PREPARED FOR: VCS Samoa Packing Company

PREPARED BY: David Wilson/CH2M HILL/SEA
Steve Costa/CH2M HILL/SFO

DATE: 30 April 1993

SUBJECT: **Chemical Analysis of Effluent February 1993 Sampling**

PROJECT: PDX30702.EL.R1

Purpose

This memorandum presents the results of the chemical analyses of VCS Samoa Packing Co. effluent samples that were collected in February 1993.

Study Objectives

Section D.2 of VCS Samoa packing Company's NPDES permit requires that semiannual priority pollutant analyses be conducted on the cannery effluent concurrently with bioassay tests. Effluent priority pollutant analyses includes those chemical constituents listed in 40 CFR 401.15. Each effluent sampling event must coincide with effluent sampling for acute biomonitoring. Effluent samples are to be collected as composite samples. The purpose of these analyses is to identify the chemicals present in the effluent, and provide data to determine whether the wastewater discharge complies with ambient water quality standards.

Methods

Between 1000 on February 16th and 1000 on February 17th, 1993, a 24-hour, flow-weighted composite sample of final effluent was collected from the VCS Samoa Packing Company treatment plant discharge. Table 1 lists the chemical analyses, method detection limits, sample holding times, sample containers, and sample preservations for these effluent samples. Effluent composite samples were collected simultaneously for chemistry and bioassay analyses.

Samples were collected from the established effluent sampling site following the routine composite sample collection schedule for the plant. A total of eight individual grab

samples were collected into pre-cleaned glass containers at three-hour intervals over a 24 hour period. The samples were stored on ice until the completion of the 24-hour sampling period, and then a flow-weighted composite sample was prepared. The grab sample collection times and the composite volumes calculated from VCS Samoa Packing flow records are summarized in Table 2. These flow records were used to prepare the final composite sample, which was used to fill the sample containers.

Samples for volatile organic analysis were collected as discrete grab samples into three 40-ml vials. Four separate sets of volatile grabs were collected and shipped. The first grab set was analyzed and the other three sample vial sets were held for confirmation if required. Table 2 indicates times of discrete grab samples for volatile organic analysis.

Sample containers were wrapped in bubble-wrap, placed in zip-lock bags, and packed on ice for shipment to the laboratory. Sample chain of custody forms were completed and then sealed into zip-lock bags and taped inside the lid of the ice chest. Samples were shipped as checked luggage on flights from Pago Pago to Honolulu and then to Seattle. Samples that were composited on February 17th, were delivered to North Creek Analytical Laboratory before 1200 on February 19th.

Results

Complete laboratory data sets, laboratory quality control data reports, and chain-of-custody forms are attached to this memorandum. The chain-of-custody form is included in Attachment 1 and analytical data sheets and quality control data reports are included as Attachment 2.

The analyses conducted detected few chemical parameters in effluent from VCS Samoa Packing Company. A total of 4 inorganics, 3 semivolatile organics, and 2 volatile organics were detected: arsenic, copper, lead, zinc, benzoic acid, phenol, 4-methylphenol, acetone, and 2-butanone. The analyses for cyanide, 2,3,7,8-TCDD/TCDF (dioxin/furan), and asbestos all showed no detections. It is recommended that effluent analyses for dioxin/furans and asbestos be eliminated in future testing.

Effluent Chemical Analyses
February 1993 Sampling
VCS Samoa Packing Co.

Table 1
Effluent Sample Analyses and Handling Procedures

Chemical Parameter	Analytical Method	Reporting Detection Limits	Sample Holding Time	Sample Container	Sample Preservation
Volatile Organics	EPA 8240/8260	2-10 ug/l	14 days	40 ml vial	4 deg. C (no head space)
Semivolatile Organics	EPA 8270	2-50 ug/l	7 days	1-liter amber glass	4 deg. C
Pesticides/PCB's	EPA 8080	0.01 - 10 ug/l	7 days	1-liter amber glass	4 deg. C
2,3,7,8-TCDD/TCDF	NCASI Method 551	1-10 ng/l	7 days	1-liter amber glass	4 deg. C
Total Cyanide	EPA 335	10 ug/l	14 days	1-liter plastic	5 ml NaOH
Asbestos	Polar Light Microscopy	N/A	None	500 ml plastic	None
Inorganics			6 months	500 ml plastic	5 ml, 2N HNO_3
Antimony	EPA 6010	100 ug/l			
Arsenic	EPA 7060	5 ug/l			
Beryllium	EPA 6010	10 ug/l			
Cadmium	EPA 6010	5 ug/l			
Chromium	EPA 6010	20 ug/l			
Copper	EPA 6010	10 ug/l			
Lead	EPA 7421	2 ug/l			
Mercury	EPA 7470 Modified	100 ug/l			
Nickel	EPA 6010	50 ug/l			
Selenium	EPA 6010	100 ug/l			
Silver	EPA 7760	20 ug/l			
Thallium	EPA 6010	100 ug/l			
Zinc	EPA 6010	40 ug/l			

Table 2
Effluent Chemistry 24-hour Composite Sample Collection at VCS Samoa Packing

Grab Sample No.	Sampling Time and Date	Effluent Flow Rate (gpm)	Percent of Total Flow	Volume Composited per 1-liter Sample (ml)
1	1200, 2/16/93	540	11.6	116
2*	1500, 2/16/93	540	11.6	116
3*	1800, 2/16/93	540	11.6	116
4	2200, 2/16/93	550	11.8	118
5	2400, 2/16/93	560	12.0	120
6	0300, 2/17/93	680	14.5	145
7*	0600, 2/17/93	640	13.6	136
8*	0900, 2/17/93	620	13.3	133

* Grab sample for volatile organic analysis also taken.

ATTACHMENT I

CHAIN OF CUSTODY FORMS

VCS SAMOA PACKING EFFLUENT SAMPLE
February 16-17, 1993

SOLEIL ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project #

Purchase Order #

Project Name: VCS - Samon Packing Co. NPDES

Company Name/CH2M HILL Office: CH2M-Hill-SEA

Project Manager & Phone #: Mr. [ ] Ms. [ ] Dr. [ ] David Wilson

Report Copy to:

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [X] RCRA [ ] OTHER ____

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

ANALYSES REQUESTED

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

'93 Sampling Date	Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	VOC's *	Sem. Vol	Pest/PCB's	Dioxin	Total Cyanide	Asbestos	Metals	REMARKS	LAB 1 ID	LAB 2 ID
2/16	1410		X	X		VCS-01		3							3020661 Vol vous w HCl		
2/16	1700		X	X		VCS-02		3							Hold **		
2/17	0535		X	X		VCS-03		3							Hold ***		
2/17	0900		X	X		VCS-04		3							Hold ***		
2/17	12:00	X				VCS		1	X						1l Amber Glass		
↓	↓	X		X		VCS		1		X					↓		
		X		X		VCS		1			X						
		X		X		VCS		1				X			1l Poly w NaOH		
		X		X		VCS		1					X		1l Poly		
		X		X		VCS		1						X	1l Poly w HNO_3		

Sampled By & Title (Please sign and print name): [signature] Date/Time: 2/19/93 1400

Relinquished By (Please sign and print name): [signature] Date/Time: 2

Received By (Please sign and print name): Date/Time:

Relinquished By (Please sign and print name): [signature] Date/Time: 2-19-93

Received By (Please sign and print name): B. Neely BETH NEELY Date/Time: 11:55 02-19-93

Relinquished By (Please sign and print name): Date/Time:

Received By (Please sign and print name): Date/Time:

Shipped Via: UPS BUS Fed-Ex Hand Other Air Carg.

Shipping #

Work Authorized By (Please sign and print name):

Remarks: Vocs outgassing during collection ~~some~~ gas bubbles unavoidable. Other samples are 24 hrs composites started 2/16/93

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other: ____

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

REV 11/92 FORM 340

ATTACHMENT II

LABORATORY DATA REPORT
North Creek Analytical Laboratory
Enseco-CAL, and Med-Tox Northwest

VCS SAMOA PACKING EFFLUENT SAMPLE
February 16-17, 1993

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.	Sampled:	Feb 17, 1993
777 108th Avenue NE	Sample Descript:	Water, VCS	Received:	Feb 19, 1993
Bellevue, WA 98009	Analysis Method:	EPA 8240/8260	Analyzed:	Mar 1, 1993
Attention: David Wilson	Sample Number:	302-0661	Reported:	Mar 5, 1993

VOLATILE ORGANICS by GC/MS (EPA 8240/8260)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	10	45
Benzene	2.0	N.D.
Bromodichloromethane	2.0	N.D.
Bromoform	2.0	N.D.
Bromomethane	2.0	N.D.
2-Butanone	10	11
Carbon disulfide	2.0	N.D.
Carbon tetrachloride	2.0	N.D.
Chlorobenzene	2.0	N.D.
Chloroethane	2.0	N.D.
2-Chloroethyl vinyl ether	10	N.D.
Chloroform	2.0	N.D.
Chloromethane	2.0	N.D.
Dibromochloromethane	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
1,1-Dichloroethene	2.0	N.D.
cis 1,2-Dichloroethene	2.0	N.D.
rans 1,2-Dichloroethene	2.0	N.D.
1,2-Dichloropropane	2.0	N.D.
cis 1,3-Dichloropropene	2.0	N.D.
rans 1,3-Dichloropropene	2.0	N.D.
Ethylbenzene	2.0	N.D.
2-Hexanone	10	N.D.
Methylene chloride	10	N.D.
4-Methyl-2-pentanone	10	N.D.
Styrene	2.0	N.D.
,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	2.0	N.D.
Toluene	2.0	N.D.
,1,1-Trichloroethane	2.0	N.D.
,1,2-Trichloroethane	2.0	N.D.
Trichloroethene	2.0	N.D.
Trichlorofluoromethane	2.0	N.D.
Vinyl chloride	2.0	N.D.
Total Xylenes	2.0	N.D.

nalytes reported as N.D. were not detected above the stated Reporting Limit.

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Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	106	76-114
Toluene-d8	102	88-110
4-Bromofluorobenzene	91	86-115

teven G. Mayer
roject Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.		
777 108th Avenue NE	Sample Descript:	Method Blank		
Bellevue, WA 98009	Analysis Method:	EPA 8240/8260	Analyzed:	Mar 1, 1993
Attention: David Wilson	Sample Number:	BLK030193	Reported:	Mar 5, 1993

VOLATILE ORGANICS by GC/MS (EPA 8240/8260)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	10	N.D.
Benzene	2.0	N.D.
Bromodichloromethane	2.0	N.D.
Bromoform	2.0	N.D.
Bromomethane	2.0	N.D.
2-Butanone	10	N.D.
Carbon disulfide	2.0	N.D.
Carbon tetrachloride	2.0	N.D.
Chlorobenzene	2.0	N.D.
Chloroethane	2.0	N.D.
2-Chloroethyl vinyl ether	10	N.D.
Chloroform	2.0	N.D.
Chloromethane	2.0	N.D.
Dibromochloromethane	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
1,1-Dichloroethene	2.0	N.D.
cis 1,2-Dichloroethene	2.0	N.D.
trans 1,2-Dichloroethene	2.0	N.D.
1,2-Dichloropropane	2.0	N.D.
cis 1,3-Dichloropropene	2.0	N.D.
trans 1,3-Dichloropropene	2.0	N.D.
Ethylbenzene	2.0	N.D.
2-Hexanone	10	N.D.
Methylene chloride	10	N.D.
4-Methyl-2-pentanone	10	N.D.
Styrene	2.0	N.D.
1,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	2.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	2.0	N.D.
1,1,2-Trichloroethane	2.0	N.D.
Trichloroethene	2.0	N.D.
Trichlorofluoromethane	2.0	N.D.
Vinyl chloride	2.0	N.D.
Total Xylenes	2.0	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

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Steven G. Mayer
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	100	76-114
Toluene-d8	98	88-110
4-Bromofluorobenzene	92	86-115

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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.	Sampled:	Feb 17, 1993
777 108th Avenue NE	Sample Descript:	Water, VCS	Received:	Feb 19, 1993
Bellevue, WA 98009	Analysis Method:	EPA 8270	Extracted:	Feb 23, 1993
Attention: David Wilson	Sample Number:	302-0661	Analyzed:	Feb 26, 1993
			Reported:	Mar 5, 1993

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acenaphthene	20	N.D.
Acenaphthylene	20	N.D.
Aniline	20	N.D.
Anthracene	20	N.D.
Benzidine	500	N.D.
Benzoic Acid	100	120
Benz[a]anthracene	20	N.D.
Benzo[b]fluoranthene	20	N.D.
Benzo[k]fluoranthene	20	N.D.
Benzo[g,h,i]perylene	20	N.D.
Benzo[a]pyrene	20	N.D.
Benzyl alcohol	20	N.D.
Bis(2-chloroethoxy)methane	20	N.D.
Bis(2-chloroethyl)ether	20	N.D.
Bis(2-chloroisopropyl)ether	20	N.D.
Bis(2-ethylhexyl)phthalate	100	N.D.
4-Bromophenyl phenyl ether	20	N.D.
Butyl benzyl phthalate	20	N.D.
Carbazole	20	N.D.
4-Chloroaniline	20	N.D.
2-Chloronaphthalene	20	N.D.
4-Chloro-3-methylphenol	20	N.D.
2-Chlorophenol	20	N.D.
4-Chlorophenyl phenyl ether	20	N.D.
Chrysene	20	N.D.
Dibenz[a,h]anthracene	20	N.D.
Dibenzofuran	20	N.D.
Di-n-butyl phthalate	100	N.D.
1,3-Dichlorobenzene	20	N.D.
1,4-Dichlorobenzene	20	N.D.
1,2-Dichlorobenzene	20	N.D.
3,3-Dichlorobenzidine	100	N.D.
2,4-Dichlorophenol	20	N.D.
Diethyl phthalate	20	N.D.
2,4-Dimethylphenol	20	N.D.
Dimethyl phthalate	20	N.D.
4,6-Dinitro-2-methylphenol	100	N.D.
2,4-Dinitrophenol	100	N.D.

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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.	Sampled:	Feb 17, 1993
777 108th Avenue NE	Sample Descript:	Water, VCS	Received:	Feb 19, 1993
Bellevue, WA 98009	Analysis Method:	EPA 8270	Extracted:	Feb 23, 1993
Attention: David Wilson	Sample Number:	302-0661	Analyzed:	Feb 26, 1993
			Reported:	Mar 5, 1993

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
2,4-Dinitrotoluene	20	N.D.
2,6-Dinitrotoluene	20	N.D.
Di-n-octyl phthalate	20	N.D.
Fluoranthene	20	N.D.
Fluorene	20	N.D.
Hexachlorobenzene	20	N.D.
Hexachlorobutadiene	20	N.D.
Hexachlorocyclopentadiene	20	N.D.
Hexachloroethane	20	N.D.
Indeno[1,2,3-cd]pyrene	20	N.D.
Isophorone	20	N.D.
2-Methylnaphthalene	20	N.D.
2-Methylphenol	20	N.D.
4-Methylphenol	20	670
Naphthalene	20	N.D.
2-Nitroaniline	100	N.D.
3-Nitroaniline	100	N.D.
4-Nitroaniline	100	N.D.
Nitrobenzene	20	N.D.
2-Nitrophenol	20	N.D.
4-Nitrophenol	100	N.D.
N-Nitrosodiphenylamine	20	N.D.
N-Nitrosodi-n-propylamine	20	N.D.
Pentachlorophenol	100	N.D.
Phenanthrene	20	N.D.
Phenol	20	110
Pyrene	20	N.D.
1,2,4-Trichlorobenzene	20	N.D.
2,4,5-Trichlorophenol	100	N.D.
2,4,6-Trichlorophenol	20	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	50	21-100	Nitrobenzene-d5	58	35-114
Phenol-d6	70	10-94	2-Fluorobiphenyl	67	43-116
4,6-Tribromophenol	66	10-123	p-Terphenyl-d14	74	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

NORTH CREEK ANALYTICAL inc

Steven G. Mayer
Project Manager

3020661.CHM <3>

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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.		
777 108th Avenue NE	Sample Descript:	Method Blank		
Bellevue, WA 98009	Analysis Method:	EPA 8270	Extracted:	Feb 18, 1993
Attention: David Wilson	Sample Number:	BLK021893	Analyzed:	Feb 23, 1993
			Reported:	Mar 5, 1993

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acenaphthene	2.0	N.D.
Acenaphthylene	2.0	N.D.
Aniline	2.0	N.D.
Anthracene	2.0	N.D.
Benzidine	50	N.D.
Benzoic Acid	10	N.D.
Benz[a]anthracene	2.0	N.D.
Benzo[b]fluoranthene	2.0	N.D.
Benzo[k]fluoranthene	2.0	N.D.
Benzo[g,h,i]perylene	2.0	N.D.
Benzo[a]pyrene	2.0	N.D.
Benzyl alcohol	2.0	N.D.
Bis(2-chloroethoxy)methane	2.0	N.D.
Bis(2-chloroethyl)ether	2.0	N.D.
Bis(2-chloroisopropyl)ether	2.0	N.D.
Bis(2-ethylhexyl)phthalate	10	N.D.
4-Bromophenyl phenyl ether	2.0	N.D.
Butyl benzyl phthalate	2.0	N.D.
Carbazole	2.0	N.D.
4-Chloroaniline	2.0	N.D.
2-Chloronaphthalene	2.0	N.D.
4-Chloro-3-methylphenol	2.0	N.D.
2-Chlorophenol	2.0	N.D.
4-Chlorophenyl phenyl ether	2.0	N.D.
Chrysene	2.0	N.D.
Dibenz[a,h]anthracene	2.0	N.D.
Dibenzofuran	2.0	N.D.
Di-n-butyl phthalate	10	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
3,3-Dichlorobenzidine	10	N.D.
2,4-Dichlorophenol	2.0	N.D.
Diethyl phthalate	2.0	N.D.
2,4-Dimethylphenol	2.0	N.D.
Dimethyl phthalate	2.0	N.D.
4,6-Dinitro-2-methylphenol	10	N.D.
2,4-Dinitrophenol	10	N.D.

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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.		
777 108th Avenue NE	Sample Descript:	Method Blank		
Bellevue, WA 98009	Analysis Method:	EPA 8270	Extracted:	Feb 18, 1993
Attention: David Wilson	Sample Number:	BLK021893	Analyzed:	Feb 23, 1993
			Reported:	Mar 5, 1993

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
2,4-Dinitrotoluene	2.0	N.D.
2,6-Dinitrotoluene	2.0	N.D.
Di-n-octyl phthalate	2.0	N.D.
Fluoranthene	2.0	N.D.
Fluorene	2.0	N.D.
Hexachlorobenzene	2.0	N.D.
Hexachlorobutadiene	2.0	N.D.
Hexachlorocyclopentadiene	2.0	N.D.
Hexachloroethane	2.0	N.D.
Indeno[1,2,3-cd]pyrene	2.0	N.D.
Isophorone	2.0	N.D.
2-Methylnaphthalene	2.0	N.D.
2-Methylphenol	2.0	N.D.
4-Methylphenol	2.0	N.D.
Naphthalene	2.0	N.D.
2-Nitroaniline	10	N.D.
3-Nitroaniline	10	N.D.
4-Nitroaniline	10	N.D.
Nitrobenzene	2.0	N.D.
2-Nitrophenol	2.0	N.D.
4-Nitrophenol	10	N.D.
N-Nitrosodiphenylamine	2.0	N.D.
N-Nitrosodi-n-propylamine	2.0	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	2.0	N.D.
Phenol	2.0	N.D.
Pyrene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
2,4,5-Trichlorophenol	10	N.D.
2,4,6-Trichlorophenol	2.0	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	77	21-100	Nitrobenzene-d5	68	35-114
Phenol-d6	88	10-94	2-Fluorobiphenyl	58	43-116
2,4,6-Tribromophenol	87	10-123	p-Terphenyl-d14	87	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL inc

Steven G. Mayer
Project Manager

3020661.CHM <5>

NORTH CREEK ANALYTICAL

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CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.	Sampled:	Feb 17, 1993
777 108th Avenue NE	Sample Descript:	Water, VCS	Received:	Feb 19, 1993
Bellevue, WA 98009	Analysis Method:	EPA 8080	Extracted:	Feb 22, 1993
Attention: David Wilson	Sample Number:	302-0661	Analyzed:	Feb 28, 1993
			Reported:	Mar 5, 1993

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Aldrin	0.10	N.D.
alpha-BHC	0.050	N.D.
beta-BHC	0.050	N.D.
delta-BHC	0.050	N.D.
gamma-BHC (Lindane)	0.40	N.D.
Chlordane	0.15	N.D.
4,4'-DDD	0.10	N.D.
4,4'-DDE	0.050	N.D.
4,4'-DDT	0.10	N.D.
Dieldrin	0.10	N.D.
Endosulfan I	0.15	N.D.
Endosulfan II	0.10	N.D.
Endosulfan sulfate	0.75	N.D.
Endrin	0.010	N.D.
Endrin aldehyde	0.25	N.D.
Heptachlor	0.10	N.D.
Heptachlor expoxide	0.10	N.D.
Methoxychlor	10	N.D.
Toxaphene	0.50	N.D.
PCB-1016	0.10	N.D.
PCB-1221	0.10	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Tetrachloro-m-xylene Surrogate Recovery, %: 56
Surrogate Recovery Control Limits are 16 - 104 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL inc

Steven G. Mayer
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.	Sampled:	Feb 17, 1993
777 108th Avenue NE	Sample Descript:	VCS	Received:	Feb 19, 1993
Bellevue, WA 98009	Matrix:	Water	Digested:	Feb 24, 1993
Attention: David Wilson	Sample Number:	302-0661	Analyzed:	Feb 24-26, 1993
			Reported:	Mar 5, 1993

METALS ANALYSIS

Analyte	EPA Method	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	6010	100	N.D.
Arsenic	7060	5.0	9.8
Beryllium	6010	10	N.D.
Cadmium	6010	5.0	N.D.
Chromium	6010	20	N.D.
Copper	6010	10	21
Lead	7421	2.0	4.3
Mercury	7470 Mod.	1.0	N.D.
Nickel	6010	50	N.D.
Selenium	6010	100	N.D.
Silver	7760	20	N.D.
Thallium	6010	100	N.D.
Zinc	6010	40	380

nalytes reported as N.D. were not detected above the stated Reporting Limit.

ORTH CREEK ANALYTICAL inc

teven G. Mayer
roject Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID:	NPDES, VCS Samoa Packing Co.		
777 108th Avenue NE	Sample Descript:	Method Blank		
Bellevue, WA 98009	Matrix:	Water	Digested:	Feb 24, 1993
Attention: David Wilson	Sample Number:	BLK022493	Analyzed:	Feb 24-26, 1993
			Reported:	Mar 5, 1993

METALS ANALYSIS

Analyte	EPA Method	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	6010	100	N.D.
Arsenic	7060	5.0	N.D.
Beryllium	6010	10	N.D.
Cadmium	6010	5.0	N.D.
Chromium	6010	20	N.D.
Copper	6010	10	N.D.
Lead	7421	2.0	N.D.
Mercury	7470 Mod.	1.0	N.D.
Nickel	6010	50	N.D.
Selenium	6010	100	N.D.
Silver	7760	20	N.D.
Thallium	6010	100	N.D.
Zinc	6010	40	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL inc

Steven G. Mayer
Project Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID: NPDES, VCS Samoa Packing Co.	Analyst :	G. Emory
777 108th Avenue NE	Method : EPA 8270		
Bellevue, WA 98009	Sample Matrix : Water	Extracted:	Feb 23, 1993
Attention: David Wilson	Units : µg/L (ppb)	Analyzed:	Feb 26, 1993
	QC Sample #: BLK022393	Reported:	Mar 5, 1993

BLANK SPIKE QUALITY CONTROL DATA REPORT

Analyte	Sample Result	Spike Conc. Added	Spike Result	Spike % Recovery	Spike Dup. Result	Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	200	160	80% (12 -110%)	160	80% (12 -110%)	0.0% (42%)
2-Chlorophenol	N.D.	200	140	70% (27 -123%)	140	70% (27 -123%)	0.0% (40%)
1,4-Dichloro-benzene	N.D.	100	54	54% (36 -97%)	59	59% (36 -97%)	8.8% (40%)
N-Nitroso-Di-N-propylamine	N.D.	100	90	90% (41 -116%)	92	92% (41 -116%)	2.2% (38%)
1,2,4-Trichloro-benzene	N.D.	100	61	61% (39 -98%)	64	64% (39 -98%)	4.8% (28%)
4-Chloro-3-Methylphenol	N.D.	200	130	65% (23 -97%)	130	65% (23 -97%)	0.0% (42%)
Acenaphthene	N.D.	100	65	65% (46 -118%)	64	64% (46 -118%)	1.6% (31%)
4-Nitrophenol	N.D.	200	180	90%, Q-1 (10 -80%)	170	85%, Q-1 (10 -80%)	5.7% (50%)
2,4-Dinitro-toluene	N.D.	100	84	84% (24 -96%)	83	83% (24 -96%)	1.2% (38%)
Pentachloro-phenol	N.D.	200	160	80% (9 -103%)	160	80% (9 -103%)	0.0% (50%)
Pyrene	N.D.	100	86	86% (26 -127%)	84	84% (26 -127%)	2.4% (31%)

Control Limits in Parentheses

NORTH CREEK ANALYTICAL inc

Please Note:
Q-1 = The Spike Recovery for this QC sample is outside of the NCA established control limits.

Steven G. Mayer
Project Manager

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Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID: NPDES, VCS Samoa Packing Co.	Analyst:	J. Cooper
777 108th Avenue NE	Method: EPA 8080		
Bellevue, WA 98009	Sample Matrix : Water	Extracted:	Feb 22, 1993
Attention: David Wilson	Units: µg/L (ppb)	Analyzed:	Feb 28, 1993
	QC Sample #: 302-0660	Reported:	Mar 5, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Lindane	Heptachlor	Aldrin
Sample Result:	N.D.	N.D.	N.D.
Spike Conc. Added:	0.66	0.66	0.66
Spike Result:	0.54	0.46	0.48
Spike % Recovery:	82%	70%	73%
Spike Dup. Result:	0.53	0.50	0.47
Spike Duplicate % Recovery:	80%	76%	71%
Upper Control Limit %:	128	163	121
Lower Control Limit %:	37	60	60
Relative % Difference:	1.9%	8.7%	2.1%
Maximum RPD:	50	50	50

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Steven G. Mayer
Project Manager

% Recovery:	$\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}}$	x 100

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Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill
777 108th Avenue NE
Bellevue, WA 98009
Attention: David Wilson

Client Project ID: NPDES, VCS Samoa Packing Co.
Sample Matrix : Water
Units: mg/L (ppm)

Analyst: R. Davies

Reported: Mar 5, 1993

INORGANIC QUALITY CONTROL DATA REPORT

ANALYTE	CN
EPA Method:	9010
Date Analyzed:	Feb 22, 1993

ACCURACY ASSESSMENT

LCS Spike Conc. Added:	0.40
LCS Spike Result:	0.41
LCS Spike % Recovery:	103
Upper Control Limit:	125
Lower Control Limit:	75

PRECISION ASSESSMENT

Sample #:	302-0660
Original:	N.D.
Duplicate:	N.D.
Relative % Difference:	RPD values are not reported at sample concentration levels <5 X the Reporting Limit.
Maximum RPD:	25

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Lab Control Sample % Recovery: $\frac{\text{Conc. of L.C.S.}}{\text{L.C.S. Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

Steven G. Mayer
Project Manager

3020661.CHM <14>

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18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill
777 108th Avenue NE
Bellevue, WA 98009
Attention: David Wilson

Client Project ID: NPDES, VCS Samoa Packing Co.
Sample Matrix : Water
Units: µg/L (ppb)

Analyst: B. Oaks

Digested: Feb 24, 1993
Reported: Mar 5, 1993

METALS QUALITY CONTROL DATA REPORT

ANALYTE	As	Pb
EPA Method:	7060	7421
Date Analyzed:	Feb 24, 1993	Feb 24, 1993
ACCURACY ASSESSMENT		
LCS Spike Conc. Added:	50	25
LCS Spike Result:	49	26
LCS Spike % Recovery:	98	104
Upper Control Limit:	121	114
Lower Control Limit:	80	82
Matrix Spike Sample #:	302-0647	302-0647
Matrix Spike % Recovery:	104	102
PRECISION ASSESSMENT		
Sample #:	302-0647	302-0647
Original:	12	3.4
Duplicate:	12	3.2
Relative % Difference:	RPD values are not reported at sample concentration levels <10 X the Reporting Limit.	

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Steven G. Mayer
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 · Bothell, WA 98011-2569
Phone (206) 481-9200 · FAX (206) 485-2992

CH2M Hill 777 108th Avenue NE Bellevue, WA 98009 Attention: David Wilson	Client Project ID: NPDES, VCS Samoa Packing Co. Sample Matrix : Water Units: µg/L (ppm)	Analyst: B. Oaks Digested: Feb 24, 1993

METALS QUALITY CONTROL DATA REPORT

ANALYTE	Sb	Be	Cd	Cr	Cu	Hg	Ni
EPA Method:	6010	6010	6010	6010	6010	6010	6010
Date Analyzed:	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993
ACCURACY ASSESSMENT							
LCS Spike Conc. Added:	1,000	1,000	1,000	1,000	1,000	5.0	1,000
LCS Spike Result:	940	970	910	930	940	4.7	940
LCS Spike % Recovery:	94	97	91	93	94	94	94
Upper Control Limit:	104	117	104	120	112	123	130
Lower Control Limit:	82	77	69	65	74	82	57
Matrix Spike Sample #:	302-0703	302-0703	302-0703	302-0703	302-0703	302-0661	302-0703
Matrix Spike % Recovery:	92	97	90	92	98	86	93
PRECISION ASSESSMENT							
Sample #:	302-0703	302-0703	302-0703	302-0703	302-0703	302-0660	302-0703
Original:	N.D.	N.D.	N.D.	N.D.	35	N.D.	N.D.
Duplicate:	N.D.	N.D.	N.D.	N.D.	38	N.D.	N.D.
Relative % Difference:	Relative Percent Difference values are not reported at sample concentration levels < 10 X the Reporting Limit.						

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Steven G. Mayer
Project Manager

3020661.CHM <16>

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

CH2M Hill	Client Project ID: NPDES, VCS Samoa Packing Co.	Analyst: B. Oaks
777 108th Avenue NE	Sample Matrix : Water	
Bellevue, WA 98009	Units: µg/L (ppm)	
Attention: David Wilson		Digested: Feb 24, 1993

METALS QUALITY CONTROL DATA REPORT

ANALYTE	Se	Ag	Tl	Zn
EPA Method:	6010	6010	7760	7470
Date Analyzed:	Feb 24, 1993	Feb 24, 1993	Feb 25, 1993	Feb 25, 1993
ACCURACY ASSESSMENT				
LCS Spike Conc. Added:	1,000	1,000	1,000	1,000
LCS Spike Result:	800	1,100	890	910
LCS Spike % Recovery:	80	110	89	91
Upper Control Limit:	104	117	112	119
Lower Control Limit:	65	87	54	71
Matrix Spike Sample #:	302-0713	302-0713	302-0713	302-0713
Matrix Spike % Recovery:	79	110	92	91
PRECISION ASSESSMENT				
Sample #:	302-0703	302-0713	302-0713	302-0661
Original:	N.D.	N.D.	N.D.	N.D.
Duplicate:	N.D.	N.D.	N.D.	N.D.
Relative % Difference:	Relative Percent Difference values are not reported at sample concentration levels <10 X the Reporting Limit.			

NORTH CREEK ANALYTICAL inc

Steven G. Mayer
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 · Bothell, WA 98011-2569
Phone (206) 481-9200 · FAX (206) 485-2992

CH2M Hill	Client Project ID: NPDES, VCS Samoa Packing Co.	Analyst:	J. Kimball
777 108th Avenue NE	Method: EPA 8240		
Bellevue, WA 98009	Sample Matrix : Water		
Attention: David Wilson	Units: µg/L (ppb)	Analyzed:	Mar 1, 1993
	QC Sample #: 302-0515	Reported:	Mar 5, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	1,1-DCE	Benzene	TCE	Toluene	Chloro-benzene
Sample Result:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10	10
Spike Result:	11	9.7	10	11	9.8
Spike % Recovery:	110%, Q-1	97%	100%	110%	98%
Spike Dup. Result:	9.7	9.6	9.8	10	9.9
Spike Duplicate % Recovery:	97%	96%	98%	100%	99%
Upper Control Limit %:	107	118	106	122	111
Lower Control Limit %:	69	83	81	66	86
Relative % Difference:	12%	1.0%	2.0%	9.5%	1.0%
Maximum RPD:	17	9.0	13	10	7.0

ORTH CREEK ANALYTICAL inc

Please Note:
Q-1 = The Spike Recovery for this QC sample is outside of the NCA established control limits.

:even G. Mayer
:oject Manager

MED-TOX NORTHWEST

LABORATORY REPORT

North Creek Analytical
18939 - 120th Avenue NE, #101
Bothell, Washington 98011-2569

Samples Received: 2/22/93
Samples Analyzed: 2/24/93
Date Reported: 2/24/93
MED-TOX Job No: 1L-2836(1)

Attn: Matt Essig

ANALYSIS: ASBESTOS IN BULK SAMPLES

METHOD: PLM (POLARIZED LIGHT MICROSCOPY/DISPERSION STAINING)
EPA 600/M4-82-020

Sample I.D. Client Lab No.	Asbestos Percent	Brief Physical Description
3020661	ND(1)	Homogeneous beige fine-grained material: 10% cellulose, fine particles, binder.

Carol Olver
Carol Olver
Laboratory Analyst

2/26/93
Date

Carol Olver
Carol Olver
Laboratory Manager
NVLAP Signatory

NIST NVLAP Participant Number 2021
* PLEASE SEE ESSENTIAL NOTES ON FOLLOWING PAGE
Samples are archived for two months following analysis. Samples that are not retrieved by the client after two months are discarded.

LAB 1L-2836.L01 2/25/93

19032 66th Avenue South, Suite C105, Kent, WA 98032, (206) 656-2920, (fax) 656-2924

NOTES:

- "ND(1)" means no asbestos detected; method limit of quantification is 1%.
- "Trace" means less than 1% asbestos material was identified in the sample; the EPA considers materials that contain less than 1% asbestos not to be a hazard.
- "SS(2)" means small sample size; may not be representative of sampled material.
- Each sample was examined for all asbestos minerals (i.e., chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite); but only those asbestos minerals detected are listed.
- Soils, vinyl floor tiles, and slurry-based materials (e.g., spray-on and troweled-on materials) can be inhomogeneous due to the nature of their preparation. Quality control checks are performed on 10% of the sample load to help ensure the accuracy of data.
- Tile, mastic, vinyl, foam, plastic, and fine powder samples may contain asbestos fibers which are too small to be detected by PLM. For such samples more sensitive analytical methods (e.g., XRD, TEM, SEM) are recommended if greater certainty of the presence and quantity of asbestos minerals.
- The coefficient of variance for PLM asbestos samples typically ranges from 0.10 to 0.50.
- Samples are archived 60 days following analysis and then properly disposed of as hazardous waste.
- This report verifies, with respect to asbestos content, only the samples analyzed.
- This test report is not valid unless it bears the name of a NVLAP approved signatory.
- Any reproduction of this document must include the entire document in order to be valid.
- Neither the NVLAP accreditation of this laboratory nor this report can be used to claim product endorsement by NVLAP or any agency of the U.S. Government.
- The laboratory is not accountable for the completeness with which a sample represents the actual material for samples not collected by Med-Tox Northwest personnel.
- For samples containing >0 but <10% asbestos, point counting by the PLM method is recommended by the EPA (NESHAPS, 40 CFR Part 61).

California Analytical
Laboratory

Enseco
A Corning Company

March 8, 1993
Lab ID: 068319

Beth Neely
North Creek Analytical, Inc.
18939 120th Ave. NE, Suite 101
Bothell, WA 98011-2569

Dear Ms. Neely:

Enclosed is the report for the 2,3,7,8-TCDD/TCDF analysis of your two aqueous samples which were received at Enseco Cal Lab on 23 February 1993 under chain-of-custody.

Detection limits are reported on a sample specific basis and all results are recovery corrected per the isotope dilution technique for dioxin/furan analyses. The method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

For pulp and paper industry samples, test methods for chlorinated dioxin/furan analyses will follow NCASI Technical Bulletin 551 unless otherwise noted. Pulp and sludge samples are air dried and prepared per this method. All results for these analyses, including detection limits, are reported on a dry weight basis.

All other solid and waste samples are reported on an "as received" basis, i.e., no correction is made for moisture content, unless the method requires or the client requests that such correction be made.

Results are on the attached data sheets.

If you have any questions, please feel free to call.

Sincerely,

Mark Bechthold
Scientist
Advanced Technology Group

Kathleen A. Gill
Program Administrator

jk

Enseco - CAL
2544 Industrial Blvd.
West Sacramento, CA 95691-3435
(916) 372-1393
FAX: (916) 372-7768

SAMPLE DESCRIPTION INFORMATION
for
North Creek Analytical, Inc.

b ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
3319-0001-SA	3020660	AQUEOUS	17 FEB 93	12:00	23 FEB 93
3319-0001-MS	3020660	AQUEOUS	17 FEB 93	12:00	23 FEB 93
3319-0001-SD	3020660	AQUEOUS	17 FEB 93	12:00	23 FEB 93
3319-0001-MB	Method Blank	AQUEOUS			23 FEB 93
3319-0002-SA	3020661	AQUEOUS	17 FEB 93	12:00	23 FEB 93

Enseco
A Corning Company

HIGH RESOLUTION

ient Name: North Creek Analytical, Inc.
ient ID: 3020661
b ID: 068319-0002-SA
trix: AQUEOUS Sampled: 17 FEB 93 Received: 23 FEB 93
thorized: 24 FEB 93 Prepared: 28 FEB 93

nple Amount 0.501 L

·ameter	Result	Units	Detection Limit	Data Qualifiers
·ans				
umn Type: DB-225				
ılyzed: 05 MAR 93				
,7,8-TCDF	ND	pg/L	4.8	
xins				
umn Type: DB-225				
lyzed: 05 MAR 93				
,7,8-TCDD	ND	pg/L	6.7	
	% Recovery			
-2,3,7,8-TCDF	57			
-2,3,7,8-TCDD	56			

Not detected
Not applicable

·ted By: Saleh Arghestani Approved By: Jill Kellmann

The cover letter is an integral part of this report.
Rev 230787

Enseco
A Corning Company

HIGH RESOLUTION

ient Name: North Creek Analytical, Inc.
ient ID: Method Blank
b ID: 068319-0001-MB
trix: AQUEOUS Sampled: NA Received: NA
thorized: 24 FEB 93 Prepared: 28 FEB 93

mple Amount 1.000 L

·ameter	Result	Units	Detection Limit	Data Qualifiers
·ans				
umn Type: DB-225				
ılyzed: 05 MAR 93				
;,7,8-TCDF	ND	pg/L	1.5	
·xins				
umn Type: DB-225				
lyzed: 05 MAR 93				
,7,8-TCDD	ND	pg/L	3.7	
	% Recovery			
-2,3,7,8-TCDF	39			
-2,3,7,8-TCDD	38			

Not detected
Not applicable

rted By: Saleh Arghestani Approved By: Jill Kellmann

The cover letter is an integral part of this report.
Rev 230787

Enseco
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2,3,7,8-TCDD/TCDF

QUALITY CONTROL SUMMARY

Client Name: North Creek analytical, Inc.
Client ID: 3020660 Matrix Spike
Lab ID: 068319-0001-MS
Matrix: AQUEOUS Sampled: 17 FEB 93 Received: 23 FEB 93
Authorized: 23 FEB 93 Prepared: 28 FEB 93 Analyzed: 05 MAR 93

Sample Amount: 0.500 L
Column Type: DB-225

Parameters	pg/uL Found in Sample	pg/uL Spiked	pg/uL Found in MS Sample	% Recovery
Furans				
2,3,7,8-TCDF	ND	25	30.0	120
Dioxins				
2,3,7,8-TCDD	ND	10	10.8	108

	% Recovery
13C-2,3,7,8-TCDF	60
13C-2,3,7,8-TCDD	62

ND=Not Detected
NA=Not Applicable

Reported by: Saleh Arghestani Approved by: Jill Kellmann

The cover letter is an integral part of this report.
Version 070187

Enseco
A Corning Company

2,3,7,8-TCDD/TCDF

QUALITY CONTROL SUMMARY

Client Name: North Creek analytical, Inc.
Client ID: 3020660 Matrix Spike Duplicate
Lab ID: 068319-0001-SD
Matrix: AQUEOUS Sampled: 17 FEB 93 Received: 23 FEB 93
Authorized: 23 FEB 93 Prepared: 28 FEB 93 Analyzed: 05 MAR 93

Sample Amount: 0.502 L
Column Type: DB-225

Parameters	pg/uL Found in Sample	pg/uL Spiked	pg/uL Found in MS Sample	% Recovery
Furans				
2,3,7,8-TCDF	ND	25	30.0	120
Dioxins				
2,3,7,8-TCDD	ND	10	11.0	110

	% Recovery
13C-2,3,7,8-TCDF	53
13C-2,3,7,8-TCDD	53

ND=Not Detected
NA=Not Applicable

Reported by: Saleh Arghestani Approved by: Jill Kellmann

The cover letter is an integral part of this report.
Version 070187