

APPENDIX G

WASTEWATER TREATMENT RELEASE DATA AND CALCULATIONS

**SARA TITLE III, SECTION 313
1990 TOXIC CHEMICAL RELEASE INVENTORY
LAKE CHARLES REFINERY**

Wastewater Treatment Release

Wastewater releases were calculated as follows:

1. Effluent
 - a. Used 1990 Benzene NESHAP source survey/design basis to estimate flowrate.
 - b. Used 1989 composition to obtain total release to water. (From Dave Kersey)
2. Volatilization
 - a. Volatilization from wastewater treatment facilities was estimated using a SIMS model (EPA supported)
 - b. Compositional data obtained from the 1990 Benzene NESHAP source survey were used as input parameters.

Releases from the API and CPI were calculated as follows:

1. Emission factors were taken from the NSPS-BID document to estimate VOC.
2. Crude oil composition has been assumed for the oil layer in the API/CPI traps.
3. Emissions are based on the weight fraction of each component with respect to crude oil.

WATER RELEASE

If concentration is not detected 1/2 detection limit is assumed.

	Concentration (ppb)	Level detected	flowrate (gpm)	Release to Water (lb/yr)
Benzene	5	ND	1700	33
Cumene	2.5	ND	1700	17
Cyclohexane	2.5	ND	1700	17
Ethylbenzene	2.5	ND	1700	17
Naphthalene	5	ND	1700	33
Toluene	5	ND	1700	33
Pseudo-cumene	2.5	ND	1700	17
Xylene	2.5	ND	1700	17
Ammonia	no report	calc'd by hand	1700	2,172
Styrene	5	ND	1700	33

LAKE CHARLES API SEPARATOR RELEASE
LAKE CHARLES REFINERY, 1990 SARA SECTION 313 REPORT

LIST OF TRAPS:	Emission Type	Emission factor (est.) Lbs/1000 gal WasteWater	Trap flowrate GPM	Annual Release Tons/yr
Lake Charles API Trap	Covered	0.03	780	6
Lake Charles CPI Trap	open	0.93	780	191
Total:				197

Individual Component Release:

	Total Release	Component Part. Pressure	Oil wt frac.	Release Estimation Lbs/Yr
Benzene	197	1.5	0.00	243
Cumene	197	0.062	0.00	5
Cyclohexane	197	1.6	0.00	926
Ethylbenzene	197	0.18	0.00	35
Naphthalene	197	0.0045	0.00	0
Toluene	197	0.4	0.00	213
Pseudo-cumene	197	0.039	0.00	3
Xylene	197	0.19	0.00	132

NOTE: Measured Partial pressure of crude oil is 3.4 psia.

SIMS ESTIMATED AIR EMISSIONS

STUDY DESCRIPTION

Title: Lake Charles Wastewater System
Feed flow rate: 4.92e-002 m3/s
Location: Industrial

Study definition file: C:\SIMS\DATA\LAKEUPDA.SDF

INDUSTRIAL CATEGORIES GENERATING FEED TO SYSTEM

Code	Industrial Category
3	COAL, OIL, PETROLEUM PRODS, & REFINING

DEVICE NUMBER 1

Description

Name: Primary DAF
Type: Diffused Air SI, No Biodegradation
Flow model: Flow-through

Physical Dimensions

Surface area: 4.00e+001 m2
Liquid depth: 2.46e+000 m

Operational Parameters

Retention time: 5.56e-001 hr
Temperature: 2.50e+001 deg C
Wind speed: 4.47e+000 m/s
Air flow rate: 1.44e-003 m3/s

AIR EMISSION SUMMARY

Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
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BENZENE	1.06e-003	5.81e+004	1.05e-003	0.00e+000	6.89e+002
CUMENE (ISOPROPYLBENZENE)	3.12e-004	1.71e+004	3.05e-004	0.00e+000	3.72e+002
CYCLOHEXANE	3.12e-004	1.71e+004	3.06e-004	0.00e+000	3.62e+002
ETHYLBENZENE	8.74e-005	4.78e+003	8.63e-005	0.00e+000	5.97e+001
NAPHTHALENE	3.12e-004	1.71e+004	3.10e-004	0.00e+000	1.05e+002

TOLUENE	6.87e-004	3.76e+004	6.78e-004	0.00e+000	4.87e+002
XYLENE(-M)	4.06e-004	2.22e+004	4.01e-004	0.00e+000	2.45e+002

Total VOC 3.18e-003 1.74e+005 3.14e-003 0.00e+000 2.32e+003

DEVICE NUMBER 2

Description

Name: Equalization Pond
 Type: Mechanically Aerated SI, No Biodegradation
 Flow model: Flow-through

Physical Dimensions

Surface area: 1.00e+003 m2
 Liquid depth: 3.05e+000 m

Operational Parameters

Retention time: 1.72e+001 hr
 Temperature: 2.50e+001 deg C
 Wind speed: 4.47e+000 m/s
 Total power to aerators: 5.62e+002 hp
 Number of aerators: 7.00e+000
 Turbulent surface area: 2.40e+001 %
 Impeller speed: 1.26e+002 rad/s
 Impeller diameter: 6.10e+001 cm
 Impeller power efficiency: 8.50e+001 %
 O2 transfer rating of aerator: 5.00e-003 lb O2/hp-hr
 O2 transfer correction factor: 8.30e+001 %

AIR EMISSION SUMMARY

Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	1.05e-003	5.74e+004	6.68e-004	0.00e+000	2.09e+004
CUMENE (ISOPROPYLBENZENE)	3.05e-004	1.67e+004	2.05e-004	0.00e+000	5.49e+003
CYCLOHEXANE	3.06e-004	1.67e+004	1.97e-004	0.00e+000	5.94e+003

ETHYLBENZENE	8.63e-005	4.72e+003	5.71e-005	0.00e+000	1.60e+003
NAPHTHALENE	3.10e-004	1.70e+004	2.08e-004	0.00e+000	5.61e+003
TOLUENE	6.78e-004	3.71e+004	4.41e-004	0.00e+000	1.29e+004
XYLENE(-M)	4.01e-004	2.20e+004	2.66e-004	0.00e+000	7.42e+003
Total VOC	3.14e-003	1.72e+005	2.04e-003	0.00e+000	5.99e+004

DEVICE NUMBER 3

Description

Name: Lake Charles Bio-Pond
 Type: Mechanically Aerated SI, Activated Sludge
 Flow model: Flow-through

Physical Dimensions

Surface area: 1.60e+003 m2
 Liquid depth: 2.44e+000 m

Operational Parameters

Retention time: 2.21e+001 hr
 Temperature: 2.50e+001 deg C
 Wind speed: 4.47e+000 m/s
 Biomass concentration: 1.00e+003 g/m3
 Total power to aerators: 3.00e+002 hp
 Number of aerators: 7.00e+000
 Turbulent surface area: 7.00e+001 %
 Impeller speed: 1.26e+002 rad/s
 Impeller diameter: 3.50e+001 cm
 Impeller power efficiency: 8.50e+001 %
 O2 transfer rating of aerator: 5.00e-002 lb O2/hp-hr
 O2 transfer correction factor: 8.30e+001 %

AIR EMISSION SUMMARY

Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	6.68e-004	3.66e+004	1.98e-005	3.27e+004	2.74e+003
CUMENE (ISOPROPYLBENZENE)	2.05e-004	1.12e+004	4.61e-006	1.04e+004	5.45e+002
CYCLOHEXANE	1.97e-004	1.08e+004	7.77e-006	9.32e+003	1.04e+003
ETHYLBENZENE	5.71e-005	3.13e+003	1.16e-006	2.92e+003	1.43e+002
NAPHTHALENE	2.08e-004	1.14e+004	8.26e-006	9.94e+003	9.82e+002

TOLUENE	4.41e-004	2.42e+004	7.87e-006	2.27e+004	1.02e+003
XYLENE(-M)	2.66e-004	1.45e+004	5.12e-006	1.36e+004	6.32e+002

Total VOC 2.04e-003 1.12e+005 5.46e-005 1.02e+005 7.11e+003

DEVICE NUMBER 4

Description

Name: Clarifier
 Type: Non-Aerated SI, No Biodegradation
 Flow model: Flow-through

Physical Dimensions

Surface area: 5.00e+001 m2
 Liquid depth: 2.46e+000 m

Operational Parameters

Retention time: 6.95e-001 hr
 Temperature: 2.50e+001 deg C
 Wind speed: 4.47e+000 m/s

AIR EMISSION SUMMARY

Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	1.98e-005	1.08e+003	1.97e-005	0.00e+000	7.27e+000
CUMENE (ISOPROPYLBENZENE)	4.61e-006	2.52e+002	4.58e-006	0.00e+000	1.48e+000
CYCLOHEXANE	7.77e-006	4.25e+002	7.72e-006	0.00e+000	2.77e+000
ETHYLBENZENE	1.16e-006	6.34e+001	1.15e-006	0.00e+000	3.87e-001
NAPHTHALENE	8.26e-006	4.52e+002	8.21e-006	0.00e+000	2.67e+000
TOLUENE	7.87e-006	4.31e+002	7.82e-006	0.00e+000	2.74e+000
XYLENE(-M)	5.12e-006	2.80e+002	5.08e-006	0.00e+000	1.71e+000

Total VOC 5.46e-005 2.99e+003 5.42e-005 0.00e+000 1.90e+001

DEVICE NUMBER 5

Description

Name: Process Lagoon
Type: Mechanically Aerated SI, No Biodegradation
Flow model: Flow-through

Physical Dimensions

Surface area: 3.00e+002 m2
Liquid depth: 2.46e+000 m

Operational Parameters

Retention time: 4.17e+000 hr
Temperature: 2.50e+001 deg C
Wind speed: 4.47e+000 m/s
Total power to aerators: 1.00e+001 hp
Number of aerators: 2.00e+000
Turbulent surface area: 2.40e+001 %
Impeller speed: 1.26e+002 rad/s
Impeller diameter: 6.10e+001 cm
Impeller power efficiency: 8.50e+001 %
O2 transfer rating of aerator: 3.00e+000 lb O2/hp-hr
O2 transfer correction factor: 8.30e+001 %

AIR EMISSION SUMMARY

Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	1.97e-005	1.08e+003	4.30e-006	0.00e+000	8.42e+002
CUMENE (ISOPROPYLBENZENE)	4.58e-006	2.51e+002	9.70e-007	0.00e+000	1.98e+002
CYCLOHEXANE	7.72e-006	4.23e+002	1.49e-006	0.00e+000	3.41e+002
ETHYLBENZENE	1.15e-006	6.30e+001	2.64e-007	0.00e+000	4.86e+001
NAPHTHALENE	8.21e-006	4.49e+002	3.33e-006	0.00e+000	2.67e+002
TOLUENE	7.82e-006	4.28e+002	1.70e-006	0.00e+000	3.35e+002
XYLENE (~M)	5.08e-006	2.78e+002	1.23e-006	0.00e+000	2.11e+002
Total VOC	5.42e-005	2.97e+003	1.33e-005	0.00e+000	2.24e+003

DEVICE NUMBER 6

Description

Name: Final DAF

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Type: Diffused Air SI, No Biodegradation
Flow model: Flow-through

Physical Dimensions

Surface area: 5.00e+001 m2
Liquid depth: 2.00e+000 m

Operational Parameters

Retention time: 5.65e-001 hr
Temperature: 2.50e+001 deg C
Wind speed: 4.47e+000 m/s
Air flow rate: 2.41e-003 m3/s

AIR EMISSION SUMMARY

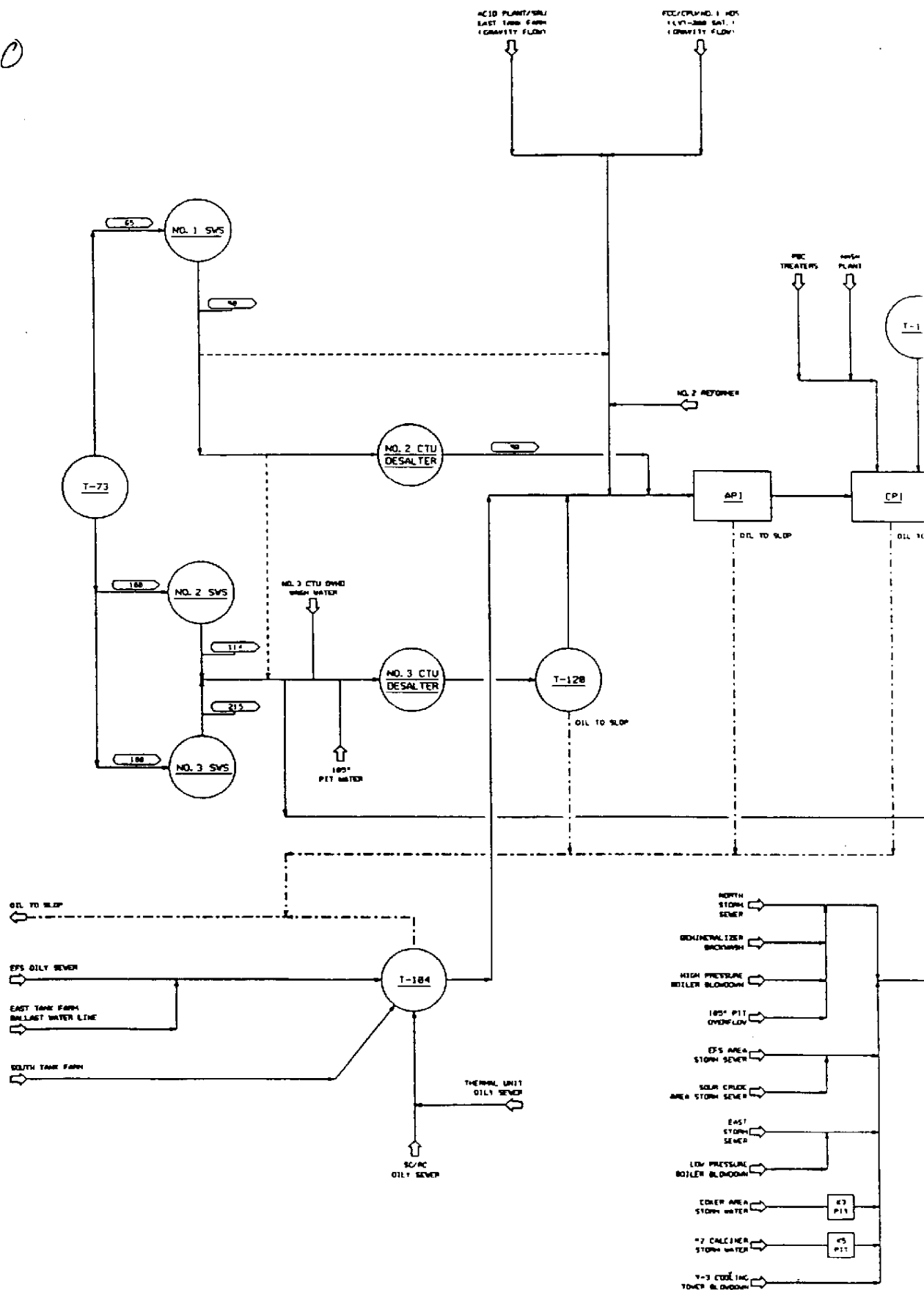
Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	4.30e-006	2.35e+002	4.22e-006	0.00e+000	4.10e+000
CUMENE (ISOPROPYLBENZENE)	9.70e-007	5.31e+001	9.37e-007	0.00e+000	1.80e+000
CYCLOHEXANE	1.49e-006	8.16e+001	1.44e-006	0.00e+000	2.68e+000
ETHYLBENZENE	2.64e-007	1.44e+001	2.59e-007	0.00e+000	2.70e-001
NAPHTHALENE	3.33e-006	1.82e+002	3.30e-006	0.00e+000	1.50e+000
TOLUENE	1.70e-006	9.33e+001	1.67e-006	0.00e+000	1.81e+000
XYLENE(-M)	1.23e-006	6.72e+001	1.21e-006	0.00e+000	1.09e+000
Total VOC	1.33e-005	7.27e+002	1.30e-005	0.00e+000	1.33e+001

SYSTEM AIR EMISSION SUMMARY

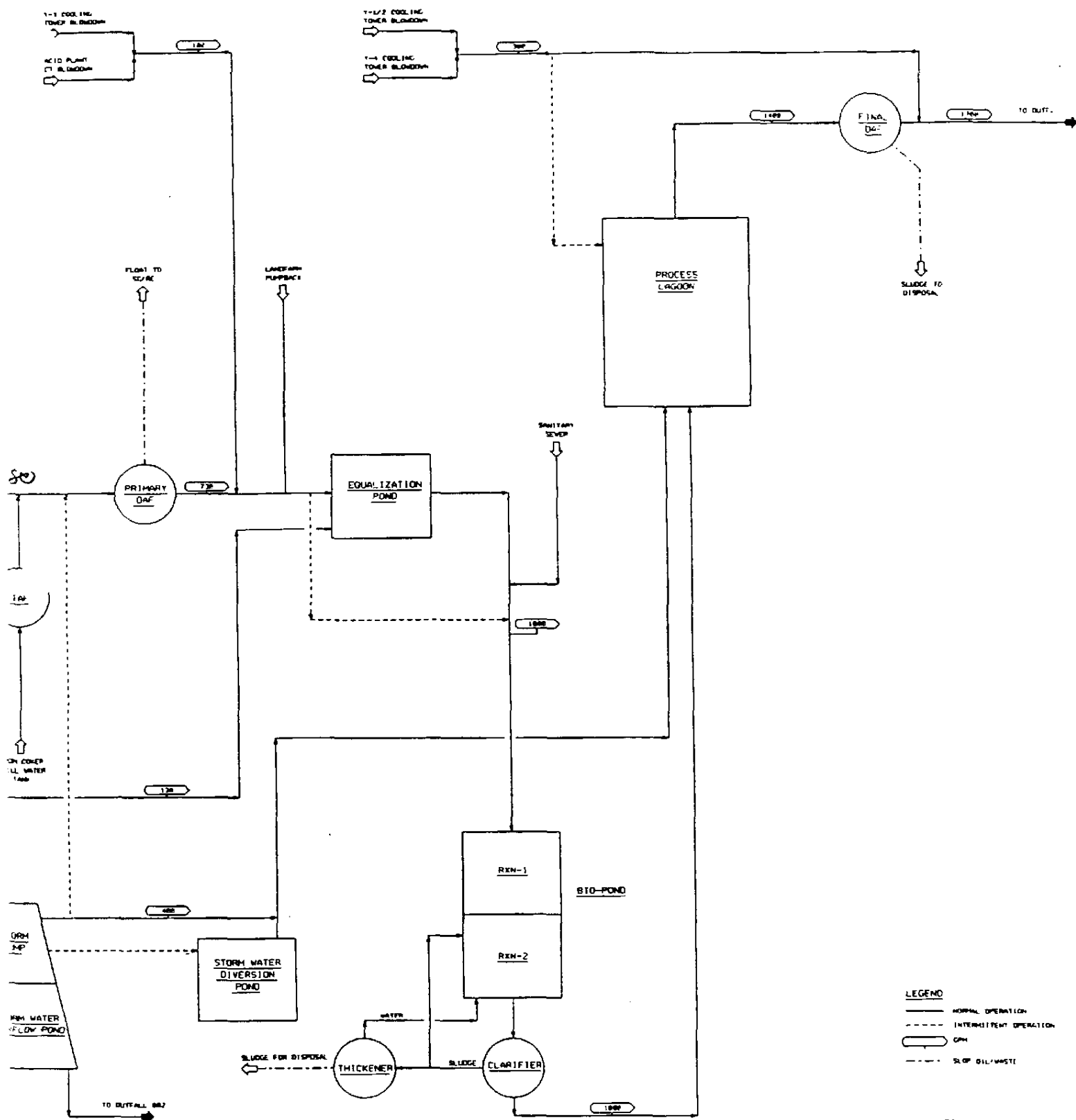
Pollutant	Inlet Conc. (lb/ft3)	Mass Loading (lb/yr)	Effluent Conc. (lb/ft3)	Biodeg. Removal (lb/yr)	Air Emissions (lb/yr)
BENZENE	1.06e-003	5.81e+004	4.22e-006	3.27e+004	2.51e+004
CUMENE (ISOPROPYLBENZENE)	3.12e-004	1.71e+004	9.37e-007	1.04e+004	6.61e+003
CYCLOHEXANE	3.12e-004	1.71e+004	1.44e-006	9.32e+003	7.69e+003
ETHYLBENZENE	8.74e-005	4.78e+003	2.59e-007	2.92e+003	1.85e+003
NAPHTHALENE	3.12e-004	1.71e+004	3.30e-006	9.94e+003	6.97e+003
TOLUENE	6.87e-004	3.76e+004	1.67e-006	2.27e+004	1.48e+004
XYLENE(-M)	4.06e-004	2.22e+004	1.21e-006	1.36e+004	8.51e+003

Total VOC 3.18e-003 1.74e+005 1.30e-005 1.02e+005 7.16e+004

CURRENT
5 CF 6/90



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LEGEND

- SOLID LINE: NORMAL OPERATION
- DASHED LINE: INTERMITTENT OPERATION
- CIRCLE: CIP
- DOTTED LINE: SLOP OIL/WASTE

1	DATE	FOR REVIEW	BY
150	DATE	DESCRIPTION	BY
CONOCO INC. ENGINEERING DEPARTMENT POKA CITY, OKLAHOMA			
BLOCK FLOW DIAGRAM WASTEWATER SYSTEM LAKE CHARLES REFINERY			
APPD	DATE	REV. NO.	REV. DATE
NO. SRE-029-9006-P1-1-L			

SAL 000004263

GULF SOUTH ENVIRONMENTAL LABORATORY

formerly GSRI

February 28, 1989

Ms. Leslie Ziegman
Remediation Technologies
23 Old Town Square, Suite 250
Fort Collins, CO 80524

Subject: Project No. 6200-3600, Episode BXT

Dear Ziegman:

Enclosed please find the analytical results for the Wastewater Test samples delivered to the Gulf South Environmental Laboratory on February 4, 1989.

A brief discussion of the analytical methodologies employed is presented, as well as a summary of quality control data generated as part of the analyses.

If you have any questions regarding any aspect of these results, please feel free to call us at any time.

Sincerely,



Richard R. Whitney, Ph.D.
Senior Research Chemist

RRW/cp
Enclosure

SAL 000004264

Analytical Methodology

Remediation Technologies Wastewater Test samples received on February 4, 1989 were analyzed for volatile organics, semivolatile organics, metals, cyanide and sulfide. Specific methods employed for the analyses are indicated.

- Volatile Organics - Appendix IX of 40 CFR Part 264, EPA Method 8240, SW-846
- Semivolatile Organics - Appendix IX of 40 CFR Part 264, EPA Method 8270, SW-846
- Metals - Appendix IX of 40 CFR Part 264, EPA Method SW-846 series
- Conventional Parameters -Appendix IX of 40 CFR Part 264
 - Cyanide - EPA Method 9010, SW-846
 - Sulfide - EPA Method 9030, SW-846

Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) measures are employed to insure the quality and define the accuracy of analytical data. The QA/QC measures employed with these analyses are summarized below:

Organics Analyses (Volatile and Semivolatile)

Instrument calibration - Instrument calibration is performed in accordance with EPA contract laboratory protocols. Instrument recalibration is performed every 12 hours.

Blank analysis - Method blanks are analyzed every 12 hours for volatile analyses and with every extraction batch for semivolatiles. Method blanks demonstrate the level of background (laboratory) contamination. Blank data are presented in the QA/QC Summary.

Surrogate spike analysis - Each sample is fortified with recovery (surrogate) standards prior to or purging. The recovery of the surrogate standards is a measure of the efficiency of the analysis. A summary of surrogate recovery data is presented in the QA/QC Summary.

Matrix spike/duplicate spike - Specific analytes are added to selected samples prior to the extraction or purging. The results of the matrix spike/duplicate spike analyses are a measure of the precision and accuracy of the analysis. Matrix spike data are included in the QA/QC Summary.

Metals Analysis

Instrument calibration - Instrument calibration is performed in accordance with EPA contract laboratory protocols. Calibration verification is conducted every two hours or every ten samples, whichever is more frequent.

Blank analysis - A method blank is prepared with each batch of samples digested. The method blank defines the level of background (laboratory) contamination. (Results are presented as ug/L in the digestate.)

Duplicate analysis - Selected samples are prepared and analyzed in duplicate to define the precision of the results.

Matrix spike analysis - Each of the metals of interest are added to selected samples prior to sample preparation. The results of spike analyses define the accuracy of the results. Blank, duplicate and matrix spike results for metals analyses are summarized in the QA/QC Summary.

Conventional Parameters

Calibration - Calibration for each of the specific conventional analyses is performed according to the specific method utilized.

Replicate analyses - QC for the conventional analyses was limited to replicate analyses to define precision (reproducibility) of the analyses.

Check Samples - Known check samples for the conventional analyses also analyzed to verify calibration and to measure the efficiency of each method.

ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier Effluent BXT-25	Outfall BXT-38
Sample ID				
Lab Number				
<u>VOLATILE COMPOUNDS</u>				
Acetone	10	ug/L	230	14
Acetonitrile	10	ug/L	80	29
Acrolein	10	ug/L	ND	ND
Acrylonitrile	10	ug/L	ND	ND
Allyl chloride	5	ug/L	ND	ND
Benzene	5	ug/L	5 ✓	ND
Bromodichloromethane	5	ug/L	ND	ND
Bromoform	5	ug/L	ND	ND
Bromomethane	5	ug/L	ND	ND
Carbondisulfide	5	ug/L	ND	ND
Carbontetrachloride	5	ug/L	ND	ND
Chlorobenzene	5	ug/L	ND	ND
Chloroprene*	10	ug/L	ND	ND
Chloroethane	10	ug/L	ND	ND
Chlorodibromomethane	5	ug/L	ND	ND
Chloroform	5	ug/L	ND	ND
Chloromethane	10	ug/L	ND	ND
1,2-Dibromoethane	5	ug/L	ND	ND
1,2-Dibromo-3-chloropropane	5	ug/L	ND	ND
Dibromomethane	5	ug/L	ND	ND
trans-1,4-Dichloro-2-butene	5	ug/L	ND	ND
Dichlorodifluoromethane	10	ug/L	ND	ND
1,1-Dichloroethane	5	ug/L	ND	ND
1,2-Dichloroethane	5	ug/L	ND	ND
trans-1,2-Dichloroethylene	5	ug/L	ND	ND
1,1-Dichloroethylene	5	ug/L	ND	ND

*Pure standard not commercially available; 5-point calibration not run for this compound.

ANALYTICAL RESULTS
WASTEWATER TEST SAMPLE RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier Effluent	Outfall
Sample ID			<u>BXT-25</u>	<u>BXT-38</u>
Lab Number				
VOLATILE COMPOUNDS				
Dichloromethane	5	ug/L	ND	ND
1,2-Dichloropropane	5	ug/L	ND	ND
cis-1,3-Dichloropropene	5	ug/L	ND	ND
trans-1,3-Dichloropropene	5	ug/L	ND	ND
1,4-Dioxane	250	ug/L	ND	ND
Ethyl benzene	5	ug/L	ND ✓	ND
Ethyl cyanide	10	ug/L	ND	ND
2-Hexanone	10	ug/L	ND	ND
Iodomethane	5	ug/L	ND	ND
Isobutyl Alcohol	250	ug/L	48	ND
Methacrylonitrile	10	ug/L	ND	ND
Methyl ethyl ketone	10	ug/L	ND	ND
4-Methyl-2-pentanone	10	ug/L	ND	ND
Styrene	5	ug/L	ND ✓	ND
1,1,1,2-Tetrachloroethane	5	ug/L	ND	ND
1,1,2,2-Tetrachloroethane	5	ug/L	ND	ND
Tetrachloroethene	5	ug/L	ND	ND
Toluene	5	ug/L	5 ✓	ND
1,1,1-Trichloroethane	5	ug/L	ND	ND
1,1,2-Trichloroethane	5	ug/L	ND	ND
Trichloroethene	5	ug/L	ND	ND
Trichlorofluoromethane	5	ug/L	ND	ND
1,2,3-Trichloropropane	5	ug/L	ND	ND
Vinyl Acetate	10	ug/L	41 ND	ND
Vinyl Chloride	10	ug/L	ND	ND
Xylene	5	ug/L	1400 ND ✓	320 ND

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ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
Sample ID			Clarifier	
Lab Number			Effluent	Outfall
			<u>BXT-32</u>	<u>BXT-44</u>
SEMIVOLATILE COMPOUNDS				
Acenaphthene	10	ug/L	42	ND
Acenaphthalene	10	ug/L	ND	ND
Acetophenone	10	ug/L	ND	ND
2-Acetylaminofluorene	10	ug/L	ND	ND
4-Aminobiphenyl	10	ug/L	ND	5
Aniline	10	ug/L	ND	ND
Anthracene	10	ug/L	27	ND
Aramite	10	ug/L	ND	ND
Benz(a)anthracene	10	ug/L	17	ND
Benzo(ghi)perylene	10	ug/L	ND	ND
Benzo(k)fluoranthene	10	ug/L	ND	ND
Benzyl alcohol	10	ug/L	ND	ND
Benzo(b)fluoranthene	10	ug/L	6	ND
Benzo(a)pyrene	10	ug/L	7	ND
Bis(2-Chloroethoxy)methane	10	ug/L	ND	ND
Bis(2-Chloroethyl)ether	10	ug/L	ND	ND
Bis(2-Chloroisopropyl)ether	10	ug/L	ND	ND
Bis(2-ethylhexyl)phthalate	10	ug/L	ND	ND
4-Bromophenyl phenyl ether	10	ug/L	ND	ND
Butyl benzyl phthalate	10	ug/L	ND	ND
2-sec-Butyl-4,6-dinitrophenol	20	ug/L	ND	ND
p-Chloroaniline	10	ug/L	ND	ND
p-Chloro-m-cresol	10	ug/L	ND	ND
2-Chloronaphthalene	10	ug/L	ND	ND
2-Chlorophenol	10	ug/L	ND	ND
4-Chlorophenyl phenyl ether	10	ug/L	ND	ND
Chrysene	10	ug/L	31	ND
m-Cresol	10	ug/L	ND	ND
o-Cresol	10	ug/L	ND	ND
p-Cresol	10	ug/L	ND	ND

ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier Effluent <u>BXT-32</u>	Outfall <u>BXT-44</u>
Sample ID				
Lab Number				
SEMIVOLATILE COMPOUNDS				
Dibenz(a,h)anthracene	10	ug/L	ND	ND
Dibenzofuran	10	ug/L	ND	ND
Di-n-butyl phthalate	10	ug/L	ND	ND
o-Dichlorobenzene	10	ug/L	ND	ND
m-Dichlorobenzene	10	ug/L	ND	ND
p-Dichlorobenzene	10	ug/L	ND	ND
3,3'-Dichlorobenzidine	20	ug/L	ND	ND
2,4-Dichlorophenol	10	ug/L	ND	ND
2,6-Dichlorophenol	10	ug/L	ND	ND
Diethyl phthalate	10	ug/L	ND	ND
p-Dimethylaminoazobenzene	10	ug/L	ND	ND
7,12-Dimethylbenz(a) anthracene	10	ug/L	ND	ND
3,3'-Dimethyl benzidine	20	ug/L	ND	ND
alpha,alpha-Dimethyl- phenethylamine	10	ug/L	ND	ND
2,4-Dimethylphenol	10	ug/L	40	ND
Dimethyl phthalate	10	ug/L	ND	ND
m-Dinitrobenzene	10	ug/L	ND	ND
4,6-Dinitro-o-cresol	20	ug/L	ND	ND
2,4-Dinitrophenol	20	ug/L	ND	ND
2,4-Dinitrotoluene	10	ug/L	ND	ND
2,6-Dinitrotoluene	10	ug/L	ND	ND
Di-n-octyl phthalate	10	ug/L	ND	ND
Diphenylamine	10	ug/L	ND	ND
Ethyl methacrylate	20	ug/L	ND	ND
Ethyl methane sulfonate	10	ug/L	ND	ND
Fluoranthene	10	ug/L	24	ND
Fluorene	10	ug/L	32	ND
Hexachlorobenzene	10	ug/L	ND	ND
Hexachlorobutadiene	10	ug/L	ND	ND
Hexachlorocyclopentadiene	10	ug/L	ND	ND

ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier Effluent	Outfall
Sample ID			BXT-32	BXT-44
Lab Number				
SEMIVOLATILE COMPOUNDS				
Hexachloroethane	10	ug/L	ND	ND
Hexachlorophene*		ug/L	ND	ND
Hexachloropropene	10	ug/L	ND	ND
Indeno(1,2,3-cd)pyrene	10	ug/L	ND	ND
Isophorone	10	ug/L	ND	ND
Isosafrole	10	ug/L	ND	ND
Methapyrilene	10	ug/L	ND	5
3-Methylcholanthrene	10	ug/L	ND	ND
Methyl methacrylate	10	ug/L	ND	ND
Methyl methanesulfonate	20	ug/L	ND	ND
2-Methylnaphthalene	10	ug/L	ND	ND
Naphthalene	10	ug/L	ND ✓	ND
1,4-Naphthoquinone	10	ug/L	ND	ND
1-Naphthylamine	10	ug/L	ND	ND
2-Naphthylamine	10	ug/L	ND	ND
o-Nitroaniline	50	ug/L	ND	ND
m-Nitroaniline	50	ug/L	ND	ND
p-Nitroaniline	50	ug/L	ND	ND
Nitrobenzene	10	ug/L	ND	ND
o-Nitrophenol	10	ug/L	ND	ND
p-Nitrophenol	50	ug/L	ND	ND
4-Nitroquinoline 1-oxide	20	ug/L	ND	ND
N-Nitrosodi-n-butylamine	10	ug/L	ND	ND
N-Nitrosodiethylamine	20	ug/L	ND	ND
N-Nitrosomethylethylamine	20	ug/L	ND	ND
N-Nitrosodiphenylamine	10	ug/L	ND	ND
N-Nitrosodimethylamine	50	ug/L	ND	ND
N-Nitrosodipropylamine	10	ug/L	ND	ND
N-Nitrosomorpholine	10	ug/L	ND	ND
N-Nitrosopiperidine	10	ug/L	ND	ND

*Not recovered in spiking recovery studies.

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ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier Effluent <u>BXT-32</u>	Outfall <u>BXT-44</u>
Sample ID				
Lab Number				
SEMIVOLATILE COMPOUNDS				
N-Nitrosopyrrolidine	10	ug/L	ND	ND
5-Nitro-o-toluidine	10	ug/L	ND	ND
Pentachlorobenzene	10	ug/L	ND	ND
Pentachloroethane	10	ug/L	ND	ND
Pentachloronitrobenzene	20	ug/L	ND	ND
Pentachlorophenol	50	ug/L	ND	ND
Phenacetin	10	ug/L	ND	ND
Phenanthrene	10	ug/L	77	ND
Phenol	10	ug/L	ND	9
p-Phenylenediamine	50	ug/L	ND	ND
2-Picoline	10	ug/L	16	9
Pronamide	10	ug/L	ND	ND
Pyrene	10	ug/L	97	6
Pyridine	20	ug/L	ND	ND
Safrole	10	ug/L	ND	ND
1,2,4,5-Tetrachlorobenzene	10	ug/L	ND	ND
2,3,4,6-Tetrachlorophenol	10	ug/L	ND	ND
o-Toluidine	10	ug/L	23	ND
1,2,4-Trichlorobenzene	10	ug/L	ND	ND
2,4,5-Trichlorophenol	10	ug/L	ND	ND
2,4,6-Trichlorophenol	10	ug/L	ND	ND
Sym-Trinitrobenzene	20	ug/L	ND	ND

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ANALYTICAL RESULTS
WASTEWATER TEST RESULTS

Parameter	Det'n Limits	Units	Analytical Results	
			Clarifier	
Sample ID			Effluent	Outfall
Lab Number			<u>BXT-34.35 & 36</u>	<u>BXT-46.47 & 48</u>
METALS				
Antimony	300	ug/L	ND	ND
Arsenic	10	ug/L	12.8	ND
Barium	20	ug/L	57.6	116
Beryllium	3	ug/L	ND	ND
Cadmium	40	ug/L	ND	ND
Chromium	70	ug/L	ND	ND
Cobalt	70	ug/L	ND	ND
Copper	60	ug/L	ND	ND
Lead	10	ug/L	ND	ND
Mercury	2	ug/L	ND	ND
Nickel	50	ug/L	ND	ND
Selenium	20	ug/L	353	102
Silver	70	ug/L	ND	ND
Thallium	10	ug/L	ND	ND
Tin	8000	ug/L	ND	ND
Vanadium	80	ug/L	ND	ND
Zinc	20	ug/L	70.2	168
PARAMETER				
Cyanide	40	ug/L	80	96
Sulfide	10000	ug/L	ND	ND

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