitoring well data base used in the assessment. We also would like to point out that additional sampling was performed at waste disposal areas beginning in the summer of 1990, and this data is not included in the Baseline Risk Assessment. As you know, additional monitoring wells were installed and sampled during 1990 and 1991. These monitoring wells and the previously installed wells were sampled for VOC, SVOC, and metals analyses after the Baseline Risk Assessment was prepared and this information should be used in the Assessment.

Table 1 identifies the risk scenarios which exceed CERCLA risk criteria based on the report as it currently exists as well as how these risk estimates could change based on our comments. As shown in Table 1, the revisions would significantly reduce the estimated risk levels. It is anticipated that the risk levels associated with off-site residential drinking water exposure (assumes groundwater used for potable water supply) and on-site worker exposure to source areas will still be unacceptable to USEPA and the overall remedial action objectives related to these exposure pathways in the FS will not change.

Continued . . .

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If you have any questions, please call me at 516-671-8440 or Michael McLeod at 313-603-2144.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Gary A. Kozmus, P.E.
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GAR/llv

cc: M. Gifford
J. Boettcher
R. Nauman
J. Bartl
W. Warren

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NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

TABLE 1

IMPACT OF COMMENTS ON ESTIMATED RISK IN BASELINE RISK ASSESSMENT

	Carcinogenic Risk Exceeds 10E-04 to 10E-06		Non-Carcinogenic Risk Exceeds Hazard Index of 1		Carcinogenic Risk Exceeds 10E-04 to 10E-06		Non-Carcinogenic Risk Exceeds HI of 1	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child
Off-Site Resident								
Current	Yes	Yes	No	Yes	Maybe	Maybe	No	No
Future	Yes	Yes	Yes	Yes	Maybe	Maybe	Maybe	Maybe
On-Site Resident								
Future	Yes	Yes	Yes	Yes	(1)	(1)	(1)	(1)
Recreational User								
Current	No	No	No	No	No	No	No	No
Future	No	No	No	No	No	No	No	No
Worker								
Current	Yes	--	Yes	--	No	--	No	--
Future	Yes	--	Yes	--	No	--	No	--

NOTES:

(1) - No longer considered.
-- = Not Applicable.

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COMMENTS ON NOVEMBER 1990 BASELINE RISK ASSESSMENT REPORT FOR NATIONAL PRESTO INDUSTRIES, INC.

General Comments

1. The Baseline Risk Assessment does not include the laboratory results for samples collected in 1990 and 1991 at the Melby Road Disposal Area, East Disposal Site and Lagoon No. 1. It also does not include the laboratory results for groundwater samples collected from monitoring wells installed in 1990 and 1991. These groundwater samples were analyzed for VOCs and selected groundwater samples were analyzed for SVOCs and metals. The impact of these results on the assessment is not known and, since PRPs cannot perform the Baseline Risk Assessment, the document cannot be updated by National Presto, Industries Inc. (NPI) to incorporate these analytical results.

2. The future on-site residential exposure scenario is extremely unlikely (see pages 3-25, 5-9 and 5-22) and should not be included in the Baseline Risk Assessment in accordance with the Preamble of the National Contingency Plan (NCP) which states that future land use scenarios (e.g. residential development of the NPI facility) "... may not be justifiable if the probability that the site will support...[that] use in the future is small." It further states that "EPA is clarifying its policy of making exposure assumptions that result in an overall exposure estimate that is conservative but within a realistic range of exposure. Under this policy, EPA defines "reasonable maximum" such that only potential exposures that are likely to occur will be included in the assessment of exposures." Since it is extremely unlikely that the NPI facility would be developed for residential use, the future on-site residential exposure scenario should be eliminated.

3. Using current groundwater concentrations from the NPI source areas as estimates of future groundwater concentrations in residential wells is unrealistic. The VOC concentration patterns are well-established, based on the age of the plumes, and the downgradient population is connected to a public water supply. If required, sufficient data exists to accurately model future groundwater concentrations off-site. A modeling approach is appropriate and should be used since future residential groundwater use is one of the most significant risks identified in the Baseline Risk Assessment (see pages 5-25 and 7-5).

4. It appears that the upper 95% confidence intervals of the arithmetic mean concentrations were used to evaluate Reasonable Maximum Exposure. However, the 95% concentrations

listed in the tables are not derived from the usual algorithm that calculates the upper 95% confidence limit of the arithmetic mean, or the geometric mean. There are either computation errors or the methodology used should be clarified.

5. Estimated carcinogenic risk and hazard indices for ingestion of organic constituents in soil were overestimated by 3 orders of magnitude (i.e., 1,000 times higher than what they should be), probably because these concentrations were expressed as µg/kg but evaluated as mg/kg. Therefore, total carcinogenic risk for future on-site residential exposures were overestimated by 3 orders of magnitude. Total-carcinogenic risk for worker exposure were overestimated by an order of magnitude.

6. According to USEPA's, Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (EPA, 1989[a]), when the upper confidence limit on the average concentration is above the maximum detected concentration, the maximum detected concentration should be used to estimate exposure concentrations. However, in this risk assessment, calculated upper 95% concentrations were used even when they were greater than the maximum detected concentrations. The rationale for calculating the upper 95% concentration to estimate reasonable maximum exposure is because in most situations, assuming long-term exposure to the maximum concentration is not reasonable. Because of the great variability in measured concentrations, very often calculated upper 95% concentrations were higher than maximum detected concentrations for soil data. Use of 95% concentrations to estimate reasonable maximum exposure would be unreasonable under this situation, and did not serve the purpose of using 95% concentrations.

7. Average exposure estimates appear to have been biased in several calculations. Geometric mean concentrations appear to have been calculated for a specific area of concern with maximum concentration, rather than being averaged for all areas of concern for a specific exposure scenario. Although this provides for a maximum exposure estimate, this approach is unrealistic for an average exposure estimate.

   For example, PCB was detected in the bottom sediment of one dry well at 14 mg/kg. The dry well is a covered ten foot deep pit. This PCB concentration was used to calculate risk from soil exposure for the entire site and contributes most of the total risk.

8. Soil data was not evaluated by depths when calculating exposure concentrations. This resulted in unrealistic exposure assessments.

For example, volatile organic compound (VOC) concentrations from depths of five and ten feet in the Melby Road and East disposal areas were used to calculate the inhalation of dust exposure. Similarly, inorganic analytes detected at depths of three to four feet at the East Disposal area were also used to calculate the inhalation of dust exposure.

9. Exposure estimates for direct contact and inhalation of soils did not adequately account for climatic conditions (snow cover and frozen soil) which limit exposure access to the soils for several months of the year in Eau Claire, Wisconsin.

10. In several cases carcinogenic risk and non-carcinogenic hazard indices (HI) were calculated for inorganic analytes in soil at concentrations below typical background concentrations. This is especially significant for analytes such as arsenic that pose risks greater than 1.0×10^{-6} at background concentrations. In Section 2.4.3 on page 2-32 it is indicated that no information on regional soil background concentrations could be identified. On page 19 of Element Concentrations in Soils and Other Surficial Materials of the United States, U.S. Geological Survey Professional Paper 1270, (1984), the background arsenic concentration in soils in the Eau Claire, Wisconsin area range between <4.1 to 10 mg/kg, most being between 2.6 and 6.5 mg/kg. Background chromium concentrations from the same source indicate that background chromium concentrations in the Eau Claire, Wisconsin area range from <20 to 70 mg/kg.

11. In the exposure scenario for dust inhalation, all chromium present is assumed to be present as hexavalent chromium. This assumption is very unlikely. As stated in Section 3.3.2.3 on page 3-13, hexavalent chromium is quite soluble and mobile. Where as trivalent chromium is relatively immobile and tends to adhere to soil particles. Chromium present in surface soils which could generate dust would most likely occur as trivalent chromium.

12. The simplistic air modeling used in the Baseline Risk Assessment is very conservative (see page 3-48) and unrealistic. A more accurate modeling approach should be used since the exposure to inhalation of dust from on-site source areas resulted in one of the most significant risks identified (see pages 5-25 and 7-5).

Specific Comments

1. Section 3.5, page 3-33 (Table 3-7).

Use of 95th percentile values of skin surface area to evaluate reasonable maximum dermal exposure to water appears to be incorrect. According to USEPA's Human Health Evaluation Manual, 50th percentile values, instead of 95th percentile value, should be used for the area of exposed skin (SA). This is because surface area and body weight are strongly correlated and 50th percentile values are most representative of the surface area of individuals of average weight (70kg) which is assumed for adults in all exposure pathways.

2. Section 3.5, page 3-33 (Table 3-7).

Risk calculated for dermal contact with the drinking water pathway appear to have been overestimated due to some of the exposure assumptions listed in this table. The exposure time used for this pathway (0.646 hr/day for the 50th percentile, and 1.21 hr/day for the 95th percentile) is for washing/dressing (USEPA, 1989[b]). This time estimate includes dressing, during which exposure to water should not occur. Therefore, this exposure time should be less.

The exposed skin surface area used is that of the whole body; washing does not usually include the whole body. Rather, the skin surface area washed generally involves only the face and hands.

The surface area of the face is only 2% of total surface area (USEPA, 1985). Total body surface area is 19,400 sq. cm. Therefore, surface area of the face is 388 sq. cm. Surface area of the hands is 820 sq. cm. (USEPA, 1989[a]). Hence, total exposed area is 1,208 sq. cm., and is only 6% of the total body surface area.

In the inhalation exposure scenario, all VOCs present in the water are assumed to be volatilized in the air (See page 3-35). Therefore, none remain to be absorbed through the skin. Either the percentage inhaled should be reduced or the absorption of VOCs while showering, should be eliminated.

Because of overestimates in exposure time, exposed skin area, inhalation, as well a chemical-specific permeability constant (see comment 16), the calculated risk for dermal exposure is overestimated and unrealistic, such that risk from dermal exposure for the adult is greater than that for ingestion (6.9×10^{-5} vs. 5.0×10^{-5}).

3. Section 3.5.6, page 3-41 (Table 3-10).

Exposure frequency of 92 days/year to surface water appears to be too high. According to USEPA's Human Health Evaluation Manual, the national average for swimming is only 7 days/year. The cool climate in Eau Claire, Wisconsin would be expected to result in fewer days/year than the national average.

4. Section 3.5.6, page 3-41 (Table 3-10).

   It appears that the duration of exposure to surface water should be 2.6 hours/day, as specified in Human Health Evaluation Manual. The value of 1.39 hr/week (50th percentile) and 2.73 hr/week (95th percentile), as cited in the risk assessment, cannot be found in the Human Health Evaluation Manual.

5. Section 3.5.6, page 3-41 (Table 3-10).

   The fish ingestion rate for children should be lower than that for adults. According to Pao (1982), the 50th percentile ingestion rate for children 3-5 is 0.028 kg/day. The 95th percentile rate is 0.07 kg/day.

6. Section 3.5.7, page 3-43.

   It appears that the conversion factor of 10^{-4} kg/mg should be 10^{-6} kg/mg.

7. Section 3.5.9, page 3-48.

   It appears that the equation to estimate dust emission should be:

$$E = 1.7 \left(\frac{S}{1.5}\right) \left[\frac{(365 - p)}{235}\right] \left(\frac{f}{15}\right)$$

8. Section 3.5.9, page 3-49.

   It appears that the definition of p should be:

   p = number of days per year with $\geq$ 0.01 inches of rain.

9. Section 3.5.9, page 3-49.

   It appears that the resulting emission rates, based on the above changes, will be higher than stated (4.02 lb/acre/day instead of 2.07 lb/acre/day).

10. Section 5.2, page 5-11 (Table 5-7).

    Hazard indices for future on-site residential exposures appear to be incorrect. For adult receptors, the hazard index should be 4.1 E-01 for the maximum exposed individual (MEI), and 4.2 E-02 for the average exposed individual (AEI). For child receptors, the hazard indices should be 3.5E + 00 and 3.7 E-01 for MEI and AEI, respectively.

11. Section 5.2, page 5-12 (Table 5-8).

Future carcinogenic risks for on-site residential exposures appear to be incorrect, and overestimated by 3 orders of magnitude. For adult receptors, the cancer risk level should be 3.0E-05 and 7.5E-07 for MEI and AEI, respectively. For child receptors, the cancer risk level should be 5.2E-05 and 4.4E-06 for MEI and AEI, respectively.

12. Section 5.4, page 5-19 (Table 5-13).

Calculated total non-carcinogenic risks associated with worker/trespasser exposures appear to be incorrect. Hazard indices for soil ingestion pathway should be 8.4E-02 and 8.8E-03 for MEI and AEI, respectively.

13. Section 5.4, page 5-20 (Table 5-14).

Total carcinogenic risks associated with worker/trespasser exposures appear to be incorrect. For soil ingestion exposure pathway, cancer risk should be 6.2E-06 for the MEI, and 5.2E-07 for the AEI.

14. Section 5.4, page 5-20 (Table 5-14).

Total carcinogenic risk associated with dermal exposure for workers is over an order of magnitude higher than that for soil ingestion (1.2E-04 vs. 6.2E-06 after correction of computation error). This high risk estimate for dermal exposure is most likely resulting from the use of unrealistic dermal absorption factors, and exposure assumptions. For example, skin surface area of 8,620 cm^2 was assumed to be exposed. Thus, the exposed area would include arms, hands and legs. However, this exposure assumption is unrealistic as warmer months only occur three months of the year. In addition, adverse effects from the dermal exposure for most chemicals have not been extensively investigated. Carcinogenicity by the dermal route has not been established, and the use of oral potency factors as a proxy for the dermal route is not justified.

15. Section 5.5, pages 5-23 and 5-24 (Table 5-15).

The potential for over estimation of risk for several assumptions appear too low on this table due to the comments presented herein. Areas where potential for over estimation are high include future groundwater use (due to future concentration assumption), dust resuspension model (due to simplistic and very conservative modeling approach) and exposure periods (due to no consideration of cold climate and snow cover).

16. Appendix B, Tables B-1 to B-12.

According to USEPA's Human Health Evaluation Manual, when the chemical-specific dermal Permeability Constant (PC) values are not available, the permeability of water can be used to derive a default value. The permeability constant for water is 8.00 E-04 cm/hr (USEPA, 1988) and this value should be used instead of the default value of 1.00 E-01 cm/hr used in the risk assessment.

REFERENCES

1. Kabata-Pendias, A. and H. Pendias. Trace Elements in Soils and Plants. CRC Press, Boca Raton, Florida, 1984.

2. Pao, E.M., K. Fleming, P. Guenther, and S. Mickle. Foods Commonly Eaten By Individuals. U.S. Department of Agriculture, 1982.

3. USEPA, 1985. Development of Statistical Distributions in Ranges of Standard Factors Used in Exposure Assessments. EPA/600/8-85/010.

4. USEPA, 1988. Superfund Exposure Assessment Manual. EPA/580/1-88/001.

5. USEPA, 1989[a]. Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual. EPA/540/1-89/002.

6. USEPA, 1989[b]. Exposure Factors Handbook. EPA/600/8-89/043.

7. USGS, 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. USGS Professional Paper 1270.

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APPENDIX F

REMEDIAL ALTERNATIVE COST ESTIMATE CALCULATIONS

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

SOURCES OF INFORMATION USED TO ESTIMATE FS COSTS

1. Lagoon 1 Standing Water and Floating Oil Removal (assumes $15,000 for pumps and piping, $110,000 for disposal of oil)	$125,000
2. Excavation Conventional Waste Forge Compound Pumping	 $ 20/yd³ (typical) $ 10/yd³ (Heritage) $ 60/yd³ (WR&R)
3. Backfill	$ 20/yd³ (typical)
4. On-Site Landfill Non-Hazardous Hazardous Costs developed by EA assuming landfill located at Lagoon 2. Design criteria of NR 504 and NR 660 were used.	 $ 45/yd³ $ 65/yd³
5. Solidification (also - 30% volume increase per ENRECO's test)	$ 35/yd³ (ENRECO)
6. Drying Cost to dry material on-site based on Porcupine Processor rental fees (also - 30% volume decrease per Porcupine Processor test)	$120/yd³ (UPE)
7. Fuel Blending Liquid fuel - WR&R - Heritage Dry, liquid fuel - WR&R dry - WR&R transport, dispose of - Heritage dry - Heritage transport, dispose of Solid fuel - Cadence, Marine Shale Processors - transport to Marine Shale Processors	 $1.38/gallon = $280/yd³ $18/yd³ + $60/ton + $100/ton = $260/yd³ $110/yd³ $280/yd³ $100/yd³ $500/ton = $750/yd³ $700/ton = $1,050/yd³ $163/ton = $245/yd³

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8. Capping Conventional Multi-layer (i.e. - East Disposal Site)	$40/yd² (typical)
Melby Road Disposal Area - cap entire area (~ 39,000 yd²) Melby Road Disposal Area - cap using CAMU concept (~ 13,000 yd₂)	$32/yd² (EA) $40/yd² (EA)
Multi-layer with geomembrane support (based on geotechnical engineer's conceptual design)	$90/yd²
9. Off-site Landfill	
Non-hazardous (costs include transportation and disposal at American Waste Landfill, Inc., Waynesburg, Ohio - per American Waste Services) materials without free liquids	$160/yd³
materials containing free liquids (includes solidification)	$230/yd³
Hazardous (costs presented for hazardous waste disposal at the Chemical Waste Management Model City, New York facility - per Chemical Waste Management)	
materials without free liquids	$300/yd³
materials containing free liquids (includes solidification)	$420/yd³
PCB sediments	$250/yd³
10. On-site Incineration	
typical on-site rotary kiln incineration cost per vendors, plus mob/demob fees, etc. (assume 50% volume decrease)	$500/yd³
11. Transportation	
to Chemical Waste Management, Model City, New York facility (approximately 950 miles) $4.05/mile/20 yd³ load	$200/yd³

NOTES:

One cubic yard = 1.5 tons

SOURCE CONTROL ALTERNATIVES

LAGOON 1
WASTE FORGE COMPOUND

		Unit Cost	Area or Volume	Capital Cost
1	NO ACTION	$0	$0	$0

2	ON-SITE NON-HAZARDOUS LANDFILL	Unit Cost	Area or Volume	Capital Cost
	- Remove standing water and floating oil	$125,000		$125,000
	- Remove Waste Forge Compound	$60 /cy	5,000 cy	$300,000
	- Dispose of on-site	$45 /cy	5,000 cy	$225,000
	- Backfill	$20 /cy	5,000 cy	$100,000
	- Subtotal			$750,000
	- Contingencies (@20%)			$150,000
	- Engineering, Legal, Administrative Fees (@25%)			$188,000
	- Total			$1,088,000

ON-SITE HAZARDOUS LANDFILL	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- Remove Waste Forge Compound	$60 /cy	5,000 cy	$300,000
- Dispose of on-site	$65 /cy	5,000 cy	$325,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$850,000
- Contingencies (@20%)			$170,000
- Engineering, Legal, Administrative Fees (@25%)			$213,000
- Total			$1,233,000

2a IN-SITU SOLIDIFICATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- In-Situ Solidification (assume 30% volume increase)	$35	/cy	5,000	cy	$175,000
- Excavate	$20	/cy	6,500	cy	$130,000
- Dispose of on-site	$45	/cy	6,500	cy	$292,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$822,500
- Contingencies (@20%)					$165,000
- Engineering, Legal, Administrative Fees (@25%)					$206,000
- Total					$1,194,000

IN-SITU SOLIDIFICATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- In-Situ Solidification (assume 30% volume increase)	$35	/cy	5,000	cy	$175,000
- Excavate	$20	/cy	6,500	cy	$130,000
- Dispose of on-site	$65	/cy	6,500	cy	$422,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$952,500
- Contingencies (@20%)					$191,000
- Engineering, Legal, Administrative Fees (@25%)					$238,000
- Total					$1,382,000

2b DRY AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Dry material using Porcupine Processor (assume 30% volume decrease)	$120	/cy	5,000	cy	$600,000
- Dispose of on-site	$45	/cy	3,500	cy	$157,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$1,282,500
- Contingencies (@20%)					$257,000
- Engineering, Legal, Administrative Fees (@25%)					$321,000
- Total					$1,861,000

DRY AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Dry material using Porcupine Processor (assume 30% volume decrease)	$120	/cy	5,000	cy	$600,000
- Dispose of on-site	$65	/cy	3,500	cy	$227,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$1,352,500
- Contingencies (@20%)					$271,000
- Engineering, Legal, Administrative Fees (@25%)					$338,000
- Total					$1,962,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Transport, solidify and dispose of off-site	$230	/cy	5,000	cy	$1,150,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$1,675,000
- Contingencies (@20%)					$335,000
- Engineering, Legal, Administrative Fees (@25%)					$419,000
- Total					$2,429,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Transport	$200	/cy	5,000	cy	$1,000,000
- Solidify and Dispose of off-site	$420	/cy	5,000	cy	$2,100,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$3,625,000
- Contingencies (@20%)					$725,000
- Engineering, Legal, Administrative Fees (@25%)					$906,000
- Total					$5,256,000

IN-SITU SOLIDIFICATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- In-Situ Solidification (assume 30% volume increase)	$35 /cy	5,000 cy	$175,000
- Excavate	$20 /cy	6,500 cy	$130,000
- Transport and dispose of off-site	$160 /cy	6,500 cy	$1,040,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$1,570,000
- Contingencies (@20%)			$314,000
- Engineering, Legal, Administrative Fees (@25%)			$393,000
- Total			$2,277,000

IN-SITU SOLIDIFICATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- In-Situ Solidification (assume 30% volume increase)	$35 /cy	5,000 cy	$175,000
- Excavate	$20 /cy	6,500 cy	$130,000
- Transport	$200 /cy	6,500 cy	$1,300,000
- Dispose of off-site	$300 /cy	6,500 cy	$1,950,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$3,780,000
- Contingencies (@20%)			$756,000
- Engineering, Legal, Administrative Fees (@25%)			$945,000
- Total			$5,481,000

DRY AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- Remove waste forge compound	$60 /cy	5,000 cy	$300,000
- Dry material using Porcupine Processor (assume 30% volume decrease)	$120 /cy	5,000 cy	$600,000
- Transport and dispose of off-site	$160 /cy	3,500 cy	$560,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$1,685,000
- Contingencies (@20%)			$337,000
- Engineering, Legal, Administrative Fees (@25%)			$421,000
- Total			$2,443,000

DRY AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- Remove waste forge compound	$60 /cy	5,000 cy	$300,000
- Dry material using Porcupine Processor (assume 30% volume decrease)	$120 /cy	5,000 cy	$600,000
- Transport	$200 /cy	3,500 cy	$700,000
- Dispose of off-site	$300 /cy	3,500 cy	$1,050,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$2,875,000
- Contingencies (@20%)			$575,000
- Engineering, Legal, Administrative Fees (@25%)			$719,000
- Total			$4,169,000

4 FUEL BLENDING - HERITAGE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$10	/cy	5,000	cy	$50,000
- Blend	$18	/cy	5,000	cy	$90,000
- Transport to Heritage (Lemont, IL)	$90	/cy	5,000	cy	$450,000
- Burn in kiln	$150	/cy	5,000	cy	$750,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$1,565,000
- Contingencies (@20%)					$313,000
- Engineering, Legal, Administrative Fees (@25%)					$391,000
- Total					$2,269,000

FUEL BLENDING - WRR

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Blend, Transport, Burn in kiln	$280	/cy	5,000	cy	$1,400,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$1,925,000
- Contingencies (@20%)					$385,000
- Engineering, Legal, Administrative Fees (@25%)					$481,000
- Total					$2,791,000

DRY, FUEL BLENDING - WRR

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Dry material (assume 30% volume decrease)	$110	/cy	5,000	cy	$550,000
- Process,Transport, and Burn in kiln	$280	/cy	3,500	cy	$980,000
- Subtotal					$2,055,000
- Contingencies (@20%)					$411,000
- Engineering, Legal, Administrative Fees (@25%)					$514,000
- Total					$2,980,000

DRY (NPI), FUEL BLENDING - WRR

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Dry material using Porcupine Processor (assume 30% volume decrease)	$120	/cy	5,000	cy	$600,000
- Process,Transport, and Burn in kiln	$280	/cy	3,500	cy	$980,000
- Subtotal					$2,105,000
- Contingencies (@20%)					$421,000
- Engineering, Legal, Administrative Fees (@25%)					$526,000
- Total					$3,052,000

DRY, FUEL BLENDING - HERITAGE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$10	/cy	5,000	cy	$50,000
- Centrifuge and dry (assume 30% volume decrease)	$100	/cy	5,000	cy	$500,000
- Transport to Giant Cement Harleyville, SC	$225	/cy	3,500	cy	$787,500
- Burn in kiln	$525	/cy	3,500	cy	$1,837,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$3,400,000
- Contingencies (@20%)					$680,000
- Engineering, Legal, Administrative Fees (@25%)					$850,000
- Total					$4,930,000

5 CAPPING IN-PLACE (with geomembrane support)

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Cap	$90	/sy	12,000	sy	$1,080,000
- Subtotal					$1,205,000
- Contingencies (@20%)					$241,000
- Engineering, Legal, Administrative Fees (@25%)					$301,000
- Total					$1,747,000

CAPPING IN-PLACE (with in-situ solidification for support)

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- In-situ solidification	$35	/cy	5,000	cy	$175,000
- Cap	$40	/sy	12,000	cy	$480,000
- Subtotal					$780,000
- Contingencies (@20%)					$156,000
- Engineering, Legal, Administrative Fees (@25%)					$195,000
- Total					$1,131,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	5,000	cy	$2,500,000
- Dispose of on-site	$45	/cy	2,500	cy	$112,500
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$3,137,500
- Contingencies (@20%)					$628,000
- Engineering, Legal, Administrative Fees (@25%)					$784,000
- Total					$4,550,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- Remove waste forge compound	$60 /cy	5,000 cy	$300,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	5,000 cy	$2,500,000
- Dispose of on-site	$65 /cy	2,500 cy	$162,500
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$3,187,500
- Contingencies (@20%)			$638,000
- Engineering, Legal, Administrative Fees (@25%)			$797,000
- Total			$4,623,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Remove standing water and floating oil	$125,000		$125,000
- Remove waste forge compound	$60 /cy	5,000 cy	$300,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	5,000 cy	$2,500,000
- Transport and dispose of off-site	$160 /cy	2,500 cy	$400,000
- Backfill	$20 /cy	5,000 cy	$100,000
- Subtotal			$3,425,000
- Contingencies (@20%)			$685,000
- Engineering, Legal, Administrative Fees (@25%)			$856,000
- Total			$4,966,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Remove standing water and floating oil	$125,000				$125,000
- Remove waste forge compound	$60	/cy	5,000	cy	$300,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	5,000	cy	$2,500,000
- Transport	$200	/cy	2,500	cy	$500,000
- Dispose of off-site	$300	/cy	2,500	cy	$750,000
- Backfill	$20	/cy	5,000	cy	$100,000
- Subtotal					$4,275,000
- Contingencies (@20%)					$855,000
- Engineering, Legal, Administrative Fees (@25%)					$1,069,000
- Total					$6,199,000

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SOURCE CONTROL ALTERNATIVES — SOIL/WASTE FORGE COMPOUND

		Unit Cost	Area or Volume	Capital Cost
1	NO ACTION	$0	0	$0

2 ON-SITE NON-HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,200 cy	$24,000
- Dispose of on-site	$45 /cy	1,200 cy	$54,000
- Backfill	$20 /cy	1,200 cy	$24,000
- Subtotal			$102,000
- Contingencies (@20%)			$20,000
- Engineering, Legal, Administrative Fees (@25%)			$26,000
- Total			$148,000

ON-SITE HAZARDOUS LANDFILL	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,200 cy	$24,000
- Dispose of on-site	$65 /cy	1,200 cy	$78,000
- Backfill	$20 /cy	1,200 cy	$24,000
- Subtotal			$126,000
- Contingencies (@20%)			$25,000
- Engineering, Legal, Administrative Fees (@25%)			$32,000
- Total			$183,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,200	cy	$24,000
- Transport and dispose of off-site	$160	/cy	1,200	cy	$192,000
- Backfill	$20	/cy	1,200	cy	$24,000
- Subtotal					$240,000
- Contingencies (@20%)					$48,000
- Engineering, Legal, Administrative Fees (@25%)					$60,000
- Total					$348,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,200	cy	$24,000
- Transport	$200	/cy	1,200	cy	$240,000
- Dispose of off-site	$300	/cy	1,200	cy	$360,000
- Backfill	$20	/cy	1,200	cy	$24,000
- Subtotal					$648,000
- Contingencies (@20%)					$130,000
- Engineering, Legal, Administrative Fees (@25%)					$162,000
- Total					$940,000

4 SOLID FUEL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,200	cy	$24,000
- Transport	$245	/cy	1,200	cy	$294,000
- Burn in kiln	$1,050	/cy	1,200	cy	$1,260,000
- Backfill	$20	/cy	1,200	cy	$24,000
- Subtotal					$1,602,000
- Contingencies (@20%)					$320,000
- Engineering, Legal, Administrative Fees (@25%)					$401,000
- Total					$2,323,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,200	cy	$24,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,200	cy	$600,000
- Dispose of on-site	$45	/cy	600	cy	$27,000
- Backfill	$20	/cy	1,200	cy	$24,000
- Subtotal					$675,000
- Contingencies (@20%)					$135,000
- Engineering, Legal, Administrative Fees (@25%)					$169,000
- Total					$979,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,200 cy	$24,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,200 cy	$600,000
- Dispose of on-site	$65 /cy	600 cy	$39,000
- Backfill	$20 /cy	1,200 cy	$24,000
- Subtotal			$687,000
- Contingencies (@20%)			$137,000
- Engineering, Legal, Administrative Fees (@25%)			$172,000
- Total			$996,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,200 cy	$24,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,200 cy	$600,000
- Transport and dispose of off-site	$160 /cy	600 cy	$96,000
- Backfill	$20 /cy	1,200 cy	$24,000
- Subtotal			$744,000
- Contingencies (@20%)			$149,000
- Engineering, Legal, Administrative Fees (@25%)			$186,000
- Total			$1,079,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,200	cy	$24,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,200	cy	$600,000
- Transport	$200	/cy	600	cy	$120,000
- Dispose of off-site	$300	/cy	600	cy	$180,000
- Backfill	$20	/cy	1,200	cy	$24,000
- Subtotal					$948,000
- Contingencies (@20%)					$190,000
- Engineering, Legal, Administrative Fees (@25%)					$237,000
- Total					$1,375,000

SOURCE CONTROL ALTERNATIVES — MELBY ROAD TRENCHES WASTE FORGE COMPOUND

		Unit Cost		Area or Volume		Capital Cost
1	NO ACTION	$0		$0		$0

2 ON-SITE NON-HAZARDOUS LANDFILL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,600	cy	$32,000
- Dispose of on-site	$45	/cy	1,600	cy	$72,000
- Backfill	$20	/cy	1,600	cy	$32,000
- Subtotal					$136,000
- Contingencies (@20%)					$27,000
- Engineering, Legal, Administrative Fees (@25%)					$34,000
- Total					$197,000

ON-SITE HAZARDOUS LANDFILL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,600	cy	$32,000
- Dispose of on-site	$65	/cy	1,600	cy	$104,000
- Backfill	$20	/cy	1,600	cy	$32,000
- Subtotal					$168,000
- Contingencies (@20%)					$34,000
- Engineering, Legal, Administrative Fees (@25%)					$42,000
- Total					$244,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,600 cy	$32,000
- Transport and dispose of off-site	$160 /cy	1,600 cy	$256,000
- Backfill	$20 /cy	1,600 cy	$32,000
- Subtotal			$320,000
- Contingencies (@20%)			$64,000
- Engineering, Legal, Administrative Fees (@25%)			$80,000
- Total			$464,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,600 cy	$32,000
- Transport	$200 /cy	1,600 cy	$320,000
- Dispose of off-site	$300 /cy	1,600 cy	$480,000
- Backfill	$20 /cy	1,600 cy	$32,000
- Subtotal			$864,000
- Contingencies (@20%)			$173,000
- Engineering, Legal, Administrative Fees (@25%)			$216,000
- Total			$1,253,000

4 SOLID FUEL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,600	cy	$32,000
- Transport	$245	/cy	1,600	cy	$392,000
- Burn in kiln	$1,050	/cy	1,600	cy	$1,680,000
- Backfill	$20	/cy	1,600	cy	$32,000
- Subtotal					$2,136,000
- Contingencies (@20%)					$427,000
- Engineering, Legal, Administrative Fees (@25%)					$534,000
- Total					$3,097,000

5 CAPPING IN-PLACE

	Unit Cost		Area or Volume		Capital Cost
- Cap	$40	/sy	0	sy	$0
- Subtotal					$0
- Contingencies (@20%)					$0
- Engineering, Legal, Administrative Fees (@25%)					$0
- Total					$0

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,600	cy	$32,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,600	cy	$800,000
- Dispose of on-site	$45	/cy	800	cy	$36,000
- Backfill	$20	/cy	1,600	cy	$32,000
- Subtotal					$900,000
- Contingencies (@20%)					$180,000
- Engineering, Legal, Administrative Fees (@25%)					$225,000
- Total					$1,305,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,600 cy	$32,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,600 cy	$800,000
- Dispose of on-site	$65 /cy	800 cy	$52,000
- Backfill	$20 /cy	1,600 cy	$32,000
- Subtotal			$916,000
- Contingencies (@20%)			$183,000
- Engineering, Legal, Administrative Fees (@25%)			$229,000
- Total			$1,328,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,600 cy	$32,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,600 cy	$800,000
- Transport and dispose of off-site	$160 /cy	800 cy	$128,000
- Backfill	$20 /cy	1,600 cy	$32,000
- Subtotal			$992,000
- Contingencies (@20%)			$198,000
- Engineering, Legal, Administrative Fees (@25%)			$248,000
- Total			$1,438,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,600	cy	$32,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,600	cy	$800,000
- Transport	$200	/cy	800	cy	$160,000
- Dispose of off-site	$300	/cy	800	cy	$240,000
- Backfill	$20	/cy	1,600	cy	$32,000
- Subtotal					$1,264,000
- Contingencies (@20%)					$253,000
- Engineering, Legal, Administrative Fees (@25%)					$316,000
- Total					$1,833,000

	Unit Cost	Area or Volume	Capital Cost
1 NO ACTION	$0	$0	$0

2 ON-SITE NON-HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Dispose of on-site	$45 /cy	29,000 cy	$1,305,000
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$2,465,000
- Contingencies (@20%)			$493,000
- Engineering, Legal, Administrative Fees (@25%)			$616,000
- Total			$3,574,000

ON-SITE HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Dispose of on-site	$65 /cy	29,000 cy	$1,885,000
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$3,045,000
- Contingencies (@20%)			$609,000
- Engineering, Legal, Administrative Fees (@25%)			$761,000
- Total			$4,415,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	29,000	cy	$580,000
- Transport and dispose of off-site	$160	/cy	29,000	cy	$4,640,000
- Backfill	$20	/cy	29,000	cy	$580,000
- Subtotal					$5,800,000
- Contingencies (@20%)					$1,160,000
- Engineering, Legal, Administrative Fees (@25%)					$1,450,000
- Total					$8,410,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	29,000	cy	$580,000
- Transport	$200	/cy	29,000	cy	$5,800,000
- Dispose of off-site	$300	/cy	29,000	cy	$8,700,000
- Backfill	$20	/cy	29,000	cy	$580,000
- Subtotal					$15,660,000
- Contingencies (@20%)					$3,132,000
- Engineering, Legal, Administrative Fees (@25%)					$3,915,000
- Total					$22,707,000

4 SOLID FUEL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	29,000	cy	$580,000
- Transport	$245	/cy	29,000	cy	$7,105,000
- Burn in kiln	$1,050	/cy	29,000	cy	$30,450,000
- Backfill	$20	/cy	29,000	cy	$580,000
- Subtotal					$38,715,000
- Contingencies (@20%)					$7,743,000
- Engineering, Legal, Administrative Fees (@25%)					$9,679,000
- Total					$56,137,000

5 CAPPING IN-PLACE (ENTIRE AREA)

	Unit Cost		Area or Volume		Capital Cost
- Cap	$32	/sy	39,000	sy	$1,248,000
- Subtotal					$1,248,000
- Contingencies (@20%)					$250,000
- Engineering, Legal, Administrative Fees (@25%)					$312,000
- Total					$1,810,000

CAPPING IN-PLACE (CAMU CONCEPT)

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	19,000	cy	$380,000
- Cap	$40	/sy	13,000	sy	$520,000
- Subtotal					$900,000
- Contingencies (@20%)					$180,000
- Engineering, Legal, Administrative Fees (@25%)					$225,000
- Total					$1,305,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	29,000 cy	$14,500,000
- Dispose of on-site	$45 /cy	14,500 cy	$652,500
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$16,312,500
- Contingencies (@20%)			$3,263,000
- Engineering, Legal, Administrative Fees (@25%)			$4,078,000
- Total			$23,654,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	29,000 cy	$14,500,000
- Dispose of on-site	$65 /cy	14,500 cy	$942,500
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$16,602,500
- Contingencies (@20%)			$3,321,000
- Engineering, Legal, Administrative Fees (@25%)			$4,151,000
- Total			$24,075,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	29,000 cy	$14,500,000
- Transport and dispose of off-site	$160 /cy	14,500 cy	$2,320,000
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$17,980,000
- Contingencies (@20%)			$3,596,000
- Engineering, Legal, Administrative Fees (@25%)			$4,495,000
- Total			$26,071,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	29,000 cy	$580,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	29,000 cy	$14,500,000
- Transport	$200 /cy	14,500 cy	$2,900,000
- Dispose of off-site	$300 /cy	14,500 cy	$4,350,000
- Backfill	$20 /cy	29,000 cy	$580,000
- Subtotal			$22,910,000
- Contingencies (@20%)			$4,582,000
- Engineering, Legal, Administrative Fees (@25%)			$5,728,000
- Total			$33,220,000

SOURCE CONTROL ALTERNATIVES	EAST DISPOSAL SITE TRENCH WASTE FORGE COMPOUND		
	Unit Cost	Area or Volume	Capital Cost
1 NO ACTION	$0	$0	$0
2 ON-SITE NON-HAZARDOUS LANDFILL			
	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	300 cy	$6,000
- Dispose of on-site	$45 /cy	300 cy	$13,500
- Backfill	$20 /cy	300 cy	$6,000
- Subtotal			$25,500
- Contingencies (@20%)			$5,000
- Engineering, Legal, Administrative Fees (@25%)			$6,000
- Total			$37,000
ON-SITE HAZARDOUS LANDFILL			
	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	300 cy	$6,000
- Dispose of on-site	$65 /cy	300 cy	$19,500
- Backfill	$20 /cy	300 cy	$6,000
- Subtotal			$31,500
- Contingencies (@20%)			$6,000
- Engineering, Legal, Administrative Fees (@25%)			$8,000
- Total			$46,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Transport and dispose of off-site	$160	/cy	300	cy	$48,000
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$60,000
- Contingencies (@20%)					$12,000
- Engineering, Legal, Administrative Fees (@25%)					$15,000
- Total					$87,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Transport	$200	/cy	300	cy	$60,000
- Dispose of off-site	$300	/cy	300	cy	$90,000
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$162,000
- Contingencies (@20%)					$32,000
- Engineering, Legal, Administrative Fees (@25%)					$41,000
- Total					$235,000

4 SOLID FUEL

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Transport	$245	/cy	300	cy	$73,500
- Burn in kiln	$1,050	/cy	300	cy	$315,000
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$400,500
- Contingencies (@20%)					$80,000
- Engineering, Legal, Administrative Fees (@25%)					$100,000
- Total					$581,000

5 CAPPING IN-PLACE

	Unit Cost		Area or Volume		Capital Cost
- Cap	$40	/sy	0	sy	$0
- Subtotal					$0
- Contingencies (@20%)					$0
- Engineering, Legal, Administrative Fees (@25%)					$0
- Total					$0

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	300	cy	$150,000
- Dispose of on-site	$45	/cy	150	cy	$6,750
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$168,750
- Contingencies (@20%)					$34,000
- Engineering, Legal, Administrative Fees (@25%)					$42,000
- Total					$245,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	300	cy	$150,000
- Dispose of on-site	$65	/cy	150	cy	$9,750
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$171,750
- Contingencies (@20%)					$34,000
- Engineering, Legal, Administrative Fees (@25%)					$43,000
- Total					$249,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	300	cy	$6,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	300	cy	$150,000
- Transport and dispose of off-site	$160	/cy	150	cy	$24,000
- Backfill	$20	/cy	300	cy	$6,000
- Subtotal					$186,000
- Contingencies (@20%)					$37,000
- Engineering, Legal, Administrative Fees (@25%)					$47,000
- Total					$270,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	300 cy	$6,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	300 cy	$150,000
- Transport	$200 /cy	150 cy	$30,000
- Dispose of off-site	$300 /cy	150 cy	$45,000
- Backfill	$20 /cy	300 cy	$6,000
- Subtotal			$237,000
- Contingencies (@20%)			$47,000
- Engineering, Legal, Administrative Fees (@25%)			$59,000
- Total			$343,000

SOURCE CONTROL ALTERNATIVES

EAST DISPOSAL SITE
SOIL/WASTE MATERIAL

		Unit Cost	Area or Volume	Capital Cost
1	NO ACTION	$0	$0	$0

2 ON-SITE NON-HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,000 cy	$20,000
- Dispose of on-site	$45 /cy	1,000 cy	$45,000
- Backfill	$20 /cy	1,000 cy	$20,000
- Subtotal			$85,000
- Contingencies (@20%)			$17,000
- Engineering, Legal, Administrative Fees (@25%)			$21,000
- Total			$123,000

ON-SITE HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,000 cy	$20,000
- Dispose of on-site	$65 /cy	1,000 cy	$65,000
- Backfill	$20 /cy	1,000 cy	$20,000
- Subtotal			$105,000
- Contingencies (@20%)			$21,000
- Engineering, Legal, Administrative Fees (@25%)			$26,000
- Total			$152,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,000	cy	$20,000
- Transport and dispose of off-site	$160	/cy	1,000	cy	$160,000
- Backfill	$20	/cy	1,000	cy	$20,000
- Subtotal					$200,000
- Contingencies (@20%)					$40,000
- Engineering, Legal, Administrative Fees (@25%)					$50,000
- Total					$290,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,000	cy	$20,000
- Transport	$200	/cy	1,000	cy	$200,000
- Dispose of off-site	$300	/cy	1,000	cy	$300,000
- Backfill	$20	/cy	1,000	cy	$20,000
- Subtotal					$540,000
- Contingencies (@20%)					$108,000
- Engineering, Legal, Administrative Fees (@25%)					$135,000
- Total					$783,000

5 CAPPING IN-PLACE

	Unit Cost		Area or Volume		Capital Cost
- Cap	$40	/sy	600	sy	$24,000
- Subtotal					$24,000
- Contingencies (@20%)					$5,000
- Engineering, Legal, Administrative Fees (@25%)					$6,000
- Total					$35,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,000	cy	$20,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,000	cy	$500,000
- Dispose of on-site	$45	/cy	500	cy	$22,500
- Backfill	$20	/cy	1,000	cy	$20,000
- Subtotal					$562,500
- Contingencies (@20%)					$113,000
- Engineering, Legal, Administrative Fees (@25%)					$141,000
- Total					$817,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	1,000	cy	$20,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	1,000	cy	$500,000
- Dispose of on-site	$65	/cy	500	cy	$32,500
- Backfill	$20	/cy	1,000	cy	$20,000
- Subtotal					$572,500
- Contingencies (@20%)					$115,000
- Engineering, Legal, Administrative Fees (@25%)					$143,000
- Total					$831,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,000 cy	$20,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,000 cy	$500,000
- Transport and dispose of off-site	$160 /cy	500 cy	$80,000
- Backfill	$20 /cy	1,000 cy	$20,000
- Subtotal			$620,000
- Contingencies (@20%)			$124,000
- Engineering, Legal, Administrative Fees (@25%)			$155,000
- Total			$899,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	1,000 cy	$20,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	1,000 cy	$500,000
- Transport	$200 /cy	500 cy	$100,000
- Dispose of off-site	$300 /cy	500 cy	$150,000
- Backfill	$20 /cy	1,000 cy	$20,000
- Subtotal			$790,000
- Contingencies (@20%)			$158,000
- Engineering, Legal, Administrative Fees (@25%)			$198,000
- Total			$1,146,000

SOURCE CONTROL ALTERNATIVES

DRAINAGE DITCH 3
SOIL/WASTE FORGE COMPOUND

		Unit Cost	Area or Volume	Capital Cost
1	NO ACTION	$0	$0	$0

2 ON-SITE NON-HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	3,000 cy	$60,000
- Dispose of on-site	$45 /cy	3,000 cy	$135,000
- Backfill	$20 /cy	3,000 cy	$60,000
- Subtotal			$255,000
- Contingencies (@20%)			$51,000
- Engineering, Legal, Administrative Fees (@25%)			$64,000
- Total			$370,000

ON-SITE HAZARDOUS LANDFILL

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	3,000 cy	$60,000
- Dispose of on-site	$65 /cy	3,000 cy	$195,000
- Backfill	$20 /cy	3,000 cy	$60,000
- Subtotal			$315,000
- Contingencies (@20%)			$63,000
- Engineering, Legal, Administrative Fees (@25%)			$79,000
- Total			$457,000

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Transport and dispose of off-site	$160	/cy	3,000	cy	$480,000
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$600,000
- Contingencies (@20%)					$120,000
- Engineering, Legal, Administrative Fees (@25%)					$150,000
- Total					$870,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Transport	$200	/cy	3,000	cy	$600,000
- Dispose of off-site	$300	/cy	3,000	cy	$900,000
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$1,620,000
- Contingencies (@20%)					$324,000
- Engineering, Legal, Administrative Fees (@25%)					$405,000
- Total					$2,349,000

5 CAPPING IN-PLACE

	Unit Cost		Area or Volume		Capital Cost
- Cap	$40	/sy	1,700	sy	$68,000
- Subtotal					$68,000
- Contingencies (@20%)					$14,000
- Engineering, Legal, Administrative Fees (@25%)					$17,000
- Total					$99,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	3,000	cy	$1,500,000
- Dispose of on-site	$45	/cy	1,500	cy	$67,500
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$1,687,500
- Contingencies (@20%)					$338,000
- Engineering, Legal, Administrative Fees (@25%)					$422,000
- Total					$2,448,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	3,000	cy	$1,500,000
- Dispose of on-site	$65	/cy	1,500	cy	$97,500
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$1,717,500
- Contingencies (@20%)					$344,000
- Engineering, Legal, Administrative Fees (@25%)					$429,000
- Total					$2,491,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	3,000	cy	$1,500,000
- Transport and dispose of off-site	$160	/cy	1,500	cy	$240,000
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$1,860,000
- Contingencies (@20%)					$372,000
- Engineering, Legal, Administrative Fees (@25%)					$465,000
- Total					$2,697,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	3,000	cy	$60,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	3,000	cy	$1,500,000
- Transport	$200	/cy	1,500	cy	$300,000
- Dispose of off-site	$300	/cy	1,500	cy	$450,000
- Backfill	$20	/cy	3,000	cy	$60,000
- Subtotal					$2,370,000
- Contingencies (@20%)					$474,000
- Engineering, Legal, Administrative Fees (@25%)					$593,000
- Total					$3,437,000

		Unit Cost	Area or Volume	Capital Cost
1	NO ACTION	$0	$0	$0

3 OFF-SITE LANDFILL NON-HAZARDOUS

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	50 cy	$1,000
- Transport and dispose of off-site	$160 /cy	50 cy	$8,000
- Backfill	$20 /cy	50 cy	$1,000
- Subtotal			$10,000
- Contingencies (@20%)			$2,000
- Engineering, Legal, Administrative Fees (@25%)			$3,000
- Total			$15,000

OFF-SITE LANDFILL HAZARDOUS

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	50 cy	$1,000
- Transport	$200 /cy	50 cy	$10,000
- Dispose of off-site	$250 /cy	50 cy	$12,500
- Backfill	$20 /cy	50 cy	$1,000
- Subtotal			$24,500
- Contingencies (@20%)			$5,000
- Engineering, Legal, Administrative Fees (@25%)			$6,000
- Total			$36,000

6 ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	50	cy	$1,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	50	cy	$25,000
- Dispose of on-site	$45	/cy	25	cy	$1,125
- Backfill	$20	/cy	50	cy	$1,000
- Subtotal					$28,125
- Contingencies (@20%)					$6,000
- Engineering, Legal, Administrative Fees (@25%)					$7,000
- Total					$41,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL ON-SITE

	Unit Cost		Area or Volume		Capital Cost
- Excavate	$20	/cy	50	cy	$1,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500	/cy	50	cy	$25,000
- Dispose of on-site	$65	/cy	25	cy	$1,625
- Backfill	$20	/cy	50	cy	$1,000
- Subtotal					$28,625
- Contingencies (@20%)					$6,000
- Engineering, Legal, Administrative Fees (@25%)					$7,000
- Total					$42,000

ON-SITE INCINERATION AND DISPOSE OF IN NON-HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	50 cy	$1,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	50 cy	$25,000
- Transport and dispose of off-site	$160 /cy	25 cy	$4,000
- Backfill	$20 /cy	50 cy	$1,000
- Subtotal			$31,000
- Contingencies (@20%)			$6,000
- Engineering, Legal, Administrative Fees (@25%)			$8,000
- Total			$45,000

ON-SITE INCINERATION AND DISPOSE OF IN HAZARDOUS LANDFILL OFF-SITE

	Unit Cost	Area or Volume	Capital Cost
- Excavate	$20 /cy	50 cy	$1,000
- Incinerate on-site in mobile unit (assume 50% volume decrease)	$500 /cy	50 cy	$25,000
- Transport	$200 /cy	25 cy	$5,000
- Dispose of off-site	$250 /cy	25 cy	$6,250
- Backfill	$20 /cy	50 cy	$1,000
- Subtotal			$38,250
- Contingencies (@20%)			$8,000
- Engineering, Legal, Administrative Fees (@25%)			$10,000
- Total			$56,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 1
NO ACTION

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

	Item and Description	Year 1	Year 2-30
A.	Groundwater and Surface Water Monitoring		
1.	Sampling	$29,000	$10,000
2.	Analysis	$82,000	$15,000
3.	Data Review, Report Preparation	$9,000	$5,000
B.	SUBTOTAL	$120,000	$30,000
C.	Administration (@10%)	$12,000	$3,000
D.	Contingency (@20%)	$24,000	$6,000
E.	TOTAL	$156,000	$39,000
F.	Present Worth of Years 1-30 (@10%)		$488,000
	Present Worth of Years 1-30 (@5%)		$718,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation		$10,000		$10,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	5	$90,000	5	$90,000
	5.	Extraction Well Pumps (@ $3,500 ea)	5	$18,000	5	$18,000
	6.	Cascade Aerator	1	$20,000	1	$20,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	1	$15,000	1	$15,000
	9.	Road Crossing (75 lf ea @ $25/lf)	1	$2,000	1	$2,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-
	11.	Electrical	-	$40,000	-	$40,000
	12.	Instrumentation and Controls	-	$18,000	-	$18,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2000	$42,000	3000	$63,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000
B.		SUBTOTAL		$465,000		$486,000
C.		Contingency (@20%)		$93,000		$97,000
D.		Engineering, Administration and Legal (@25%)		$116,000		$122,000
E.		TOTAL		$674,000		$705,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$32,000	$32,000	$34,000	$34,000
	2.	Electrical Power (@ $0.09/kw-hr)	$42,000	$42,000	$45,000	$45,000
	3.	Operating Labor	$10,000	$5,000	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$204,000	$109,000	$209,000	$114,000
C.		Administration (@10%)	$20,000	$11,000	$21,000	$11,000
D.		Contingency (@20%)	$41,000	$22,000	$42,000	$23,000
E.		TOTAL	$265,000	$142,000	$272,000	$148,000
F.		Present Worth of Years 1-30 (@10%)		$1,475,000		$1,533,000
		Present Worth of Years 1-30 (@5%)		$2,313,000		$2,406,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 2

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$10,000	-	$10,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	4	$72,000	4	$72,000
	5.	Extraction Well Pumps (@ $3,500 ea)	4	$14,000	4	$14,000
	6.	Cascade Aerator	1	$20,000	1	$20,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	-	-	1	$20,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	-	1	$2,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-
	11.	Electrical	-	$30,000	-	$35,000
	12.	Instrumentation and Controls	-	$12,000	-	$15,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	1000	$21,000	11000	$231,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000
B.		SUBTOTAL		$389,000		$629,000
C.		Contingency (@20%)		$78,000		$126,000
D.		Engineering, Administration and Legal (@25%)		$97,000		$157,000
E.		TOTAL		$564,000		$912,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 2

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$24,000	$24,000	$48,000	$48,000
	2.	Electrical Power (@$ 0.09/kw-hr)	$24,000	$24,000	$48,000	$48,000
	3.	Operating Labor	$10,000	$5,000	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$178,000	$83,000	$226,000	$131,000
C.		Administration (@10%)	$18,000	$8,000	$23,000	$13,000
D.		Contingency (@20%)	$36,000	$17,000	$45,000	$26,000
E.		TOTAL	$232,000	$108,000	$294,000	$170,000
F.		Present Worth of Years 1-30 (@10%)		$1,152,000		$1,742,000
		Present Worth of Years 1-30 (@5%)		$1,789,000		$2,745,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 3

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$20,000	-	$20,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $500 ea)	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000 ea)	6	$108,000	6	$108,000
	5.	Extraction Well Pumps (@ $3,500 ea)	6	$21,000	6	$21,000
	6.	Cascade Aerator	2	$30,000	2	$30,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	1	$15,000	2	$40,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	-	6	$12,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	1	$38,000
	11.	Electrical	-	$45,000	-	$50,000
	12.	Instrumentation and Controls	-	$21,000	-	$24,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2500	$53,000	14500	$305,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000
B.		SUBTOTAL		$733,000		$1,068,000
C.		Contingency (@20%)		$147,000		$214,000
D.		Engineering, Administration and Legal (@25%)		$183,000		$267,000
E.		TOTAL		$1,063,000		$1,549,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 3

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$43,000	$43,000	$77,000	$77,000
	2.	Electrical Power (@$0.09/kw-hr)	$42,000	$42,000	$63,000	$63,000
	3.	Operating Labor	$20,000	$10,000	$20,000	$10,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$48,000	$17,000	$48,000	$17,000
	2.	Analysis	$154,000	$28,000	$154,000	$28,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$316,000	$145,000	$371,000	$200,000
C.		Administration (@10%)	$32,000	$15,000	$37,000	$20,000
D.		Contingency (@20%)	$63,000	$29,000	$74,000	$40,000
E.		TOTAL	$411,000	$189,000	$482,000	$260,000
F.		Present Worth of Years 1-30 (@10%)		$2,021,000		$2,697,000
		Present Worth of Years 1-30 (@5%)		$3,136,000		$4,231,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 4

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$20,000	-	$20,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $500 ea)	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000 ea)	8	$144,000	8	$144,000
	5.	Extraction Well Pumps (@ $3,500 ea)	8	$28,000	8	$28,000
	6.	Cascade Aerator	2	$30,000	2	$30,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	2	$40,000	2	$40,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	-	2	$4,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-
	11.	Electrical	-	$60,000	-	$60,000
	12.	Instrumentation and Controls	-	$30,000	-	$30,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2000	$42,000	13000	$273,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000
B.		SUBTOTAL		$814,000		$1,049,000
C.		Contingency (@20%)		$163,000		$210,000
D.		Engineering, Administration and Legal (@25%)		$204,000		$262,000
E.		TOTAL		$1,181,000		$1,521,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 4

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

	Item and Description	Discharge Option A		Discharge Option B	
		Year 1	Year 2-30	Year 1	Year 2-30
A. 1.	Maintenance (@ 10% of Installed Equipment Cost)	$51,000	$51,000	$75,000	$75,000
2.	Electrical Power (@ $0.09/kw-hr)	$75,000	$75,000	$75,000	$75,000
3.	Operating Labor	$20,000	$10,000	$20,000	$10,000
	Groundwater and Surface Water Monitoring				
1.	Sampling	$48,000	$17,000	$48,000	$17,000
2.	Analysis	$154,000	$28,000	$154,000	$28,000
3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.	SUBTOTAL	$357,000	$186,000	$381,000	$210,000
C.	Administration (@10%)	$36,000	$19,000	$38,000	$21,000
D.	Contingency (@20%)	$71,000	$37,000	$76,000	$42,000
E.	TOTAL	$464,000	$242,000	$495,000	$273,000
F.	Present Worth of Years 1-30 (@10%)		$2,525,000		$2,820,000
	Present Worth of Years 1-30 (@5%)		$3,954,000		$4,432,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation		$10,000		$10,000		$10,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	5	$90,000	5	$90,000	5	$90,000
	5.	Extraction Well Pumps (@ $3,500 ea)	5	$18,000	5	$18,000	5	$18,000
	6.	Cascade Aerator	-	-	-	-	-	-
	7.	Air Stripping Tower	-	$70,000	-	$70,000	-	$70,000
	8.	Pump Station	1	$15,000	1	$15,000	1	$15,000
	9.	Road Crossing (75 lf ea @ $25/lf)	1	$2,000	1	$2,000	1	$2,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-	-	-
	11.	Electrical	-	$45,000	-	$45,000	-	$45,000
	12.	Instrumentation and Controls	-	$21,000	-	$21,000	-	$21,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2000	$42,000	3000	$63,000	1000	$21,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000	1	$150,000
B.		SUBTOTAL		$523,000		$544,000		$562,000
C.		Contingency (@20%)		$105,000		$109,000		$112,000
D.		Engineering, Administration and Legal (@25%)		$131,000		$136,000		$141,000
E.		TOTAL		$759,000		$789,000		$815,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$37,000	$37,000	$39,000	$39,000	$41,000	$41,000
	2.	Electrical Power (@ $0.09/kw-hr)	$48,000	$48,000	$51,000	$51,000	$45,000	$45,000
	3.	Operating Labor	$20,000	$15,000	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$29,000	$10,000	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$225,000	$130,000	$230,000	$135,000	$226,000	$131,000
C.		Administration (@10%)	$23,000	$13,000	$23,000	$14,000	$23,000	$13,000
D.		Contingency (@20%)	$45,000	$26,000	$46,000	$27,000	$45,000	$26,000
E.		TOTAL	$293,000	$169,000	$299,000	$176,000	$294,000	$170,000
F.		Present Worth of Years 1-30 (@10%)		$1,733,000		$1,798,000		$1,742,000
		Present Worth of Years 1-30 (@5%)		$2,730,000		$2,837,000		$2,745,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 2

PRELIMIMARY CAPITAL COST ESTIMATE

	Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
		Number	Cost	Number	Cost	Number	Cost
A. 1.	Site Preparation	-	$10,000	-	$10,000	-	$10,000
2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000	10	$50,000
3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000	20	$10,000
4.	Extraction Wells (@ $18,000 ea)	4	$72,000	4	$72,000	4	$72,000
5.	Extraction Well Pumps (@ $3,500 ea)	4	$14,000	4	$14,000	4	$14,000
6.	Cascade Aerator	-	-	-	-	-	-
7.	Air Stripping Tower	-	$70,000	-	$70,000	-	$70,000
8.	Pump Station	-	-	1	$20,000	1	$20,000
9.	Road Crossing (75 lf ea @ $25/lf)	-	-	1	$2,000	1	$2,000
10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-	-	-
11.	Electrical	-	$35,000	-	$40,000	-	$40,000
12.	Instrumentation and Controls	-	$15,000	-	$18,000	-	$18,000
13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-	-	-
15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-	-	-
16.	8-Inch Diameter PVC Pipe (@ $21/lf)	1000	$21,000	11000	$231,000	10000	$210,000
17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000	1	$150,000
B.	SUBTOTAL		$447,000		$687,000		$726,000
C.	Contingency (@20%)		$89,000		$137,000		$145,000
D.	Engineering, Administration and Legal (@25%)		$112,000		$172,000		$182,000
E.	TOTAL		$648,000		$996,000		$1,053,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 2

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$30,000	$30,000	$54,000	$54,000	$58,000	$58,000
	2.	Electrical Power (@ $0.09/kw-hr)	$30,000	$30,000	$54,000	$54,000	$54,000	$54,000
	3.	Operating Labor	$20,000	$15,000	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$29,000	$10,000	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$200,000	$105,000	$248,000	$153,000	$252,000	$157,000
C.		Administration (@10%)	$20,000	$11,000	$25,000	$15,000	$25,000	$16,000
D.		Contingency (@20%)	$40,000	$21,000	$50,000	$31,000	$50,000	$31,000
E.		TOTAL	$260,000	$137,000	$323,000	$199,000	$327,000	$204,000
F.		Present Worth of Years 1-30 (@10%)		$1,427,000		$2,018,000		$2,065,000
		Present Worth of Years 1-30 (@5%)		$2,236,000		$3,193,000		$3,269,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 3

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$20,000	-	$20,000	-	$20,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $500 ea)	40	$20,000	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000)	6	$108,000	6	$108,000	6	$108,000
	5.	Extraction Well Pumps (@ $3,500 ea)	6	$21,000	6	$21,000	6	$21,000
	6.	Cascade Aerator	-	-	-	-	-	-
	7.	Air Stripping Tower	2	$100,000	2	$100,000	2	$100,000
	8.	Pump Station	1	$15,000	2	$40,000	2	$40,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	-	6	$12,000	6	$12,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	1	$38,000	1	$38,000
	11.	Electrical	-	$55,000	-	$60,000	-	$60,000
	12.	Instrumentation and Controls	-	$27,000	-	$30,000	-	$30,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2500	$53,000	14500	$305,000	13500	$284,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000	2	$300,000
B.		SUBTOTAL		$819,000		$1,154,000		$1,193,000
C.		Contingency (@20%)		$164,000		$231,000		$239,000
D.		Engineering, Administration and Legal (@25%)		$205,000		$289,000		$298,000
E.		TOTAL		$1,188,000		$1,674,000		$1,730,000

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NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 3

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$52,000	$52,000	$85,000	$85,000	$89,000	$89,000
	2.	Electrical Power (@ $0.09/kw-hr)	$54,000	$54,000	$75,000	$75,000	$75,000	$75,000
	3.	Operating Labor	$30,000	$20,000	$30,000	$20,000	$30,000	$20,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$48,000	$17,000	$48,000	$17,000	$48,000	$17,000
	2.	Analysis	$154,000	$28,000	$154,000	$28,000	$154,000	$28,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$347,000	$176,000	$401,000	$230,000	$405,000	$234,000
C.		Administration (@10%)	$35,000	$18,000	$40,000	$23,000	$41,000	$23,000
D.		Contingency (@20%)	$69,000	$35,000	$80,000	$46,000	$81,000	$47,000
E.		TOTAL	$451,000	$229,000	$521,000	$299,000	$527,000	$304,000
F.		Present Worth of Years 1-30 (@10%)		$2,402,000		$3,068,000		$3,116,000
		Present Worth of Years 1-30 (@5%)		$3,753,000		$4,833,000		$4,911,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 4

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$20,000	-	$20,000	-	$20,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $500 ea)	40	$20,000	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000 ea)	8	$144,000	8	$144,000	8	$144,000
	5.	Extraction Well Pumps (@ $3,500 ea)	8	$28,000	8	$28,000	8	$28,000
	6.	Cascade Aerator	-	-	-	-	-	-
	7.	Air Stripping Tower	2	$100,000	2	$100,000	2	$100,000
	8.	Pump Station	1	$20,000	2	$40,000	1	$20,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	-	2	$4,000	2	$4,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-	-	-
	11.	Electrical	-	$70,000	-	$70,000	-	$65,000
	12.	Instrumentation and Controls	-	$36,000	-	$36,000	-	$33,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	2000	$42,000	13000	$273,000	9000	$189,000
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000	2	$300,000
B.		SUBTOTAL		$880,000		$1,135,000		$1,083,000
C.		Contingency (@20%)		$176,000		$227,000		$217,000
D.		Engineering, Administration and Legal (@25%)		$220,000		$284,000		$271,000
E.		TOTAL		$1,276,000		$1,646,000		$1,571,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 1-2

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 4

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$60,000	$60,000	$84,000	$84,000	$78,000	$78,000
	2.	Electrical Power (@ $0.09/kw-hr)	$66,000	$66,000	$87,000	$87,000	$75,000	$75,000
	3.	Operating Labor	$30,000	$20,000	$30,000	$20,000	$30,000	$20,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$48,000	$17,000	$48,000	$17,000	$48,000	$17,000
	2.	Analysis	$154,000	$28,000	$154,000	$28,000	$154,000	$28,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$367,000	$196,000	$412,000	$241,000	$394,000	$223,000
C.		Administration (@10%)	$37,000	$20,000	$41,000	$24,000	$39,000	$22,000
D.		Contingency (@20%)	$73,000	$39,000	$82,000	$48,000	$79,000	$45,000
E.		TOTAL	$477,000	$255,000	$535,000	$313,000	$512,000	$290,000
F.		Present Worth of Years 1-30 (@10%)		$2,649,000		$3,201,000		$2,982,000
		Present Worth of Years 1-30 (@5%)		$4,154,000		$5,048,000		$4,694,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 1
NO ACTION

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

	Item and Description	Year 1	Year 2-30
A.	Groundwater and Surface Water Monitoring		
	1. Sampling	$29,000	$10,000
	2. Analysis	$82,000	$15,000
	3. Data Review, Report Preparation	$9,000	$5,000
B.	SUBTOTAL	$120,000	$30,000
C.	Administration (@10%)	$12,000	$3,000
D.	Contingency (@20%)	$24,000	$6,000
E.	TOTAL	$156,000	$39,000
F.	Present Worth of Years 1-30 (@10%)		$488,000
	Present Worth of Years 1-30 (@5%)		$718,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	2	$36,000	2	$36,000
	5.	Extraction Well Pumps (@ $3,500 ea)	2	$7,000	2	$7,000
	6.	Cascade Aerator	1	$10,000	1	$10,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station (@ $15,000 ea)	1	$15,000	1	$15,000
	9.	Road Crossing (75 lf ea @ $25/lf)	2	$4,000	2	$4,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-
	11.	Electrical	-	$25,000	-	$25,000
	12.	Instrumentation and Controls	-	$9,000	-	$9,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	1000	$10,000	1000	$10,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	3500	$46,000	2500	$33,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000
B.		SUBTOTAL		$377,000		$364,000
C.		Contingency (@20%)		$75,000		$73,000
D.		Engineering, Administration and Legal (@25%)		$94,000		$91,000
E.		TOTAL		$546,000		$528,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$23,000	$23,000	$21,000	$21,000
	2.	Electrical Power (@ $0.09/kw-hr)	$18,000	$18,000	$18,000	$18,000
	3.	Operating Labor	$10,000	$5,000	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$171,000	$76,000	$169,000	$74,000
C.		Administration (@10%)	$17,000	$8,000	$17,000	$7,000
D.		Contingency (@20%)	$34,000	$15,000	$34,000	$15,000
E.		TOTAL	$222,000	$99,000	$220,000	$96,000
F.		Present Worth of Years 1-30 (@10%)		$1,065,000		$1,038,000
		Present Worth of Years 1-30 (@5%)		$1,650,000		$1,604,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 2

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$10,000	-	$10,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $ 500 ea)	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000 ea)	4	$72,000	4	$72,000
	5.	Extraction Well Pumps (@ $3,500 ea)	4	$14,000	4	$14,000
	6.	Cascade Aerator	2	$30,000	2	$30,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	2	$30,000	2	$30,000
	9.	Road Crossing (75 lf ea @ $25/lf)	4	$8,000	4	$8,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-
	11.	Electrical	-	$35,000	-	$40,000
	12.	Instrumentation and Controls	-	$18,000	-	$18,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	2500	$25,000	2500	$25,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	4000	$52,000	2500	$33,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000
B.		SUBTOTAL		$714,000		$700,000
C.		Contingency (@20%)		$143,000		$140,000
D.		Engineering, Administration and Legal (@25%)		$179,000		$175,000
E.		TOTAL		$1,036,000		$1,015,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 2

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$41,000	$41,000	$40,000	$40,000
	2.	Electrical Power (@ $0.09/kw-hr)	$30,000	$30,000	$36,000	$36,000
	3.	Operating Labor	$20,000	$10,000	$20,000	$10,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$48,000	$17,000	$48,000	$17,000
	2.	Analysis	$154,000	$28,000	$154,000	$28,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$302,000	$131,000	$307,000	$136,000
C.		Administration (@10%)	$30,000	$13,000	$31,000	$14,000
D.		Contingency (@20%)	$60,000	$26,000	$61,000	$27,000
E.		TOTAL	$392,000	$170,000	$399,000	$177,000
F.		Present Worth of Years 1-30 (@10%)		$1,840,000		$1,907,000
		Present Worth of Years 1-30 (@5%)		$2,843,000		$2,951,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMP AT LAKE HALLIE

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	NA	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	-	NA	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	-	NA	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	-	NA	2	$36,000
	5.	Extraction Well Pumps (@ $3,500 ea)	-	NA	2	$7,000
	6.	Cascade Aerator	-	NA	1	$10,000
	7.	Air Stripping Tower	-	NA	-	-
	8.	Pump Station	-	NA	-	-
	9.	Road Crossing (75 lf ea @ $25/lf)	-	NA	-	-
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	NA	-	-
	11.	Electrical	-	NA	-	$20,000
	12.	Instrumentation and Controls	-	NA	-	$6,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	NA	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	NA	500	$5,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	NA	200	$3,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	NA	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	NA	-	-
	18.	Aquifer Pumping Tests (@ $150,000/well field)	-	NA	1	$150,000
B.		SUBTOTAL		NA		$302,000
C.		Contingency (@20%)		NA		$60,000
D.		Engineering, Administration and Legal (@25%)		NA		$76,000
E.		TOTAL		NA		$438,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMP AT LAKE HALLIE

PRELIMMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	NA	NA	$15,000	$15,000
	2.	Electrical Power (@ $0.09/kw-hr)	NA	NA	$12,000	$12,000
	3.	Operating Labor	NA	NA	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	NA	NA	$29,000	$10,000
	2.	Analysis	NA	NA	$82,000	$15,000
	3.	Data Review, Report Preparation	NA	NA	$9,000	$5,000
B.		SUBTOTAL	NA	NA	$157,000	$62,000
C.		Administration (@10%)	NA	NA	$16,000	$6,000
D.		Contingency (@20%)	NA	NA	$31,000	$12,000
E.		TOTAL	NA	NA	$204,000	$80,000
F.		Present Worth of Years 1-30 (@10%)	NA	NA		$885,000
		Present Worth of Years 1-30 (@5%)	NA	NA		$1,358,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$5,000	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	2	$36,000	2	$36,000	2	$36,000
	5.	Extraction Well Pumps (@ $3,500 ea)	2	$7,000	2	$7,000	2	$7,000
	6.	Cascade Aerator	-	-	-	-	-	-
	7.	Air Stripping Tower	1	$50,000	1	$50,000	1	$50,000
	8.	Pump Station	1	$15,000	1	$15,000	1	$15,000
	9.	Road Crossing (75 lf ea @ $25/lf)	2	$4,000	2	$4,000	2	$4,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-	-	-
	11.	Electrical	-	$30,000	-	$30,000	-	$30,000
	12.	Instrumentation and Controls	-	$12,000	-	$12,000	-	$12,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	1000	$10,000	1000	$10,000	1000	$10,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	3500	$46,000	2500	$33,000	1500	$20,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	1	$150,000	1	$150,000	1	$150,000
B.		SUBTOTAL		$425,000		$412,000		$459,000
C.		Contingency (@20%)		$85,000		$82,000		$92,000
D.		Engineering, Administration and Legal (@25%)		$106,000		$103,000		$115,000
E.		TOTAL		$616,000		$597,000		$666,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$28,000	$28,000	$26,000	$26,000	$31,000	$31,000
	2.	Electrical Power (@ $0.09/kw-hr)	$24,000	$24,000	$24,000	$24,000	$24,000	$24,000
	3.	Operating Labor	$20,000	$15,000	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$29,000	$10,000	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$192,000	$97,000	$190,000	$95,000	$195,000	$100,000
C.		Administration (@10%)	$19,000	$10,000	$19,000	$10,000	$20,000	$10,000
D.		Contingency (@20%)	$38,000	$19,000	$38,000	$19,000	$39,000	$20,000
E.		TOTAL	$249,000	$126,000	$247,000	$124,000	$254,000	$130,000
F.		Present Worth of Years 1-30 (@10%)		$1,322,000		$1,303,000		$1,361,000
		Present Worth of Years 1-30 (@5%)		$2,066,000		$2,035,000		$2,129,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 2

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$10,000	-	$10,000	-	$10,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	20	$100,000	20	$100,000	20	$100,000
	3.	Sampling Pumps (@ $500 ea)	40	$20,000	40	$20,000	40	$20,000
	4.	Extraction Wells (@ $18,000 ea)	4	$72,000	4	$72,000	4	$72,000
	5.	Extraction Well Pumps (@ $3,500 ea)	4	$14,000	4	$14,000	4	$14,000
	6.	Cascade Aerator	-	-	-	-	2	$20,000
	7.	Air Stripping Tower	2	$70,000	2	$70,000	-	-
	8.	Pump Station	2	$30,000	2	$30,000	2	$30,000
	9.	Road Crossing (75 lf ea @ $25/lf)	4	$8,000	4	$8,000	4	$8,000
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	-	-	-	-	-
	11.	Electrical	-	$50,000	-	$50,000	-	$50,000
	12.	Instrumentation and Controls	-	$24,000	-	$24,000	-	$24,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	-	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	2500	$25,000	2500	$25,000	2500	$25,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	4000	$52,000	2500	$33,000	2500	$33,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	2	$60,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	2	$300,000	2	$300,000	2	$300,000
B.		SUBTOTAL		$775,000		$756,000		$766,000
C.		Contingency (@20%)		$155,000		$151,000		$153,000
D.		Engineering, Administration and Legal (@25%)		$194,000		$189,000		$192,000
E.		TOTAL		$1,124,000		$1,096,000		$1,111,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 2

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$48,000	$48,000	$46,000	$46,000	$47,000	$47,000
	2.	Electrical Power (@ $0.09/kw-hr)	$39,000	$39,000	$45,000	$45,000	$45,000	$45,000
	3.	Operating Labor	$30,000	$20,000	$30,000	$20,000	$30,000	$20,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$48,000	$17,000	$48,000	$17,000	$48,000	$17,000
	2.	Analysis	$154,000	$28,000	$154,000	$28,000	$154,000	$28,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$328,000	$157,000	$332,000	$161,000	$333,000	$162,000
C.		Administration (@10%)	$33,000	$16,000	$33,000	$16,000	$33,000	$16,000
D.		Contingency (@20%)	$66,000	$31,000	$66,000	$32,000	$67,000	$32,000
E.		TOTAL	$427,000	$204,000	$431,000	$209,000	$433,000	$210,000
F.		Present Worth of Years 1-30 (@10%)		$2,165,000		$2,211,000		$2,222,000
		Present Worth of Years 1-30 (@5%)		$3,369,000		$3,445,000		$3,461,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMP AT LAKE HALLIE

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	NA	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	-	NA	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	-	NA	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	-	NA	2	$36,000	2	$36,000
	5.	Extraction Well Pumps (@ $3,500 ea)	-	NA	2	$7,000	2	$7,000
	6.	Cascade Aerator	-	NA	-	-	-	-
	7.	Air Stripping Tower	-	NA	-	$50,000	-	$50,000
	8.	Pump Station	-	NA	-	-	-	-
	9.	Road Crossing (75 lf ea @ $25/lf)	-	NA	-	-	-	-
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	NA	-	-	-	-
	11.	Electrical	-	NA	-	$25,000	-	$25,000
	12.	Instrumentation and Controls	-	NA	-	$9,000	-	$9,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	NA	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	NA	500	$5,000	500	$5,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	NA	200	$3,000	200	$3,000
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	NA	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	NA	-	-	1	$30,000
	18.	Aquifer Pumping Tests (@ $150,000/well field)	-	NA	1	$150,000	1	$150,000
B.		SUBTOTAL		NA		$350,000		$380,000
C.		Contingency (@20%)		NA		$70,000		$76,000
D.		Engineering, Administration and Legal (@25%)		NA		$88,000		$95,000
E.		TOTAL		NA		$508,000		$551,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUMES 3 AND 4

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMP AT LAKE HALLIE

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	NA	NA	$20,000	$20,000	$23,000	$23,000
	2.	Electrical Power (@ $0.09/kw-hr)	NA	NA	$18,000	$18,000	$18,000	$18,000
	3.	Operating Labor	NA	NA	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	NA	NA	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	NA	NA	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	NA	NA	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	NA	NA	$178,000	$83,000	$181,000	$86,000
C.		Administration (@10%)	NA	NA	$18,000	$8,000	$18,000	$9,000
D.		Contingency (@20%)	NA	NA	$36,000	$17,000	$36,000	$17,000
E.		TOTAL	NA	NA	$232,000	$108,000	$235,000	$112,000
F.		Present Worth of Years 1-30 (@10%)	NA	NA		$1,152,000		$1,189,000
		Present Worth of Years 1-30 (@5%)	NA	NA		$1,789,000		$1,850,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 1
NO ACTION

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

	Item and Description	Year 1	Year 2-30
A.	Groundwater and Surface Water Monitoring		
1.	Sampling	$29,000	$10,000
2.	Analysis	$82,000	$15,000
3.	Data Review, Report Preparation	$9,000	$5,000
B.	SUBTOTAL	$120,000	$30,000
C.	Administration (@10%)	$12,000	$3,000
D.	Contingency (@20%)	$24,000	$6,000
E.	TOTAL	$156,000	$39,000
F.	Present Worth of Years 1-30 (@10%)		$488,000
	Present Worth of Years 1-30 (@5%)		$718,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	1	$18,000	2	$36,000
	5.	Extraction Well Pumps (@ $3,000 ea)	1	$3,000	1	$3,000
	6.	Cascade Aerator	1	$5,000	1	$5,000
	7.	Air Stripping Tower	-	-	-	-
	8.	Pump Station	1	$15,000	1	$10,000
	9.	Road Crossing (75 lf ea @ $25/lf)	1	$2,000	2	$4,000
	10.	Highway Crossing (200 lf ea @ $250/lf)	1	$50,000	1	$50,000
	11.	Electrical	-	$20,000	-	$20,000
	12.	Instrumentation and Controls	-	$6,000	-	$6,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	4500	$36,000	4000	$32,000
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-
	18.	Aquifer Pumping Tests (@ $50,000/pumping well)	1	$50,000	1	$50,000
B.		SUBTOTAL		$270,000		$281,000
C.		Contingency (@20%)		$54,000		$56,000
D.		Engineering, Administration and Legal (@25%)		$68,000		$70,000
E.		TOTAL		$392,000		$407,000

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NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$22,000	$22,000	$23,000	$23,000
	2.	Electrical Power (@ $0.09/kw-hr)	$6,000	$6,000	$6,000	$6,000
	3.	Operating Labor	$10,000	$5,000	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$158,000	$63,000	$159,000	$64,000
C.		Administration (@10%)	$16,000	$6,000	$16,000	$6,000
D.		Contingency (@20%)	$32,000	$13,000	$32,000	$13,000
E.		TOTAL	$206,000	$82,000	$207,000	$83,000
F.		Present Worth of Years 1-30 (@10%)		$904,000		$914,000
		Present Worth of Years 1-30 (@5%)		$1,388,000		$1,404,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMP AT LAKE HALLIE

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Number	Cost	Number	Cost
A.	1.	Site Preparation	-	NA	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	-	NA	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	-	NA	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	-	NA	1	$18,000
	5.	Extraction Well Pumps (@ $3,500 ea)	-	NA	1	$4,000
	6.	Cascade Aerator	-	NA	1	$10,000
	7.	Air Stripping Tower	-	NA	-	-
	8.	Pump Station	-	NA	-	-
	9.	Road Crossing (75 lf ea @ $25/lf)	-	NA	-	-
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	NA	-	-
	11.	Electrical	-	NA	-	$15,000
	12.	Instrumentation and Controls	-	NA	-	$3,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	NA	-	-
	14.	4-Inch Diameter PVC Pipe (@ $108/lf)	-	NA	250	$3,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	NA	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	NA	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	NA	-	-
	18.	Aquifer Pumping Tests (@ $50,000/well)	-	NA	1	$50,000
B.		SUBTOTAL		NA		$168,000
C.		Contingency (@20%)		NA		$34,000
D.		Engineering, Administration and Legal (@25%)		NA		$42,000
E.		TOTAL		NA		$244,000

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NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 2
PUMP AND CASCADE AERATION
PUMP AT LAKE HALLIE

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B	
			Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	NA	NA	$12,000	$12,000
	2.	Electrical Power (@ $0.09/kw-hr)	NA	NA	$6,000	$6,000
	3.	Operating Labor	NA	NA	$10,000	$5,000
	Groundwater and Surface Water Monitoring					
	1.	Sampling	NA	NA	$29,000	$10,000
	2.	Analysis	NA	NA	$82,000	$15,000
	3.	Data Review, Report Preparation	NA	NA	$9,000	$5,000
B.		SUBTOTAL	NA	NA	$148,000	$53,000
C.		Administration (@10%)	NA	NA	$15,000	$5,000
D.		Contingency (@20%)	NA	NA	$30,000	$11,000
E.		TOTAL	NA	NA	$193,000	$69,000
F.		Present Worth of Years 1-30 (@10%)	NA	NA		$781,000
		Present Worth of Years 1-30 (@5%)	NA	NA		$1,188,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	$5,000	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	10	$50,000	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	20	$10,000	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	1	$18,000	2	$36,000	2	$36,000
	5.	Extraction Well Pumps (@ $3,000 ea)	1	$3,000	1	$3,000	1	$3,000
	6.	Cascade Aerator	-	-	-	-	-	-
	7.	Air Stripping Tower	1	$25,000	1	$25,000	1	$25,000
	8.	Pump Station	1	$15,000	1	$10,000	1	$10,000
	9.	Road Crossing (75 lf ea @ $25/lf)	1	$2,000	2	$4,000	2	$4,000
	10.	Highway Crossing (200 lf ea @ $250/lf)	1	$50,000	1	$50,000	1	$50,000
	11.	Electrical	-	$25,000	-	$25,000	-	$25,000
	12.	Instrumentation and Controls	-	$9,000	-	$9,000	-	$9,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	4500	$36,000	4000	$32,000	5000	$40,000
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	-	-	-	-	-
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	-	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	-	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	-	-	-	1	$30,000
	18.	Aquifer Pumping Tests (@ $50,000/pumping well)	1	$50,000	1	$50,000	1	$50,000
B.		SUBTOTAL		$298,000		$309,000		$347,000
C.		Contingency (@20%)		$60,000		$62,000		$69,000
D.		Engineering, Administration and Legal (@25%)		$75,000		$77,000		$87,000
E.		TOTAL		$433,000		$448,000		$503,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMPING SCENARIO 1

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	$25,000	$25,000	$26,000	$26,000	$30,000	$30,000
	2.	Electrical Power (@ $0.09/kw-hr)	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000
	3.	Operating Labor	$20,000	$15,000	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	$29,000	$10,000	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	$82,000	$15,000	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	$9,000	$5,000	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	$174,000	$79,000	$175,000	$80,000	$179,000	$84,000
C.		Administration (@10%)	$17,000	$8,000	$18,000	$8,000	$18,000	$8,000
D.		Contingency (@20%)	$35,000	$16,000	$35,000	$16,000	$36,000	$17,000
E.		TOTAL	$226,000	$103,000	$228,000	$104,000	$233,000	$109,000
F.		Present Worth of Years 1-30 (@10%)		$1,103,000		$1,114,000		$1,161,000
		Present Worth of Years 1-30 (@5%)		$1,711,000		$1,728,000		$1,805,000

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMP AT LAKE HALLIE

PRELIMIMARY CAPITAL COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Number	Cost	Number	Cost	Number	Cost
A.	1.	Site Preparation	-	NA	-	$5,000	-	$5,000
	2.	Drill and Install Additional Monitoring Wells (@ $5,000 ea)	-	NA	10	$50,000	10	$50,000
	3.	Sampling Pumps (@ $500 ea)	-	NA	20	$10,000	20	$10,000
	4.	Extraction Wells (@ $18,000 ea)	-	NA	1	$18,000	1	$18,000
	5.	Extraction Well Pumps (@ $3,500 ea)	-	NA	1	$4,000	1	$4,000
	6.	Cascade Aerator	-	NA	-	-	-	-
	7.	Air Stripping Tower	-	NA	-	$30,000	-	$30,000
	8.	Pump Station	-	NA	-	-	1	$15,000
	9.	Road Crossing (75 lf ea @ $25/lf)	-	NA	-	-	-	-
	10.	Railroad Crossing (150 lf ea @ $250/lf)	-	NA	-	-	-	-
	11.	Electrical	-	NA	-	$20,000	-	$25,000
	12.	Instrumentation and Controls	-	NA	-	$6,000	-	$9,000
	13.	2-Inch Diameter PVC Pipe (@ $8/lf)	-	NA	-	-	-	-
	14.	4-Inch Diameter PVC Pipe (@ $10/lf)	-	NA	250	$3,000	1000	$10,000
	15.	6-Inch Diameter PVC Pipe (@ $13/lf)	-	NA	-	-	-	-
	16.	8-Inch Diameter PVC Pipe (@ $21/lf)	-	NA	-	-	-	-
	17.	Recharge Basin Installation (@ $30,000/acre)	-	NA	-	-	1	$30,000
	18.	Aquifer Pumping Tests (@ $50,000/well)	-	NA	1	$50,000	1	$50,000
B.		SUBTOTAL		NA		$196,000		$256,000
C.		Contingency (@20%)		NA		$39,000		$51,000
D.		Engineering, Administration and Legal (@25%)		NA		$49,000		$64,000
E.		TOTAL		NA		$284,000		$371,000

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NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

PLUME 5

ALTERNATIVE 3
PUMP AND AIR STRIPPING
PUMP AT LAKE HALLIE

PRELIMIMARY OPERATION AND MAINTENANCE
COST ESTIMATE

		Item and Description	Discharge Option A		Discharge Option B		Discharge Option C	
			Year 1	Year 2-30	Year 1	Year 2-30	Year 1	Year 2-30
A.	1.	Maintenance (@ 10% of Installed Equipment Cost)	NA	NA	$15,000	$15,000	$21,000	$21,000
	2.	Electrical Power (@ $0.09/kw-hr)	NA	NA	$12,000	$12,000	$18,000	$18,000
	3.	Operating Labor	NA	NA	$20,000	$15,000	$20,000	$15,000
	Groundwater and Surface Water Monitoring							
	1.	Sampling	NA	NA	$29,000	$10,000	$29,000	$10,000
	2.	Analysis	NA	NA	$82,000	$15,000	$82,000	$15,000
	3.	Data Review, Report Preparation	NA	NA	$9,000	$5,000	$9,000	$5,000
B.		SUBTOTAL	NA	NA	$167,000	$72,000	$179,000	$84,000
C.		Administration (@10%)	NA	NA	$17,000	$7,000	$18,000	$8,000
D.		Contingency (@20%)	NA	NA	$33,000	$14,000	$36,000	$17,000
E.		TOTAL	NA	NA	$217,000	$93,000	$233,000	$109,000
F.		Present Worth of Years 1-30 (@10%)	NA	NA		$1,009,000		$1,161,000
		Present Worth of Years 1-30 (@5%)	NA	NA		$1,558,000		$1,805,000

APPENDIX G

"LEGALLY APPLICABLE OR RELEVANT AND APPROPRIATE STATE STANDARDS, REQUIREMENTS, CRITERIA AND LIMITATIONS FOR SUPERFUND PROJECTS IN WISCONSIN"

Does rct rpt include NR 141 & NR 103

LEGALLY APPLICABLE OR RELEVANT AND APPROPRIATE STATE STANDARDS, REQUIREMENTS, CRITERIA AND LIMITATIONS FOR SUPERFUND PROJECTS IN WISCONSIN

Introduction

Recent amendments to the Comprehensive Environmental Response and Liability Act (CERCLA, commonly known as Superfund) under the Superfund Amendments and Reauthorization Act of 1986 (SARA) included a section on clean-up standards, Section 121. This section requires that any long-term clean-up (i.e., remedial actions) under the Act attain legally applicable or relevant and appropriate standards, requirements, criteria and limitations (ARAR's) under State and Federal law. State ARAR's must be met if they are promulgated and legally applicable. If they are not legally applicable to a Superfund site, but were developed to regulate or protect an environmental media under a different program, they are still considered relevant and appropriate. State ARAR's must be formally promulgated to be required; they may be waived if they are not consistently applied by the State.

To assist persons (i.e., EPA, their contractors, responsible parties and their contractors) the Bureau of Solid and Hazardous Waste Management, Department of Natural Resources (DNR) has prepared this comprehensive listing of all promulgated State ARAR's which may apply to Superfund long-term clean-ups. By providing this listing to such persons, Wisconsin is satisfying the requirement of Section 121 to provide timely notice of the ARAR's.

The comprehensive listing can be easily matched to specific site responses considered through an alternatives array in a feasibility study. Therefore, it may be used at any Superfund site in Wisconsin by interested persons.

Rules, statutes and program requirements are subject to revisions. As the Bureau of Solid and Hazardous Waste Management becomes aware of them, this listing will be revised.

Explanation and Use of the Listings

Table 1 is a list of general options for possible remedial actions at Superfund sites. With exception of item D. in the table, it is arranged in a "ascending order" of more comprehensive response activities. For example, the options listed under category A are generally "easier" or less involved than, say, the options in category C. It is also important to note that more comprehensive options, when used at a site, will generally include less comprehensive options as part of a total site remedial action. For example, the treatment of hazardous substances in-place (B.1.) will usually include the management of extracted substances (A.4.) and monitoring (A.1.) as part of an action.

Table 2 matches all promulgated State ARAR's with the general options described in Table 1. Where no ARAR is given for an option from Table 1, there is no promulgated standard we are aware of. The Table describes the requirement in a general way, lists any important exceptions and specifies regulated activity and media regulated or protected.

Table 3 is a list of construction-related activities associated with the remedial actions listed in Table 1. These activities are not traditionally described in remedial option alternative descriptions, but are often encountered at Superfund construction projects, and are subject to State ARAR's. Often, these activities are not identified until detailed design for an action is prepared.

Table 4 matches the promulgated State ARAR's with the construction-related activities described in Table 3. The Table describes the requirements in a general way and any important exceptions.

Construction contractors who operate in Wisconsin will usually have a good knowledge of these ARAR's.

Appendices 1-10 are the specific requirements, regulations and laws promulgated by the State and administered by the DNR. The Appendices are arranged by each Department program. The names of each specific program contact is provided so interested persons may contact them for further details as a project progresses. Policies and guidelines utilized by DNR in interpreting the requirements, regulations and laws are also provided. Regulations administered by the Department of Industry, Labor and Human Relations may be obtained from the Office of Document Sales, P.O. Box 7840, Madison, Wisconsin 53707 (608-266-3358).

State Permits, Licenses, Plan Approvals and Other Approvals

In order for the listing to be comprehensive, State permit, approval, license and plan approval ARAR's are provided. In many instances, technical standards and design or construction requirements are imposed through a license, permit or plan review and approval process. Section 121 of SARA states that "on-site" actions are not subject to State "permits". Generally, the Department will require that the necessary permits, approvals, licenses and plan approvals be obtained. However, some programs can waive these requirements if the "substantive" technical standards applied through such approvals are met.

Wisconsin Environmental Policy Act

Many DNR decisions, such as permits, license and plan approvals are subject to review under the Wisconsin Environmental Policy Act (WEPA), Section 1.11, Stats. and Chapter NR 150, which is provided in Appendix 10. Department decisions involving Superfund sites could be subject to review under these provisions. For some projects, it is possible that an environmental impact statement would have to be written before the project may proceed. Although it is not entirely clear if WEPA will apply at all Superfund sites, it is necessary to mention it so interested persons have been provided with timely notice.

Table 1 - General Options for Remediation

A. Leave hazardous substances in place; and

1. Monitor

   a. Groundwater
   b. Air
   c. Surface water/sediments
   d. Soil gas/subsurface gas migration

2. Contain

   a. Cap, cut-off walls; covers

3. Extract Migrating Substances

   a. Collection trenches/drains
   b. Withdrawal wells
   c. Gas collection

4. Manage Extracted Substances (from 3.)

   a. Discharge to groundwater; with treatment; without treatment

      1) Seepage/infiltration/spray irrigation
      2) Injection wells

   b. Discharge to surface water; with treatment; without treatment

   c. Discharge to publicly owned treatment works; with treatment; without treatment

   d. Release to air; with treatment; without treatment

      1) Vents/flares/stripper tower discharges

   e. Residuals; sludges; etc., generated from above - See C.

B. Manage hazardous substances in place; and

1. Treat/stabilize

   a. Physical treatment/stabilization

      1) Vitrification/heat/electrical/microwave, etc.

   b. Chemical treatment

      1) Chemical addition/flushing, etc.

   c. Biological treatment

1) In-situ biodegradation

C. Remove hazardous substances; and

1. Manage on-site

a. Re-disposal; landfill

b. Treat/stabilize

1) Physical treatment/incineration
2) Chemical treatment
3) Biological treatment
4) Recycle
5) Land spread/land treat

c. Storage

2. Manage off-site

a. In Wisconsin

1) Landfill
2) Treatment - all methods
3) Recycle
4) Landspread/land treat
5) Storage

b. Out-of-State

D. Water Supply (Does not "Remediate" the Facility Itself)

1. New Public Water Supply

2. New Private Water Supply Well(s)

3. Treat Public Water Supply

a. Air Stripping Tower
b. Activated Carbon
c. Other

4. Treat Private Water Supply(s)

a. In-house unit(s)

Table 2 - Promulgated Standards/Requirements
Activity and Media Regulated or Protected
General Options for Remediation
(Revised 3/91)

A.	Chs. NR 600 - 685: Activity - Any disposal or management in surface impoundments or landfills of hazardous waste (generally, defined the same as RCRA) after August 1, 1981, even if the unit ceased accepting waste before being addressed by the Environmental Repair Program or Superfund, must meet the closure and long-term care requirements (see ss. NR 685.05, 685.06, 660.15, 660.16 and 660.17) as well as groundwater monitoring requirements (See s. NR 635) that are generally consistent with RCRA 40 CFR 264/265 Subpart F. Clean closure or closure as a landfill is required for surface impoundments. These requirements are applicable to units that accepted hazardous waste after August 1, 1981, and may be relevant and appropriate to units that accepted hazardous waste before that date. Also see A.2.a., below. Media - Soil and groundwater.
A.	Chs. NR 500 - 520: Activity - Any solid waste landfill, regardless of when it accepted waste or when it closed, must meet the minimum closure and monitoring requirements the rule. Such landfills, should they have exceedances of Ch. NR 140 standards, must have a cover that meets the requirements of s. NR 504.07 (see A.1.e., A.2.a and A.3.c., below). Media - Soil and groundwater.
A.1.a.	Ch. NR 140: Activity - Legally applicable to all Department regulated activities that may have an impact on groundwater. The rule include groundwater monitoring and sampling frequency standards and specifies the actions required should groundwater standards be exceeded at the point of standards application. Media - Groundwater.
A.1.a.	Ch. NR 141: Activity - Groundwater monitoring well standards. Applies to all Department regulated activities that involve groundwater monitoring. Media - Groundwater.
A.1.a.	Ch. 149: Activity - Use of laboratories for testing of samples from groundwater monitoring.
A.1.a.	Chs. NR 500-520: Activity - Groundwater monitoring at solid waste landfills. See s. NR 508. This also relates to chs. NR 140 and NR 141.
A.1.a.	Ch. NR 109: Drinking water standards for water supplies. The standards include federal MCLs. The standards for maximum contaminant amounts in drinking water supplies are generally considered relevant and appropriate for groundwater at facilities addressed under Superfund. Media: Groundwater.
A.1.b.	Chs. NR 400-499: Media - Air pollution control standards Chs. NR 445 governs hazardous air pollutant emissions
A.1.c.	Chs. NR 500-520: Activity - Surface water monitoring at solid waste landfills. See s. NR 508.04(3).
A.1.c.	Chs. NR 102, NR 104, NR 105, NR 106 and NR 219: Activity - Stream classification/standards and sampling/testing methods. Water quality criteria must be met for surface waters where contaminants from Superfund sites cause exceedances.

Discharges from in-place pollutants, such as sediments or contaminated groundwater are included. Media - Surface water and sediments.

A.1.e. Chs. NR 500-520: Activity - Solid waste disposal landfill gas monitoring standards. See ss. NR 506.07(3), NR 504.04(4)(e) and NR 508.04(2). Media - Landfill gas in soils.

A.2.a. Chs. NR 500-520: Activity - Solid waste disposal landfill cap standards. See ss. NR 506.08(3), NR 504.07, Ch. 516 and s. NR 514.07.

A.2.a. Chs. NR 600 - 685: Activity - Hazardous waste disposal landfill cap standards. See ss. NR 660.15 and 660.16.

A.3.b. Ch. NR 112: Activity - Any withdrawal well or combination of wells withdrawing 70 gpm or greater; standards and approvals. Media - Groundwater (drawdown impacts).

A.3.c. Chs. NR 500-520: Activity - Solid waste disposal landfill gas control standards. Media - Landfill gas in soils and the air. See ss. NR 506.08(6), NR 506.07(3) and NR 504.04(4)(e). This also relates to Ch. NR 445, hazardous air pollution control standards. See guidance memos relating to solid waste and air pollution control rules for further details.

A.4.a.1) Ch. NR 108: Activity - Wastewater treatment facility plan review and standards.

A.4.a.1) Chs. NR 140, NR 200, NR 214, NR 219, NR 220 and Ch. 147, Stats.: Activity - Discharge of wastewater to the land (i.e., groundwater); effluent limits; discharge permits; sampling/testing methods. Media - Groundwater.

A.4.a.2) Ch. NR 112: Activity - Prohibits injection wells of any sort. Media - Groundwater.

A.4.b. Ch. NR 108: Activity - Wastewater treatment facility plan review and standards.

A.4.b. Chs. NR 102, NR 104, NR 105, NR 106, NR 200, NR 207, NR 219 and NR 220 and Ch. 147, Stats.: Activity - Discharge of wastewater to surface waters; effluent limits; discharge permits; sampling/testing methods. Media - Surface water.

A.4.c. Ch. NR 108: Activity - Wastewater pretreatment facility plan review and standards.

A.4.c. Ch. NR 211 and Ch. 147, Stats.: Activity - Discharge of wastewater to publicly owned treatment works; effluent limits. Media - Discharges from publicly owned treatment works - surface water/groundwater.

A.4.d.1) Chs. 400-499: Media - Air pollution control standards.
Ch. NR 445 governs hazardous air pollutant emissions.

A.4.e. See C.

B.1.b. Chs. NR 112, NR 140, NR 200, NR 214, NR 219, NR 220 and Ch. 147, Stats.: Activity - Discharge of wastewater to the land (i.e., groundwater; provided that a discharge to carry chemicals is used). Use of injection wells of any sort to inject chemicals is prohibited. Media - Groundwater.

B.1.c.	Same as B.1.b., but applies to nutrients as well as any chemicals.
C.1.&2.	Chs. NR 157, NR 500-520, NR 600 - 685 and s. 144.79, Stats.: Activity - Management of PCB contaminated wastes. The treatment, storage, disposal and transportation of PCB wastes are subject to special State requirements and standards. Generally, the standards applied to wastes of concentrations greater than 50 ppm of PCBs follow the federal requirements. For wastes containing less than 50 ppm of PCBs, see the special guidance document in Appendix 3, which is a restatement and clarification of promulgated State standards. Media - Groundwater, soil and air.
C.1.a.	Chs. NR 500-520 and s. 144.44, Stats.: Activity - Solid waste disposal licensing process, plan review and standards. Standards are applied through plan review and a siting process which involves local governments and a State siting board. Media - Groundwater, soil.
C.1.a.	Chs. NR 600 - 685 and s. 144.44, Stats.: Activity - Hazardous waste disposal licensing process, plan review and standards. Standards are applied through plan review and a siting process which involves local governments and a State siting board. Media - Groundwater, soil.
C.1.b.1), 2),3)	Chs. NR 600 - 685: Activity - Hazardous waste treatment (includes incineration) facilities are subject to a licensing process, plan review and standards. For new facilities, standards are applied through plan review and a siting process which involves local governments and a State siting board. Systems for treating wastewater which discharge to surface water, groundwater, or a publicly owned treatment works pursuant to Ch. 147, Stats., fall under A. or B., above. Media - Air, groundwater and soil.
C.1.b.1)	Chs. 400-499: Activity - Emissions from treatment systems/incinerators. Media - Air pollution control. Ch. NR 445 governs hazardous air pollutant emissions.
C.1.b.4)	Chs. NR 600 - 685: Activity - Recycling of hazardous waste requires a special written exemption. Standards are applied through plan review of the exemption request. Media - Groundwater and soil.
C.1.b.5)	Chs. NR 600 - 685: Activity - Land treatment of hazardous waste is prohibited. Media - Groundwater and soil.
C.1.b.5)	Chs. NR 140, NR 214, NR 200 and NR 219: Activity - Landspreading of wastewater treatment facility sludges (nonhazardous waste sludges) is regulated under the wastewater program rules. Media - Groundwater and soil.
C.1.c.	Chs. NR 600 - 685: Activity - Hazardous waste storage facilities are subject to a licensing process, plan review and standards. For new facilities, standards are applied through plan review and a siting process involving local governments and a State siting board. Media - Groundwater and soil.
C.2.	Chs. NR 600 - 685: Activity - Generation and transportation standards for hazardous waste are specified. They are based on RCRA standards. Manifests must be used for hazardous waste shipments. Transporters must be licensed to haul hazardous waste.
C.2.a.1)	Chs. NR 500-520 and s. 144.44, Stats.: Activity - Solid waste disposal licensing

process, plan review and standards. For new sites, standards are applied through plan review and siting process which involves local governments and a State siting board. Existing sites must be given special one-time waste disposal approval for solid (nonhazardous) waste disposal (See ss. NR 506.09 through NR 506.14). Media - Groundwater and soil.

C.2.a.1) Chs. NR 600 - 685 and s. 144.44, Stats.: Activity - Hazardous waste disposal licensing process, plan review and standards. For new sites, standards are applied through plan review and siting process which involves local governments and a State siting board. There are currently no existing commercially available sites for hazardous waste land disposal in the State of Wisconsin. Media - Groundwater and soil.

C.2.a.2) Chs. NR 600 - 685: Activity - Hazardous waste treatment (includes incineration) facilities are subject to a licensing process, plan review and standards. For new facilities, standards are applied through a siting process involving local governments and a State siting board. Existing commercially available treatment facilities must be approved (through modification of their existing licenses) for acceptance of new waste streams they are not already approved to accept. Systems for treating wastewater which discharges to surface water, groundwater or a publicly owned treatment works, pursuant to Ch. 147, Stats., fall under A. or B., above. Media - Air, groundwater and soil.

C.2.a.2) Chs. 400-499: Activity - Emissions from treatment systems. Media - Air pollution control. Ch. NR 445 governs hazardous air pollutant emissions.

C.2.a.3) Chs. NR 600 - 685: Activity - Recycling of hazardous waste requires a special written exemption. Standards are applied through plan review of the exemption request. Existing, commercially available recycling facilities must be approved (through modification of their existing written exemption) for acceptance of new waste streams they are not already approved to accept. Off-site storage licensing may also apply. Media - Groundwater and soil.

C.2.a.4) Chs. NR 600 - 685: Activity - Land treatment of hazardous waste is prohibited. Media - Groundwater and soil.

C.2.a.4) Chs. NR 140, NR 214, NR 200 and NR 219: Activity - Landspreading of wastewater treatment facility sludges (nonhazardous waste sludges) is regulated under the wastewater program rules. Media - Groundwater and soil.

C.2.a.5) Chs. NR 600 - 685: Activity - Hazardous waste storage facilities are subject to a licensing process, plan review and standards. For new facilities, standards are applied through a siting process involving local governments and a State siting board. Existing, commercially available storage facilities must be approved (through modification of their existing licenses) for acceptance of new waste types they are not already licensed to accept. Media - Groundwater and soil.

C.2.b. Note: The Department has recently issued interim guidelines, dated March 14, 1991, for clean-up actions involving hazardous wastes. These guidelines specify that on-site and/or in-state management of hazardous wastes is preferred. These guidelines are not promulgated, so they are not ARAR's, but are to be considered (TBC's) during remedy selection.

D.1. See Tables 3 and 4, item B.1.

D.2. See Tables 3 and 4, item B.1.a.

D.3. See Tables 3 and 4, item B.1.a.

D.3.a. Activity - Stripper discharges: See A.4.d.

D.3.b. Activity - Spent Carbon: See C

D.3.c. Activity - Other treatment residuals: See C

D.4. Ch. NR 112: Activity - In-house treatment units must be approved by the Department. See ss. NR 112.15(5) and (6). The property owner is responsible for obtaining the approval. As a matter of policy, the Department will only approve such systems as a method of last resort.

D.4. Chs. ILHR 81-84 (Uniform Plumbing Code): Activity - Plumbing system plans for in-house treatment units must be approved by DILHR. Only DILHR-approved products may be used in such systems. Products must have prior, separate approval. The plumbing code contains technical standards the system must conform to.

D.4. Activity - Spend carbon or other residuals from home treatment units: See C. Household waste may not be subject to ch. NR 181 requirements.

Table 3 - Construction Related Activities Associated With Options for Remediation

A. Construction Dewatering

1. Withdrawal wells

   a. Discharge to groundwater or surface water of withdrawn water; treated; untreated

2. Other methods of dewatering

   a. Discharge to groundwater or surface water of withdrawn water; treated; untreated

B. Water Supply

1. Potable supply

   a. Well(s)
   b. Surface water withdrawal

2. Nonpotable supply

   a. Well(s)
   b. Surface water withdrawal

C. Sewage/Sanitary Disposal

1. Discharge to surface water - with treatment
2. Discharge to groundwater - with treatment
3. Septic systems/holding tanks
4. Hook-up to local sewers
5. Landspreading/septage

D. Solid Waste Disposal/Dredge Spoil Disposal

1. On-site
2. Off-site

E. Buildings/Structures/Equipment

1. Tanks - flammable materials

   a. Below ground
   b. Above ground

2. Plumbing

3. Structures

4. Boilers/pressure vessels

5. Refrigeration

F. Floodplain/Shoreland Activities

1. Any construction in the floodplain

   a. Incorporated areas, including wetlands
   b. Unincorporated areas
   c. St. Croix River

G. Surface Water/Sediment Management and Structures

1. Dredging
2. Surface water rerouting
3. Pond construction
4. Filling
5. Dams
6. Bridges
7. Any other structure

H. Wetland/Shoreland Activities

1. Dredging/removal
2. Filling

I. Spills of Hazardous Materials

J. Safety in the Work Place

1. Trenches, excavations and tunnels
2. Noise
3. Compressed air
4. Illumination
5. Fire prevention
6. Dust, fumes, vapors and gases
7. Spray coatings

Table 4 - Promulgated Standards/Requirements
Construction Regulated Activities
Associated with Options for Remediation
(Revised 3/91)

A.1. Ch. NR 112: Any withdrawal well or combination of wells withdrawing 70 GPM or greater; standards and approvals.

A.1.a. Chs. NR 102, NR 104, NR 105, NR 106, NR 200, NR 207, NR 219, NR 220 and Ch. 147, Stats.: Discharge of wastewater to surface waters; effluent limits; discharge permits; sampling/testing methods. If no pollutants are to be discharged, several of these requirements can be waived.

A.1.a. Chs. NR 112, NR 140, NR 200, NR 214, NR 219, NR 220 and Ch. 147, Stats.: Discharge of wastewater to land (i.e., groundwater). Use of injection wells of any sort is prohibited. Effluent limits; discharge permits; sampling/testing methods. If no pollutants are to be discharged several of these requirements may be waived.

A.1.a. Ch. NR 108: Treatment facility (if needed to meet effluent limits) plan review and standards.

A.2.a. Same as A.1.a.

B.1.a. Chs. NR 111, NR 112, NR 108 and NR 109: Potable well construction for all applications must meet the ch. NR 112 construction and design standards. For any application withdrawing 70 GPM or more, standards and approvals are required under ch. NR 112. Wells, treatment and distribution systems for community and municipal water supplies must meet the construction and design standards in ch. NR 111, and are subject to the plan approval requirements of ch. NR 108. Potable water quality must meet ch. NR 109 standards.

B.1.b. Chs. NR 111, NR 112, NR 108 and NR 109: Surface waters may not be used for private water supplies in accordance with ch. NR 112, nor for community supplies per ch. NR 111. They may be used for municipal water supplies; such systems utilizing surface water for a source are subject to the design and construction standards in ch. NR 111, plan approval under ch. NR 108 and the water quality standards in ch. NR 109.

B.2.a. Ch. NR 112: Wells for all applications must meet ch. NR 112 construction and design standards. Any applications withdrawing 70 GPM or more are subject to standards and approvals.

C.1.&2. Chs. NR 110, NR 104, NR 105, NR 106, NR 210, NR 214 and NR 219: Generally, separate sewage treatment facilities are prohibited unless determined to be necessary under s. NR 110.08(5)(c). If allowed, plans and reports are required under ch. NR 110. Effluent limits, permits and sampling/analysis requirements apply under the other rules. Land application is regulated under ch. NR 214.

C.3.&4. Chs. ILHR81-84: Plumbing code requirements apply to the design and construction of septic systems, holding tanks and lateral connections to public sewer systems.

C.5. Ch. NR 113: Septage and holding tank hauling and landspreading requirements, licenses and approvals.

D.1.&2. Ch. 147, Stats.: Confined dredge disposal areas adjacent to surface waters are regulated through a wastewater permit. Plan review, construction and design requirements apply.

D.1. Chs. NR 500-520 and ss. 144.436 and 144.44, Stats., Solid waste disposal landfills licensing process, plan review and standards. Standards are applied through plan review and a siting process than involves local governments and a State siting board. Generally, involves local governments and a State siting board. Generally, under s. 144.436, Stats., open burning of solid waste is prohibited.

D.2. Chs. NR 500-520 and s. 144.44, Stats.: Same as D.1. Off-site commercial or municipal landfills may need a special approval (plan modification) to accept special (nongarbage) wastes. See ss. NR 506.09 through 506.14.

E.1. Ch. IND 8: Tanks, including underground tanks, standards and design.

E.2. Chs. ILHR81-84: Plumbing code (see C.3. and 4.).

E.3. Chs. ILHR50-53 and 64: Building code - design, standards, construction, etc.

E.4. Chs. ILHR41 and 42: Boiler and pressure vessel design, standards, construction, etc.

E.5. ILHR45: Refrigeration design and standards.

F.1. Ch. NR 116: Regulates all construction activities in the floodplain (generally, the 100-year floodplain). Any construction activity must be evaluated for impact on upstream flooding. Generally, no activities are allowed in the "floodway", including solid or hazardous waste disposal.

F.1.a. Ch. NR 117: Requirements (implemented by local zoning) for floodplain activities in incorporated areas.

F.1.b. Ch. NR 115: Requirements for floodplain activities in unincorporated areas.

F.1.c. Ch. NR 118: Requirements for floodplain activities in the St. Croix basin.

G.1. Chs. NR 345-347 and Chapter 30, Stats.: Permits, approvals and technical standards for dredging activities. See the dredge spoil disposal requirements (D., above).

G.2. Ch. 30, Stats.: Permits, approvals, technical standards.

G.3. Ch. 30, Stats.: Permits, approvals, technical standards (if connected to, or within 500 feet of a stream).

G.4. Ch. 30, Stats.: Generally, this activity is prohibited, except for structures.

G.5. Ch. NR 333 and Ch. 31, Stats.: Permits, approvals and standards for construction.

G.6. Ch. NR 320 and Chs. 30 and 31, Stats.: Permits, approvals and standards.

G.7. Chs 30 and 31, Stats.: Permits, approvals and technical standards.

H.2. Chs. NR 115-117: Regulates filling in wetlands that are in the shoreland zone. Generally, implemented by local zoning.

I. Ch. 144.76, Stats. and Ch. NR 158: Spill law. Requires reporting and clean-up of spills of any hazardous substance.

J. Ch. IND1: General safety requirements.

J.1. Ch. IND6: Safety requirements for trenches, excavations and tunnels.

J.2. Ch. IND11: Safety requirements for noise protection.

J.3. Ch. IND12: Safety requirements for compressed air.

J.4. Ch. IND19: Safety requirements related to illumination.

J.5. Ch. IND65: Safety requirements for fire prevention.

J.6. Ch. IND220: Safety requirements for dust, fumes, vapors and gases.

J.7. Ch. IND221: Safety requirements for spray coating operations.

Appendix 1 - General/Permit Primer

Appendix 2 - Water Resources Program Rules

Chapter NR 140 - Groundwater Quality

Chapter NR 141 - Groundwater Monitoring Well Requirements
Note: This code replaces the groundwater well installation and sampling guidelines in appendix 3.
Contact: David Lindorff, 266-9265/Kevin Kessler, 267-9350

Chapter NR 102 - Water Quality Standards for Surface Waters

Chapter NR 104 - Classification Standards

Chapter NR 105 - Surface Water Quality Criteria for Toxic Substances

Chapter NR 106 - Procedures for Calculating Toxic Effluent Limits
Contact: Duane Schuettpelz, 266-0156

Appendix 3 - Solid Waste/Hazardous Waste Program Rules/Statutes/Guidance

Chapter NR 157 - PCBs
Contacts: District Hazardous Waste Specialists, Ed Lynch, 266-3084, or any Engineer in the Hazardous Waste Section

Chapter NR 158 - Spills
Contact: Kim McCutcheon, 266-2857 (This program however, is decentralized to the DNR Districts)

Chapter NR 500-520 - Solid Waste
General Contact: Lakshmi Sridharan, 266-0520
Gas and Cover Systems: Dennis Mack, 267-9386
Groundwater Monitoring: Jack Connelly, 267-7574
Solid Waste Program Guidance:
Memorandum dated 9/27/89 and letter dated 11/12/90 to Landfill Owners w/attachments - Guidance on how Solid Waste Rules apply to landfill gas emission control

Chapters NR 600 - 685 - Hazardous Waste
Contact: Barbara Zellmer, 266-7055, or Ed Lynch, 266-3084

Chapter NR 550 - Environmental Response and Repair
Contact: Mark Giesfeldt, 267-7562
Emergency and Remedial Response Program Guidance:
Landfill ARAR's Training Document dated 4/12/90
Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in Wisconsin, dated 3/14/91

Chapter NR 144, Stats., - Solid Waste, Hazardous Waste, PCBs, and Spills

PCB Guidance (Based on promulgated rules and Statutes)
Contacts: District Hazardous Waste Specialists, Ed Lynch, 266-3084, or any Engineer in the Hazardous Waste Section

Appendix 4 - Wastewater Program Rules/Statutes

General Explanation
Contact: Ken Wiesner, 266-0014

Chapter NR 108 - Plan Approvals

Chapter NR 200 - Wastewater Permit Applications

Chapter NR 211 - Pretreatment

Chapter NR 214 - Land Application

Chapter NR 219 - Test Methods

Chapter NR 220 - Categories and Classes of Point Sources and Effluent Limitations

Section 144.04, Stats. - Plan Approvals

Chapter 147, Stats. - Wastewater Program Statute

Appendix 5 - Air Program Rules

Chapters NR 400-499, Air Pollution Control
General Contact: Pat Kirsop, 266-2060
Landfill Gas and Toxic Emissions: Steve Dunn, 267-0566
Air Monitoring Plans: Julian Chazin, 266-1902
Air Management Program Guidance:
Memorandum dated 11/17/89 - Guidance on Compliance with NR 445 for Landfill Gas Emissions

Appendix 6 - Water Supply Program Rules

Chapter NR 108 - Plan Approvals

Chapter NR 109 - Safe Drinking Water

Chapter NR 111 - Community Water Systems
Contact: Robert Baumeister, 266-2299

Chapter NR 112 - Well Construction
Contact: Bill Rock, 267-7649

Appendix 7 - Municipal Wastewater Program Rules

Chapter NR 110 - Sewage Systems
Contact: Chuck Burney, 266-2304

Chapter NR 113 - Servicing Septic/Holding Tanks
Contact: Bob Steindorf, 266-0449

Chapter NR 210 - Effluent Limits for Sewage Treatment Works

Appendix 8 - Technical Services Program Rules

Chapter NR 149 - Lab Certification
Contact: Ron Arneson, 267-7633

Appendix 9 - Water Regulation and Zoning Rules and Statutes

Chapter NR 115 - Shoreland Management

Chapter NR 116 - Floodplain Management

Chapter NR 117 - City/Village Program

Chapter NR 118 - St. Croix River

Chapter NR 320 - Bridges

Chapter NR 333 - Dams

Chapter NR 340 - Waterway Construction

Chapter 345 - Waterway Beds Construction

Chapter NR 346 - Fees

Chapter NR 347 - Dredging Project

Chapter 30, Stats.

Chapter 31, Stats.
Contact: Scott Hausmann, 266-7360
(This program, however, is mostly decentralized to the DNR district offices).
Water Regulation and Zoning Guidance:
Water Regulation and Zoning ARAR's Training Document dated 4/12/90

Appendix 10 - Environmental Impact Rules

Chapter NR 150 - Environmental Analysis and Review
Contact: Roger Fritz, 266-1201

Department of Industry, Labor & Human Relations Rules

Copies of these codes are available through: Document Sales - Department of Administration, P.O. Box 7840, Madison, WI 53707, 266-3358
Contacts: Ron Buchholtz, 266-9420
Loretta Trapp, 266-2990 (Home treatment units)

(Revised 3/91)

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Chapter NR 140

The groundwater standards in ch. NR 140, Wis. Adm. Code are applicable to any operable unit that is an activity regulated by the Department. Generally, all units at Superfund sites would fall under a regulated activity (e. g., solid or hazardous waste disposal facilities, wastewater lagoons, spill sites, etc). The standards are applied at the point of standards application, defined in the rule for different types of activities. In instances where there are groundwater standard exceedances, ch. NR 140, Wis. Adm. Code, requires some sort of response. At a minimum, groundwater monitoring would always be required, so a strict no action alternative at a site with exceedances would not meet the rule. The remedial goal for sites is to restore the groundwater to the preventive action limits where technically and economically feasible. Restoration of the groundwater to the enforcement standards is required regardless of technical or economic feasibility. No continuing releases from the source which may cause an exceedance of the standards at their point of standards application is allowed. It is important to note that the chapter has no time limit to reach the standards. Dilution and attenuation can be integrated with other remedial actions to achieve the standards. However, there must be documentation showing how this integration will achieve the standards. Issues needing additional guidance include:

a. Are more active restoration methods always required? Are we able to consider such factors as groundwater use, risk assessment and economic viability of the persons required to take the action when selecting remedial actions to restore groundwater, especially when enforcement standards are exceeded? The policy for Superfund sites, as specified in a March 28, 1990 memo, is to favor active methods of restoration, where practicable.

b. When can dilution and attenuation be integrated into an action? Should this occur only when there are no other practicable alternatives? It is clear that this can't occur if it would allow a release from a source to continue to cause a standards exceedance at the point of standards application.

c. It may be more difficult, perhaps impossible, to meet the standards at hazardous waste sites and other sites where the DMZ or property boundary is very close to or at the edge of the waste. There may always be some groundwater at the DMZ or property boundary that's contaminated above the standards, especially where remediation barriers are installed at some distance away from the waste.

Water Quality Standards

The water quality criteria for toxics in chs. NR 105 and NR 106, Wis. Adm. Code can be ARAR's in 2 ways. First, if a site remedy involves a discharge to surface water, either through a direct point source discharge from a treatment system (such as a leachate or groundwater treatment system) or an indirect discharge through contaminated groundwater flows, the applicable effluent limits for toxic substances would be determined for such discharges based on

Enclosures for Revision #3 (3/91):

1. Revised NR 140 - Groundwater Quality - This replaces the earlier version of the same rule in Appendix 2, which may be discarded or kept for historical reference.

2. NR 141 - Groundwater Monitoring Well Requirements - Add to Appendix 2. Also, this replaces the monitoring well construction and groundwater sampling procedure guidance documents in appendix 3. The guidance documents may be discarded or kept for historical reference.

3. Water Resource Management ARAR's Training Document dated 4/12/90 - Add to Appendix 2.

4. NR 600 - 685 - Hazardous Waste Rules - These rules replace NR 181 in Appendix 3, which may be discarded or kept for historical reference.

5. Landfill ARAR's Training Document dated 4/12/90 - Add to Appendix 3.

6. Letter dated 11/12/90 to Landfill Owners with attachments - Guidance on how Solid Waste Rules apply to landfill gas emission control - Add to Appendix 3.

7. Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in Wisconsin, dated 3/14/91 - Add to Appendix 3.

8. NR 207 - Water Quality Antidegradation - Add to Appendix 4.

9. NR 220 - Categories and Classes of Point Sources and Effluent Limitations - Add to appendix 4.

10. Revised NR 109 - Safe Drinking Water and Revised NR 112 - Well Construction and Pump Installation - These replace the earlier versions of the rules in Appendix 6, which may be discarded or kept for historical reference.

11. Water Regulation and Zoning ARAR's Training Document dated 4/12/90 - Add to Appendix 9.

Note: The DNR is currently in the process of developing guidelines for soil cleanup levels and how ch. NR 140 groundwater standards apply at clean-up sites. They will be added to Appendix 3 when complete.

the rules. Second, if the site has contaminated sediments, the Water Resources Program will calculate the acceptable sediment quality criteria based on the standards in the rules. An equilibrium partitioning method is used to calculate the sediment quality criteria.

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Covers at Existing Units

Areas where the past disposal (or placement; this would not include areas contaminated by spills, drippage, etc.) of wastes and materials took place, are considered old landfill units. In accordance with s. NR 506.08(3), Wis. Adm. Code, the final cover system specified under NR 504.07, Wis. Adm. Code (multilayer soil cover), is required (i. e., it would be legally applicable) if there are exceedances of ch. NR 140, Wis. Adm. Code, groundwater standards (enforcement standards or preventive action limits (PALs) at the DMZ) at the units. This cover system is necessary to prevent future and abate current exceedances of groundwater standards contained in ch. NR 140, Wis. Adm. Code. It should be noted that ch. NR 140, Wis. Adm. Code, requires the Department to consider economic and technical feasibility when requiring actions if only PALs are exceeded. The Department can't consider those feasibility factors if any enforcement standards are exceeded.

Plans for the cover system should follow s. NR 514.07, Wis. Adm. Code, requirements for engineering plans and a design report. Documentation of the completed cover system should follow s. NR 516, Wis. Adm. Code, construction documentation requirements for report preparation, testing and plans. Both s. NR 514.07 and ch. 516, Wis. Adm. Code, are legally applicable to a facility if the cover system is required.

Chapter NR 181, Wis. Adm. Code, cover requirements may be relevant and appropriate for past landfill units. This determination is based on how similar the unit is to a disposal unit which is required to undergo RCRA (Ch. NR 181) closure. The requirements are generally relevant and appropriate if it is known that hazardous wastes (or wastes sufficiently similar to hazardous wastes) were disposed of, even if before 1980. However, they may be relevant, but not appropriate to capping large, dispersed areas of low level contamination. See 53 FR, 51446-51447 and 55 FR, 8763 (proposed and final NCP preambles) for further detailed discussion on RCRA requirements as relevant and appropriate requirements. Also note that the s. NR 181.44(12), Wis. Adm. Code, existing facility cover standards are less stringent than the solid waste cover requirements specified above, while the new facility cover standards under s. NR 181.44(13), Wis. Adm. Code, are based on, but are slightly more stringent than the RCRA §264 cover standards.

Solid or hazardous waste cover requirements are not legally applicable to areas not considered past landfill units, such as large areas of soil contamination from past drippage, spillage and discharges. However, certain solid or hazardous waste cover standards may be relevant and appropriate for these areas if they are to be contained. The type of cover that may be relevant and appropriate would depend on the nature and extent of the contamination, the soil and groundwater conditions in the area, and the risks that require mitigation. Department regulations specify 3 types of covers that may be relevant and appropriate:

1. Sections NR 181.44(12) and NR 506.08(3), Wis. Adm. Code, soil cover. This is essentially 2 feet of clay with 6 inches of topsoil. We believe such

a cover is relevant and appropriate for containment of low-level contaminants where direct contact and/or dust is a primary concern and frost penetration, gas, settlement and precipitation percolation is of secondary concern.

2. Section NR 504.07, Wis. Adm. Code, multi-layer soil cover system for solid waste facilities. We believe such a cover is relevant and appropriate for containment of municipal waste sites (or co-disposal sites), where frost penetration, gas, settlement and precipitation percolation is of primary concern, in addition to concern about direct contact.

3. Section NR 181.44(13), Wis. Adm. Code, new facility cover (based on RCRA §264). We believe such a cover is relevant and appropriate for the containment of hazardous wastes, or similar wastes, where settlement, side slopes and other problems can be overcome. Generally, such a cover may be inappropriate at municipal co-disposal sites because of the engineering problems associated with the low permeability membrane portion. However, there may be a few co-disposal landfill Superfund sites where the engineering problems could be overcome.

Gas Collection and Monitoring

Any solid waste disposal unit (regardless of size) that accepted municipal waste which could have subsurface gas migration are required to comply with the gas monitoring requirements in ss. NR 506.07(3), NR 504.04(4)(e) and NR 508.04(2), Wis. Adm. Code (they are applicable). Therefore, soil gas monitoring is required and the explosive gas level standards must be met.

Any solid waste disposal unit that accepted more than 500,000 cubic yards of municipal refuse is required to comply with s. NR 506.08, Wis. Adm. Code (it would be applicable). These units must have an effective gas collection system to collect and combust the gas, unless it can be shown through testing that the air contaminant standards in s. NR 445.03, Wis. Adm. Code (Air Toxics rule), will be met without collection and combustion. Guidance has been prepared by the Solid Waste and Air Management Programs, in response to questions from the Superfund Program Unit, outlining collection, testing and combustion requirements (see the ARAR's listings document, dated January 9 and sent to all SF Program staff). Generally, most landfill units will be required to have active gas collection with extraction wells and flares for combustion. "Testing out" of the collection and combustion requirement will generally be difficult and expensive, and will likely not succeed at larger sites. Therefore, the Department generally recommends that "testing out" not be attempted at these larger sites, and persons assume the active gas extraction and combustion installation is required (some PRP's have accepted this assumption outright).

Plans for a gas collection and combustion system should follow s. NR 514.07, Wis. Adm. Code, requirements for engineering plans and a design report. Documentation of the completed system should follow s. NR 516, Wis. Adm. Code, construction documentation requirements for report preparation, testing and plans. Both s. NR 514.07 and ch. 516, Wis. Adm. Code, are legally applicable to a facility if the collection and combustion system is required.

Groundwater Monitoring and Long-Term Care

Using the same logic for determining when certain cover systems are applicable or relevant and appropriate, as described above, the groundwater monitoring requirements in the solid waste rules, ch. NR 508, Wis. Adm. Code, or the hazardous waste rules, s. NR 181.49, may be applicable or relevant and appropriate. Monitoring should be carried out in accordance with ch. NR 141, Wis. Adm. Code, which sets out monitoring well construction requirements. Sampling and analysis should be in accordance with the Department's sampling and analysis guideline document (a "to be considered" (TBC) guideline).

Requirements for long-term care outlined in the solid or hazardous waste rules are also applicable or relevant and appropriate to landfill units, based on the same determination for cover systems. The site O&M plan, prepared as part of the remedial design, must address these requirements, including cover maintenance, gas collection system operation and maintenance, gas and groundwater monitoring, and leachate and/or groundwater collection and treatment system maintenance. Generally, landfills are expected to be cared for at least 30 years, but longer time period may be specified under certain circumstances, depending on the nature of the site. Owners of unapproved landfills are responsible for the care of the site into perpetuity. If hazardous waste long-term care requirements are found to be applicable or relevant and appropriate, the long-term care period may be extended past 30 years if necessary to protect human health or the environment.

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny, Secretary
Box 7921
Madison, Wisconsin 53707
DNR TELEFAX NO. 608-267-3579
TDD NO. 608-267-6897
SOLID WASTE TELEFAX NO. 608-267-2768

November 12, 1990 File Ref: 4400

^F1^

Dear ^F2^

As you know, Wisconsin's current administrative code series governing solid waste management, chs NR 500-520 Wis. Adm. Code, went into effect in February of 1988. A specific provision of this series, NR 506.08(6) HAZARDOUS AIR CONTAMINANT CONTROL, states:

"All solid waste disposal facilities which have a design capacity of greater than 500,000 cubic yards and have accepted municipal solid waste shall install a department approved system to efficiently collect and combust hazardous air contaminants emitted by the facility within 18 months of February 1, 1988 unless the owner can demonstrate that the performance criteria of s. NR 504.04(f) can be achieved without implementing such a system. Control techniques other than combustion may be approved by the department."

We believe that you have at least one landfill which is subject to this requirement for control of hazardous air contaminants. (Please see attached list.) If so, you are currently more than one year overdue in complying with this requirement. In order to come into compliance with this regulation, you will have to do one of the following:

1. Submit proposed plans for an active gas extraction system to the Bureau of Solid and Hazardous Waste and plans for an emission control system to the Bureau of Air Management. The Bureau of Solid and Hazardous Waste is responsible for approving gas extraction system plans. The Bureau of Air Management is responsible for approving emission control plans. Upon obtaining Department approval of the plans you would be required to install the system during the next construction season.

2. Conclusively show that the performance criteria of NR 504.04(4)(f) are being achieved without such a system. (NR 504.04(4)(f) itself refers to NR 445, the administrative code regulating the discharge of hazardous air contaminants.)

3. Demonstrate to the Department's satisfaction that your landfill's design capacity does not exceed 500,000 cubic yards or did not accept municipal solid waste.

We strongly encourage you to choose the first option and proceed with plans for an active gas extraction and emission control system. However, we have developed a method for attempting to "test out" of this requirement, which is detailed in Appendix A of this document. This method necessitates installation of a "mini extraction system" and in-depth monitoring of landfill gas constituents for a period of five years. Money spent on testing could be largely wasted, should a site fail to test out of NR 506.08(6).

In light of the above discussion, we ask that you contact us in writing within thirty days regarding your intentions toward regaining compliance with NR 506.08(6). If you are agreeable to submitting plans and installing an active extraction and emission control system, we would like to enter into an administrative consent order with you in the near future. Because the Department cannot handle all affected landfills at once, we intend to stagger the plan submittal and construction dates in the consent orders over the next two or three years based upon the priority given specific facilities. If complied with, this consent order would eliminate any violations associated with failing to meet the August 6, 1989 deadline for compliance with NR 506.08(6), Wis. Adm. Code.

We're also including a memo in Appendix B which provides insight on NR 445 itself and requirements for treatment of hazardous air contaminants once extracted from the landfill. Questions regarding this letter and Appendix A should be directed to Dennis Mack or Ann Timmerman of our Solid Waste Management program at (608) 267-9386 and (608) 267-7575, respectively, and questions regarding Appendix B should be directed to Steve Dunn of our Air Management program at (608) 267-0566.

Sincerely,

Lakshmi Sridharan, Ph.D, P.E., Chief
Solid Waste Management Section
Bureau of Solid & Hazardous Waste Management

LS:dpm

Enclosures

cc: Solid and Hazardous Waste Program Supervisors

City of Kenosha (38)
Sanitary Transfer and Landfill - Oconomowoc (718)
Town of East Troy (24)
City of Burlington (186)
City of Waukesha (521)
Master Disposal (2425) *

* Means hazardous air contaminant control system has been installed or plan has at least been received by Department.

( ) License Number

APPENDIX A

SUGGESTED METHOD FOR ESTIMATING HAZARDOUS AIR CONTAMINANT EMISSIONS FROM LANDFILLS

Any source planning to conduct any of the tests specified below must submit a test plan in accordance with ch. NR 439.07, Wis. Adm. Code.

STEP 1. In order to determine which hazardous constituents are present in a particular site's gas, monitoring wells would be installed at various points within the landfill. One well would be installed per five acres of landfill, with a minimum of four wells. These wells should have long screens covering all but perhaps the upper 10 or 15 feet of the waste in order to obtain average gas concentrations. Unless otherwise determined by the Bureau of Air Management (BAM), each of the wells would then be monitored at least three times for benzene, vinyl chloride and all parameters contained in Tables 1, 3B and 4 of ch. NR 445. Elimination of some of the parameters in Tables 1, 3B and 4 may be possible if the landfill owner can demonstrate to BAM's satisfaction that their presence in the landfill or possibility of emission is remote. Only the substances detected in this step would subsequently be monitored for.

STEP 2. Either during or after performing step 1. above, landfill gas extraction wells would be installed to the base of the waste. These extraction wells would be placed at the same frequency as the monitoring wells mentioned above; one per five acres, with a minimum of four wells. Each extraction well would be screened over approximately the lower two-thirds of its length. All extraction wells would be located away from leachate collection systems or other conduits which could conduct gas or outside air such as existing passive system vents. If this is not possible, sources of outside air intrusion must be tightly sealed. Each of the extraction wells would be connected by flexible header piping, and the header piping would be connected to a blower capable of producing a sufficient vacuum within the waste at all wells. Additional gas monitoring wells would be required at various distances from each extraction well in order to determine the distance from which the extraction well is drawing gas when pumped.

STEP 3. Each quarter, the blower would be run for a period of one or more days. During this time, the following data would be obtained:

- -The gas extraction rate
- -The concentration of each substance of concern identified in step 1.
- -The radius of influence for each extraction well and the volume of waste contained within the theoretical cylinder formed by that radius

The level of vacuum applied by the blower is not critical. However, it should not be so great as to cause appreciable outside air intrusion.

LANDFILLS SUBJECT TO NR 506.08(6)
HAZARDOUS AIR CONTAMINANT CONTROL

Northwest District

City of Superior (2627)
Lake Area Disposal (3144)

North Central District

Holz - Krause (674)
Midstate (436) (2812) *
Marathon County (2892) *
Oneida County (2805) *
Portage County (2966)
Tork Old (652) *
Tork-Seneca (2967)
City of Rhinelander - Slaughterhouse Creek (686)
Juneau County (2565)
Adams County (3150) *

Western District

Eau Claire County (2921) *
Jackson County Sanitary Landfill (2004)
LaCrosse County (2637) *
Monroe County (2858)
Junker Sanitary Landfill (1972)
City of Eau Claire - Blue Valley (77)
City of La Crosse - Isle la Plume (144)
City of Chippewa Falls (85)

Lake Michigan District

Brown County East (2569) *
Brown County West (2568) *
Door County (2937)
WMI-Ridgeview (2575)
WMI-Ridgeview horizontal (3041)
Outagamie County (2484) *
Winnebago County (611) *
WMI-Eaton (3)
City of Two Rivers (318)
City of Green Bay - Humboldt Road (1129)
City of Green Bay - Military Avenue (169)
City of Green Bay - Danz Avenue (170)
City of Manitowoc - Muth Site
Lehrer - Midwest Disposal (73)
Marinette County (3095)
City of Appleton (112)
City of Neenah (2299)

Southern District

Dane County - Verona (2680) *
Dane County - Rodefeld (3018)
Refuse Hideaway (1953) *
Hechimovich (3068)
Land and Gas Reclamation (1118)
Central Sanitary Landfill (2132)
Jongetes (943)
Valley Sanitation (2686)
Rock County (3023)
City of Janesville (62) *
City of Janesville (2822) *
Sauk County (2051)
Sauk County (2978)
WMI-Valley Trail (1890) *
WMI-Valley Trail (3066)
Fond du Lac County (2358) *
City of Portage (2330)
Carl Schmidt - Old Site (1309)
City of Madison - Green Tree Hills (1714)
City of Madison - Sycamore (1935)
Dane County - Truax
WMI-City Disposal (37)
Sanitary Transfer and Landfill - Koshkonong (720)
City of Sun Praire (814)
Metropolitan Refuse District (107)
Majerus Landfill (7)

Southeast District

WMI-Pheasant Run (1739) *
WMI-Pheasant Run - Northern Expansion (3062)
WMI-Metro (1099) *
City of Milwaukee - College Avenue (428)
City of Milwaukee - Hartung Quarry (1501)
City of Milwaukee - Hauley Road (426)
City of Wauwatosa (525)
Land Reclamation Ltd. (572)
City of Sheboygan Falls (1167)
BFI-Troy Area (3090)
WMI-Mallard Ridge (140)
WMI-Parkview (3108)
WMI-Stone Ridge (141)
WMI-Stone Ridge (2895) *
Sanitary Transfer and Landfill - Delafield (719)
WMI-Omega Hills (1678) *
WMI-Lauer 1 (11)
City of West Bend (2619)
Milwaukee County Highway Department Landfill (881)
WMI-Reclamation Inc. (1356)
WMI-Brookfield (1) *
WMI-Caledonia (147) *
WMI-Polk (307)

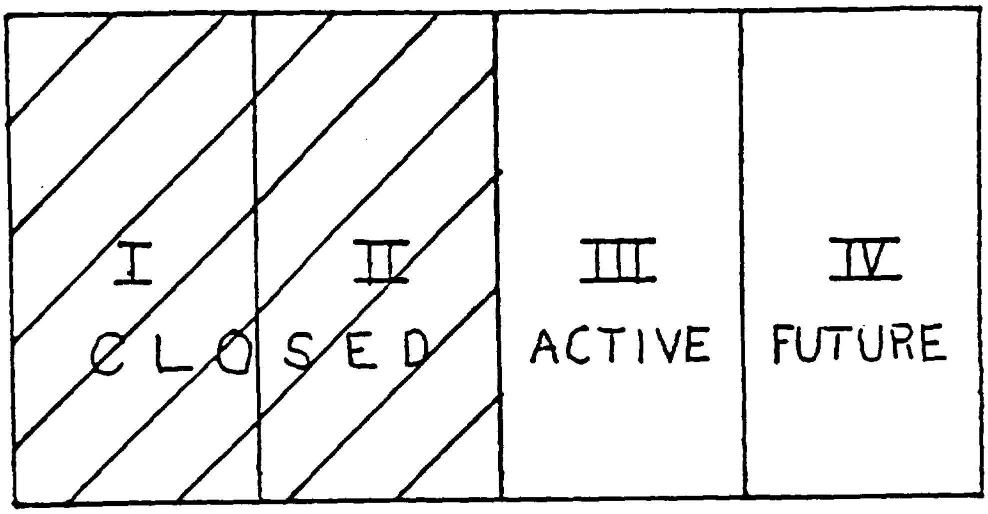
STEP 4. Using the information gathered in step 3., the owner would be required to calculate the rate at which each substance of concern is being emitted in units of pounds per year per cubic yard of waste affected by the test extraction wells. Then, this data would be extrapolated to estimate the total emissions from the entire landfill. If, for any quarter of testing, the estimated emission rate for a substance in Table 3 exceeded that allowed in ch. NR 445, installation of an active gas extraction system to meet control requirements of ch NR 445, Wis. Adm. Code. would be required. For exceedances of Tables 1 and 4, the landfill owner would have the option of performing air modelling to demonstrate that ambient concentrations at the landfill's property line do not exceed 1 or 24-hour limits. If the standards were not exceeded at the property line, no system would be required for hazardous air contaminant control.

For example, assume that from steps 1 through 3 it was determined that for the second quarter of the third year of testing on a 5,000,000 cubic yard landfill, the Table 3 parameter vinyl chloride was being emitted at a rate of 20 pounds per year, and that the volume of waste affected by the test extraction wells was 200,000 cubic yards. Then, the extrapolation of this data would give an estimated emissions rate of 500 pounds of vinyl chloride per year. Since this exceeds the 300 pound per year level in ch. NR 445, an active gas system would be required.

If, after five years of quarterly testing, no exceedances of ch. NR 445 emission rates had occurred, a site would then be exempt from the requirement to install a system to efficiently collect and combust hazardous air contaminants. An abbreviated example which follows this method and contains schematic drawings is included on the next three pages.

All questions regarding proper sampling techniques should be addressed to the Department's Bureau of Air Management.

EXAMPLE



* *20 Acre Active Landfill Which Accepts Municipal Solid Waste*

* *Landfill Divided into 4 Phases, 2 of Which are Closed, Filling Occuring in 3rd Phase*

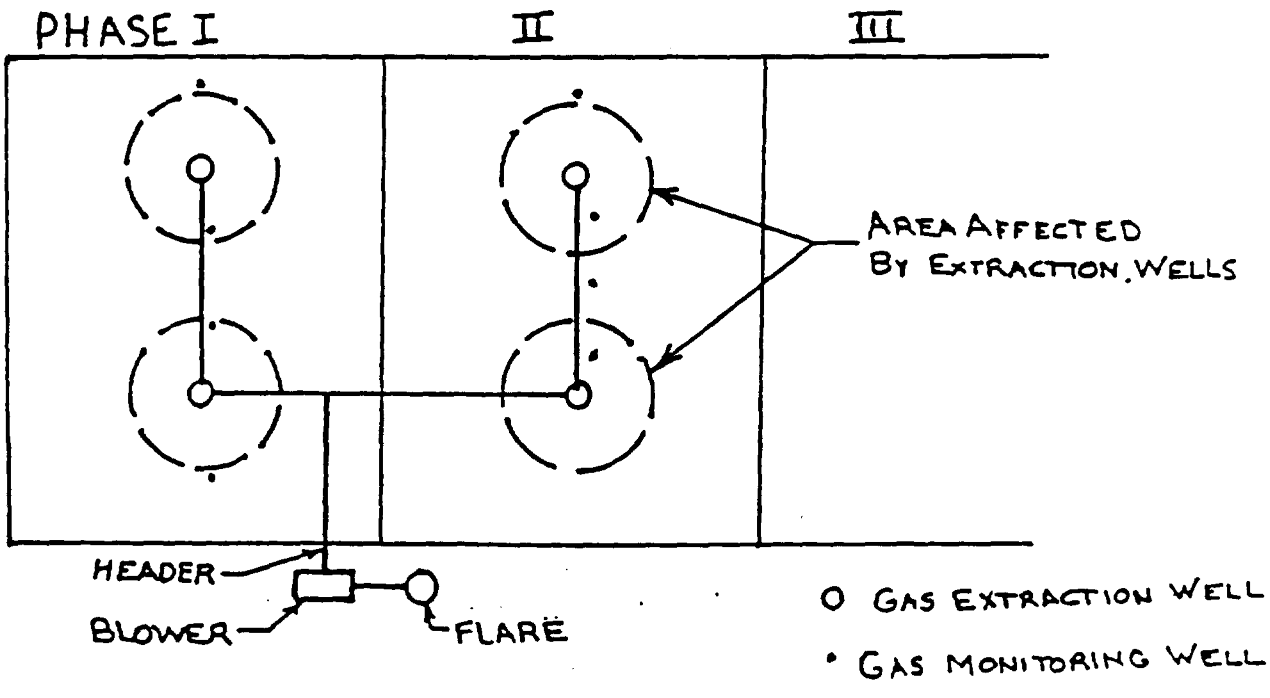
* *Design Capacity All 4 Phases of Landfill in total= 5 million Cubic Yards*

Step 1: *Install at least 2 gas monitoring wells in each of closed Phases 1 & 2.*

Sample each well 3 time for all parameters in Tables 1, 3, & 4 of NR 445

Step 2: *Install at least 2 gas extraction wells in each of Phases 1 & 2 and hook them up to a common blower.*

Install more gas monitoring wells at varying distances from the extraction wells.



APPENDIX B

DATE: November 7, 1990 FILE REF: 4500

TO: Landfill Owners

FROM: Steve Dunn - AM/3 SJD

SUBJECT: Landfill Requirements Under Chapter NR 445, Wis. Adm. Code

1. What is NR 445?

Chapter NR 445, Wis. Adm. Code is an Air Management rule developed to control the emission of hazardous pollutants to the atmosphere. The wide scope of the rule has brought many non-traditional sources under regulation by the Bureau of Air Management (BAM). These non-traditional sources include wastewater treatment plants, gas stations and landfills, among others.

Under ch. NR 445, hazardous pollutants are regulated under one of two basic approaches. These are:

- Carcinogens (known or suspected human carcinogens) are required to be controlled based on available control technologies.
- Non-carcinogens (acute toxics) are regulated on the basis of their ambient air concentrations.

The known and suspected human carcinogens are contained in Table 3 of ch. NR 445. (Note: There are four tables in ch. NR 445.) These are further subdivided into Tables 3A and 3B. Table 3A is a list of known human carcinogens. Table 3B is a list of suspected human carcinogens. The only practical difference between Tables 3A and 3B are the levels of control required of sources. Control is required when actual emissions exceed the de minimis values listed in the tables.

Facilities which have actual emissions above the Table 3A de minimis levels are required to install control technology which meets the Lowest Achievable Emission Rate (LAER). LAER will be defined and more thoroughly explained in Sections 2, 3 and 4.

Facilities which have actual emissions above the Table 3B de minimis levels are required to install control technology which represents Best Available Control Technology (BACT). BACT will be more thoroughly discussed and defined in Sections 4, 5, 6 and 7.

Facilities which desire to meet LAER or BACT requirements by using an energy recovery device (i.e. internal combustion engine, gas turbine, ...) to control emissions of hazardous pollutants should contact BAM for specific requirements for these devices.

2. What is LAER?

LAER is defined in ch. NR 445 to be the more stringent of the following:

a. The most stringent emission limitation for the hazardous air contaminant which is contained in the air pollution regulatory program of any state for this class or category of source, unless an applicant for a permit demonstrates that this limitation is not achievable; or

b. The most stringent emission limitation for the hazardous air contaminant which is achieved in practice by the class or category of source.

Under Air Management rules, the burden of demonstrating what is LAER is placed on the facility. The Department is only required to determine whether the proposed LAER is adequate through the approval, disapproval or conditional approval of the facility's compliance plan. For landfills, BAM has decided to develop a "presumptive LAER" for all landfills. The decision was based on BAM's opinion that most landfills have sufficiently similar emissions to allow a presumptive LAER to be generally applicable.

Since each facility is required to do a LAER analysis, any facility may submit an alternative LAER analysis, which differs from presumptive LAER, to the Department for approval. However, it is unlikely any alternative LAER submittal would be deemed acceptable if it did not meet the required destruction/capture efficiencies contained in the Department's presumptive LAER analysis.

3. Presumptive LAER Analysis for Landfills

The Department has determined that LAER for landfills will be the installation and operation of an enclosed thermal oxidizer ("gas flare"). The requirements for design and operation of the LAER flare may be found in Attachment 1 of this memo. The following is a brief summary of the requirements.

a. Flare Type - An enclosed thermal oxidizer is the flare type with the highest organic destruction efficiency.

b. Operating Temperature/Ret. Time - To meet LAER requirements, the unit must operate at 1500°F with a 0.6 sec. retention time.

c. Operating Requirements - There is a continuous temperature monitoring requirement to ensure that organic emissions are being controlled at the Required Destruction Efficiency. The low temp./flame-out alarm system is required to minimize uncontrolled or improperly controlled emissions.

d. Emission Testing - The required emission testing characterizes the landfill gas, and measures the flare's destruction efficiency. Benzene and vinyl chloride serve as indicators for all ch. NR 445, Table 3 compounds. Non-methane organic carbon (NMOC) is used as a surrogate indicator for all NR 445 compounds. Also, NMOC will likely be the primary pollutant indicator for designing control measures in upcoming EPA regulations for large landfills.

e. Required Destruction Efficiency - The required destruction efficiencies must be met by all flares. Operating at the minimum temperature and retention time is not a satisfactory compliance demonstration if the required destruction efficiencies are not met.

f. Reporting Requirements - The reporting requirements represent the data the Department believes is necessary to ensure the flare is operating properly. It also allows the Department to estimate emissions from the flare.

g. Other Requirements - These requirements are meant to highlight Air Management regulations which need to be followed by every landfill required to control the emission of hazardous air contaminants.

4. Testing to Demonstrate LAER is not Applicable.

A facility is exempt from LAER requirements if it is able to demonstrate that its Department-approved gas extraction system does not emit any Table 3A compounds above the de minimis levels. This could be accomplished by demonstrating through testing that benzene and vinyl chloride are not present in sufficient concentrations to exceed ch. NR 445 de minimis levels (300 pounds/yr for each compound). Once this has been established, LAER would not be required for the source. However, since Table 3B emissions may be above de minimis levels, BACT may still be required [See Attachment 2].

5. What is BACT?

BACT (Best Available Control Technology) is defined as "the maximum degree of emission reduction practically achievable taking into account energy, economic and environmental impacts." BACT is generally considered to be a less stringent level of control than LAER.

BACT, like LAER, is generally determined by the facility. However, in order to ease the burden on affected facilities, BAM has developed a presumptive BACT for landfills. The development of a presumptive BACT does not obviate the requirement that a facility conduct its own BACT review.

6. Presumptive BACT Analysis for Landfills

The Department has determined that BACT for landfills is the installation and operation of an enclosed thermal oxidizer ("gas flare"). The design and operational requirements for the BACT flare for landfills is essentially the same as LAER except for two changes (See Attachment 1). These two exceptions are:

a. Operating Temperature/Ret. Time - The flare operating parameters for BACT are 1400°F and 0.6 secs. retention time.

b. Required Destruction Efficiency - There are no required destruction efficiencies for benzene and vinyl chloride. The required efficiency for NMOC must, however, still be met.

7. Testing to demonstrate that BACT is not Applicable.

A facility is exempt from BACT requirements if it is able to demonstrate that its Department-approved gas extraction system does not emit any Table 3B compound above the de minimis level.

Unlike the Table 3A compounds, indicators (benzene, vinyl chloride) would not be considered an acceptable compliance demonstration. Thus, all Table 3B compounds would need to be evaluated [See Attachment 2].

8. Procedures for Testing to demonstrate that flaring is not required.

The procedures for testing to demonstrate that the LAER or BACT control requirements do not apply may be found in Attachment 2. The Department believes these procedures will ensure that no source, with or without control, will emit any NR 445 compound above the de minimis levels [See Attachment 2].

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Attachment 1

Flare design and operating requirements to meet LAER and BACT under ch. NR 445.

Attachment 2

Procedures for testing to demonstrate that control requirements are not applicable.

Attachment 1

Landfill Gas Flare
LAER Design and Operating Requirements
Under Chapter NR 445, Wis. Adm. Code

Flare Type - Enclosed thermal oxidizer.

Operating Temperature/Ret. Time - 1500°F for 0.6 seconds after flame burner.

Operating Requirements - Continuous measurement and recording of the fifteen minute average flue gas temperature after the flame zone, and low temperature/flame out telephone alarm system to notify responsible party. An alternative system may also be installed if it is determined by the Department to be equally effective in ensuring against emissions of toxic pollutants.

Emissions Testing - Testing of the inlet and outlet of the flare for the concentration and mass emission rate of carbon monoxide, carbon dioxide, methane, nonmethane organic carbon (NMOC), vinyl chloride and benzene. Determine destruction efficiency for NMOC, vinyl chloride and benzene. If a compound is not found at the inlet, it does not need to be tested for at the outlet. The testing is to be done within 60 days of system start-up and biennially at the inlet and quadrennially at the outlet thereafter (i.e. destruction efficiency need only be measured once every four years). Each biennial/quadrennial test shall be performed within 60 days of the anniversary date of the first test.

Required Destruction Efficiencies - 90% for Benzene, 99% for Vinyl Chloride and NMOC.

Reporting Requirements - The Quarterly reports need to include the following information:

- Percent operating time for the extraction system.
- Average daily temperature after the flame zone.
- Biweekly measured flowrate of gas in standard cubic feet per minute.
- Duration and cause of any uncontrolled emissions (i.e., system operation without combustion).

The reports should be sent to the appropriate Air Management District Office for the first year of operation. Thereafter, the reports should be maintained at the site only.

Other Requirements - The source must comply with all applicable Air Management Regulations in the Wis. Adm. Code. Specifically:

- NR 439.03 (Reporting)
- NR 439.04 (Recordkeeping)
- NR 439.07 (Testing)
- NR 439.11 (Malfunction Prevention and Abatement)
- any other Air Regulation which is applicable to the specific source.

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Landfill Gas Flare
BACT Design and Operating Requirements
Under Chapter NR 445, Wis. Adm. Code

Flare Type - Enclosed thermal oxidizer.

Operating Temperature/Ret. Time - 1400°F for 0.6 seconds after flame burner.

Operating Requirements - Continuous measurement and recording of the fifteen minute average flue gas temperature after the flame zone, and low temperature/flame out telephone alarm system to notify responsible party. An alternative system may also be installed if it is determined by the Department to be equally effective in ensuring against emissions of toxic pollutants.

Emissions Testing - Testing of the inlet and outlet of the flare for the concentration and mass emission rate of carbon monoxide, carbon dioxide, methane, nonmethane organic carbon (NMOC), vinyl chloride and benzene. Determine destruction efficiency for NMOC. If NMOC is not found at the inlet, then no outlet testing is required. The testing is to be done within 60 days of system start-up and biennially at the inlet and quadrennially at the outlet thereafter (i.e. destruction efficiency need only be measured once every four years). Each biennial/quadrennial test shall be performed within 60 days of the anniversary date of the first test.

Required Destruction Efficiencies - 99% for NMOC

Reporting Requirements - The Quarterly reports need to include the following information:

- Percent operating time for the extraction system.
- Average daily temperature after the flame zone.
- Biweekly measured flowrate of gas in standard cubic feet per minute.
- Duration and cause of any uncontrolled emissions (i.e., system operation without combustion).

The reports should be sent to the appropriate Air Management District Office for the first year of operation. Thereafter, the reports should be maintained at the site only.

Other Requirements - The source must comply with all applicable Air Management Regulations in the Wis. Adm. Code. Specifically:

- NR 439.03 (Reporting)
- NR 439.04 (Recordkeeping)
- NR 439.07 (Testing)
- NR 439.11 (Malfunction Prevention and Abatement)
- any other Air Regulation which is applicable to the specific source.

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Attachment 2

The following testing procedures apply to landfills which have installed, are in the process of installing, or are required to install active gas collection systems. Facilities which had complete and operational gas extraction systems prior to October 1, 1988 may use an abbreviated test procedure with Department approval. Other facilities will be evaluated individually as necessary by BAM.

Two control "levels" may be applicable to landfills under NR 445. These levels are Lowest Achievable Emission Rate (LAER) and Best Available Control Technology (BACT).

Presumptive LAER and BACT determinations may be found in Attachment 1.

Testing Procedures

Any source planning to conduct any of the tests specified below must submit a test plan in accordance with ch. NR 439.07, Wis. Adm. Code.

1. LAER - LAER is required of all sources which emit greater than the de minimis level of any Table 3A compound. BAM has determined that benzene and vinyl chloride are the primary Table 3A compounds which may reasonably be expected to be emitted from landfills. Thus, LAER control technology is required for any landfill which emits more than 300 lb/yr of benzene or vinyl chloride.

In order for a facility to be exempt from the requirement to install LAER technology, it must demonstrate through testing that it does not emit benzene or vinyl chloride above the de minimis levels. This may be established by the following procedure:

The mass emission rate of benzene and vinyl chloride will be determined by a series of four quarterly tests over a one-year period.

The tests shall commence within 60 days of system start-up.

2. BACT - BACT is required of all sources which emit greater than the de minimis level of any Table 3B compound, but do not emit Table 3A compounds above de minimis levels. For a source to be exempt from the requirement to install BACT it must demonstrate that it does not emit any Table 3B compound above de minimis levels by using the following procedure:

The mass emission rate of all Table 3B compounds which could reasonably be expected to be emitted from landfills shall be determined by a series of four quarterly tests over a one-year period.

The tests shall commence within 60 days of system start-up.

"Reasonably be expected to be emitted" includes all Table 3B compounds which are not solid at standard temperature and pressure.

3. <u>No hazardous emissions</u> - If a source wishes to demonstrate that no hazardous air contaminant treatment technology is required because it does not emit any NR 445 compounds above de minimis levels (including Tables 1 and 4 of ch. NR 445), it may use the following procedure:

The mass emission rate of all ch. NR 445 compounds (Tables 1,3 and 4) which could reasonably be expected to be emitted from landfills shall be determined by a series of four quarterly tests plus yearly reconfirmation of results. The following time schedule should be used:

Time(DAYS)	Action
0	System Start-up
60	First Quarterly Test
150	Second Quarterly Test
240	Third Quarterly Test
330	Fourth Quarterly Test
330+365	First Annual Test
+365	Second Annual Test
+365	Third Annual Test
+365	Fourth Annual Test
+730	7-Year Test
+730	9-Year Test
+365	Final Test

"Reasonably be expected to be emitted" includes all NR 445 compounds which are not solid at standard temperature and pressure.

State of Wisconsin

CORRESPONDENCE/MEMORANDUM

Date: February 19, 1991

To: Michelle Owens - NCD

From: Ann Zimmerman and Dennis Mack - SW/3 DM

Subject: Spickler Landfill Superfund Site

This memo is in response to your February 4, 1991 request for assistance. Based upon available methane monitoring results from gas wells located outside of the limits of waste, we believe a gas migration control system is definitely necessary on the west side of the site and possibly on the south side as well. Given the limited information on site geology, waste depths, etc. it is difficult to tell at this time whether a passive system would suffice or whether an active system is necessary for control of methane migration.

The site is under 500,000 cubic yards and is not required to have an active gas system under NR 506.08(6), Hazardous Air Contaminant Control. However, the following must be complied with:

> NR 504.04(4)(e), Wis. Adm. Code, performance standard for the migration and concentration of explosive gases in any facility structures or in the soils or air at or beyond the facility property boundary in excess of 25% of the lower explosive limit for such gases at any time. The site is clearly in violation of this code provision.
>
> NR 504.04(4)(f), Wis. Adm. Code, performance standard for the emission of any hazardous air contaminant exceeding the limitations for those substances contained in s. NR 445.03. (The implicit assumption in the code is that sites with design capacities less than 500,000 cubic yards will not exceed NR 445 emission standards.)

Several options may be considered to control the migration of gas: a perimeter system which could be either passive or active; a system over the entire site which could be either passive or active; or possibly a combination of these systems.

To be effective, a perimeter system must extend to or below the bottom of waste. This type of system prevents the horizontal migration of gas in that direction but does not affect gasses in other portions of the landfill. A passive perimeter system would be located just outside of the limits of waste. It must be continuous along the entire perimeter, extend below the deepest waste, and be keyed into an impermeable layer at its base. An active perimeter system would require a series of vertical wells spaced approximately every 100-150 feet, all of which would be located inside the limits of waste approximately 50-75 feet from the landfill perimeter. The wells would be connected by a header pipe located near the landfill surface to a blower and flare. The blower creates a vacuum that sucks the gas out of the waste.

A surficial passive system over the entire site would only dissipate the gases generated near the top of the landfill. This system would not stop the gases from migrating off site and would need to be supplemented in areas where this is a concern. Also, it is unlikely that a passive system could be modified to efficiently collect and combust hazardous air contaminants or control methane migration should problems develop.

If properly designed and installed, an active system over the entire site would remove essentially all gas from the landfill thereby preventing gas migration from occurring at all locations. An active gas extraction system could be modified to efficiently collect and combust hazardous air contaminants if subsequently found to be necessary. Also, it has been shown that an active gas extraction system within waste helps reduce groundwater contamination by removing contaminants that otherwise would enter the groundwater aquifer.

On a related topic, this site may also have a leachate mound within it, based on the clay environment and high water table. Generally, the Solid Waste Section requires leachate extraction if there is more than five or so feet of liquid above the base of a site. A low permeability cap alone is probably not an effective way of remediating and/or preventing groundwater contamination at a zone of saturation landfill. Vertical gas extraction wells and an active gas system can be designed to include leachate extraction or may be modified, if needed, at a later date.

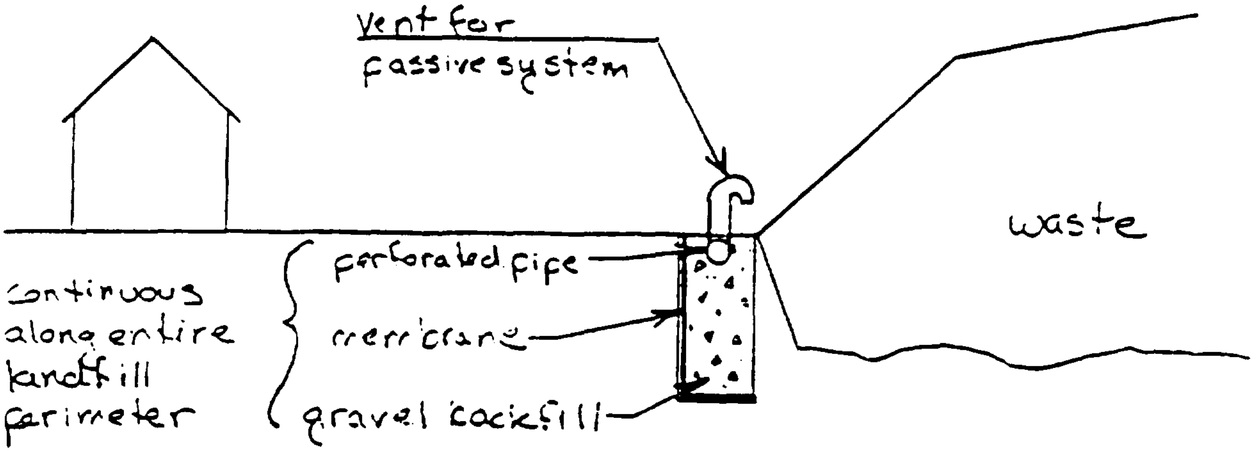
As stated earlier, due to lack of information we cannot give you a definitive answer now on the type of gas system needed. However, based on the information we do have, we would recommend an active gas extraction system over the entire site that is also designed to remove leachate.

We also believe that the methane levels detected west of the landfill are cause for concern. Frequent monitoring of this perimeter and especially nearby structures should occur at least until a control system is constructed and operational.

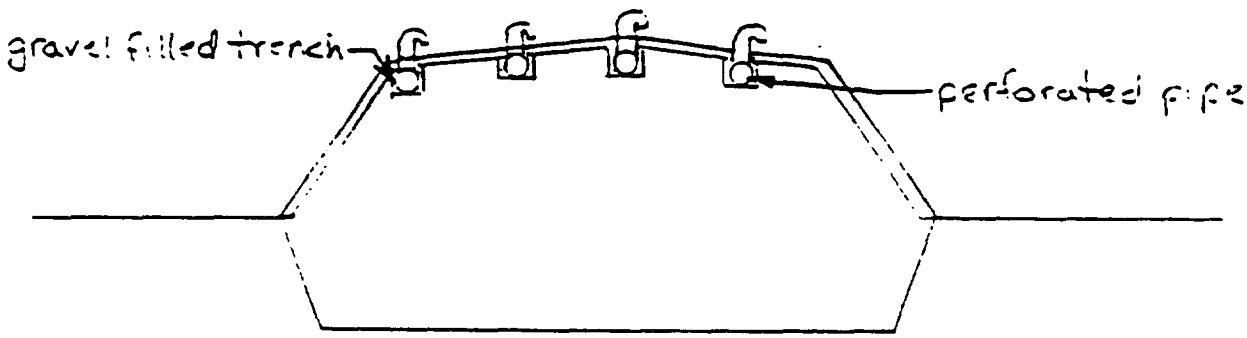
If you have any questions or need additional information please feel free to call Ann at (608) 275-7575 or Dennis at (608) 267-9386.

cc: Mark Giesfeldt/Sue Bangert - SW/3
Lakshmi Sridharan/Dennis Mack - SW/3
Don Grasser - NCD
Gary Kulibert - NCD

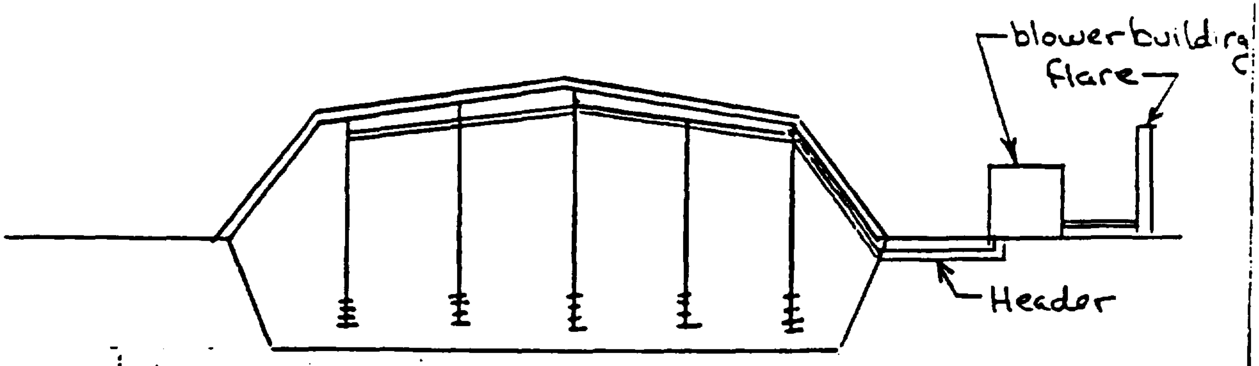
2/15/91



perimeter gas system



passive gas system
(entire site)



Vertical gas extraction
(active)

State of Wisconsin

CORRESPONDENCE/MEMORANDUM

DATE: March 14, 1991 FILE REF: 4440

TO: District Solid and Hazardous Waste Program Supervisors
District ERR/LUST Unit Leaders
District Hazardous Waste Unit Leaders
Bureau Section Chiefs
Bureau Unit Leaders

FROM: Paul P. Didier, Director Paul
Bureau of Solid and Hazardous Waste Management

SUBJECT: Transmittal Memo for the "Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in the State of Wisconsin."

Purpose:

This memorandum transmits to program managers and staff the "Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in the State of Wisconsin." The objective of this policy is to promote the recycling of hazardous wastes and the on-site and in-state treatment and disposal of hazardous waste resulting from clean-up actions. The policy is attached to this transmittal memo.

This interim policy applies to clean ups conducted by responsible parties, the federal government, and the State under the hazardous substance spills law, hazardous waste closure authorities, hazardous waste corrective action authorities, and applies to clean ups taken by the Superfund, LUST, and Environmental Repair programs. In addition, program managers and staff should strive to promote this policy when dealing with any hazardous waste generated in the State.

Background:

Before selecting a remedy which involves the management of hazardous wastes, a comparative analysis of the clean-up options utilizing this policy's "waste management strategy" and the "eight evaluation criteria" is to be undertaken and documented in a memo or report. In some instances, WDNR staff will have enough information available to them to prepare this comparative analysis between clean-up options. With others, we will have to include a provision in a State-funded contract with a consultant to conduct this analysis or in the case of responsible party clean ups, request them to prepare this analysis.

Once the analysis is complete, remedial actions may proceed for those sites where recycling or in-state and on-site management of hazardous waste is selected. For those sites where out-of-state treatment and/or disposal is proposed, the written documentation of how the waste management strategy and the eight evaluation criteria were applied must be submitted to the Director of the Solid and Hazardous Waste Management Bureau for review and approval. No out-of-state shipment of hazardous waste from clean-up actions shall be approved by WDNR staff, without concurrence from the Bureau Director on the proposed action.

Implementation:

These interim guidelines and procedures shall be in place for a period of six months so that they may be evaluated. Therefore, from now until September 1, 1991, these procedures must be followed. During the month of August 1991, we will evaluate the effectiveness of applying these criteria. Based upon the findings of that evaluation, appropriate changes will be made before further implementation of this process.

In closing, we all agree that every effort should be made to limit the out-of-state shipment of hazardous waste for treatment or disposal. I believe that this interim policy is useable, and necessary to ensure that the State of Wisconsin has capacity to manage hazardous wastes produced in the State. One of the means of accomplishing this is by reducing our dependence on other states' capacity.

If you have any further questions regarding this policy, please contact me directly at (608) 266-1327.

Attachment

cc:

Lyman Wible - AD/5
Darsi Foss - SW/3
Mark Giesfeldt - SW/3
Esther Chapman - SW/3
Bureau Program Coordinators - SW/3
Guidance Notebook

"Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in the State of Wisconsin"

March 14, 1991

Developed by the
Bureau of Solid and Hazardous Waste Management
Wisconsin Department of Natural Resources

Interim Policy for Promoting the In-State and On-Site Management of Hazardous Wastes in the State of Wisconsin

Goal of the Policy:

The goal of this policy is to maximize the on-site or in-state management of any hazardous wastes (including PCBs) generated during clean-up actions. To accomplish this goal, this policy establishes remedy selection criteria and administrative procedures which are to be used when making clean-up decisions involving hazardous wastes. This policy will apply to state-funded, federally-funded, and responsible party clean-ups. Upon finalization, this policy will be incorporated in to Wisconsin's Capacity Assurance Plan.

Background:

In 1986, Congress included a provision in the Superfund amendments which mandated that each state assess its capacity to manage hazardous waste for the next twenty years. More specifically, section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), required that by October 17, 1989, states demonstrate they have "adequate capacity for the destruction, treatment, or secure disposition of all hazardous wastes that are reasonably expected to be generated within the State in the next twenty years". The federal statute directs that a state will not be eligible to receive Superfund remedial action funds (i.e., construction and operation and maintenance monies) if that state fails to provide the required assurance.

Wisconsin submitted its Capacity Assurance Plan (CAP) to the Environmental Protection Agency (EPA) by the October 1989 deadline. The State was able to assure EPA that adequate hazardous waste capacity existed for the next twenty years by entering into a "regional" agreement with the other EPA Region V states. Although the State's CAP was conditionally approved by the EPA, Wisconsin's CAP documented that this state continues to be a net exporter of hazardous waste.

In recognition of this, the Wisconsin CAP established five goals and initiatives which are intended to diminish the state's reliance on out-of-state capacity. One of those five initiatives was the development of "a policy for managing environmental clean-up waste on-site or in-state." This initiative, as well as the others, were included in the

1989 CAP to assure the EPA and the other Region V states (who were crucial to our success in demonstrating capacity) that Wisconsin was making a good faith effort to minimize the export of hazardous waste. The policy and procedures established here were developed to fulfill the 1989 CAP commitment and will be a key component of the State's 1991 CAP submittal.

Implementation:

The specific implementation components of this policy include:

1. A waste management strategy and related guidelines;
2. Remedy selection criteria;
3. Administrative and documentation procedures; and
4. Public participation requirements.

1. Waste Management Strategy and Guidelines

This policy adopts the waste management strategy established by the Wisconsin Pollution Prevention Act (1989 Wisconsin Act 325), with a few "capacity-specific" modifications. This waste management strategy establishes a hierarchy of waste management options, from the most-preferred option to the least-preferred. State agencies, federal agencies and responsible parties conducting clean-ups in the State should follow, "to the extent possible or practicable," the waste management strategy outlined below:

First	Prevent the formation or production of pollutants at the source;
Second	Reuse or recycle any wastes that cannot be prevented;
Third	Provide treatment on-site or in-state for any waste that cannot be prevented or recycled;
Fourth	Ensure safe disposal on-site or in-state for any waste that cannot be prevented, recycled or treated; and
Fifth	Ensure safe treatment or disposal of waste out-of-state, giving preference to treatment of the waste over land disposal.

As is evident, the first preference at any clean-up should be given to the recycling of the waste. The feasibility of recycling any hazardous waste or treatment residuals should be analyzed as a routine part of the clean-up analysis (e.g., in the feasibility study, remedial action plan, corrective action plan, or closure plan). For example, if heavy-metal contaminated sludge will be generated as part of the groundwater treatment system at a site, the feasibility of recycling or reusing this sludge should be pursued.

If a recycling market can be found for the hazardous waste or contaminated media, it should be recycled regardless of whether that market is in the State of Wisconsin or not. In addition, the waste should be recycled or reused regardless of whether it will be rendered non-hazardous or not. Attachment One provides information on waste recycling or reuse markets and hazardous waste exchange services. [This attachment, however, does not include a list of all recycling markets.] These markets and services should be explored, as well as any others not mentioned in Attachment One, as a routine part of the clean-up process.

In the event that the hazardous wastes cannot be recycled or reused, the next preference would be to treat the waste or contaminated environmental media on-site or in-state. Mobile treatment units or treatment of the materials in place should be evaluated. When treatment is not feasible, then the option of safely disposing of the waste on-site or in-state should be explored. If in-state or on-site disposal is not available or feasible, then treatment out-of-state should be evaluated. Disposal of untreated waste at an out-of-state facility is the DNR's least-preferred waste management option, and would likely be infeasible due to the RCRA land disposal restrictions.

To further define the "waste management strategy", the Wisconsin DNR has developed waste management "guidelines". These guidelines provide more specific examples of the preferred waste management approaches at clean-up actions. These guidelines are integral to minimizing the export of hazardous waste, and are presented below in Exhibit One.

Exhibit One: WDNR's Waste Management Guidelines

Hazardous materials and treatment residuals should be recycled or reused whenever possible or practicable;

Remedies chosen will treat, store or dispose of hazardous waste on-site and/or in-state, to the extent feasible;

Remedial options which involve out-of-state shipment of hazardous wastes -- especially those involving no prior treatment of wastes -- will be chosen only when in-state and/or on-site actions are infeasible;

Appropriate remedies often will combine on-site/in-state treatment and on-site disposal of hazardous wastes, including treatment residuals;

Innovative technologies should be considered when there are no conventional treatment options available and on-site disposal is impracticable due to site-specific conditions or risks associated with untreated wastes;

On-site containment will be considered for wastes that pose low, long-term threats or where treatment is impracticable (usually due to waste type or volume); and

For wastes that need to be stabilized/secured (i.e., emergency actions) prior to completion of a long-term response at a site, the on-site storage of any hazardous wastes is preferred over the out-of-state shipment of waste. In the future, stabilized wastes should be incorporated into the longer-term response, when that option is timely and feasible.

2. Remedy Selection Criteria

The Wisconsin DNR's waste management "guidelines" represent the typical remedies that should be chosen at clean-up actions conducted in the State. However, the DNR recognizes that the final determination on whether or not recycling and in-state/on-site management of hazardous wastes is feasible will be made on a case-by-case basis. In order to ensure that remedy selection decisions are made in accordance with this policy's goal and waste management strategy, the DNR has adopted a set of eight remedy selection criteria. These criteria will assist state agencies, federal agencies, and responsible parties in providing the rationale for why the in-state/on-site management or recycling/reuse of hazardous wastes was feasible or not.

The eight remedy selection criteria which are used to determine the most appropriate remedy for a site are listed in Exhibit Two. These criteria are: protection of human health and the environment; attainment of legally-enforceable state and federal laws; long-term effectiveness; reduction of toxicity, mobility and volume through treatment; implementability; short-term effectiveness; cost; and public acceptance. These criteria are organized into 3 categories -- threshold criteria, balancing criteria and considerations, as illustrated in Exhibit Two.

The application of these criteria works as follows. For any remedial option to be viable for selection, it must meet the threshold criteria of being protective and complying with federal and State environmental laws, or it cannot be chosen.[1] For those remedial options that pass this screen, they then are analyzed "comparatively" against each other using the criteria of: long-term effectiveness, short-term effectiveness, implementability, and reduction of mobility, toxicity and volume through treatment. This is a qualitative analysis utilizing site-specific information and professional judgement. From this comparative analysis, a preferred remedial option will be identified. This will be the remedial option that provides the best overall balance of tradeoffs (i.e., advantages and disadvantages) when analyzed against the four balancing criteria.

---

1 / In complying with federal and state environmental laws, it is important to recognize the difference between compliance with the substantive portions of a law versus the administrative (i.e., procedural) requirements. The substantive requirements (e.g., numeric clean-up and performance standards) of the Solid Waste, Hazardous Waste, Air Management, Waste Water regulations, for example, must be met. However, administrative requirements, such as permitting and licensing procedures, should not delay or jeopardize the timely, on-site management of hazardous wastes.

The final step considers the criteria of cost and public acceptance. These criteria will be used generally to modify the preferred alternative, but not to change to another clean-up option. In the event that there is not unanimous public acceptance of an on-site/in-state remedy, this is not enough to warrant the out-of-state management of hazardous waste. Every effort should be made to communicate to the public and responsible parties the importance of managing our own hazardous wastes within the boundaries of the State of Wisconsin. Furthermore, costs should be considered as the last reason to send hazardous wastes out-of-state.

The DNR's eight remedy selection criteria and the sub-factors which define the criteria are presented in Exhibit Two. In order to select remedies in accordance with this policy directive -- and to document those selections -- these eight criteria should be utilized when making remedy selection determinations. Each program will be responsible for determining the appropriate way to document this analysis.

3. Administrative and Documentation Procedures

As previously discussed, a comparative analysis of the clean-up options should be conducted before selecting a remedy which involves the management of hazardous wastes. This analysis should take into consideration the goal of this policy, the waste management strategy and guidelines, and it should utilize the eight evaluation criteria to compare the clean-up options. Once completed, this should be documented in a memo or report (e.g., feasibility study or corrective action plan). In some instances, WDNR staff will have enough information available to them to prepare this analysis. With others we will have to include a provision in a State-funded contract with a consultant to conduct this analysis or in the case of responsible party clean ups, request them to prepare this analysis.

Once the analysis is complete, remedial actions may proceed for those sites where recycling or instate and on-site management of hazardous waste is selected. For those sites where out-of-state management is proposed, written documentation explaining how the eight evaluation criteria were applied must be submitted to the Director of the Solid and Hazardous Waste Management Bureau for review and approval. (The Bureau Director should be notified as early in the process, as possible.) No out-of-state shipment of hazardous waste from clean-up actions shall be "approved" by the WDNR until the WDNR's Director of the Solid and Hazardous Waste Management Bureau has concurred. If a responsible party (RP) proposes to dispose of or treat hazardous waste out of state, the WDNR staff will need to notify the Bureau director in writing. The Bureau Director will determine whether the RP's proposed action complies with this policy. It should be noted, however, that compliance with this policy should not jeopardize or unduly delay clean-up actions conducted by responsible parties.

4. Public Participation

The success of this policy will rely, to a great extent, on communicating to the public and responsible parties the importance of recycling and managing hazardous waste on-site or in-state. The method that will be used to inform the public of this policy will be to incorporate it into the existing community relations programs for clean-up actions. Those individual programs will be responsible for ensuring that this policy is communicated to the public and factored into the decisionmaking process at each site. When community relations is not required by law at a site (e.g., voluntary clean-ups), the WDNR recommends that the responsible parties conduct community relations as a routine part of the clean-up process.

The WDNR has a number of clean-up programs that routinely conduct community relations activities. For example, the federal Superfund has a legally-mandated public participation program. The focus of this program is on communicating to the public the Environmental Protection Agency's recommended plan for cleaning up a site. The state's Leaking Underground Storage Tank (LUST) program has developed a public participation plan for that program's clean-up actions. State-funded, clean-up actions taken pursuant to the Environmental Repair Law are required by law to conduct community relations at the remedy selection stage in the process. The state's hazardous waste regulations contain public participation provisions for regulated treatment, storage or disposal facilities undergoing closure, licensing and corrective action.

It should be noted that all public participation requirements directly associated with obtaining a hazardous waste license are not currently required under existing rules, when a waiver or a variance from the licensing requirements is granted by WDNR. For example, if a clean-up action involving the treatment of hazardous waste is proposed, those parties conducting the clean up may pursue a waiver or variance from obtaining a hazardous waste license (under specific circumstances). If granted by the WDNR, a hazardous waste license would not be required, nor would the participation requirements associated with that permit. However, there is a requirement to provide a public notice if a waiver is granted.

Even if a hazardous waste waiver or variance is granted, there likely is public participation requirements associated with the clean-up action itself. For example, if a Superfund site is granted a waiver from obtaining a hazardous waste permit, that waiver does not "release" the Superfund program for meeting the legal requirement to

Exhibit Two: Remedy Selection Criteria

Threshold Criteria:

Protection of Human Health and the Environment
-How risks are controlled, eliminated or reduced

Compliance with Federal and State laws
-Whether alternative complies with environmental laws

Balancing Criteria:

Long-term Effectiveness
-Adequacy and reliability of alternative over time
-Risk from, or volume of, waste remaining on-site
-State's responsibility/costs for long-term O & M
compared to capital costs for treatment

Reduction of Toxicity, Mobility and Volume through Treatment
-Ability to recycle or reuse hazardous waste and treatment residuals
-Treatment process used and materials treated
-Amount of hazardous substances destroyed or treated
-Degree of reduction expected
-Degree to which treatment is irreversible
-Type and quantity of residuals remaining after treatment
-Ability to treat and manage as solid waste
-Ability to treat so waste no longer exhibits a RCRA "characteristic"

Short-term Effectiveness
-Protection of community during the remedial action
-Protection of workers during remedial actions
-Environmental impacts
-Time until clean-up goals/standards are achieved

Implementability
-Availability of treatment process, in-state or on-site
-Availability of innovative technologies
-Ability to dispose of waste on-site/in-state
-Ability to construct and operate the technology
-Ability to obtain approvals from other agencies

Considerations:

Cost
-Capital costs
-Operation and maintenance costs
-Present worth costs

Community Acceptance
-Community concerns/preferences
-Responsible party concerns/preferences

conduct community relations under its own statute. This is true for other environmental programs as well; the granting of a hazardous waste waiver or variance does not eliminate the legal requirement to conduct community relations required by other environmental authorities.

Additionally, if a waiver or variance is granted for a clean-up action, the parties conducting the clean-up will not be allowed to operate a "commercial-like" hazardous waste operation. The treatment, storage or disposal unit that has been granted the waiver or variance will only be allowed by the DNR to manage, over a specified period of time, the type and volume of hazardous waste approved by WDNR in its submittal. Generally, a waiver or a variance will only cover the hazardous waste that is to be generated on-site, from the clean-up action.

Water Regulation and Zoning ARAR's
Superfund Remedial Meeting, Stevens Point
April 12, 1990

Floodplain

Under ch. NR 116, Wis Adm. Code, local communities must adopt a floodplain zoning ordinance if adequate floodplain data is available for the area. The Department oversees the enforcement of such ordinances. Site remedial alternatives that affect flood elevations must be analyzed to determine their impact in accordance with the procedures ch. NR 116, Wis. Adm. Code. If an alternative affects flood elevations by increasing backwater more than 0.01' from the current profile, easements must be obtained from upstream property owners to allow the increase.

Persons responsible for project implementation are required to determine if the project will affect flood elevations. Normally, there is a DNR District review and local approval process to determine if the activities are allowed under the ordinance. While it is understood that, under the CERCLA on-site permit exemption, state and local permits or approvals are not required for on-site actions affecting floodplains, the substantive technical requirements imposed through the state review and local approval processes are still applicable. Therefore, the analysis of floodplain impacts is still required. This should be done as part of the FS review and RD processes.

Shoreland-Wetland

Under ss. 59.971, 61.351, 62.231 and 144.26, Wis. Stats., and chs. NR 115 and NR 117, Wis. Adm. Code, local communities must adopt a shoreland-wetland zoning ordinance. The Department oversees the enforcement of such ordinances.

Site remedial alternatives that involve excavation, dredging and filling activities are generally prohibited in a shoreland-wetland district, except where these activities are specifically allowed because they are associated with a certain permitted use. A wetland may not be removed from a shoreland-wetland district (to allow excavation, dredging or filling) if that removal would result in a significant adverse impact upon certain identified wetland functions.

Persons responsible for project implementation are required to determine if the project will have a significant adverse impact on wetland functions. Normally, there is a DNR District review and local approval process to determine if the proposed activities are allowed under the ordinance, or if the wetland may be removed from a shoreland-wetland district. While it is understood that, under the CERCLA on-site permit exemption, state and local permits or approvals are not required for on-site actions affecting wetlands or shorelands, the substantive technical requirements imposed through the state review and local approval processes are still applicable. Therefore, the analysis of shoreland-wetland impacts is still required. This should be done as part of the FS review and RD processes.

Chapter 30

These statutory requirements regulate dredging, relocation, enlargement, grading and structures in or near navigable waters of the state. Permits are required for those activities, and are issued by the DNR District office. Site-specific permit conditions are usually developed for each project. As above, while we understand that ch. 30 permits are not required for on-site actions, the substantive technical requirements imposed through the permitting process are still applicable. Therefore, the specific technical conditions that would be contained in such permits apply. Site-specific conditions should be developed as part of the FS review and RD processes.

Step 3: *Run blower quarterly and determine its extraction rate (cfm).*

Determine radius of influence of extraction wells & volume of garbage affected.

Determine concentrations of contaminant. identified in Step 1.

Step 4: *Assume it's determined that vinyl chloride being emitted at rate of 20 lbs./yr, and th 4 extraction wells are affecting a total of 200,000 yds³ of waste.*

Extrapolate this over entire design capacity:

$$\frac{20\ lbs/yr}{200,000\ yds^3} \times 5,000,000\ yds^3 = 500\ \frac{lbs}{yr}\ VC$$

Since this is > 300 lbs/yr standard in NP 445, must install system to control HAC's.

APPENDIX H

SAMPLE WPDES GENERAL DISCHARGE PERMIT

GENERAL PERMIT TO DISCHARGE UNDER
THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 147, Wisconsin Statutes, any facility located in the State of Wisconsin discharging

CONTAMINATED OR UNCONTAMINATED GROUNDWATER

meeting the applicability criteria listed in Part I of this General permit, is permitted to discharge these wastewaters directly to

surface waters of the state and/or indirectly to state groundwaters

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

This permit shall become effective on the date of signature.

This permit to discharge shall expire at midnight September 30, 1995.

State of Wisconsin Department of Natural Resources
For the Secretary

By Mary Jo Kopecky

Mary Jo Kopecky, Director
Bureau of Wastewater Management
Division for Environmental Quality

For Reference only

Dated FEB 8 - 1991

Table of Contents

A. APPLICABILITY CRITERIA

1. Eligible Facilities

This permit is only applicable to uncontaminated or treated contaminated groundwater discharges to surface waters or to groundwaters where the Department determines that the discharge will not have significant impacts on receiving waters.

2. Pollutants Regulated by this Permit

This permit is designed to regulate the impacts on surface waters from the discharge of groundwater contaminated by petroleum products and volatile organic compounds. The permit can also be used to regulate pollutants listed in NR 140 for wastewater discharges to groundwaters via infiltration.

3. Pollutants Not Properly Regulated by this Permit

The permit does not adequately protect surface water quality when wastewater discharges from groundwater clean-up remediations require limits for priority pollutant pesticides, toxic metals, phenols or cyanide. This permit is not applicable to discharges requiring limits for these compounds. A separate WPDES permit shall be drafted on a case-by-case basis for a discharge requiring limits for pollutants of this nature. Except for polynuclear aromatic hydrocarbons from petroleum product releases, a separate permit shall also be drafted for a discharge requiring limits for priority pollutant GC/MS acids or base neutral compounds. Polynuclear aromatic hydrocarbons are limited in the permit since they may be found in groundwater contaminated by petroleum products.

4. Bioaccumulating Toxic Substances

This permit does not authorize the discharge of any of the following 21 bio-accumulating toxic substances. This permit is not applicable to discharges containing these compounds; such a discharge must be regulated by an individually drafted permit.

Acrolein	Dieldrin	Mercury
alpha-BHC	Endosulfan	PCB
beta-BHC	Endrin	Pentachlorobenzene
gamma-BHC (Lindane)	Fluoranthene	1,2,4,5-Tetrachlorobenzene
tech.-BHC	Heptachlor	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Chlordane	4,4'-DDT	Toxaphene
3,3'-Dichlorobenzidine	Hexachlorobenzene	2,4,6-Trichlorophenol

5. Cover Letter

This permit is only valid if accompanied by a letter from the Department stating that pollutants present in the discharge have been evaluated for compliance with the applicable surface water or groundwater quality standards, and that the general permit limits are sufficiently restrictive to protect surface and groundwater quality. The cover letter will specify

A. APPLICABILITY CRITERIA (Cont.)

which parameters must be monitored to document compliance with water quality or treatment technology based standards. Monitoring may be required for parameters not listed in the effluent limit table so that pollutant removal in the treatment system may be evaluated.

6. Outstanding Resource Waters

This permit does not authorize discharges to outstanding resource waters as defined in Ch. NR 207 and NR 102.10. This permit does not authorize discharges that would lower the water quality of downstream outstanding resource waters. An individually drafted WPDES permit is required to protect outstanding resource waters from the effects of any discharge.

7. Waters Classified as a Public Water Supply

This permit does not authorize direct discharges to waters classified as a public water supply in Ch. NR 103 and NR 104. An individually drafted WPDES site specific permit is required to protect public water supplies from the effects of a remediation discharge.

8. Exceptional Resource Waters

This permit may authorize discharges that lower the water quality of exceptional resource waters as defined in NR 102.11 when the discharge meets the requirements of Ch. NR 207, such as preventing or correcting an existing groundwater contamination situation or a public health problem.

6. More Than One Permit (GP) Can Apply

A WPDES Permit shall be obtained for all wastewater discharges from a facility that are conveyed through storm sewers, ditches or direct pipes to surface waters or groundwaters of the state. Facilities discharging wastewater meeting all the applicability criteria of this permit shall comply with the effluent limitations, monitoring requirements, and other conditions of this permit. Chapter 147, Wis. Stats. requires that if a wastewater discharge to the environment does not meet all of the applicability criteria of this permit, that discharge must be authorized under another WPDES permit. That other permit may be a different general WPDES permit, or it may be a WPDES Permit specifically drafted for the discharges from the facility. A facility may discharge wastewater in compliance with one general WPDES permit and discharge other wastewaters in compliance with a different general permit (e.g. the Remedial Action GP for one discharge, and the Non-contact Cooling Water GP for another discharge). The appropriate general WPDES permit is determined by the applicability of the permit to the wastewater being discharged. In no way shall this condition be used to avoid more stringent requirements.

B. SPECIAL CONDITIONS

1. Surface Water and Groundwater Standards

This permit does not authorize discharges of pollutants in quantities which would be harmful to human, animal, plant or aquatic life. No discharge is allowed that would violate surface water quality standards (Ch. NR 102, NR 105, NR 106, and NR 207 Wis. Adm. Code) or groundwater quality standards (Ch. NR 140, Wis. Adm. Code).

2. Treatment of Contaminated Groundwater

Any discharge of contaminated groundwater, including pump tests, shall be treated for pollutant removal prior to discharge. The level of treatment shall be adequate to assure compliance with water quality standards or shall be equivalent to Best Available Treatment Economically Achievable, whichever is more restrictive. The treatment unit shall be adequately sized, designed, and operated to remove contaminants identified through sampling and characterization of the discharge.

For Reference only

3. Submittal of the Treatment System Design for Approval

Section 144.04, Wisconsin Statutes requires review and approval of construction plans and specifications for wastewater treatment systems. When treatment units for contaminated groundwater are package units purchased from a supplier, a minimum plan submittal would be a diagram, a summary of the design, and the sizing calculations for the units.

4. Inspection, Maintenance, and Documentation

Separated contaminants, and solids if present, shall be removed on a periodic basis to maintain the treatment capacity and efficiency of the system. The water discharge side of the treatment unit shall be maintained clean and there shall be no contaminant sheen or scum on the equipment. All removed substances shall be disposed of in accordance with General Condition #18 in Part II of this permit. Documentation of contaminant disposal shall include: the amount removed, date of removal, hauling firm, and ultimate fate of the separated material. These records shall be maintained on site.

5. Floating Solids and Foam

There shall be no direct discharge to surface waters of floating solids or visible foam in other than trace amounts.

6. Dewatering

Discharges from pumping uncontaminated groundwater to lower the water table or dewater excavations shall contain Total Suspended Solids (TSS) at 40 mg/L or less, and Oil/Grease at 10 mg/l or less on a daily maximum basis. Total daily flow, TSS and oil/grease shall be monitored at a frequency specified in the cover letter accompanying this permit.

B. SPECIAL CONDITIONS (Cont.)

7. Chlorine for Bacterial Control

Chlorine may be used to control the growth of micro-organisms in the treatment system. The preferred chlorination system would be to clean and chlorinate the treatment unit when it is out of service, and then capture the cleaning wastewater for acceptable offsite disposal, such as a sanitary sewer. Alternatively, the cleaning wastewater may be treated for removal of suspended solids and other pollutants, and then discharged under this permit. However, the discharge of chlorinated water to surface waters under this permit shall not contain detectable amounts of Total Residual Chlorine using Standard Methods #408B, D or E (DPD titration or colorimetric) or by using an ion specific electrode approved in Ch. NR 219. Monitoring of trihalomethanes or other chlorinated hydrocarbons may be required for a discharge of chlorinated water. Other biocides may not be discharged under this permit.

8. pH Limit and Monitoring For Surface Water Discharges

The pH of all surface water discharges authorized by this permit shall be maintained within the range of 6.0 to 9.0 standard units. A grab sample shall be analyzed whenever treatment unit cleaning solutions are discharged.

9. Dike or Berm Leakage

Where treatment or disposal ponds are contained by dikes or berms, no above ground leakage is allowed on the outer surface of such dikes or berms.

10. Other Permits For Work Near Surface Waters

Any work performed below, or within 500 feet of the ordinary high water mark of navigable waters, in wetland areas, or within areas subject to local floodplain and shoreland regulations, must conform to all such county or local ordinances. Also, all applicable state permits and/or contracts required by Chapters 30, 31, and 87, Stats. (or Wisconsin Administrative Code adopted under these laws), and federal permits must be obtained as necessary for wetland, shoreland or floodplain work of this nature.

11. Other Permits For Air Emissions

The emission of Volatile Organic Contaminants from air stripping of contaminated groundwater shall be either exempted from, or in compliance with a DNR air emission permit. Current regulations call for a permit for emissions of more than 300 pounds of benzene per year. Other air emissions from treatment of contaminated groundwater shall be evaluated on a case-by-case basis regarding the need for an air emission permit.

C. EFFLUENT LIMITATIONS FOR DISCHARGES TO SURFACE WATERS FROM REMEDIATION OF GROUNDWATER CONTAMINATED BY PETROLEUM PRODUCTS

During the period beginning on the date of signature and lasting until September 30, 1995, the permittee is authorized to discharge groundwater that has been treated for removal of petroleum products to surface waters of the state. Surface waters includes ditches, storm sewers and pipes that convey wastewater to creeks, streams, rivers and lakes in Wisconsin.

1. Where to Sample. Samples representative of the discharge shall be collected after treatment and prior to discharge to the environment. When treatment efficiency reporting is required, the influent sample shall be collected before the wastewater passes through the treatment unit.

2. Regular Wastewater Testing. The cover letter accompanying this permit shall specify which parameters shall be monitored to assure compliance with water quality or treatment technology based standards.

3. Surface water effluent limits are specified below for discharges of groundwater that have been treated for removal of petroleum products.

Parameter	Effluent Limit	Sample Type	Sample Frequency	Test Method
Flow	-	Total Daily	Daily	-
Total BETX	750 ug/L, Daily Maximum	Grab	See (a) below	See (b) below
Benzene, (c)	50 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Polynuclear Aromatic Hydrocarbons, (d)	0.1 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Oil/Grease, (e)	10 mg/L, Daily Maximum	Grab	See (a) below	See (b) below
Total Suspended Solids, (f)	40 mg/L, Daily Maximum	Grab	See (a) below	See (b) below

a. Sample Frequency. The discharge shall be sampled weekly during the first four weeks of discharge, and then sampled every two weeks. After three months, the Department may, by letter, authorize a monthly sampling frequency. Reduced sampling will only be allowed if the pollutant levels in the discharge are always well below permit limits, and there is little chance that influent pollutants may break through the treatment unit and violate permit limits. After reviewing a year of sample data, the Department may reduce the sampling frequency to quarterly.

b. Test Methods. The following test methods shall be used unless specified otherwise by a letter from the Department. EPA methods 602, 624, or 1624 shall be used for determination of benzene, ethyl benzene, toluene and total xylenes including ortho-, meta-, and para-xylene. EPA method 610 HPLC shall be used for the determination of polynuclear aromatic hydrocarbons. EPA method 413.1 (Standard Methods 503A) shall be used for determination of oil and grease when required. EPA Method 160.2 (Standard Methods 209C) shall be used for determination of total suspended solids when required.

c. Benzene. Compliance with the benzene effluent limit will require effective wastewater treatment consisting of free product separation followed by removal of

C. EFFLUENT LIMITS FOR PETROLEUM PRODUCT REMEDIATIONS (Cont.)

the benzene dissolved in the wastewater. Some pollutant removal will be required in all cases, even when the untreated wastewater could meet the limits listed above. The 50 ug/L benzene limit will assure compliance with Wisconsin Water Quality Standards in almost all cases. A more restrictive water quality based benzene limit would be included in a permit specifically drafted for a direct discharge to waters, such as the Great Lakes or Lake Winnebago, that are classified as public drinking water sources.

d. Polynuclear Aromatic Hydrocarbons. Groundwater remediation of "heavier" products such as heating fuel, diesel fuel, jet fuel, and other similar substances may contain polynuclear aromatic hydrocarbons. Detection of any combination of the following polynuclear aromatic hydrocarbons shall be less than 0.1 ug/L: benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. A more restrictive site specific permit shall be drafted for a direct discharge of polynuclear aromatic hydrocarbons to waters, such as the Great Lakes or Lake Winnebago, that are classified as public drinking water sources.

e. Oil and Grease. Monitoring will not be required if the petroleum product is solely gasoline. For "heavier" products such as heating fuel, diesel fuel, jet fuel, and other similar substances, monitoring is important to assure that free product separation followed by VOC removal is effectively treating the wastewater.

f. Total Suspended Solids. Monitoring for TSS shall be required at sites where groundwater is pumped from open pits or trenches. Discharges from wells will not require monitoring for TSS.

g. Grab Sample. A grab sample means a single sample taken at one moment of time or a combination of several smaller samples of equal volume taken in less than a two minute period.

h. Daily Maximum Effluent Limitation. A daily maximum effluent limit is to be compared with the result of each analysis performed during that day. Compliance is achieved when each analysis result is less than the maximum daily effluent limitation.

D. EFFLUENT LIMITATIONS FOR DISCHARGES TO SURFACE WATERS FROM REMEDIATION OF GROUNDWATER CONTAMINATED BY VOLATILE ORGANIC COMPOUNDS

During the period beginning on the date of signature and lasting until September 30, 1995, the permittee is authorized to discharge groundwater that has been treated for removal of volatile organic compounds to surface waters of the state. Surface waters includes ditches, storm sewers and pipes that convey wastewater to creeks, streams, rivers and lakes in Wisconsin.

1. Where to Sample. Samples representative of the discharge shall be collected after treatment and prior to discharge to the environment. When treatment efficiency reporting is required, the influent sample shall be collected before the wastewater passes through the treatment unit.

2. Regular Wastewater Testing. The cover letter accompanying this permit shall specify which parameters shall be monitored to assure compliance with water quality or treatment technology based standards.

3. Surface water effluent limits are specified below for discharges of groundwater that have been treated for removal of volatile organic compounds. These limits are not restrictive enough to protect the quality of waters classified as a public drinking water source. A discharge must be covered by a site specific WPDES permit when the following limits are not sufficiently restrictive to meet state water quality criteria.

For Reference Only

Parameter	Effluent Limit	Sample Type	Sample Frequency	Test Method
Flow	-	Total Daily	Daily	-
Total Suspended Solids, (e)	40 mg/L, Daily Maximum	Grab	See (a) below	See (b) below
Acrylonitrile	See (c) below	-	-	-
Bromoform	120 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Carbon Tetrachloride	150 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Chloroform	120 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Dichlorobromomethane	120 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
1,2-Dichloroethane	180 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
– 1,1-Dichloroethylene	50 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Methyl Bromide	120 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Methyl Chloride	120 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
1,1,2,2,-Tetrachloroethane	50 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
- Tetrachloroethylene	50 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
1,1,2,-Trichloroethane	50 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
– Trichloroethylene	100 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below
Vinyl Chloride	10 ug/L, Monthly Avg.	Grab	See (a) below	See (b) below

a. Sample Frequency. The discharge shall be sampled weekly during the first four weeks of discharge, and then sampled every two weeks. After three months, the Department may, by letter, authorize a monthly sampling frequency. Reduced sampling will only be allowed if the pollutant levels in the discharge are always well below

D. EFFLUENT LIMITS FOR VOLATILE ORGANIC COMPOUND REMEDIATIONS (Cont.)

permit limits, and there is little chance that influent pollutants may break through the treatment unit and violate permit limits. After reviewing a year of sample data, the Department may reduce the sampling frequency to quarterly.

b. Test Methods. The following test methods shall be used unless specified otherwise by a letter from the Department. EPA methods 601 or 624 shall be used for determination of volatile organic compounds. EPA Method 160.2 (Standard Methods 209C) shall be used for determination of total suspended solids when required.

c. Acrylonitrile. Discharges containing detectable quantities of Acrylonitrile shall not be regulated by this permit, but by a separate WPDES permit specifically drafted for the discharge. This permit does not regulate acrylonitrile because of the very low water quality criteria, problems in treating the compound and the difficulties of obtaining adequate analysis detection limits.

d. Treatment of Volatile Organic Compounds. This permit requires effective treatment, such as air stripping or activated carbon adsorption, for discharges containing volatile organic chemicals. Some pollutant removal will be required in all cases, even when the untreated wastewater could meet the limits listed above. This requirement for wastewater treatment will assure compliance with Wisconsin Water Quality Standards in almost all cases. When more restrictive water quality based effluent limits are needed, such as for direct discharges to very low flow cold water fisheries, outstanding resource waters, or to waters that are classified as public drinking water sources, a site specific WPDES permit shall be individually drafted to regulate the discharge.

e. Total Suspended Solids. Monitoring for TSS shall be required at sites where groundwater is pumped from open pits or trenches. Discharges from wells will not require monitoring for TSS.

f. Grab Sample. A grab sample means a single sample taken at one moment of time or a combination of several smaller samples of equal volume taken in less than a two minute period.

g. Monthly Average Effluent Limitation. A monthly average effluent limit is to be compared with the result of the average of all the analyses performed during the month. Compliance is achieved when the average analysis result is not greater than the monthly average effluent limitation.

E. LIMITATIONS FOR DISCHARGES TO GROUNDWATERS VIA INFILTRATION FROM GROUNDWATER REMEDIAL ACTIONS

During the period beginning on the date of signature and lasting until September 30, 1995, the permittee is authorized to discharge wastewaters that have been treated for pollutant removal to groundwaters of the state. A discharge to groundwaters in Wisconsin includes wastewater infiltration from irrigation, drain fields, ditches, and ponds that may impact water beneath the ground surface.

1. Treatment of Wastewater Pollutants For Discharges to Seepage. Wastewater treatment will be required to minimize the level of substances in the groundwater and to prevent exceedance of the groundwater preventive action limits (PAL) contained in Chapter NR 140, Wisconsin Administrative code, to the extent that it is technically and economically feasible.

2. Where to Sample. Compliance with the NR 140 groundwater quality standards shall be demonstrated either by sampling water from groundwater monitoring wells or by sampling wastewater treatment effluent before discharge. When treatment efficiency reporting is required, the influent sample shall be collected before the wastewater passes through the treatment unit.

3. Cover Letter. Limits and monitoring requirements necessary to assure compliance with Ch. NR 140 groundwater quality standards will be specified by letter on a case by case basis.

4. Preventive Action Limits for Petroleum Product Remediations. The following are the Ch. NR 140 PAL's for petroleum products:

Benzene	- 0.067 ug/L	Toluene	- 68.6 ug/L
Ethylbenzene	- 272 ug/L	Xylene	- 124 ug/L
EDB	- 0.001 ug/L		

5. Preventive Action Limits for Volatile Organic Compound Remediations. The following are the PAL's for volatile organic compounds listed in NR 140:

1,1-Dichloroethane	- 85 ug/L		
1,2-Dichloroethane	- 0.05 ug/L	Tetrachloroethylene	- 0.1 ug/L
1,1-Dichloroethylene	- 0.024 ug/L	1,1,1,-Trichloroethane	- 40 ug/L
1,2-Dichloroethylene (cis)	- 10 ug/L	1,1,2,-Trichloroethane	- 0.06 ug/L
1,2-Dichloroethylene (trans)	- 20 ug/L	Trichloroethylene	- 0.18 ug/L
Methylene Chloride	- 15 ug/L	Vinyl Chloride	- 0.0015 ug/L

6. Enforcement Standards. The enforcement standards for the compounds listed above are 10 times the preventive action limit, except for the following compounds that are listed with their enforcement standard: Benzene- 5 ug/L, 1,2-Dichloroethane - 5 ug/L, 1,1-Dichloroethylene - 7 ug/L, Trichloroethylene - 5 ug/L, and Vinyl Chloride - 0.2 ug/L.

E. LIMITS FOR REMEDIAL ACTION DISCHARGES TO SEEPAGE (Cont.)

7. Sample Frequency. The discharge shall be sampled weekly during the first four weeks of discharge, and then sampled every two weeks. After three months, the Department may, by letter, authorize a monthly sampling frequency. Reduced sampling will only be allowed if the pollutant levels in the discharge are always well below permit limits, and there is little chance that influent pollutants may break through the treatment unit and violate permit limits. After reviewing a year of sample data, the Department may reduce the sampling frequency to quarterly.

8. Test Methods. The following test methods shall be used unless specified otherwise by a letter from the Department. EPA methods 602, 624, or 1624 shall be used for determination of benzene, ethylbenzene, toluene and total xylenes including ortho-, meta-, and para-xylene. EPA methods 601 or 624 shall be used for determination of volatile organic compounds.

9. Reporting Results. Compliance with the groundwater standards may be demonstrated by reporting an analytical result less than the PAL or by reporting a result less than the level of detection using the recommended analytical test methods specified above.

10. Flow. Total daily discharge volume records shall be retained for inspection for 3 years and shall be submitted with other monitoring reports as required. The required flow measurement method shall be specified in the cover letter accompanying this permit.

F. REPORTING REQUIREMENTS

1. Monitoring results shall be submitted to the Department by letter on a monthly basis, or during the month following analysis for less frequent monitoring requirements.

2. Records shall be maintained of total daily discharge volumes. Such records shall be retained for inspection by this Department or shall be submitted with other monitoring reports if required.

3. Reports required by this permit shall be signed:

   (a) for a corporation by a principal executive officer of at least the level of Vice President or his/her duly authorized representative having overall responsibility for the operation of the facility for which this permit is issued,

   (b) for a partnership by a general partner, and

   (c) for a sole proprietorship by the proprietor.

4. Discharge monitoring reports, and any other special reporting required by Part I or Part II (the general conditions) of this permit, shall be submitted to the address of the DNR district office printed on the discharge monitoring report, or to:

   Wisconsin Department of Natural Resources
   WPDES Permit Section
   P.O. Box 7921
   Madison, Wisconsin 53707

PART II
GENERAL CONDITIONS

1. <u>Duty to comply</u>
The permittee shall comply with all conditions of the permit. Any permit noncompliance is a violation of the permit and is grounds for enforcement action, denial of coverage under the general permit, or denial of a permit reissuance application.

2. <u>Permit actions</u>
As provided in s. 147.03, Stats., after notice and opportunity for a hearing the permit may be modified or revoked and reissued for cause. If the permittee files a request for an individual permit or a notification of planned changes or anticipated noncompliance, this action by itself does not relieve the permittee of any permit condition.

3. <u>Property rights</u>
The permit does not convey any property rights of any sort, or any exclusive privilege. The permit does not authorize any injury or damage to private property or any invasion of personal rights, or any infringement of federal, state or local laws or regulations.

4. <u>Inspection and entry</u>
The permittee shall allow an authorized representative of the Department, upon the presentation of credentials, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are required under the conditions of the permit;

b. Have access to and copy, at reasonable times, any records that are required under the conditions of the permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under the permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance, any substances or parameters at any location.

5. <u>Recording of results</u>
For each effluent measurement or sample taken, the permittee shall record the following information.

a. The date, exact place, method and time of sampling or measurements;
b. The individual who performed the sampling or measurements;
c. The date the analysis was performed;
d. The individual who performed the analysis;
e. The analytical techniques or methods used; and
f. The results of the analysis.

6. Records retention
The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. The Department may request that this period be extended by issuing a public notice to modify the permit to extend this period.

7. Signatory requirement
All applications, reports or information submitted to the Department shall be signed for a corporation by a responsible corporate officer including a president, secretary, treasurer, vice president or manager; and for a municipality by a ranking elected official; or other person authorized by one of the above and who has responsibility for the overall operation of the facility or activity regulated by the permit. The representative shall certify that the information was gathered and prepared under his or her supervision and based on inquiry of the people directly under his or her supervision that, to the best of his or her knowledge, the information is true, accurate and complete.

8. Compliance schedules
Reports of compliance or noncompliance with interim and final requirements contained in any compliance schedule of the permit shall be submitted in writing within 14 days after the schedule date, except that progress reports shall be submitted in writing on or before each schedule date for each report. Any report of noncompliance shall include the cause of noncompliance, a description of remedial actions taken and an estimate of the effect of the noncompliance on the permittee's ability to meet the remaining schedule dates.

9. Transfers
A permit is not transferable to any person except after notice to the Department. In the event of a transfer of control of a permitted facility, the prospective owner or operator shall notify the Department WPDES permit section in writing. The Department may require the prospective owner to file a new permit application and obtain an individual permit to reflect the requirements of ch. 147, Stats.

10. Proper operation and maintenance
The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of the permit. The wastewater treatment facility shall be under the direct supervision of a state certified operator as required in s. NR 108.06(2). Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114 and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

11. Duty to mitigate
The permittee shall take all reasonable steps to minimize or prevent any adverse impact on the waters of the state resulting from noncompliance with the permit.

12. Duty to provide information
The permittee shall furnish the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking or reissuing the permit or to determine compliance with the permit. The permittee shall also furnish the Department, upon request, copies of records required to be kept by the permittee.

13. Sampling procedures
Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the monitored discharge and shall be taken at points specified in the permit using sample types specified in the permit and the following procedures:

a. For effluent flow measurement and sample collection - ch. NR 218.
b. For groundwater sample collection and analysis - ch. NR 214.

14. Test procedures
Monitoring shall be conducted according to test procedures listed in ch. NR 219, or any other test procedures specified in the permit.

15. Additional monitoring
If a permittee monitors any pollutant more frequently than required by the permit, using test procedures specified in ch. NR 219, the results of that monitoring shall be recorded and reported in accordance with this chapter. Results of this additional monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

16. Monitoring reports
The monitoring results shall be reported at the intervals specified in the permit. Monitoring results shall be summarized on forms designated by the Department.

Note: The forms used for monitoring reports are DMR Forms 3200-28 and 3200-40.

17. Noncompliance notification

a. The permittee shall report the following types of noncompliance by a telephone call to the Department's district office within 24 hours after becoming aware of the noncompliance.

(1) Any noncompliance which may endanger health or the environment.
(2) Any violation of an effluent limitation resulting from an unanticipated bypass.
(3) Any violation of an effluent limitation resulting from an upset.
(4) Any violation of a maximum daily discharge limitation for those pollutants specifically designated in the permit to be reported within 24 hours.

b. A written report describing the noncompliance reported in condition 17, part a. shall be submitted to the Department's district office within 5 days after the permittee becoming aware of the noncompliance. The Department may waive the written report on a case-by-case basis based on the oral report received within 24 hours. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

c. Reports of all noncompliance not required to be reported under condition 8 or condition 17, parts a. and b. shall be submitted with the monitoring reports required under condition 16.. The reports shall contain all the information listed in condition 17, part b.

18. Removed substances
Solids, sludges, filter backwash or other pollutants removed from or resulting from treatment or control of wastewaters or intake waters shall be stored and disposed of in a manner to prevent any pollutant from the materials from entering the waters of the state. Land disposal of treatment plant solids and sludges shall be at a site or operation licensed by the Department under ch. NR 180 or 181, or in accordance with ch. NR 214.

19. Spill reporting
The permittee shall notify the Department in accordance with ch. NR 158, in the event that a spill or accidental release of any material or substance results in the discharge of pollutants to the waters of the state at a rate or concentration greater than the effluent limitations established in the permit, or the spill or accidental release of the material is unregulated in the permit, unless the spill or release of pollutants has been reported to the Department under condition 17.

20. Planned changes
In accordance with ss. 147.02(4)(b) and 147.14(1), Stats., the permittee shall report to the Department any facility expansion, production increase or process modifications which will result in new, different or increased discharges of pollutants. The report shall either be a new permit application or, if the new discharge will not violate the effluent limitations of the permit, a written notice of the new, different or increased discharge. The notice shall contain a description of the new activities, an estimate of the new, different or increased discharge of pollutants and a description of the effect of the new or increased discharge on existing waste treatment facilities. Following receipt of this report, the Department may issue an individual permit to specify and limit any pollutants not previously regulated in the general permit.

Note: The notification should be directed to the Industrial Wastewater Section.

21. Increased discharge of toxic pollutants

a. 'Routine or frequent increase'. The permittee shall notify the Department in writing as soon as it knows or has reason to believe that any activity has occurred or will occur which would result, on a routine or frequent basis, in the discharge of any toxic pollutant which is not limited in the permit, if that discharge exceeds the highest of the following levels.

(1) One hundred micrograms per liter (100 ug/l);

(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

(3) Five times the maximum concentration value reported for that pollutant in the permit application; or

(4) A notification level greater than the level in sections (1), (2), or (3) above, which the Department has included as a special condition of the permit.

b. 'Nonroutine or infrequent increase'. The permittee shall notify the Department in writing as soon as it knows or has reason to believe that any activity has occurred or will occur which would result, on a nonroutine or infrequent basis, in any discharge of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following levels.

(1) Five hundred micrograms per liter (500 ug/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten times the maximum concentration value reported for that pollutant in the permit application; or

(4) A notification level greater than the level in sections (1), (2), or (3), above which the Department has included as a special condition to the permit.

22. Duty to halt or reduce activity

Upon failure or impairment of treatment facility operation, the permittee shall, to the extent necessary to maintain compliance with its permit, curtail production or wastewater discharges or both until the treatment facility operations are restored or an alternative method of treatment is provided.

23. Bypass
The permittee may bypass waste treatment facilities if this is necessary for the essential maintenance of the facilities and if the bypass does not exceed permit effluent limitations. The permittee may also bypass if the bypass is due to runoff in excess of the 10 year, 24 hour rainfall event and the bypass is designated as a specific discharge point in the WPDES permit. All other bypasses of waste treatment facilities, including diversion of wastewater from land disposal systems to surface waters, are prohibited unless the following conditions are met:

a. The bypass is necessary to prevent loss of life, personal injury or severe property damage;

b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes or maintenance during normal periods of equipment downtime; and

c. The permittee submitted written notice 10 days before the date of the bypass and the Department's district office wastewater supervisor had approved the bypass in writing prior to its occurrence; or

d. In the event of an unanticipated bypass, the permittee notified the Department verbally within 24 hours and in writing within 5 days of each unanticipated bypass.

24. The department shall withdraw a point source from coverage by a general permit and issue an individual permit upon written request of the discharger.

25. The department may require any point source covered by a general permit to apply for and obtain an individual permit if:

a. The point source is a significant contributor of pollution or if the point source is more appropriately regulated by an individual permit. Any person may submit a written request that the department take action under this section;

b. The point source is not in compliance with the terms and conditions of the general permit;

c. A change occurs in the availability of demonstrated technology or practices for the control or abatement of pollutants from the point source or class of discharger;

d. Effluent limitations or standards are promulgated for a point source or class of point sources covered by the general permit and are different than the conditions contained in the general permit;

e. A water quality management plan containing requirements applicable to the point source is approved.

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APPENDIX I

"GROUNDWATER MODELING STUDY"

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

DRAFT FEASIBILITY STUDY
GROUNDWATER MODELING STUDY

PROJECT #497-8
AUGUST 1992

EDER ASSOCIATES
CONSULTING ENGINEERS, P.C.
Locust Valley, New York
Madison, Wisconsin
Ann Arbor, Michigan
Augusta, Georgia

TABLE OF CONTENTS

I. INTRODUCTION

The purpose of the modeling exercise was to simulate groundwater flow to estimate the numbers of recovery wells, pumping rates, well interactions, and remedial time frames under various pumping scenarios for the National Presto Industries, Inc. (NPI) site Feasibility Study (FS). The groundwater flow analysis was used with a calibrated steady-state groundwater model (FLOWPATH) to simulate the groundwater flow patterns over a wide range of hydraulic stresses.

The scope of the groundwater modeling analysis included the review and organization of the hydrogeological data base, the extension of the conceptual model to suit the site-specific data base, model calibration, the remedial pumping simulations, and sensitivity analysis.

The data review component of the modeling effort consisted of an evaluation of all available data on the hydrogeologic system including its geologic framework, hydraulic properties, water levels, water sources, and sinks.

The data base for this model includes information from the various site investigations conducted by Eugene A. Hickok and Associates (1983), Roy F. Weston, Inc. (1988), and Eder Associates. These data were supplemented by information provided by the United States Geological Survey (USGS) and the City of Eau Claire Department of Public Works.

A conceptual model, consisting of a concise description of the significant components of the groundwater system, was prepared using the accumulated data base. The conceptual model was used to guide the calibration of the numerical model and as an aid in interpreting the model results.

After the conceptual model was developed, the numerical model was constructed by discretizing the flow system into rectangular cells, assigning aquifer properties to each cell, and fixing groundwater sources and sinks.

The numerical model was calibrated using water levels measured on April 1-2, 1992 (Figure 1-1). Model calibration refers to the process of adjusting hydraulic parameters to obtain a reasonable match between water levels measured in the field (calibration targets) and water levels calculated by the model.

Four areas of VOC-contaminated groundwater associated with the NPI site, identified as Plumes 1-2, 3, 4 and 5, were defined during the NPI site remedial investigation. Plume 1-2 is a well-defined VOC plume that extends from the southwest corner of the NPI site to the Eau Claire Municipal Well Field (ECMWF), where groundwater is currently extracted and treated pursuant to a March 31, 1988 Record of Decision (ROD). Groundwater Plumes 3, 4 and 5 currently discharge to Lake Hallie. Plumes 3 and 4 behave hydrologically as a single plume.

An operable unit will be implemented to remediate groundwater at the Melby Road Disposal Area and the southwest corner of the NPI site pursuant to a September 30, 1991 ROD. This on-site operable unit will pump approximately 200 gpm at each area to prevent off-site migration of VOCs from the Melby Road Disposal Area and the southwest corner of the NPI site.

II. SUMMARY OF GROUNDWATER FLOW SYSTEM

Groundwater flow in the study area is principally controlled by the location and orientation of the buried valley containing alluvial sand and gravel deposits, known as the outwash aquifer. The buried valley is cut into the sandstone which also functions as an aquifer. The sandstone is underlain by granite, the confining unit which underlies the outwash aquifer along the axis of the buried valley where the sandstone bedrock has been eroded away.

Groundwater flow in the outwash aquifer is generally parallel to the axis of the valley, while groundwater flow in the sandstone aquifer is perpendicular to the sandstone bedrock surface. Because of a considerable difference in the hydraulic conductivity between the outwash and the sandstone, hydraulic gradients in the sandstone are substantially greater than in the outwash. A rather steep hydraulic gradient in the outwash aquifer at the Eau Claire County Airport may be caused by relatively high recharge in this area compared to the rest of the study area.

A northwest-trending groundwater basin divide in the study area causes flow to groundwater discharge areas located to the north (Lake Hallie) and to the west (the Chippewa River) of the NPI site. Generally, groundwater west of the divide discharges at the Chippewa River, and groundwater east of the divide discharges at Lake Hallie. The shape and location of the groundwater divide is subject to change, probably driven by seasonal and yearly variations in recharge.

The hydrogeologic data suggest that the Chippewa River is a gaining stream in the study area. However, groundwater levels at the ECMWF are lowered by heavy pumpage and water from the Chippewa River is introduced into the outwash aquifer under this pumping influence.

III. PREVIOUS MODELING STUDY

A modular three-dimensional finite-difference groundwater flow and transport model was previously constructed for the "Feasibility Study Report for the Eau Claire Municipal Well Field Site" by Roy F. Weston, Inc., in 1988. This two-layer model, in which one layer represented the outwash and the second layer represented the sandstone, was constructed after a single layer approach was considered unrealistic.

The modeled domain encompassed approximately 13.7 square miles. The Chippewa River and Lake Hallie were treated as constant head boundaries and the remaining boundaries were treated as no-flow boundaries.

The net recharge data (3 inches per year) used for the model seemed low considering the rainfall, evapotranspiration rate, and the rapid infiltration possibility where there are few large paved areas.

IV. GROUNDWATER FLOW MODEL CONSTRUCTION

4.1 Code Selection

Groundwater flow in the study area was modeled with the well documented two-dimensional finite difference horizontal aquifer simulation code called FLOWPATH (Franz and Guiguer, Waterloo Hydrogeologic Software, 1989 - 1992). Others have successfully validated FLOWPATH against PLASM (Prickett and Lonnquist, 1971) and MODFLOW (McDonald and Harbaugh, 1984) for the hydraulic head distribution, and RESSQ (Javandel and Tsang, 1986) and GWPATH (Shafer, 1987) for pathlines and travel times.

The relatively simple hydrostratigraphy in the NPI study area allowed the use of a two-dimensional model.

4.2 Model Configuration

4.2.1 Discretization

The model grid covers approximately 11.6 square miles with a north-south dimension of 15,400 feet and an east-west dimension of 21,000 feet. The model is larger than the area of interest, in order to incorporate regional groundwater flow effects.

With the finite-difference modeling technique used in FLOWPATH, the modeled area is divided into rectangular cells. The cell size is assigned by the modeler. The maximum dimension of any cell used in the NPI study is 1,400 feet. These large cells were placed in the area of minimum interest, away from the NPI site and areas of potential remedial pumping. Finer grid spacing was used in areas where the most detailed knowledge of the aquifer was needed to model capture zones. The smallest cell dimension is 80 to 90 feet on a side.

Different cell sizes were assigned to the western part of the modeled domain which includes Plume 1-2, and the eastern part which includes Plumes 3 and 4, and 5. This was required by the potential location(s) of remedial pumpage where it was necessary to improve the definition of the capture zones. The grid patterns of the modeled domain for Plumes 1-2, 3 and 4, and 5 are shown on Figures 4-1 and 4-2.

4.2.2 Boundary Conditions

A boundary condition is a numerical representation of a physical boundary or process affecting the aquifer system. The Chippewa River and Lake Hallie were treated as constant-head boundaries and the remaining boundaries were treated as no-flux boundaries. The boundary conditions of the modeled domain are shown on Figures 4-1 and 4-2.

When creating constant-head boundaries along the Chippewa River and Lake Hallie, groundwater head values were assumed equivalent to the surface water elevations obtained from USGS topographic maps. The use of no-flux boundaries is justified on the basis of the groundwater flow pattern showing that flow directions at the boundary areas are relatively parallel to selected no-flux boundaries.

4.3 Aquifer Parameters

Aquifer parameters, such as hydraulic conductivity, effective porosity and aquifer thickness were assigned to groups of cells, using the concept of parameter zonation, which specifies several discrete values of each parameter, to characterize different groups (zones) of cells.

The outwash aquifer was treated as isotropic and homogeneous, and the hydraulic conductivity of 270 feet per day (ft/day) is based on July 1991 pumping test data from the NPI site. The hydraulic conductivity of the sandstone aquifer was obtained through several slug tests in the study area. The data used in the simulation, which range from 2 ft/day to 4 ft/day, were finalized during the course of model calibration and agree with the field data.

The effective porosities of the outwash and sandstone aquifer materials are estimated at 0.20 and 0.25, respectively, based on literature values.

Areas of sandstone aquifer located underneath the outwash aquifer were not taken into account based on their negligible contribution to groundwater flow along the valley. Therefore, in the modeled domain, the outwash aquifer was distributed along the valley, while the sandstone aquifer was placed only in the areas where the outwash aquifer does not occur.

The bottom elevation of the aquifer is used to calculate transmissivities for both aquifers, based on hydraulic conductivity. For modeling purposes, the outwash bottom elevation was established on the known bedrock (sandstone or granite) elevation. The bottom of the sandstone aquifer was based on the known elevation of the granite which is approximately 750 feet above mean sea level, based on boring logs and the general site geology.

4.4 Groundwater Recharge

An initial net recharge rate of 17.5 in/year was used to calibrate the model to simulate groundwater flow in the western part of the modeled domain (at Plume 1-2). This rate agrees with climatological data for the La Crosse area, which shows precipitation of approximately 30 in/year and evapotranspiration of approximately 10 in/year (data on surface run-off is not available). During model calibration, the net recharge data in the airport area was increased to 30 in/year to simulate the very steep hydraulic gradient in this section of the buried valley. This is justifiable, taking into account the open grassy areas at the airport which allow very rapid infiltration and virtually no runoff. Moreover, boring logs for all monitoring wells in this area did not indicate any evidence of lower permeability deposits that would account for the steeper hydraulic gradient. The need to recalibrate the model to more precisely simulate the groundwater flow in the eastern part of the modeled domain (at Plumes 3, 4 and 5), required the use of a lower general net recharge rate (11 in/year) while the recharge data in the airport area remained the same.

4.5 Groundwater Pumpage

Data from the City of Eau Claire Department of Public Works indicates that the combined winter pumpage at the ECMWF is approximately 8 MGD. This data was used in the model because the water table map used to calibrate the model was based on water level data collected in April 1992. This combined pumpage was averaged among the pumping wells.

V. MODEL CALIBRATION

5.1 Calibration Technique

A groundwater model is calibrated by adjusting hydrogeologic/hydrologic parameters and boundary conditions within reasonable limits that do not violate the characteristics of the site conditions to obtain an acceptable match between observed and calculated groundwater levels.

The model was calibrated by successive runs with marginal changes to the input variables until an acceptable match between observed and calculated groundwater levels was achieved. The model was run in a steady-state simulation for 200 iterations until a 5% convergence was achieved.

5.2 Calibration Targets

As the model was intended to estimate the pumping rate and duration, and the location of groundwater wells for several remedial scenarios, the calibration emphasized the model's ability to reflect known water table conditions along the buried valley, such as the groundwater elevation, hydraulic gradients, flow directions, and the location of the groundwater divide at the NPI site. A particle tracking technique was used in the calibration process to ensure that critical points of the plume would travel through the modeled media in the correct direction.

5.3 Calibration Results

The first calibration phase was devoted to obtaining a single calibration pattern that reasonably represented all of the hydrogeological targets. However, as the calibration progressed, it was evident that the complexity of the groundwater flow system was accurately represented in the two model critical sub-domains: the western part of the modeled area at Plume 1-2 and the eastern part at Plumes 3 and 4, and 5. The hydraulic head distribution representing the model calibration results are shown on Figures 5-1 and 5-2.

As indicated in Section 4.5 ("Groundwater Recharge"), a net recharge of 17.5 in/year was used to calibrate the model in the western sub-domain and a recharge of 11 in/year was used to calibrate the model in the eastern sub-domain. Considering the modeling goal and the empirical evidence, this approach fairly represents the site conditions. All other parameters of the conceptual model remained the same.

VI. EFFECTS OF SIMULATED REMEDIAL PUMPING

6.1 The Modeling Approach

For the FS, several pumping scenarios were modeled to estimate the time frame and pumpage required to remediate each plume. The remedial scenarios modeled include: a baseline scenario (the true no action alternative for the NPI site) in which pumping continues at the ECMWF, but the on-site operable unit is not implemented; no further action, where groundwater is pumped at the ECMWF and the on-site operable unit; and pumping at various locations with the plumes to reduce the remedial timeframe. Alternative remedial pumping areas for each plume are depicted on Figures 6-1, 6-2, 6-3 and 6-4.

The model predicts the time required for one pore volume exchange (flush) between selected points within the aquifer. Several remedial scenarios consider installing pumping systems within the plumes, dividing the plumes into segments. The FS compares remedial pumping scenarios based on relative aquifer restoration time frames. The number of flushes that would be required to restore the aquifer to the Wisconsin Preventive Action Limits or to the minimum levels technically and economically feasible is uncertain due to contaminant adsorption and desorption, and aquifer variations. The aquifer restoration time frames presented in the FS are based on the model predictions, recognizing that the actual times would be some multiple of the modeled values.

The remedial time frames are presented as the calculated model output without allowing for the uncertainty of input data or the method. In addition, simulating the time frame for each pumping scenario required data smoothing. The model expressed times in years, a fairly large time step, so the results are presented in ranges (i.e. - 4 to 5 years) that indicate the approximate time required to flush a specific segment of the plume. This approach is adequate for the FS, which compares remedial scenarios based on relative plume restoration time frames.

In modeling different pumping scenarios, each plume was treated independently assuming no pumpage in the other plumes. To assure that this assumption did not affect the pumping rates or predicted time frame required to remediate a specific plume, a series of pumping scenarios was modeled for Plume 5, taking into account the maximum pumping modeled for Plumes 3 and 4. This exercise showed that while the flow pattern in Plume 5 was affected by pumping at Plumes 3 and 4, the total pumpage and remedial time frame remained the same.

6.2 Simulated Remedial Pumping at Plume 1-2

The model results for the Plume 1-2 remedial scenarios listed below are summarized in Table 6-1. This table also refers to the figures which show the capture zone model output.

- Scenario 1 (baseline) assumes continuing pumpage of the ECMWF, without implementing the on-site operable unit.
- Scenario 2 (no further action) assumes continuing pumpage of the ECMWF and implementing the operable unit at the southwest corner of the NPI site.
- Scenario 3 divides the plume into two unequal parts by pumping at the western side of the airport, reducing the remedial time frame.
- Scenario 4 divides the plume into two relatively equal parts by pumping at the eastern side of the airport.
- Scenario 5 divides the plume into three unequal parts by pumping at the eastern and western sides of the airport.
- Scenario 6 divides the plume into three parts by installing and pumping wells on the eastern side of the airport and between the airport and the NPI site (in the industrial park area).

6.3 Simulated Remedial Pumping at Plumes 3 and 4

The model results for Plumes 3 and 4 remedial scenarios listed below are summarized in Table 6-2. This table also refers to the figures which show the capture zone model output.

- Scenario 1 (baseline) assumes there would be no pumping in the plumes.
- Scenario 2 (no further action) assumes operable unit pumping at the Melby Road Disposal Area.
- Scenario 3 pumps the plumes just upgradient of Lake Hallie.
- Scenario 4 divides the plumes into two relatively equal parts by pumping in the middle of the plume.
- Scenario 5 divides the plumes into three parts by pumping at Lake Hallie, approximately 1,400 feet south of Lake Hallie, and approximately 1,500 feet north of Melby Road.

6.4 Simulated Remedial Pumping at Plume 5 with no Remedial Pumping at Plumes 3 and 4

The model results for the Plume 5 remedial scenarios listed below are summarized in Table 6-3. Operable unit pumping at the Melby Road Disposal Area is simulated, except for Scenario 1. The table also refers to the figures which show the capture zone model output.

- Scenario 1 (baseline) assumes that there would be no pumping in the plume.
- Scenario 2 (no further action) assumes there would be no pumping in Plume 5, but the operable unit at the Melby Road Disposal Area would be implemented.
- Scenario 3 pumps just upgradient of Lake Hallie.

- Scenario 4 divides the plume into two relatively equal parts by pumping at the edge of the outwash aquifer.

6.5 Simulated Remedial Pumping at Plume 5 with Remedial Pumping at Plumes 3 and 4

These results are summarized in Table 6-4. This table also refers to the figures which show the capture zone model output.

In order to demonstrate that independent modeling of each plume would not affect results, such as estimated remedial pumpage and time frame, Plume 5 was also modeled assuming Scenario 5 was implemented at Plumes 3 and 4.

- Scenario 1 (baseline) assumes that no remedial pumping would be conducted at Plume 5.

- Scenario 2 pumps Plume 5 at its discharge to Lake Hallie.

- Scenario 3 pumps Plume 5 at its discharge to Lake Hallie and at the edge of the outwash aquifer near the border of the sandstone aquifer.

Comparing the results presented in Tables 6-3 and 6-4 shows that remedial pumpage at Plumes 3 and 4 does not affect estimated pumping rates or remedial time frames at Plume 5.

TABLES

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TABLE 6-1

REMEDIAL PUMPING SCENARIOS: PLUME 1-2

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
1	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-5	Between ECMWF and the eastern edge of the plume	14
2	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-6	Between ECMWF and wells at the southwest corner of the NPI site	12-13
	The southwest corner of the NPI site.	2	100	0.3	6-7	Between wells at the southwest corner of the NPI site and the eastern edge of the plume	12-13
3	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-8	Between ECMWF and wells west of the airport	2-3
	West of the airport	5	200	1.4	6-9	Between wells west of the airport and wells at the southwest corner of the NPI site	10-11
	The southwest corner of the NPI site	2	100	0.3	6-10	Between wells at the southwest corner of the NPI site and the eastern edge of the plume	10-11
4	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-11	Between ECMWF and wells east of the airport	4-5
	East of the airport	4	200	1.15	6-12	Between wells east of the airport and wells at the southwest corner of the NPI site	7-8
	The southwest corner of the NPI site	2	100	0.3	6-13	Between wells at the southwest corner of the NPI site and the eastern edge of the plume	7-8

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Table 6-1 continued . . .

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
5	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-14	Between ECMWF and wells west of the airport	2-3
	West of the airport	4	200	1.15	6-15	Between wells west and east of the airport	3-4
	East of the airport	4	200	1.15	6-16	Between wells east of the airport and wells at the southwest corner of the NPI site	7-8
	The southwest corner of the NPI site	2	100	0.3	6-17	Between wells at the southwest corner of the NPI site and the eastern edge of the plume	7-8
6	Wells 11, 15, 16 and 17 at ECMWF	4	370, 450, 370 and 450	2.4	6-18	Between ECMWF and wells east of the airport	4-5
	East of the airport	3	200	0.85	6-19	Between wells east of the airport and wells in the industrial park area	3-4
	The industrial park area	3	200	0.85	6-20	Between wells at the industrial park area and wells at the southwest corner of the NPI site	4-5
	The southwest corner of the NPI site	2	100	0.3	6-21	Between wells at the southwest corner of the NPI site and the eastern edge of the plume	4-5

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TABLE 6-2

REMEDIAL PUMPING SCENARIOS: PLUMES 3 AND 4

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
1	NA	NA	NA	NA	6-22	Between the southern edge of the plumes and Lake Hallie	14-15
2	NA	NA	NA	NA	6-23	Between the southern edge of the plumes and Lake Hallie	11-12
	Melby Road Site	2	100	0.3	6-23	Between the southern edge of the plumes and wells at Melby Road Site	11-12
3	At Lake Hallie	2	150	0.45	6-24	Between wells at Lake Hallie and wells at Melby Road Site	10-11
	Melby Road Site	2	100	0.3	6-25	Between the southern edge of the plumes and wells at Melby Road Site	10-11
4	At Lake Hallie	1	150	0.2	6-26	Between the well at Lake Hallie and wells in the midpoint of the plumes	3-4
	In the midpoint of the plumes	2	200	0.6	6-27	Between wells in the midpoint of the plumes and wells at Melby Road Site	4-5
	Melby Road Site	2	100	0.3	6-28	Between the southern edge of the plumes and wells at Melby Road Site	4-5
5	Melby Road Site	2	100	0.3	6-29	Between the southern edge of the plumes and wells at Melby Road Site	3-4
	Approximately 1,500 feet north of Melby Road Site	2	150	0.45	6-29	Between wells 1,500 feet north of Melby Road Site and wells at Melby Road Site	3-4
	Approximately 1,400 feet south of Lake Hallie	2	150	0.45	6-29	Between wells 1,400 feet south of Lake Hallie and wells 1,500 north of Melby Road Site	3-4
	At Lake Hallie	1	150	0.2	6-29	Between the well at Lake Hallie and wells 1,400 feet south of Lake Hallie	3-4

NOTE

NA = Not Applicable.

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TABLE 6-3

REMEDIAL PUMPING SCENARIOS: PLUME 5 WITH NO REMEDIAL PUMPING AT PLUMES 3 AND 4[1]

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
1	NA[2]	NA	NA	NA	6-30	Between the southern edge of the plume and Lake Hallie	22-23
2[1]	NA	NA	NA	NA	6-31	Between the southern edge of the plume and Lake Hallie	22-23
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA
3[1]	At Lake Hallie	1	150	0.2	6-32	Between the well at Lake Hallie and the southern edge of the plume	20-21
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA
4[1]	At Lake Hallie	1	150	0.2	6-34	Between the well at Lake Hallie and the well at the edge of the sandstone aquifer	6-7
	At the edge of the sandstone aquifer	1	50	0.07	6-33	Between the well at the edge of the sandstone aquifer and the southern edge of the plume	14-15
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA

NOTES:

(1) Operable unit pumping at Melby Road Site is simulated.
(2) NA = Not Applicable.

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TABLE 6-4

REMEDIAL PUMPING SCENARIOS: PLUME 5 WITH REMEDIAL PUMPING AT PLUMES 3 AND 4

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
1	NA	NA	NA	NA	6-35	Between the southern edge of the plume and Lake Hallie	22-23
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA
	Approximately 1,500 feet north of Melby Road Site (at Plumes 3 and 4)	2	150	0.45	NA	NA	NA
	Approximately 1,400 feet south of Lake Hallie (at Plumes 3 and 4):						
	- the eastern well	1	150	0.2	6-35	Between the southern edge of the plume and the eastern well 1,400 feet south of Lake Hallie (at Plumes 3 and 4)	22-23
	- the western well	1	150	0.2	NA	NA	NA
	At Lake Hallie (at Plumes 3 and 4)	1	150	0.2	6-35	Between the southern edge of the plume and the well at Lake Hallie (at Plumes 3 and 4)	22-23

Table 6-4 Continued . . .

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
2	At Lake Hallie	1	150	0.2	6-36	Between the southern edge of the plume and the well at Lake Hallie	20-21
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA
	Approximately 1,500 feet north of Melby Road Site (at Plumes 3 and 4)	2	150	0.45	NA	NA	NA
	Approximately 1,400 feet south of Lake Hallie (at Plumes 3 and 4):	2	150	0.45	NA	NA	NA
	- the eastern well	1	150	0.2	6-36	Between the southern edge of the plume and the eastern well 1,400 feet south of Lake Hallie (at Plumes 3 and 4)	20-21
	- the western well	1	150	0.2	NA	NA	NA
	At Lake Hallie (at Plumes 3 and 4)	1	150	0.2	6-36	Between the southern edge of the plume and the well at Lake Hallie (at Plumes 3 and 4)	20-21

Table 6-4 Continued . . .

Scenario Number	Pumping Wells				Plume Segments		
	Location	Number of Wells	Estimated Pumping Rate (GPM/Well)	Estimated Combined Pumpage (MGD)	Capture Zone Figure Number	Description of Segment	Time Frame (years)
3	At Lake Hallie	1	150	0.2	6-38	Between the well at the edge of the sandstone aquifer and the well at Lake Hallie	6-7
	At the edge of the sandstone aquifer	1	50	0.07	6-37	Between the southern edge of the plume and the well at the edge of the sandstone aquifer	14-15
	Melby Road Site (at Plumes 3 and 4)	2	100	0.3	NA	NA	NA
	Approximately 1,500 feet north of Melby Road Site (at Plumes 3 and 4)	2	150	0.45	NA	NA	NA
	Approximately 1,400 feet south of Lake Hallie (at Plumes 3 and 4):						
	- the eastern well	1	150	0.2	6-38	Between the well at the edge of the sandstone aquifer and the eastern well 1,400 feet south of Lake Hallie (at Plumes 3 and 4)	6-7
	- the western well	1	150	0.2	NA	NA	NA
	At Lake Hallie (at Plumes 3 and 4)	1	150	0.2	6-38	Between the well at Lake Hallie (at Plumes 3 and 4) and the well at the edge of the sandstone aquifer	6-7

NOTE:

NA = Not Applicable.

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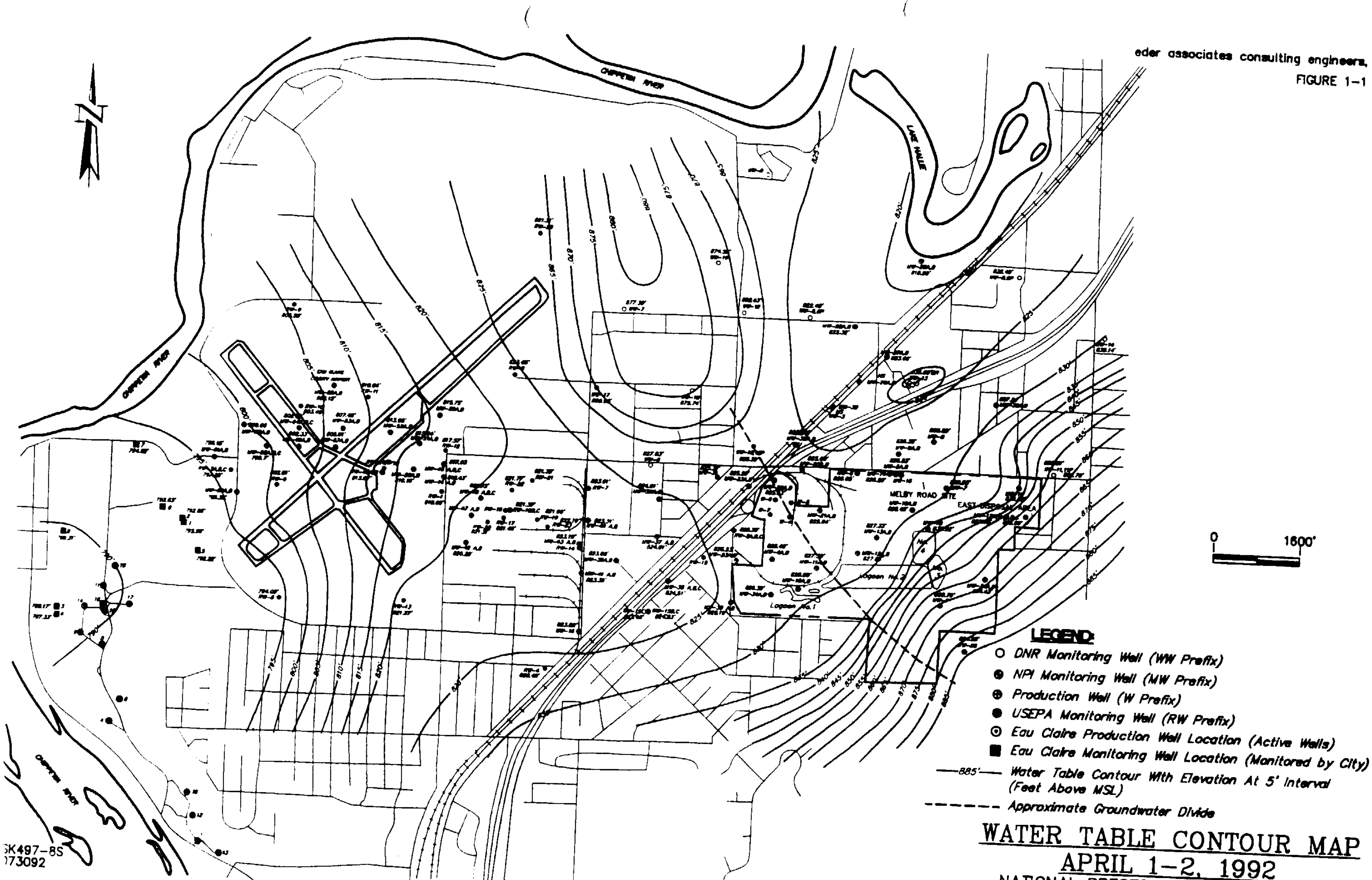
FIGURE 1-1



WATER TABLE CONTOUR MAP
APRIL 1-2, 1992
NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

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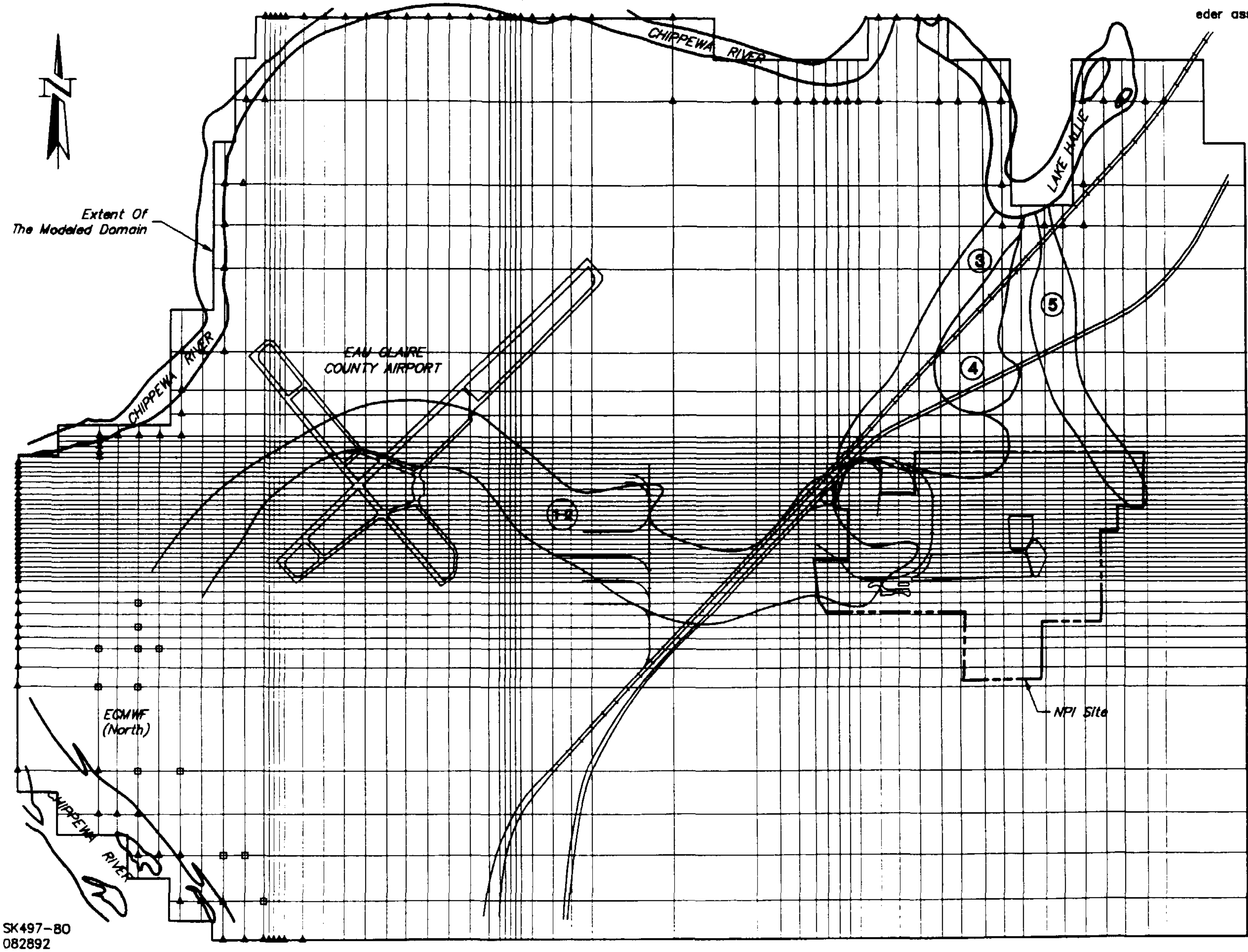
FIGURE 4-1



MODEL CALIBRATION FOR PLUME 1-2: BOUNDARY CONDITIONS AND GRID PATTERN OF THE MODELED DOMAIN

NATIONAL PRESTO INDUSTRIES, INC. SITE

EAU CLAIRE, WISCONSIN

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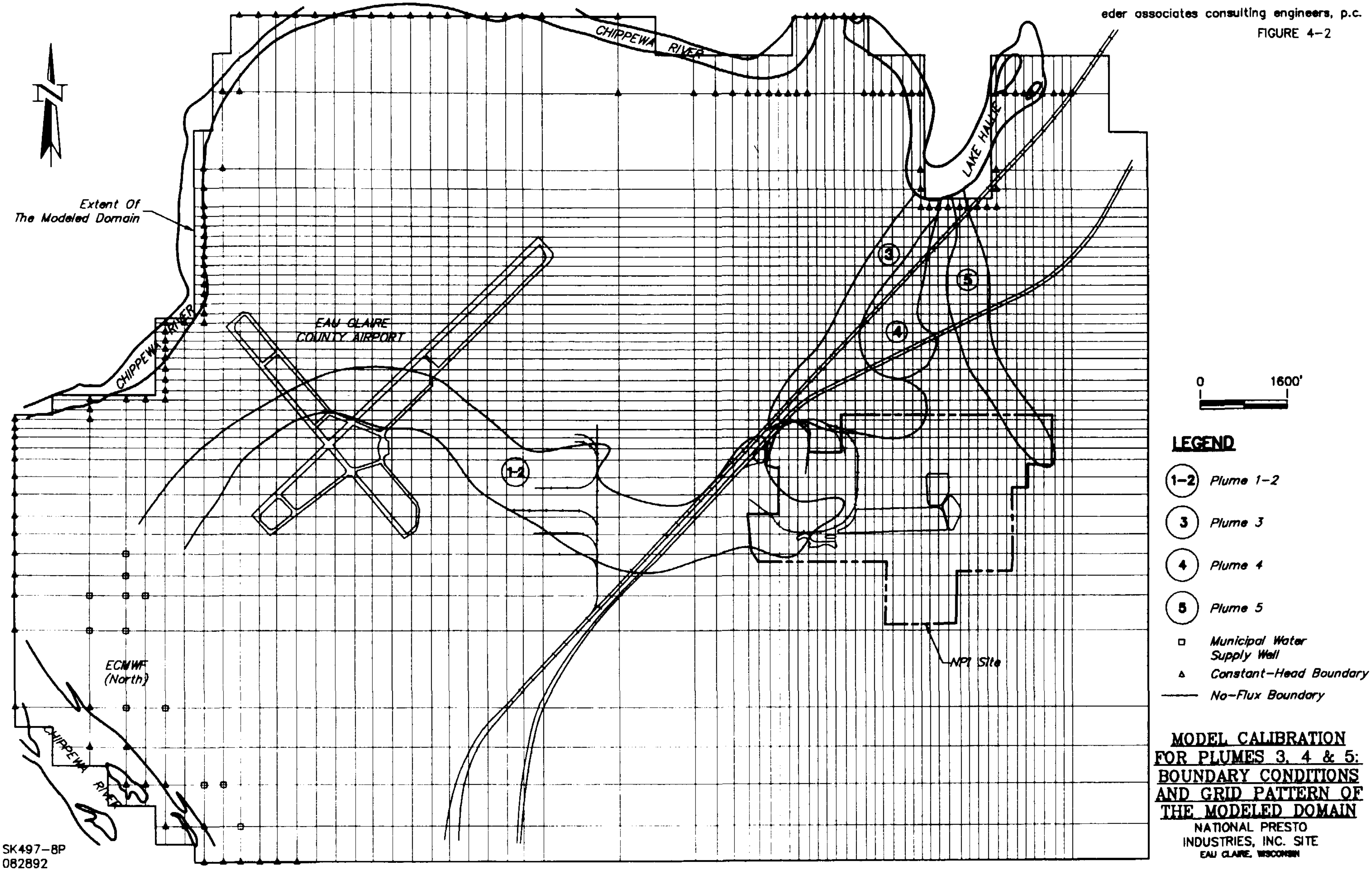

MODEL CALIBRATION FOR PLUMES 3, 4 & 5: BOUNDARY CONDITIONS AND GRID PATTERN OF THE MODELED DOMAIN

NATIONAL PRESTO INDUSTRIES, INC. SITE
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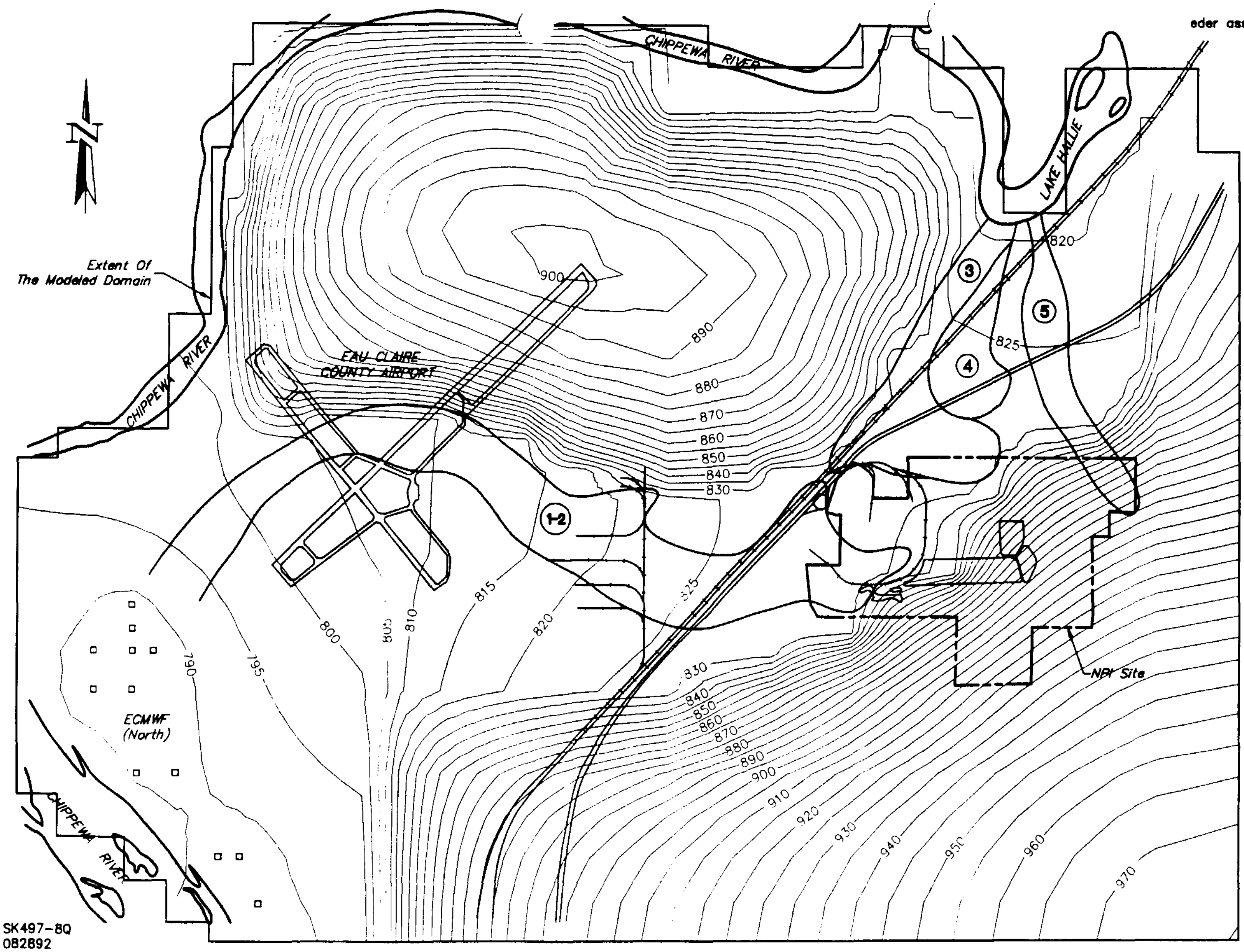
FIGURE 5-1



LEGEND

(1-2) Plume 1-2

(3) Plume 3

(4) Plume 4

(5) Plume 5

—820— Water Table Contour With Elevation (Feet Above MSL)

□ Municipal Water Supply Well

NOTE

Contour Interval Is 5 Feet

MODEL CALIBRATION FOR PLUME 1-2: HYDRAULIC HEAD DISTRIBUTION

NATIONAL PRESTO INDUSTRIES, INC. SITE

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SK497-8Q
082892

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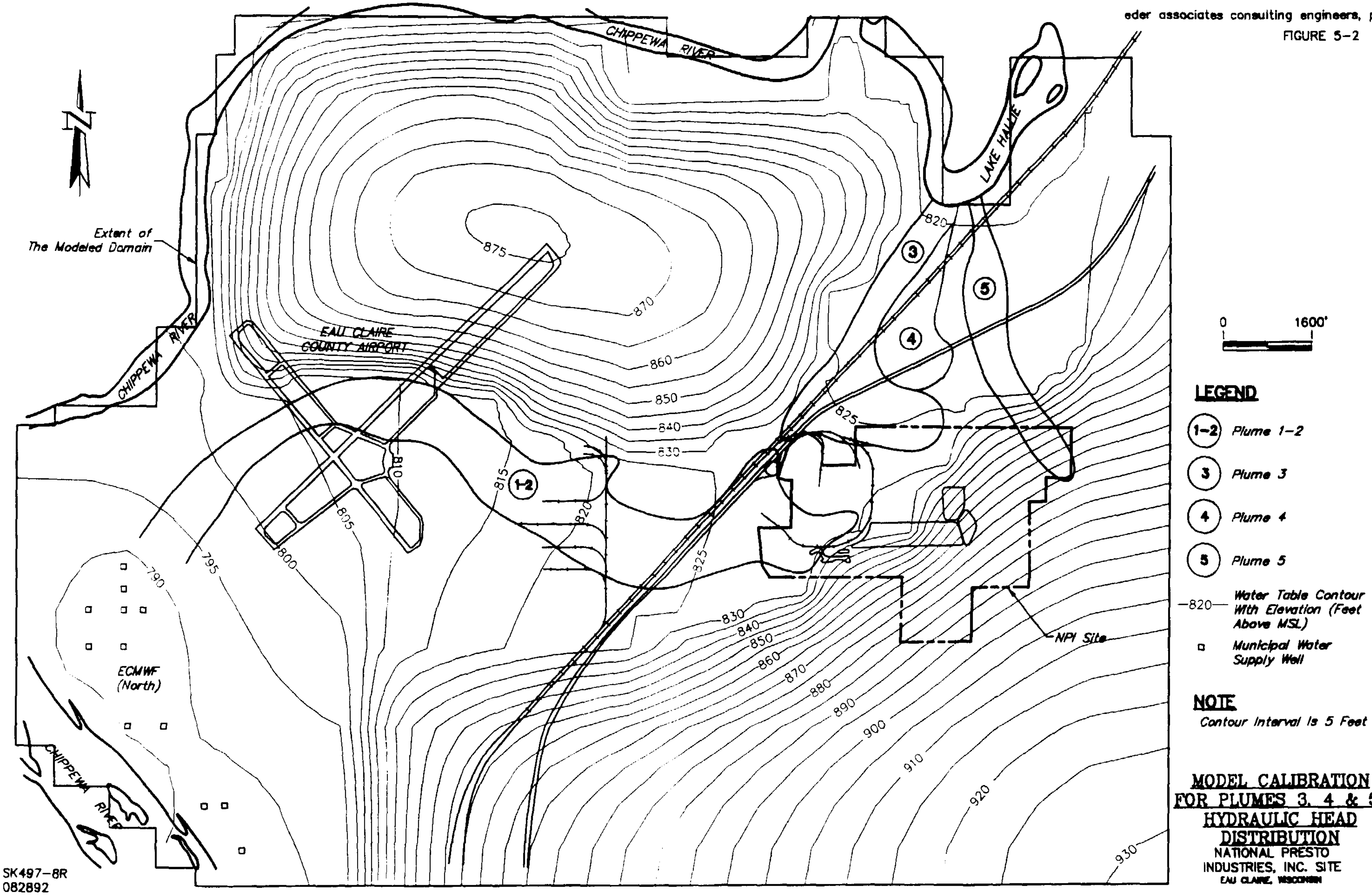
FIGURE 5-2



MODEL CALIBRATION FOR PLUMES 3, 4 & 5: HYDRAULIC HEAD DISTRIBUTION

NATIONAL PRESTO INDUSTRIES, INC. SITE

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082892

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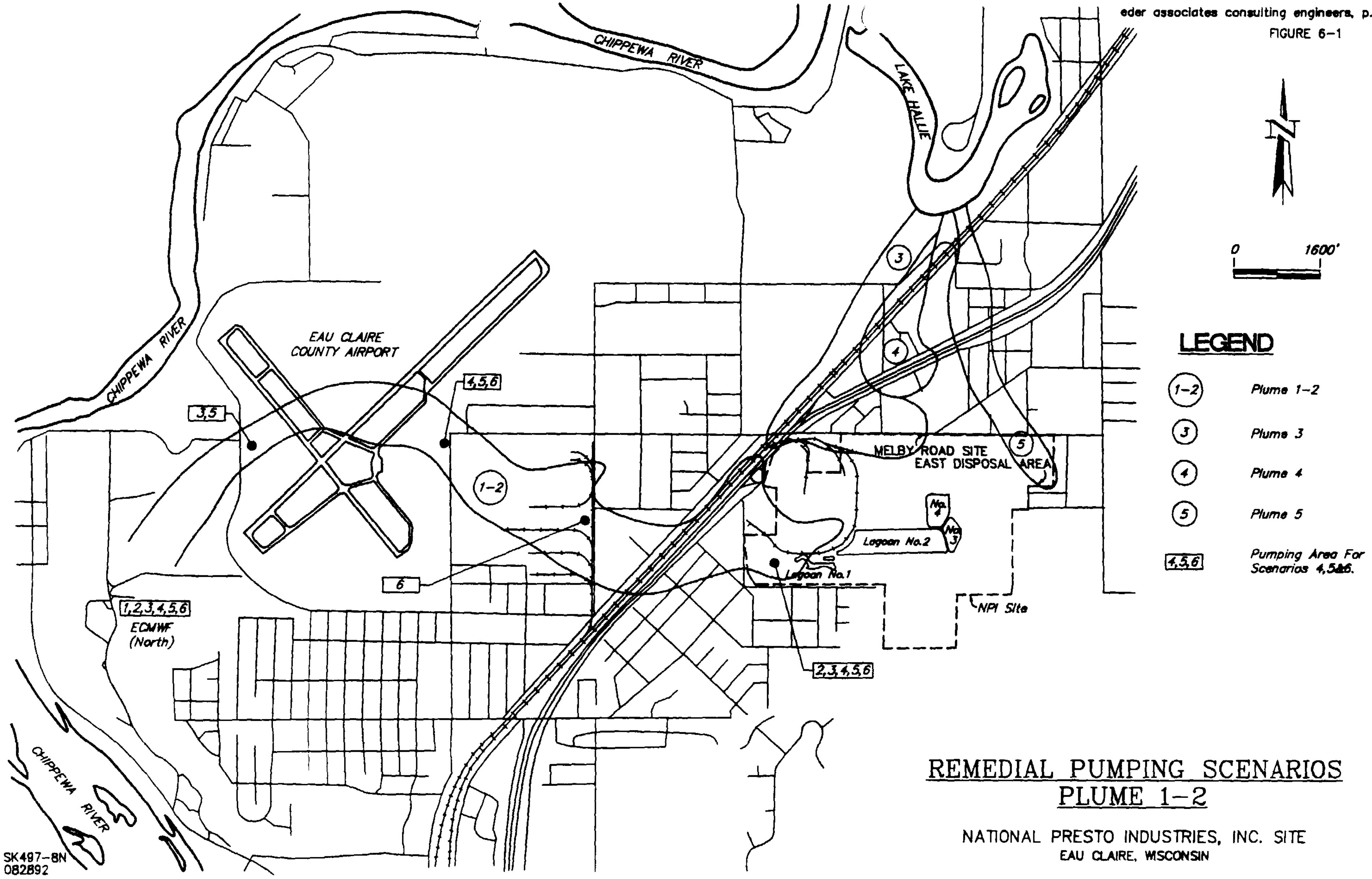
FIGURE 6-1



REMEDIAL PUMPING SCENARIOS PLUME 1-2

NATIONAL PRESTO INDUSTRIES, INC. SITE

EAU CLAIRE, WISCONSIN

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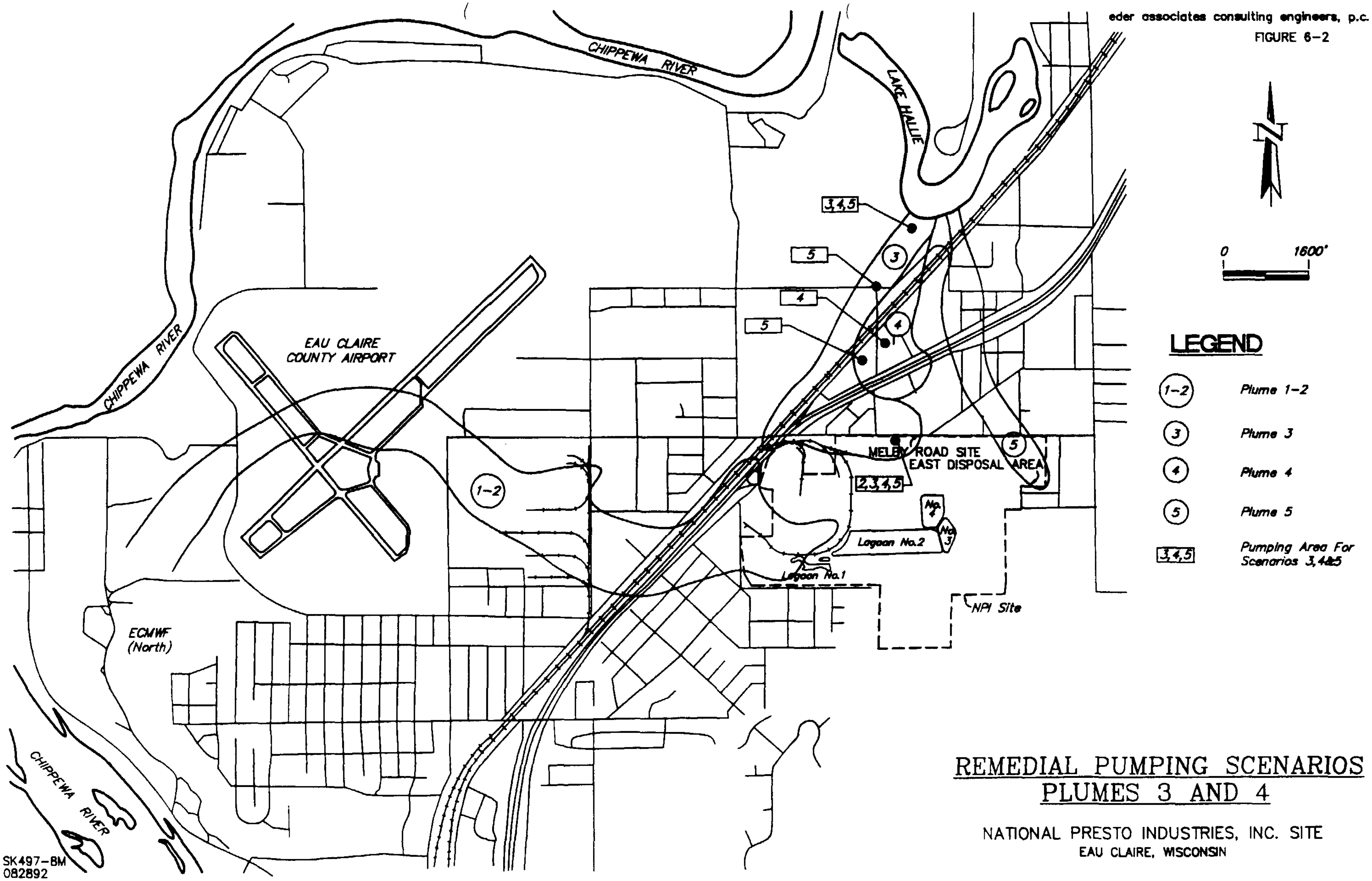
FIGURE 6-2



REMEDIAL PUMPING SCENARIOS
PLUMES 3 AND 4

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

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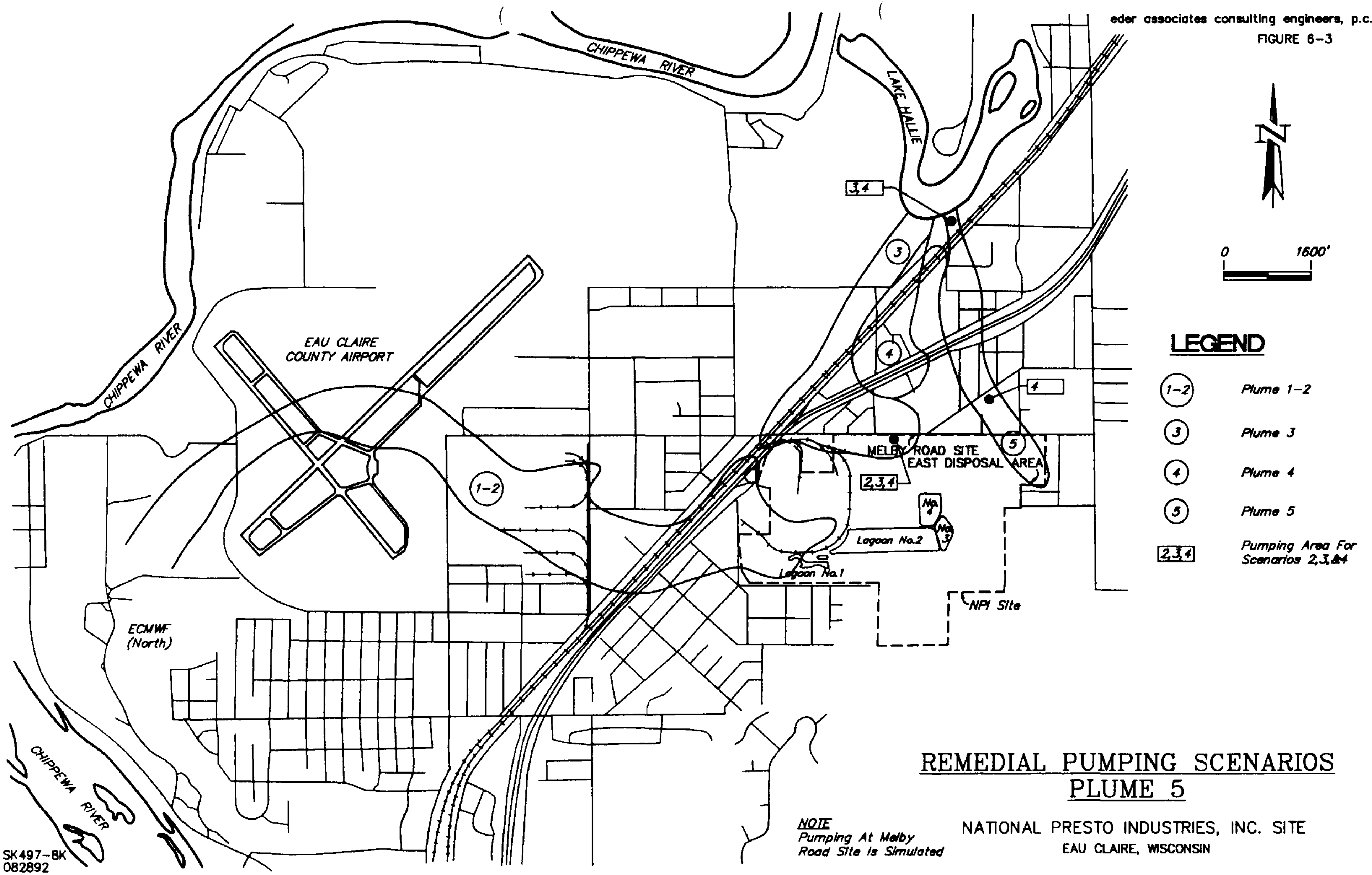
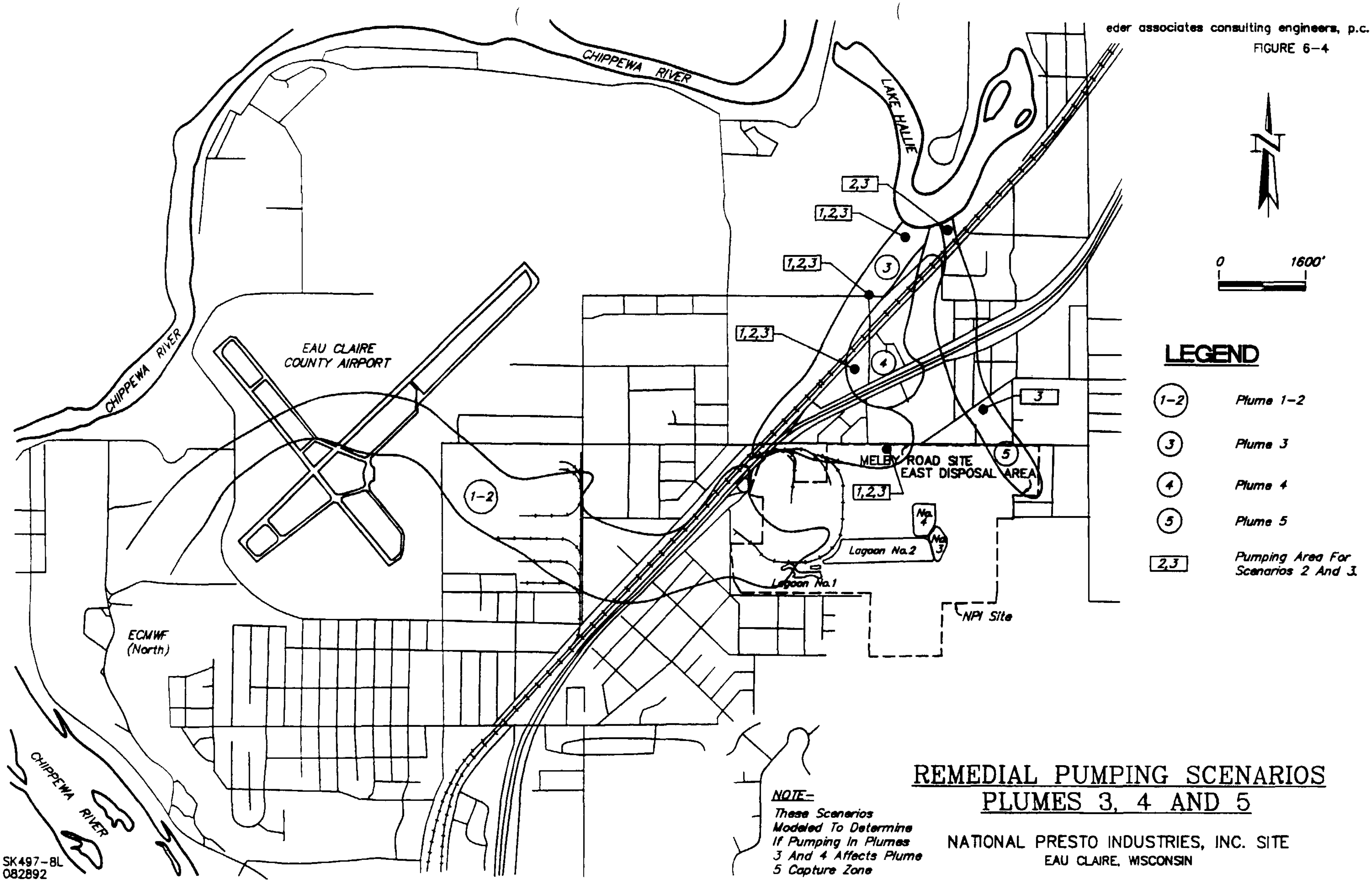
FIGURE 6-3



REMEDIAL PUMPING SCENARIOS
PLUME 5

NOTE
Pumping At Melby Road Site Is Simulated

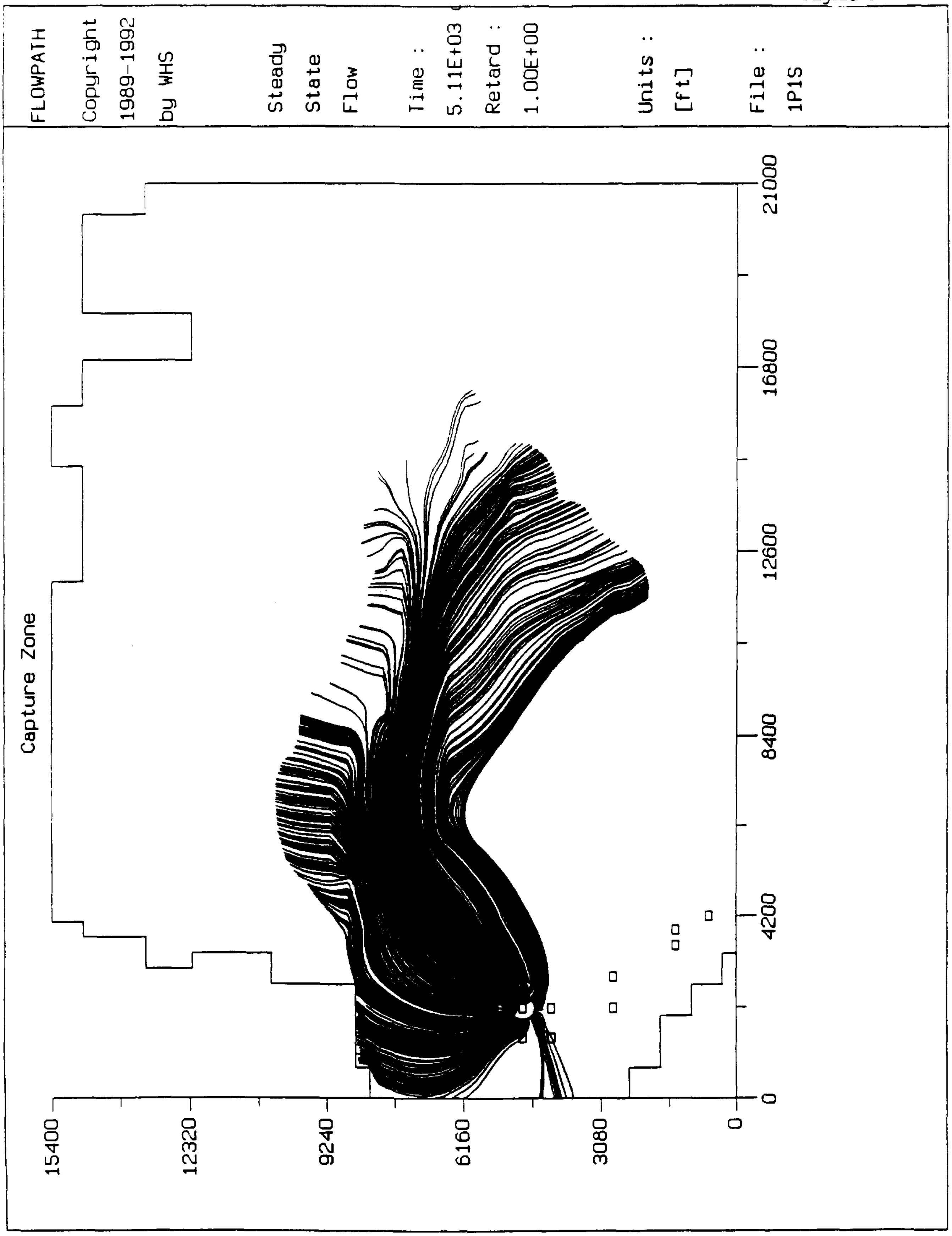
NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN



REMEDIAL PUMPING SCENARIOS PLUMES 3, 4 AND 5

NATIONAL PRESTO INDUSTRIES, INC. SITE
EAU CLAIRE, WISCONSIN

Figure 6-5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1P1S
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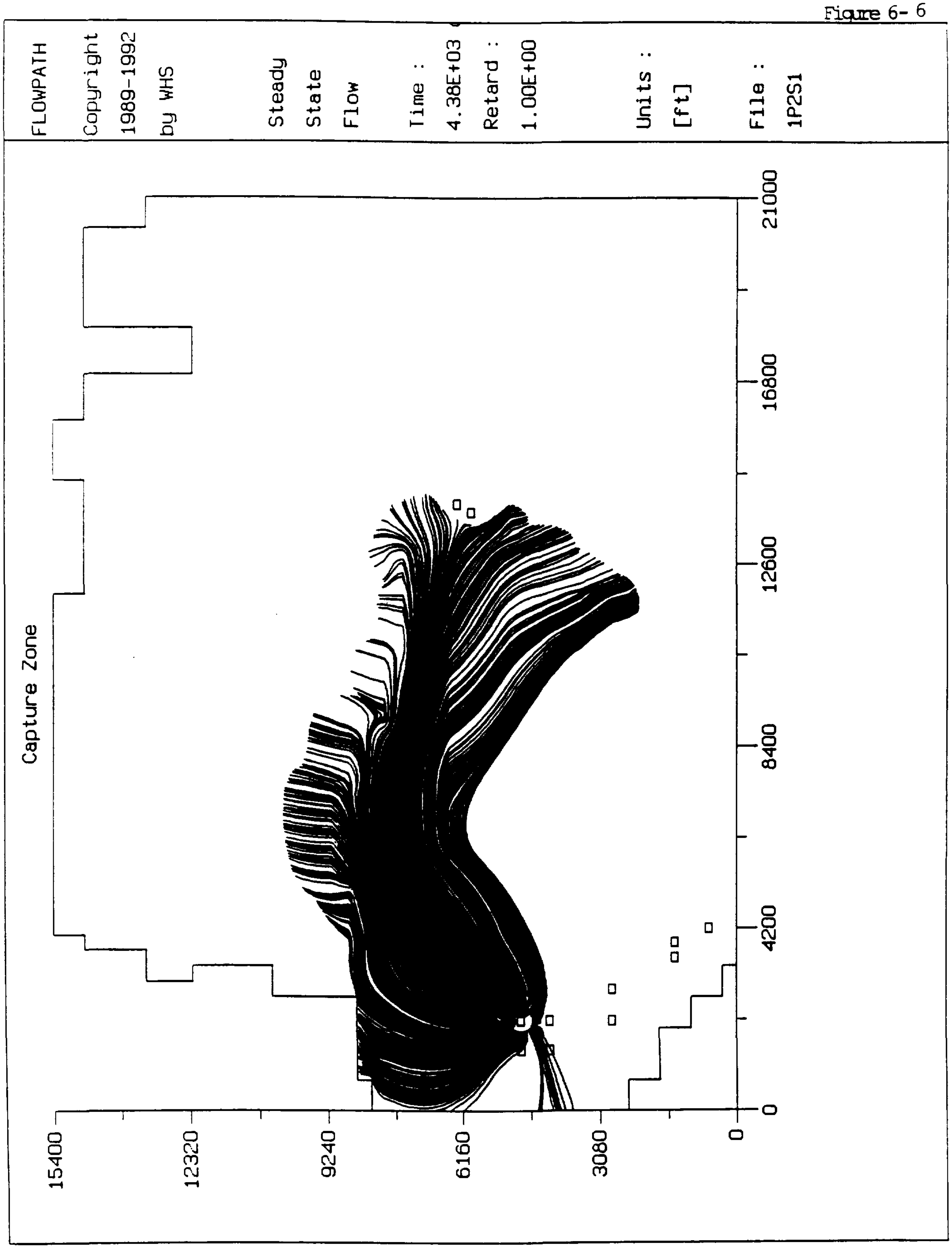
Figure 6- 6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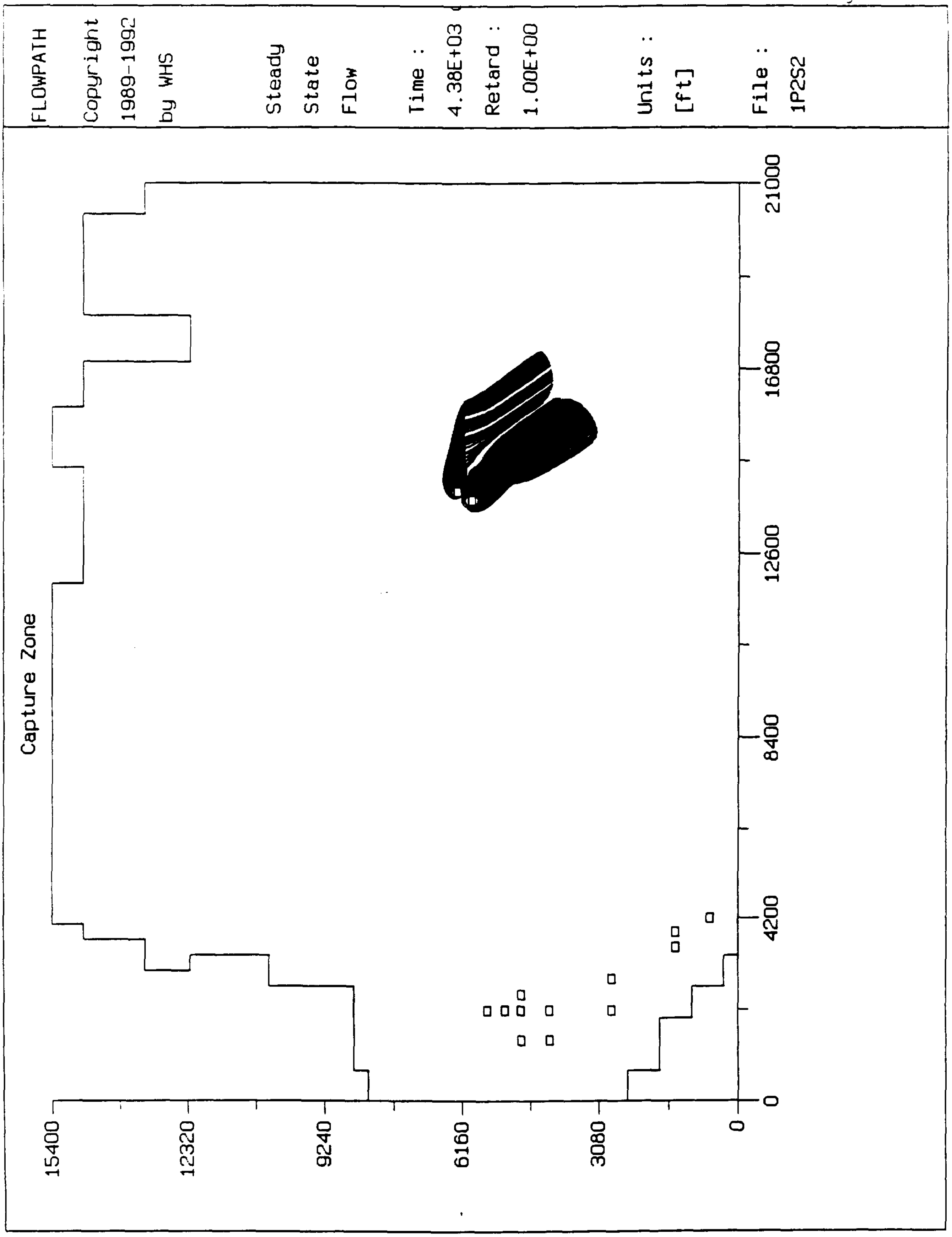
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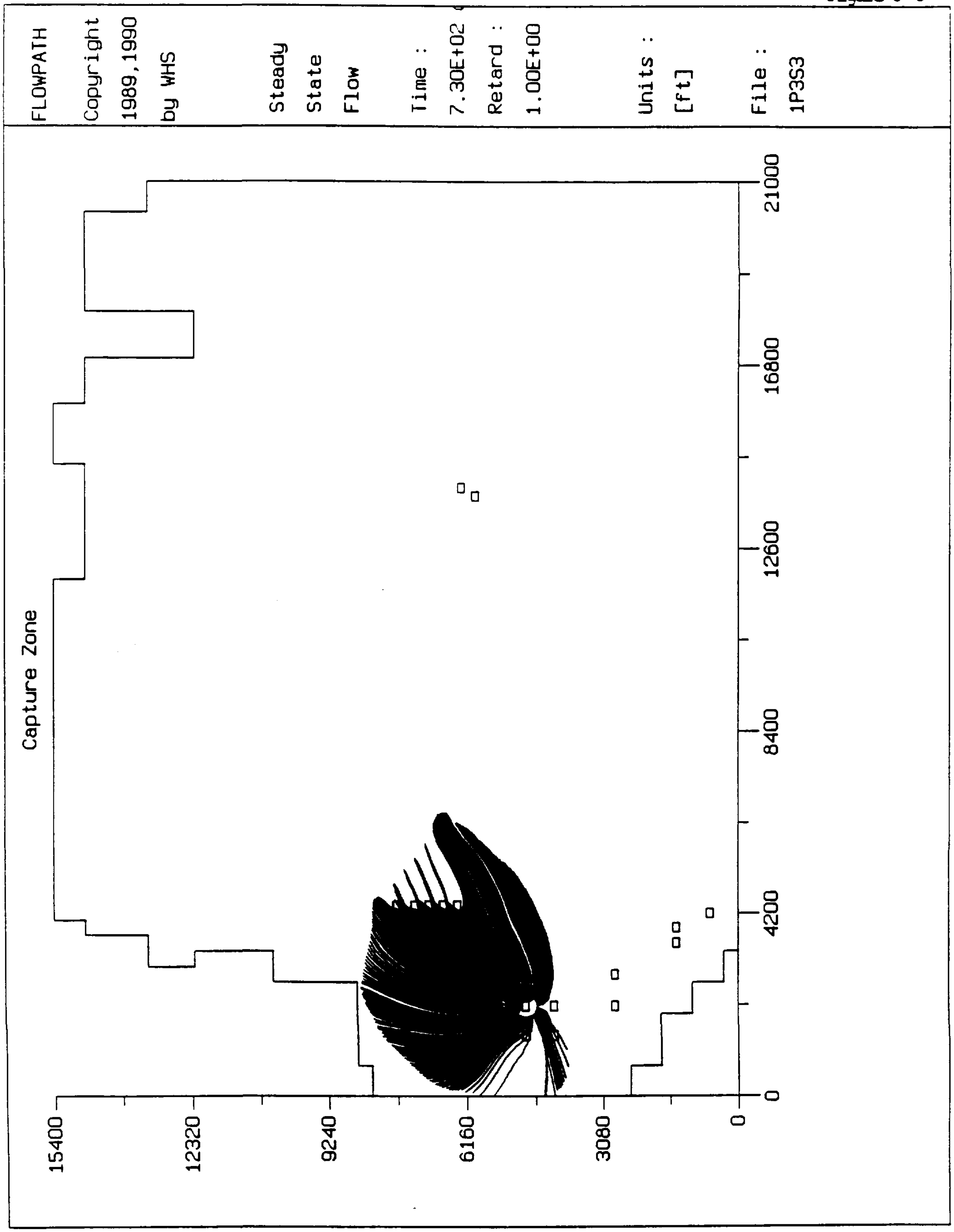
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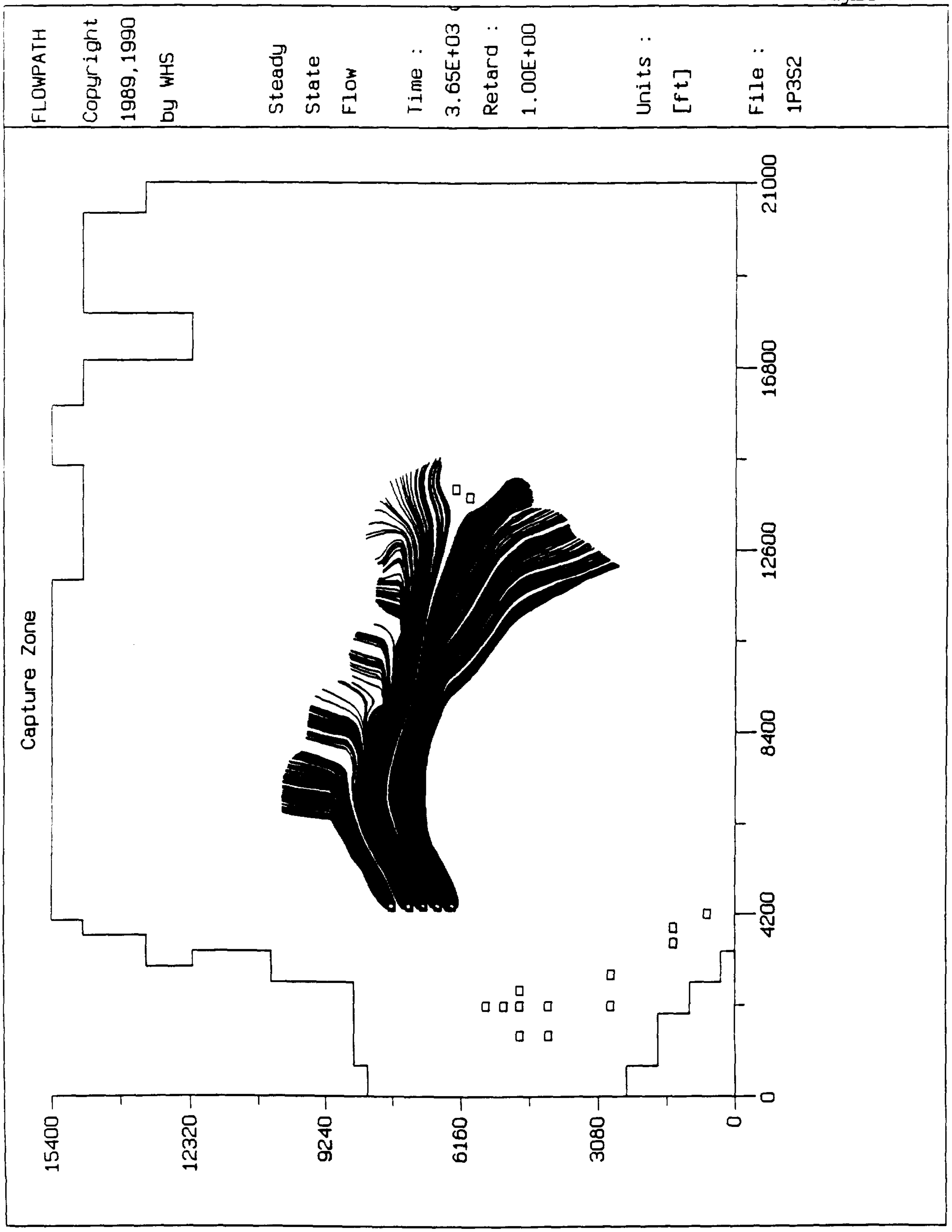
Figure 6-9



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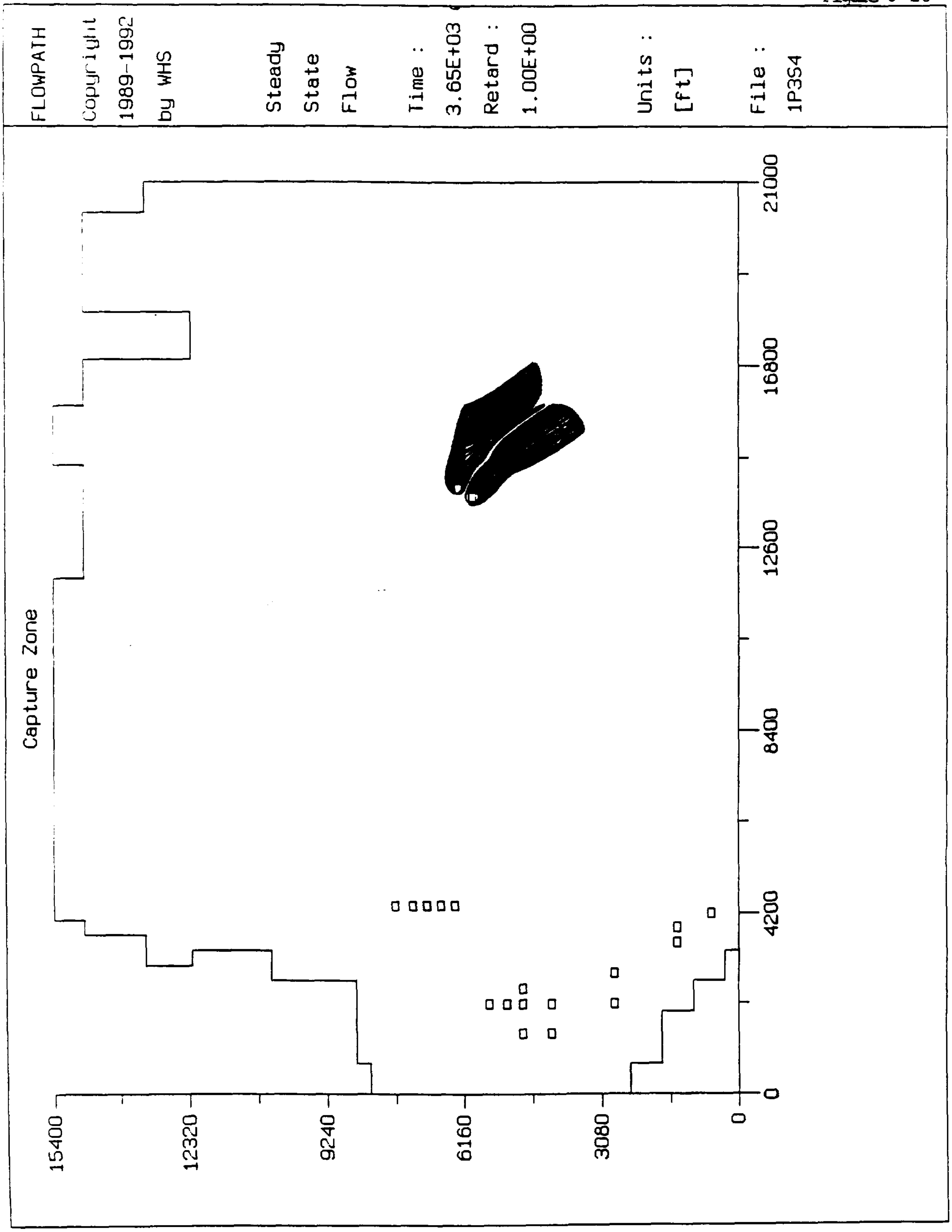
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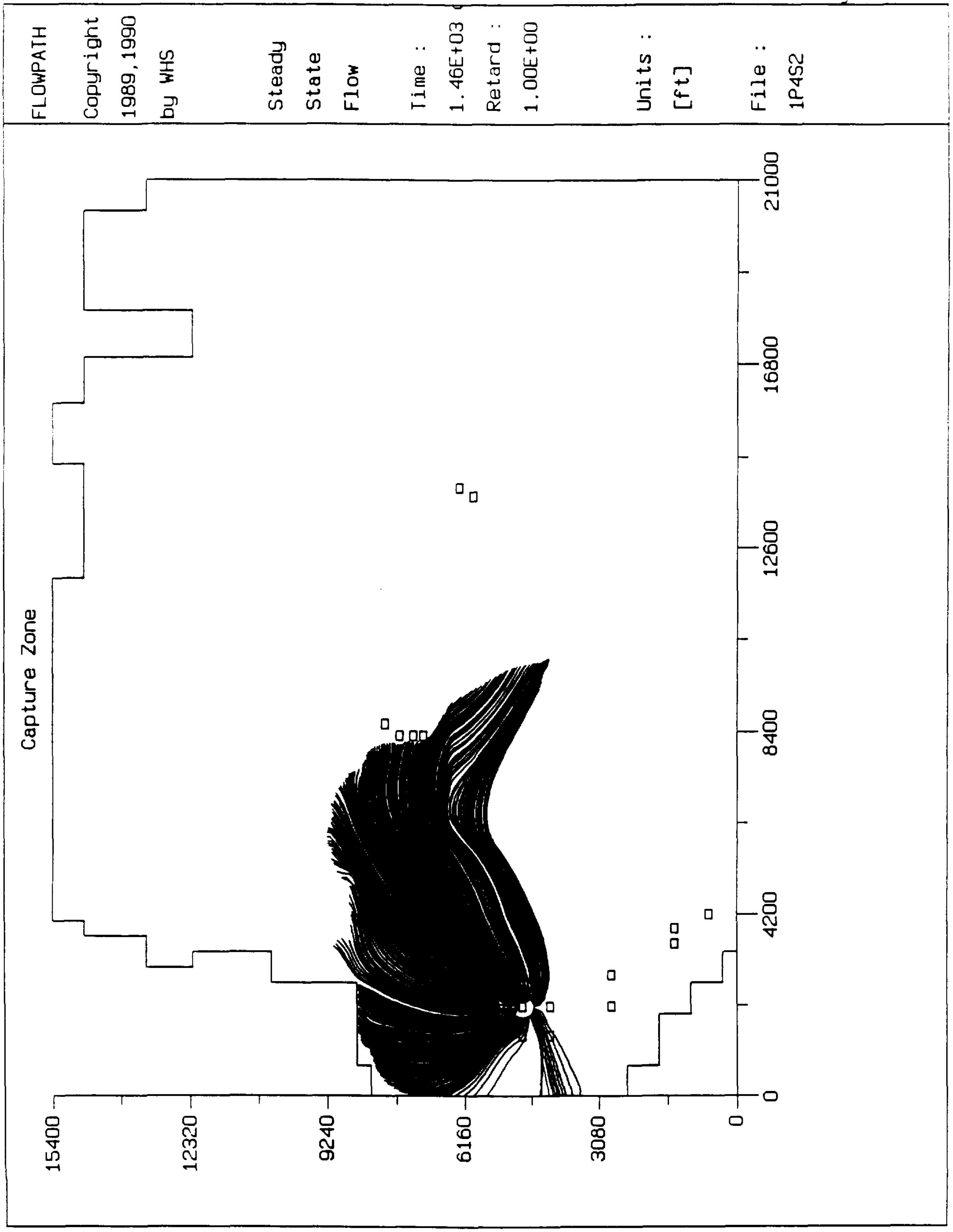
Figure 6-11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Capture Zone
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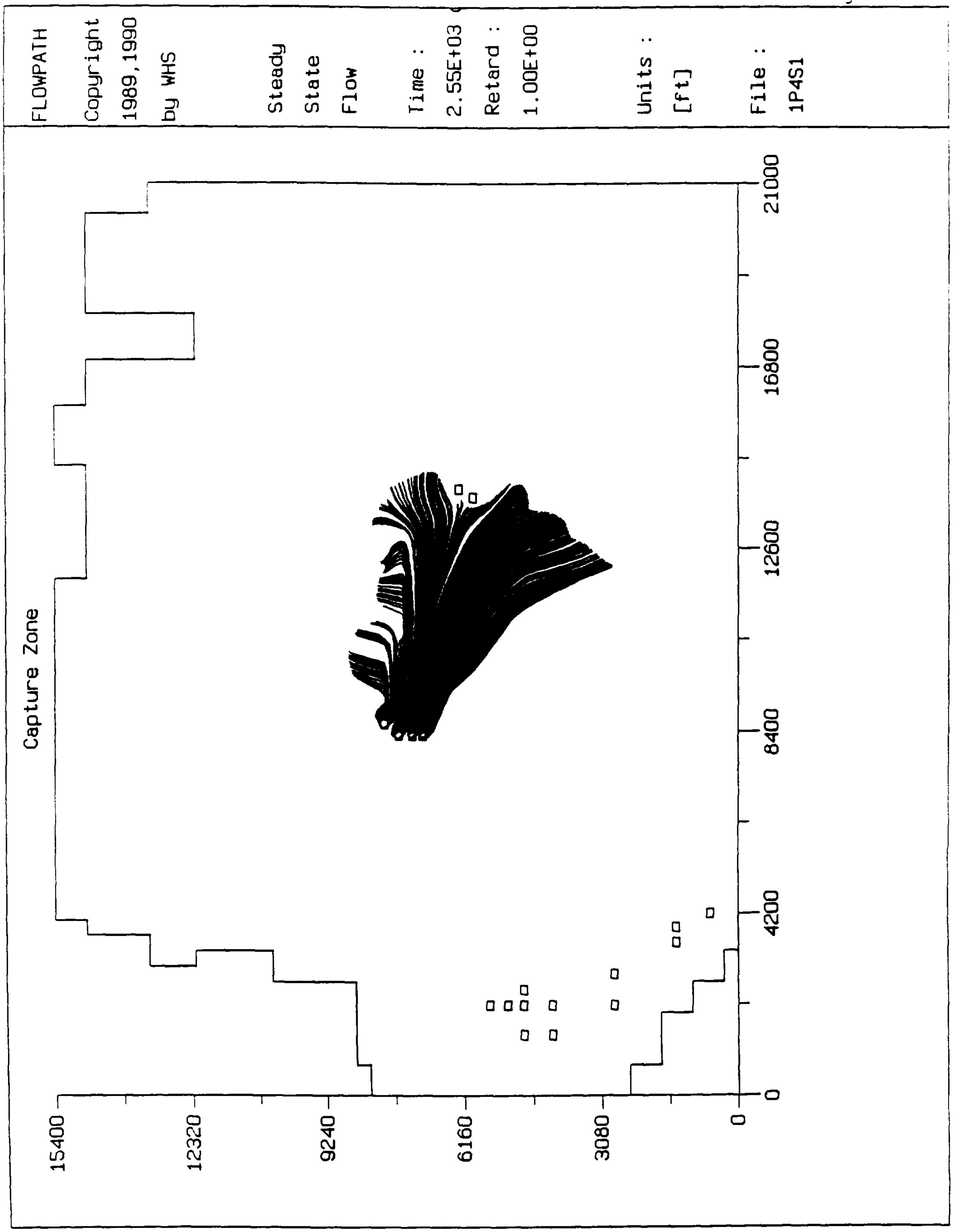
Figure 6-12



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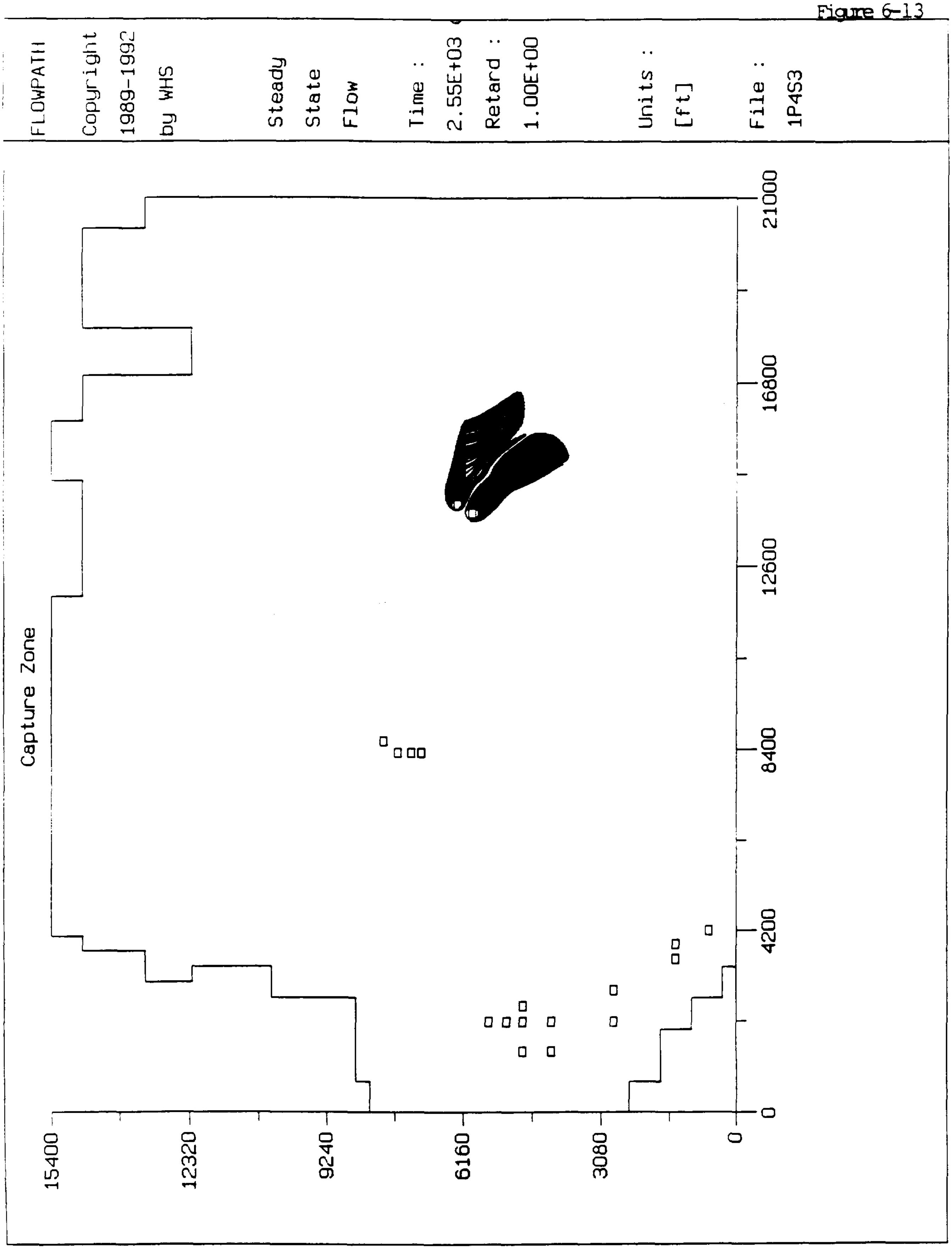
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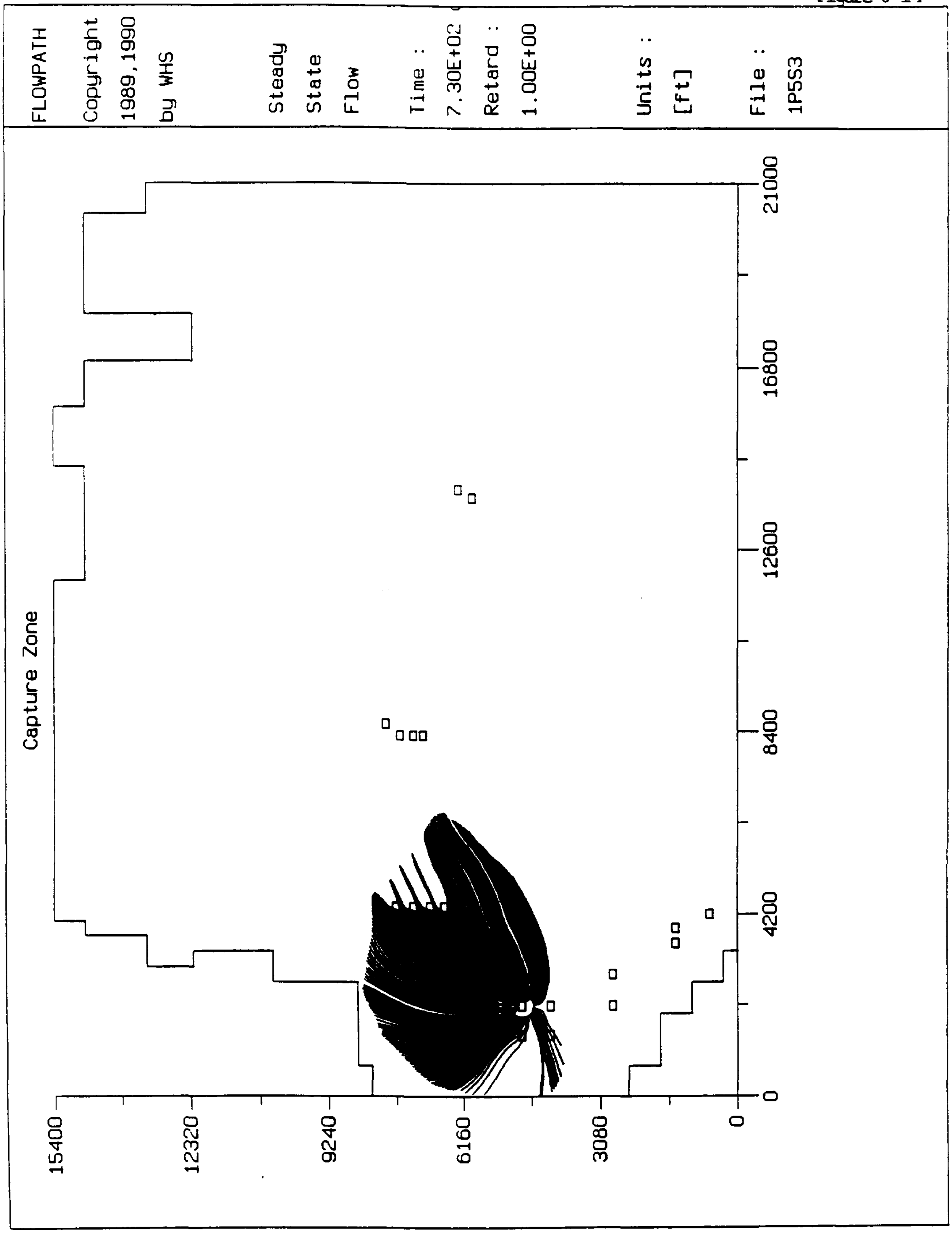
Figure 6-14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Capture Zone
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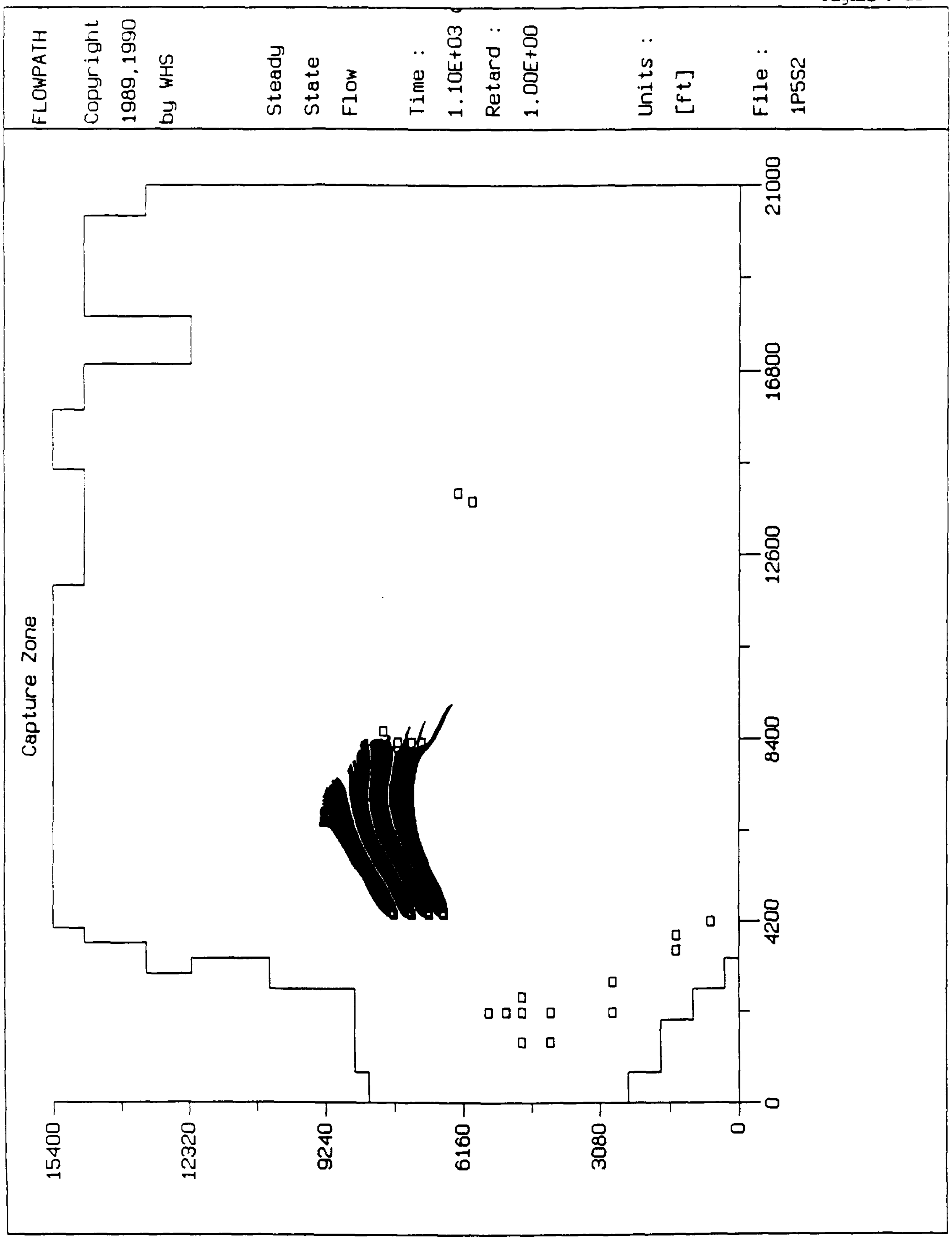
Figure 6-15



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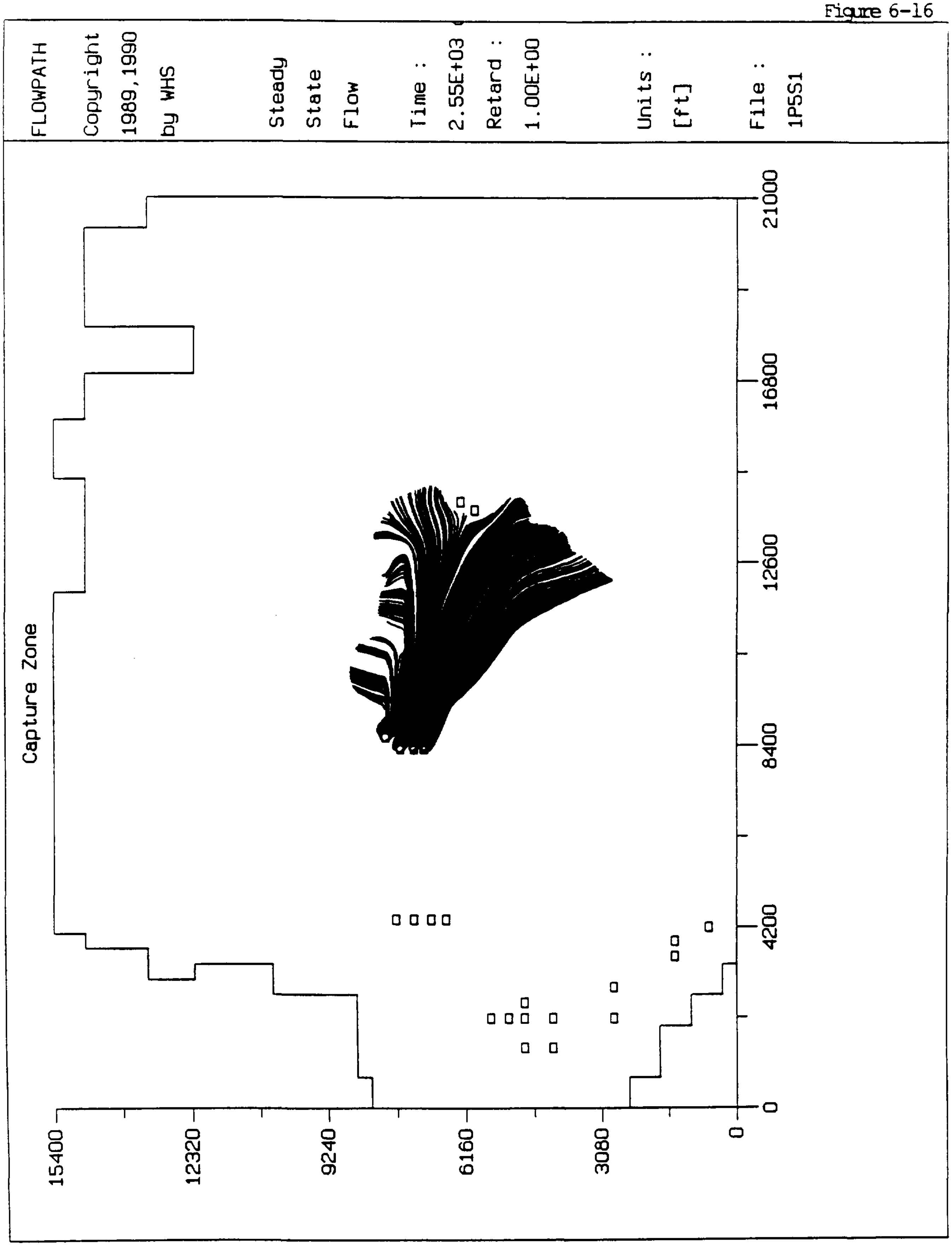
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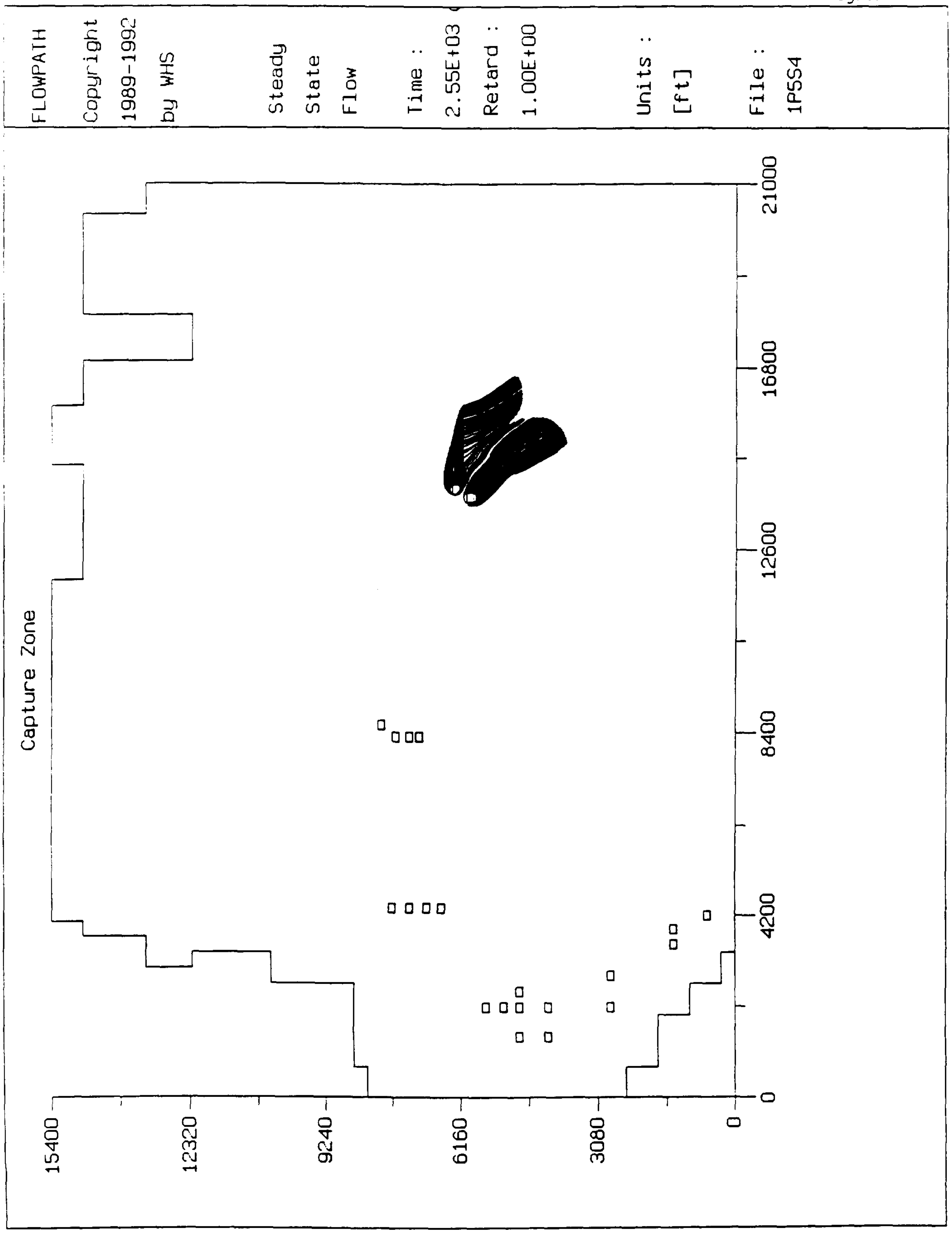
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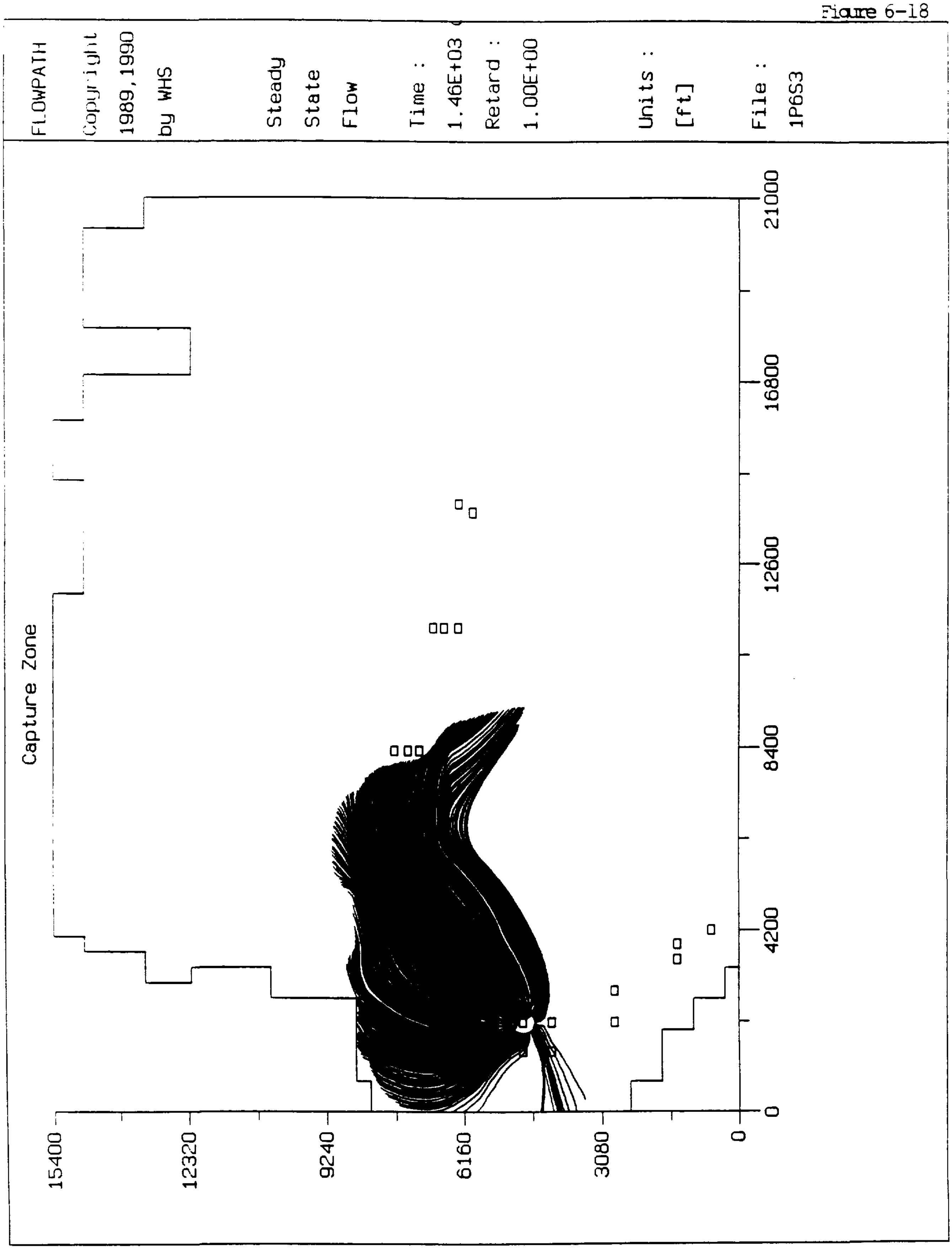
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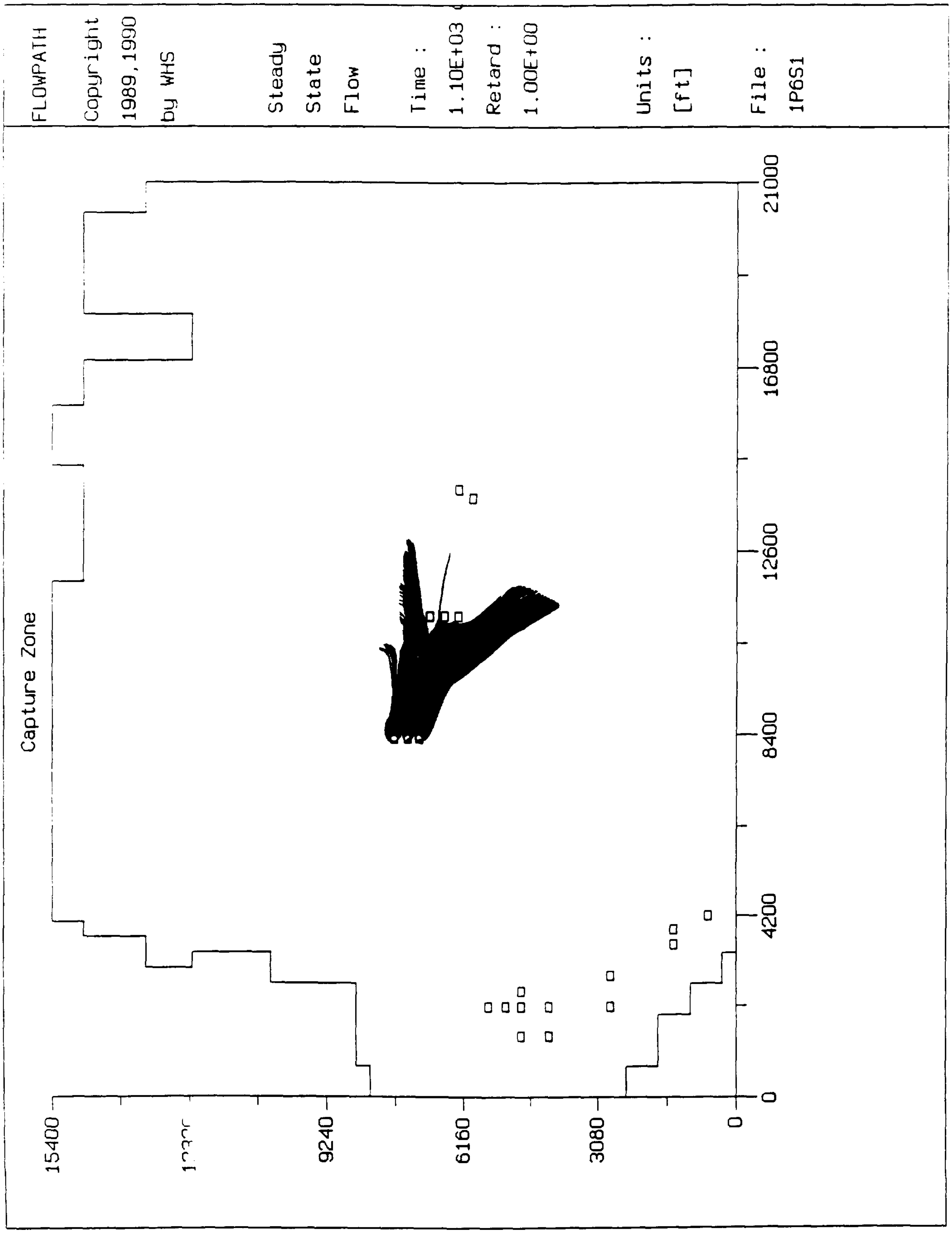
Figure 6-19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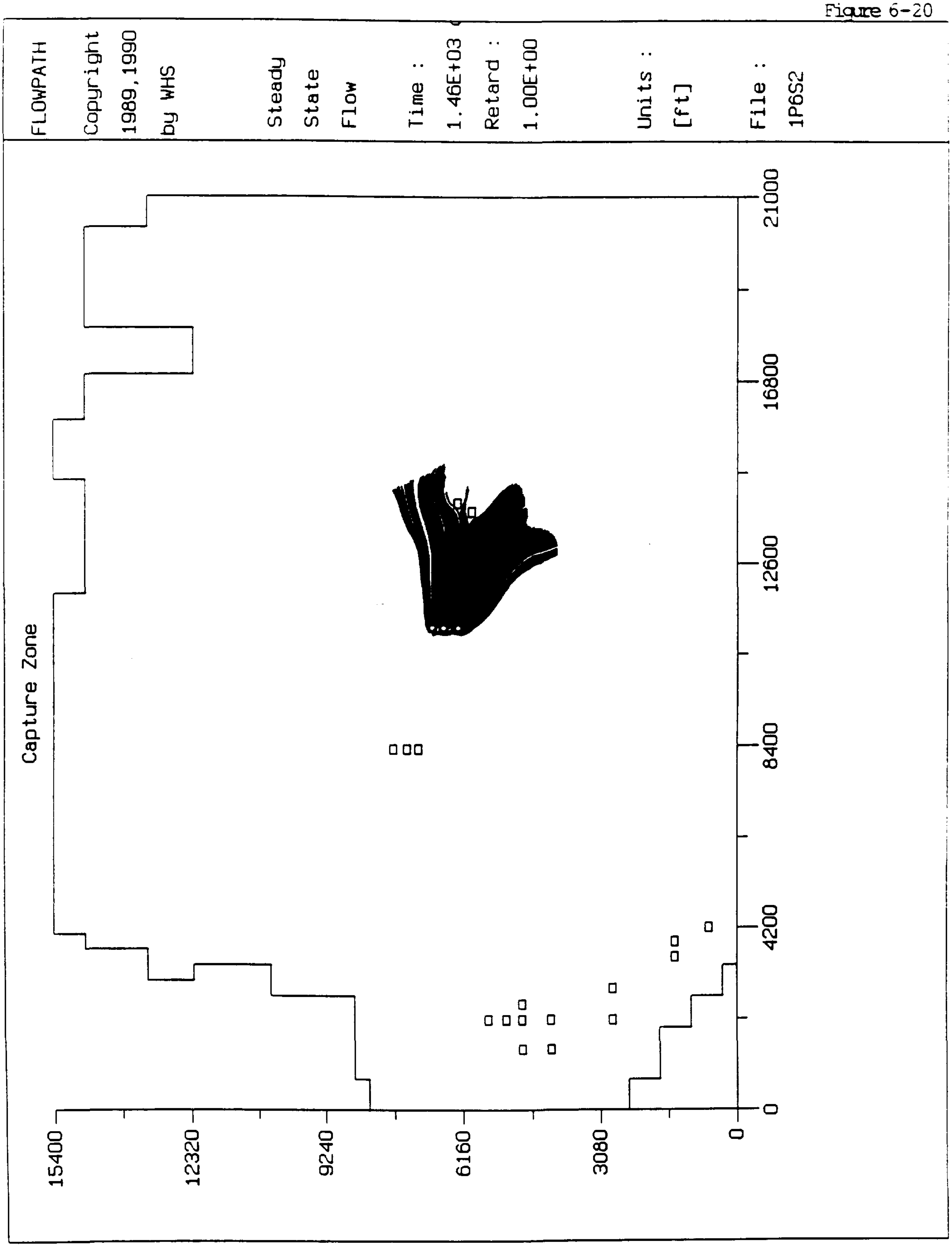
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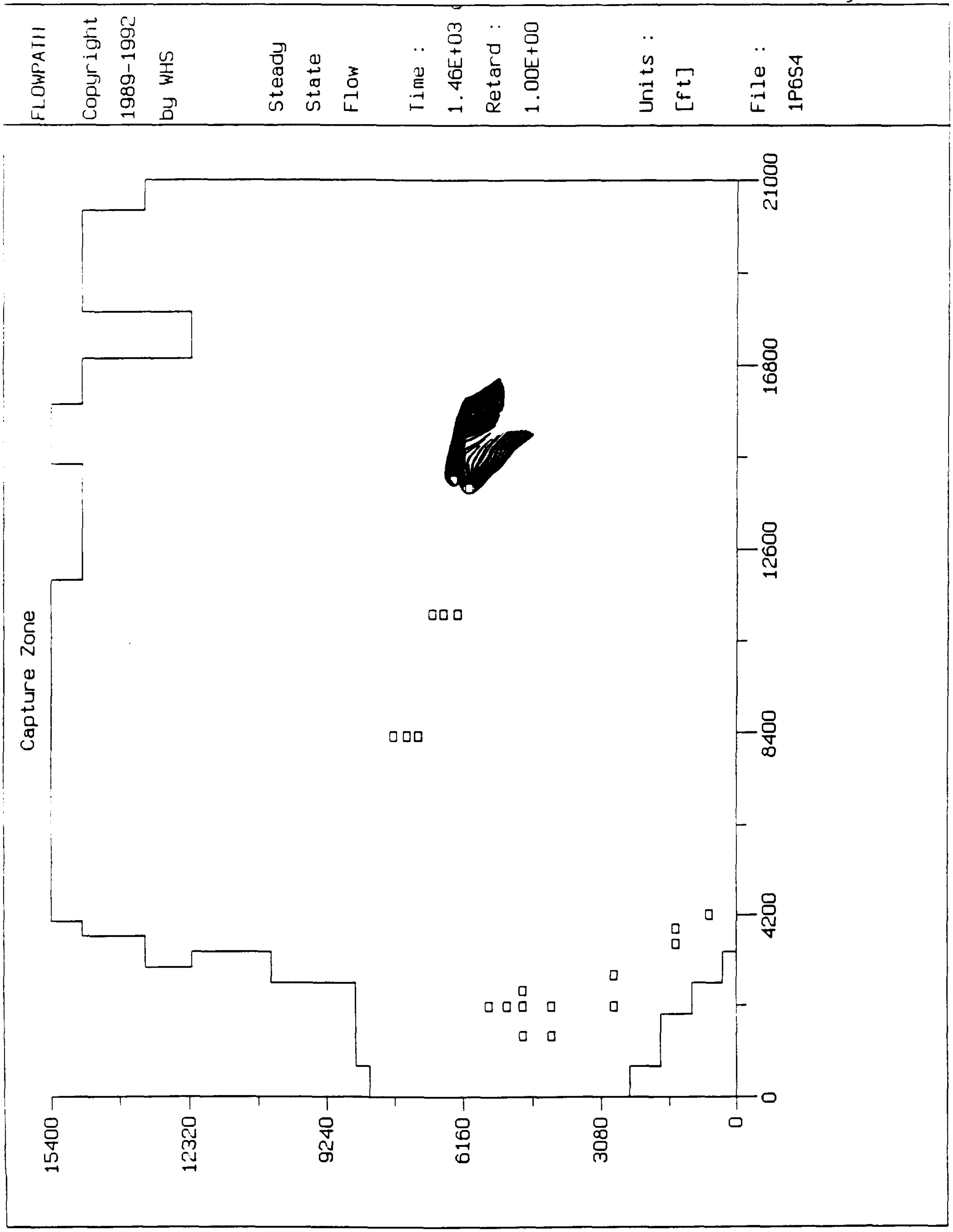
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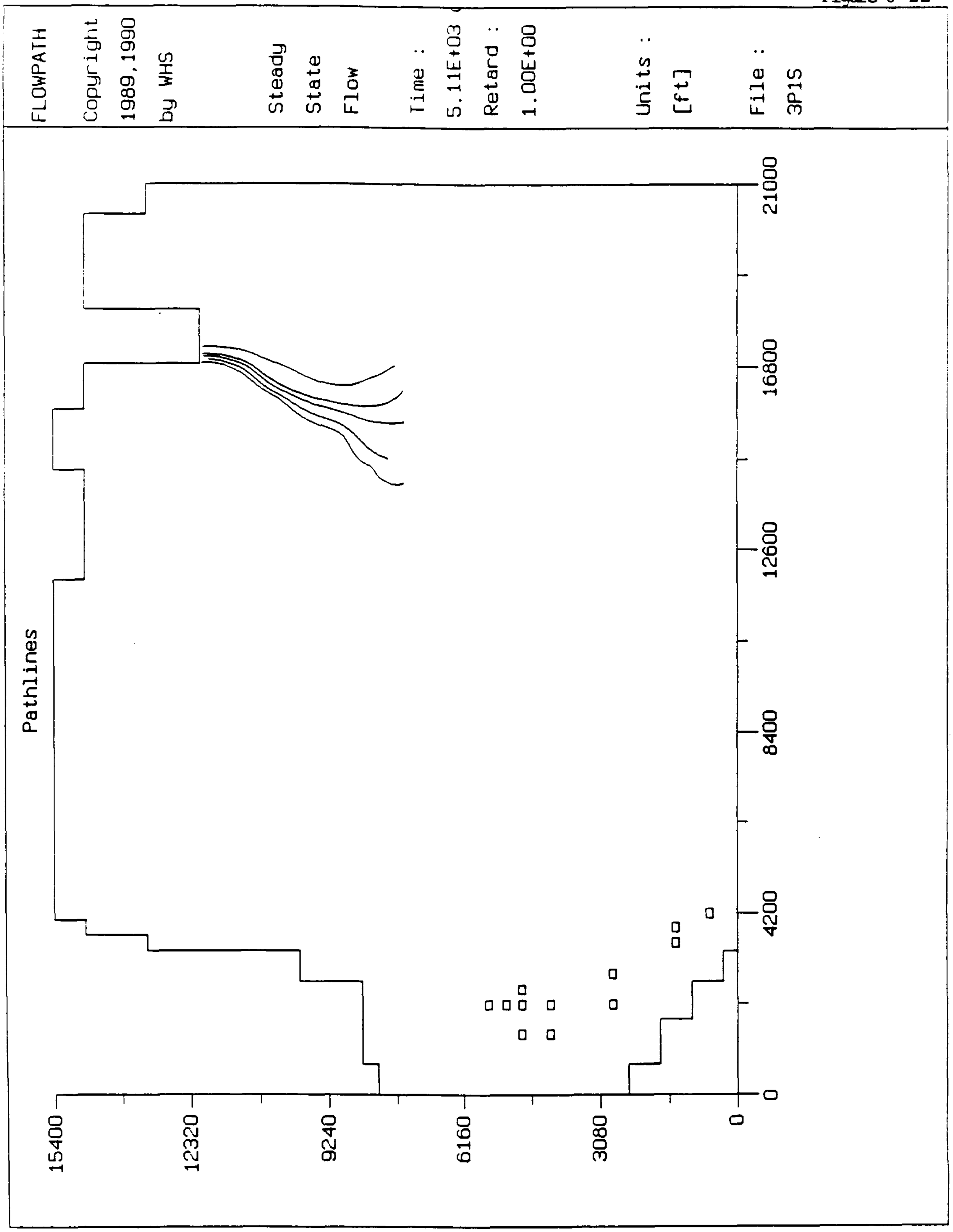
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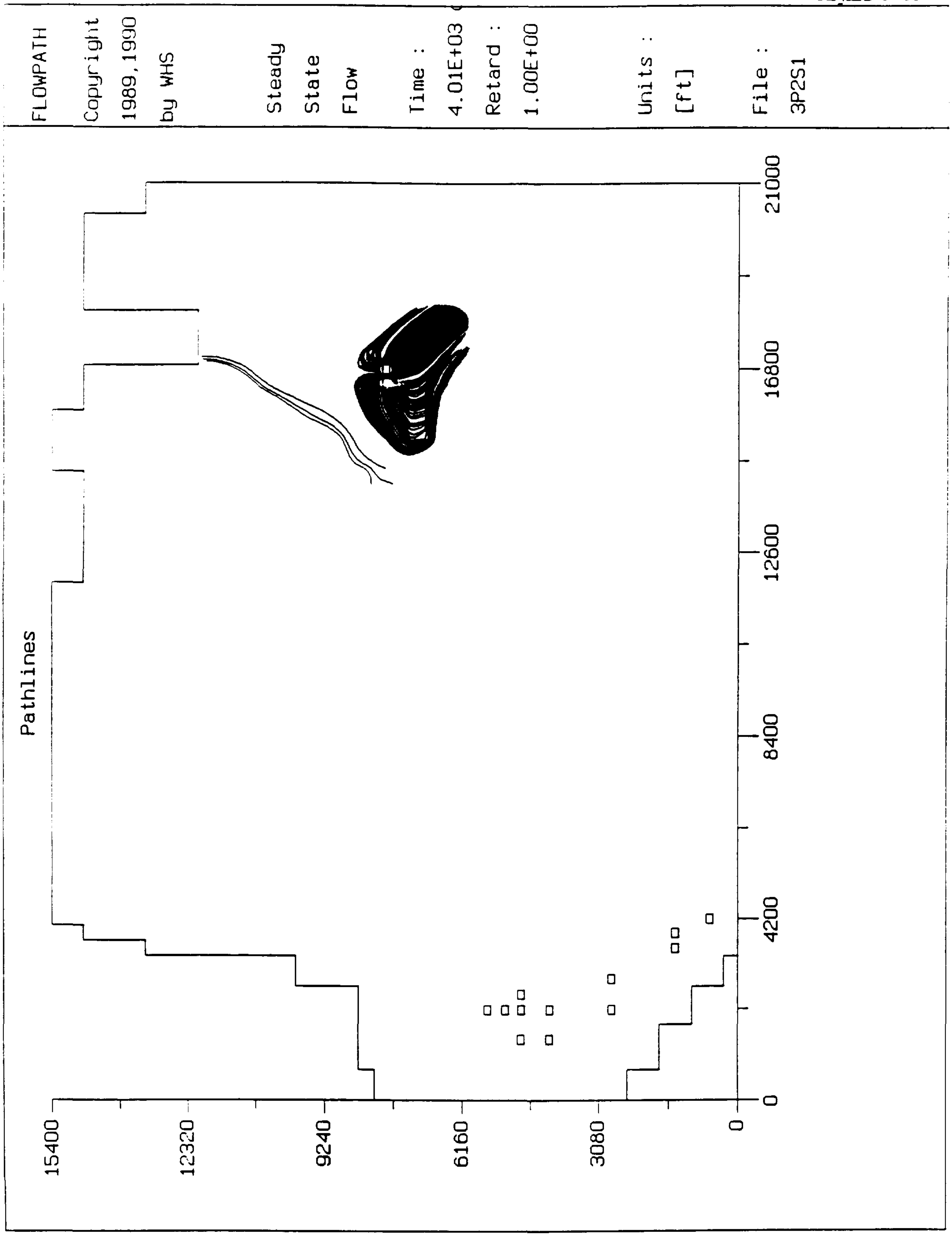
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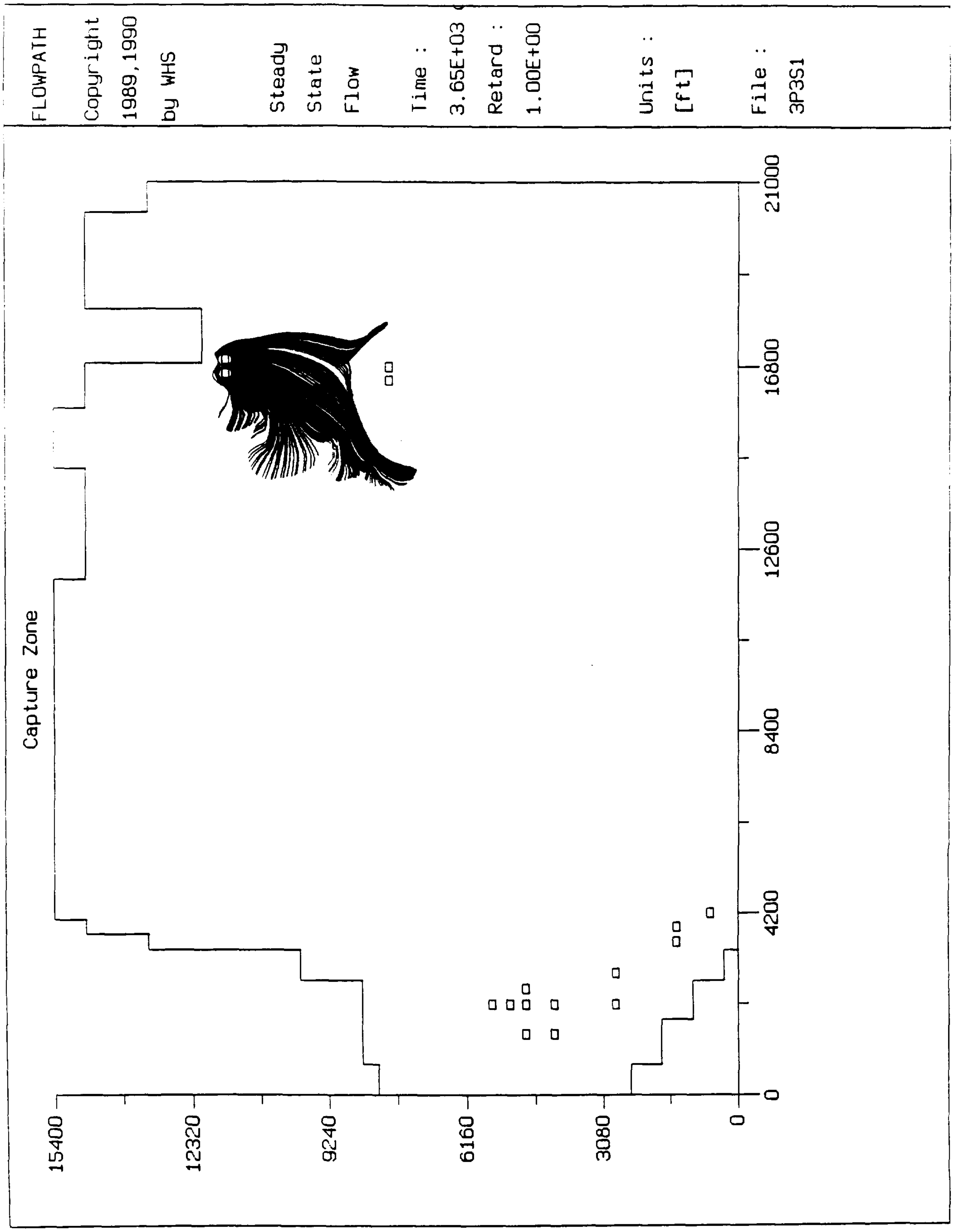
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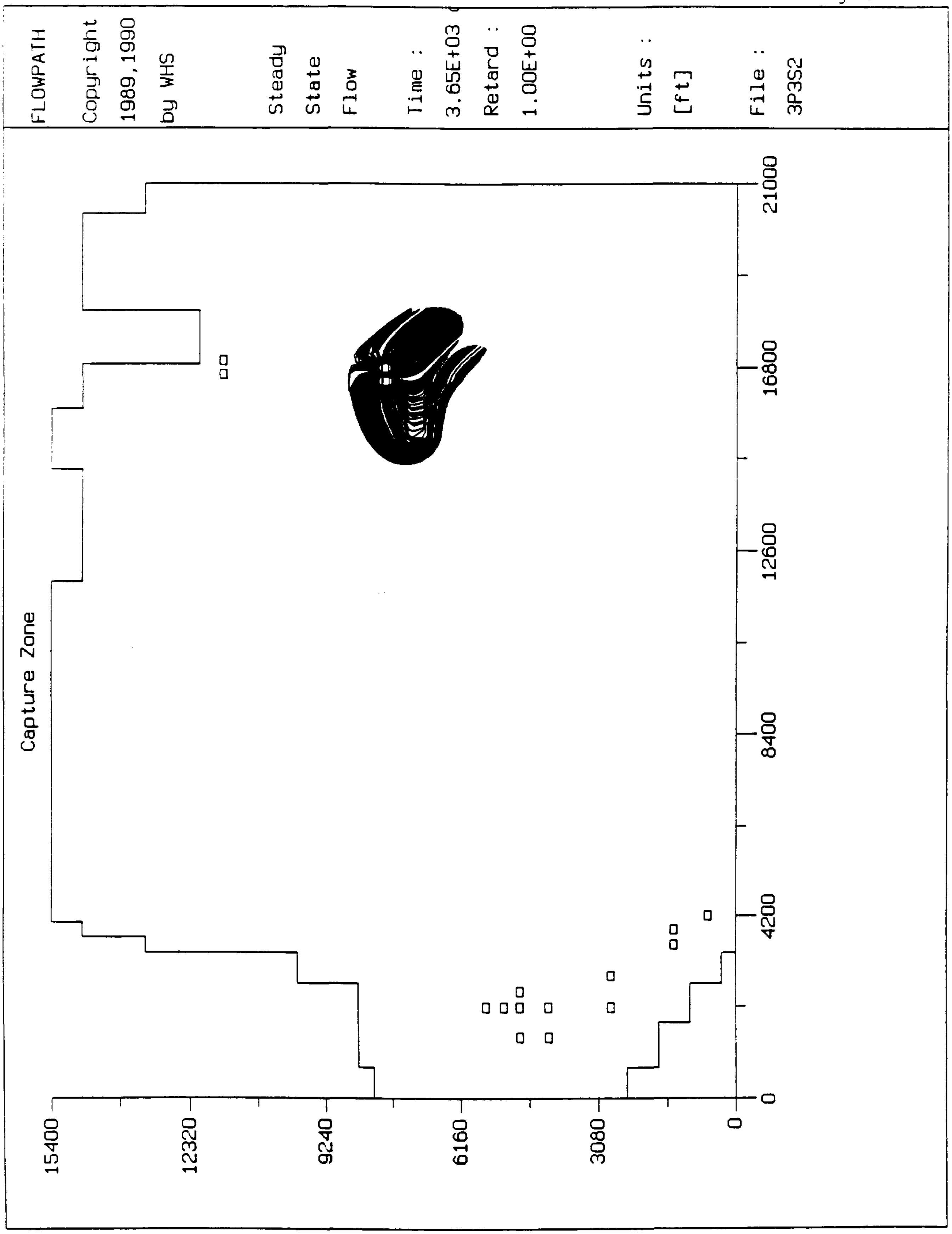
Figure 6-25



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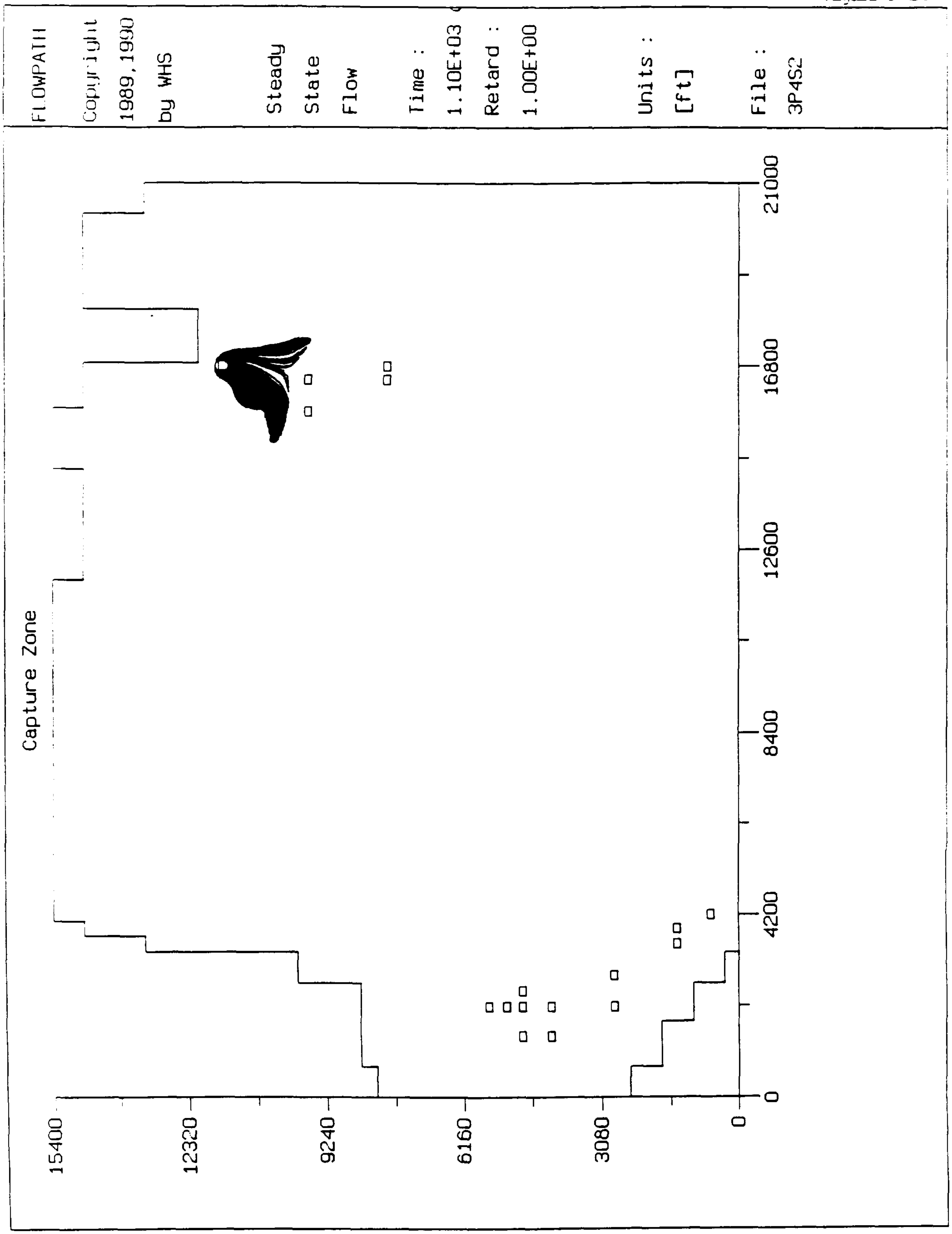
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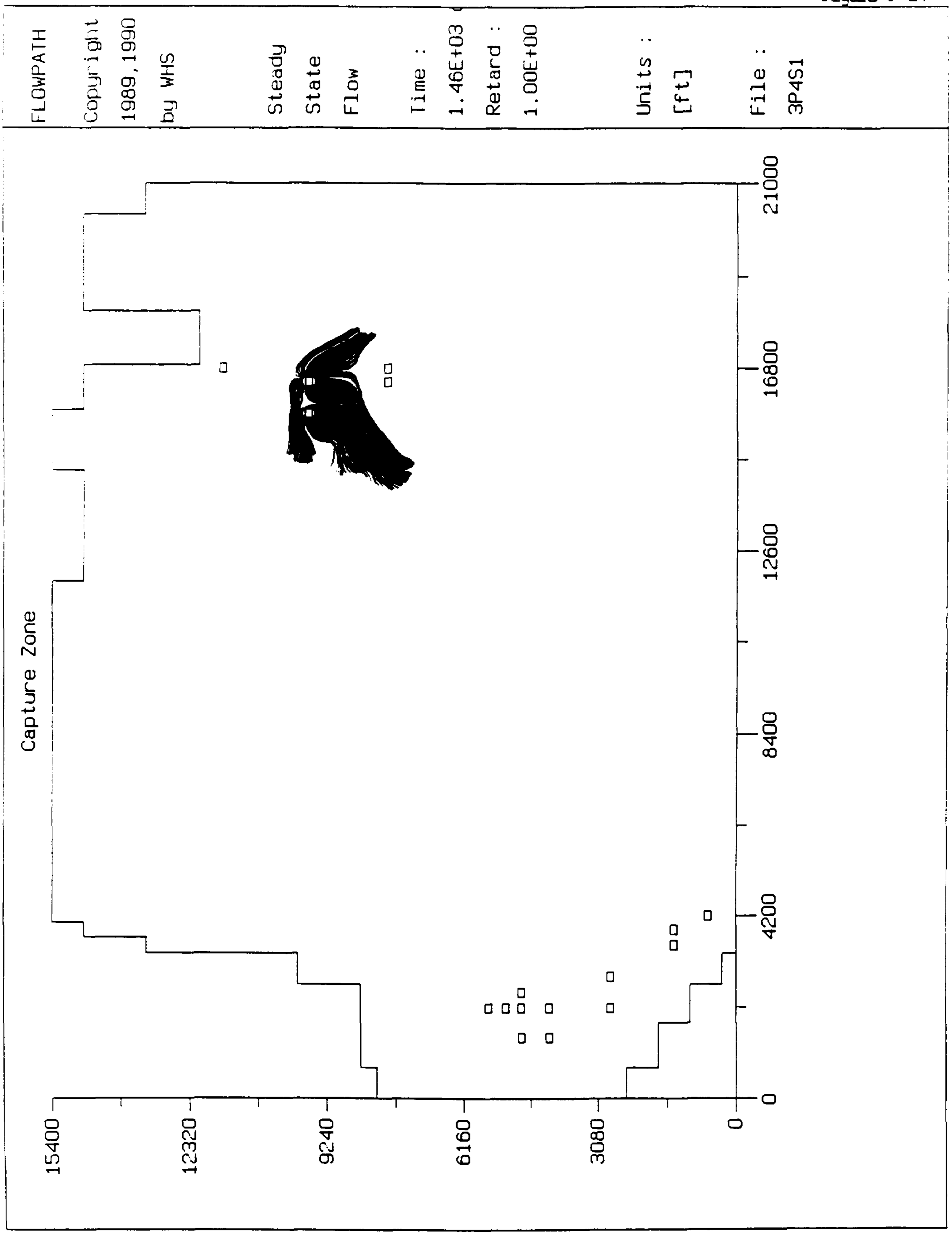

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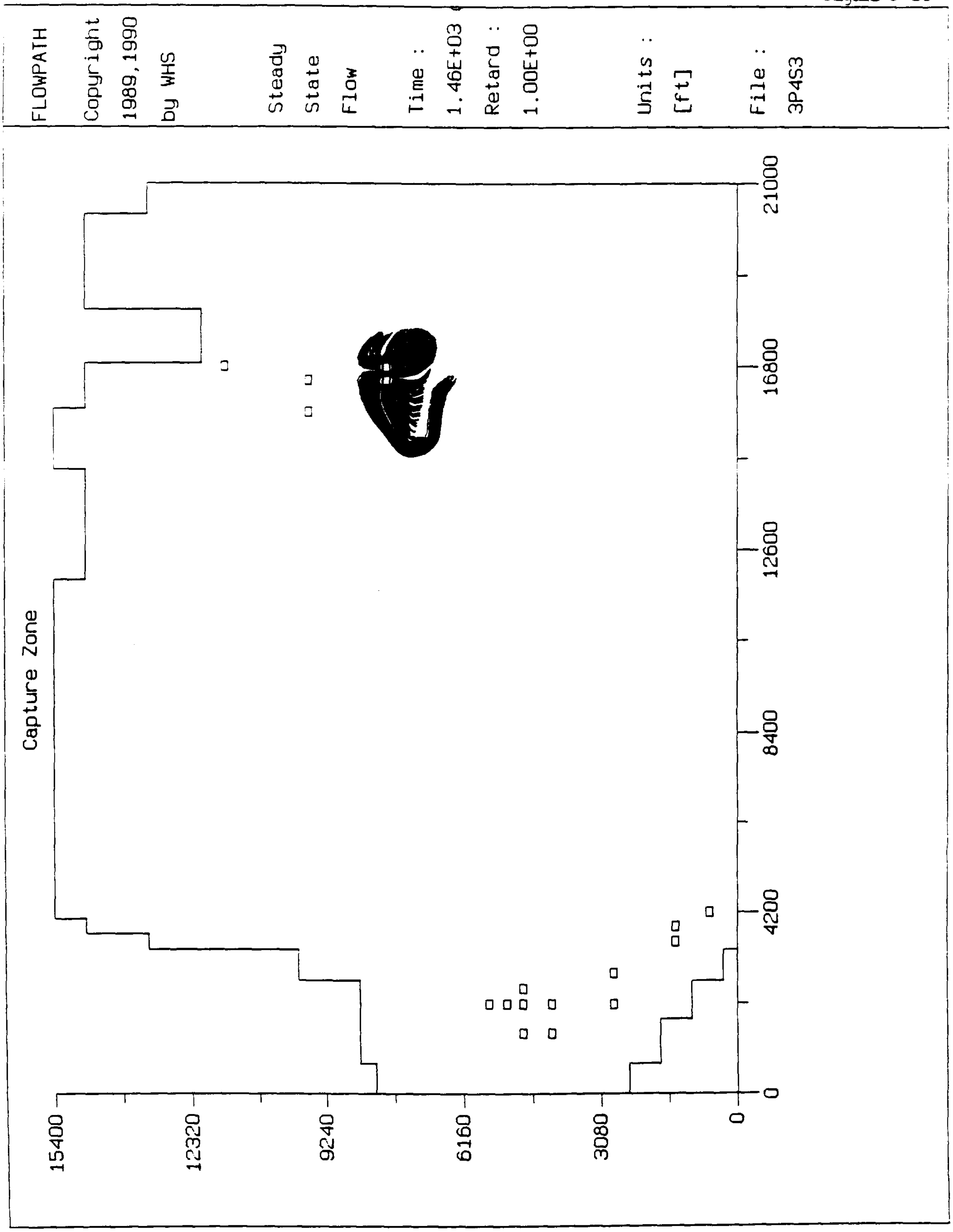
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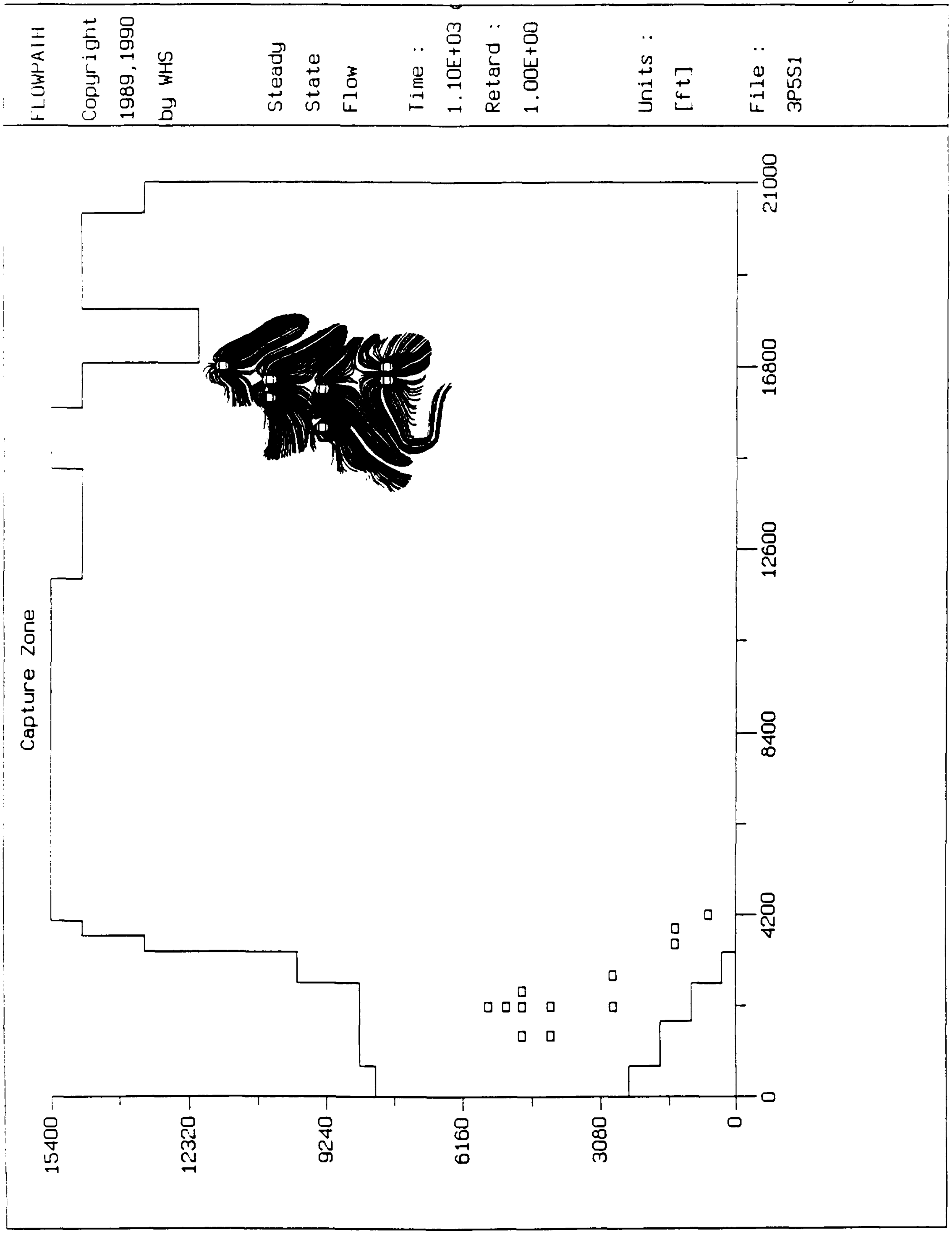
Figure 6-29



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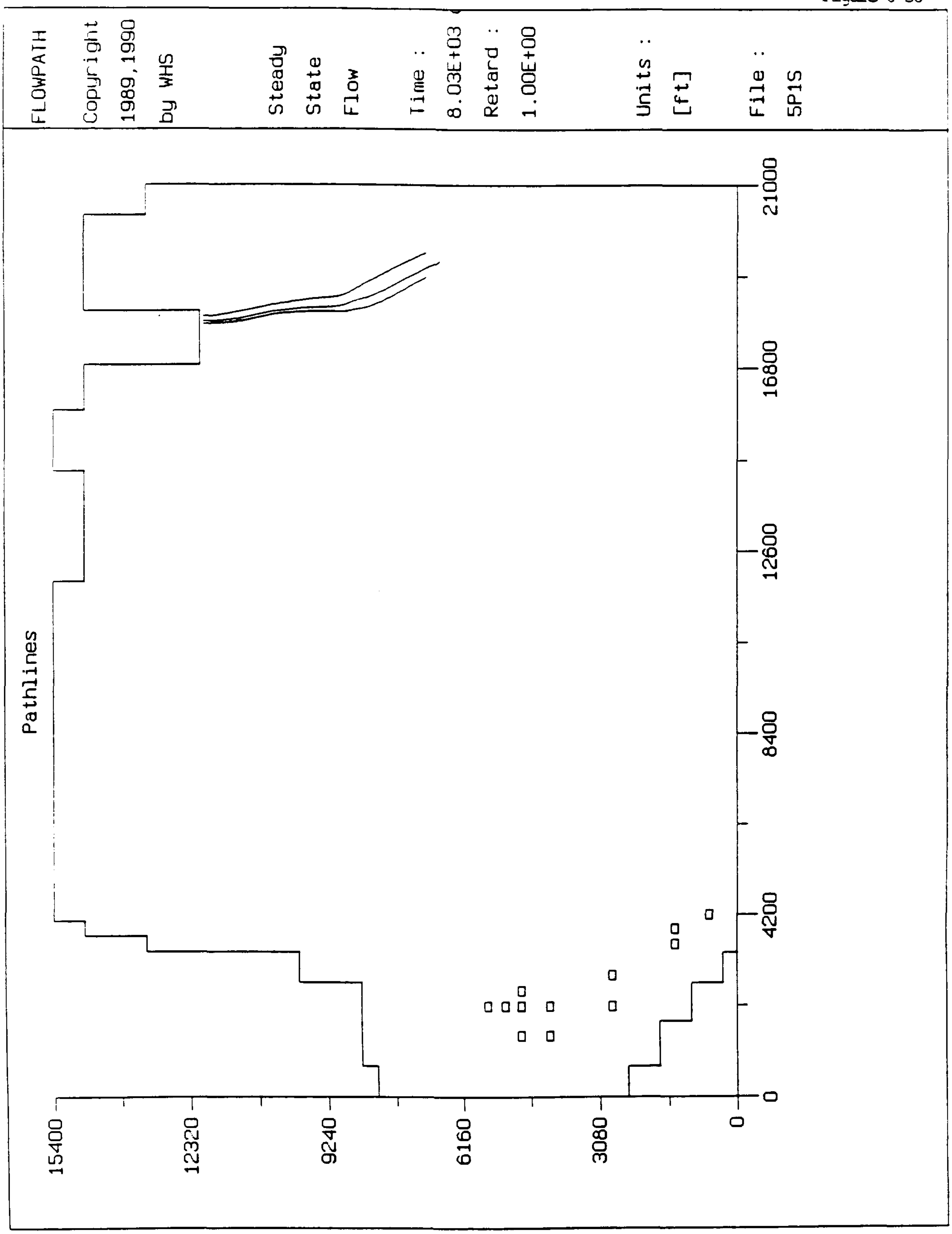

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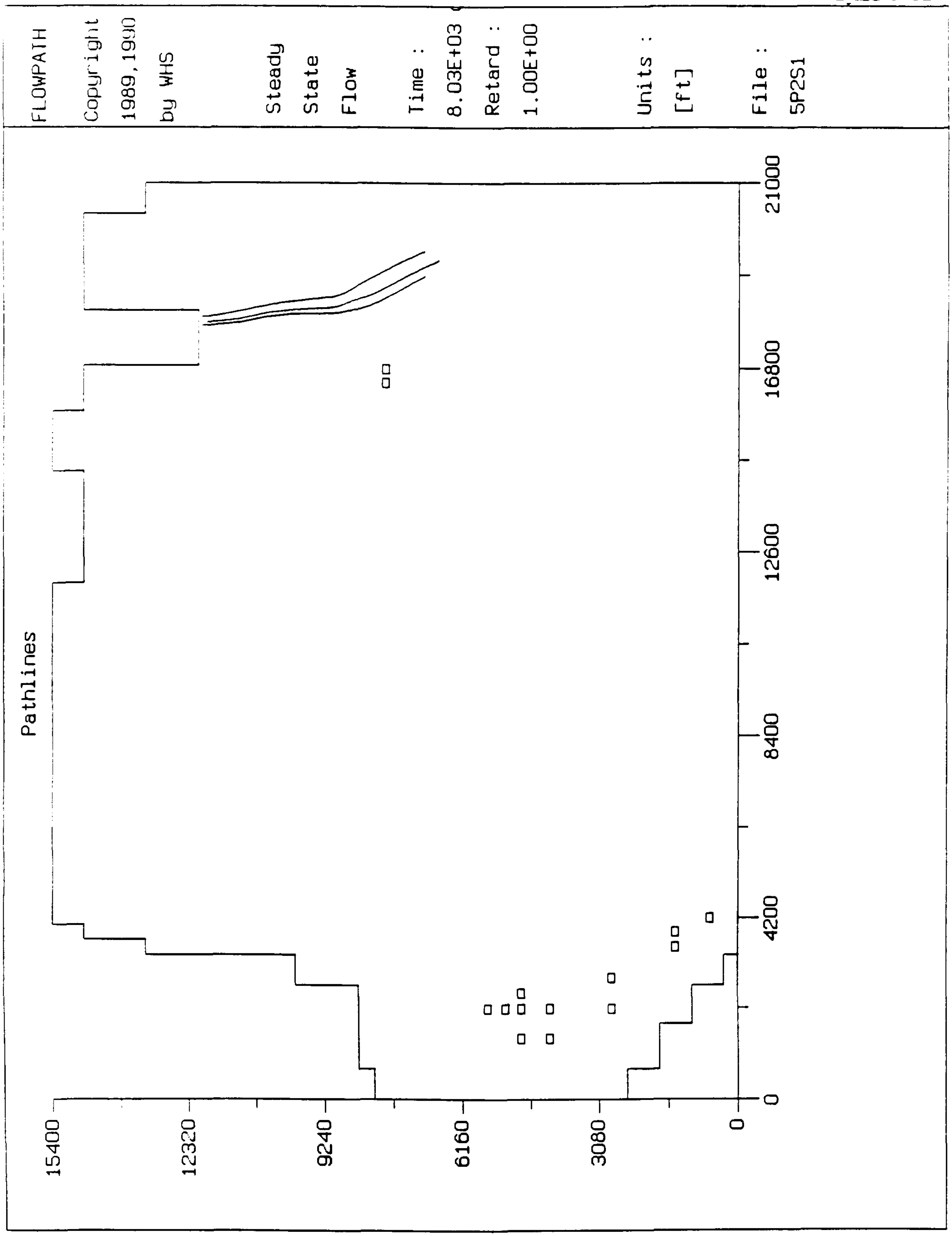
Figure 6-31



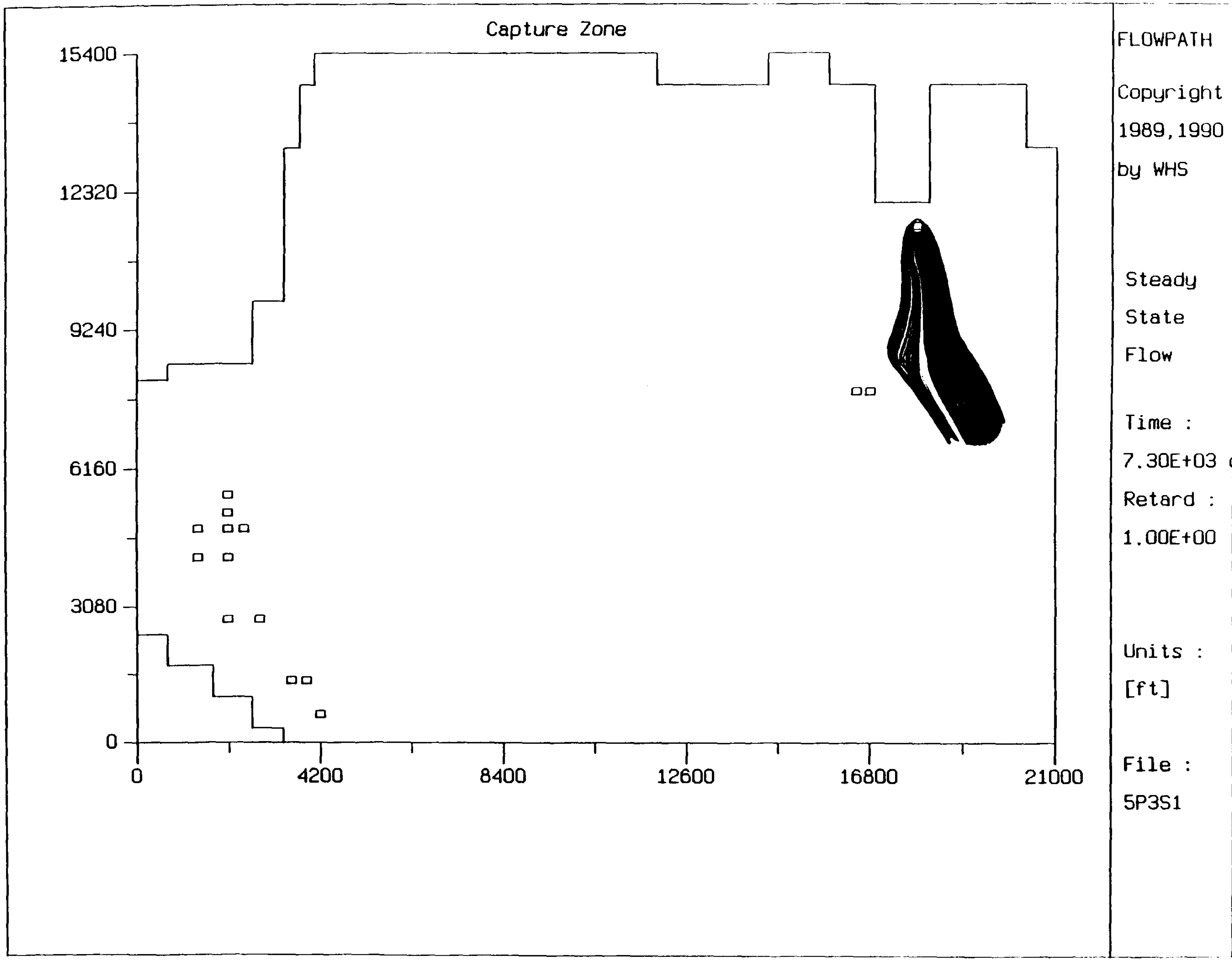


Figure 6-32

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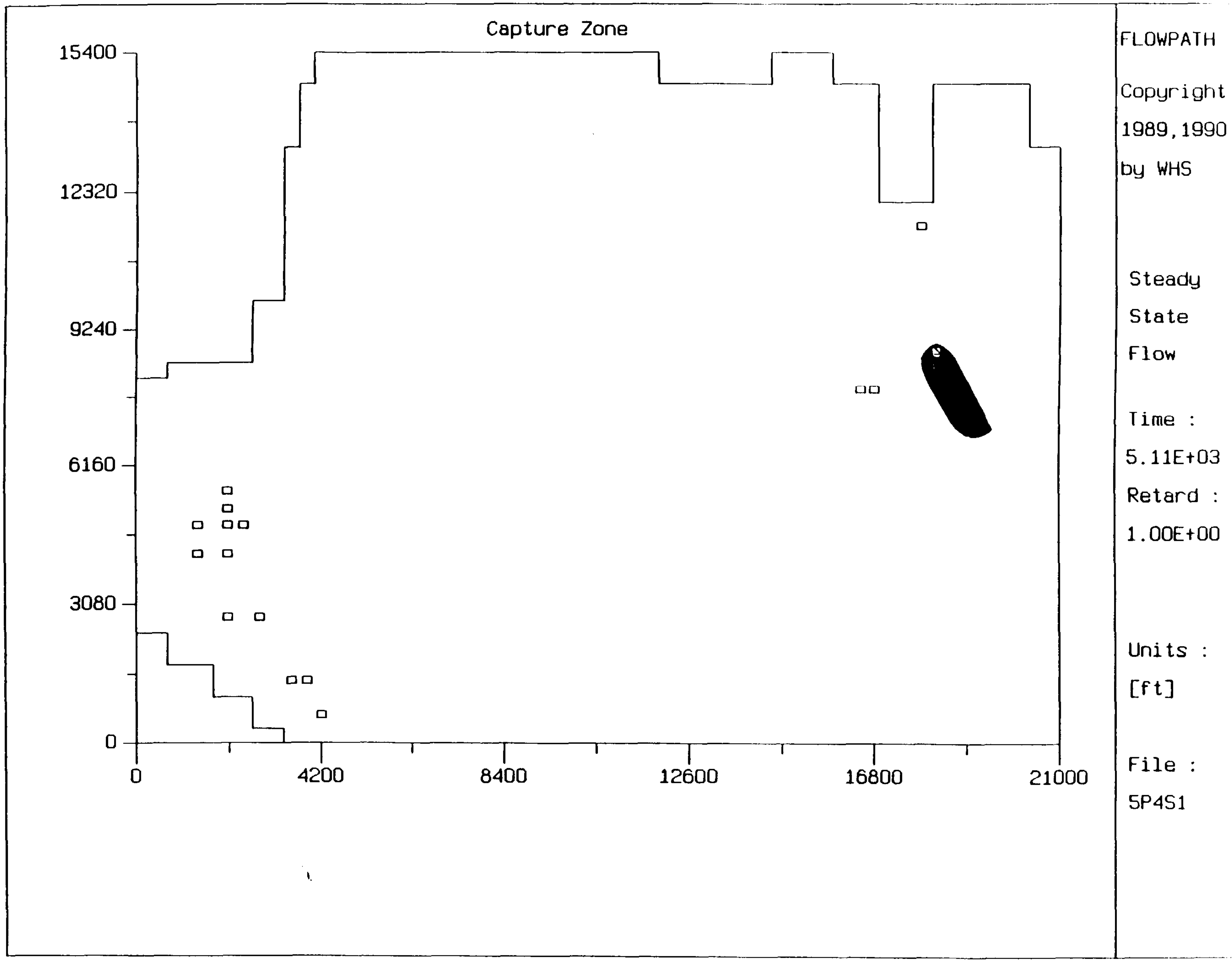

Figure 6-33

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Figure 6-34

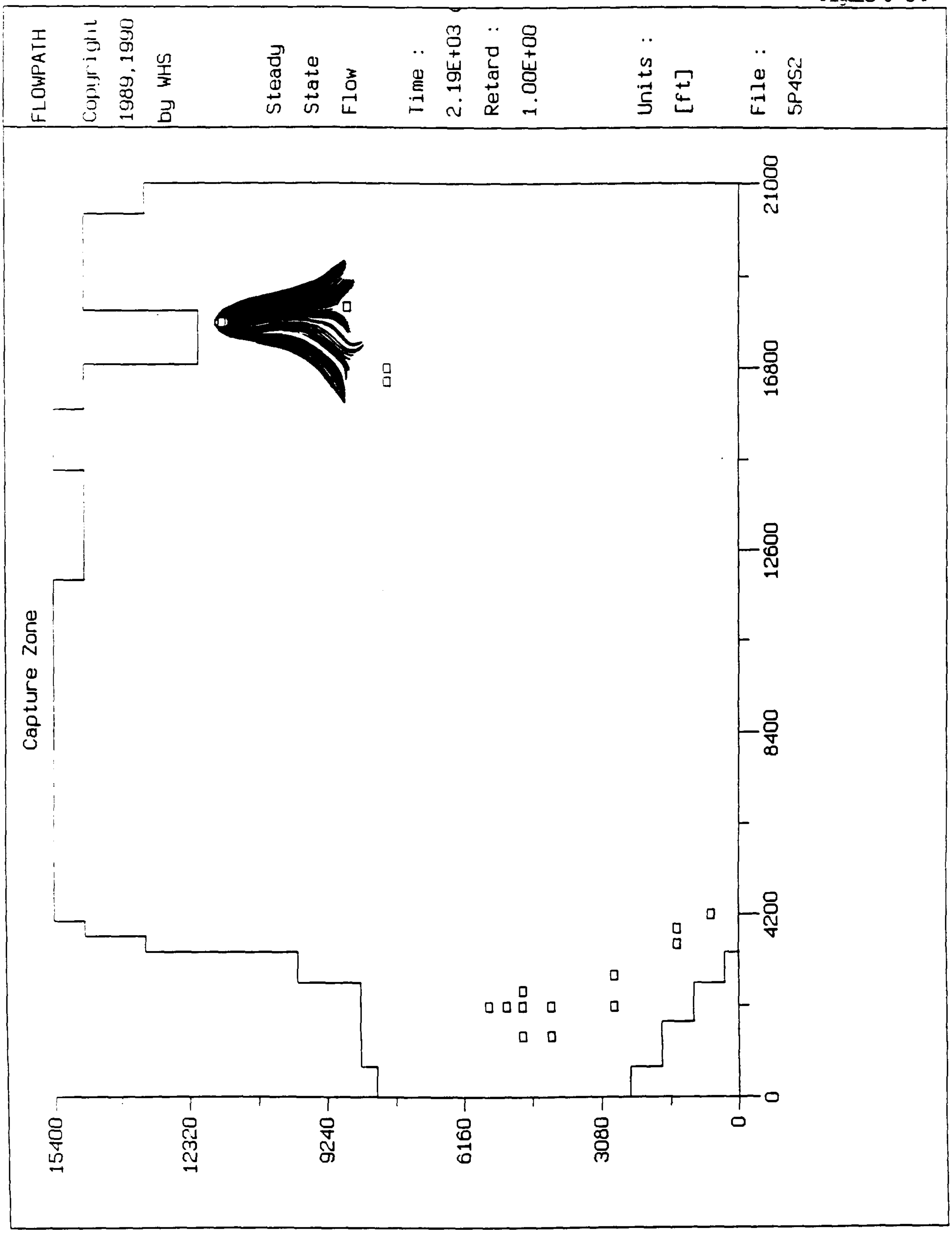
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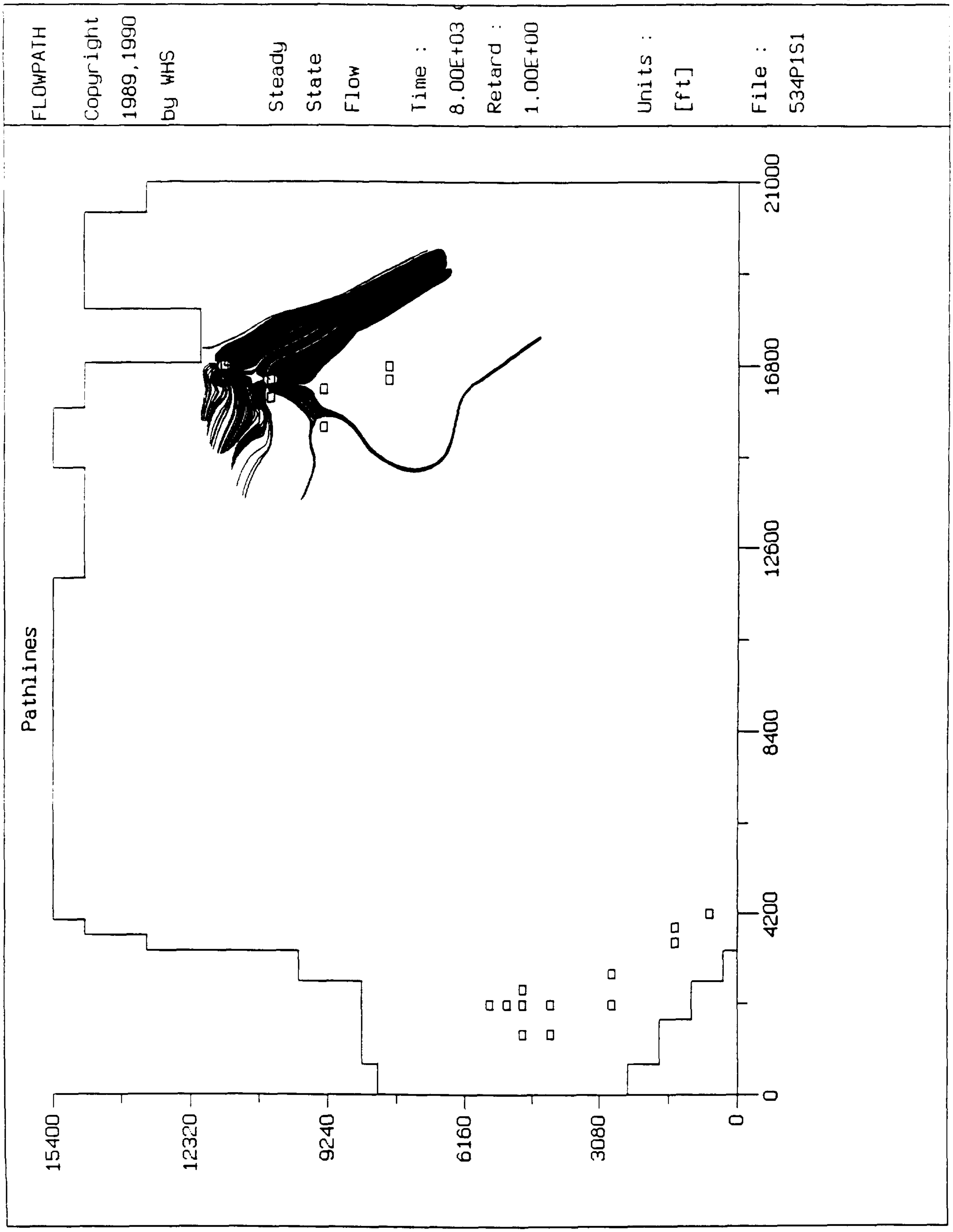
Figure 6-35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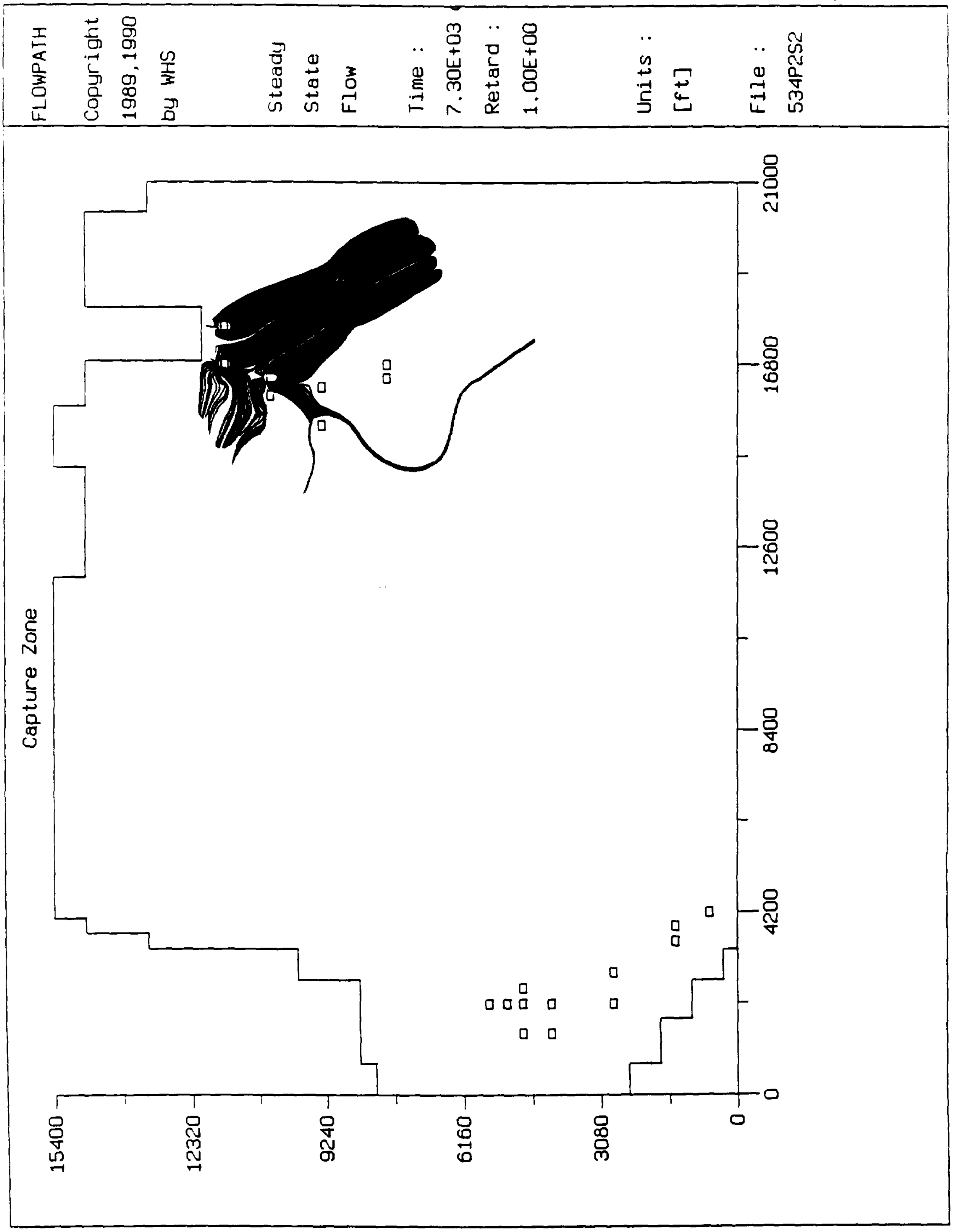
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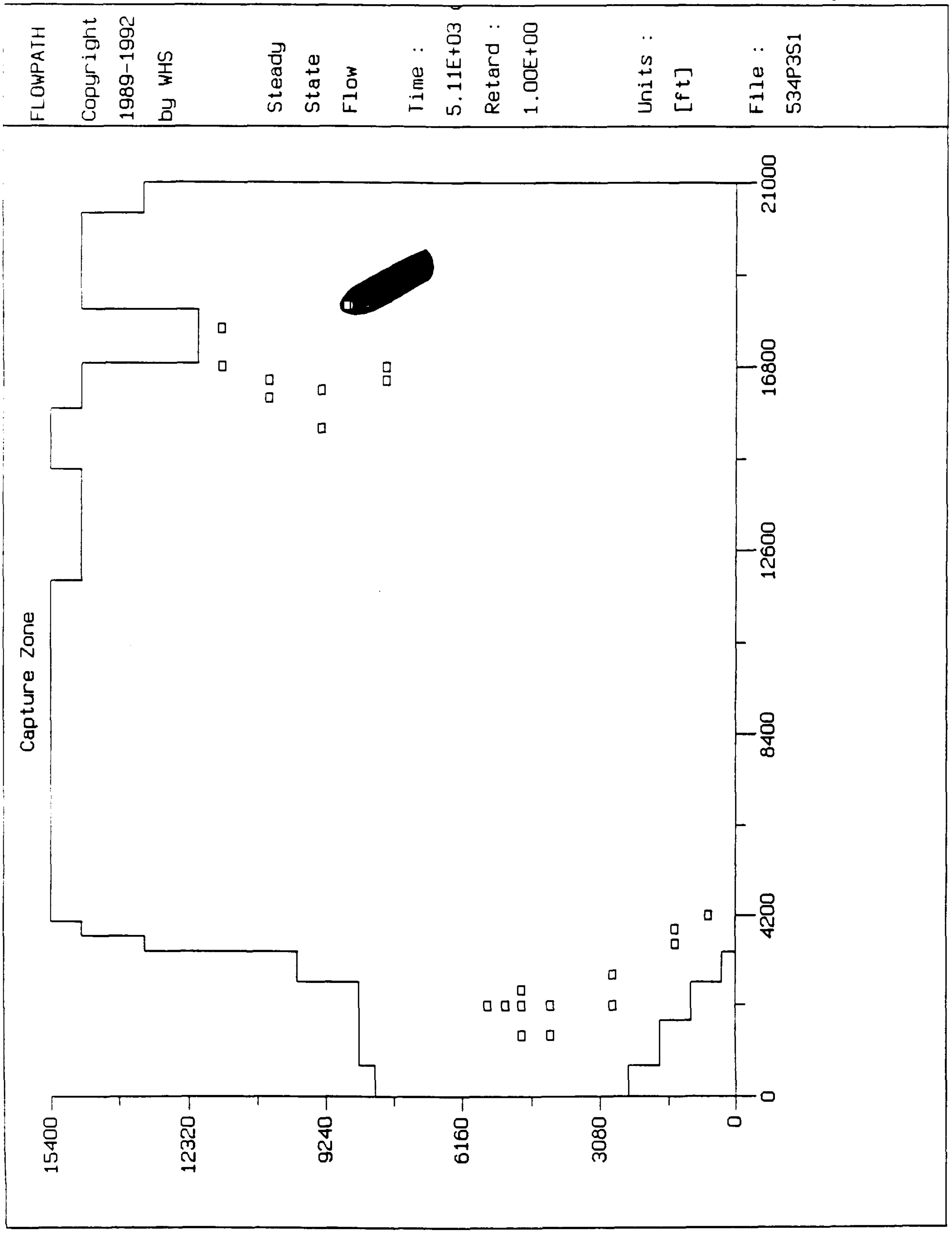
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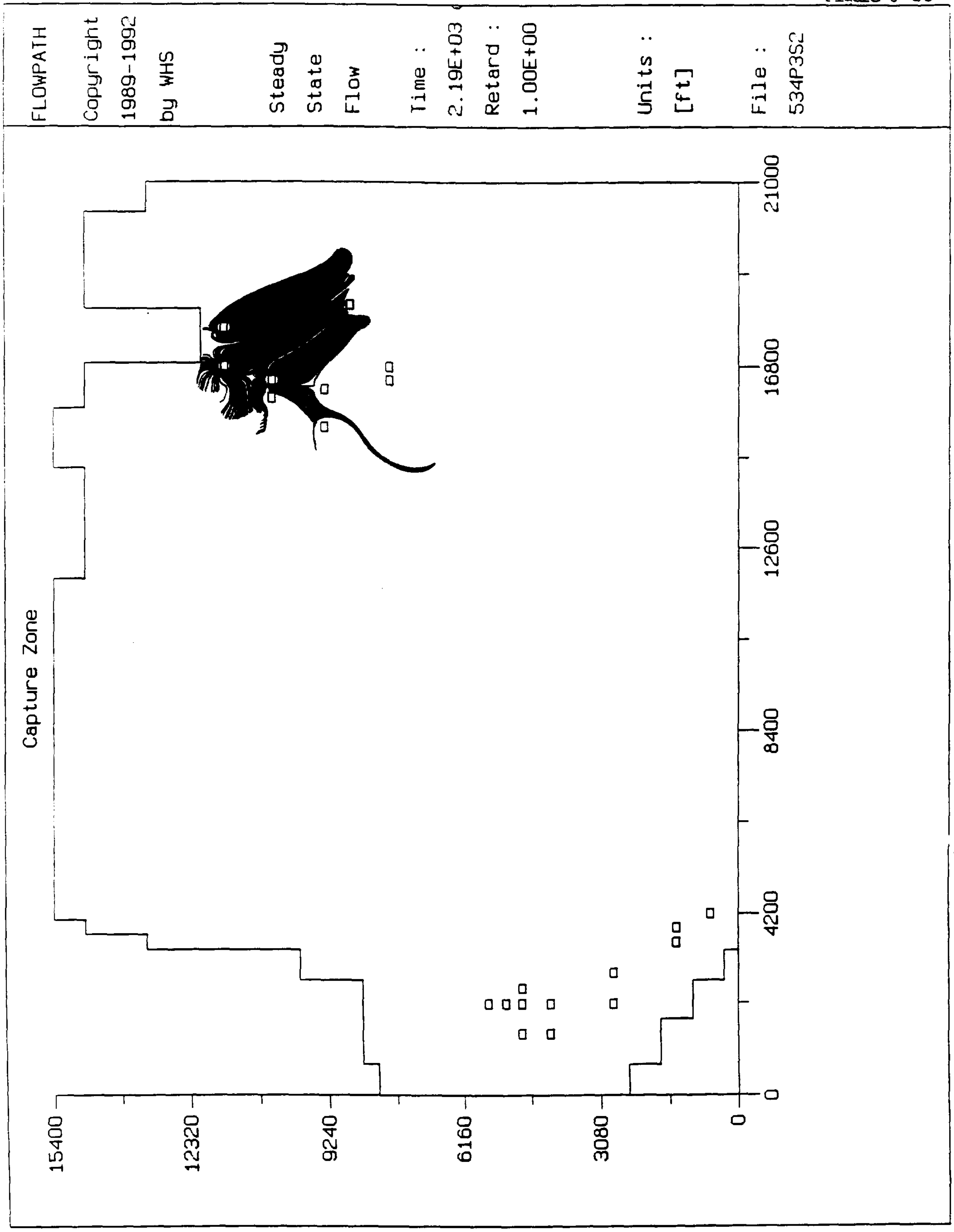
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