**STOPPING
WATER POLLUTION
AT ITS SOURCE**

MISA

Municipal/Industrial Strategy for Abatement

**ACUTE LETHALITY DATA FOR ONTARIO'S
PETROLEUM REFINERY EFFLUENTS
COVERING THE PERIOD FROM
DECEMBER 1988 TO MAY 1989**

JUNE 1990

Ontario

**Environment
Environnement**

Jim Bradley Minister/ministre

MUNICIPAL/INDUSTRIAL STRATEGY FOR ABATEMENT
(MISA)

ACUTE LETHALITY DATA FOR ONTARIO'S
PETROLEUM REFINERY EFFLUENTS COVERING
THE PERIOD FROM DECEMBER 1988 to MAY 1989

Report Prepared by:
Aquatic Toxicity Unit
Water Resources Branch
Ontario Ministry of the Environment

JUNE 1990

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FIBS 1048
LOG 90-2330-086

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SUMMARY

Ontario's Regulation under the Environmental Protection Act requires Petroleum Refineries to monitor their discharge (both process and cooling water) to receiving waters for acute lethality to trout and to *Daphnia magna*. The timing of these samples was arranged to coincide with chemical characterization also required under the regulation. The frequency of these samples is monthly for both toxicity test procedures on process effluents with the exception that if tests over three consecutive months show insignificant mortalities with trout then in subsequent months a single concentration test may be used. For cooling waters the required frequency of sampling is quarterly. In both cases the Ministry's test protocols were followed by all laboratories. All toxicity tests required by the regulation were submitted to the Ministry. The following data report presents the toxicity test results of this monitoring along with the results of audit samples that were tested at the Ministry's lab in Rexdale. In addition, toxicity tests on some intake waters were also submitted and these have been included in this report.

Of the more than 50 samples that were tested, only the process effluent at the Petro Canada refinery in Oakville had samples that caused significant mortalities. The sample from March 21, 1989 was toxic to both *Daphnia* and trout. This is explained best by the fact that samples taken on the same day measured more than 27 mg/l zinc. This is clearly above lethal levels. Other contributors to toxicity on this day may have been hexavalent chromium at 0.1 mg/l and unionized ammonia. The sample from April 11 was only toxic to *Daphnia*. At the Rexdale laboratory, toxicity tests with hexavalent chromium were performed and a LC50 value of 0.1 mg/l was determined for *Daphnia*. Since *Daphnia* tend to be slightly more sensitive to hexavalent chromium than trout, a value of 0.26 mg/l may have been lethal to one without being lethal to the other. The third lethal sample collected on December 13, 1989 was only lethal to trout. The toxicants in this sample cannot be determined with certainty. Neither zinc or chromium were measured on this sampling date. However, the ammonia concentration was close to lethal level and may have contributed to the observed lethality. Generally, trout are more sensitive to ammonia than are *Daphnia*.

It is clear that for these organisms, at least, samples from the Petroleum Refineries during this period had little effect on acute lethality.

The chemical characterization for the Petro-Canada refinery in Oakville was also reviewed in terms of other potential impacts. Eliminating the substances that had measured concentrations at or below detection limits, there is left a small list of organic compounds, which some are chlorinated. None of these appear to be present at acute lethal levels or even at chronic effect levels. However, a number of them can transfer to other media by volatilization or sorption to sediment therefore the potential for bioaccumulation should be reviewed.

Common to many of the samples from the Petro-Canada Oakville refinery are

measurable levels of some of the smaller Polycyclic Aromatic Hydrocarbons (PAHs). These chemicals are known to be transformed enzymatically by many aquatic organisms to varying degrees. Fish, for example, are more able to do this than are clams. Clams, therefore, tend to bioaccumulate higher concentrations of PAHs in their tissues. The ability of the organism to metabolize PAHs will not only reduce the amount of PAHs within itself but also reduce the availability for accumulation up the food chain. Although the levels of PAHs may be reduced, the remaining metabolites however can be highly genotoxic. Best known are the 4 and 5 ring PAHs like Benzo-a-pyrene but other PAHs have some of this effect.

Also present are measurable concentrations of two chlorinated hydrocarbons; chloromethane and 1,2 dichloropropane. These are highly volatile and would transfer to the air rapidly and not bioaccumulate. 1,2 Dichloropropane is fairly stable and may distribute through long range transport.

Some of the samples contain measurable amounts of benzene, toluene, xylene, and styrene. These single ring aromatics are generally highly volatile and may also be soluble in water.

There are also some chlorinated aromatics including 2,4,5 trichlorotoluene, 1,2,3,4 tetrachlorobenzene, and octachlorodibenzo-p-dioxin. They do not bioaccumulate but may have other toxic effects. Of the substances found, 2,4,5 trichlorotoluene and 1,2,3,4 tetrachlorobenzene represent the most potential hazard. The levels found, however, are considerably lower than known toxic levels. The dioxin found is the least toxic of the dioxins, having approximately 0.0001 times the toxicity of 2,3,7,8 TCDD. These substances may bioaccumulate and would be found primarily associated with particulates. The dioxin, while it has a high log Kow, it is also a large molecule and tends to be non-mobile in the environment.

Creosol, 2,4 dinitrophenol, 4 chloro 3 methyl phenol were found in measurable quantities. These are non-volatile and relatively soluble in water. Therefore their fate is determined primarily by dilution, dispersion, and reaction in the water. They would not be expected to bioaccumulate, but can be highly toxic.

In general, the reporting of toxicity data by the industries went smoothly. The quality of the toxicity results and presentation has been good. All problems have been minor ones which have now been resolved.

None of the audit samples caused significant mortalities to either species which was consistent with the results supplied by the industry. Unfortunately, it was not possible to have the audit samples collected at the same time as one of the industry reported samples. Other split samples with the same consultant labs have indicated that all labs involved are capable of producing comparable results.

COMPANY: Esso Petroleum Canada, Sarnia
(70102)
(now with Sarnia Refinery(Imperial Oil Ltd.))
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989 were provided by Esso Petroleum Canada. All six process effluent samples were determined to have been non-acutely lethal to test fish.

intake water

process effluent

05880001 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890009 sampled: 01/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890010 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890026 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890028 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890033 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890105 sampled: 05/30/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

Eso Petroleum Canada (continued)

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890043 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890042 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890041 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

TOXICITY TEST REPORT Sample: 05880001

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Esso Petroleum Canada
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : Water
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish., OME, 1985).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY	
%	00:00	02:10	03:10	05:25	22:10	46:10	70:00	95:00	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

56 hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05880001

TEST CONC. %	E L A P S E D T I M E						
%	00:00	02:10	03:10	05:25	22:10	46:10	70:00 95:00
100	pH 7.0 02 ppm 9.8 Cond. 710 Temp(C) 15.0	7.4 9.2 15.0	7.4 9.2 15.0	7.5 9.3 15.0	7.5 9.6 15.0	7.6 9.7 15.0	7.5 9.6 15.0
75	pH 7.0 02 ppm 10.0 Cond. 550 Temp(C) 15.0	7.5 9.5 15.0	7.5 9.3 15.0	7.5 9.6 15.0	7.6 9.7 15.0	7.6 9.9 15.0	7.5 9.6 15.0
56	pH 7.1 02 ppm 10.2 Cond. 450 Temp(C) 15.0	7.1 9.6 15.0	7.1 9.2 15.0	7.1 9.9 15.0	7.6 9.7 15.0	7.6 9.9 15.0	7.6 9.7 15.0
25	pH 7.0 02 ppm 10.4 Cond. 320 Temp(C) 15.0	7.0 9.8 15.0	7.0 9.7 15.0	7.0 9.8 15.0	7.6 9.9 15.0	7.6 9.9 15.0	7.6 9.8 15.0
10	pH 7.0 02 ppm 10.5 Cond. 230 Temp(C) 15.0	7.0 9.9 15.0	7.0 9.8 15.0	7.0 9.8 15.0	7.6 10.0 15.0	7.6 10.1 15.0	7.6 10.0 15.0
1	pH 7.0 02 ppm 10.5 Cond. 162 Temp(C) 15.0	7.0 10.5 15.0	7.0 10.5 15.0	7.0 10.5 15.0	7.6 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0
Control	pH 7.0 02 ppm 10.2 Cond. 162 Temp(C) 15.0	7.0 10.2 15.0	7.0 10.2 15.0	7.0 10.2 15.0	7.6 10.0 15.0	7.6 10.1 15.0	7.6 10.2 15.0
Control	pH 7.1 02 ppm 10.3 Cond. 162 Temp(C) 15.0	7.1 10.3 15.0	7.1 10.1 15.0	7.1 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 058900009

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Esso Petroleum Canada
(70102)
Region : Sarnia, ONT
Industry : Southwest
: Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 01/23/89
Received : 01/23/89
Tested : 01/24/89 at: 1700

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	17:00	42:00	65:30	93:30	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 058900009

TEST CONC. %	E L A P S E D T I M E				
	00:00	17:00	42:00	65:30	93:30
100	pH	7.1	7.4	7.4	7.4
	O2 ppm	8.0	9.8	10.0	9.8
	Cond. Temp(C)	800 15.0	800 15.0	850 15.0	850 15.0
75	pH	7.1	7.5	7.4	7.4
	O2 ppm	8.2	10.0	10.1	9.8
	Cond. Temp(C)	670 15.0	670 15.0	710 15.0	710 15.0
56	pH	7.1	7.6	7.5	7.4
	O2 ppm	9.0	10.2	10.1	9.6
	Cond. Temp(C)	470 15.0	465 15.0	465 15.0	465 15.0
25	pH	7.1	7.6	7.5	7.5
	O2 ppm	10.2	10.2	10.0	9.7
	Cond. Temp(C)	300 15.0	315 15.0	315 15.0	315 15.0
10	pH	7.2	7.6	7.4	7.5
	O2 ppm	10.0	10.0	9.8	9.8
	Cond. Temp(C)	220 15.0	285 15.0	285 15.0	285 15.0
1	pH	7.3	7.6	7.4	7.6
	O2 ppm	10.2	10.2	10.0	9.9
	Cond. Temp(C)	172 15.0	192 15.0	192 15.0	192 15.0
Control	pH	7.3	7.6	7.4	7.4
	O2 ppm	10.2	10.0	9.9	9.9
	Cond. Temp(C)	162 15.0	182 15.0	182 15.0	182 15.0
Control	pH	7.3	7.5	7.4	7.4
	O2 ppm	10.3	10.2	9.9	9.8
	Cond. Temp(C)	165 15.0	182 15.0	182 15.0	182 15.0

SLOPE of Mortality Curve :
 LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 05890010

TEST CONDITIONS

Company : Esso Petroleum Canada
 : Sarnia, ONT
 : (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : process effluent, (300)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/06/89
 Received : 02/06/89
 Tested : 02/07/89 at: 1615

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:25	45:15	70:25	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890010

TEST CONC. %	E L A P S E D T I M E				
	00:00	21:25	45:15	70:25	95:15
100	pH 8.0 O2 ppm 980 Temp(C) 15.0	6.8 7.3 7.3 9.3 9.4 15.0	7.2 7.3 7.2 9.4 9.0 15.0	7.2 7.3 7.2 9.0 8.90 15.0	7.3 9.0 8.90 15.0
75	pH 9.0 O2 ppm 680 Temp(C) 15.0	7.0 7.5 7.4 9.2 9.4 15.0	7.2 7.3 7.2 9.4 8.8 15.0	7.3 9.8 6.80 15.0	7.3 9.8 6.80 15.0
50	pH 9.6 O2 ppm 535 Temp(C) 15.0	7.1 7.5 9.6 9.2 9.2 15.0	7.3 7.3 9.2 9.2 9.1 15.0	7.3 7.3 9.1 8.5 550 15.0	7.4 8.5 550 15.0
25	pH 10.4 O2 ppm 320 Temp(C) 15.0	7.3 7.7 9.5 8.4 9.3 15.0	7.5 7.5 7.5 9.3 9.4 15.0	7.5 9.4 325 15.0	7.5 9.4 325 15.0
10	pH 10.8 O2 ppm 225 Temp(C) 15.0	7.4 7.8 9.7 9.6 9.4 15.0	7.5 7.5 9.6 9.4 9.2 15.0	7.5 9.2 232 15.0	7.6 9.2 232 15.0
1	pH 11.0 O2 ppm 170 Temp(C) 15.0	7.4 7.9 9.7 9.8 9.6 15.0	7.5 7.5 9.8 9.6 9.5 15.0	7.5 9.5 190 15.0	7.7 9.5 190 15.0
Control	pH 10.8 O2 ppm 162 Temp(C) 15.0	7.3 7.7 9.8 9.9 10.0 15.0	7.5 7.6 9.9 10.0 10.0 15.0	7.6 9.7 172 15.0	7.6 9.7 172 15.0
Control	pH 11.0 O2 ppm 162 Temp(C) 15.0	7.3 7.6 9.8 9.8 9.9 15.0	7.4 7.4 9.8 9.8 9.9 15.0	7.5 9.7 172 15.0	7.6 9.7 172 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890026

TEST CONDITIONS

Company : Esso Petroleum Canada
 Sarnia, ONT (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : process effluent, (300)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 03/06/89
 Received : 03/06/89
 Tested : 03/07/89 at: 1530

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish, OME, 1983).

Test Animal
 Weight(gm)
 Length(mm)

: Rainbow trout
 ;

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST
CONC.
%

E L A P S E D T I M E

00:00 20:00 49:10 68:00 94:10

100	pH 7.0	pH 7.5	pH 7.4	pH 7.4	pH 7.4
	O2 ppm 9.0	O2 ppm 9.0	O2 ppm 9.5	O2 ppm 10.0	O2 ppm 9.7
	Cond. 600	Cond. 600	Cond. 600	Cond. 680	Cond. 680
	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0
100	pH 7.0	pH 7.4	pH 7.5	pH 7.4	pH 7.5
	O2 ppm 7.6	O2 ppm 9.2	O2 ppm 9.6	O2 ppm 10.0	O2 ppm 9.8
	Cond. 600	Cond. 600	Cond. 600	Cond. 690	Cond. 690
	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0
Control	pH 7.6	pH 7.5	pH 7.6	pH 7.5	pH 7.7
	O2 ppm 10.0	O2 ppm 9.8	O2 ppm 10.1	O2 ppm 10.2	O2 ppm 10.2
	Cond. 168	Cond. 168	Cond. 178	Cond. 178	Cond. 178
	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0
Control	pH 7.6	pH 7.5	pH 7.6	pH 7.6	pH 7.7
	O2 ppm 9.9	O2 ppm 9.6	O2 ppm 9.8	O2 ppm 10.2	O2 ppm 10.2
	Cond. 178	Cond. 178	Cond. 178	Cond. 178	Cond. 178
	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0	Temp(C) 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890028

TEST CONDITIONS

Company : Esso Petroleum Canada
 : Sarnia, ONT
 : (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : process effluent, (300)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 04/03/89
 Received : 04/03/89
 Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10		%
100	0	0	0	0	0		0
100	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

% Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST CONC. %	E L A P S E D T I M E					
	00:00	19:15	46:10	69:00	95:10	
100	pH 02 ppm Cond. Temp(C)	6.9 7.4 550 15.0	7.3 8.2 9.0 15.0	7.3 9.0 15.0	7.3 9.2 550 15.0	7.4 9.2 550 15.0
100	pH 02 ppm Cond. Temp(C)	6.9 7.6 550 15.0	7.3 9.0 9.2 15.0	7.3 9.0 9.2 15.0	7.4 9.2 550 15.0	7.4 9.2 550 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.2 162 15.0	7.3 9.2 10.1 15.0	7.6 10.1 9.9 15.0	7.3 9.9 172 15.0	7.5 10.0 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.2 162 15.0	7.4 9.2 10.2 15.0	7.6 10.2 10.0 15.0	7.4 10.0 170 15.0	7.5 10.0 170 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890033

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30			%
100	0	0	0	0	0			0
100	0	0	0	0	0			0
Control	0	0	0	0	0			0
Control	0	0	0	0	0			0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST CONC. %	E L A P S E D T I M E						
	00:00	21:30	47:30	72:30	97:30		
100	pH O2 ppm Cond. Temp(C)	6.8 7.8 660 15.0	7.5 9.8 15.0	7.4 8.6 15.0	7.6 9.0 15.0	7.2 9.6 650	7.2
100	pH O2 ppm Cond. Temp(C)	6.8 7.6 660 15.0	7.5 9.6 15.0	7.4 8.6 15.0	7.4 9.0 15.0	7.2 9.5 650	7.2
Control	pH O2 ppm Cond. Temp(C)	7.3 10.6 158 15.0	7.6 9.8 15.0	7.6 9.3 15.0	7.6 9.8 15.0	7.3 10.1 172	7.3
Control	pH O2 ppm Cond. Temp(C)	7.3 10.4 158 15.0	7.6 10.0 15.0	7.6 9.4 15.0	7.5 9.9 15.0	7.3 170	7.3

TOXICITY TEST REPORT

Sample: 01890105

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 05/30/89
Received : 05/31/89
Tested : at: 930

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal
Weight (gm)
Length (mm)

: Rainbow trout
:
:
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	02:10	24:00	48:10	75:30	98:10		%
100	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0

% Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : WISA audit sample.

TOXICITY TEST PARAMETERS

Sample Number: 01890105

TEST
CONC.
%

E L A P S E D T I M E

00:00 02:10 24:00 48:10 75:30 98:10

100	pH	7.0	7.3	7.6	7.5	7.3	7.2
	O2 ppm	8.7	9.5	9.6	9.6	9.6	9.5
	Cond.	510	510	540	560	540	525
	Temp(C)	14.0	14.0	15.0	15.0	15.0	15.0
65	pH	7.6	7.6	7.6	7.6	7.7	7.2
	O2 ppm	10.0	9.6	9.7	9.7	9.7	9.4
	Cond.	445	450	450	450	460	450
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0
40	pH	7.5	7.7	7.6	7.6	6.8	7.3
	O2 ppm	10.0	9.7	9.7	9.7	9.7	9.4
	Cond.	374	375	370	390	350	350
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0
30	pH	7.5	7.6	7.6	7.6	8.1	7.3
	O2 ppm	9.9	9.7	9.7	9.7	9.7	9.5
	Cond.	335	345	345	330	330	340
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0
20	pH	7.4	7.7	7.5	7.5	8.1	7.3
	O2 ppm	9.8	9.6	9.7	9.8	9.4	9.4
	Cond.	315	315	320	320	280	280
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0
10	pH	7.4	7.6	7.5	7.5	8.1	7.3
	O2 ppm	9.7	9.6	9.6	9.6	9.6	9.4
	Cond.	285	280	280	280	275	275
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.1	7.4	8.1	7.3	7.3
	O2 ppm	9.7	9.8	9.8	9.7	9.7	9.5
	Cond.	260	260	260	260	260	260
	Temp(C)	14.0	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890017

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-SEP. 11812, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sample Collected : 02/14/89
Date Received : 02/14/89
Tested : 02/15/89 at: 1315

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	00:00	21:25	46:25	72:30	95:15	TOTAL MORTALITY %
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC. %	ELAPSED TIME	00:00	21:25	46:25	72:30	95:15
100	pH	7.9	7.6	7.6	7.6	7.6
	O2 ppm	9.4	9.4	9.4	9.8	9.7
	Cond.	188				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.6	7.6	7.6	7.6
	O2 ppm	9.0	9.8	9.3	9.8	9.8
	Cond.	184				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.7	7.6	7.6	7.7
	O2 ppm	9.2	9.6	9.7	9.8	9.8
	Cond.	182				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.5	7.6
	O2 ppm	9.4	9.4	9.3	9.6	10.0
	Cond.	178				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	9.8	10.1
	Cond.	176				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.5	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	10.0	10.0
	Cond.	174				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.6	7.7
	O2 ppm	10.4	9.9	10.6	10.2	10.2
	Cond.	176				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.5	7.6	7.7
	O2 ppm	10.6	9.9	10.3	10.1	10.3
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890043

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-SEP. 11&12, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	52:10	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

56 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 52:10 75:10 97:10

100	pH 02 ppm Cond. Temp(C)	8.2 9.0 178 15.0	7.5 9.4 15.0	7.5 8.4 15.0	7.4 9.3 15.0	7.5 9.7 187
75	pH 02 ppm Cond. Temp(C)	7.8 9.2 176 15.0	7.5 9.5 15.0	7.5 8.5 15.0	7.4 9.6 15.0	7.5 9.7 182
56	pH 02 ppm Cond. Temp(C)	7.5 9.5 174 15.0	7.4 9.5 15.0	7.5 9.2 15.0	7.4 9.2 15.0	7.5 9.6 179
25	pH 02 ppm Cond. Temp(C)	7.3 9.2 172 15.0	7.3 9.3 15.0	7.4 8.6 15.0	7.3 9.2 15.0	7.4 9.1 185
10	pH 02 ppm Cond. Temp(C)	7.2 9.9 170 15.0	7.3 9.1 15.0	7.4 8.4 15.0	7.3 8.6 15.0	7.4 9.1 175
1	pH 02 ppm Cond. Temp(C)	7.2 9.9 170 15.0	7.3 9.3 15.0	7.5 8.4 15.0	7.3 9.2 15.0	7.4 9.2 173
Control	pH 02 ppm Cond. Temp(C)	7.0 9.9 172 15.0	7.4 9.7 15.0	7.4 8.4 15.0	7.3 9.8 15.0	7.4 9.6 178
Control	pH 02 ppm Cond. Temp(C)	7.0 9.8 174 15.0	7.3 9.5 15.0	7.3 8.6 15.0	7.3 9.0 15.0	7.3 9.6 178

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

Sample: 05890016

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Esso Petroleum Canada
 (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : CW-Sep.9, (500)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/14/89
 Received : 02/14/89
 Tested : 02/15/89 at: 1315

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:25	51:25	72:30	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890016

TEST CONC.	E L A P S E D T I M E				
%	00:00	21:25	51:25	72:30	95:15
100	pH 7.8	7.5	7.6	7.6	7.7
	O2 ppm 8.0	10.0	9.6	9.7	10.0
	Cond. 720				740
	Temp(C) 15.0	15.0	15.0	15.0	15.0
75	pH 7.7	7.6	7.6	7.6	7.7
	O2 ppm 8.1	9.8	9.4	9.6	10.0
	Cond. 560				600
	Temp(C) 15.0	15.0	15.0	15.0	15.0
56	pH 7.6	7.5	7.5	7.4	7.7
	O2 ppm 8.2	9.6	9.6	9.6	10.1
	Cond. 460				458
	Temp(C) 15.0	15.0	15.0	15.0	15.0
25	pH 7.5	7.5	7.6	7.5	7.6
	O2 ppm 9.4	9.9	9.4	9.6	9.9
	Cond. 320				310
	Temp(C) 15.0	15.0	15.0	15.0	15.0
10	pH 7.5	7.5	7.5	7.5	7.6
	O2 ppm 9.4	9.9	9.6	9.8	10.2
	Cond. 220				225
	Temp(C) 15.0	15.0	15.0	15.0	15.0
1	pH 7.5	7.5	7.6	7.5	7.6
	O2 ppm 9.4	9.6	9.7	10.1	10.2
	Cond. 180				195
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.4	7.7	7.6	7.6	7.7
	O2 ppm 10.6	9.9	10.6	10.2	10.2
	Cond. 174				178
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.4	7.6	7.5	7.6	7.7
	O2 ppm 10.6	9.6	10.3	10.1	10.3
	Cond. 174				178
	Temp(C) 15.0	15.0	15.0	15.0	15.0

Sample: 05890042

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-Sep.9, (500)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	E L A P S E D T I M E				TOTAL MORTALITY %
	00:00	24:00	52:10	75:10	97:10
100	0	0	0	0	0
75	0	0	0	0	0
56	0	0	0	0	0
25	0	0	0	0	0
10	0	0	0	0	0
1	0	0	0	0	0
Control	0	0	0	0	0
Control	0	0	0	0	0

% Hour LC50 : Non-lethal

% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 52:10 75:10 97:10

100	pH 7.8	O2 ppm 9.6	Cond. 620	7.4 9.4	7.4 8.7	7.3 9.1	7.3 650
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
75	pH 7.5	O2 ppm 9.4	Cond. 520	7.3 9.2	7.4 8.5	7.3 9.1	7.3 530
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
56	pH 7.3	O2 ppm 9.5	Cond. 410	7.3 9.5	7.3 8.2	7.2 9.4	7.3 410
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
25	pH 7.2	O2 ppm 9.5	Cond. 292	7.2 9.6	7.3 8.3	7.3 9.0	7.4 295
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
10	pH 7.2	O2 ppm 9.6	Cond. 210	7.3 9.4	7.3 8.4	7.2 9.1	7.4 210
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
1	pH 7.2	O2 ppm 9.8	Cond. 180	7.2 9.5	7.3 8.4	7.3 8.5	7.4 179
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH 7.0	O2 ppm 9.9	Cond. 172	7.4 9.7	7.4 8.4	7.3 9.8	7.4 178
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH 7.0	O2 ppm 9.8	Cond. 174	7.3 9.5	7.3 8.6	7.3 9.0	7.3 178
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890015

TEST CONDITIONS

Company : Esso Petroleum Canada
 : Sarnia, ONT
 : (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : CW-Sep.3, (600)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/14/89
 Received : 02/14/89
 Tested : 02/15/89 at: 1315

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:25	51:25	72:30	95:25	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	1	10
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC.	E L A P S E D T I M E				
%	00:00	21:25	51:25	72:30	95:25
100	pH	7.7	7.7	7.7	7.6
	O2 ppm	8.2	9.9	9.6	9.9
	Cond.	174			178
75	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.6	7.5	7.6	7.5
	O2 ppm	8.2	9.6	9.5	9.8
56	Cond.	174			178
	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.6	7.6	7.6	7.6
25	O2 ppm	8.2	9.6	9.9	9.9
	Cond.	172			178
	Temp(C)	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.6
	O2 ppm	8.2	9.7	9.7	10.0
	Cond.	174			179
1	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.6	7.6	7.6	7.6
	O2 ppm	8.1	9.8	9.8	10.1
Control	Cond.	176			179
	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.5	7.5	7.6	7.5
Control	O2 ppm	8.2	9.9	9.9	10.0
	Cond.	176			180
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.7
	O2 ppm	10.6	9.9	10.6	10.2
	Cond.	174			178
Control	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.4	7.6	7.5	7.7
	O2 ppm	10.6	9.6	10.3	10.3
Control	Cond.	174			178
	Temp(C)	15.0	15.0	15.0	15.0

Sample: 05890041

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-Sep.3, (600)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	49:00	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST CONC.	E L A P S E D T I M E				
%	00:00	24:00	49:00	75:10	97:10
100	pH 7.7 O2 ppm 9.7 Cond. 170 Temp(C) 15.0	7.4 7.3 9.9 8.7 15.0 15.0	7.4 7.3 9.9 8.7 15.0 15.0	7.3 7.3 9.1 9.1 172 172	7.3 7.3 9.8 9.8 172 172
75	pH 7.4 O2 ppm 9.8 Cond. 170 Temp(C) 15.0	7.3 7.4 9.9 8.6 15.0 15.0	7.4 7.2 8.6 8.8 15.0 15.0	7.3 7.3 9.1 9.1 172 172	7.3 7.3 9.1 9.1 175 175
56	pH 7.2 O2 ppm 9.7 Cond. 172 Temp(C) 15.0	7.2 7.4 9.8 8.4 15.0 15.0	7.4 7.2 8.4 8.7 15.0 15.0	7.3 7.3 9.1 9.1 175 175	7.3 7.3 9.1 9.1 175 175
25	pH 7.1 O2 ppm 9.8 Cond. 172 Temp(C) 15.0	7.1 7.3 9.8 8.2 15.0 15.0	7.3 7.2 8.2 8.6 15.0 15.0	7.3 7.3 8.8 8.8 175 175	7.3 7.3 8.8 8.8 175 175
10	pH 7.1 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.1 7.3 9.5 8.4 15.0 15.0	7.3 7.2 9.2 9.2 15.0 15.0	7.3 7.3 9.2 9.2 178 178	7.3 7.3 9.2 9.2 178 178
1	pH 7.1 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.1 7.4 9.4 8.4 15.0 15.0	7.3 7.3 9.1 9.1 180 180	7.3 7.3 9.0 9.0 180 180	7.3 7.3 9.0 9.0 180 180
Control	pH 7.0 O2 ppm 9.9 Cond. 172 Temp(C) 15.0	7.4 7.4 9.7 8.4 15.0 15.0	7.3 7.3 8.4 9.8 15.0 15.0	7.4 7.4 9.6 9.6 178 178	7.4 7.4 9.6 9.6 178 178
Control	pH 7.0 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.3 7.3 9.5 8.6 15.0 15.0	7.3 7.3 8.6 9.0 15.0 15.0	7.3 7.3 9.0 9.0 178 178	7.3 7.3 9.0 9.0 178 178

COMPANY: Esso Petroleum Canada, Sarnia
(70102)
(now with Sarnia Refinery(Imperial Oil Ltd.))
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Data for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were provided by Esso Petroleum Canada in Sarnia. All six of these samples were determined to be not acutely lethal to *Daphnia*.

Toxicity tests were also conducted on two samples from each of CW.-Sep 3, CW.-Sep 9, and CW.-Sep 11&12 sampling points. All six samples were not acutely lethal to *Daphnia magna*.

intake water

process effluent

05880001 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890009 sampled: 01/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890010 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890026 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890028 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890033 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890105 sampled: 05/30/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Esso Petroleum Canada (continued)

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890043 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890042 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890041 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

TOXICITY TEST REPORT Sample: 05880001

TEST CONDITIONS

Company : Esso Petroleum Canada
 Location : Sarnia, ONT
 Region : Southwest
 Industry : Petroleum Refining
 Control point : process effluent, (300)
 Laboratory : Pol/Lutech
 Sampling Method : Grab
 Sampled By : T. Moran
 Date Collected : 12/12/88
 Date Received : 12/12/88
 Tested : 12/13/88 at: 1100

Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol. OME, 1985)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 47:00	0
50	0		0
26	0		8
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880001

TEST CONC. %

ELAPSED TIME

00:00 47:00

100	pH 7.1 7.3 O2 ppm 8.0 8.8 Cond. 800 800 Temp(C) 20.0 20.0
50	pH 7.6 7.5 O2 ppm 8.7 9.1 Cond. 700 700 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 8.9 9.3 Cond. 600 650 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 9.1 9.4 Cond. 620 625 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 9.2 9.4 Cond. 600 600 Temp(C) 20.0 20.0
Control	pH 8.1 8.0 O2 ppm 9.3 9.4 Cond. 600 600 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890009

TEST CONDITIONS

Company : Esso Petroleum Canada
 Sarnia, ONT
 (70102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : process effluent, (300)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : T. Moran
 Date Collected : 01/23/89
 Received : 01/23/89
 Tested : 01/24/89 at: 930

Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 51:00	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890009

TEST CONC.
 %

E L A P S E D T I M E
 00:00 51:00

100	pH 7.2 O2 ppm 8.7 Cond. 880 Temp(C) 20.0	7.4 8.4 1000 20.0
50	pH 7.6 O2 ppm 9.0 Cond. 710 Temp(C) 20.0	7.7 8.2 800 20.0
26	pH 7.8 O2 ppm 9.2 Cond. 650 Temp(C) 20.0	7.8 8.4 700 20.0
13	pH 8.0 O2 ppm 9.2 Cond. 600 Temp(C) 20.0	7.8 8.6 650 20.0
6	pH 8.0 O2 ppm 9.3 Cond. 600 Temp(C) 20.0	7.9 8.4 650 20.0
Control	pH 8.0 O2 ppm 9.3 Cond. 580 Temp(C) 20.0	7.6 9.0 600 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

Sample: 058900010

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/06/89 at: 1735

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 47:35	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 058900010

TEST CONC. %

ELAPSED TIME

00:00 47:35

100	pH	7.0	7.3
	O2 ppm	6.2	7.4
	Cond.	920	820
	Temp(C)	20.0	20.0
50	pH	7.4	7.7
	O2 ppm	7.6	7.4
	Cond.	740	740
	Temp(C)	20.0	20.0
26	pH	7.6	7.9
	O2 ppm	8.0	7.8
	Cond.	660	700
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.2	7.9
	Cond.	620	640
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.6	8.4
	Cond.	600	620
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	8.6	8.4
	Cond.	540	620
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890026

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 47:30	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST CONC. %
ELAPSED TIME
00:00 47:30

100	pH 6.9 O2 ppm 7.4 Cond. 8.6 Temp(C) 690 680 20.0 20.0
50	pH 7.5 O2 ppm 7.8 Cond. 9.1 8.6 Temp(C) 630 650 20.0 20.0
26	pH 7.8 O2 ppm 7.9 Cond. 9.0 8.9 Temp(C) 610 620 20.0 20.0
13	pH 8.0 O2 ppm 8.0 Cond. 9.0 9.2 Temp(C) 600 610 20.0 20.0
6	pH 8.0 O2 ppm 8.0 Cond. 8.9 9.4 Temp(C) 600 610 20.0 20.0
Control	pH 8.1 O2 ppm 8.0 Cond. 9.1 9.4 Temp(C) 600 610 20.0 20.0

TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST CONC. %	ELAPSED TIME
	00:00 49:30

26	pH	7.7	7.8
	02 ppm	8.7	9.1
	Cond.	520	590
	Temp.(C)	20.0	20.0

13	pH	7.9	7.9
	02 ppm	8.8	9.0
	Cond.	520	580
	Temp.(C)	20.0	20.0

	Temp (C)	20.0	20.0	20.0
6	pH	8.0	7.9	
	02 ppm	8.8	9.0	
	Cond.	520	550	
	Temp (C)	20.0	20.0	

6	pH	8.0	7.9
	0.2 ppm	8.8	9.3
	Cond.	520	550
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 05890033

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 945

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 49:05	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST E L A P S E D T I M E
CONC. %
00:00 49:05

100	pH 7.0 7.1 O2 ppm 8.6 8.2 Cond. 700 790 Temp(C) 20.0 20.0
50	pH 7.5 7.7 O2 ppm 9.4 8.4 Cond. 600 620 Temp(C) 20.0 20.0
26	pH 7.7 7.8 O2 ppm 9.4 9.2 Cond. 540 596 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 9.6 9.3 Cond. 500 530 Temp(C) 20.0 20.0
6	pH 7.9 8.0 O2 ppm 9.6 9.3 Cond. 500 520 Temp(C) 20.0 20.0
Control	pH 8.0 8.0 O2 ppm 9.8 9.3 Cond. 490 510 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 02890105

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : process effluent, (300)
Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 05/30/89
Received : 05/30/89
Tested : 05/31/89 at: 1000

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	1	8
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890105

TEST CONC. %	E L A P S E D T I M E			
	00:00	01:00	24:00	48:00
100	pH 7.5 O2 ppm 9.2 Cond. 683 Temp(C) 20.0	7.5 9.2 683 20.0	20.0	20.0
60	pH 7.8 O2 ppm 9.7 Cond. 521 Temp(C) 20.0	7.8 9.7 521 20.0	20.0	20.0
30	pH 8.0 O2 ppm 9.8 Cond. 420 Temp(C) 20.0	8.0 9.8 420 20.0	20.0	20.0
15	pH 8.1 O2 ppm 9.8 Cond. 362 Temp(C) 20.0	8.1 9.8 362 20.0	20.0	20.0
5	pH 8.2 O2 ppm 9.7 Cond. 328 Temp(C) 20.0	8.2 9.7 328 20.0	20.0	20.0
Control	pH 8.2 O2 ppm 9.4 Cond. 313 Temp(C) 20.0	8.2 9.4 313 20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 05890017

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-SEP. 11&12, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/16/89
Received : 02/16/89
Tested : 02/15/89 at: 1625

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 48:15	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC.
%
ELAPSED TIME
00:00 48:15

100	pH 8.1 O2 ppm 8.8 Cond. 208 Temp(C) 20.0	7.9 9.2 210 20.0
50	pH 8.0 O2 ppm 8.6 Cond. 410 Temp(C) 20.0	7.9 9.3 400 20.0
26	pH 8.0 O2 ppm 8.6 Cond. 500 Temp(C) 20.0	8.0 8.0 510 20.0
13	pH 8.0 O2 ppm 8.8 Cond. 490 Temp(C) 20.0	8.0 8.0 9.0 550 20.0
6	pH 8.0 O2 ppm 8.8 Cond. 600 Temp(C) 20.0	8.0 8.0 9.2 600 20.0
Control	pH 8.0 O2 ppm 9.0 Cond. 640 Temp(C) 20.0	7.9 9.0 630 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated by :

TOXICITY TEST REPORT Sample: 05890043

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CU-SEP. 11&12, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/26/89 at: 1030

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D	T I M E	TOTAL MORTALITY
%	00:00	50:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST CONC.
% E L A P S E D T I M E
00:00 50:10

100	pH 02 ppm Cond. Temp(C)	8.0 10.2 192 20.0	7.9 9.5 210 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 10.0 348 20.0	8.0 9.5 352 20.0
26	pH 02 ppm Cond. Temp(C)	8.0 9.9 420 20.0	8.1 9.5 418 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 9.8 458 20.0	8.1 9.6 445 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 9.9 480 20.0	8.1 9.6 459 20.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.8 498 20.0	8.1 9.4 455 20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890016

TEST CONDITIONSCompany : Esso Petroleum Canada
Sarnia, ONT
(70102)Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep. 9, (500)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : C. Ferguson

Date Collected : 02/14/89

Received : 02/14/89

Tested : 02/15/89 at: 1550

Type of Bioassay : STATIC
(Toxicity magna Acute Lethality Toxicity
Test Protocol: OME, 1988)

Test Animal : D. magna

Weight(gm)

Length(mm)

MORTALITY DATA

TEST CONC.	E	L	A	P	S	E	T	M	T
%	0	1	1	5	4	8	5	0	%
100	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890016

TEST CONC. %
E L A P S E D T I M E
01:15 48:50

100	pH	7.9	7.8
	O2 ppm	9.6	9.4
	Cond.	760	800
	Temp(C)	20.0	20.0
50	pH	7.8	7.9
	O2 ppm	9.2	9.3
	Cond.	700	700
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	9.4
	Cond.	680	680
	Temp(C)	20.0	20.0
13	pH	7.8	7.9
	O2 ppm	9.0	9.4
	Cond.	680	680
	Temp(C)	20.0	20.0
6	pH	7.7	7.9
	O2 ppm	8.8	9.2
	Cond.	680	660
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.0
	Cond.	640	660
	Temp(C)	20.0	20.0

TOXICITY TEST REPORT Sample: 05890042

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-Sep.9, (500)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/23/89 at: 1530

Type of Bioassay : STATIC
Daphnia magna Acute Lethality Toxicity
Test Protocol: OME, 1988

Test Animal : 0. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0	8
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST CONC.
% ELAPSED TIME
00:00 48:00

100	pH 7.8 7.7 O2 ppm 8.6 8.7 Concl. 680 700 Temp(C) 20.0 20.0
50	pH 7.9 7.8 O2 ppm 9.0 8.9 Concl. 580 600 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 9.0 9.2 Concl. 520 530 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 9.0 9.4 Concl. 500 505 Temp(C) 20.0 20.0
6	pH 7.9 7.9 O2 ppm 9.0 9.4 Concl. 488 505 Temp(C) 20.0 20.0
Control	pH 7.9 7.9 O2 ppm 9.4 9.4 Concl. 478 489 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890015

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-Sep.3, (600)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/14/89
Received : 02/14/89
Tested : 02/15/89 at: 1515

Type of Bioassay : STATIC
Daphnia magna Acute Lethality Toxicity
Test Protocol: ONE, 1988

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 47:25	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC. %
ELAPSED TIME
00:00 47:25

100	pH 7.6 7.7 O2 ppm 10.4 9.5 Cond. 192 210 Temp(C) 20.0 20.0
50	pH 7.7 7.8 O2 ppm 9.4 9.4 Cond. 410 420 Temp(C) 20.0 20.0
26	pH 7.7 7.9 O2 ppm 9.2 9.4 Cond. 520 520 Temp(C) 20.0 20.0
13	pH 7.7 7.9 O2 ppm 9.0 9.5 Cond. 580 600 Temp(C) 20.0 20.0
6	pH 7.7 7.9 O2 ppm 9.0 9.6 Cond. 620 600 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.0 9.4 Cond. 640 650 Temp(C) 20.0 20.0

Sample: 05890041

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining
Control point : CW-Sep.3, (600)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/23/89 at: 1510

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0	0
50	0	0
26	0	25
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST
CONC.
%

ELAPSED
TIME

00:00 48:00

100	pH 7.8	7.6
	O2 ppm 9.4	8.8
	Cond. 188	202
	Temp(C) 20.0	20.0
50	pH 7.9	7.8
	O2 ppm 9.2	8.8
	Cond. 388	355
	Temp(C) 20.0	20.0
26	pH 8.0	7.9
	O2 ppm 9.0	9.4
	Cond. 406	425
	Temp(C) 20.0	20.0
13	pH 8.0	7.9
	O2 ppm 9.2	9.4
	Cond. 440	462
	Temp(C) 20.0	20.0
6	pH 8.0	7.9
	O2 ppm 9.1	9.4
	Cond. 452	480
	Temp(C) 20.0	20.0
Control	pH 7.9	7.9
	O2 ppm 9.4	9.4
	Cond. 478	488
	Temp(C) 20.0	20.0

COMPANY: Petro-Canada Inc., Mississauga
(130104)
(now with Clarkson Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petro-Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on cooling water samples collected in February and May 1989 indicate the samples were not acutely lethal. Bioassay data for one intake water sample collected in February indicate the sample was not acutely lethal to test fish.

Process Effluent

06881219 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890113 sampled: 01/17/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 10 % mortality in full strength effluent

06890207 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890334 sampled: 03/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mort. or sublethal impairment observed

06890422 sampled: 04/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890508 sampled: 05/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

storm water

Petro-Canada Inc. (continued)

cooling water-trap 1

06890223 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890523 sampled: 05/09/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 40 % mort. in full strength effluent

cooling water-trap 3

06890224 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890525 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

intake water

Sample: 06881219

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.-
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 12/13/88
Received : 12/13/88
Tested : 12/13/88 at: 1400
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OIE, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
50	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06881219

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	7.2	8.0	8.0	7.9	8.1
	O2 ppm	8.0	8.8	8.6	8.3	9.2
	Cond.	584				574
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.4	7.7	7.9	7.8	7.9
	O2 ppm	7.4	7.8	7.2	7.4	7.6
	Cond.	455				436
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.5	8.0	8.2	8.1	8.2
	O2 ppm	9.3	8.8	9.4	8.3	8.6
	Cond.	431				418
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.5	8.0	8.3	8.3	8.3
	O2 ppm	9.2	9.6	9.4	9.9	9.9
	Cond.	414				415
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	8.0	8.3	8.3	8.3
	O2 ppm	8.8	9.6	9.6	9.7	9.8
	Cond.	405				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.3	8.1	8.3
	O2 ppm	9.3	10.4	9.4	9.4	9.9
	Cond.	317				336
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890113

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1630
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	1	10
50	0	0	1	2	3	30
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 10 % mortality in full strength effluent

TOXICITY TEST PARAMETERS

Sample Number: 06890113

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH 02 ppm Cond. Temp(C)	7.6 7.6 679 15.0	7.8 8.0 7.4 15.0	7.9 7.4 7.7 15.0	7.7 7.4 7.9 15.0
50	pH 02 ppm Cond. Temp(C)	7.7 8.2 533 15.0	7.8 7.4 547 15.0	7.9 8.1 547 15.0	7.7 7.7 547 15.0
30	pH 02 ppm Cond. Temp(C)	7.8 7.8 466 15.0	8.1 8.8 466 15.0	8.0 8.0 474 15.0	7.9 8.2 474 15.0
20	pH 02 ppm Cond. Temp(C)	7.9 8.7 433 15.0	8.1 9.4 433 15.0	8.1 8.5 442 15.0	8.2 10.4 442 15.0
10	pH 02 ppm Cond. Temp(C)	7.8 8.9 399 15.0	7.8 8.0 391 15.0	8.2 9.3 391 15.0	8.1 9.6 391 15.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.0 363 15.0	8.2 9.4 363 15.0	8.1 9.8 357 15.0	8.0 9.6 357 15.0

Sample: 06890207

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
 (130104)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beek
 Sampling Method : grab
 Sampled By : Tom Tubello
 Date Collected : 02/07/89
 Received : 02/07/89 at: 1230
 Tested : 02/07/89
 Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).
 Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890207

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	7.4 8.2 15.0	8.0 9.4 14.0	8.1 10.0 15.0	8.1 10.0 16.0
50	pH 02 ppm Cond. Temp(C)	7.5 9.5 607	8.1 10.0 15.0	8.1 10.2 14.0	8.2 10.1 16.0
30	pH 02 ppm Cond. Temp(C)	7.5 9.8 513	8.1 10.2 15.0	8.1 10.4 14.0	8.2 9.9 15.0
20	pH 02 ppm Cond. Temp(C)	7.4 9.6 461	7.9 9.0 15.0	8.1 9.2 14.0	8.0 9.1 16.0
10	pH 02 ppm Cond. Temp(C)	7.3 9.8 407	8.0 10.1 15.0	8.1 9.6 14.0	8.0 9.4 15.0
Control	pH 02 ppm Cond. Temp(C)	7.4 9.8 382	7.8 10.0 14.0	7.9 10.2 14.0	8.0 9.8 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT

Sample: 06890334

TEST CONDITIONS

Company : Petro-Canada Inc.
Region : Mississauga, ONT
Industry : (130104)
Control point : Central
Laboratory : Petroleum Refining
Sampling Method : Process Effluent, (100)
Sampled By : Beak
Date Collected : grab
Received : Tom Tubello
Tested : 03/21/89
at: 1130 : 03/21/89
Type of Bioassay : STATIC
(protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mort. or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890334

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	7.3	7.8	8.0	8.3	8.4
	O2 ppm	9.2	9.8	9.5	9.4	9.3
	Cond.	697				642
	Temp(C)	15.0	14.0	15.0	15.0	14.0
50	pH	7.4	7.8	8.0	8.3	8.3
	O2 ppm	9.7	9.9	7.9	8.7	8.7
	Cond.	532				509
	Temp(C)	15.0	14.0	15.0	15.0	14.0
30	pH	7.4	8.0	8.0	8.4	8.5
	O2 ppm	9.6	10.4	8.9	10.0	8.8
	Cond.	468				446
	Temp(C)	15.0	14.0	15.0	15.0	14.0
20	pH	7.4	8.0	8.0	8.3	8.4
	O2 ppm	9.8	9.8	9.4	9.4	8.4
	Cond.	434				417
	Temp(C)	15.0	14.0	15.0	15.0	14.0
10	pH	7.4	7.9	8.0	8.3	8.4
	O2 ppm	9.4	9.3	9.2	8.4	9.5
	Cond.	404				390
	Temp(C)	15.0	14.0	15.0	15.0	14.0
Control	pH	7.3	7.9	7.9	8.3	8.5
	O2 ppm	8.9	8.2	8.2	7.2	8.9
	Cond.	372				351
	Temp(C)	15.0	14.0	15.0	15.0	14.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890422

TEST CONDITIONS

Company : Petro-Canada Inc.
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 04/11/89
Received : 04/11/89
Tested : 04/11/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890422

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	7.4 8.8 610 15.0	7.8 8.0 14.0 14.0	8.0 9.0 14.0 15.0	8.0 9.1 652 15.0	7.9 9.0 652 15.0
50	pH 02 ppm Cond. Temp(C)	7.6 9.9 204 15.0	8.1 9.6 14.0 14.0	8.2 9.8 15.0 15.0	8.1 9.7 509 15.0	8.1 9.7 509 15.0
30	pH 02 ppm Cond. Temp(C)	7.5 9.7 664 15.0	7.8 8.9 14.0 14.0	7.9 9.2 14.0 14.0	8.2 9.5 461 15.0	8.1 9.3 461 15.0
20	pH 02 ppm Cond. Temp(C)	7.5 9.4 439 15.0	7.9 8.9 14.0 14.0	8.0 8.0 14.0 14.0	7.7 8.8 428 15.0	8.1 8.4 428 15.0
10	pH 02 ppm Cond. Temp(C)	7.4 8.9 405 15.0	7.8 8.1 14.0 14.0	7.8 8.2 14.0 14.0	7.4 8.0 393 15.0	8.1 8.0 393 15.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.2 379 15.0	7.8 8.0 14.0 14.0	7.8 8.6 14.0 14.0	8.0 8.8 371 15.0	7.9 8.6 371 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890508

TEST CONDITIONS

Company : Petro-Canada Inc.
Missionsburg, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/02/89
Received : 05/02/89
Tested : 05/03/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
30	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890508

TEST CONC.	E L A P S E D T I M E				
%	00:00	24:00	48:00	72:00	96:00
100	pH 7.4 O2 ppm 6.8 Cond. 596 Temp(C) 15.0	8.1 8.1 9.5 9.5 14.0 15.0	8.1 8.1 9.5 8.7 15.0 15.0	8.1 8.1 9.5 8.7 15.0 15.0	8.1 9.0 591 591
65	pH 7.4 O2 ppm 509 Cond. 509 Temp(C) 15.0	8.1 8.1 9.1 9.6 15.0 14.0	8.1 8.1 8.8 8.8 15.0 15.0	8.1 8.1 8.8 8.8 15.0 15.0	8.1 9.0 511 511
50	pH 7.6 O2 ppm 474 Cond. 474 Temp(C) 15.0	8.1 8.1 9.0 9.7 15.0 14.0	8.1 8.1 8.3 8.3 15.0 15.0	8.1 8.1 8.3 8.3 15.0 15.0	8.1 9.0 472 472
30	pH 7.6 O2 ppm 425 Cond. 425 Temp(C) 15.0	8.1 8.1 9.6 9.8 15.0 14.0	8.2 8.2 9.3 9.3 15.0 15.0	8.2 8.2 9.3 9.3 15.0 15.0	8.2 9.1 424 424
20	pH 7.6 O2 ppm 404 Cond. 404 Temp(C) 15.0	8.0 8.0 8.8 10.3 15.0 14.0	8.2 8.2 9.9 9.9 15.0 15.0	8.2 8.2 9.9 9.9 15.0 15.0	8.2 9.1 402 402
10	pH 7.7 O2 ppm 383 Cond. 383 Temp(C) 15.0	8.2 8.1 9.2 9.3 15.0 14.0	8.1 8.3 9.3 9.5 15.0 15.0	8.3 8.3 9.5 8.8 15.0 15.0	8.3 8.7 373 373
Control	pH 7.6 O2 ppm 358 Cond. 358 Temp(C) 15.0	7.9 7.8 9.4 8.2 15.0 14.0	8.3 8.3 9.5 9.5 15.0 15.0	8.3 8.3 9.5 9.5 15.0 15.0	8.0 9.2 349 349

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890223

TEST CONDITIONS		
Company	: Petro-Canada Inc. Mississauga, ONT (130104)	
Region	: Central	
Industry	: Petroleum Refining	
Control point	: cooling water-trap 1, (300)	
Laboratory	: Beak	
Sampling Method	: grab	
Sampled By	: Tom Tubello	
Date Collected	: 02/27/89	
Date Received	: 02/27/89	
Tested	: 02/27/89 at: 1500	
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).	
Test Animal	: Rainbow trout	
Weight(gm)	:	
Length(mm)	:	
MORTALITY DATA		
TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 24:00 48:00 72:00 96:00	%
100	0 0 0 0 0	0
50	0 0 0 0 0	0
30	0 0 0 0 0	0
20	0 0 0 0 0	0
10	0 0 0 0 0	0
Control	0 0 0 0 0	0

96 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	: no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890223

TEST CONC. % E L A P S E D T I M E
00:00 24:00 48:00 72:00 96:00

100	pH O2 ppm Cond. Temp(C)	8.1 11.4 346 15.0	7.9 10.0 14.0	8.2 10.6 14.0	8.1 10.3 15.0	8.1 10.0 388 15.0
50	pH O2 ppm Cond. Temp(C)	7.9 10.6 374 15.0	7.9 8.8 14.0	8.0 9.2 14.0	8.1 9.4 15.0	8.1 9.7 393 15.0
30	pH O2 ppm Cond. Temp(C)	7.9 10.6 384 15.0	8.2 10.6 14.0	8.1 10.3 14.0	8.2 10.3 15.0	8.1 10.4 392 15.0
20	pH O2 ppm Cond. Temp(C)	7.9 9.9 388 15.0	8.1 9.4 14.0	8.1 9.3 14.0	8.2 8.5 15.0	8.1 9.6 391 15.0
10	pH O2 ppm Cond. Temp(C)	7.9 9.3 380 15.0	7.8 8.9 14.0	8.1 10.0 14.0	8.2 9.2 15.0	8.1 9.2 377 15.0
Control	pH O2 ppm Cond. Temp(C)	7.7 9.8 397 15.0	7.8 10.4 14.0	7.9 10.4 14.0	8.0 9.6 15.0	7.8 10.0 379 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : probit
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890523

TEST CONDITIONS

Company : Petro-Canada Inc.
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 1, (300)
Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	1	2	2	4	40
65	0	0	0	0	0	0
50	0	0	0	1	1	10
30	0	0	0	1	1	10
20	0	1	1	2	2	20
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 40 % mort. in full strength effluent

TOXICITY TEST PARAMETERS

Sample Number: 06890523

TEST CONC.	ELAPSED TIME				
%	00:00	24:00	48:00	72:00	96:00
100	pH 8.2 O2 ppm 10.4 Cond. 344 Temp(C) 15.0	8.2 8.2 10.4 10.2 344 15.0	8.3 9.0 9.0 9.0 344 15.0	8.2 8.2 8.2 8.2 344 15.0	8.2 9.0 9.0 9.0 344 15.0
65	pH 8.0 O2 ppm 9.2 Cond. 346 Temp(C) 15.0	8.2 8.2 9.2 8.7 346 15.0	8.2 8.2 8.2 8.2 346 15.0	8.2 8.6 8.2 8.6 347 15.0	8.2 8.0 8.0 8.0 347 15.0
50	pH 7.9 O2 ppm 9.0 Cond. 346 Temp(C) 15.0	8.2 8.2 9.0 9.7 346 15.0	8.3 8.2 8.2 8.2 346 15.0	8.2 8.9 8.2 8.9 352 15.0	8.2 8.5 8.5 8.5 352 15.0
30	pH 7.8 O2 ppm 9.3 Cond. 348 Temp(C) 15.0	8.2 8.2 9.3 9.3 348 15.0	8.3 8.2 8.3 8.2 348 15.0	8.2 8.5 8.2 8.5 353 15.0	8.1 8.7 8.7 8.7 353 15.0
20	pH 7.8 O2 ppm 9.3 Cond. 348 Temp(C) 15.0	8.2 8.2 9.3 9.0 348 15.0	8.2 8.3 8.2 8.3 348 15.0	8.3 8.3 8.3 8.3 357 15.0	8.1 7.9 7.9 7.9 357 15.0
10	pH 7.8 O2 ppm 9.3 Cond. 350 Temp(C) 15.0	8.2 8.2 9.3 9.0 350 15.0	8.2 7.0 7.0 7.6 350 15.0	8.1 6.5 6.5 6.5 363 15.0	8.0 6.5 6.5 6.5 363 15.0
Control	pH 7.7 O2 ppm 9.8 Cond. 352 Temp(C) 15.0	8.2 8.3 9.8 8.3 352 15.0	8.3 8.2 8.8 8.3 352 15.0	8.2 8.5 8.5 8.5 374 15.0	8.2 8.5 8.5 8.5 374 15.0

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890224

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(13010)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 3, (500)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89 at: 1530
Tested : 02/27/89
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890224

TEST E L A P S E D T I M E
CONC. % 00:00 24:00 48:00 72:00 96:00

100	pH	9.0	8.5	8.0	8.2	8.1
	O2 ppm	12.0	8.8	10.0	10.6	10.3
	Cond.	437				493
	Temp(C)	15.0	14.0	14.0	15.0	15.0
50	pH	8.5	8.1	8.1	8.1	8.0
	O2 ppm	10.4	10.4	10.6	10.7	10.4
	Cond.	420				440
	Temp(C)	15.0	14.0	14.0	15.0	15.0
30	pH	8.2	7.9	8.0	8.1	7.9
	O2 ppm	10.2	9.5	9.4	9.5	9.1
	Cond.	413				420
	Temp(C)	15.0	14.0	14.0	15.0	15.0
20	pH	8.0	7.9	8.0	8.1	8.0
	O2 ppm	10.6	10.5	10.2	9.7	9.1
	Cond.	410				405
	Temp(C)	15.0	14.0	14.0	15.0	15.0
10	pH	7.9	7.8	7.9	8.0	7.9
	O2 ppm	9.4	9.0	8.5	8.8	8.1
	Cond.	405				395
	Temp(C)	15.0	14.0	14.0	15.0	15.0
Control	pH	7.7	7.8	7.9	8.0	7.8
	O2 ppm	9.8	10.2	10.4	9.6	10.0
	Cond.	397				379
	Temp(C)	15.0	14.0	14.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average
LC50 Calculated by :

TOXICITY TEST REPORT Sample: 06890525

TEST CONDITIONS

Company : Petro-Canada Inc.
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 3, (500)
Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890525

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.7	8.5	8.3	8.3	8.2
	O2 ppm	9.7	8.1	9.0	8.8	8.4
	Cond.	400				406
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.4	8.1	8.2	8.2	8.2
	O2 ppm	9.2	8.2	8.8	8.3	8.7
	Cond.	381				396
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.1	8.2	8.2	8.1	8.1
	O2 ppm	9.8	8.3	8.0	8.2	8.2
	Cond.	374				393
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.1	8.1	8.0	8.0
	O2 ppm	9.7	8.5	8.0	9.0	7.3
	Cond.	364				373
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.1	8.2	8.1	8.1
	O2 ppm	8.7	8.2	8.2	7.9	7.8
	Cond.	359				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.1	8.2	8.1	8.1
	O2 ppm	10.0	8.3	7.9	8.2	8.5
	Cond.	351				377
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.2	8.3	8.2	8.2
	O2 ppm	9.8	8.3	8.8	8.3	8.5
	Cond.	352				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Mississauga
(130104)
(now with Clarkson Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

Results of eleven Daphnia magna acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Mississauga. Five of the six Process Effluent samples were not acutely lethal to Daphnia. The sample collected in January was toxic to Daphnia with a 48 h LC50 value of 28.2% effluent.

One sample of Intake Water and two samples from each of Cooling Water Trap 1 and Cooling Water Trap 3 were all not acutely lethal to Daphnia.

Process Effluent

06881224 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 20 % mortality in full strength effluent

06890116 sampled: 01/17/89 LC50: 28.2 %
95% fid. limits: 20.4 - 38.8 %
comments:

06890208 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobility observed during testing

06890332 sampled: 03/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890423 sampled: 04/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed

06890509 sampled: 05/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

Petro-Canada Inc. (continued)

storm water

cooling water-trap 1

06890225 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 5 % circling at the end of exposure

06890524 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

cooling water-trap 3

06890226 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 70 % of Daphnia floating at the end of expos.

06890526 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

intake water

06890209 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobility observed during testing

TOXICITY TEST REPORT Sample: 06881224

TEST CONDITIONS

Company : Petro-Canada Inc.,
 (130104)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : BEAK
 Sampling Method : Grab
 Sampled By : Tom Tubello
 Date Collected : 12/13/88
 Received : 12/13/88
 Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00 24:00 48:00		%
100	0	0	20
50	0	0	0
30	0	0	20
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments : 20 % mortality in full strength effluent

SLOPE of Mortality Curve :
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06881224

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	7.2	7.5
	O2 ppm	5.6	4.1
	Cond.	582	627
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	6.3	5.4
	Cond.	547	506
	Temp(C)	20.0	20.0
30	pH	7.7	7.9
	O2 ppm	6.3	6.2
	Cond.	421	456
	Temp(C)	20.0	20.0
20	pH	7.8	8.0
	O2 ppm	5.8	5.8
	Cond.	391	427
	Temp(C)	20.0	20.0
10	pH	8.0	8.0
	O2 ppm	6.6	5.5
	Cond.	374	429
	Temp(C)	20.0	20.0
Control	pH	8.2	7.6
	O2 ppm	6.9	6.5
	Cond.	339	335
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890116

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1500

Type of Bioassay : STATIC
Daphnia magna Acute Lethality Toxicity
Test Protocol: OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E	L	A	P	S	E	D	T	I	M	E	TOTAL MORTALITY	%
		00:00	24:00	48:00										
100	0	2	10										100	
50	0	1	9										90	
30	0	0	3										30	
20	0	0	4										40	
10	0	0	1										10	
Control	0	0	0										0	

48 Hour LC50 : 28.2 %
95% fid. limits : 20.4 - 38.8 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06890116

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00

100	pH	7.3	7.9
	O2 ppm	7.1	8.3
	Cond.	709	735
	Temp(C)	20.0	20.0
50	pH	7.6	8.1
	O2 ppm	9.1	8.5
	Cond.	552	583
	Temp(C)	20.0	20.0
30	pH	7.8	8.1
	O2 ppm	9.2	8.4
	Cond.	493	518
	Temp(C)	20.0	20.0
20	pH	7.9	8.1
	O2 ppm	9.2	8.4
	Cond.	451	486
	Temp(C)	20.0	20.0
10	pH	8.0	8.2
	O2 ppm	9.3	8.6
	Cond.	419	450
	Temp(C)	20.0	20.0
Control	pH	8.1	8.2
	O2 ppm	9.2	8.7
	Cond.	385	432
	Temp(C)	20.0	20.0

Sample: 06890208

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
 (130104)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : grab
 Sampled By : Tom Tubello
 Date Collected : 02/07/89
 Received : 02/07/89
 Tested : 02/07/89 at: 1430
 Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol. OME, 1988)
 Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

TOXICITY TEST PARAMETERS

Sample Number: 06890208

TEST
CONC.
%

ELAPSED TIME

00:00 24:00 48:00

100	pH 7.3 O2 ppm 7.4 Cond. 660 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 740 20.0
50	pH 7.7 O2 ppm 8.1 Cond. 500 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 556 20.0
30	pH 8.0 O2 ppm 8.2 Cond. 390 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 436 20.0
20	pH 8.1 O2 ppm 8.1 Cond. 375 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.1 421 20.0
10	pH 8.1 O2 ppm 8.6 Cond. 350 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.6 350 20.0
Control	pH 8.0 O2 ppm 8.6 Cond. 325 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.4 344 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890332

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 03/21/89
Received : 03/21/89
Tested : 03/21/89 at: 1730

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890332

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00

100	pH O2 ppm Cond. Temp(C)	7.3 8.8 712 20.0	8.0 8.3 708 20.0
50	pH O2 ppm Cond. Temp(C)	7.6 8.9 570 20.0	8.1 8.4 556 20.0
30	pH O2 ppm Cond. Temp(C)	7.9 9.0 512 20.0	8.1 8.4 494 20.0
20	pH O2 ppm Cond. Temp(C)	8.0 8.8 479 20.0	8.1 8.4 456 20.0
10	pH O2 ppm Cond. Temp(C)	8.1 8.9 448 20.0	8.2 8.5 419 20.0
Control	pH O2 ppm Cond. Temp(C)	8.2 8.9 418 20.0	8.2 8.3 402 20.0

Sample: 06890423

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
 (130104)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : grab
 Sampled By : Tom Tubello
 Date Collected : 04/11/89
 Received : 04/11/89
 Tested : 04/11/89 at: 1600

Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol. OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

TOXICITY TEST PARAMETERS

Sample Number: 06890423

TEST CONC.
 %

ELAPSED TIME
 00:00 24:00 48:00

100	pH 7.3 O2 ppm 8.8 Cond. 685 Temp(C) 20.0	7.3 8.8 685 20.0	8.1 7.0 686 20.0
50	pH 7.7 O2 ppm 9.0 Cond. 535 Temp(C) 20.0	7.7 9.0 535 20.0	8.1 8.0 532 20.0
30	pH 7.9 O2 ppm 9.0 Cond. 472 Temp(C) 20.0	7.9 9.0 472 20.0	8.2 8.2 478 20.0
20	pH 8.0 O2 ppm 9.0 Cond. 442 Temp(C) 20.0	8.0 9.0 442 20.0	8.2 8.3 448 20.0
10	pH 8.1 O2 ppm 9.1 Cond. 412 Temp(C) 20.0	8.1 9.1 412 20.0	8.3 8.5 422 20.0
Control	pH 8.2 O2 ppm 9.0 Cond. 382 Temp(C) 20.0	8.2 9.0 382 20.0	8.2 8.4 391 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890509

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled by : Karen Gregory
Date Collected : 05/02/89
Received : 05/02/89
Tested : 05/02/89 at: 1305

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890509

TEST CONC.
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH 7.4 O2 ppm 8.5 Cond. 590 Temp(C) 20.0	20.0	20.0	21.0	8.0 8.3 629 21.0
50	pH 7.8 O2 ppm 8.1 Cond. 468 Temp(C) 20.0	20.0	20.0	21.0	8.1 8.4 502 21.0
30	pH 8.0 O2 ppm 8.9 Cond. 418 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.5 453 21.0
20	pH 8.1 O2 ppm 8.9 Cond. 394 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.5 424 21.0
10	pH 8.2 O2 ppm 8.9 Cond. 367 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.6 396 21.0
Control	pH 8.2 O2 ppm 8.9 Cond. 343 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.6 367 21.0

TOXICITY TEST REPORT Sample: 06890225

TEST CONDITIONS

Company : Petro-Canada Inc.
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 1, (300)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/28/89 at: 1130

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol.. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : 5 % circling at the end of exposure

TOXICITY TEST PARAMETERS

Sample Number: 06890225

TEST ELAPSED TIME
CONC. % 00:00 24:00 48:00

100	pH 8.1 O2 ppm 9.0 Cond. 350 Temp(C) 20.0	8.0 8.6 371 21.0
50	pH 7.9 O2 ppm 9.4 Cond. 350 Temp(C) 20.0	8.0 8.7 371 21.0
30	pH 7.9 O2 ppm 9.5 Cond. 350 Temp(C) 20.0	8.0 8.9 373 21.0
20	pH 7.9 O2 ppm 9.5 Cond. 352 Temp(C) 20.0	8.0 8.5 374 21.0
10	pH 7.9 O2 ppm 9.6 Cond. 353 Temp(C) 20.0	8.0 8.7 376 21.0
Control	pH 7.9 O2 ppm 9.6 Cond. 359 Temp(C) 20.0	7.7 8.6 355 21.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890524

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 1, (300)
Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1400
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)
Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E L A P S E D	T I M E	TOTAL MORTALITY
		00:00	24:00	48:00
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890524

TEST CONC.	%	E L A P S E D	T I M E
		00:00	24:00
			48:00

100	pH	8.4	8.0
	O2 ppm	10.2	8.4
	Cond.	331	314
	Temp(C)	20.0	20.0
50	pH	8.4	8.3
	O2 ppm	9.8	8.3
	Cond.	327	309
	Temp(C)	20.0	20.0
30	pH	8.4	8.3
	O2 ppm	9.2	8.4
	Cond.	342	311
	Temp(C)	20.0	20.0
20	pH	8.4	8.3
	O2 ppm	8.3	8.2
	Cond.	365	322
	Temp(C)	20.0	20.0
10	pH	8.4	8.2
	O2 ppm	8.7	8.1
	Cond.	339	311
	Temp(C)	20.0	20.0
Control	pH	8.4	8.1
	O2 ppm	8.8	8.0
	Cond.	323	304
	Temp(C)	20.0	20.0

TOXICITY TEST REPORT Sample: 06890226

TEST CONDITIONS

Company : Petro-Canada Inc.
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 3, (500)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/28/89 at: 1300
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol., OME, 1988)
Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : 70 % of Daphnia floating at the end of expos.

TOXICITY TEST PARAMETERS

Sample Number: 06890226

TEST CONC. %	ELAPSED TIME
100	00:00 24:00 48:00

100	pH 8.3	8.0
	O2 ppm 8.6	8.5
	Cond. 459	474
	Temp(C) 20.0	20.0
50	pH 8.1	8.0
	O2 ppm 8.3	8.9
	Cond. 403	426
	Temp(C) 20.0	20.0
30	pH 8.0	8.0
	O2 ppm 9.5	8.6
	Cond. 382	403
	Temp(C) 20.0	20.0
20	pH 7.9	7.9
	O2 ppm 9.5	9.0
	Cond. 373	392
	Temp(C) 20.0	20.0
10	pH 7.9	7.7
	O2 ppm 9.5	9.0
	Cond. 374	379
	Temp(C) 20.0	20.0
Control	pH 7.9	7.7
	O2 ppm 9.7	8.9
	Cond. 356	355
	Temp(C) 20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890526

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : cooling water-trap 3, (500)
Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1100
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, ONE, 1988)
Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 24:00 48:00	%
100	0	0 0 0	0
50	0	0 0 0	0
30	0	0 0 0	0
20	0	0 0 0	0
10	0	0 0 0	0
Control	0	0 0 0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890526

TEST CONC. %
ELAPSED TIME
00:00 24:00 48:00

100	pH 8.7 O2 ppm 9.2 Cond. 366 Temp(C) 20.0	8.7 9.2 366 20.0	8.7 8.5 366 20.0
50	pH 8.6 O2 ppm 8.6 Cond. 347 Temp(C) 20.0	8.6 8.6 347 20.0	8.0 8.4 339 20.0
30	pH 8.5 O2 ppm 8.6 Cond. 337 Temp(C) 20.0	8.5 8.6 337 20.0	8.0 8.3 328 20.0
20	pH 8.4 O2 ppm 8.6 Cond. 331 Temp(C) 20.0	8.4 8.6 331 20.0	8.0 8.3 324 20.0
10	pH 8.4 O2 ppm 8.5 Cond. 326 Temp(C) 20.0	8.4 8.5 326 20.0	8.0 8.0 319 20.0
Control	pH 8.3 O2 ppm 9.0 Cond. 319 Temp(C) 20.0	8.3 9.0 319 20.0	8.0 8.2 310 20.0

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

Sample: 06890209

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining
Control point : intake water, (600)
Laboratory : Beak
Sampling Method : Beak
Sample Size : 100 Tubello
Date Collected : 02/07/89
Date Received : 02/07/89
Tested : 02/07/89 at: 1445

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

TOXICITY TEST PARAMETERS

Sample Number: 06890209

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00

100	pH 8.0 O2 ppm 9.8 Cond. 332 Temp(C) 20.0	8.0 9.8 332 20.0	8.1 7.4 334 20.0
50	pH 8.1 O2 ppm 9.7 Cond. 340 Temp(C) 20.0	8.1 9.7 340 20.0	8.1 8.0 341 20.0
30	pH 8.1 O2 ppm 9.0 Cond. 347 Temp(C) 20.0	8.1 9.0 347 20.0	8.1 8.2 349 20.0
20	pH 8.1 O2 ppm 8.7 Cond. 349 Temp(C) 20.0	8.1 8.7 349 20.0	8.0 8.5 350 20.0
10	pH 8.1 O2 ppm 8.7 Cond. 353 Temp(C) 20.0	8.1 8.7 353 20.0	8.0 8.5 356 20.0
Control	pH 8.0 O2 ppm 8.6 Cond. 351 Temp(C) 20.0	8.0 8.6 351 20.0	8.0 8.4 355 20.0

COMPANY: Petro-Canada Inc., Oakville
(530006)
(now with Trafalgar Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

The data for six trout bioassays, conducted on process effluent samples between December 1988 and May 1989, were provided by Petro-Canada Incorporated. Two of the process effluent samples were determined to have been acutely lethal to the test fish. Statistically, the percentage effluent required to kill 50 % of the test fish by the end of the four days exposure were 76.4 % (December) and 71.0 % (March). The other four samples were determined to have been non-acutely lethal.

Process Effluent

06881223	sampled: 12/13/88	LC50:	76.4 %
	95% fid. limits:	74.0 - 78.7 %	
	comments:		
06890112	sampled: 01/17/89	non-lethal	
	95% fid. limits:	0.0 - 0.0 %	
	comments:		
06890217	sampled: 02/21/89	non-lethal	
	95% fid. limits:	0.0 - 0.0 %	
	comments:		
06890335	sampled: 03/21/89	LC50:	71.0 %
	95% fid. limits:	50.0 - 100.0 %	
	comments:	fish mort. occurred within 24 Hrs of exposure	
06890424	sampled: 04/11/89	non-lethal	
	95% fid. limits:	0.0 - 0.0 %	
	comments:	no mortality or sublethal impairment observed	
01890072	sampled: 05/03/89	non-lethal	
	95% fid. limits:	0.0 - 0.0 %	
	comments:	MISA audit sample.	
06890539	sampled: 05/16/89	non-lethal	
	95% fid. limits:	0.0 - 0.0 %	
	comments:	no mortality or sublethal impairment in 96Hrs	

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

Sample: 06881223

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : 24hr. Comp
Sample Collected : 12/13/88
Date Collected : 12/13/88
Tested : 12/13/88 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	2	7	9
50	0	0	0	0	0
30	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	1
Control	0	0	0	0	0

96 Hour LC50 : 76.4 %

95% fid. limits : 74.0 - 78.7 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06881223

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	8.3 8.2 1820 14.0	8.3 8.6 8.4 15.0	8.3 8.3 7.2 15.0	8.3 8.6 1877 15.0
50	pH 02 ppm Cond. Temp(C)	8.1 8.2 1165 14.0	8.2 9.2 8.6 15.0	8.4 8.3 8.6 15.0	8.4 9.2 1138 15.0
30	pH 02 ppm Cond. Temp(C)	8.0 9.4 851 14.0	8.3 9.6 8.8 15.0	8.4 9.4 8.3 15.0	8.4 10.0 834 15.0
20	pH 02 ppm Cond. Temp(C)	7.9 8.4 677 14.0	8.2 9.8 9.6 15.0	8.3 8.3 9.9 15.0	8.3 9.7 650 15.0
10	pH 02 ppm Cond. Temp(C)	7.7 8.2 509 14.0	8.1 8.2 8.2 15.0	8.1 8.0 8.3 15.0	8.2 8.2 480 15.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.3 317 15.0	8.2 10.4 9.4 15.0	8.3 9.4 9.4 15.0	8.3 9.9 336 15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890112

TEST CONDITIONS

Company : Petro-Canada Inc.
 : Oakville, ONT
 : (530006)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : grab
 Sampled By : Tom Tubello
 Date Collected : 01/17/89
 Received : 01/17/89
 Tested : 01/17/89 at: 1600

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	1	10
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : moving average
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06890112

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH	9.0	8.4	8.4	8.3
	O2 ppm	8.6	8.8	9.0	9.2
	Cond.	2110			2120
50	Temp(C)	15.0	15.0	15.0	15.0
	pH	8.8	8.2	8.3	8.1
	O2 ppm	8.0	8.6	8.6	8.8
30	Cond.	1260			1307
	Temp(C)	15.0	15.0	15.0	15.0
	pH	8.5	8.2	8.2	8.3
20	O2 ppm	8.6	9.4	8.8	10.0
	Cond.	905			935
	Temp(C)	15.0	15.0	15.0	15.0
10	pH	8.3	8.1	8.2	8.2
	O2 ppm	8.2	8.4	9.8	8.6
	Cond.	731			760
Control	Temp(C)	15.0	15.0	15.0	15.0
	pH	8.1	8.1	8.3	8.1
	O2 ppm	9.3	9.8	9.8	10.0
Control	Cond.	547			571
	Temp(C)	15.0	15.0	15.0	15.0
	pH	8.0	8.2	8.1	8.0
Control	O2 ppm	9.0	9.4	9.8	9.6
	Cond.	363			351
	Temp(C)	15.0	15.0	15.0	15.0

Sample: 06890217

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
 : Oakville, ONT
 : (530006)
 Region : Central
 : Petroleum Refining
 Industry :
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : grab
 Sampled By : Steve Mo
 Date Collected : 02/21/89
 Received : 02/21/89
 Tested : 02/21/89 at: 1700

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal
 weight(gm)
 Length(mm)

: Rainbow trout
 :
 :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-Lethal
 %% fld. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06890217

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH 7.9 O2 ppm 7.0 Cond. 1887 Temp(C) 15.0	8.0 8.6 9.4 15.0	8.1 9.4 14.0	8.1 9.4 14.0	8.0 10.4 1785 15.0
50	pH 7.7 O2 ppm 8.4 Cond. 1182 Temp(C) 15.0	8.1 8.9 9.8 15.0	8.1 9.8 14.0	8.1 9.9 14.0	8.1 10.8 1087 15.0
30	pH 7.7 O2 ppm 8.5 Cond. 884 Temp(C) 15.0	7.8 8.8 9.5 15.0	8.1 9.5 10.3 14.0	8.1 10.3 14.0	8.1 10.8 819 15.0
20	pH 7.5 O2 ppm 8.8 Cond. 720 Temp(C) 15.0	7.9 8.4 9.0 15.0	8.0 8.8 9.5 14.0	8.0 8.8 9.5 14.0	8.1 8.9 680 15.0
10	pH 7.3 O2 ppm 8.8 Cond. 540 Temp(C) 15.0	7.3 7.8 8.8 15.0	8.1 9.8 9.9 14.0	8.1 9.9 14.0	8.1 10.3 531 15.0
Control	pH 7.4 O2 ppm 8.2 Cond. 399 Temp(C) 15.0	7.8 8.8 8.4 15.0	8.0 8.4 9.0 14.0	7.9 9.5 411 14.0	8.0 9.5 411 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
 LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890335

TEST CONDITIONS

Company : Petro-Canada Inc.
 Oakville, ONT
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : Grab
 Sample No :
 Date Collected : 03/21/89
 Received : 03/21/89
 Tested : 03/21/89 at: 1500

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY %
%	00:00	24:00	48:00	72:00	96:00	
100	0	10	10	10	10	100
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : 71.0 %

95% fid. limits : 50.0 - 100.0 %

Comments : fish mort. occurred within 24 Hrs of exposure

TOXICITY TEST PARAMETERS

Sample Number: 06890335

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH	8.4	8.1		
	O2 ppm	7.0	10.0		
	Cond. Temp(C)	2110	15.0	14.0	
50	pH	7.9	8.0	8.1	8.3
	O2 ppm	8.6	10.2	9.0	7.9
	Cond. Temp(C)	1253	15.0	14.0	15.0
30	pH	7.7	8.1	8.1	8.2
	O2 ppm	9.5	10.2	9.2	7.3
	Cond. Temp(C)	898	15.0	14.0	15.0
20	pH	7.6	7.9	8.0	8.1
	O2 ppm	9.4	9.3	8.6	7.9
	Cond. Temp(C)	730	15.0	14.0	15.0
10	pH	7.4	7.9	8.1	8.3
	O2 ppm	9.2	8.9	8.7	8.8
	Cond. Temp(C)	539	15.0	14.0	15.0
Control	pH	7.3	7.9	7.9	8.3
	O2 ppm	8.9	8.2	8.2	7.2
	Cond. Temp(C)	372	15.0	14.0	15.0

WJSA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

Sample: 06890424

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
Location : Oakville, ONT
Region : (S30006)
Industry : Chemical
Control point : Petroleum Refining
Laboratory : Process Effluent, (100)
Sampling Method : Beak
Sampled By : Grab
Date Collected : Steven Mo
Received : 04/11/89
Tested : 04/11/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890424

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00 72:00 96:00

100	pH 8.4 O2 ppm 7.2 Cond. 1910 Temp(C) 15.0	8.2 8.9 9.1 14.0 14.0	8.2 9.1 9.3 14.0 14.0	8.3 9.2 1799 15.0	8.1 9.2 1799 15.0
50	pH 8.1 O2 ppm 7.9 Cond. 1249 Temp(C) 15.0	7.9 7.0 8.1 14.0 14.0	7.9 8.1 8.7 14.0 14.0	7.8 8.2 1182 15.0	7.8 8.2 1182 15.0
30	pH 8.0 O2 ppm 9.2 Cond. 874 Temp(C) 15.0	8.0 8.3 8.6 14.0 14.0	8.1 8.6 9.1 14.0 14.0	8.1 9.0 862 15.0	8.0 9.0 862 15.0
20	pH 8.1 O2 ppm 10.2 Cond. 1331 Temp(C) 15.0	8.1 9.6 9.6 14.0 14.0	8.3 9.6 9.7 14.0 14.0	8.2 9.4 705 15.0	8.2 9.4 705 15.0
10	pH 7.8 O2 ppm 9.6 Cond. 564 Temp(C) 15.0	8.1 8.9 8.9 14.0 14.0	8.2 8.8 8.8 14.0 14.0	8.0 8.9 554 15.0	8.1 8.9 554 15.0
Control	pH 7.9 O2 ppm 9.2 Cond. 379 Temp(C) 15.0	7.8 8.0 8.6 14.0 14.0	8.0 8.6 8.8 14.0 14.0	8.0 8.6 366 15.0	7.9 8.6 366 15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890072

TEST CONDITIONS

Company : Petro-Canada Inc.
 Oakville, ONT
 (530006)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : MOE
 Sampling Method : Grab
 Sampled By : R. Gibson
 Date Collected : 05/03/89
 Received :
 Tested : 05/04/89 at: 1100

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal

Weight(gm)
 Length(mm)
 :
 : Rainbow trout
 :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY	
%	00:00	00:30	01:00	02:00	04:00	22:00	72:00	96:00	%
100	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890072

TEST CONC. %	E L A P S E D T I M E						
	00:00	00:30	01:00	02:00	04:00	22:00	72:00 96:00
100	pH 8.4 O2 ppm 7.0 Cond. 1500 Temp(C) 15.0	8.1 9.1 1500 15.0	8.1 9.1 1500 15.0	8.1 9.6 1600 15.0	7.9 9.6 1585 15.0	8.1 9.6 1600 15.0	7.9 9.6 1585 15.0
65	pH 8.1 O2 ppm 9.2 Cond. 1100 Temp(C) 15.0	8.1 9.2 1100 15.0	8.1 9.2 1100 15.0	8.1 9.6 1210 15.0	8.1 9.7 1190 15.0	8.1 9.6 1190 15.0	8.1 9.6 1190 15.0
40	pH 8.0 O2 ppm 9.0 Cond. 800 Temp(C) 15.0	8.0 9.0 745 15.0	8.0 9.0 745 15.0	8.0 9.6 800 15.0	8.0 9.7 775 15.0	8.0 9.6 775 15.0	8.0 9.7 770 15.0
30	pH 8.0 O2 ppm 9.3 Cond. 640 Temp(C) 15.0	8.0 9.3 640 15.0	8.0 9.3 640 15.0	8.0 9.6 640 15.0	7.8 9.7 625 15.0	7.8 9.6 620 15.0	7.8 9.7 625 15.0
20	pH 8.0 O2 ppm 9.5 Cond. 540 Temp(C) 15.0	8.0 9.5 495 15.0	8.0 9.5 495 15.0	8.0 9.7 540 15.0	7.7 9.7 530 15.0	7.7 9.6 530 15.0	7.7 9.7 530 15.0
10	pH 7.7 O2 ppm 9.5 Cond. 385 Temp(C) 15.0	7.7 9.5 385 15.0	7.7 9.5 385 15.0	7.7 9.6 400 15.0	7.8 9.6 400 15.0	7.8 9.6 400 15.0	7.8 9.6 400 15.0
Control	pH 7.4 O2 ppm 9.5 Cond. 260 Temp(C) 15.0	7.4 9.5 260 15.0	7.4 9.5 260 15.0	7.4 9.7 265 15.0	7.4 9.8 265 15.0	7.4 9.7 265 15.0	7.4 9.8 265 15.0

TOXICITY TEST REPORT Sample: 06890539

TEST CONDITIONS

Company : Petro-Canada Inc.
 : Oakville, ONT
 : (530006)
 Region : Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beak
 Sampling Method : Grab
 Sampled By : Steven Mo
 Date Collected : 05/16/89
 Date Received : 05/16/89 at: 1130
 Tested

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm)
 Length(mm)

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY %
%	00:00	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	1	1	1	10
30	0	0	0	0	0	0
15	0	0	0	0	0	0
5	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments : no mortality or sublethal impairment in 96hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890539

TEST CONC. %
 ELAPSED TIME
 00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	8.1 7.1 1809 14.0	8.4 9.0 15.0	2.0 8.4 15.0	8.2 8.4 15.0	8.2 8.4 15.0
65	pH 02 ppm Cond. Temp(C)	7.9 7.5 1243 14.0	8.3 9.8 7.9	8.1 8.8 15.0	8.1 9.5 1258 15.0	8.1 9.5 1258 15.0
50	pH 02 ppm Cond. Temp(C)	7.9 7.9 1009 14.0	8.3 9.8 15.0	8.2 9.7 15.0	8.1 9.0 15.0	8.1 9.0 15.0
30	pH 02 ppm Cond. Temp(C)	7.8 7.9 713 14.0	8.2 9.0 8.4	8.0 8.6 15.0	8.1 9.2 677 15.0	8.0 9.2 677 15.0
15	pH 02 ppm Cond. Temp(C)	7.9 8.6 568 14.0	8.2 8.4 15.0	8.1 8.8 15.0	8.1 9.2 490 15.0	8.1 9.2 490 15.0
5	pH 02 ppm Cond. Temp(C)	7.8 9.5 382 14.0	8.3 9.0 15.0	8.2 8.8 15.0	8.2 9.0 360 15.0	8.2 9.0 360 15.0
Control	pH 02 ppm Cond. Temp(C)	7.7 9.9 402 14.0	8.1 9.6 15.0	8.2 9.0 15.0	8.2 9.2 402 15.0	8.2 9.2 402 15.0

COMPANY: Petro-Canada Inc., Oakville
(530006)
(now with Trafalgar Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

Results for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Oakville. Three of the six samples were not toxic to *Daphnia*. Two samples were toxic to *Daphnia* with 48 h LC50 values of 31% and 41% effluent. One sample was mildly toxic with a 48 h LC50 > 100% effluent.

Process Effluent

06881218 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890115 sampled: 01/17/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890218 sampled: 02/21/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20 % mortality in undiluted sample

06890333 sampled: 03/21/89 LC50: 41.0 %
95% fid. limits: 34.0 - 49.0 %
comments: most mort. occurred within 24 Hrs of exposure

06890425 sampled: 04/11/89 LC50: 31.0 %
95% fid. limits: 27.0 - 36.0 %
comments: 10% *Daphnia* floating in 20% conc. at 48 Hrs

02890072 sampled: 05/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06890540 sampled: 05/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

SLOPE of Mortality Curve :
LC50 calculated by :

Sample: 06B5121B

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Petro-Canada Inc.,
Oakville, Ont
(530006)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : BEAF
Sampling Method : 24hr. Comp.
Sampled By : Petro Canada
Date Collected : 12/13/88
Date Received : 12/13/88
Date Tested : 12/14/88 at: 1100

Type of Bioassay

: STATIC
Toxicity magna Acute Lethality Toxicity
Test Protocol, (MBC, 1988)

Test Animal :
Weight(gm) :
Length(mm) :

: D. magna
:

MORTALITY DATA

TEST CONC. %	E L A P S E D T I M E		TOTAL MORTALITY %
	00:00	24:00 48:00	
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50

Non Lethal

95% fid. limits 0.0 - 0.0 %

Comments :

Sample Number: 06B5121B

TEST E L A P S E D T I M E
CONC. %
00:00 24:00 48:00

100	pH 02 1400 Concl. Temp(C)	8.2 5.6 1930 20.0	8.2 3.2 1961 20.0	7.9 3.2 1961 20.0
50	pH 02 1400 Concl. Temp(C)	8.1 6.7 1068 20.0	8.0 5.5 1203 20.0	8.0 5.5 1203 20.0
30	pH 02 1400 Concl. Temp(C)	8.1 6.2 815 20.0	8.1 6.2 867 20.0	8.1 6.2 867 20.0
20	pH 02 1400 Concl. Temp(C)	8.1 6.7 653 20.0	8.1 6.3 701 20.0	8.1 6.3 701 20.0
10	pH 02 1400 Concl. Temp(C)	8.0 7.1 489 20.0	8.1 6.5 517 20.0	8.1 6.5 517 20.0
Control	pH 02 1400 Concl. Temp(C)	8.2 6.9 339 20.0	7.6 6.5 355 20.0	7.6 6.5 355 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890115

TEST CONDITIONS

Company : Petro-Canada Inc.
: Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1300

Type of Bioassay

: STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal
Weight(gm)
Length(mm)

: D. magna
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00 24:00 48:00		%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06890115

TEST CONC. %	E L A P S E D T I M E	
	00:00 24:00 48:00	
100	pH 8.5 8.2 O2 ppm 8.9 7.4 Cond. 2230 2240 Temp(C) 20.0 20.0 20.0	
50	pH 8.4 8.1 O2 ppm 9.1 8.0 Cond. 1285 1328 Temp(C) 20.0 20.0 20.0	
30	pH 8.3 8.1 O2 ppm 9.2 8.5 Cond. 932 967 Temp(C) 20.0 20.0 20.0	
20	pH 8.3 8.1 O2 ppm 9.2 8.4 Cond. 745 766 Temp(C) 20.0 20.0 20.0	
10	pH 8.2 8.2 O2 ppm 9.1 8.4 Cond. 547 565 Temp(C) 20.0 20.0 20.0	
Control	pH 8.2 8.1 O2 ppm 9.1 8.5 Cond. 407 432 Temp(C) 20.0 20.0 20.0	

TOXICITY TEST REPORT Sample: 06890218

TEST CONDITIONS

Company : Petro-Canada Inc.
 : Oakville, ONT
 : (S30006)
 Region : Central
 : Petroleum Refining
 Control point : Process Effluent, (100)
 Laboratory : Beek
 Sampling Method : grab
 Sampled By : Steve Mo
 Date Collected : 02/21/89
 Received : 02/21/89
 Tested : 02/21/89 at: 1500

Type of Bioessey : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol. ONE, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	2	20
50	0	0	2	20
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 20 % mortality in undiluted sample

TOXICITY TEST PARAMETERS

Sample Number: 06890218

TEST CONC.
 %

E L A P S E D T I M E

00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	8.0 6.0 1730 20.0	7.8 6.2 1924 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 8.0 1086 20.0	7.9 7.5 1163 20.0
30	pH 02 ppm Cond. Temp(C)	7.9 8.0 775 20.0	8.0 8.1 820 20.0
20	pH 02 ppm Cond. Temp(C)	7.9 8.1 691 20.0	8.0 8.4 723 20.0
10	pH 02 ppm Cond. Temp(C)	8.0 8.1 544 20.0	8.0 8.7 537 20.0
Control	pH 02 ppm Cond. Temp(C)	8.1 7.7 371 20.0	7.9 10.0 345 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890333

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sample No : 03/21/89
Date Collected : 03/21/89
Date Received : 03/21/89
Tested : 03/21/89 at: 1730

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : 0, magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00			%
100	0	10	10			100
50	0	1	9			90
30	0	0	1			10
20	0	0	1			10
10	0	0	0			0
Control	0	0	0			0

48 Hour LC50 : 41.0 %

95% fid. limits : 34.0 - 49.0 %

Comments : most mort. occurred within 24 Hrs of exposure

TOXICITY TEST PARAMETERS

Sample Number: 06890333

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00

100	pH	8.5	7.7
	O2 ppm	6.4	2.0
	Cond.	2210	2450
	Temp(C)	20.0	20.0
50	pH	8.5	7.8
	O2 ppm	7.8	4.4
	Cond.	1344	1319
	Temp(C)	20.0	20.0
30	pH	8.4	7.8
	O2 ppm	7.9	6.1
	Cond.	981	977
	Temp(C)	20.0	20.0
20	pH	8.4	8.0
	O2 ppm	8.3	7.0
	Cond.	804	804
	Temp(C)	20.0	20.0
10	pH	8.3	8.1
	O2 ppm	8.8	8.1
	Cond.	608	568
	Temp(C)	20.0	20.0
Control	pH	8.2	8.3
	O2 ppm	8.9	8.8
	Cond.	418	390
	Temp(C)	20.0	20.0

Sample: 06890425

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Steven Mo
Date Collected : 04/11/89
Received : 04/11/89
Tested : 04/11/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E	L	A	P	S	E	D	T	I	M	E	TOTAL MORTALITY	%
100	0	0	0	0	0	0	0	0	0	0	0	0	100	
50	0	0	0	0	0	0	0	0	0	0	0	0	100	
30	0	0	0	0	0	0	0	0	0	0	0	0	50	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	
Control	0	0	0	0	0	0	0	0	0	0	0	0	0	

48 Hour LC50 : 31.0 %

95% fid. limits : 27.0 - 36.0 %

Comments : 10% Daphnia floating in 20% conc. at 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890425

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00

100	pH	8.2	8.1
	O2 ppm	4.5	8.6
	Cond.	2030	1956
	Temp(C)	20.0	20.0
50	pH	8.2	8.2
	O2 ppm	7.2	8.6
	Cond.	1144	1168
	Temp(C)	20.0	20.0
30	pH	8.2	8.2
	O2 ppm	8.0	8.6
	Cond.	837	850
	Temp(C)	20.0	20.0
20	pH	8.2	8.2
	O2 ppm	8.5	8.6
	Cond.	675	699
	Temp(C)	20.0	20.0
10	pH	8.2	8.3
	O2 ppm	8.9	8.5
	Cond.	533	556
	Temp(C)	20.0	20.0
5	pH	8.2	8.3
	O2 ppm	9.0	8.7
	Cond.	467	479
	Temp(C)	20.0	20.0
Control	pH	8.2	8.2
	O2 ppm	9.0	8.4
	Cond.	362	391
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 calculated by :

TOXICITY TEST REPORT Sample: 02890072

TEST CONDITIONS

Company : Petro-Canada, Inc.
 : Oakville, ONT
 : (530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : MOE
Sampling Method : grab
Sampled By : Raeburn-Gibson
Date Collected : 05/03/89
Received : 05/03/89
Tested : 05/04/89 at: 1130

Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 : Test Protocol, ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	48:00 72:00	%
100	0	0	0
60	0	0	0
30	0	1	8
15	0	0	0
5	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890072

TEST CONC. %

E L A P S E D T I M E

00:00 48:00 72:00

100	pH	8.2	8.2	8.2
	O2 ppm	7.8	7.1	7.1
	Cond.	1840	1840	1840
	Temp(C)	20.0	20.0	20.0
60	pH	8.2	8.1	8.1
	O2 ppm	8.9	8.0	8.0
	Cond.	1223	1230	1230
	Temp(C)	20.0	20.0	20.0
30	pH	8.1	8.0	8.0
	O2 ppm	9.9	8.0	8.0
	Cond.	780	785	785
	Temp(C)	20.0	20.0	20.0
15	pH	8.1	8.1	8.1
	O2 ppm	9.9	9.1	9.1
	Cond.	550	565	565
	Temp(C)	20.0	20.0	20.0
5	pH	8.0	8.1	8.1
	O2 ppm	8.9	7.9	7.9
	Cond.	397	401	401
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0	8.1	8.1
	O2 ppm	9.1	8.3	8.3
	Cond.	340	330	330
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890540

TEST CONDITIONS

Company : Petro-Canada Inc.
City : Oakville, ONT
(L350000)
Region : Central
Industry : Petroleum Refining
Control point : Process Effluent, (100)
Laboratory : Beak
Sampling Method : grab
Sampled By : Steven Mo
Date Collected : 05/16/89
Received : 05/16/89
Tested : 05/16/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, DME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890540

TEST CONC.
%
E L A P S E D T I M E
00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	8.0 3.7 2160 21.0	8.1 6.9 2310 21.0
50	pH 02 ppm Cond. Temp(C)	8.1 7.8 1326 21.0	8.2 8.0 1351 21.0
30	pH 02 ppm Cond. Temp(C)	8.1 7.6 971 21.0	8.2 7.9 1002 21.0
20	pH 02 ppm Cond. Temp(C)	8.2 8.0 977 21.0	8.2 8.0 795 21.0
10	pH 02 ppm Cond. Temp(C)	8.2 8.2 601 21.0	8.1 7.9 606 21.0
Control	pH 02 ppm Cond. Temp(C)	8.2 8.7 461 21.0	8.2 8.2 425 21.0

COMPANY: Petrosar Limited, Sarnia
(480004)
(now with Corunna Mfg. Complex)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petrosar Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish.

intake water

Process Effluent

05880002 sampled: 12/12/88 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05890001 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890011 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890022 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890031 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890036 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

storm water

landfarm leachate

Petrosar Limited (continued)

emergency overflow

TOXICITY TEST REPORT Sample: 05880002

TEST CONDITIONS

Company : Petroser Limited
 : Sudbury, ONT
 : (L80004)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : T. Moran
 Date Collected : 12/12/88
 Received : 12/12/88
 Tested : 12/13/88 at: 1130
 Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).
 Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY	
%	00:00	02:10	03:10	05:00	22:25	46:25	70:00	95:10				
100	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	1	2	3	3	3	3	30	30
56	0	0	0	0	0	1	1	1	1	1	10	10
25	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST CONC. % E L A P S E D T I M E
 00:00 02:10 03:10 05:00 22:25 46:25 70:00 95:10

100	pH 7.1 O2 ppm 10.2 Cond. 1600 Temp(C) 15.0	7.5 7.5 7.5 7.6 9.6 8.9 8.9 1700	7.5 7.5 7.5 7.6 9.6 8.9 8.9 1700
75	pH 7.1 O2 ppm 10.3 Cond. 1325 Temp(C) 15.0	7.5 7.6 7.6 7.6 9.5 9.4 10.0 9.8	7.5 7.6 7.6 7.6 9.5 9.4 10.0 9.8
56	pH 7.1 O2 ppm 10.4 Cond. 1000 Temp(C) 15.0	7.5 7.6 7.6 7.6 9.4 9.6 10.1 9.8	7.5 7.6 7.6 7.6 9.4 9.6 10.1 9.8
25	pH 7.1 O2 ppm 10.4 Cond. 550 Temp(C) 15.0	7.5 7.6 7.6 7.7 9.4 9.8 10.1 9.8	7.5 7.6 7.6 7.7 9.4 9.8 10.1 9.8
10	pH 7.1 O2 ppm 10.5 Cond. 312 Temp(C) 15.0	7.5 7.7 7.7 7.7 9.3 9.7 10.1 10.1	7.5 7.7 7.7 7.7 9.3 9.7 10.1 10.1
1	pH 7.2 O2 ppm 10.2 Cond. 180 Temp(C) 15.0	7.4 7.7 7.6 7.7 9.4 9.8 10.1 10.0	7.4 7.7 7.6 7.7 9.4 9.8 10.1 10.0
Control	pH 7.0 O2 ppm 10.2 Cond. 162 Temp(C) 15.0	7.6 7.7 7.6 7.6 10.0 10.0 10.1 10.2	7.6 7.7 7.6 7.6 10.0 10.0 10.1 10.2
Control	pH 7.1 O2 ppm 10.3 Cond. 162 Temp(C) 15.0	7.6 7.6 7.6 7.6 9.9 10.1 10.2 10.1	7.6 7.6 7.6 7.6 9.9 10.1 10.2 10.1

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890001

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/12/89 at: 1130

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal
Weight(gm)
Length(mm)

: Rainbow trout
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890001

TEST CONC. %
E L A P S E D T I M E
00:00 23:00 47:10 71:10 96:10

100	pH 9.4 Cond. 1990 Temp(C)	7.3 7.6 9.5 15.0	7.6 7.6 10.4 15.0	7.6 7.6 9.9 15.0	7.6 9.8 1960 15.0
75	pH 9.3 Cond. 1450 Temp(C)	7.5 9.3 9.5 15.0	7.6 7.6 10.3 15.0	7.6 9.8 10.0 15.0	7.6 9.8 1420 15.0
56	pH 9.6 Cond. 1220 Temp(C)	7.5 9.6 12.2 15.0	7.7 7.6 10.2 15.0	7.6 10.2 10.0 15.0	7.7 10.0 1200 15.0
25	pH 9.3 Cond. 680 Temp(C)	7.7 10.4 10.0 15.0	7.7 10.0 10.2 15.0	7.7 10.2 10.0 15.0	7.7 600 15.0
10	pH 9.3 Cond. 350 Temp(C)	7.7 10.4 10.3 15.0	7.7 10.2 10.1 15.0	7.7 10.1 10.2 15.0	7.8 374 188 15.0
1	pH 9.3 Cond. 185 Temp(C)	7.7 10.4 10.4 15.0	7.7 10.2 10.2 15.0	7.7 10.2 10.0 15.0	7.9 188 164 15.0
Control	pH 9.3 Cond. 165 Temp(C)	7.7 10.4 10.3 15.0	7.6 10.2 10.0 15.0	7.7 10.0 10.0 15.0	7.7 164 15.0
Control	pH 9.3 Cond. 165 Temp(C)	7.8 10.6 10.2 15.0	7.7 10.1 10.1 15.0	7.8 9.9 10.2 15.0	7.7 164 15.0

TOXICITY TEST REPORT Sample: 05890011

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : J. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1620

Type of Bioassay : STATIC
: (Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:10	21:20	45:10	70:20	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890011

TEST CONC. %
E L A P S E D T I M E
00:10 21:20 45:10 70:20 95:10

100	pH 02 ppm Cond. Temp(C)	7.1 9.6 2000 15.0	7.5 9.5 15.0	7.5 9.8 15.0	7.5 9.4 2050 15.0
75	pH 02 ppm Cond. Temp(C)	7.2 9.6 1600 15.0	7.6 9.5 15.0	7.5 9.4 1590 15.0	7.5 9.3 1590 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 10.0 1200 15.0	7.6 9.5 15.0	7.5 9.4 1220 15.0	7.5 9.3 1220 15.0
25	pH 02 ppm Cond. Temp(C)	7.4 10.4 650 15.0	7.8 9.7 15.0	7.6 9.6 15.0	7.5 9.4 650 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 10.4 330 15.0	7.7 9.5 15.0	7.5 9.4 15.0	7.6 9.5 348 15.0
1	pH 02 ppm Cond. Temp(C)	7.4 10.4 180 15.0	7.9 9.8 15.0	7.5 9.2 15.0	7.6 9.8 192 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.8 162 15.0	7.7 9.8 15.0	7.5 9.9 15.0	7.6 9.7 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 11.0 162 15.0	7.6 9.8 15.0	7.4 9.8 15.0	7.5 9.9 172 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890022

TEST CONDITIONS

Company : Petrosar Limited
 : Sarnia, ONT
 : (480004)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 03/06/89
 Received : 03/06/89
 Tested : 03/07/89 at: 1520

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:10	49:20	68:10	95:10	%

100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %	E L A P S E D T I M E				
	00:00	20:10	49:20	68:10	95:10

100	pH 02 ppm Cond. Temp(C)	7.2 8.4 2200 15.0	7.2 8.4 8.8 15.0	7.2 9.8 2220 15.0	7.3 9.3 2220 15.0
75	pH 02 ppm Cond. Temp(C)	7.3 6.9 1770 15.0	7.1 6.4 9.2 15.0	7.3 9.8 1790 15.0	7.4 9.4 1790 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 9.2 900 15.0	7.4 9.0 9.4 15.0	7.3 10.0 900 15.0	7.6 9.6 900 15.0
25	pH 02 ppm Cond. Temp(C)	7.5 9.5 780 15.0	7.5 9.6 7.6 15.0	7.6 10.0 800 15.0	7.6 9.9 800 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 9.5 390 15.0	7.5 9.4 9.0 15.0	7.6 9.8 410 15.0	7.5 10.2 410 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 9.7 189 15.0	7.6 9.4 9.4 15.0	7.5 9.8 198 15.0	7.5 10.0 198 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.0 168 15.0	7.5 9.8 10.1 15.0	7.6 10.2 178 15.0	7.7 10.2 178 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 9.9 168 15.0	7.5 9.6 9.8 15.0	7.6 10.2 178 15.0	7.7 10.3 178 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890031

TEST CONDITIONS

Company : Petrosar Limited
 (480004)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 04/03/89
 Received : 04/03/89
 Tested : 04/04/89 at: 1330

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

95% Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST
CONC.
%

E L A P S E D T I M E

00:00 19:15 46:10 69:00 95:10

100	pH 7.2 02 p.p.m 8.3 Cond. 1710 Temp(C) 15.0	7.4 7.4 8.6 9.3 15.0	7.4 7.4 9.3 9.1 15.0	7.6 9.3 1710 15.0
100	pH 7.2 02 p.p.m 8.4 Cond. 1710 Temp(C) 15.0	7.6 7.6 9.4 9.4 15.0	7.5 7.5 8.9 15.0	7.6 9.4 1710 15.0
Control	pH 7.6 02 p.p.m 162 Cond. 15.0	7.3 7.3 9.2 10.1 15.0	7.3 7.3 9.9 15.0	7.5 10.0 172 15.0
Control	pH 7.6 02 p.p.m 162 Cond. 15.0	7.4 7.4 9.2 10.2 15.0	7.4 7.4 10.0 15.0	7.5 10.0 170 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890036

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal
Weight(gm)
Length(mm)

: Rainbow trout
:
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30			%
100	0	0	0	0	0			0
100	0	0	0	0	0			0
Control	0	0	0	0	0			0
Control	0	0	0	0	0			0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST CONC. %	E L A P S E D T I M E						
	00:00	21:30	47:30	72:30	97:30		
100	pH	7.1	7.1	7.2	7.1		
	O2 ppm	8.8	8.9	8.2	9.4		
	Cond.	2100			2100		
	Temp(C)	15.0	15.0	15.0	15.0		
100	pH	7.1	7.1	7.2	7.1		
	O2 ppm	8.8	9.6	8.6	9.2		
	Cond.	2080			2110		
	Temp(C)	15.0	15.0	15.0	15.0		
Control	pH	7.3	7.6	7.6	7.3		
	O2 ppm	10.6	9.8	9.3	9.8		
	Cond.	158			172		
	Temp(C)	15.0	15.0	15.0	15.0		
Control	pH	7.3	7.6	7.6	7.5		
	O2 ppm	10.4	10.0	9.4	9.9		
	Cond.	158			170		
	Temp(C)	15.0	15.0	15.0	15.0		

COMPANY: Petrosar Limited, Sarnia
(480004)
(now with Corunna Mfg. Complex)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six Daphnia magna toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were supplied by Petrosar Ltd. in Sarnia. All six samples were not acutely lethal to Daphnia magna.

intake water

Process Effluent

05880002 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890001 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890011 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890022 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890031 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890036 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

storm water

landfarm leachate

Petrosar Limited (continued)

emergency overflow

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880002

TEST CONDITIONS

Company : Petrosas Limited
Address : 2480042, ONI
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1150

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST CONC. % ELAPSED TIME
00:00 48:00

100	pH O2 ppm Cond. Temp(C)	7.4 9.1 1820 20.0	7.5 9.1 1820 20.0
50	pH O2 ppm Cond. Temp(C)	7.9 9.1 1060 20.0	7.7 9.0 1200 20.0
26	pH O2 ppm Cond. Temp(C)	8.0 9.1 940 20.0	8.0 9.0 930 20.0
13	pH O2 ppm Cond. Temp(C)	8.1 9.1 780 20.0	8.1 9.2 780 20.0
6	pH O2 ppm Cond. Temp(C)	8.1 9.1 680 20.0	8.0 9.2 690 20.0
Control	pH O2 ppm Cond. Temp(C)	8.2 9.0 600 20.0	8.1 9.0 600 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890001

TEST CONDITIONS

Company : Petrosar Limited
 : Sarnia, ONT
 : (S80004)
Region : Southeast
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/09/89 at: 1400

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D	T I M E	TOTAL MORTALITY
%	00:00	47:30	%
100	0	0	0
50	0	0	0
25	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890001

TEST CONC.
%

E L A P S E D

T I M E

00:00 47:30

100	pH 7.0 7.5 O2 ppm 9.5 8.2 Cond. 2290 2200 Temp(C) 20.0 20.0
50	pH 7.5 7.8 O2 ppm 9.5 9.2 Cond. 1450 1400 Temp(C) 20.0 20.0
26	pH 8.0 7.9 O2 ppm 9.4 9.5 Cond. 1050 1020 Temp(C) 20.0 20.0
13	pH 8.1 8.1 O2 ppm 9.5 9.5 Cond. 800 800 Temp(C) 20.0 20.0
6	pH 8.1 8.1 O2 ppm 9.5 9.5 Cond. 700 700 Temp(C) 20.0 20.0
Control	pH 8.2 8.0 O2 ppm 9.4 9.5 Cond. 590 600 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 058900011

TEST CONDITIONS

Company : Petrosar Limited
 : Sarnia, ONT
 : (480004)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/06/89
 Received : 02/06/89
 Tested : 02/07/89 at: 1520

Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 : Test Protocol. OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	01:20 46:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 058900011

TEST ELAPSED TIME
 CONC. % 01:20 46:25

100	pH 7.2 7.5 O2 ppm 9.2 8.6 Cond. 2260 2390 Temp(C) 20.0 20.0
50	pH 7.7 7.8 O2 ppm 9.2 8.9 Cond. 1480 1510 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 9.0 9.0 Cond. 1080 1100 Temp(C) 20.0 20.0
13	pH 7.9 8.0 O2 ppm 9.0 9.0 Cond. 880 890 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 9.0 9.2 Cond. 740 750 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.2 9.2 Cond. 620 650 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890022

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1130

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY	%
100	00:00 48:25		
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %	ELAPSED TIME
	00:00 48:25

100	pH 7.3 7.0 O2 ppm 8.6 5.5 Cond. 2480 2500 Temp(C) 20.0 20.0
50	pH 7.8 7.4 O2 ppm 8.5 7.2 Cond. 1510 1600 Temp(C) 20.0 20.0
26	pH 7.9 7.7 O2 ppm 8.6 8.0 Cond. 1110 1120 Temp(C) 20.0 20.0
13	pH 8.0 7.8 O2 ppm 8.8 8.7 Cond. 850 900 Temp(C) 20.0 20.0
6	pH 8.0 7.9 O2 ppm 8.9 8.8 Cond. 710 740 Temp(C) 20.0 20.0
Control	pH 8.1 7.9 O2 ppm 9.1 9.2 Cond. 600 610 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890031

TEST CONDITIONS

Company : Petrosar Limited
 (480004)
 Region : Sarnia, ONT
 Industry : Southwest
 : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 04/03/89
 Received : 04/03/89
 Tested : 04/04/89 at: 1545
 Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)
 Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST ELAPSED TIME
 CONC. % 00:00 49:10

100	pH 02 ppm Cond. Temp(C)	7.3 8.8 1880 20.0	7.6 8.8 1910 20.0
50	pH 02 ppm Cond. Temp(C)	7.6 9.0 1220 20.0	7.8 8.9 1260 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 9.2 900 20.0	7.9 9.0 920 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.0 720 20.0	7.9 9.2 780 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 9.2 620 20.0	7.9 9.2 680 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	7.9 9.2 595 20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890036

TEST CONDITIONS

Company : Petrosar Limited
Selling Unit : South East
Region : Southeast
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 1020

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 48:05	%
100	0	8
50	0	0
20	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST CONC. %
E L A P S E D T I M E
00:00 48:05

100	pH 7.3 O2 ppm 7.4 Cond. 9.6 Temp(C) 7.7 2080 2400 20.0 20.0
50	pH 7.8 O2 ppm 7.7 Cond. 9.6 Temp(C) 7.8 1220 1420 20.0 20.0
26	pH 7.9 O2 ppm 7.9 Cond. 9.6 Temp(C) 8.0 940 1010 20.0 20.0
13	pH 8.0 O2 ppm 8.0 Cond. 9.6 Temp(C) 8.2 700 790 20.0 20.0
6	pH 8.0 O2 ppm 8.0 Cond. 9.4 Temp(C) 8.7 540 620 20.0 20.0
Control	pH 8.0 O2 ppm 8.1 Cond. 9.8 Temp(C) 9.2 490 510 20.0 20.0

COMPANY: Shell Canada Products Limited, Sarnia
(510107)
(now with Sarnia Mfg.)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Shell Canada Products Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish. Data for bioassays conducted on three intake water samples collected in December 1988, January and May 1989 indicate they were not acutely lethal. Data for bioassays conducted on cooling water samples collected in January and May 1989 indicate they were not acutely lethal.

intake water

05880007 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890007 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890037 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880006 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890008 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890012 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890027 sampled: 03/28/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Shell Canada Products Limited (continued)

05890032 sampled: 04/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890060 sampled: 04/26/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

05890040 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890038 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890039 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880007

TEST CONDITIONS

Company : Shell Canada Products Limited
Region : Sarnia, ON (S10107)
Industry : Southeast
Control point : Petroleum Refining
Laboratory : intake water, (100)
Sampling Method : Pollutech
Sampled By : Grab
Date Collected : T. Moran
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal
Weight(gm)
Length(mm)

: Rainbow trout
:
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E								TOTAL MORTALITY		
%	00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10	%		
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
Control	7	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 HOURS LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST CONC.	E L A P S E O T I M E									
%	00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10		
100	pH	7.6	7.6	7.7	7.8	7.8	7.8	7.8		
	O2 ppm	10.2	10.2	9.6	10.1	10.1	10.1	10.1		
	Cond.	208	208	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
75	pH	7.5	7.5	7.7	7.8	7.8	7.8	7.8		
	O2 ppm	10.1	10.1	9.8	10.0	10.0	9.9	9.9		
	Cond.	195	195	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
56	pH	7.4	7.4	7.8	7.8	7.7	7.7	7.7		
	O2 ppm	10.0	10.0	9.9	9.9	9.9	10.0	10.0		
	Cond.	188	188	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
25	pH	7.2	7.2	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	10.1	10.1	9.9	10.1	10.1	10.0	10.0		
	Cond.	172	172	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
10	pH	7.3	7.3	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	9.9	9.9	9.9	10.0	10.0	10.0	10.0		
	Cond.	165	165	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
1	pH	7.2	7.2	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	9.8	9.8	9.8	9.7	9.7	9.7	9.7		
	Cond.	160	160	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
Control	pH	7.0	7.0	7.6	7.6	7.6	7.6	7.6		
	O2 ppm	10.2	10.2	10.0	10.0	10.1	10.2	10.2		
	Cond.	162	162	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
Control	pH	7.1	7.1	7.6	7.6	7.6	7.6	7.6		
	O2 ppm	10.3	10.3	9.9	10.1	10.2	10.1	10.1		
	Cond.	162	162	15.0	15.0	15.0	15.0	15.0		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890007

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D %	T I M E 00:00 22:10 46:00 70:00 95:10	TOTAL MORTALITY %
---------------	--------------------	--	-------------------------

100	0	0 0 0 0	0
75	0	0 0 0 0	0
56	0	0 0 0 0	0
25	0	0 0 0 0	0
10	0	0 0 0 0	0
1	0	0 0 0 0	0
Control	0	0 0 0 0	0
Control	0	0 0 0 0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890007

TEST CONC. %	E L A P S E D T I M E 00:00 22:10 46:00 70:00 95:10
--------------------	---

100	pH 7.8 7.7 7.7 7.8 7.8 O2 ppm 10.8 10.0 9.9 10.2 10.1 Cond. 212 15.0 15.0 15.0 15.0 Temp(C)
75	pH 7.8 7.7 7.7 7.8 7.8 O2 ppm 10.8 9.8 9.8 10.2 10.2 Cond. 202 15.0 15.0 15.0 15.0 Temp(C)
56	pH 7.7 7.6 7.7 7.8 7.8 O2 ppm 10.6 10.1 9.8 10.2 10.2 Cond. 194 15.0 15.0 15.0 15.0 Temp(C)
25	pH 7.7 7.6 7.6 7.8 7.7 O2 ppm 10.4 10.2 9.8 10.0 10.2 Cond. 182 15.0 15.0 15.0 15.0 Temp(C)
10	pH 7.7 7.7 7.6 7.7 7.7 O2 ppm 10.4 9.9 10.0 10.0 10.0 Cond. 180 15.0 15.0 15.0 15.0 Temp(C)
1	pH 7.7 7.8 7.7 7.9 7.8 O2 ppm 10.2 9.9 10.0 10.2 10.2 Cond. 178 15.0 15.0 15.0 15.0 Temp(C)
Control	pH 7.6 7.7 7.7 7.8 7.7 O2 ppm 10.4 9.9 9.9 10.0 10.2 Cond. 170 15.0 15.0 15.0 15.0 Temp(C)
Control	pH 7.6 7.7 7.7 7.8 7.7 O2 ppm 10.2 10.0 10.0 10.2 10.2 Cond. 170 15.0 15.0 15.0 15.0 Temp(C)

TOXICITY TEST REPORT Sample: 05890037

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST ELAPSED TIME TOTAL
CONC. % 00:00 19:00 44:10 69:15 97:10 %

TEST CONC.	%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST ELAPSED TIME
CONC. % 00:00 19:00 44:10 69:15 97:10

TEST CONC.	%	00:00	19:00	44:10	69:15	97:10
100	pH 7.7 7.5 7.5 7.5 7.6 O2 ppm 10.8 9.4 9.2 9.4 9.3 Cond. 214 214 214 214 214 Temp(C) 15.0 15.0 15.0 15.0 15.0					
75	pH 7.4 7.4 7.4 7.4 7.6 O2 ppm 10.4 9.5 9.6 9.2 9.2 Cond. 202 202 202 202 201 Temp(C) 15.0 15.0 15.0 15.0 15.0					
56	pH 7.4 7.4 7.5 7.4 7.5 O2 ppm 10.3 9.5 9.6 9.3 9.0 Cond. 198 198 198 198 199 Temp(C) 15.0 15.0 15.0 15.0 15.0					
25	pH 7.5 7.5 7.5 7.4 7.5 O2 ppm 10.0 9.5 9.6 9.2 9.5 Cond. 182 182 182 182 181 Temp(C) 15.0 15.0 15.0 15.0 15.0					
10	pH 7.5 7.5 7.5 7.5 7.5 O2 ppm 10.0 9.8 9.4 9.4 9.3 Cond. 176 176 176 176 175 Temp(C) 15.0 15.0 15.0 15.0 15.0					
1	pH 7.4 7.4 7.6 7.5 7.6 O2 ppm 10.1 10.0 9.4 9.4 9.4 Cond. 170 170 170 170 169 Temp(C) 15.0 15.0 15.0 15.0 15.0					
Control	pH 7.3 7.5 7.2 7.4 7.4 O2 ppm 10.2 9.8 9.4 9.3 9.4 Cond. 168 168 168 168 168 Temp(C) 15.0 15.0 15.0 15.0 15.0					
Control	pH 7.3 7.5 7.3 7.5 7.4 O2 ppm 10.2 9.7 9.2 9.4 9.6 Cond. 168 168 168 168 169 Temp(C) 15.0 15.0 15.0 15.0 15.0					

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880006

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T. Moran

Date Collected : 12/12/88

Date Received : 12/12/88

Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC

(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY
	%	00:00	02:10	03:10	05:00	22:25	46:10	70:00	95:10	%	
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05880006

TEST E L A P S E D T I M E

CONC. % 00:00 02:10 03:10 05:00 22:25 46:10 70:00 95:10

100 pH 7.3 7.6 7.6 7.6 7.7
02 ppm 7.6 8.9 9.2 7.8 9.9
Conc. 650 695
Temp(C) 15.0 15.0 15.0 15.0 15.0

75 pH 7.2 7.6 7.6 7.6 7.7
02 ppm 7.4 7.6 7.6 7.6 7.7
Conc. 525 540
Temp(C) 15.0 15.0 15.0 15.0 15.0

56 pH 7.1 7.5 7.5 7.7 7.7
02 ppm 7.8 8.9 9.0 9.8 10.0
Conc. 430 438
Temp(C) 15.0 15.0 15.0 15.0 15.0

25 pH 7.0 7.5 7.5 7.7 7.7
02 ppm 9.1 9.0 9.1 10.0 10.0
Conc. 282 290
Temp(C) 15.0 15.0 15.0 15.0 15.0

10 pH 7.1 7.6 7.7 7.7 7.7
02 ppm 9.2 9.5 9.2 10.1 10.1
Conc. 210 218
Temp(C) 15.0 15.0 15.0 15.0 15.0

1 pH 7.0 7.5 7.6 7.6 7.7
02 ppm 9.9 9.9 9.9 10.0 10.2
Conc. 170 175
Temp(C) 15.0 15.0 15.0 15.0 15.0

Control pH 7.0 7.6 7.7 7.6 7.6
02 ppm 10.2 10.0 10.0 10.1 10.2
Conc. 162 168
Temp(C) 15.0 15.0 15.0 15.0 15.0

Control pH 7.1 7.6 7.6 7.6 7.6
02 ppm 10.3 9.9 10.1 10.1 10.1
Conc. 162 168
Temp(C) 15.0 15.0 15.0 15.0 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890008

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)

Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T. Moran

Date Collected : 01/16/89

Date Received : 01/16/89

Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal :
Weight(gm) :
Length(mm) :
: Rainbow trout

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST CONC. %	E L A P S E D T I M E				
	00:00	22:10	47:10	70:00	95:10
100	pH 7.4	7.6	7.5	7.8	7.8
	O2 ppm 8.8	10.0	9.9	10.4	10.2
	Cond. 540				550
	Temp(C) 15.0	15.0	15.0	15.0	15.0
75	pH 7.5	7.6	7.7	7.8	7.8
	O2 ppm 9.4	10.0	9.9	10.0	10.0
	Cond. 464				460
	Temp(C) 15.0	15.0	15.0	15.0	15.0
56	pH 7.5	7.5	7.6	7.9	7.8
	O2 ppm 9.6	9.6	9.8	10.6	9.2
	Cond. 388				388
	Temp(C) 15.0	15.0	15.0	15.0	15.0
25	pH 7.6	7.6	7.6	7.8	7.8
	O2 ppm 10.2	10.0	9.4	10.2	9.0
	Cond. 268				270
	Temp(C) 15.0	15.0	15.0	15.0	15.0
10	pH 7.7	7.4	7.5	7.7	7.8
	O2 ppm 10.4	9.0	9.7	9.8	9.3
	Cond. 206				210
	Temp(C) 15.0	15.0	15.0	15.0	15.0
1	pH 7.7	7.6	7.6	7.7	7.7
	O2 ppm 10.4	9.6	9.9	9.8	9.6
	Cond. 178				182
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.7	7.7	7.8	7.7
	O2 ppm 10.4	9.9	9.9	10.0	10.2
	Cond. 170				182
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.6	7.7	7.8	7.7
	O2 ppm 10.2	10.0	10.0	10.2	10.2
	Cond. 170				182
	Temp(C) 15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890012

TEST CONDITIONS

Company : Shell Canada Products Limited
 : Sarnia, ONT
 : (S10107)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/06/89
 Received : 02/06/89
 Tested : 02/07/89 at: 1625

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:15	45:05	70:15	95:05	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST
CONC.
%

E L A P S E D T I M E

00:00 21:15 45:05 70:15 95:05

100	pH	7.1	7.8	7.7	7.7	7.7
	O ₂ ppm	7.2	9.5	8.6	8.8	9.7
	Cond.	900				890
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.1	7.6	7.5	7.7	7.7
	O ₂ ppm	8.4	9.0	8.6	8.8	9.5
	Cond.	700				710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.7	7.6	7.8	7.7
	O ₂ ppm	9.0	9.4	8.6	9.2	9.7
	Cond.	600				590
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.7	7.5	7.7	7.6
	O ₂ ppm	10.2	9.3	9.2	9.4	9.6
	Cond.	340				349
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.4	7.9	7.6	7.7	7.7
	O ₂ ppm	10.6	9.8	9.6	9.4	10.0
	Cond.	250				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.8	7.5	7.6	7.7
	O ₂ ppm	10.2	9.8	9.4	9.5	10.1
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.5	7.6	7.6
	O ₂ ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.5	7.6
	O ₂ ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 05890027

TEST CONDITIONS

Company : Shell Canada Products Limited
 Region : Sarnia, ONT (510107)
 Industry : Southwest
 : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : T.Moran
 Date Collected : 03/28/89
 Received : 03/28/89
 Tested : 03/29/89 at: 930

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	25:10	50:20	82:10	10:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC. %
 00:00 25:10 50:20 82:10 10:00

100	pH	7.1	7.6	7.6	7.6
	O2 ppm	7.7	9.8	9.8	9.8
	Cond.	680			610
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	7.1	7.6	7.7	7.6
	O2 ppm	7.9	9.8	9.7	9.9
	Cond.	655			620
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.4	7.5	7.5	7.5
	O2 ppm	10.6	10.1	10.2	10.1
	Cond.	155			168
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.6	7.5
	O2 ppm	10.6	10.3	10.1	10.1
	Cond.	155			168
	Temp(C)	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890032

TEST CONDITIONS

Company : Shell Canada Products Limited
 : Sarnia, ONT
 : (510107)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 04/10/89
 Received : 04/10/89
 Tested : 04/11/89 at: 1420

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:10	43:20	68:20	96:10	%	
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST CONC. %	E L A P S E D T I M E					
	00:00	19:10	43:20	68:20	96:10	
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.9	9.8	9.6	9.6
	Cond.	488				479
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.8	9.8	9.4	9.4
	Cond.	492				482
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.2	10.2	10.0	9.8	10.0
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.3	10.1	9.9	9.8	10.1
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 01890060

TEST CONDITIONS

Company : Shell Canada Products Limited

Sarnia, ONT

(510107)

Region : Southwest

Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE

Sampling Method : Grab

Sampled By : O. Hamilton

Date Collected : 04/26/89

Received : 04/27/89

Tested : 04/27/89 at: 1500

Type of Bioassay : STATIC

(Protocol to determine the acute lethality
of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%	
100	0	0	0	0	0	1	10	
65	0	0	0	0	0	1	10	
40	0	0	0	0	0	0	0	
30	0	0	0	0	0	1	10	
20	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	
Control	0	0	0	0	0	0	0	

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

TOXICITY TEST PARAMETERS

Sample Number: 01890060

TEST CONC. %	E L A P S E D T I M E						
	00:00	00:30	24:00	48:00	72:00	96:00	

100	pH	7.5	7.5	8.4	8.1	7.9	8.3
	O2 ppm	8.5	8.5	9.8	9.7	9.8	9.6
	Cond.	665	665	630	650	650	650
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	7.8	8.2	8.0	7.9	8.3	
	O2 ppm	9.1	9.7	9.8	9.8	9.5	
	Cond.	515	500	495	495	500	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
40	pH	7.8	8.0	8.0	8.1	8.0	
	O2 ppm	9.3	9.4	9.5	9.7	9.4	
	Cond.	420	410	415	410	415	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
30	pH	7.7	8.0	8.0	8.0	8.1	
	O2 ppm	9.4	9.7	9.8	9.7	9.5	
	Cond.	385	375	380	370	380	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
20	pH	7.7	8.0	7.9	7.8	8.1	
	O2 ppm	9.3	9.7	9.8	9.7	9.5	
	Cond.	345	340	340	335	335	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
10	pH	7.6	7.9	7.9	7.9	7.7	8.0
	O2 ppm	9.6	9.7	9.7	9.8	9.6	
	Cond.	305	295	300	295	300	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
Control	pH	7.7	7.6	7.6	7.6	7.6	7.4
	O2 ppm	9.5	9.8	9.7	9.7	9.6	
	Cond.	270	260	260	260	260	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890040

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Southwest

Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T-Moran

Date Collected : 05/08/89

Received : 05/08/89

Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC

(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890040

TEST
CONC.
%

E L A P S E D T I M E

00:00 19:00 44:10 69:15 97:10

100	pH	7.2	7.8	7.7	7.8	7.8
	O2 ppm	8.0	9.0	9.6	9.4	9.5
	Cond.	580				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.7	7.6	7.7	7.7
	O2 ppm	8.0	9.1	9.6	9.2	9.3
	Cond.	580				560
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.5
	O2 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 058900004

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : CW to Talford Creek, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : J. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY %
%	00:00	22:10	47:10	70:00	95:10		
100	0	0	0	0	0		0
75	0	0	0	0	0		0
56	0	0	0	0	0		0
25	0	0	0	0	0		0
10	0	0	0	0	0		0
1	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 058900004

TEST CONC. %
E L A P S E D T I M E
00:00 22:10 47:10 70:00 95:10

100	pH 9.4 Cond. Temp(C)	7.8 9.4 224 15.0	7.7 9.8 15.0	7.7 10.4 15.0	7.8 10.2 224 15.0
75	pH O2 ppm Cond. Temp(C)	7.7 9.6 210 15.0	7.6 10.0 210 15.0	7.7 9.8 15.0	7.8 10.2 210 15.0
56	pH O2 ppm Cond. Temp(C)	7.7 9.8 202 15.0	7.6 10.0 15.0	7.6 9.9 15.0	7.8 10.1 205 15.0
25	pH O2 ppm Cond. Temp(C)	7.6 10.2 186 15.0	7.7 10.0 15.0	7.6 10.2 15.0	7.8 10.2 192 15.0
10	pH O2 ppm Cond. Temp(C)	7.6 10.4 180 15.0	7.6 10.0 15.0	7.6 10.2 15.0	7.8 10.2 189 15.0
1	pH O2 ppm Cond. Temp(C)	7.6 10.4 174 15.0	7.6 10.2 15.0	7.6 10.1 15.0	7.8 10.4 182 15.0
Control	pH O2 ppm Cond. Temp(C)	7.6 10.4 170 15.0	7.7 9.9 15.0	7.7 10.0 15.0	7.8 10.2 182 15.0
Control	pH O2 ppm Cond. Temp(C)	7.6 10.2 170 15.0	7.7 10.0 15.0	7.7 10.2 15.0	7.8 10.2 182 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890038

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : CW to Talford Creek, (400)
Laboratory : Pollutech
Sampling Method : grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E	L	A	P	S	E	D	T	M	T	TOTAL MORTALITY	%
%	00:00	19:00	44:10	69:15	97:10							

100	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %	E	L	A	P	S	E	D	T	M	T
%	00:00	19:00	44:10	69:15	97:10					

100	pH	7.8	7.6	7.6	7.6	7.6	7.5			
	O2 ppm	9.1	9.6	9.4	9.2	9.0	9.0			
	Cond.	216	15.0	15.0	15.0	15.0	214			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
75	pH	7.7	7.6	7.6	7.6	7.6	7.6			
	O2 ppm	9.3	9.5	9.5	9.1	9.2	9.2			
	Cond.	204	15.0	15.0	15.0	15.0	203			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
56	pH	7.6	7.5	7.5	7.6	7.6	7.6			
	O2 ppm	9.6	9.6	9.2	9.3	9.3	9.4			
	Cond.	198	15.0	15.0	15.0	15.0	199			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
25	pH	7.5	7.5	7.5	7.6	7.6	7.6			
	O2 ppm	9.8	9.2	9.3	9.2	9.1	9.1			
	Cond.	182	15.0	15.0	15.0	15.0	181			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
10	pH	7.5	7.5	7.5	7.5	7.5	7.5			
	O2 ppm	10.0	9.4	9.4	9.2	9.0	9.0			
	Cond.	174	15.0	15.0	15.0	15.0	175			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
1	pH	7.5	7.5	7.5	7.6	7.6	7.6			
	O2 ppm	10.1	9.6	9.2	9.2	9.4	9.4			
	Cond.	170	15.0	15.0	15.0	15.0	170			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
Control	pH	7.3	7.5	7.2	7.4	7.4	7.4			
	O2 ppm	10.2	9.8	9.4	9.3	9.4	9.4			
	Cond.	168	15.0	15.0	15.0	15.0	168			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			
Control	pH	7.3	7.5	7.3	7.6	7.6	7.6			
	O2 ppm	10.2	9.7	9.2	9.6	9.6	9.6			
	Cond.	168	15.0	15.0	15.0	15.0	169			
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0			

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890005

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT (510107)

Industry : Southwest

Control point : Petroleum Refining

Laboratory : CW from POW, (500)

Sampling Method : Pollutech

Sampled By : Grab

Date Collected : T. Moran

Date Received : 01/16/89

Tested : 01/16/89 at: 1230

Type of Bioassay

: STATIC (Protocol to determine the acute lethality of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10		%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890005

TEST CONC. %
 E L A P S E D T I M E
 00:00 22:10 47:10 70:00 95:10

100	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.6	9.8	9.9	9.6	10.2
	Cond.	262				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.8	10.1	9.8	9.6	9.9
	Cond.	234				265
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.6	7.6	7.7	7.6
	O2 ppm	9.8	10.2	9.8	9.6	9.9
	Cond.	224				229
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.7	7.7
	O2 ppm	10.2	10.4	9.9	9.6	10.2
	Cond.	200				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.7	7.6	7.8	7.7
	O2 ppm	10.4	10.1	9.9	9.8	10.3
	Cond.	192				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.7	7.6	7.9	7.7
	O2 ppm	10.4	10.4	9.9	10.0	10.2
	Cond.	178				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890039

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : CW from POW, (500)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY	
%	00:00	19:00 44:10 69:15 97:10	%	
100	0	0	0	0
75	0	0	0	0
56	0	0	0	0
25	0	0	0	0
10	0	0	0	0
1	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890039

TEST
CONC.
%

E L A P S E D T I M E

00:00 19:00 44:10 69:15 97:10

100	pH 02 ppm Cond. Temp(C)	7.8 9.5 218 15.0	7.7 9.5 15.0	7.5 9.6 15.0	7.6 9.2 15.0	7.5 9.2 218 15.0
75	pH 02 ppm Cond. Temp(C)	7.7 9.6 208 15.0	7.7 9.5 15.0	7.6 9.4 15.0	7.6 9.6 15.0	7.6 9.7 208 15.0
56	pH 02 ppm Cond. Temp(C)	7.6 9.6 198 15.0	7.6 9.6 15.0	7.6 9.2 15.0	7.6 9.5 15.0	7.6 9.5 198 15.0
25	pH 02 ppm Cond. Temp(C)	7.5 9.7 182 15.0	7.6 9.4 15.0	7.6 9.6 15.0	7.6 9.4 15.0	7.6 9.6 182 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 9.8 178 15.0	7.6 9.3 15.0	7.6 9.4 15.0	7.5 9.5 15.0	7.5 9.1 178 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 10.0 172 15.0	7.5 9.6 15.0	7.6 9.6 15.0	7.6 9.6 15.0	7.5 9.4 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.2 168 15.0	7.5 9.8 15.0	7.2 9.4 15.0	7.4 9.3 15.0	7.4 9.4 168 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.2 168 15.0	7.5 9.7 15.0	7.3 9.2 15.0	7.5 9.4 15.0	7.4 9.6 169 15.0

TOXICITY TEST REPORT Sample: 05890006

TEST CONDITIONS

Company : Shell Canada Products Limited
 : Sarnia, ONT
 : (510107)
 Region : Southwest
 : Petroleum Refining
 Control point : CW to POW, (800)
 Laboratory : Pollutech
 : Grab
 Sampling Method : T. Moran
 :
 Sampled By :
 Date Collected : 01/16/89
 Received :
 Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	E L A P S E D T I M E				TOTAL MORTALITY	%
		00:00	22:10	47:10	71:10	93:00	
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890006

TEST CONC. %

E L A P S E D T I M E	00:00	22:10	47:10	71:10	93:00
-----------------------	-------	-------	-------	-------	-------

100	pH O2 ppm Cond. Temp(C)	7.8 9.6 238 15.0	7.8 9.6 238 15.0	7.6 9.8 245 15.0	7.8 10.0 245 15.0
75	pH O2 ppm Cond. Temp(C)	7.8 9.8 212 15.0	7.7 10.0 212 15.0	7.6 9.8 220 15.0	7.6 10.1 220 15.0
56	pH O2 ppm Cond. Temp(C)	7.7 10.0 206 15.0	7.7 9.0 206 15.0	7.6 9.9 210 15.0	7.8 10.0 210 15.0
25	pH O2 ppm Cond. Temp(C)	7.7 10.4 190 15.0	7.7 10.2 190 15.0	7.6 9.7 192 15.0	7.8 10.0 192 15.0
10	pH O2 ppm Cond. Temp(C)	7.6 10.4 182 15.0	7.6 9.7 182 15.0	7.5 9.8 189 15.0	7.7 9.9 189 15.0
1	pH O2 ppm Cond. Temp(C)	7.6 10.2 176 15.0	7.7 10.1 176 15.0	7.6 9.9 180 15.0	7.8 9.8 180 15.0
Control	pH O2 ppm Cond. Temp(C)	7.6 10.4 170 15.0	7.7 9.9 170 15.0	7.8 10.2 182 15.0	7.7 10.0 182 15.0
Control	pH O2 ppm Cond. Temp(C)	7.6 10.2 170 15.0	7.7 10.0 170 15.0	7.8 10.2 182 15.0	7.7 10.2 182 15.0

COMPANY: Shell Canada Products Limited, Sarnia
(510107)
(now with Sarnia Mfg.)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Results from 14 *Daphnia magna* acute lethality toxicity tests on samples collected between December 1988 and May 1989 were submitted by Shell Canada Products Limited in Sarnia. Five of the six samples of Process Effluent were not acutely lethal to *Daphnia*. The sample collected and tested in December was only mildly toxic with a 48 h LC50 > 100% effluent.

Toxicity test results submitted for three samples of Intake Water, two samples from CW. to Talford Creek, two samples of CW. from POW and one sample of CW. to Pow were all not acutely lethal to *Daphnia magna*.

intake water

05880007 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890007 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890037 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880006 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Number of Floating *Daphnia* Observed

05890008 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890012 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890027 sampled: 03/28/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Shell Canada Products Limited (continued)

05890032 sampled: 04/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890060 sampled: 04/26/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05890040 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890038 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890039 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Sample: 05880007

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : J. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E L A P S E D TIME	TOTAL MORTALITY
100	0	00:00 47:00	8
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST
CONC.
%

E L A P S E D
TIME

00:00 47:00

100	pH 02 ppm Cond. Temp(C)	7.8 9.4 200 20.0	7.8 9.4 250 20.0
50	pH 02 ppm Cond. Temp(C)	8.1 9.4 400 20.0	8.1 9.4 390 20.0
26	pH 02 ppm Cond. Temp(C)	8.1 9.3 500 20.0	8.1 9.3 500 20.0
13	pH 02 ppm Cond. Temp(C)	8.1 9.2 510 20.0	8.1 9.2 510 20.0
6	pH 02 ppm Cond. Temp(C)	8.1 9.2 560 20.0	8.1 9.2 560 20.0
Control	pH 02 ppm Cond. Temp(C)	8.1 9.4 560 20.0	8.1 9.4 570 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890007

TEST CONDITIONSCompany : Shell Canada Products Limited
 : Sarnia, ONT
 : (510107)Region : Southwest
Industry : Petroleum Refining

Control point : Intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1330Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 : Test Protocol, OME, 1988)Test Animal : D. magna
Weight(gm) :
Length(mm) :MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 47:10	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890007

TEST CONC. %
E L A P S E D T I M E
00:00 47:10

100	pH 7.7 7.8 O2 ppm 10.0 9.6 Cond. 172 262 Temp(C) 20.0 20.0
50	pH 7.9 7.9 O2 ppm 9.2 9.6 Cond. 424 422 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 9.0 9.5 Cond. 480 492 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 8.8 9.6 Cond. 504 500 Temp(C) 20.0 20.0
6	pH 8.0 7.8 O2 ppm 8.8 9.6 Cond. 560 590 Temp(C) 20.0 20.0
Control	pH 8.0 8.0 O2 ppm 9.0 9.6 Cond. 580 600 Temp(C) 20.0 20.0

TOXICITY TEST REPORT Sample: 05890037

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Intake water, (100)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T. Moran

Date Collected : 05/08/89

Received : 05/08/89

Tested : 05/09/89 at: 1320

Type of Bioassay: STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)Test Animal

Weight(gm)

Length(mm)

: D. magna

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
X	00:00 48:10	X
100	0	0
50	0	16
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 X

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST CONC. % ELAPSED TIME
00:00 48:10

100	pH 7.7 7.8 O2 ppm 10.2 8.8 Cond. 260 268 Temp(C) 20.0 20.0
50	pH 7.9 8.0 O2 ppm 9.4 8.8 Cond. 388 390 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 9.0 8.6 Cond. 448 452 Temp(C) 20.0 20.0
13	pH 8.0 8.1 O2 ppm 9.0 8.8 Cond. 478 480 Temp(C) 20.0 20.0
6	pH 8.0 8.1 O2 ppm 9.0 8.8 Cond. 490 500 Temp(C) 20.0 20.0
Control	pH 8.0 8.1 O2 ppm 9.2 9.2 Cond. 500 500 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : >20% <=50% in 100% Concn.

Sample: 05880006

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONI

Industry : (510107)

Control point : Southwest

Laboratory : Petroleum Refining

Sampling Method : Process Effluent, (200)

Sampled By : Polutech

Date Collected : Grib

Received : T. Moran

Tested : 12/12/88

at: 1100

Type of Bioassay : STATIC

(Daphnia magna Acute Lethality Toxicity

Test Protocol, OME, 1988)

: D. magna

: Length(mm)

MORTALITY DATA

TEST CONC.

%

ELAPSED TIME

00:00 47:30

TOTAL MORTALITY

%

100 0 2 41

50 0 1 33

16 0 1 8

13 0 0 0

6 0 0 0

Control 0 0 0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : Number of Floating Daphnie Observed

Sample Number: 05880006

TEST CONC. %

ELAPSED TIME

00:00 47:30

TOXICITY TEST PARAMETERS

100 pH 7.2 7.3

O2 ppm 6.8 7.2

Cond. 700 720

Temp(C) 20.0 20.0

50 pH 7.6 7.9

O2 ppm 8.6 8.6

Cond. 720 620

Temp(C) 20.0 20.0

26 pH 7.9 7.9

O2 ppm 9.2 9.2

Cond. 600 610

Temp(C) 20.0 20.0

13 pH 8.1 8.0

O2 ppm 9.5 9.3

Cond. 580 605

Temp(C) 20.0 20.0

6 pH 8.2 8.1

O2 ppm 9.5 9.3

Cond. 580 600

Temp(C) 20.0 20.0

Control pH 8.3 8.1

O2 ppm 9.5 9.6

Cond. 520 590

Temp(C) 20.0 20.0

TOXICITY TEST REPORT Sample: 05890008

TEST CONDITIONS

Company : Shell Canada Products Limited
(Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1415

Type of Bioassay : STATIC,
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OMC, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	8
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST ELAPSED TIME
% 00:00 47:25

100	pH 02 ppm Cond. Temp(C)	7.3 8.0 600 20.0	7.6 9.6 600 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 8.4 580 20.0	7.7 9.6 600 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 8.6 580 20.0	7.9 9.5 595 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 8.6 580 20.0	8.0 9.6 595 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 8.6 600 20.0	8.0 9.6 600 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.0 580 80.0	7.9 9.6 605 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890012

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1615Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)Test Animal : 0. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D	T I M E	TOTAL MORTALITY
%	01:25	46:25	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST CONC. %
E L A P S E D T I M E
01:25 46:25

100	pH 02 ppm Cond. Temp(C)	7.2 7.0 980 20.0	7.5 7.8 1100 20.0
50	pH 02 ppm Cond. Temp(C)	7.6 8.4 800 20.0	7.8 8.2 820 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 8.6 720 20.0	7.9 9.0 750 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.0 680 20.0	8.0 9.3 700 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 9.2 660 20.0	8.0 9.4 660 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 620 20.0	8.0 9.4 650 20.0

TOXICITY TEST REPORT Sample: 05890027

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 03/28/89
Received : 03/28/89
Tested : 03/28/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal :
Weight(gm) :
Length(mm) :
: D. magna

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 48:00	%
100	0 0	0
50	0 0	0
26	0 0	0
13	0 0	0
6	0 0	0
Control	0 0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC.
%
E L A P S E D T I M E
00:00 48:00

100	pH 7.3 7.6 O2 ppm 7.9 8.2 Cond. 710 700 Temp(C) 20.0 20.0
50	pH 7.6 7.8 O2 ppm 8.3 8.3 Cond. 610 610 Temp(C) 20.0 20.0
26	pH 7.8 7.9 O2 ppm 8.9 8.6 Cond. 595 590 Temp(C) 20.0 20.0
13	pH 7.9 8.0 O2 ppm 9.2 8.7 Cond. 580 570 Temp(C) 20.0 20.0
6	pH 7.9 8.0 O2 ppm 9.2 9.3 Cond. 530 510 Temp(C) 20.0 20.0
Control	pH 7.8 8.0 O2 ppm 9.6 9.5 Cond. 510 500 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 calculated by :

TOXICITY TEST REPORT Sample: 05890032

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/10/89
Received : 04/10/89
Tested : 04/10/89 at: 1540

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 48:05	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST CONC.	E L A P S E D T I M E
%	00:00 48:05

100	pH 7.4 7.7 O2 ppm 8.4 8.6 Cond. 500 550 Temp(C) 20.0 20.0
50	pH 7.9 7.9 O2 ppm 8.8 8.6 Cond. 495 550 Temp(C) 20.0 20.0
26	pH 8.0 7.9 O2 ppm 8.9 8.9 Cond. 490 520 Temp(C) 20.0 20.0
13	pH 8.1 8.0 O2 ppm 9.3 9.2 Cond. 500 472 Temp(C) 20.0 20.0
6	pH 8.1 8.0 O2 ppm 9.5 9.3 Cond. 505 498 Temp(C) 20.0 20.0
Control	pH 8.0 8.0 O2 ppm 9.5 9.4 Cond. 500 505 Temp(C) 20.0 20.0

TOXICITY TEST REPORT Sample: 02890060

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : MOE
Sampling Method : grab
Sampled By : Hamilton
Date Collected : 04/26/89
Received : 04/27/89
Tested : 04/27/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0 3	25
60	0	1 1	8
30	0	0 0	0
15	0	1 2	16
5	0	3 3	25
Control	0	0 0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890060

TEST
CONC.
%

ELAPSED
TIME

00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.6 9.0 811 20.0	8.1 7.9 751 20.0
60	pH 02 ppm Cond. Temp(C)	7.8 9.0 614 20.0	8.0 7.0 589 20.0
30	pH 02 ppm Cond. Temp(C)	7.9 9.0 472 20.0	8.1 7.9 459 20.0
15	pH 02 ppm Cond. Temp(C)	8.0 9.0 402 20.0	8.1 8.0 390 20.0
5	pH 02 ppm Cond. Temp(C)	8.1 8.9 357 20.0	8.1 8.1 350 20.0
Control	pH 02 ppm Cond. Temp(C)	8.1 9.1 332 20.0	8.0 8.2 330 20.0

MISA-PETROLEUM-ORPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890040

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : Process Effluent, (200)

Sampling Method : Pollutech

Sampled By : Grab

Date Collected : T. Moran

Received : 05/08/89

Tested : 05/11/89 at: 1400

Type of Bioassay : STATIC

Toxicant : Daphnia magna Acute Lethality Toxicity

Test Protocol : ONE, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0 0	0
50	0 0	0
26	0 0	0
13	0 0	0
6	0 0	0
Control	0 0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890040

TEST CONC.
%
E L A P S E D TIME
00:00 48:00100 pH 7.4 7.6
O2 ppm 8.8 8.6
Cond. 580 650
Temp(C) 20.0 20.050 pH 7.7 7.8
O2 ppm 8.8 8.7
Cond. 540 590
Temp(C) 20.0 20.026 pH 7.9 7.9
O2 ppm 8.8 8.7
Cond. 520 550
Temp(C) 20.0 20.013 pH 7.9 7.9
O2 ppm 8.8 9.4
Cond. 500 510
Temp(C) 20.0 20.06 pH 8.0 7.9
O2 ppm 8.8 9.3
Cond. 500 510
Temp(C) 20.0 20.0Control pH 8.0 7.9
O2 ppm 8.8 9.2
Cond. 500 510
Temp(C) 20.0 20.0

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890004

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT
 (S10107)

Industry : Southwest
 : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T. Moran

Date : 01/16/89

Received : 01/16/89

Tested : 01/16/89 at: 1645

Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 41:55	%
100	0	0
50	0	0
26	0	0
13	0	8
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890004

TEST CONC. %
 ELAPSED TIME
 00:00 41:55

100	pH 8.0 8.1 O2 ppm 9.2 8.8 Cond. 250 250 Temp(C) 20.0 20.0
50	pH 8.1 8.2 O2 ppm 9.4 8.9 Cond. 400 390 Temp(C) 20.0 20.0
26	pH 8.1 8.2 O2 ppm 9.4 8.9 Cond. 480 500 Temp(C) 20.0 20.0
13	pH 8.2 8.2 O2 ppm 9.6 8.9 Cond. 520 520 Temp(C) 20.0 20.0
6	pH 8.2 8.2 O2 ppm 10.0 9.0 Cond. 560 540 Temp(C) 20.0 20.0
Control	pH 8.1 8.2 O2 ppm 9.8 9.1 Cond. 560 580 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890038

TEST CONDITIONS

Company : Shell Canada Products Limited
 : Sarnia, ONT
 : (510107)
Region : Southwest
Industry : Petroleum Refining
Control point : CW to Talford Creek, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1300

Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 : Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	0
26	0	0
13	0	8
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %
ELAPSED TIME
00:00 48:10

100	pH 7.8 O2 ppm 9.2 Cond. 256 Temp(C) 20.0	7.8 8.6 256 20.0	7.8 8.6 262 20.0
50	pH 7.9 O2 ppm 8.8 Cond. 382 Temp(C) 20.0	7.9 8.8 382 20.0	8.0 8.6 392 20.0
26	pH 8.0 O2 ppm 8.8 Cond. 440 Temp(C) 20.0	8.0 8.8 440 20.0	8.0 8.6 420 20.0
13	pH 8.0 O2 ppm 8.8 Cond. 472 Temp(C) 20.0	8.0 8.8 472 20.0	8.0 8.6 480 20.0
6	pH 8.0 O2 ppm 8.8 Cond. 486 Temp(C) 20.0	8.0 8.8 486 20.0	8.1 8.6 490 20.0

Control pH
O2 ppm
Cond.
Temp(C)

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890005

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : CW from POW, (500)

Sampling Method : Pollutech

Sampled By : Grab

Date Collected : T. Moran

Received : 01/16/89

Tested : 01/16/89 at: 1400

Type of Bioassay : STATIC

(Daphnia magna Acute Lethality Toxicity

Test Protocol. OME, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY %
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890005

TEST CONC.	ELAPSED TIME
100	02:45 44:30

100	pH 8.0	7.8
	O2 ppm 9.6	8.9
	Cond. 290	270
	Temp(C) 20.0	20.0

50	pH 8.1	8.0
	O2 ppm 9.6	8.8
	Cond. 344	440
	Temp(C) 20.0	20.0

26	pH 8.1	8.1
	O2 ppm 9.6	8.9
	Cond. 490	500
	Temp(C) 20.0	20.0

13	pH 8.2	8.1
	O2 ppm 9.6	9.0
	Cond. 520	540
	Temp(C) 20.0	20.0

6	pH 8.2	8.1
	O2 ppm 9.4	8.9
	Cond. 520	560
	Temp(C) 20.0	20.0

Control	pH 8.1	8.1
	O2 ppm 9.8	9.0
	Cond. 560	560
	Temp(C) 20.0	20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 058900039

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : CW from POW, (500)

Sampling Method : Pollutech

Sampled By : Grab

Date Collected : T. Moran

Received : 05/08/89

Tested : 05/09/89 at: 1200

Type of Bioassay : STATIC

: (Daphnia magna Acute Lethality Toxicity

Test Protocol. ONE, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 49:15	%
100	0	2
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 058900039

TEST ELAPSED TIME

CONC. %

00:00 49:15

100

pH

O2 ppm

Cond.

Temp(C)

7.9

9.2

254

268

20.0

20.0

7.9

9.0

372

384

20.0

20.0

8.0

8.0

8.8

440

450

20.0

20.0

8.0

8.0

8.8

440

450

20.0

20.0

8.0

8.0

8.8

480

498

20.0

20.0

Control

pH

O2 ppm

Cond.

Temp(C)

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890006

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : CW to POW, (800)

Sampling Method : Pollutech

Sampled By : Greb

Date Collected : T. Moran

Received : 01/16/89

Tested : 01/17/89 at: 1330

Type of Bioassay : STATIC

(Daphnia magna Acute Lethality Toxicity Test Protocol, OME, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 49:00	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890006

TEST CONC. %
 ELAPSED TIME
 00:00 49:00

100	pH	7.8	7.9
	O2 ppm	9.0	9.6
	Cond.	270	279
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	8.8	9.6
	Cond.	430	430
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.8	9.5
	Cond.	490	510
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.0	9.6
	Cond.	580	600
	Temp(C)	20.0	20.0

COMPANY: Suncor Inc., Sarnia
(490102)
(now with Sunoco Division)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Suncor Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on intake water samples collected during the same period were determined to have been non-acutely lethal. Data for one trout bioassay conducted on a cooling water sample collected in March 1989 indicate the sample was not acutely lethal.

intake water

05880004	sampled: 12/12/88	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890003	sampled: 01/09/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890014	sampled: 02/06/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890023	sampled: 03/06/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890030	sampled: 04/03/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890035	sampled: 05/01/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		

Suncor Inc. (continued)

Process Effluent

05880003 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890002 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890013 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890024 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890032 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

05890029 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890034 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890025 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890033 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

landfarm leachate

Suncor Inc. (continued)

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880004

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:10	%		
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

Sample Number: 05880004

TEST CONC.		E L A P S E D T I M E									
%		00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:10		
100	pH	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	10.4	10.4	10.2	10.2	9.8	9.6	10.2	10.2		
	Conc.	315	315	320	320	320	320	320	320		
75	pH	7.5	7.5	7.8	7.8	7.8	7.7	7.8	7.8		
	O2 ppm	10.3	10.3	10.3	10.3	10.0	9.6	10.1	10.3		
	Conc.	275	275	285	285	285	285	285	285		
56	pH	7.3	7.3	7.8	7.8	7.8	7.7	7.8	7.8		
	O2 ppm	10.3	10.3	10.2	10.2	10.0	9.6	10.0	10.2		
	Conc.	250	250	253	253	253	253	253	253		
25	pH	7.2	7.2	7.8	7.8	7.8	7.7	7.8	7.8		
	O2 ppm	10.2	10.2	9.9	9.9	9.9	9.6	9.9	10.1		
	Conc.	200	200	205	205	205	205	205	205		
10	pH	7.2	7.2	7.8	7.8	7.8	7.6	7.8	7.8		
	O2 ppm	10.0	10.0	9.9	9.9	9.9	9.6	9.8	10.1		
	Conc.	165	165	170	170	170	170	170	170		
1	pH	7.1	7.1	7.8	7.8	7.8	7.6	7.8	7.7		
	O2 ppm	10.2	10.2	10.1	10.0	10.0	9.6	9.9	10.1		
	Conc.	160	160	160	160	160	160	160	160		
Control	pH	7.0	7.0	7.6	7.6	7.6	7.6	7.7	7.6		
	O2 ppm	10.2	10.2	10.2	10.2	10.2	10.0	10.1	10.2		
	Conc.	162	162	168	168	168	168	168	168		
Control	pH	7.1	7.1	7.6	7.6	7.6	7.6	7.6	7.6		
	O2 ppm	10.3	10.3	10.1	10.1	10.1	9.9	10.1	10.2		
	Conc.	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0		

Sample: 05890003

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. : 00:00 23:00 47:10 71:10 96:10

TOTAL MORTALITY

%

TEST CONC.	%	00:00	23:00	47:10	71:10	96:10	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890003

TEST CONC. : 00:00 23:00 47:10 71:10 96:10

TEST CONC.	%	00:00	23:00	47:10	71:10	96:10	%
100	pH	7.7	7.8	7.8	7.8	7.8	7.8
	O2 ppm	10.5	10.1	10.1	9.9	9.8	9.8
	Cond.	318	15.0	15.0	15.0	15.0	312
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.8	7.8	7.8	7.8	7.8
	O2 ppm	10.6	10.0	10.1	9.9	9.8	9.8
	Cond.	380	15.0	15.0	15.0	15.0	278
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.8	7.8	7.8	7.8	7.8
	O2 ppm	10.4	10.0	10.2	10.0	10.0	10.0
	Cond.	260	15.0	15.0	15.0	15.0	248
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
25	pH	7.7	7.7	7.7	7.7	7.8	7.8
	O2 ppm	10.4	10.1	10.0	9.9	10.0	10.0
	Cond.	205	15.0	15.0	15.0	15.0	202
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.7	7.7	7.7	7.8	7.8
	O2 ppm	10.6	10.3	9.8	9.9	10.0	10.0
	Cond.	180	15.0	15.0	15.0	15.0	170
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.7	7.6	7.7	7.7	7.7
	O2 ppm	10.5	10.4	9.8	10.0	9.8	9.8
	Cond.	170	15.0	15.0	15.0	15.0	166
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.8	7.7	7.7
	O2 ppm	10.6	10.2	10.2	9.9	10.2	10.2
	Cond.	165	15.0	15.0	15.0	15.0	164
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.7	7.7	7.7
	O2 ppm	10.4	10.3	10.1	10.2	10.0	10.0
	Cond.	165	15.0	15.0	15.0	15.0	164
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890014

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled by : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	26:10	50:00	75:10	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST CONC. %

E L A P S E D T I M E				
00:00	26:10	50:00	75:10	96:00

100	pH	7.7	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.0	10.1
	Cond.	282				292
75	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.4	9.6	9.6	9.6	10.1
56	Cond.	252				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.6	7.7	7.6	7.6	7.6
25	O2 ppm	10.2	9.6	9.6	9.5	10.1
	Cond.	232				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.6	9.8
	Cond.	194				208
1	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.5	7.6	7.5	7.5	7.6
	O2 ppm	10.2	9.4	9.4	9.6	9.8
Control	Cond.	168				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.4	7.6	7.5	7.6	7.6
Control	O2 ppm	10.4	9.2	9.2	9.7	10.2
	Cond.	166				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.4	7.5	7.3	7.5
	O2 ppm	10.0	9.9	9.9	9.8	10.2
	Cond.	178				178
Control	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.3	7.5	7.5	7.4	7.5
	O2 ppm	10.0	9.8	9.8	9.9	10.2
Control	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

Sample: 05890023

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : intake water, (100)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : J. Ferguson
 Date collected : 03/06/89
 Received : 03/06/89
 Tested : 03/07/89 at: 1530

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	1	1	10
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

Sample Number: 05890023

TEST CONC. %	E L A P S E D T I M E				
	00:00	20:00	49:10	68:00	94:10
100	pH 7.8	pH 7.8	pH 7.7	pH 7.6	pH 7.7
	O2 ppm 10.5	O2 ppm 9.2	O2 ppm 9.9	O2 ppm 10.2	O2 ppm 315
	Cond. 310	Cond. 15.0	Cond. 15.0	Cond. 15.0	Cond. 15.0
100	pH 7.8	pH 7.7	pH 7.7	pH 7.7	pH 7.8
	O2 ppm 10.6	O2 ppm 9.2	O2 ppm 9.9	O2 ppm 10.0	O2 ppm 10.1
	Cond. 310	Cond. 15.0	Cond. 15.0	Cond. 15.0	Cond. 315
Control	pH 7.6	pH 7.5	pH 7.6	pH 7.5	pH 7.7
	O2 ppm 10.0	O2 ppm 9.8	O2 ppm 10.1	O2 ppm 10.2	O2 ppm 178
	Cond. 168	Cond. 15.0	Cond. 15.0	Cond. 15.0	Cond. 15.0
Control	pH 7.6	pH 7.5	pH 7.6	pH 7.6	pH 7.7
	O2 ppm 9.9	O2 ppm 9.6	O2 ppm 9.8	O2 ppm 10.2	O2 ppm 178
	Cond. 168	Cond. 15.0	Cond. 15.0	Cond. 15.0	Cond. 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated By :

Sample: 05890030

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONI
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST CONC. %	E L A P S E D T I M E				
	00:00	19:15	46:10	69:00	95:10
100	pH 02 ppm Cond. Temp(C)	7.6 10.2 310 15.0	7.6 8.4 15.0 15.0	7.5 9.8 15.0 15.0	7.6 9.9 320 15.0
100	pH 02 ppm Cond. Temp(C)	7.6 10.2 312 15.0	7.4 9.2 9.7 15.0	7.4 9.6 9.6 15.0	7.6 9.5 320 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.2 162 15.0	7.3 9.2 10.1 15.0	7.6 10.1 15.0 15.0	7.5 10.0 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.2 162 15.0	7.4 9.2 10.2 15.0	7.6 10.0 10.0 15.0	7.5 170 15.0 15.0

TOXICITY TEST REPORT Sample: 05890035

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : intake water, (100)
 Laboratory : Pollutach
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 05/01/89
 Received : 05/01/89
 Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-Lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC. %	E L A P S E D T I M E				
	00:00	21:30	47:30	72:30	97:30
100	pH 7.7 O2 ppm 9.8 Cond. 278 Temp(C) 15.0	7.8 9.8 15.0	7.6 8.8 15.0	7.6 9.1 15.0	7.5 9.6 298 15.0
100	pH 7.7 O2 ppm 10.0 Cond. 278 Temp(C) 15.0	7.7 9.9 15.0	7.6 8.9 15.0	7.6 9.3 15.0	7.3 9.6 288 15.0
Control	pH 7.3 O2 ppm 10.6 Cond. 158 Temp(C) 15.0	7.6 9.8 15.0	7.6 9.3 15.0	7.6 9.8 15.0	7.3 10.1 172 15.0
Control	pH 7.3 O2 ppm 10.6 Cond. 170 Temp(C) 15.0	7.6 10.0 170	7.6 9.4 15.0	7.5 9.9 15.0	7.3 10.0 170 15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : J. Moran
Date Collected : 12/12/88
Received : 12/13/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:10	70:00	95:10	%		
100	0	0	0	0	0	0	0	0	0		0
75	0	0	0	0	0	0	0	0	0		0
56	0	0	0	0	0	0	0	0	0		0
25	0	0	0	0	0	0	0	0	0		0
10	0	0	0	0	0	0	0	0	0		0
1	0	0	0	0	0	0	0	0	0		0
Control	0	0	0	0	0	0	0	0	0		0
Control	0	0	0	0	0	0	0	0	0		0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST CONC. %	E L A P S E D T I M E									
	00:00	02:10	03:10	05:00	22:10	46:10	70:00	95:10		
100	pH 7.2 O2 ppm 9.8 Cond. 1290 Temp(C) 15.0	7.5 9.4 15.0	7.6 9.8 15.0	7.5 9.5 15.0	7.6 9.8 15.0	7.5 9.5 15.0	7.5 9.5 15.0	7.5 9.5 15.0		
75	pH 7.2 O2 ppm 9.9 Cond. 1000 Temp(C) 15.0	7.5 9.6 15.0	7.6 9.8 15.0	7.6 10.1 10.0 1000 15.0	7.6 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0		
56	pH 7.2 O2 ppm 10.2 Cond. 820 Temp(C) 15.0	7.5 9.8 15.0	7.7 9.8 15.0	7.6 10.2 820 15.0	7.6 10.2 820 15.0	7.7 10.2 820 15.0	7.7 10.2 820 15.0	7.7 10.2 820 15.0		
25	pH 7.2 O2 ppm 10.4 Cond. 430 Temp(C) 15.0	7.6 9.7 15.0	7.7 9.9 15.0	7.7 10.4 430 15.0	7.7 10.4 445 15.0	7.7 10.4 445 15.0	7.7 10.4 445 15.0	7.7 10.4 445 15.0		
10	pH 7.3 O2 ppm 10.8 Cond. 280 Temp(C) 15.0	7.6 9.8 15.0	7.7 9.9 15.0	7.7 10.8 280 15.0	7.7 10.8 280 15.0	7.7 10.8 280 15.0	7.7 10.8 280 15.0	7.7 10.8 280 15.0		
1	pH 7.3 O2 ppm 10.8 Cond. 172 Temp(C) 15.0	7.5 9.8 15.0	7.7 9.8 15.0	7.7 10.8 172 15.0	7.7 9.8 15.0	7.7 10.8 172 15.0	7.7 9.8 15.0	7.7 10.8 172 15.0		
Control	pH 7.0 O2 ppm 10.2 Cond. 162 Temp(C) 15.0	7.6 10.0 15.0	7.7 10.0 15.0	7.6 10.2 162 15.0	7.6 10.0 15.0	7.6 10.0 15.0	7.6 10.0 15.0	7.6 10.0 15.0		
Control	pH 7.1 O2 ppm 10.3 Cond. 162 Temp(C) 15.0	7.6 9.9 15.0	7.6 10.1 15.0	7.6 10.3 162 15.0	7.6 9.9 15.0	7.6 10.1 15.0	7.6 10.1 15.0	7.6 10.1 15.0		

TOXICITY TEST REPORT Sample: 05890002

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST
CONC.
%

E L A P S E D T I M E

00:00 23:00 47:10 71:10 96:10

100	pH 02 ppm Cond. Temp(C)	6-6 9-8 1120 15.0	6-8 9-5 10.0	6-9 9-7 1080 15.0	6-7 9-8 1080 15.0
75	pH 02 ppm Cond. Temp(C)	7-0 9-9 980 15.0	7-3 9-5 10.0	7-3 10.0 9-8 15.0	7-2 9-8 900 15.0
56	pH 02 ppm Cond. Temp(C)	7-2 10-0 700 15.0	7-4 9-4 10-2	7-5 9-9 10.0 15.0	7-4 10.0 700 15.0
25	pH 02 ppm Cond. Temp(C)	7-6 10-4 442 15.0	7-6 9-8 10-2	7-6 9-9 10.0 15.0	7-6 10.0 448 15.0
10	pH 02 ppm Cond. Temp(C)	7-7 10-4 365 15.0	7-7 10-0 9-4	7-7 9-9 10-2 15.0	7-7 10-2 262 15.0
1	pH 02 ppm Cond. Temp(C)	7-7 10-4 175 15.0	7-7 10-4 9-8	7-7 10-0 10.0 15.0	7-7 10.0 176 15.0
Control	pH 02 ppm Cond. Temp(C)	7-7 10-6 165 15.0	7-6 10-2 10-2	7-8 9-9 10.2 15.0	7-7 10.2 164 15.0
Control	pH 02 ppm Cond. Temp(C)	7-7 10-4 165 15.0	7-6 10-3 10-2	7-7 10-0 10.0 15.0	7-7 10.0 164 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 05890013

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1630

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal
Weight(gm)
Length(mm)

: Rainbow trout
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:10	45:00	70:10	95:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890013

TEST
CONC.
%

E L A P S E D T I M E

00:00 21:10 45:00 70:10 95:00

100	pH	7.1	7.3	7.3	7.4	7.3
	O2 ppm	9.6	9.5	9.4	9.5	9.8
	Cond.	1000				1050
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.2	7.4	7.4	7.4	7.4
	O2 ppm	9.9	9.5	9.2	9.5	9.8
	Cond.	800				860
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.5	7.5	7.5	7.5
	O2 ppm	10.4	9.5	9.2	9.8	9.8
	Cond.	650				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.4	7.7	7.6	7.5	7.5
	O2 ppm	10.8	9.6	9.0	9.6	9.4
	Cond.	350				372
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.5	7.4	7.4
	O2 ppm	11.0	9.3	9.4	9.4	9.2
	Cond.	240				260
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.6	7.4	7.3	7.3
	O2 ppm	11.0	9.2	9.2	9.8	9.2
	Cond.	170				225
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.4	7.6	7.6
	O2 ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.5	7.5	7.6
	O2 ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890024

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (300)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 03/06/89
 Received : 03/06/89
 Tested : 03/07/89 at: 1530

Type of Bioassay : STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OIE, 1983).

Test Animal : Rainbow trout
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC.	E L A P S E D T I M E				
%	00:00	20:00	49:10	68:00	94:10
100	pH 7.0	7.3	7.3	7.3	7.2
	O2 ppm 9.0	9.4	9.6	10.2	10.0
	Cond. 1180				1160
	Temp(C) 15.0	15.0	15.0	15.0	15.0
100	pH 7.0	7.1	7.2	7.2	7.2
	O2 ppm 8.9	9.6	9.5	10.0	10.1
	Cond. 1180				1140
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.5	7.6	7.5	7.7
	O2 ppm 10.8	9.8	10.1	10.2	10.2
	Cond. 1688				1778
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.5	7.6	7.4	7.7
	O2 ppm 9.9	9.6	9.8	10.2	10.3
	Cond. 1688				1778
	Temp(C) 15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By :

Sample: 01890032

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : MOE
Sampling Method : Grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : MISA audit sample

TOXICITY TEST PARAMETERS

Sample Number: 01890032

TEST CONC. %
E L A P S E D T I M E
00:00 00:30 24:00 48:00 72:00 96:00

100	pH 7.2 O2 ppm 8.7 Cond. 870 Temp(C) 15.0	7.5 9.6 9.6 900 15.0	7.8 9.7 9.7 880 15.0	7.8 9.7 9.2 875 15.0	7.7 9.3 880 15.0
65	pH 7.7 O2 ppm 9.8 Cond. 670 Temp(C) 15.0	7.9 9.8 9.8 660 15.0	7.8 10.0 650 15.0	7.7 9.3 650 15.0	7.7 9.7 660 15.0
40	pH 7.8 O2 ppm 9.7 Cond. 510 Temp(C) 15.0	7.9 9.7 9.7 520 15.0	7.8 10.0 515 15.0	7.6 9.2 520 15.0	7.7 9.5 520 15.0
30	pH 7.7 O2 ppm 9.7 Cond. 470 Temp(C) 15.0	7.8 9.7 9.7 470 15.0	7.7 10.0 465 15.0	7.7 9.3 460 15.0	7.6 9.5 465 15.0
20	pH 7.9 O2 ppm 9.7 Cond. 405 Temp(C) 15.0	7.9 9.9 9.4 410 15.0	7.8 10.0 405 15.0	7.7 9.4 410 15.0	7.7 9.7 410 15.0
10	pH 8.0 O2 ppm 9.8 Cond. 355 Temp(C) 15.0	7.9 9.8 9.4 365 15.0	7.8 10.0 360 15.0	7.5 9.4 360 15.0	7.6 9.4 365 15.0
Control	pH 7.6 O2 ppm 9.7 Cond. 260 Temp(C) 15.0	7.8 9.7 9.8 260 15.0	7.8 9.8 260 15.0	7.7 9.7 260 15.0	7.9 9.7 260 15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST REPORT Sample: 05890029

TEST CONDITIONS

Company : Suncor Inc.
Region : Sarnia, ONT
Industry : (490102)
Control point : Southwest
Laboratory : Petroleum Refining
Sampling Method : Process Effluent, (300)
Sampled By : Pollutech
Date Collected : Grab
Received : C. Ferguson
Tested : 04/03/89
Type of Bioassay : 04/04/89 at: 1330
Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).
Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10		%
100	0	0	0	0	0		0
100	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC.	E L A P S E D T I M E					
%	00:00	19:15	46:10	69:00	95:10	
100	pH	7.3	7.4	7.4	7.4	7.5
	O2 ppm	8.6	8.6	9.4	9.4	9.4
	Cond.	960				960
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.5	7.4	7.4	7.6
	O2 ppm	8.5	8.8	9.6	9.4	9.4
	Cond.	960				960
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated by :

TOXICITY TEST REPORT Sample: 05890034

TEST CONDITIONS

Company : Suncor Inc.
Sensing Unit : (490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1985).

Test Animal
Weight(gm)
Length(mm)

: Rainbow trout
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC. %	E L A P S E D T I M E				
	00:00	21:30	47:30	72:30	97:30
100	pH	7.1	7.3	7.3	7.1
	O2 ppm	8.5	8.5	8.4	9.1
	Cond.	1100			1100
100	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.1	7.2	7.2	7.0
	O2 ppm	8.5	8.4	8.3	9.2
Control	Cond.	1100			1090
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	10.1
	Cond.	158			172
Control	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.3	7.6	7.6	7.5
	O2 ppm	10.4	10.0	9.4	10.0
Control	Cond.	158			170
	Temp(C)	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 05880005

TEST CONDITIONS

Company : Sunco Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : cooling water, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:25	%		
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST CONC. %

E L A P S E D T I M E

00:00 02:10 03:10 05:00 22:10 46:25 70:25 95:25

100	pH	7.6	7.8	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.1	9.6	10.2	10.2	10.2	10.2	7.8
	Cond.	320	320	320	320	320	320	9.8
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.7	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.2	9.5	9.8	10.1	9.9	9.9	9.9
	Cond.	280	280	280	288	288	288	288
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.7	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.0	9.6	9.9	10.2	9.9	9.9	9.9
	Cond.	250	250	250	270	270	270	270
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.7	7.7	7.7	7.7	7.7	7.7
	O2 ppm	10.0	9.7	10.1	10.2	10.2	10.2	10.0
	Cond.	190	190	190	200	200	200	200
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.6	7.7	7.7	7.7	7.7	7.7
	O2 ppm	10.0	9.8	10.0	10.2	10.1	10.1	10.1
	Cond.	175	175	175	182	182	182	182
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1	pH	7.1	7.6	7.7	7.7	7.7	7.7	7.7
	O2 ppm	9.9	9.8	9.9	10.1	10.1	10.1	10.1
	Cond.	155	155	155	170	170	170	170
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.6	7.7	7.6	7.6	7.6	7.6
	O2 ppm	10.2	10.0	10.0	10.1	10.2	10.2	10.2
	Cond.	162	162	162	168	168	168	168
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.6	7.6	7.6	7.6	7.6	7.6
	O2 ppm	10.3	9.9	10.1	10.1	10.2	10.2	10.2
	Cond.	162	162	162	168	168	168	168
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890025

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : cooling water, (400)
Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1520

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:10	49:20	68:10	95:10	%

100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST CONC.	E L A P S E D T I M E				
%	00:00	20:10	49:20	68:10	95:10

100	pH 02 ppm Cond. Temp(C)	7.7 9.8 318 15.0	7.8 9.6 15.0	7.7 9.8 15.0	7.7 10.2 15.0
75	pH 02 ppm Cond. Temp(C)	7.7 9.8 280 15.0	7.8 9.4 15.0	7.7 9.7 15.0	7.7 10.2 15.0
56	pH 02 ppm Cond. Temp(C)	7.7 9.7 250 15.0	7.8 9.4 15.0	7.7 9.7 15.0	7.7 10.0 15.0
25	pH 02 ppm Cond. Temp(C)	7.6 9.6 202 15.0	7.7 9.4 15.0	7.7 9.6 15.0	7.7 10.0 15.0
10	pH 02 ppm Cond. Temp(C)	7.6 10.0 180 15.0	7.7 9.2 15.0	7.7 9.9 15.0	7.7 9.8 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 9.9 170 15.0	7.8 9.6 15.0	7.8 9.8 15.0	7.7 10.2 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.0 168 15.0	7.5 9.8 15.0	7.6 10.1 15.0	7.5 10.2 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 9.9 168 15.0	7.5 9.6 15.0	7.6 9.8 15.0	7.7 10.2 15.0

TOXICITY TEST REPORT Sample: 01890033

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1500

Type of Bioassay : STATIC
 : (Protocol to determine the acute lethality
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
65	0	0	0	0	0	0
40	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : WISA audit sample

TOXICITY TEST PARAMETERS

Sample Number: 01890033

TEST CONC. %	E L A P S E D T I M E							
	00:00	00:30	24:00	48:00	72:00	96:00		
100	pH 7.8	8.1	7.8	7.8	7.6	7.7		
	O2 ppm 9.9	10.0	9.2	9.9	9.0	9.1		
	Cond. 300	300	315	325	325	325		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
65	pH 8.1	7.6	7.6	7.4	7.4	7.6		
	O2 ppm 10.1	8.5	9.5	9.0	8.7	8.7		
	Cond. 295	305	305	310	310	310		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
40	pH 8.0	7.7	7.7	7.6	7.6	7.8		
	O2 ppm 10.0	9.2	10.1	9.6	9.4	9.4		
	Cond. 290	300	300	300	300	300		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
30	pH 8.0	7.6	7.6	7.6	7.6	7.7		
	O2 ppm 10.0	9.1	10.2	9.3	9.3	9.3		
	Cond. 285	295	290	290	295	300		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
20	pH 8.0	7.4	7.5	7.5	7.5	7.6		
	O2 ppm 9.9	8.7	9.8	9.1	9.0	9.0		
	Cond. 280	290	290	290	290	290		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
10	pH 7.9	6.8	7.4	7.3	7.4	7.4		
	O2 ppm 10.1	8.0	9.3	8.9	8.3	8.3		
	Cond. 280	290	290	290	290	295		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		
Control	pH 7.9	7.9	7.6	7.9	7.6	7.6		
	O2 ppm 9.7	9.6	9.6	9.7	9.7	9.7		
	Cond. 260	260	260	260	260	260		
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0		

COMPANY: Suncor Inc., Sarnia
(490102)
(now with Sunoco Division)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Data for 14 *Daphnia magna* acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Suncor Inc. in Sarnia. Six samples of Process Effluent were not acutely lethal to *Daphnia*.

Seven samples of Intake Water and one sample of Cooling Water were all not acutely lethal to *Daphnia*.

intake water

05880004 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890003 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890014 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890023 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890030 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890035 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880003 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890002 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Suncor Inc. (continued)

05890013 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890024 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890032 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05890029 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890034 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890025 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890033 sampled: 03/29/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

landfarm leachate

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880004

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Chapman
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1000

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:30	%
100	0	0
50	0	0
26	0	8
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880004

TEST CONC.
% ELAPSED TIME
00:00 47:30

100	pH O2 ppm Cond. Temp(C)	7.8 10.4 300 20.0	7.8 9.3 370 20.0
50	pH O2 ppm Cond. Temp(C)	7.9 10.0 400 20.0	7.9 9.3 468 20.0
26	pH O2 ppm Cond. Temp(C)	8.1 9.8 500 20.0	8.0 9.3 500 20.0
13	pH O2 ppm Cond. Temp(C)	8.1 9.7 520 20.0	8.0 9.3 520 20.0
6	pH O2 ppm Cond. Temp(C)	8.1 9.5 640 20.0	8.0 9.3 600 20.0
Control	pH O2 ppm Cond. Temp(C)	8.1 9.5 660 20.0	8.0 9.2 600 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/09/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E L A P S E O	T I M E	TOTAL MORTALITY
100	0	00:00	48:10	8
50	0			0
26	0			0
13	0			0
6	0			8
Control	0			0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890003

TEST CONC. %
E L A P S E O T I M E
00:00 48:10

100	pH 7.4 O2 ppm 10.2 Cond. 360 Temp(C) 20.0	7.4 7.8 8.8 370 20.0 20.0
50	pH 7.8 O2 ppm 9.9 Cond. 460 Temp(C) 20.0	8.0 8.8 460 470 20.0 20.0
26	pH 8.0 O2 ppm 9.8 Cond. 520 Temp(C) 20.0	8.1 8.8 520 520 20.0 20.0
13	pH 8.1 O2 ppm 9.6 Cond. 570 Temp(C) 20.0	8.1 8.1 570 570 20.0 20.0
6	pH 8.1 O2 ppm 9.6 Cond. 590 Temp(C) 20.0	8.1 8.1 590 590 20.0 20.0
Control	pH 8.2 O2 ppm 9.4 Cond. 590 Temp(C) 20.0	8.0 8.0 9.4 9.2 590 600 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
 LC50 Calculated By :

TOXICITY TEST REPORT

Sample: 05890014

TEST CONDITIONS

Company : Suncor Inc.
 : Sarnia, ONT
 : (490102)
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Intake water, (100)
 Laboratory : Pollutech
 Sampling Method : Grab
 Sampled By : C. Ferguson
 Date Collected : 02/06/89
 Received : 02/06/89
 Tested : 02/06/89 at: 1715

Type of Bioassay : STATIC
 : (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC. %	E L A P S E D T I M E	TOTAL MORTALITY %
100	00:00 47:15	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST E L A P S E D T I M E
 CONC. %
 00:00 47:15

100	pH 7.7 7.9 O2 ppm 10.2 9.1 Cond. 288 320 Temp(C) 20.0 20.0
50	pH 7.9 8.0 O2 ppm 8.8 9.0 Cond. 430 480 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 8.4 9.0 Cond. 490 520 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 8.0 9.0 Cond. 520 580 Temp(C) 20.0 20.0
6	pH 8.0 8.1 O2 ppm 8.0 9.1 Cond. 520 600 Temp(C) 20.0 20.0
Control	pH 8.0 8.0 O2 ppm 8.6 9.1 Cond. 540 600 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

Sample: 05890023

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1100
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)
: D. magna
: Test Animal
Weight(gm)
Length(mm)

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 48:30	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

Sample Number: 05890023

TEST CONC. %	ELAPSED TIME
100	00:00 48:30

100	pH 7.9 O2 ppm 9.8 Cond. 9.4 Temp(C) 350 355 20.0 20.0
50	pH 8.0 O2 ppm 9.4 Cond. 452 465 Temp(C) 20.0 20.0
26	pH 8.1 O2 ppm 9.2 Cond. 520 550 Temp(C) 20.0 20.0
13	pH 8.1 O2 ppm 9.2 Cond. 550 590 Temp(C) 20.0 20.0
6	pH 8.1 O2 ppm 9.2 Cond. 580 600 Temp(C) 20.0 20.0
Control	pH 8.1 O2 ppm 9.1 Cond. 600 610 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890030

TEST CONDITIONS

Company : Suncor Inc.
Region : Sarnia, ONT
Industry : Southwest
Control point : intake water, (100)
Laboratory : Pollutec
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1515
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, DME, 1988)
Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00 48:20		%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST
CONC.
%
ELAPSED TIME
00:00 48:20

100	pH 02 ppm Cond. Temp(C)	7.7 9.4 320 20.0	7.7 9.3 370 20.0
50	pH 02 ppm Cond. Temp(C)	7.8 9.4 420 20.0	7.8 9.4 450 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 9.0 480 20.0	7.9 9.4 500 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 8.8 500 20.0	7.9 9.2 520 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 8.8 500 20.0	7.9 9.4 550 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	8.0 9.3 560 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT

Sample: 05890035

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Intake water, (100)
Laboratory : Pollutech
Sampling Method : Grab
Sample Collected : 05/01/89
Date Received : 05/01/89
Tested : 05/03/89 at: 1115

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, ONE, 1988)

Test Animal : 0. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC. %

ELAPSED TIME

00:00 48:20

100	pH 7.8 O2 ppm 10.4 Cond. 8.5 Temp(C) 308 338 20.0 20.0	7.8 7.8 8.5 8.5 308 338 20.0 20.0
50	pH 7.9 O2 ppm 9.8 Cond. 8.5 Temp(C) 402 422 20.0 20.0	7.9 7.8 8.5 8.5 402 422 20.0 20.0
26	pH 8.0 O2 ppm 9.8 Cond. 8.5 Temp(C) 448 452 20.0 20.0	8.0 7.9 8.5 8.5 448 452 20.0 20.0
13	pH 8.0 O2 ppm 9.8 Cond. 9.0 Temp(C) 468 478 20.0 20.0	8.0 8.0 9.8 9.0 468 478 20.0 20.0
6	pH 8.0 O2 ppm 9.6 Cond. 9.2 Temp(C) 470 478 20.0 20.0	8.0 8.0 9.6 9.2 470 478 20.0 20.0
Control	pH 8.0 O2 ppm 9.8 Cond. 9.2 Temp(C) 490 510 20.0 20.0	8.0 8.0 9.8 9.2 490 510 20.0 20.0

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Date Received : 12/12/88
Tested : 12/13/88 at: 1245

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY %
100	01:00 46:25	0
50	0	0
25	0	0
13	0	0
6	1	8
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST CONC. %
ELAPSED TIME
01:00 46:25

100	pH 7.5 O2 ppm 7.6 Concl. 8.9 Temp(C) 1680 20.0 1680 20.0 20.0
50	pH 7.9 O2 ppm 7.9 Concl. 8.8 Temp(C) 1040 1050 20.0 20.0
25	pH 8.1 O2 ppm 8.1 Concl. 9.0 Temp(C) 820 820 20.0 20.0
13	pH 8.1 O2 ppm 8.1 Concl. 9.0 Temp(C) 700 700 20.0 20.0
6	pH 8.2 O2 ppm 8.1 Concl. 9.0 Temp(C) 640 650 20.0 20.0
Control	pH 8.2 O2 ppm 8.1 Concl. 9.0 Temp(C) 600 600 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890002

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sample Collected : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/10/89 at: 1215
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)
Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 47:15	%
100	0	1	0
50	0	1	0
20	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST CONC. %
ELAPSED TIME
00:00 47:15

100	pH O2 ppm Cond. Temp(C)	6.7 9.8 1220 20.0	6.8 8.6 1250 20.0
50	pH O2 ppm Cond. Temp(C)	7.7 9.9 920 20.0	7.7 8.7 910 20.0
26	pH O2 ppm Cond. Temp(C)	8.0 9.7 790 20.0	7.9 8.8 780 20.0
13	pH O2 ppm Cond. Temp(C)	8.0 9.9 700 20.0	7.9 9.3 680 20.0
6	pH O2 ppm Cond. Temp(C)	8.1 9.9 650 20.0	8.0 9.4 610 20.0
Control	pH O2 ppm Cond. Temp(C)	8.0 9.9 590 20.0	7.9 9.4 590 20.0

WISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

Sample: 05890013

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled by : J. Ferguson
Date collected : 02/06/89
Date received : 02/06/89
Tested : 02/06/89 at: 1745

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:10	48:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890013

TEST CONC. %
E L A P S E D T I M E
00:10 48:10

100	pH 7.3 7.4 O2 ppm 7.8 8.7 Cond. 1040 1120 Temp(C) 20.0 20.0
50	pH 7.8 7.8 O2 ppm 7.8 8.6 Cond. 820 860 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 7.8 8.7 Cond. 700 740 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 7.8 8.7 Cond. 640 680 Temp(C) 20.0 20.0
6	pH 8.1 8.1 O2 ppm 8.0 8.7 Cond. 600 620 Temp(C) 20.0 20.0
Control	pH 8.0 8.1 O2 ppm 8.6 8.7 Cond. 540 600 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT

Sample: 05890024

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled by : Ferguson
Date Collected : 01/06/89
Received : 03/07/89
Tested : 03/07/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 47:50	%
100	0	0	0
50	0	0	0
20	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC.
%
ELAPSED TIME
00:00 47:50

100	pH 02 ppm Cond. Temp(C)	7.0 9.2 1100 20.0	7.1 8.2 1220 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 9.0 880 20.0	7.6 8.6 950 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 9.0 760 20.0	7.8 8.9 800 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.0 680 20.0	7.8 8.9 695 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 9.0 620 20.0	7.9 9.0 640 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.4 580 20.0	8.0 9.4 610 20.0

Sample: 02890032

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
 (40016) UNIT
 Region : Southwest
 Industry : Petroleum Refining
 Control point : Process Effluent, (300)
 Laboratory : MQE
 Sampling Method : grab
 Sampled By : D. Hamilton
 Date Collected : 03/29/89
 Received : 03/30/89
 Tested : 03/30/89 at: 1536

Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol. OME, 1988)

Test Animal : D. magna
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
60	0	0	0
30	0	0	0
15	0	0	0
5	0	0	0
Control	0	1	8

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890032

TEST E L A P S E D T I M E
 CONC. % 00:00 24:00 48:00

100	pH 7.5 O2 ppm 8.9 Cond. 1091 Temp(C) 20.0	7.5 7.5 1082 20.0	7.7 7.5 1082 20.0
60	pH 7.8 O2 ppm 9.0 Cond. 781 Temp(C) 20.0	7.9 7.7 775 20.0	7.9 7.7 775 20.0
30	pH 8.0 O2 ppm 8.9 Cond. 560 Temp(C) 20.0	8.0 8.1 558 20.0	8.0 8.1 558 20.0
15	pH 8.0 O2 ppm 8.8 Cond. 443 Temp(C) 20.0	8.1 8.2 439 20.0	8.1 8.2 439 20.0
5	pH 8.1 O2 ppm 8.8 Cond. 368 Temp(C) 20.0	8.2 8.3 365 20.0	8.2 8.3 365 20.0
Control	pH 8.1 O2 ppm 9.0 Cond. 337 Temp(C) 20.0	8.2 8.5 330 20.0	8.2 8.5 330 20.0

MISA-PETROLEUM-DAPHNIA

Sample: 05890029

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sample By : C Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	E L A P S E O	T I M E	TOTAL MORTALITY	%
100	0	1		8	
50	0	0		0	
26	0	0		0	
13	0	0		0	
6	0	0		0	
Control	0	0		0	

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC. %
E L A P S E D T I M E
00:00 48:30

100	pH 02 ppm Cond. Temp(C)	7.4 8.8 980 20.0	7.6 9.2 1080 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 8.8 780 20.0	7.8 9.2 800 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 8.8 660 20.0	7.8 9.3 700 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 8.8 600 20.0	7.9 9.2 610 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 8.8 540 20.0	7.9 9.2 580 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	7.9 9.1 550 20.0

TOXICITY TEST REPORT Sample: 05890034

TEST CONDITIONS

Company : Suncor Inc.
Region : Sarnia, ONT
Industry : (490102)
Southwest
Petroleum Refining
Control point : Process Effluent, (300)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 1010

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC.	ELAPSED TIME
%	00:00 48:10

100	pH 7.3 O2 ppm 9.2 Cond. 8.2 Temp(C) 1120 20.0 1250 20.0 20.0
50	pH 7.9 O2 ppm 9.6 Cond. 8.4 Temp(C) 820 20.0 900 20.0 20.0
26	pH 8.0 O2 ppm 7.9 Cond. 9.8 Temp(C) 640 20.0 700 20.0 20.0
13	pH 8.0 O2 ppm 9.6 Cond. 8.4 Temp(C) 520 20.0 600 20.0 20.0
6	pH 8.1 O2 ppm 9.6 Cond. 8.9 Temp(C) 360 20.0 550 20.0 20.0
Control	pH 8.0 O2 ppm 9.8 Cond. 9.2 Temp(C) 490 20.0 510 20.0 20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880005

TEST CONDITIONS

Company : Suncor Inc.
(400105)
Region : Southwest
Industry : Petroleum Refining
Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1030

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST
CONC.
%

ELAPSED
TIME

00:00 48:10

100	pH 02 ppm Cond. Temp(C)	7.9 10.2 300 20.0	7.9 9.6 370 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 9.8 460 20.0	8.0 9.6 472 20.0
26	pH 02 ppm Cond. Temp(C)	8.2 9.6 500 20.0	8.1 9.6 520 20.0
13	pH 02 ppm Cond. Temp(C)	8.2 9.6 520 20.0	8.1 9.4 560 20.0
6	pH 02 ppm Cond. Temp(C)	8.2 9.6 520 20.0	8.1 9.4 560 20.0
Control	pH 02 ppm Cond. Temp(C)	8.2 9.6 560 20.0	8.1 9.4 600 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890025

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(480102)
Region : Southwest
Industry : Petroleum Refining
Control point : cooling water, (400)
Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1630

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	0
20	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST CONC. %
ELAPSED TIME
00:00 48:10

100	pH 7.9 7.7 O2 ppm 9.8 9.4 Cond. 320 360 Temp(C) 20.0 20.0
50	pH 8.0 7.9 O2 ppm 10.0 9.2 Cond. 480 435 Temp(C) 20.0 20.0
26	pH 8.0 7.9 O2 ppm 9.2 9.5 Cond. 520 420 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 9.0 9.4 Cond. 540 600 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 9.0 9.4 Cond. 580 610 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.4 9.3 Cond. 580 610 Temp(C) 20.0 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none
LC50 Calculated By :

Sample: 02890033

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining
Control point : cooling water, (400)
Laboratory : MOE
Sampling Method : grab
Sampled By : O. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1555

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, ONE, 1988)

Test Animal
Weight(gm)
Length(mm)
: 0. magna
:

MORTALITY DATA

TEST CONC.	%	E L A P S E D TIME	TOTAL MORTALITY %
100	0	2 2	16
60	0	0 0	0
30	0	0 0	0
15	0	1 1	8
5	0	0 0	0
Control	0	0 1	8

48 Hour LC50 : >100%
95% fid. limits : 0.0 - 0.0 %
Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890033

TEST CONC. %	E L A P S E D TIME
	00:00 24:00 48:00

100	pH 8.1 O2 ppm 10.1 Cond. 382 Temp(C) 20.0	8.1 8.3 379 20.0
60	pH 8.1 O2 ppm 8.9 Cond. 360 Temp(C) 20.0	8.2 8.3 351 20.0
30	pH 8.1 O2 ppm 9.7 Cond. 346 Temp(C) 20.0	8.2 8.3 341 20.0
15	pH 8.2 O2 ppm 9.7 Cond. 338 Temp(C) 20.0	8.3 8.2 340 20.0
5	pH 8.2 O2 ppm 8.6 Cond. 334 Temp(C) 20.0	8.3 8.3 334 20.0
Control	pH 8.2 O2 ppm 8.8 Cond. 330 Temp(C) 20.0	8.3 8.3 335 20.0

COMPANY: Texaco Canada Inc., Nanticoke
(520205)
(now with Nanticoke Refinery)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Texaco Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish.

Process Effluent

06881220 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890126 sampled: 01/24/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890210 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890308 sampled: 03/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890405 sampled: 04/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890529 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

01890108 sampled: 05/31/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

storm water

Texaco Canada Inc. (continued)

landfarm leachate

EO-leachate-creek

Sample: 06881220

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : 24hr. Comp
Sample Size : 150
Date Collected : 12/12/88
Date Received : 12/14/88
Date Tested : 12/14/88 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06881220

TEST
CONC.
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	7.8	8.3	8.3	8.4	8.4
	O2 ppm	7.8	9.8	9.2	10.3	10.2
	Cond.	130.1	130.1	130.1	130.1	130.1
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.8	8.3	8.3	8.3	8.3
	O2 ppm	8.2	9.2	9.9	9.8	9.5
	Cond.	82.4	82.4	82.4	82.4	83.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.7	7.9	8.3	8.3	8.3
	O2 ppm	7.0	8.2	9.7	10.4	9.7
	Cond.	64.7	64.7	64.7	64.7	64.9
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.7	8.2	8.3	8.2	8.2
	O2 ppm	7.5	6.9	9.2	8.9	9.6
	Cond.	54.8	54.8	54.8	54.8	55.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.9	8.2	8.2	8.2
	O2 ppm	7.6	7.2	9.3	8.9	9.8
	Cond.	45.0	45.0	45.0	44.8	44.8
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.5	8.0	8.2	8.1	8.0
	O2 ppm	7.2	8.6	8.0	8.2	8.2
	Cond.	35.2	35.2	35.2	35.2	36.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT

Sample: 06890126

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : grab
Sampled By : Bob Buntalis
Date Collected : 01/24/89
Received : 01/25/89
Tested : 01/25/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal :
Weight(gm) :
Length(mm) :
: Rainbow trout

MORTALITY DATA

TEST		E L A P S E D T I M E				TOTAL MORTALITY
CONC.	%	00:00	24:00	48:00	72:00	
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06890126

TEST		E L A P S E D T I M E			
CONC.	%	00:00	24:00	48:00	72:00
100	pH	8.3	8.5	8.6	8.5
	O2 ppm	8.6	8.2	9.5	9.2
	Cond.	304.1			333.0
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.2	8.4	8.4	8.3
	O2 ppm	9.0	8.0	8.9	8.6
	Cond.	176.2			190.8
	Temp(C)	15.0	15.0	15.0	15.0
30	pH	8.0	8.1	8.4	8.2
	O2 ppm	9.2	8.9	9.5	9.7
	Cond.	126.9			127.5
	Temp(C)	15.0	15.0	15.0	15.0
20	pH	8.0	8.3	8.3	8.4
	O2 ppm	8.2	8.0	8.8	8.9
	Cond.	99.2			103.9
	Temp(C)	15.0	15.0	15.0	15.0
10	pH	7.8	8.2	8.2	8.3
	O2 ppm	9.0	8.8	9.2	9.0
	Cond.	71.0			72.8
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.7	8.0	8.1	8.1
	O2 ppm	8.6	9.2	9.0	9.1
	Cond.	39.7			43.0
	Temp(C)	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 06890210

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(320205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : Rice-Bumellis
Sample Collected : 02/06/89
Date Collected : 02/07/89
Received : 02/07/89
Tested : 02/07/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890210

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	7.7	8.1	8.1	8.1	8.2
	O2 ppm	10.2	9.3	9.3	9.6	9.2
	Cond.	1990				2190
	Temp(C)	13.0	14.0	14.0	15.0	16.0
50	pH	7.7	8.2	8.2	8.2	8.3
	O2 ppm	9.9	10.4	10.4	10.1	10.2
	Cond.	1230				1368
	Temp(C)	14.0	14.0	14.0	15.0	16.0
30	pH	7.6	8.1	8.2	8.1	8.2
	O2 ppm	9.8	10.4	10.4	9.9	10.1
	Cond.	876				983
	Temp(C)	14.0	14.0	14.0	15.0	16.0
20	pH	7.6	8.0	8.1	8.1	8.1
	O2 ppm	9.8	10.0	9.4	9.2	9.3
	Cond.	718				809
	Temp(C)	15.0	14.0	14.0	15.0	16.0
10	pH	7.5	7.9	8.0	7.9	8.1
	O2 ppm	9.8	9.6	9.6	9.4	9.4
	Cond.	554				629
	Temp(C)	15.0	14.0	14.0	15.0	16.0
Control	pH	7.4	7.8	7.9	7.8	8.0
	O2 ppm	9.8	10.0	10.2	9.8	9.7
	Cond.	382				398
	Temp(C)	15.0	14.0	14.0	15.0	16.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890308

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Texaco Canada Inc.
: Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumellis
Date Collected : 03/07/89
Received : 03/08/89
Tested : 03/08/89 at: 1500

Type of Bioassay

: STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OIE, 1983).

Test Animal
Weight(gm)
Length(mm)
:

: Rainbow trout
:
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
50	0	0	0	0	0
30	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

Sample Number: 06890308

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH	8.0	7.9	8.0	7.9
	O2 ppm	11.0	9.8	10.0	8.7
	Cond.	2200			2100
	Temp(C)	15.0	14.0	15.0	15.0
50	pH	8.0	8.0	8.0	7.9
	O2 ppm	10.2	10.2	10.4	9.0
	Cond.	1269			1296
	Temp(C)	15.0	14.0	15.0	15.0
30	pH	8.1	8.0	8.0	7.9
	O2 ppm	10.4	10.4	10.3	9.3
	Cond.	923			930
	Temp(C)	15.0	14.0	15.0	15.0
20	pH	8.0	8.0	7.9	7.7
	O2 ppm	10.2	10.2	10.4	8.3
	Cond.	739			742
	Temp(C)	15.0	14.0	15.0	15.0
10	pH	7.8	8.0	7.8	7.7
	O2 ppm	10.0	10.0	9.5	8.6
	Cond.	573			565
	Temp(C)	15.0	14.0	15.0	15.0
Control	pH	7.4	7.9	7.8	7.3
	O2 ppm	9.4	9.8	9.8	7.8
	Cond.	438			378
	Temp(C)	15.0	14.0	15.0	15.0

Sample: 06890405

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Texaco Canada Inc.
 Location : White Lake, ONT
 Region : West Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : Beak
 Sampling Method : Grab
 Sampled By : Rob Bunellis
 Date Collected : 04/04/89
 Date Received : 04/05/89
 Tested : 04/05/89 at: 1400

Type of Bioassay

: STATIC
 (Protocol to determine the acute lethality
 of liquid effluents to fish. OME, 1983).

Test Animal
 Weight(gm)
 Length(mm)

: Rainbow trout
 :
 :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

Sample Number: 06890405

TEST CONC.
 %

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.1	8.2	8.6	8.4	8.5
	O2 ppm	9.2	8.3	8.6	9.0	7.8
	Cond.	1983				1945
	Temp(C)	15.0	15.0	15.0	14.0	14.0
100	pH	8.2	8.5	8.7	8.6	8.7
	O2 ppm	9.3	9.4	9.8	9.9	8.2
	Cond.	2070				2050
	Temp(C)	15.0	15.0	15.0	14.0	14.0
Control	pH	8.1	8.5	8.6	8.6	8.6
	O2 ppm	9.3	9.4	9.3	9.0	8.1
	Cond.	361				382
	Temp(C)	15.0	15.0	15.0	14.0	14.0
Control	pH	8.1	8.5	8.5	8.6	8.6
	O2 ppm	9.1	9.2	9.1	9.1	8.4
	Cond.	363				382
	Temp(C)	15.0	15.0	15.0	14.0	14.0

MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890529

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(320205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Runellis
Date Collected : 05/09/89
Received : 05/10/89
Tested : 05/10/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

TOXICITY TEST PARAMETERS

Sample Number: 06890529

TEST CONC. %
E L A P S E D T I M E
00:00 24:00 48:00 72:00 96:00

100	pH	8.3	8.1	8.2	8.2	8.1
	O2 ppm	6.5	8.8	8.5	8.3	9.3
	Cond.	1239	1218	1572	1580	1574
65	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.3	8.2	8.1	8.1	8.0
	O2 ppm	8.1	8.3	8.4	7.5	9.0
50	Cond.	1168	1078	1151	1158	1155
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	8.2	8.1	8.0	8.1	8.0
	O2 ppm	7.2	7.5	8.2	8.2	8.0
	Cond.	762	748	973	764	780
20	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.1	8.1	8.0	8.1	8.0
	O2 ppm	8.1	7.5	8.0	8.7	8.6
10	Cond.	650	658	825	843	835
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	8.2	8.1	8.0	8.1	8.0
	O2 ppm	8.5	7.2	8.5	8.2	8.4
	Cond.	584	554	581	559	598
Control	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.1	8.2	8.1	7.9	8.0
	O2 ppm	8.6	8.8	9.0	8.5	8.6
Control	Cond.	472	468	479	499	499
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.1	8.1	7.7	7.9
	O2 ppm	8.1	8.2	8.0	7.7	8.5
	Cond.	348	347	354	358	362
Control	Temp(C)	14.0	15.0	15.0	15.0	15.0

WISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890108

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : MOE
Sampling Method : grab
Sampled By : G. Perkins
Date Collected : 05/31/89
Received : 05/31/89
Tested : 05/31/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	00:00	03:00	23:45	46:00	73:45	96:30	TOTAL MORTALITY	%
100	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	1	10	10
20	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	1	10	10
Control	0	0	0	0	0	0	1	10	10

96 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : WISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890108

TEST CONC. %
00:00 03:00 23:45 46:00 73:45 96:30

100	pH	7.5	8.0	8.1	8.2	8.3	7.3
	O2 ppm	8.7	9.6	9.7	9.7	9.5	9.1
	Cond.	1800	1800	1590	1550	1550	1500
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.0	8.1	8.2	7.4	
	O2 ppm	9.3	9.7	9.7	9.4	9.2	
	Cond.	1180	1120	1120	1120	1100	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
40	pH	7.9	7.9	7.9	7.9	8.0	7.4
	O2 ppm	9.5	9.6	9.7	9.4	9.2	
	Cond.	800	800	800	800	800	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
30	pH	7.7	7.8	7.9	8.0	7.4	
	O2 ppm	9.4	9.7	9.8	9.5	9.3	
	Cond.	680	660	660	660	680	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
20	pH	7.8	7.8	7.9	8.0	7.4	
	O2 ppm	9.6	9.7	9.7	9.7	9.5	
	Cond.	340	300	320	320	350	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
10	pH	7.5	7.6	7.7	7.9	7.4	
	O2 ppm	9.5	9.7	9.8	9.7	9.3	
	Cond.	390	380	385	380	390	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
Control	pH	7.0	7.4	7.6	7.5	7.4	
	O2 ppm	9.6	9.6	9.8	9.7	9.3	
	Cond.	260	260	260	260	260	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	

COMPANY: Texaco Canada Inc., Nanticoke
(520205)
(now with Nanticoke Refinery)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY

Data for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Texaco Canada Inc. in Nanticoke. All six samples were not acutely lethal to *Daphnia magna*.

Process Effluent

06881225 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890127 sampled: 01/24/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890211 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobilty observed during testing

06890309 sampled: 03/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890406 sampled: 04/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890530 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed

02890108 sampled: 05/31/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

storm water

Texaco Canada Inc. (continued)

landfarm leachate

EO-leachate-creek

SLOPE of Mortality Curve :
LC50 Calculated By :

Sample: 06881225

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Texaco Canada Inc.
Address : 1500 Ste. 100, ONT
Region : East Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : BEAK
Sampling Method : 24hr. Comp
Sampled By : Texaco
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal :
Weight(gm) : 0. magna
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06881225

TEST E L A P S E D T I M E
CONC. % 00:00 24:00 48:00

100	pH 7.8 O2 ppm 7.0 Cond. 1308 Temp(C) 20.0	20.0	20.0	48:00	8.1 6.1 1285 20.0
50	pH 8.0 O2 ppm 7.0 Cond. 826 Temp(C) 20.0	8.1 6.3 815 20.0	20.0	20.0	
30	pH 8.0 O2 ppm 7.1 Cond. 633 Temp(C) 20.0	8.1 6.5 648 20.0	20.0	20.0	
20	pH 8.0 O2 ppm 7.2 Cond. 534 Temp(C) 20.0	8.1 5.7 590 20.0	20.0	20.0	
10	pH 8.0 O2 ppm 6.1 Cond. 435 Temp(C) 20.0	8.0 5.7 362 20.0	20.0	20.0	
Control	pH 8.2 O2 ppm 6.9 Cond. 339 Temp(C) 20.0	7.6 6.5 335 20.0	20.0	20.0	

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890127

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(320205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : Bob
Sampled By : Bob Bumelis
Date Collected : 01/24/89
Received : 01/25/89
Tested : 01/25/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : 0. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0 0 0	0
50	0	0 0 0	0
30	0	0 0 0	0
20	0	0 0 0	0
10	0	0 0 0	0
Control	0	0 0 0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments :

TOXICITY TEST PARAMETERS

Sample Number: 06890127

TEST ELAPSED TIME
CONC. % 00:00 24:00 48:00

100	pH 8.2 O2 ppm 8.6 Cond. 3190 Temp(C) 21.0	8.2 8.6 3190 21.0	8.6 8.6 3240 20.0
50	pH 8.2 O2 ppm 8.6 Cond. 1855 Temp(C) 21.0	8.2 8.6 1855 21.0	8.5 8.5 1757 20.0
30	pH 8.2 O2 ppm 8.7 Cond. 1211 Temp(C) 21.0	8.2 8.7 1211 21.0	8.4 8.9 1181 20.0
20	pH 8.3 O2 ppm 8.6 Cond. 1041 Temp(C) 21.0	8.3 8.6 1041 21.0	8.3 8.5 963 20.0
10	pH 8.2 O2 ppm 8.6 Cond. 682 Temp(C) 21.0	8.2 8.6 682 21.0	8.2 8.8 663 20.0
Control	pH 8.1 O2 ppm 8.4 Cond. 405 Temp(C) 21.0	8.1 8.4 405 21.0	7.9 8.7 405 20.0

Sample: 06890211

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : Grab
Sampled By : Bob Brunalis
Date Collected : 02/07/89
Received : 02/07/89
Tested at: 1410

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 24:00 48:00	%
100	0	0 0 0	0
50	0	0 0 0	0
30	0	0 0 0	0
20	0	0 0 0	0
10	0	0 0 0	0
Control	0	0 0 0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

Sample Number: 06890211

TEST CONC.
%
ELAPSED TIME
00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.8 8.8 1831 20.0	8.2 8.6 1842 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 8.7 1129 20.0	8.1 8.5 1140 20.0
30	pH 02 ppm Cond. Temp(C)	8.1 8.5 814 20.0	8.1 8.4 854 20.0
20	pH 02 ppm Cond. Temp(C)	8.1 8.6 666 20.0	8.1 8.4 679 20.0
10	pH 02 ppm Cond. Temp(C)	8.1 8.2 536 20.0	8.2 8.3 540 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 8.6 328 20.0	8.0 8.4 335 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890309

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bunellis
Date Collected : 03/07/89
Received : 03/08/89
Tested : 03/08/89 at: 1620
Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)
: D. magna
: :
Test Animal
Weight(gm)
Length(mm)

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal
95% fid. limits : 0.0 - 0.0 %
Comments : no mortality or immobility observed in 48 Hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890309

TEST CONC. %	E L A P S E D T I M E	
	00:00	24:00 48:00

100	pH O2 ppm Cond. Temp(C)	7.8 9.1 1976 20.0	7.8 8.0 1990 20.0
50	pH O2 ppm Cond. Temp(C)	7.8 9.0 1152 20.0	7.8 8.1 1155 20.0
30	pH O2 ppm Cond. Temp(C)	7.8 8.6 819 20.0	7.8 7.0 824 20.0
20	pH O2 ppm Cond. Temp(C)	7.8 8.5 645 20.0	7.9 7.0 652 20.0
10	pH O2 ppm Cond. Temp(C)	7.8 8.7 510 20.0	8.0 7.4 511 20.0
Control	pH O2 ppm Cond. Temp(C)	7.7 9.0 341 20.0	8.0 7.6 345 20.0

WISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average
LC50 Calculated By :

Sample: 06890406

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining
Control point : Process Effluent, (200)
Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bunellis
Date Collected : 04/04/89
Received : 04/05/89
Tested : 04/05/89 at: 1330

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol, OMC, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 hrs

TOXICITY TEST PARAMETERS

Sample Number: 06890406

TEST CONC.
%
ELAPSED TIME
00:00 24:00 48:00

100	pH 8.0 O2 ppm 9.4 Cond. 2220 Temp(C) 20.0	20.0	20.0	8.1 8.2 2220 20.0
50	pH 8.2 O2 ppm 9.2 Cond. 1398 Temp(C) 20.0	8.2 9.2 1398 20.0	20.0	8.2 8.4 1299 20.0
30	pH 8.3 O2 ppm 9.1 Cond. 946 Temp(C) 20.0	8.3 9.1 946 20.0	20.0	8.2 8.4 957 20.0
20	pH 8.4 O2 ppm 9.1 Cond. 761 Temp(C) 20.0	8.4 9.1 761 20.0	20.0	8.2 8.7 771 20.0
10	pH 8.5 O2 ppm 9.4 Cond. 568 Temp(C) 20.0	8.5 9.4 568 20.0	20.0	8.2 8.8 576 20.0
Control	pH 8.5 O2 ppm 9.3 Cond. 388 Temp(C) 20.0	8.5 9.3 388 20.0	20.0	8.2 8.6 393 20.0

MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

Sample: 06890530

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Texaco Canada Inc.
 : Nanticoke, ONT
 : (520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : Grab
Sampled By : Rob Bunellis
Date Collected : 05/09/89
Received : 05/10/89
Tested : 05/10/89 at: 1530

Type of Bioassay

: STATIC
 : (Daphnia magna Acute Lethality Toxicity
 : Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00 24:00 48:00		%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

TOXICITY TEST PARAMETERS

Sample Number: 06890530

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	7.8	8.1
	O2 ppm	8.9	8.2
	Cond.	1484	1467
	Temp(C)	21.0	21.0
50	pH	8.0	8.1
	O2 ppm	8.4	8.1
	Cond.	903	902
	Temp(C)	21.0	21.0
30	pH	8.1	8.2
	O2 ppm	8.5	8.1
	Cond.	667	663
	Temp(C)	21.0	21.0
20	pH	8.2	8.2
	O2 ppm	8.5	8.0
	Cond.	554	568
	Temp(C)	21.0	21.0
10	pH	8.2	8.2
	O2 ppm	8.4	8.2
	Cond.	439	442
	Temp(C)	21.0	21.0
Control	pH	7.3	8.1
	O2 ppm	8.5	8.2
	Cond.	327	323
	Temp(C)	21.0	21.0

TOXICITY TEST REPORT Sample: 02890108

TEST CONDITIONS

Company : Texaco Canada Inc.
 (520205)
 Region : West Central
 Industry : Petroleum Refining
 Control point : Process Effluent, (200)
 Laboratory : MOE
 Sampling Method : grab
 Sampled By : T. G. Perkins
 Date Collected : 05/31/89
 Received : 05/31/89
 Tested : 05/31/89 at: 1210
 Type of Bioassay : STATIC
 (Daphnia magna Acute Lethality Toxicity
 Test Protocol, OME, 1988)
 : D. magna
 Test Animal :
 Weight(gm) :
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	00:00	01:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
60	0	0	0	0	0	0
30	0	0	0	0	0	0
15	0	0	0	0	0	0
5	0	0	0	0	0	0
Control	0	0	0	0	0	0

48 Hour LC50 : Non-lethal
 95% fid. limits : 0.0 - 0.0 %
 Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890108

TEST CONC. %	E L A P S E D T I M E	00:00	01:00	24:00	48:00
100	pH 8.0 O2 ppm 9.3 Cond. 1177 Temp(C) 20.0	20.0	20.0	20.0	20.0
60	pH 8.1 O2 ppm 9.4 Cond. 816 Temp(C) 20.0	20.0	20.0	20.0	20.0
30	pH 8.1 O2 ppm 9.6 Cond. 562 Temp(C) 20.0	20.0	20.0	20.0	20.0
15	pH 8.2 O2 ppm 9.6 Cond. 442 Temp(C) 20.0	20.0	20.0	20.0	20.0
5	pH 8.2 O2 ppm 9.6 Cond. 359 Temp(C) 20.0	20.0	20.0	20.0	20.0
Control	pH 8.2 O2 ppm 9.7 Cond. 311 Temp(C) 20.0	20.0	20.0	20.0	20.0