

The Boeing Company
P.O. Box 3707
Seattle, WA 98124-2207

8e

8EHQ-0594-12980

PDCN: 88940000222

ORIGINAL

Contains No CBI

8EHQ-94-12980

May 12, 1994

Document Processing Center (TS-790)
Attn: Section 8 (e) Coordinator
Office of Toxic Substances
U.S. Environmental Protection Agency
401 "M" Street, S. W.
Washington, D.C. 20460



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BOEING

ATTENTION SECTION 8 (e) COORDINATOR

The Boeing Company submits the following documents pursuant to the TSCA Section 8 (e). These documents contain additional data received as follow-up information about our earlier submission on April 13, 1994.

- Enclosure A: Chain of Command Record
- Enclosure B: Determination of Static Acute Fish Toxicity, Sample 7502
- Enclosure C: Determination of Static Acute Fish Toxicity, Sample 7503
- Enclosure D: MSDS for Pacific Chemical Coolube 21
- Enclosure E: Memo, Karen Morris-Fine, The Boeing Co., to U.S. EPA Section 8(e) Coordinator, April 13, 1994



The test results reported on enclosures B and C were received by The Boeing Company Environmental Engineering organization on April 25, 1994. Two tests were conducted on waste coolant from a composite milling process. Filter paper (from Industrial Filters Co., 9 Industrial Road, P.O. Box 823, Fairfield, NJ 07006) was used to separate the composite particulate and solid sludge fraction (Sample 7502) from the liquid coolant (Pace Chemical Coolube 21) fraction (Sample 7503). Under Washington State Dangerous Waste Criteria (WAC 173-303-100), the solid fraction was classified as "extremely hazardous" waste and the liquid fraction as "dangerous" waste.

The study is described as follows:

Analysis consisted of a 96 hour static acute fish toxicity test. In this test, a predetermined amount of test material is immersed in water for a fixed amount of time. Fish are then exposed to the water to determine if anything that dissolved from the test material is toxic to fish.

Conclusion:

The test results for sample 7502 show 93% mortality (28 deaths in 30 organisms) of the fish within 96 hours at a concentration of 100 mg/l. This result categorizes the test material as "extremely hazardous waste" according to Washington State standards.

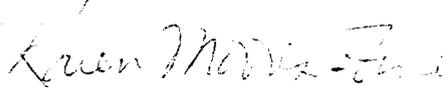
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May 12, 1994
Document Processing Center (TS-790)
Section 8 (e) Coordinator
Page 2

The test results for sample 7503 show 67% mortality (20 deaths in 30 organisms) of the fish within 96 hours at a concentration of 1000 mg/l. This result categorizes the test material as "dangerous waste" according to Washington State standards.

Submitted by:

BOEING



Karen Morris-Fine, Ph.D.
Manager Toxicology/TSCA/Epidemiology
(206) 393-4757, 7E-HM

ENCLOSURE A



**ANALYTICAL
RESOURCES
INCORPORATED**

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

25 April 1994

Contains No CBI

Peter Weickmann
Environmental Analysis Laboratory
Boeing Defense and Space Group
P.O. Box 3999, M/S 8J-55
Seattle, WA 98124-2499

RE: Project: A94030 - ARI Job G890

Dear Peter,

Please find enclosed an original Chain of Custody (COC) record and a set of analytical results for the above referenced project. One solid and one aqueous sample were received in good condition on April 12, 1994.

Analysis for fish toxicity following WDOE 80-12 testing protocols proceeded without incident. The original reports submitted to ARI by Patrick Berkley at Beak Consultants are included for your review.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions, feel free to call anytime.

Sincerely,

ANALYTICAL RESOURCES, INC.

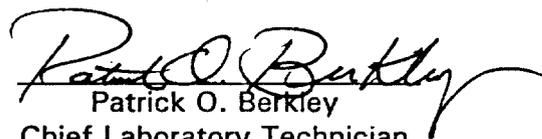
Jeff J. Reitan
Project Manager
206-340-2866, Ext.119

JJR/dn
Enclosures

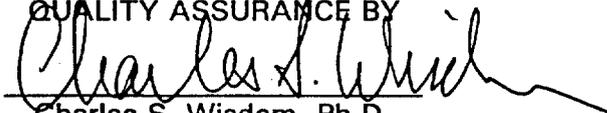
ENCLOSURE
Contains No CBI

DETERMINATION OF
STATIC ACUTE FISH TOXICITY
FOR ANALYTICAL RESOURCES INC.,
SAMPLE ID 94-5415-G890A/
BOEING SAMPLE 7502

PREPARED BY:


Patrick O. Berkley
Chief Laboratory Technician

QUALITY ASSURANCE BY


Charles S. Wisdom, Ph.D.
Bioassay Laboratory Manager

Aquatic Bioassay Services
Washington Laboratory Accreditation #C117
BEAK CONSULTANTS INCORPORATED

April 21, 1994

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1.0 ABSTRACT

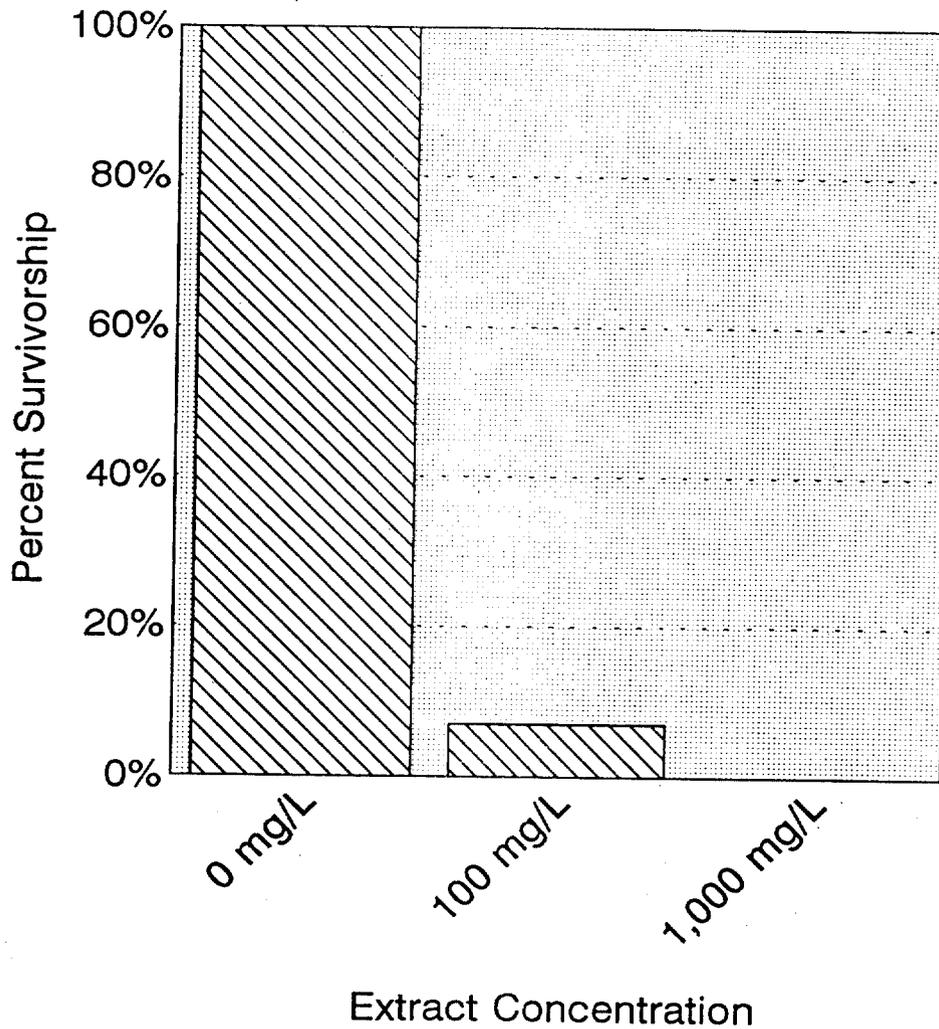
Analytical Resources Inc. Sample ID 94-5415-G890A/Boeing Sample 7502 was examined for toxicity using the static acute fish toxicity test WDOE 80-12 with rainbow trout (*Oncorhynchus mykiss*) as the test organism (Hazardous Waste Section, 1991). The sample was extracted with dilution water using a rotary agitator at the appropriate test concentrations. Fish were exposed to the extract concentrations and control dilution water for 96 hours. Survivorship in the control fish population was within the acceptable range for this test protocol - 100%. Survivorship of fish exposed to each of the two extracts of ARI Sample ID 94-5415-G890A/Boeing Sample 7502 was low, 7% at the 100ppm concentration, and 0% at the 1000 ppm concentration.

1.1 Summary

ARI Sample ID 94-5415-G890A/Boeing Sample 7502 is an extremely hazardous material according to the WDOE 80-12 test protocol.

2.0 RANGE FINDING BAR GRAPH

ARI SAMPLE 94-5415-G890A Static Acute Fish Toxicity Test



Job No. 31300-137

Figure 1: Survivorship of fish in the control and test concentrations for ARI Sample ID 94-5415-G890A/Boeing Sample 7502.

3.0 ANALYTICAL RESOURCES INC. SAMPLE ID 94-5415-G890A/Boeing Sample 7502 INFORMATION

3.1 Report Overview

ARI Sample ID 94-5415-G890A/Boeing Sample 7502 was received for the purpose of determining the response of rainbow trout fry to the 100 ppm and 1,000 ppm extracts. The 100 ppm and 1,000 ppm levels have been established by the Hazardous Waste Section of the Washington State Department of Ecology to determine whether if a material is either an extremely hazardous or dangerous waste. Significant differences in mortality between the control and each extract concentration will determine the level of hazard assigned. This report details the conditions under which this material was tested, the nature of the sample, the test conditions, quality assurance measures and test results.

3.2 Source of Sample

ARI Sample ID 94-5415-G890A/Boeing Sample 7502 was transported by local courier to our Kirkland laboratory to initiate the test.

3.2.1 Sample Information

Category	Sample
Sample Volume	Approx 50 g
Delivery Date & Time	15 April 10:00 HR
Storage Conditions	Room Temperature
Matrix	Solid - Filter Paper
Color	Gray/Black
Odor	None

3.2.2 Dilution Water Information

Source: Seattle Water District
Collection Date and Time: 16 April 1994 / 12:00 HR
Pretreatment: Dechlorination with Granulated Activated Charcoal
Physical and Chemical Parameters When Received: Temperature: 12.0 °C pH: 7.48 Dissolved Oxygen: 10.1 ppm Hardness: 23.04 mg/L as CaCO ₃ Conductivity: 60 µmhos/cm
Comments: Water was temperature equilibrated to 12.0 °C prior to the initiation of the test.

4.0 TOXICITY TEST

4.1 Test Parameters

Toxicity Test Methodology: WDOE 80-12, Rainbow Trout Acute Toxicity Test
Method Modifications (if applicable): None
Test Started: 16 April 1994 / 13:35 HR
Test Completed: 20 April 1994 / 14:15 HR
Test Concentrations: 0 mg/L, 100 mg/L and 1,000 mg/L
Test Chambers: Plastic Buckets with disposable pail liners, Total Volume 15.1 L Sample Volume/Chamber: 10.2 L/Test Bucket
Test Endpoint: Mortality
Test Acceptability: 90% or greater survivorship in the control population
Feeding Regime: Test Organisms were not fed during the test
Aeration: None Type of Renewal: None
Sample Dechlorination: None Photoperiod: 16:8 L:D
Organisms/Chamber: 10 Fish/Test Chamber Replicate Chambers/Concentration: 3 Test Chambers/Concentration
Test temperature: 12.0 °C ± 0 °C
Organism Loading Rates: .414 g/L

4.2 Test Organisms

Scientific Name: <i>Oncorhynchus mykiss</i> , Rainbow Trout
Life Stage: Juvenile Age: 57 Days Lab Acclimation: 16 Days
Largest Length: 3.0 cm Average Weight: 0.4224 g
Source and Culture Batch: Weyerhaeuser Technical Center #OM0023
Diseases and Treatment (where applicable): None

4.3 Quality Assurance

4.3.1 Reference Toxicant Use

A reference toxicant test ($ZnCl_2$) was performed on March 30, 1994. A 10,000 $\mu g/L$ stock solution of zinc chloride (Fisher #Z33-100, Lot #914997A) was diluted to 2,000 $\mu g/L$ as the initial concentration. Material was then diluted 50% for each subsequent concentration to produce the test conditions. Fish of the same size and age as the current test were placed in test buckets. Mortality, pH, and dissolved oxygen were recorded over the 96 hour testing period and an LC_{50} value was calculated by the Trimmed Spearman-Kärber statistical method.

4.3.2 Reference Toxicant Test Results

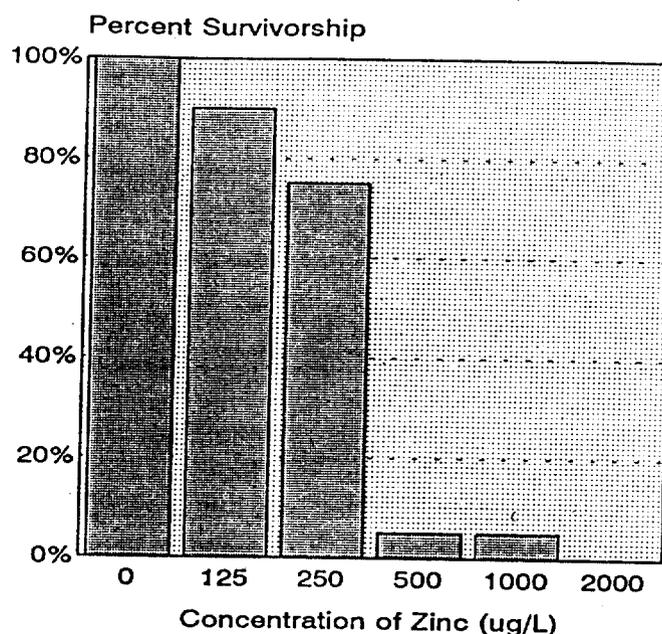
Toxicant Concentration	Organism Mortality	Percent Mortality
0 $\mu g/L$	0	0%
125 $\mu g/L$	2	10%
250 $\mu g/L$	5	25%
500 $\mu g/L$	19	95%
1,000 $\mu g/L$	19	95%
2,000 $\mu g/L$	20	100%

Calculated LC_{50} Value = 304.3 $\mu g/L$
Lower 95% Confidence Interval = 253.9 $\mu g/L$
Upper 95% Confidence Interval = 364.6 $\mu g/L$

4.3.3 Current Reference Toxicant Bar Chart

RAINBOW TROUT

Reference Toxicant Test



30 MARCH 1994

4.3.4 Physical and Chemical Methods Used

Various water quality parameters were measured during the course of the test. Temperature was determined by mercury thermometer with an accuracy of 1°C. The pH of each replicate was measured by Orion Research model 211, Digital pH meter with Orion/Ross Combination pH probe model 81-02. The pH meter was calibrated daily against external standards at the test temperature. Dissolved oxygen was determined using a YSI model 51B oxygen meter with an associated YSI model 5739 probe. The dissolved oxygen meter was air calibrated daily. Hardness was measured using the EDTA titrimetric method, #2340 C (APHA 1989). The hardness test was calibrated using a standard reference material purchased from LabChem Inc, Calcium Carbonate Standard (Lot #2181-8). Sample conductivity was measured with a YSI S-C-T Meter and Probe, Model #33. Chlorine levels were determined using a Hach Test Kit (Free and Total Chlorine Test Kit, Model CN66/66F/66T).

5.0 RESULTS

5.1 Original Data

The effluent concentration series each started with 30 fish (10 fish in each of three buckets) on Day 0. The following data represent the number of fish remaining daily in both test buckets.

Effluent Concentration	SURVIVING ORGANISMS				
	DAY 1	DAY 2	DAY 3	DAY 4	% SURVIVORS
Control, 0 mg/L	30	30	30	30	100%
100 mg/L	30	12	3	2	7%
1,000 mg/L	30	2	0	0	0%

5.2 Summary Physical and Chemical Data

Effluent Concentration	PHYSICAL AND CHEMICAL DATA					
	TEMPERATURE, °C		pH		DISSOLVED OXYGEN, ppm	
	MEAN	STD ¹	MEAN	STD	MEAN	STD
Control, 0 mg/L	12.0	0.0	7.1	0.2	9.7	0.4
100 mg/L	12.0	0.0	7.2	0.3	9.6	0.7
1,000 mg/L	12.0	0.0	7.6	0.5	8.9	2.0

¹STD = Standard deviation of the data around the mean value

5.3 Numerical and Statistical Analysis

5.3.1 Statistical Methods

The statistical methods used for this test are quite direct. If there is greater than 37% mortality in the combined 1,000 mg/L extract fish population, the test sample is deemed a dangerous waste. If there is greater than 33.3% mortality in the combined 100 mg/L extract fish population, the test sample is deemed an extremely hazardous waste.

5.3.2 Statistical Analysis Summary

Survivorship in the ARI Sample ID 94-5415-G890A/Boeing Sample 7502 control population (100%) was within the acceptable range for this test protocol. The mortalities in the 100 ppm fish population (93%) and in the 1,000 ppm fish population (100%) were well above the decision criterion for each waste classification. Therefore, ARI Sample ID 94-5415-G890A/Boeing Sample 7502 is an extremely hazardous waste according to the DOE hazardous material classification scheme.

6.0 BIBLIOGRAPHY

American Public Health Association. 1989. Standard methods for the examination of water and wastewater. Seventeenth Edition.

Environmental Protection Agency. 1991. Methods for measuring acute toxicity of effluents and receiving waters to freshwater marine organisms. Fourth Edition. EPA/600/4-90/027. Washington, D.C.

Hazardous Waste Section. 1991. Biological Testing Methods. Part A. Static acute fish toxicity test. Washington State Department of Ecology, WDOE 80-12.

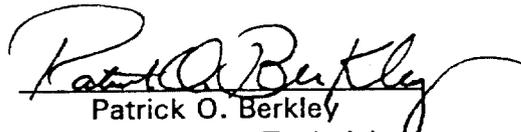
Rohlf, F.J. and R.R. Sokal. 1969. Statistical Tables. W.H. Freeman and Co., New York, New York.

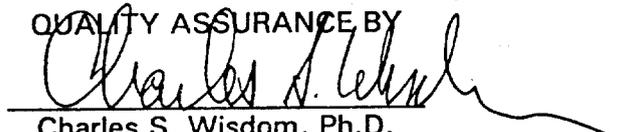
Sokal, R.R. and F.J. Rohlf. 1981. Biometry. Second Edition. W.H. Freeman and Co., New York, New York.

ENCLOSURE C
Contains No CBI

DETERMINATION OF
STATIC ACUTE FISH TOXICITY
FOR ANALYTICAL RESOURCES INC.,
SAMPLE ID 94-5416-G890B
BOEING SAMPLE 7503

PREPARED BY:


Patrick O. Berkley
Chief Laboratory Technician

QUALITY ASSURANCE BY

Charles S. Wisdom, Ph.D.
Bioassay Laboratory Manager

Aquatic Bioassay Services
Washington Laboratory Accreditation #C117
BEAK CONSULTANTS INCORPORATED

April 21, 1994

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5.3	Numerical and Statistical Analysis	7
5.3.1	Statistical Methods	7
5.3.2	Statistical Analysis Summary	8
6.0	Bibliography	8

1.0 ABSTRACT

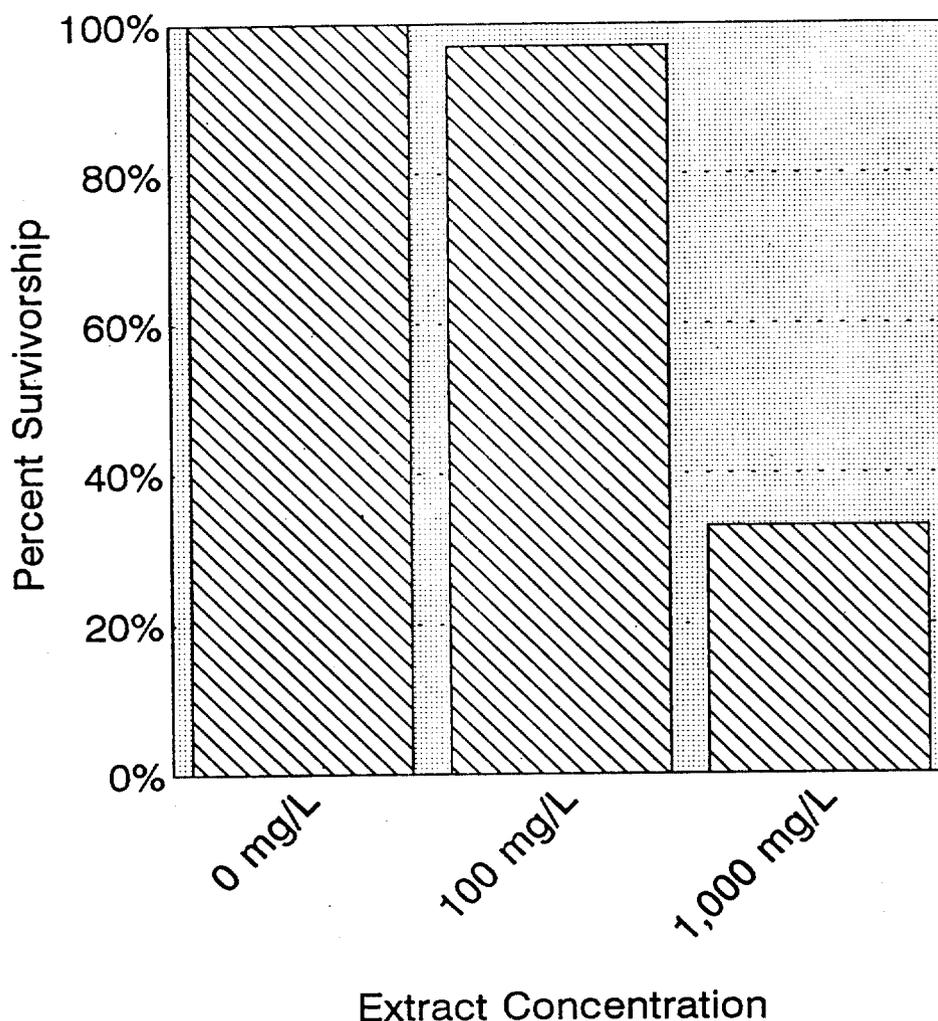
Analytical Resources Inc. Sample ID 94-5416-G890B/Boeing Sample 7503 was examined for toxicity using the static acute fish toxicity test WDOE 80-12 with rainbow trout (*Oncorhynchus mykiss*) as the test organism (Hazardous Waste Section, 1991). The sample was extracted with dilution water using a rotary agitator at the appropriate test concentrations. Fish were exposed to the extract concentrations and control dilution water for 96 hours. Survivorship in the control fish population was within the acceptable range for this test protocol - 100%. Survivorship of fish exposed to each of the two extracts of ARI Sample ID 94-5416-G890B/Boeing Sample 7503 varied, 97% at the 100ppm concentration, and 33% at the 1000 ppm concentration.

1.1 Summary

ARI Sample ID 94-5416-G890B/Boeing Sample 7503 is a dangerous material according to the WDOE 80-12 test protocol.

2.0 RANGE FINDING BAR GRAPH

ARI SAMPLE 94-5416-G890B Static Acute Fish Toxicity Test



Job No. 31300-138

Figure 1: Survivorship of fish in the control and test concentrations for ARI Sample ID 94-5416-G890B/Boeing Sample 7503.

3.0 ANALYTICAL RESOURCES INC. SAMPLE ID 94-5416-G890B/Boeing Sample 7503 INFORMATION

3.1 Report Overview

ARI Sample ID 94-5416-G890B/Boeing Sample 7503 was received for the purpose of determining the response of rainbow trout fry to the 100 ppm and 1,000 ppm extracts. The 100 ppm and 1,000 ppm levels have been established by the Hazardous Waste Section of the Washington State Department of Ecology to determine whether if a material is either an extremely hazardous or dangerous waste. Significant differences in mortality between the control and each extract concentration will determine the level of hazard assigned. This report details the conditions under which this material was tested, the nature of the sample, the test conditions, quality assurance measures and test results.

3.2 Source of Sample

ARI Sample ID 94-5416-G890B/Boeing Sample 7503 was transported by local courier to our Kirkland laboratory to initiate the test.

3.2.1 Sample Information

Category	Sample
Sample Volume	200 mL
Delivery Date & Time	15 April 10:43 HR
Storage Conditions	Room Temperature
Matrix	Liquid
Temperature	13 °C
Conductivity	1320 μ mhos
Dissolved Oxygen	9.0 ppm
Hardness	Unable to Determine
Chlorine	Unable to Determine
Ammonia	Unable to Determine
pH	8.80
Color	Yellow/Green
Odor	None

3.2.2 Dilution Water Information

Source:	Seattle Water District
Collection Date and Time:	16 April 1994 / 12:00 HR
Pretreatment:	Dechlorination with Granulated Activated Charcoal
Physical and Chemical Parameters When Received:	
Temperature:	12.0 °C pH: 7.48
Dissolved Oxygen:	10.1 ppm Hardness: 23.04 mg/L as CaCO ₃
Conductivity:	60 μmhos/cm
Comments: Water was temperature equilibrated to 12.0 °C prior to the initiation of the test.	

4.0 TOXICITY TEST

4.1 Test Parameters

Toxicity Test Methodology:	WDOE 80-12, Rainbow Trout Acute Toxicity Test
Method Modifications (if applicable):	None
Test Started:	16 April 1994 / 13:35 HR
Test Completed:	20 April 1994 / 14:30 HR
Test Concentrations:	0 mg/L, 100 mg/L and 1,000 mg/L
Test Chambers:	Plastic Buckets with disposable pail liners, Total Volume 15.1 L
Sample Volume/Chamber:	10.2 L/Test Bucket
Test Endpoint:	Mortality
Test Acceptability:	90% or greater survivorship in the control population
Feeding Regime:	Test Organisms were not fed during the test
Aeration:	None Type of Renewal: None
Sample Dechlorination:	None Photoperiod: 16:8 L:D
Organisms/Chamber:	10 Fish/Test Chamber
Replicate Chambers/Concentration:	3 Test Chambers/Concentration
Test temperature:	12.0 °C ± 0 °C
Organism Loading Rates:	.414 g/L

4.2 Test Organisms

Scientific Name: <i>Oncorhynchus mykiss</i> , Rainbow Trout		
Life Stage: Juvenile	Age: 57 Days	Lab Acclimation: 16 Days
Largest Length: 3.0 cm	Average Weight: 0.4224 g	
Source and Culture Batch: Weyerhaeuser Technical Center #OM0023		
Diseases and Treatment (where applicable): None		

4.3 Quality Assurance

4.3.1 Reference Toxicant Use

A reference toxicant test ($ZnCl_2$) was performed on March 30, 1994. A 10,000 $\mu g/L$ stock solution of zinc chloride (Fisher #Z33-100, Lot #914997A) was diluted to 2,000 $\mu g/L$ as the initial concentration. Material was then diluted 50% for each subsequent concentration to produce the test conditions. Fish of the same size and age as the current test were placed in test buckets. Mortality, pH, and dissolved oxygen were recorded over the 96 hour testing period and an LC_{50} value was calculated by the Trimmed Spearman-Kärber statistical method.

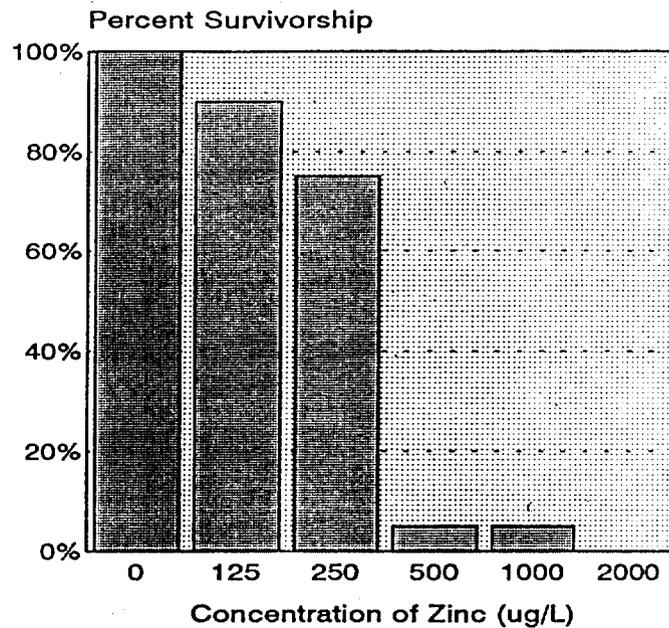
4.3.2 Reference Toxicant Test Results

Toxicant Concentration	Organism Mortality	Percent Mortality
0 $\mu g/L$	0	0%
125 $\mu g/L$	2	10%
250 $\mu g/L$	5	25%
500 $\mu g/L$	19	95%
1,000 $\mu g/L$	19	95%
2,000 $\mu g/L$	20	100%
Calculated LC_{50} Value = 304.3 $\mu g/L$ Lower 95% Confidence Interval = 253.9 $\mu g/L$ Upper 95% Confidence Interval = 364.6 $\mu g/L$		

4.3.3 Current Reference Toxicant Bar Chart

RAINBOW TROUT

Reference Toxicant Test



30 MARCH 1994

4.3.4 Physical and Chemical Methods Used

Various water quality parameters were measured during the course of the test. Temperature was determined by mercury thermometer with an accuracy of 1°C. The pH of each replicate was measured by Orion Research model 211, Digital pH meter with Orion/Ross Combination pH probe model 81-02. The pH meter was calibrated daily against external standards at the test temperature. Dissolved oxygen was determined using a YSI model 51B oxygen meter with an associated YSI model 5739 probe. The dissolved oxygen meter was air calibrated daily. Hardness was measured using the EDTA titrimetric method, #2340 C (APHA 1989). The hardness test was calibrated using a standard reference material purchased from LabChem Inc, Calcium Carbonate Standard (Lot #2181-8). Sample conductivity was measured with a YSI S-C-T Meter and Probe, Model #33. Chlorine levels were determined using a Hach Test Kit (Free and Total Chlorine Test Kit, Model CN66/66F/66T).

5.0 RESULTS

5.1 Original Data

The effluent concentration series each started with 30 fish (10 fish in each of three buckets) on Day 0. The following data represent the number of fish remaining daily in both test buckets.

Effluent Concentration	SURVIVING ORGANISMS				
	DAY 1	DAY 2	DAY 3	DAY 4	% SURVIVORS
Control, 0 mg/L	30	30	30	30	100%
100 mg/L	30	30	30	29	97%
1,000 mg/L	30	14	11	10	33%

5.2 Summary Physical and Chemical Data

Effluent Concentration	PHYSICAL AND CHEMICAL DATA					
	TEMPERATURE, °C		pH		DISSOLVED OXYGEN, ppm	
	MEAN	STD ¹	MEAN	STD	MEAN	STD
Control, 0 mg/L	12.0	0.0	7.3	0.3	10.0	0.2
100 mg/L	12.0	0.0	7.3	0.4	10.1	0.3
1,000 mg/L	12.0	0.0	7.4	0.4	10.0	0.2

¹STD = Standard deviation of the data around the mean value

5.3 Numerical and Statistical Analysis

5.3.1 Statistical Methods

The statistical methods used for this test are quite direct. If there is greater than 37% mortality in the combined 1,000 mg/L extract fish population, the test sample is deemed a dangerous waste. If there is greater than 33.3% mortality in the combined 100 mg/L extract fish population, the test sample is deemed an extremely hazardous waste.

5.3.2 Statistical Analysis Summary

Survivorship in the ARI Sample ID 94-5416-G890B/Boeing Sample 7503 control population (100%) was within the acceptable range for this test protocol. The mortalities in the 100 ppm fish population (3%) were well below the decision criterion for the extremely hazardous and dangerous waste classification. The mortality in the 1,000 ppm fish population (67%) was above the criterion for dangerous waste. Therefore, ARI Sample ID 94-5416-G890B/Boeing Sample 7503 is a dangerous waste according to the DOE hazardous material classification scheme.

6.0 BIBLIOGRAPHY

American Public Health Association. 1989. Standard methods for the examination of water and wastewater. Seventeenth Edition.

Environmental Protection Agency. 1991. Methods for measuring acute toxicity of effluents and receiving waters to freshwater marine organisms. Fourth Edition. EPA/600/4-90/027. Washington, D.C.

Hazardous Waste Section. 1991. Biological Testing Methods. Part A. Static acute fish toxicity test. Washington State Department of Ecology, WDOE 80-12.

Rohlf, F.J. and R.R. Sokal. 1969. Statistical Tables. W.H. Freeman and Co., New York, New York.

Sokal, R.R. and F.J. Rohlf. 1981. Biometry. Second Edition. W.H. Freeman and Co., New York, New York.

ENCLOSURE D

Material Safety Data Sheet

Contains No CBI

PACE NATIONAL
Pacific Chemical
500 7th Ave. So.
Kirkland, WA 98033

7100 1st Ave. S.E.
TOLSON OFFICE

Date: November 19, 1991
Emergency phone # (206) 827-8711
Chemtrec (24 hrs) # (800) 424-9300

SECTION I - PRODUCT INFORMATION

Product Name COOLUBE 21 Chemical Formula Complex mixture
Chemical Family Proprietary blend of water soluble lubricants, corrosion inhibitors and preservative.

SECTION II - HAZARD IDENTIFICATION

Summary of Hazards: This product may be irritating to eyes
Section 313 of SARA TITLE III: Ingredients subject to reporting are identified by asterisk(*)

Hazardous Ingredient(s):	Component	CAS No.	Percent	TLV
	Triethanolamine	102-71-6	<5	Not known
Carcinogenic Ingredient(s):	None			

SECTION III - PHYSICAL DATA

Appearance: Green-amber liquid
Odor: Bland
Boiling Point: >212°F
Vapor Pressure: Unknown.
Specific Gravity: 1.04

Vapor Density: Unknown
Evaporation Rate (Butyl Acetate = 1): <1
% Volatile: 70
Solubility in Water: Complete

SECTION IV - FIRE AND EXPLOSION DATA

Flash Point (closed cup): None
Extinguishing Media: Water, CO2, foam
Special Fire Fighting Procedures: None known
Unusual Fire and Explosion Hazards: None known

Flammable Limits (in air): Not known

SECTION V - REACTIVITY DATA

Incompatibility (materials to avoid): Strong oxidizers
Hazardous Decomposition Products: CO, nitrogen compounds
Hazardous Polymerization: may occur , will not occur .
Reactivity Data (stability): unstable , stable .
Conditions to avoid: Unknown

SECTION VI - PROTECTIVE EQUIPMENT & EXPOSURE CONTROL METHODS

Respiratory Protection (specify type): 985 - 29590 TREV 76 Not normally required
Ventilation: Local exhaust Normal Mechanical (general) Normal
Protective Gloves: Not normally required Eye Protection: Goggles recommended
Other Protective Equipment: None normally required.

EFFECTS OF OVEREXPOSURE (acute health effects):

Inhalation: Mist may be irritating to respiratory passages

Eye Contact: Mild irritant

Skin Contact: May be irritating to people with dermatitis

Ingestion: May cause nausea

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Provide fresh air

Eye Contact: Flush eyes with water for at least 15 minutes, get medical attention. Irritation persists.

Skin Contact: Wash with soap and water

Ingestion: Dilute with water. Induce vomiting by giving Syrup of Ipecac. Get medical attention.

Routes of Entry: Most Common: Skin Other: Eyes

Medical Conditions Generally Aggravated by Exposure: Unknown

Chronic Health Effects: Unknown

SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled: Dilute small spills with water and flush to sewer. Absorb large spills on absorbant.

Waste Disposal Method: Dispose of in approved waste disposal area in accordance with local and state regulations.

SECTION IX - TRANSPORTATION DATA

DOT Shipping Name: None

UN Number: None

DOT Hazard Class: None

SECTION X - SPECIAL PRECAUTIONS OR OTHER COMMENTS

Precautions to be taken in handling and storing: Keep container closed when not in use

Other Precautions: None

The Boeing Company
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ENCLOSURE E

Confidential No CAT

April 13, 1994

Document Processing Center (TS-790)
Attn: Section 8 (e) Coordinator
Office of Toxic Substances
U.S. Environmental Protection Agency
401 "M" Street, S. W.
Washington, D.C. 20460

BOEING

ATTENTION SECTION 8 (e) COORDINATOR

The Boeing Company submits the following documents pursuant to the TSCA Section 8 (e).

Enclosure A: Beak Consultants Inc. Testing Results

Enclosure B: MSDS for Pacific Chemical Coolube 21

The test results reported on enclosure A were received by The Boeing Company Environmental Engineering organization on March 28, 1994. The tested coolant sludge and its chemical components meeting Washington State "extremely hazardous" waste categorization is:

1. Pacific Chemical Coolube 21 Triethanolamine 102-71-6
2. fine composite particulate from milling operations
3. bacterial/fungal growth

The study is described as follows:

Waste analysis of coolant sludge consisted of a 96 hour static acute fish toxicity test. In this test, a predetermined amount of test material is immersed in water for a fixed amount of time. Fish are then exposed to the water to determine if anything that dissolved from the test material is toxic to fish.

Conclusion:

The test results show 97% mortality (29 deaths in 30 organisms) of the fish within 96 hours at a concentration of 100 mg/l. This result categorizes the test material as "extremely hazardous waste" according to Washington State standards.

Submitted by:

Karen Morris-Fine

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