



February 26, 2001

Service Request No: K2101038

John Strand  
Columbia Biological Assessments  
1314 Cedar  
Richland, WA 99352



**Re: Water/Sediment Quality Monitoring/00-101G**

Dear John:

Enclosed are the results of the sample(s) submitted to our laboratory on February 12, 2001. Preliminary results were transmitted via facsimile on February 23, 2001. For your reference, these analyses have been assigned our service request number K2101038.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 3316.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Jeff Christian  
Laboratory Director

JC/gep

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**AR 021605**

### Acronyms

ASTM	American Society for Testing and Materials
<del>A2LA</del>	<del>American Association for Laboratory Accreditation</del>
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

01002

AR 021606

### Inorganic Data Qualifiers

- The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- ~~B The analyte was found in the associated method blank at a level that is significant relative to the sample result.~~
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

### Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The reported value is estimated because of the presence of matrix interference.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- \* The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

### Organic Data Qualifiers

- The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

### Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

00003

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

Client: Airport Communities Coalition  
 Project: Water/Sediment Quality Monitoring  
 Sample Matrix: Water

Service Request: K2101038  
 Date Collected: 02/09/2001  
 Date Received: 02/12/2001

Glycols

Sample Name: IA-1  
 Lab Code: K2101038-001  
 Extraction Method: METHOD  
 Analysis Method: 8015B

Units: mg/L  
 Basis: NA  
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	97	50-150	02/22/01	Acceptable

**00004**

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Results**

**Client:** Airport Communities Coalition  
**Project:** Water/Sediment Quality Monitoring  
**Sample Matrix:** Water

**Service Request:** K2101038  
**Date Collected:** 02/09/2001  
**Date Received:** 02/12/2001

**Glycols**

**Sample Name:** IA-2  
**Lab Code:** K2101038-002  
**Extraction Method:** METHOD  
**Analysis Method:** 8015B

**Units:** mg/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND U	5.0	1	02/21/01	02/21/01	KWG0100851	
Propylene Glycol	ND U	5.0	1	02/21/01	02/21/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	80	50-150	02/21/01	Acceptable

**00005**

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Results**

**Client:** Airport Communities Coalition  
**Project:** Water/Sediment Quality Monitoring  
**Sample Matrix:** Water

**Service Request:** K2101038  
**Date Collected:** 02/09/2001  
**Date Received:** 02/12/2001

**Glycols**

**Sample Name:** IIA-1  
**Lab Code:** K2101038-003  
**Extraction Method:** METHOD  
**Analysis Method:** 8015B

**Units:** mg/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	81	50-150	02/22/01	Acceptable

**00006**

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Results**

**Client:** Airport Communities Coalition  
**Project:** Water/Sediment Quality Monitoring  
**Sample Matrix:** Water

**Service Request:** K2101038  
**Date Collected:** 02/09/2001  
**Date Received:** 02/12/2001

**Glycols**

**Sample Name:** IIA-2  
**Lab Code:** K2101038-004  
**Extraction Method:** METHOD  
**Analysis Method:** 8015B

**Units:** mg/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	79	50-150	02/22/01	Acceptable

**00007**

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

Client: Airport Communities Coalition  
 Project: Water/Sediment Quality Monitoring  
 Sample Matrix: Water

Service Request: K2101038  
 Date Collected: 02/09/2001  
 Date Received: 02/12/2001

Glycols

Sample Name: IB-1  
 Lab Code: K2101038-005  
 Extraction Method: METHOD  
 Analysis Method: 8015B

Units: mg/L  
 Basis: NA  
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	81	50-150	02/22/01	Acceptable



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

Client: Airport Communities Coalition  
 Project: Water/Sediment Quality Monitoring  
 Sample Matrix: Water

Service Request: K2101038  
 Date Collected: 02/09/2001  
 Date Received: 02/12/2001

Glycols

Sample Name: IB-2  
 Lab Code: K2101038-006  
 Extraction Method: METHOD  
 Analysis Method: 8015B

Units: mg/L  
 Basis: NA  
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	83	50-150	02/22/01	Acceptable

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Airport Communities Coalition  
Project: Water/Sediment Quality Monitoring  
Sample Matrix: Water

Service Request: K2101038  
Date Collected: 02/09/2001  
Date Received: 02/12/2001

Glycols

Sample Name: IIB-1  
Lab Code: K2101038-007  
Extraction Method: METHOD  
Analysis Method: 8015B

Units: mg/L  
Basis: NA  
Level: Low

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	11	5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	80	50-150	02/22/01	Acceptable

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

Client: Airport Communities Coalition  
 Project: Water/Sediment Quality Monitoring  
 Sample Matrix: Water

Service Request: K2101038  
 Date Collected: 02/09/2001  
 Date Received: 02/12/2001

Glycols

Sample Name: IIB-2  
 Lab Code: K2101038-008  
 Extraction Method: METHOD  
 Analysis Method: 8015B

Units: mg/L  
 Basis: NA  
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	ND	U	5.0	1	02/21/01	02/22/01	KWG0100851	
Propylene Glycol	12		5.0	1	02/21/01	02/22/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	81	50-150	02/22/01	Acceptable

**00011**

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

Client: Airport Communities Coalition  
 Project: Water/Sediment Quality Monitoring  
 Sample Matrix: Water

Service Request: K2101038  
 Date Collected: NA  
 Date Received: NA

Glycols

Sample Name: Method Blank  
 Lab Code: KWG0100851-10  
 Extraction Method: METHOD  
 Analysis Method: 8015B

Units: mg/L  
 Basis: NA  
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Ethylene Glycol	7.8		5.0	1	02/21/01	02/21/01	KWG0100851	
Propylene Glycol	ND	U	5.0	1	02/21/01	02/21/01	KWG0100851	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,3-Butylene Glycol	78	50-150	02/21/01	Acceptable

# **Appendix A**

## **QA/QC Results**

**00013**

**AR 021617**

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client:** Airport Communities Coalition  
**Project:** Water/Sediment Quality Monitoring  
**Sample Matrix:** Water

**Service Request:** K2101038

**Surrogate Recovery Summary  
Glycols**

**Extraction Method:** METHOD  
**Analysis Method:** 8015B

**Units:** PERCENT  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
IA-1	K2101038-001	97
IA-2	K2101038-002	80
IIA-1	K2101038-003	81
IIA-2	K2101038-004	79
IB-1	K2101038-005	81
IB-2	K2101038-006	83
IIB-1	K2101038-007	80
IIB-2	K2101038-008	81
Method Blank	KWG0100851-10	78
IIB-2MS	KWG0100851-3	97
IIB-2DMS	KWG0100851-4	91
Lab Control Sample	KWG0100851-9	95

**Surrogate Recovery Control Limits (%)**

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Sur1 = 2,3-Butylene Glycol 50-150

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

00014

**COLUMBIA ANALYTICAL SERVICES, INC.**

QA/QC Report

**Client:** Airport Communities Coalition  
**Project:** Water/Sediment Quality Monitoring  
**Sample Matrix:** Water

**Service Request:** K2101038  
**Date Extracted:** 02/21/2001  
**Date Analyzed:** 02/22/2001

**Matrix Spike/Duplicate Matrix Spike Summary  
Glycols**

**Sample Name:** IIB-2  
**Lab Code:** K2101038-008  
**Extraction Method:** METHOD  
**Analysis Method:** 8015B

**Units:** mg/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG0100851

Analyte Name	Sample Result	IIB-2MS KWG0100851-3 Matrix Spike			IIB-2DMS KWG0100851-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Ethylene Glycol	ND	84	100	84	89	100	89	50-150	6	30
Propylene Glycol	12	93	100	81	96	100	84	50-150	3	30

Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

00015

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Airport Communities Coalition  
Project: Water/Sediment Quality Monitoring  
Sample Matrix: Water

Service Request: K2101038  
Date Extracted: 02/21/2001  
Date Analyzed: 02/21/2001

Lab Control Spike Summary  
Glycols

Extraction Method: METHOD  
Analysis Method: 8015B

Units: mg/L  
Basis: NA  
Level: Low  
Extraction Lot: KWG0100851

Analyte Name	Lab Control Sample KWG0100851-9 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Ethylene Glycol	110	100	110	50-150
Propylene Glycol	100	100	100	50-150

Results flagged with an asterisk (\*) indicate values outside control criteria.

00016



**Appendix B**  
**Chain of Custody**  
**Information**

**00017**

**AR 021621**



# CHAIN OF CUSTODY

1317 South 13th Ave. • Kenosha, WI 98828 • (960) 577-7222 • (800) 895-7222 • FAX (960) 638-1088

SR#: K2101038 OF \_\_\_\_\_ PAGE \_\_\_\_\_ OF \_\_\_\_\_ COC # \_\_\_\_\_

PROJECT NAME	PROJECT NUMBER	PROJECT MANAGER	COMPANY ADDRESS	PHONE	FAX	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS		REMARKS
										GCMS	GCMS-SIM	
Water Treatment Quality Monitoring	00-1016	John Strand	21630 119th Ave, Des Moines, WI 98188	572-493-4347	(960) 446-1467	2/09	2:45	1	W			
							2:45	2				
							2:00	3				
							2:00	4				
							2:15	5				
							2:15	6				
							1:30	7				
							1:30	8				
								9				Temperature blank

*Circle which metals are to be analyzed:*

Total Metals: Al As Sb Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg  
 Dissolved Metals: Al As Sb Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

\*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: \_\_\_\_\_ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:  
 W = water

REPORT REQUIREMENTS  
 I. Routine Report: Method Blank, Surrogate, as required  
 II. Report Dup., MS, MSD as required  
 III. Data Validation Report (Includes all raw data)  
 IV. CLP Deliverable Report  
 V. EDD

INVOICE INFORMATION  
 P.O. # \_\_\_\_\_  
 Bill To: \_\_\_\_\_

TURNAROUND REQUIREMENTS  
 24 hr. \_\_\_\_\_ 48 hr. \_\_\_\_\_  
 5 Day \_\_\_\_\_  
 Standard (10-15 working days)  
 Provide FAX Results \_\_\_\_\_

Requested Report Date \_\_\_\_\_

RELINQUISHED BY: [Signature] Date/Time 2/09/11 15:59 Firm MAVON

RECEIVED BY: [Signature] Date/Time 2/12/11 Firm MAVON

Columbia Analytical Services Inc.  
Cooler Receipt And Preservation Form

FedEx

Project/Client City of Des Moines Work Order K21 1038-

Cooler received on 2/12/01 and opened on 2/12/01 by DM

- Were custody seals on outside of cooler?  
If yes, how many and where? Front.  YES  NO
- Were seals intact and signature & date correct?  YES  NO
- COC # 44 \_\_\_\_\_  
Temperature of cooler(s) upon receipt: 4.4 \_\_\_\_\_  
Temperature Blank: \_\_\_\_\_
- Were custody papers properly filled out (ink, signed, etc.)?  YES  NO
- Type of packing material present ICE PACKS
- Did all bottles arrive in good condition (unbroken)?  YES  NO
- Were all bottle labels complete (i.e. analysis, preservation, etc.)?  YES  NO
- Did all bottle labels and tags agree with custody papers?  YES  NO
- Were the correct types of bottles used for the tests indicated?  YES  NO
- Were all of the preserved bottles received at the lab with the appropriate pH?  YES  NO
- Were VOA vials checked for absence of air bubbles, and if present, noted below?  YES  NO
- Did the bottles originate from CAS/K or a branch laboratory?  YES  NO

Explain any discrepancies There is not a temp blank, as per  
COC

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials