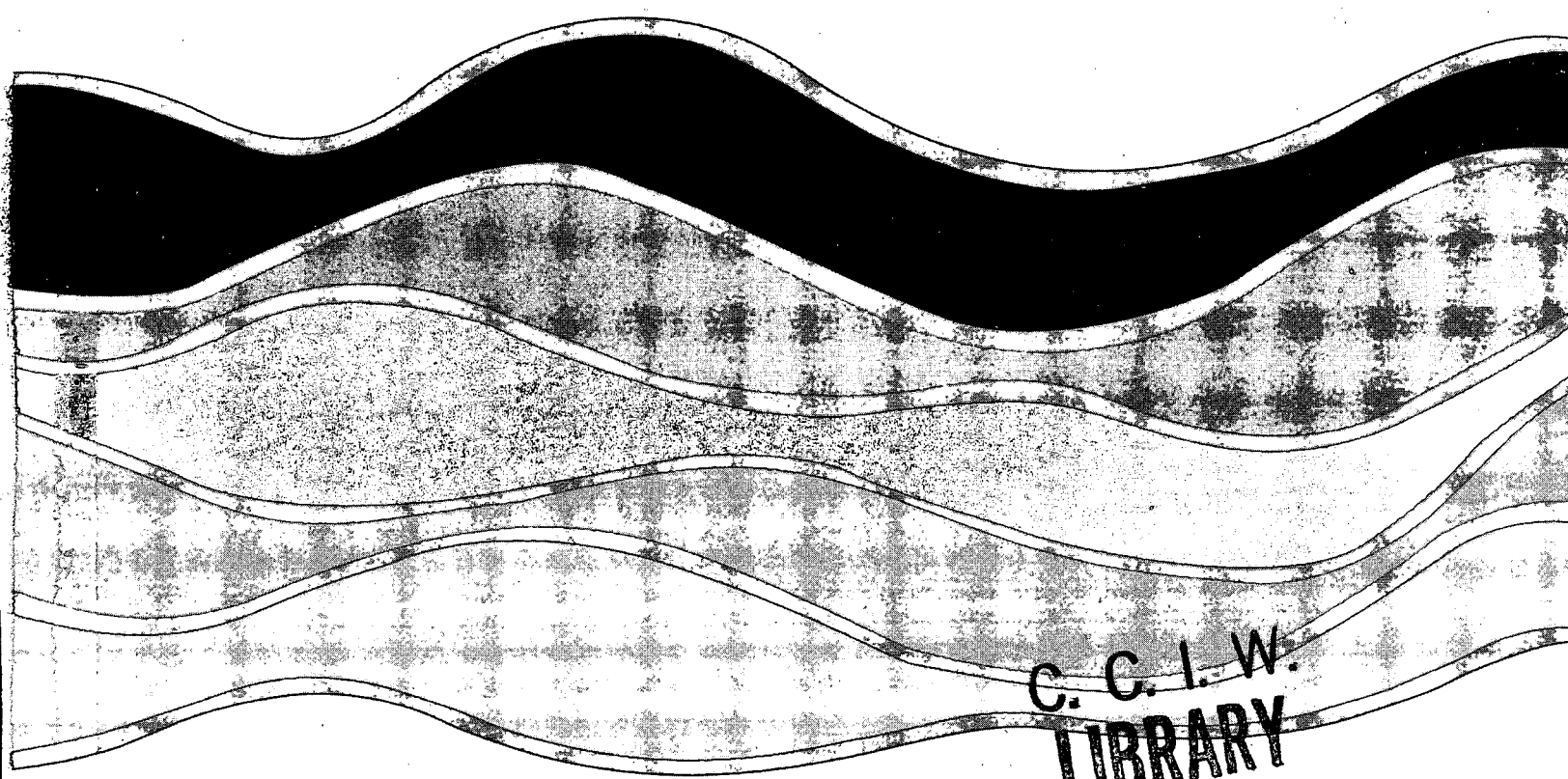


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Ecosystems Interlaboratory QA Program,
Study FP62 for a Variety of Trace Metals
in Surface Waters (January & February 1993)

H. Alkema

Research and Applications Branch
National Water Research Institute
867 Lakeshore Rd, Burlington, ON
Canada L7R 4A6

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no. 93-08

RESEARCH & APPLICATIONS BRANCH

FINAL REPORT

REPORT NO. RAB 93-08

**ECOSYSTEMS INTERLABORATORY QUALITY ASSURANCE PROGRAM
FP/GLAP STUDY 62**

for January and February 1993

**An Interlaboratory Quality Assurance Study
for a Variety of Trace Metals in Surface Waters ***

by

H. Alkema

Quality Assurance Project
Research & Applications Branch
National Water Research Institute
Burlington, Ontario

June 1993

* the companion studies (FP62) for Major Ions & Nutrients and Total P is RAB Report 93-07



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LE PLAN VERT DU CANADA

National Water Research Institute
867 Lakeshore Road, P.O. Box 5050
Burlington, Ontario
L7R 4A6

Your file Votre référence

Our file Notre référence

22 June 1993

To: Participants & Managers in the:
Ecosystems Interlaboratory Quality Assurance Program

Re: Final Report for FP/GLAP Study FP62 - Trace Metals Portion

Dear Participant,

The Institute is pleased to distribute this final report to the FP/GLAP participant laboratories. This report includes results for a unique series of 10 samples which were analysed in January and February of this year. The evaluation of results is in the LRTAP style, giving an evaluation for systematic bias as well as for precision (flagged results). A complete listing of all laboratory results is included so that each laboratory can compare its results and evaluations with other laboratories. For details concerning the evaluations please refer to the attached Appendix A: Glossary of Terms, or to the Research & Applications Branch QA Manual.

We would like to thank all participants for their cooperation and prompt responses. In the future, now that all evaluation programs have been adapted to the FP/GLAP format, reports will be prompt.

The laboratories listed in this report submitted their data with a confidential laboratory code. This confidentiality is fully respected by our staff. Access to these codes is possible through the relevant laboratories or program authorities.

Laboratory heads are encouraged to discuss the attached report openly with those who manage their programs and those who use their laboratory data. In addition, if any laboratory is experiencing difficulties or is reviewing a methodology, I can make a referral to a laboratory which has demonstrated good performance. Also, to assist in improving or confirming accuracy of analysis, our Institute is able to provide a wide variety of reference waters for a cost recovery fee.

Should you have any questions or comments regarding this study, please contact me - phone 416-336-4929 or fax 336-4989. (On October 4, 1993, our area code is changing to 905.)

Yours truly,

H. Alkema
QA Chemist, FPQA

Attachment: Individual Laboratory Appraisal

Think recycling



Pensez à recycler

Canada

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Fait de papiers récupérés

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Table 1

ENVIRONMENT CANADA
National Water Research Institute

FP-GLAP Quality Assurance Program
PARTICIPATION LIST - Study FP62 (Jan & Feb '93)

Alberta Environmental Centre
ASL Analytical Service Lab Ltd.
Barringer Laboratories Ltd.
Can Test Ltd.
Chemex Labs Alberta Inc.
Chemical & Geological Laboratories Inc.
Consumer & Corporate Affairs Canada
Crossfield Laboratories Ltd.
Environment Canada - Atlantic Region
Environment Canada - Centre St. Laurent
Environment Canada - NLET
Environment Canada - Pacific & Yukon Region
Environment Canada - Western & Northern Region
Environment Canada - WQB, Western & Northern Region
Environment Manitoba
Environment New Brunswick
Elemental Research Inc.
Forestry Canada - Sault Ste Marie
Geological Survey of Canada - Ottawa (I)
Geological Survey of Canada - Ottawa (II)
Illinois State Water Survey
Indian & Northern Affairs Canada
Laboratoire de Santé, Publique du Québec
Ministère de l'Environnement du Québec - Laval
Ministère de l'Environnement du Québec - Ste. Foy
Ontario Ministry of Environment - Etobicoke
Ontario Ministry of Environment - Kingston
Ontario Ministry of Environment - London
Ontario Ministry of Environment - Thunder Bay
PEI Agriculture
Rockcliff Research Management Inc. (WTC)
Saskatchewan Health
Saskatchewan Research Council
Sawyer Environmental Laboratory - University of Maine
Suncor Inc., OSG
USEPA, Region 5 - Chicago
Walker Laboratories
Zenon Environmental Inc., BC

Table 2

COMPARISON OF LABORATORY PERFORMANCE (STUDY FP62)
TRACE METALS

BIAS				FLAGS			
LAB CODE	NO. OF PARAMETERS ANALYZED	NO. OF PARAMETERS BIASED	PERCENTAGE OF PARAMETERS BIASED (%)	NO. OF RESULTS RANKED	NO. OF FLAGS ASSIGNED	PERCENTAGE OF RESULTS FLAGGED (%)	SUM OF % BIAS AND % FLAGS SCORE
F032	15	14	93.33	150	57	38.00	131.33
F037	12	5	41.67	120	64	53.33	95.00
F014	9	3	33.33	77	23	29.87	63.20
F055	21	6	28.57	179	60	33.52	62.09
F047	21	9	42.86	184	30	16.30	59.16
F024	14	5	35.71	140	27	19.29	55.00
F043	21	6	28.57	175	25	14.29	42.86
F016	21	5	23.81	139	20	14.39	38.20
F040	10	2	20.00	100	18	18.00	38.00
F045	3	1	33.33	30	0	0.00	33.33
F025	19	4	21.05	168	18	10.71	31.77
F008	16	3	18.75	106	10	9.43	28.18
F039	21	2	9.52	171	31	18.13	27.65
F030	20	3	15.00	163	16	11.04	26.04
F036	11	0	0.00	110	28	25.45	25.45
F010	19	2	10.53	188	28	14.89	25.42
F046	21	2	9.52	157	18	11.46	20.99
F002	9	1	11.11	79	7	8.86	19.97
F013	7	1	14.29	33	0	0.00	14.29
F044	11	1	9.09	105	4	3.81	12.90
F033	19	2	10.53	173	2	1.16	11.68
F001	19	1	5.26	170	9	5.29	10.56
F038	21	1	4.76	163	9	5.52	10.28
F020	20	0	0.00	160	15	9.38	9.38
F015	19	1	5.26	121	2	1.65	6.92
F011	10	0	0.00	97	5	5.15	5.15
F003	17	0	0.00	163	2	1.23	1.23
F042	1	0	0.00	10	0	0.00	0.00

THE FOLLOWING CODES WERE USED IN THE ANALYSIS:

13091 23091 24091 25091 26091 27091 28091 29091 30091 38091
42091 48091 56091 82091 33095 34095 47095 51095 83095 93095
94095

THE FOLLOWING CODE WAS EXCLUDED: NONE

Table 3

Sample Design - FP 62 - January '93

Trace Metals

Sample No.	Sample Name	Type (DA/Low)	Cu Conc'n (FP62)
1	TM-01	DA	0.026
2	TMH12	DA	0.149
3	TM-03	DA	0.130
4	TM-04	DA	0.470
5	TMH13	DA	0.260
6	TM-21	Low	0.0070
7	TM-23	Low	0.0090
8	TM-25	Low	0.0280
9	TM-24	Low	0.0070
10	TM-26	Low	0.0140

Table 4

SUMMARY OF INTERLABORATORY MEDIAN VALUES FOR Trace Metals - STUDY EP62

PARAMETER	SAMPLE NUMBER							
	TMDA-01 SAMPLE 1	TMH12 SAMPLE 2	TMDA-03 SAMPLE 3	TMDA-04 SAMPLE 4	TMH13 SAMPLE 5	TM-21 SAMPLE 6	TM-23 SAMPLE 7	
Aluminum	mg/L	.2100	.3100	.4800	.7200	.6000	.0320	.0380
Vanadium	mg/L	.2010	.1300	.4800	.8510	.2070	.0050	.0020
Chromium	mg/L	.0560	.1150	.2520	.6200	.2100	.0070	.0090
Manganese	mg/L	.0150	.1510	.1100	.5200	.1140	.0060	.0080
Iron	mg/L	.0630	.3500	.2530	2.7550	.9500	.0070	.0150
Cobalt	mg/L	.0550	.0540	.1030	.1900	.1350	.0050	.0080
Nickel	mg/L	.0700	.0850	.1800	.4880	.1900	.0060	.0080
Copper	mg/L	.0260	.1490	.1300	.4700	.2600	.0070	.0090
Zinc	mg/L	.0280	.1800	.0950	.4960	.1150	.0070	.0050
Arsenic	ug/L	1.0000	.4000	.7800	1.1200	.3000	.2000	9.8300
Selenium	ug/L	.4300	1.0000	.9800	1.0050	.3100	-	1.0000
Strontium	mg/L	.1470	.0490	.2800	.6700	.0440	.1650	.0460
Molybdenum	mg/L	.1800	.0760	.3900	.6000	.0650	.0070	.0060
Silver	ug/L	.1000	.0100	-	.4800	-	-	3.3000
Cadmium	mg/L	.0130	.0260	.0360	.0670	.0410	.0050	.0030
Antimony	ug/L	11.000	.2100	20.000	46.500	-	.4500	4.4000
Barium	mg/L	.2180	.0420	.2750	.6610	.0720	.0220	.0130
Lead	mg/L	.1270	.2500	.2740	.6140	.3000	.0050	.0030
Bismuth	ug/L	100.000	-	380.000	540.000	-	-	4.4000
Lithium	ug/L	5.0000	-	15.000	21.000	1.0000	1.8000	3.2500
Beryllium	ug/L	7.0000	15.000	20.500	27.000	5.0000	.2200	.5000

PARAMETER	SAMPLE NUMBER			
	TM-25 SAMPLE 8	TM-24 SAMPLE 9	TM-26 SAMPLE 10	
Aluminum	mg/L	.0520	.0200	.0680
Vanadium	mg/L	.0150	.0070	.0120
Chromium	mg/L	.0040	.0060	.0170
Manganese	mg/L	.0190	.0030	.0110
Iron	mg/L	.0100	.0050	.0230
Cobalt	mg/L	.0130	.0190	.0040
Nickel	mg/L	.0100	.0030	.0190
Copper	mg/L	.0280	.0070	.0140
Zinc	mg/L	.0080	.0140	.0250
Arsenic	ug/L	1.0000	3.0000	4.5000
Selenium	ug/L	2.0000	4.0000	7.0000
Strontium	mg/L	.2400	.1100	.4400
Molybdenum	mg/L	.0090	.0040	.0180
Silver	ug/L	2.4000	.8000	7.8000
Cadmium	mg/L	.0070	.0120	.0170
Antimony	ug/L	8.0000	14.800	1.7500
Barium	mg/L	.0640	.0090	.0300
Lead	mg/L	.0220	.0070	.0140
Bismuth	ug/L	9.4000	2.5000	6.5000
Lithium	ug/L	7.5000	5.1500	10.700
Beryllium	ug/L	7.0000	1.5700	3.2900

Appendix A

Glossary of Terms

GLOSSARY OF TERMS

Appendix A:

Used for the Evaluation of Interlaboratory Results

- Satisfactory:** Quite acceptable, "good results".
- Erratic:** A set of results for a given characteristic is deemed erratic when both high and low flags are assigned.
- Out of Control:** An analytical system is said to be out of control when it has demonstrated the ability to perform adequately and produces an extreme result or results. For an example, consider a set of results obtained by laboratory on Vanadium in Study FP62:

Sample No.	Result	Median	Difference
1	0.21	0.2010	-0.009
2	0.13	0.1300	0.0
3	0.49	0.4800	-0.01
4	0.091	0.8505	0.7595
5	0.22	0.2065	-0.013
6	0.005	0.0050	0.0
7	0.002	0.0022	0.0002
8	0.016	0.0151	-0.0009
9	0.007	0.0069	-0.0001
10	0.012	0.0123	0.0003

Given the excellent results obtained on samples 1 through 10, the result on sample 4 indicates that the analytical system was out of control.

- Bias:** A set of results is said to be biased when that set exhibits a tendency to be either higher or lower than some standard. The ranking procedure employed in testing for bias is described in W.J. Youden's paper, "Ranking Laboratories by Round-Robin Tests" from Precision Measurement and Calibration, H.H. Ku, Editor, NBS Special Publication 300-Volume 1, U.S. Government Printing Office, Washington, D.C., 1969. In this paper, Youden established the rationale for evaluating laboratories' performance by ranking results. In our use of the procedure there is about 1 chance in 20 of deeming a set of results biased when in fact it is not, ($\alpha=0.05$).

- W or T Code:** A "W" or "T" code is used with a reported result as also described in ASTM. The use of these codes is discouraged in the FP/GLAP context, as incorrect flagging of results can occur. "Less than" values are normally used when reporting FP/GLAP data.

LLBAE Lower Limit for Use of Basic Acceptable Error, Basic Acceptable Error, and
BAE Concentration Error Increment:
CEI:

These terms define the acceptable differences from median of results (target value) that is allowed without a result being flagged either low or high. For a sample whose target value is at or below the lower limit for use of basic acceptable error, the basic acceptable error is used to determine the range of acceptable deviations.

For example: Suppose that the lower limit for use of basic acceptable error has been set a 10 $\mu\text{g/L}$ and the basic acceptable error is 1.0 $\mu\text{g/L}$, if a target (median) value for a sample is 5 $\mu\text{g/L}$, then any reported result within the range 5 ± 1.0 or 4.0 to 6.0 $\mu\text{g/L}$ would be considered acceptable. The BAE would define the acceptable result within the 0-10 $\mu\text{g/L}$ range.

For results above the *lower limit for use of basic acceptable error*, an allowance is made for the increased variability due to concentration. (For almost all substances it appears that the variability of results increases with concentration.) The allowance is added to the *basic acceptable error*. It is calculated by multiplying the *concentration error increment* by the difference between the target value and the *lower limit for use of basic acceptable error*.

For example: If a target value for a sample is 21 $\mu\text{g/L}$, and the *lower limit for use of basic acceptable error* is 10 $\mu\text{g/L}$, the difference between them is $21 - 10 = 11$ $\mu\text{g/L}$. Multiplying the difference by the *concentration increment*, say 0.10, which gives $11 \mu\text{g/L} \times 0.10$, resulting in 1.1 $\mu\text{g/L}$ to determine the acceptable difference 21.0 ± 2.1 . Thus the range 18.9 to 23.1 $\mu\text{g/L}$ would be considered acceptable and would not be flagged.

In general, for the FP/GLAP studies, the values chosen for the *basic acceptable error* and the *concentration error increment* are selected so that good precision may be inferred. Historically, for the FP QA Program, for moderate ranges, this has been achieved with the 10% Deviation Rule. To be consistent in the FP/GLAP studies, Performance Ratings with the LRTAP type evaluation program should generally remain the same; eg. Very Good = approximately 5% of data flagged. In a sense these evaluations represent state of the art for analysis of the Round-Robin samples.

Flag: A result is flagged high ("H") when its value is greater than the median (target value) plus the acceptable difference, (but not greater than the median plus 1.5 times). A result greater than 1.5 times the acceptable difference is flagged very high ("VH"). Similarly, a result lower than the median by the acceptable difference (but not minus 1.5 times the acceptable difference) is flagged low ("L"). A still lower result is flagged very low ("VL"). Extremely different values are those that deviate more than twice the acceptable difference from the median. These results are flagged - "EL" or "EH".

Acceptable Difference: The absolute values of the maximum difference between a result and (of Acceptable Deviation) the target value which will not be flagged.

Reference: ASTM, 1983, Volume 11.01, Water 1, Section II, pg D4210-83

June, 1993

Appendix B

Laboratory Results

PARAMETER: 13091 Aluminum

MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0075 BASIC ACCEPTABLE ERROR= .0075 CONCENTRATION ERROR INCREMENT= .1250

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.223	20.00	.322	18.00	.459	5.50	.669	4.00	.557	4.00	.032	10.00
F002	.20	6.50	.31	11.00	.49	18.00	.76	17.00	.59	7.50	.031	8.00
F003	.210	11.00	.318	15.00	.480	13.00	.720	13.00	.625	20.00	.030	6.00
F008	.180	3.00	.274	2.00	.402 L	2.00	.678	5.00	.526	3.00	.030	6.00
F010	.21	11.00	.31	11.00	.48	13.00	.71	12.00	.60	11.50	.04	17.50
F014	.22	18.50	.32	16.50	.48	13.00	.73	14.50	.62	19.00	.026	3.50
F015	.21	11.00	.31	11.00	.46	7.00	.7	8.00	.59	7.50	<.05	0.00
F016	.232	21.50	.345	22.00	.517	23.00	.814	23.00	.649	23.00	.037	15.00
F020	.212	14.50	.310	11.00	.471	10.00	.707	10.50	.599	9.00	.03	6.00
F024	.20	6.50	.31	11.00	.47	9.00	.77	19.00	.61	17.50	.036	14.00
F025	.232	21.50	.354	23.00	.534	24.00	.786	22.00	.657	24.00	.042	19.00
F030	.22	18.50	.32	16.50	.48	13.00	.73	14.50	.60	11.50	.04	17.50
F032	.2004	8.00	.2749	3.00	.4229	3.00	.6425	3.00	.5118 L	2.00	.0388	16.00
F033	.21	11.00	.30	6.00	.48	13.00	.70	8.00	.61	17.50	.032	10.00
F036	.2183	17.00	.3235	19.00	.5011	20.00	.7724	21.00	.6058	16.00	.0066 EL	1.00
F037	.191	5.00	.313	14.00	.487	17.00	1.1140 EH	25.00	.640	21.50	.0246	2.00
F038	.17 L	1.00	.28	4.50	.51	21.50	.77	19.00	.64	21.50	.045 H	20.00
F039	.25 H	23.50	.36 H	24.00	.50	19.00	.70	8.00	.60	11.50	.05 VH	21.00
F040	.212	14.50	.307	8.00	.459	5.50	.687	6.00	.576	6.00	.0329	12.00
F042	.210	11.00	.301	7.00	.465	8.00	.731	16.00	.602	14.00	.032	10.00
F043	.18	3.00	.28	4.50	.43	4.00	.64	2.00	.56	5.00	<.02 L	0.00
F044	.218	16.00	.331	20.00	.485	16.00	.707	10.50	.604	15.00	.035	13.00
F046	.25 H	23.50	.34	21.00	.51	21.50	.77	19.00	.60	11.50	<.15	0.00
F047	.18	3.00	.27	1.00	.40 L	1.00	.62 L	1.00	.51 L	1.00	.026	3.50
F055	.55 EH	25.00	.60 EH	25.00	.55 H	25.00	.85 H	24.00	.70 H	25.00	.15 EH	22.00
MEDIAN CONC.	.2100		.3100		.4800		.7200		.6000		.0324	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.039	15.00	.045	5.50	.020	11.00	.068	11.50
F002	.038	11.50	.052	12.50	.021	14.00	.069	14.00
F003	.041	17.50	.057	17.00	.022	15.50	.072	18.00
F008	.038	11.50	.052	12.50	.018	6.50	.065	9.00
F010	.05 H	20.50	.07 H	22.00	.03 H	20.50	.08	20.50
F014	.035	7.50	.048	7.00	.014	4.00	.059	4.00
F015	<.05	0.00	.05	9.50	<.05	0.00	.06	5.50
F016	.043	19.00	.062	21.00	.022	15.50	.077	19.00
F020	.03	4.00	.04	2.00	.02	11.00	.06	5.50
F024	.032	6.00	.050	9.50	.020	11.00	.065	9.00
F025	.038	11.50	.057	17.00	.023	17.00	.068	11.50
F030	.04	16.00	.05	9.50	.01 L	2.00	.08	20.50
F032	.0410	17.50	.0544	14.00	.0190	8.50	.0697	15.00
F033	.038	11.50	.051	17.00	.0197	8.50	.07	16.50
F036	.0084 EL	1.00	.0264 VL	1.00	.0073 L	1.00	.0129 EL	1.00
F037	.0263 L	2.00	.0403	3.00	.0143	5.00	.064	7.00
F038	.053 H	22.00	.074 VH	23.00	.026	19.00	.082	22.00
F039	.05 H	20.50	.06	20.00	.03 H	20.50	.09 H	23.00
F040	.0386	14.00	.0556	15.00	.0207	13.00	.0689	13.00
F042	.035	7.50	.041	4.00	.018	6.50	.065	9.00
F043	.03	4.00	.05	9.50	<.02	0.00	.05 L	2.00
F044	.037	9.00	.058	19.00	.025	18.00	.070	16.50
F046	<.15	0.00	<.15	0.00	<.15	0.00	<.15	0.00
F047	.030	4.00	.045	5.50	.013	3.00	.055	3.00
F055	.15 EH	23.00	.20 EH	24.00	.15 EH	22.00	.20 EH	24.00
MEDIAN CONC.	.0380		.0520		.0200		.0684	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	104.50	10.450	10			SE-FAAS, ICP-MS
F002	120.00	12.000	10			13305/02
F003	146.00	14.600	10		BIASED LOW	AL/E-ICP (MG/L)
F008	60.50	6.050	10	L		FLAME A.A.
F010	159.50	15.950	10			I.C.A.P.
F014	107.50	10.750	10			I.C.P. & G.F.
F015	59.50	5.950	7		BIASED HIGH	I.C.P.
F016	202.00	20.200	10			I.C.P. 4X
F020	83.50	8.350	10			I.C.P./GFAA 16-19
F024	112.50	11.250	10			I.C.P. 5X
F025	190.50	19.050	10			I.C.P.
F030	139.50	13.950	10			I.C.P. 5X
F032	90.00	9.000	10	L		ICP 20X
F033	119.00	11.900	10			I.C.P.-O.E.S.
F036	98.00	9.800	10			I.C.P.-5 GRAPH.
F037	101.50	10.150	10	L EH		FURNACE
F038	173.50	17.350	10			I.C.P./G.F.A.A.
F039	191.00	19.100	10	L H H		I.C.P. 4X CONC'N
F040	107.00	10.700	10			I.C.P.-M.S.
F042	93.00	9.300	8		BIASED LOW	GFAAS
F043	34.00	4.250	8			I.C.P.-E.S.
F044	153.00	15.300	10			I.C.P.-M.S.
F046	96.50	19.300	5	H	BIASED LOW	I.C.P. CONC.
F047	26.00	2.600	10	L L L	BIASED HIGH	I.C.P.-M.S. 1X
F055	239.00	23.900	10	EHEHH H H EHEHEHEHEH		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F047	26.00	2.600	10	LLL	BIASED LOW	I.C.P.-M.S. 1X
F043	34.00	4.250	8	LL	BIASED LOW	I.C.P.-E.S.
F008	60.50	6.050	10	L	BIASED LOW	FLAME A.A.
F020	83.50	8.350	10			I.C.P./GFAA 16-19
F015	59.50	5.950	7			I.C.P.
F032	90.00	9.000	10	L		ICP 20X
F042	93.00	9.300	10			GFAAS
F036	98.00	9.800	10	ELELVLEL		I.C.P.-5 GRAPH.
F037	101.50	10.150	10	EHL		FURNACE
F001	104.50	10.450	10			SE-FAAS, ICP-MS
F040	107.00	10.700	10			I.C.P.-M.S.
F014	107.50	10.750	10			I.C.P. & G.F.
F024	112.50	11.250	10			I.C.P. 5X
F033	119.00	11.900	10			I.C.P.-O.E.S.
F002	120.00	12.000	10			13305/02
F030	139.50	13.950	10	L		I.C.P. 5X
F003	146.00	14.600	10			AL/E-ICP (MG/L)
F044	153.00	15.300	10			I.C.P.-M.S.
F010	159.50	15.950	10	HHH		I.C.A.P.
F038	173.50	17.350	10	LHHVH		I.C.P./G.F.A.A.
F025	190.50	19.050	10			I.C.P.
F039	191.00	19.100	10	HHVHHH		I.C.P. 4X CONC'N
F046	96.50	19.300	5	H	BIASED HIGH	I.C.P. CONC.
F016	202.00	20.200	10		BIASED HIGH	I.C.P. 4X
F055	239.00	23.900	10	EHEHHHEHEHEHEHEH		FLAME A.A.

OVERALL AVERAGE RANK IS 12.529

Aluminum

PARAMETER: 23091 Vanadium

mg/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.186	3.00	.124	4.00	.453	4.00	.829	7.00	.204	9.00	.0046	4.50
F003	.206	13.00	.139	17.00	.504	20.00	.880	15.00	.216	15.00	.0044	2.50
F008	.40 EH	20.00	<.20	0.00	.50	18.00	.80	5.00	.20	5.50	<.20	0.00
F010	.200	8.00	.130	9.00	.472	9.00	.861	13.00	.207	11.00	.006	12.00
F015	.2	8.00	.13	9.00	.48	10.50	.84	8.50	.2	5.50	<.01	0.00
F016	.204	12.00	.146 H	18.00	.486	13.00	.887	16.00	.223	20.00	.017 EH	16.00
F020	.207	14.50	.135	13.50	.491	15.00	.891	17.00	.216	15.00	.008 H	14.00
F024	.21	17.50	.12	2.50	.50	18.00	.93	20.00	.20	5.50	.005	7.00
F025	.207	14.50	.135	13.50	.484	12.00	.878	14.00	.213	13.00	.007	13.00
F030	.209	16.00	.136	15.00	.498	16.00	.908	19.00	.216	15.00	.004	1.00
F032	.1848	2.00	.1153	1.00	.4057 L	1.00	.7486 L	2.00	.1738 L	1.00	.0054	10.00
F033	.20	8.00	.137	16.00	.50	18.00	.90	18.00	.22	18.00	.005T	7.00
F038	.20	8.00	.13	9.00	.47	8.00	.85	10.00	.20	5.50	<.030	0.00
F039	.202	11.00	.131	12.00	.464	7.00	.797	4.00	.206	10.00	.0055	11.00
F040	.197	5.00	.128	6.00	.463	6.00	.851	11.00	.202	8.00	.0050	9.00
F043	.21	17.50	.13	9.00	.49	14.00	.091 EL	1.00	.22	18.00	.005	7.00
F044	.194	4.00	.126	5.00	.456	5.00	.824	6.00	.196	3.00	.0046	4.50
F046	.20	8.00	.13	9.00	.48	10.50	.86	12.00	.21	12.00	.009 VH	15.00
F047	.18	1.00	.12	2.50	.42 L	2.00	.78	3.00	.18 L	2.00	.0044	2.50
F055	.26 EH	19.00	.18 EH	19.00	.44	3.00	.84	8.50	.22	18.00	.04 EH	17.00
MEDIAN CONC.	.2010		.1300		.4800		.8505		.2065		.0050	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.0022	6.50	.012	2.50	.0069	8.00	.012	5.50
F003	.0022	6.50	.0156	10.50	.0065	7.00	.0119	2.00
F008	<.20	0.00	<.20	0.00	<.20	0.00	<.20	0.00
F010	.005T H	12.00	.016	12.50	.005	1.50	.013	13.00
F015	<.01	0.00	.01 VL	1.00	<.01	0.00	<.01	0.00
F016	.017 EH	13.00	.027 EH	17.00	.017 EH	16.00	.025 EH	16.00
F020	.003	0.00	.012	2.50	.007	11.00	.013	13.00
F024	.002	2.50	.015	7.50	.007	11.00	.012	5.50
F025	.002	2.50	.017	15.00	.008	14.00	.013	13.00
F030	<.002	0.00	.013	4.00	.005	1.50	.012	5.50
F032	.0030	11.00	.0136	5.00	.0062	4.00	.0128	11.00
F033	.002T	2.50	.015	7.50	.007T	11.00	.012	5.50
F038	<.030	0.00	<.030	0.00	<.030	0.00	<.030	0.00
F039	.0025	9.00	.0156	10.50	.0063	5.50	.0127	9.50
F040	.0025	8.00	.0162	14.00	.0070	11.00	.0127	9.50
F043	.002	2.50	.016	12.50	.007	11.00	.012	5.50
F044	.0021	5.00	.0151	9.00	.0063	5.50	.0120	5.50
F046	<.005	0.00	.020 H	16.00	.009	15.00	.016 H	15.00
F047	.0026	10.00	.014	6.00	.0060	3.00	.011	1.00
F055	<.04	0.00	<.04	0.00	<.04	0.00	<.04	0.00
MEDIAN CONC.	.0022		.0151		.0069		.0123	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	54.00	5.400	10			ICP 5X
F003	108.50	10.850	10		INSUFFICIENT DATA	V/E-ICP (MG/L)
F008	48.50	12.125	4	EH		FLAME A.A.
F010	101.00	10.100	10			I.C.A.P.
F015	42.50	7.083	6		BIASED HIGH	I.C.P.
F016	157.00	15.700	10	H		I.C.P. 4X
F020	115.50	12.833	9			I.C.P.
F024	97.00	9.700	10			I.C.P. 5X
F025	124.50	12.450	10			I.C.P.
F030	93.00	10.333	9		BIASED LOW	I.C.P. 5X
F032	48.00	4.800	10	L L L		ICP 20X
F033	111.50	11.150	10			I.C.P.-O.E.S
F038	40.50	8.100	5			I.C.P.
F039	89.50	8.950	10			I.C.P. 4X CONC'N
F040	87.50	8.750	10			I.C.P.-M.S.
F043	98.00	9.800	10	EL		I.C.P.-M.S.
F044	52.50	5.250	10			I.C.P.-M.S.
F046	112.50	12.500	9		BIASED LOW	I.C.P. CONC.
F047	33.00	3.300	10	L L VH H H		I.C.P.-M.S. 1X
F055	84.50	14.083	6	EHEH L L EH		FLAME A.A.
OVERALL AVERAGE RANK IS		9.545				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F047	33.00	3.300	10	LL	BIASED LOW	I.C.P.-M.S. 1X
F032	48.00	4.800	10	LLL	BIASED LOW	ICP 20X
F044	52.50	5.250	10			I.C.P.-M.S.
F001	54.00	5.400	10			ICP 5X
F015	42.50	7.083	6	VL		I.C.P.
F038	40.50	8.100	5			I.C.P.
F040	87.50	8.750	10			I.C.P.-M.S.
F039	89.50	8.950	10			I.C.P. 4X CONC'N
F024	97.00	9.700	10			I.C.P. 5X
F043	98.00	9.800	10	EL		I.C.P.-M.S.
F010	101.00	10.100	10	H		I.C.A.P.
F030	93.00	10.333	9			I.C.P. 5X
F003	108.50	10.850	10			V/E-ICP (MG/L)
F033	111.50	11.150	10		INSUFFICIENT DATA	I.C.P.-O.E.S
F008	48.50	12.125	4	EH		FLAME A.A.
F025	124.50	12.450	10			I.C.P.
F046	112.50	12.500	9	VHHH		I.C.P. CONC.
F020	115.50	12.833	9	H		I.C.P.
F055	84.50	14.083	6	EHEHEH	BIASED HIGH	FLAME A.A.
F016	157.00	15.700	10	HEHEHEHEHEH		I.C.P. 4X
OVERALL AVERAGE RANK IS		9.545				Vanadium

PARAMETER: 24091 Chromium

mg/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.055	6.50	.110	3.50	.247	7.00	.614	9.00	.209	9.50	.0068	8.00
F003	.061	18.50	.115	12.50	.260	16.50	.629	14.00	.215	16.00	.0056	2.50
F008	.057	12.00	.12	18.50	.27	19.00	.64	17.00	.22	19.50	.006	4.50
F010	.059	15.00	.117	15.50	.256	14.00	.638	16.00	.214	15.00	.008	17.00
F011	.055	6.50	.113	9.00	.239	3.00	.592	5.00	.199	5.00	.008	17.00
F013	.056	9.50	.111	6.50	.246	6.00	.595	6.00	.198	3.50		0.00
F015	.058	13.50	.116	14.00	.255	13.00	.611	8.00	.202	7.00	.007	11.00
F016	.056	9.50	.123	21.00	.259	15.00	.634	15.00	.216	17.00	.011 VH	20.00
F020	.056	9.50	.113	9.00	.248	8.00	.616	10.00	.210	12.00	.008	17.00
F024	.060	16.00	.12	18.50	.29 H	22.00	.74 VH	21.00	.23	22.00	.005	1.00
F025	.051	1.00	.114	11.00	.265	18.00	.645	18.00	.211	14.00	.007	11.00
F030	.058	13.50	.110	3.50	.253	12.00	.605	7.00	.209	9.50	.007	11.00
F032	.0525	3.00	.0971 L	1.00	.2172 L	1.00	.5487 L	1.00	.1746 VL	1.00	.0056	2.50
F033	.053	4.50	.115	12.50	.25	9.50	.62	12.00	.21	12.00	.006	4.50
F037	.0519	2.00	.1170	15.50	.2510	11.00	1.9760 EH	22.00	.2070	8.00	.0078T	15.00
F038	.056	9.50	.11	3.50	.25	9.50	.62	12.00	.21	12.00	.007	11.00
F039	.0602	17.00	.111	6.50	.243	5.00	.588	3.00	.198	3.50	.0076	14.00
F040	.0611	20.00	.113	9.00	.240	4.00	.582	2.00	.200	6.00	.0067	7.00
F043	.061	18.50	.12	18.50	.26	16.50	.62	12.00	.22	19.50	.007	11.00
F046	.072 EH	22.00	.12	18.50	.28 H	20.00	.66	19.00	.22	19.50	.012 VH	21.00
F047	.053	4.50	.11	3.50	.23	2.00	.59	4.00	.19	2.00	.0065	6.00
F055	.067 H	21.00	.136 VH	22.00	.285 H	21.00	.730 VH	20.00	.220	19.50	.009	19.00
MEDIAN CONC.	.0565		.1145		.2520		.6200		.2100		.0070	

PARAMETER: 24091 Chromium

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.0085	9.50	.003	4.50	.0061	14.50	.017	11.50
F003	.0079	4.00	.0033	7.00	.0050	5.00	.0155	8.00
F008	.009	13.00	.003	4.50	.006	11.50	.018	16.00
F010	.010	18.50	.004	11.00	.006	11.50	.018	16.00
F011	.010	18.50	.005	15.00	.007	17.00	.019	18.50
F013		0.00		0.00		0.00		0.00
F015	.008	6.00	<.005	0.00	<.005	0.00	.015	4.50
F016	.012 H	20.00	<.010	0.00	<.010	0.00	.018	16.00
F020	.009	13.00	.003	4.50	.006	11.50	.017	11.50
F024	.007	2.00	.003	4.50	.005	5.00	.015	4.50
F025	.005 L	1.00	.007 H	19.00	.009 H	19.00	.014	1.00
F030	.009	13.00	.006	17.50	.005	5.00	.017	11.50
F032	.0073	3.00	.0028	1.00	.0040	1.00	.0141	2.00
F033	.008	6.00	.0035T	8.00	.005T	5.00	.015	4.50
F037	.0092T	16.00	.0041T	13.00	.0061T	14.50	.0176	14.00
F038	.009	13.00	.004	11.00	.006	11.50	.019	18.50
F039	.0099	17.00	.0050	15.00	.0057	9.00	.0168	9.00
F040	.0082	8.00	.0039	9.00	.0055	8.00	.0154	7.00
F043	.008	6.00	.004	11.00	.005	5.00	.017	11.50
F046	.016 EH	21.00	.005	15.00	.007	17.00	.024 VH	21.00
F047	.0085	9.50	.0029	2.00	.0046	2.00	.015	4.50
F055	.009	13.00	.006	17.50	.007	17.00	.021 H	20.00
MEDIAN CONC.	.0090		.0040		.0060		.0170	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	83.50	8.350	10			ICP 5X
F003	104.00	10.400	10			CR/E-ICP (MG/L)
F008	135.50	13.550	10			A.A.-GRAPHITE FURN
F010	149.50	14.950	10			I.C.A.P.
F011	114.50	11.450	10			AA-SE
F013	31.50	6.300	5			ICP DA
F015	77.00	9.625	8			I.C.P.
F016	133.50	16.688	8	VHH		I.C.P. 4X
F020	106.00	10.600	10			I.C.P.
F024	116.50	11.650	10	H VH		I.C.P. 5X
F025	113.00	11.300	10	L H H		I.C.P.
F030	103.50	10.350	10			I.C.P. 5X
F032	16.50	1.650	10	L L L VL	BIASED LOW	ICP 20X
F033	78.50	7.850	10			I.C.P.-O.E.S.
F037	131.00	13.100	10	EH		FURNACE
F038	111.50	11.150	10			I.C.P./G.F.A.A.
F039	99.00	9.900	10			I.C.P. 4X CONC'N
F040	80.00	8.000	10			I.C.P.-M.S.
F043	129.50	12.950	10			I.C.P.-M.S.
F046	194.00	19.400	10	EH H VEH VH	BIASED HIGH	I.C.P. CONC.
F047	40.00	4.000	10		BIASED LOW	I.C.P.-M.S. 1X
F055	190.00	19.000	10	H VHH VH H	BIASED HIGH	FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	16.50	1.650	10	LLLVL	BIASED LOW	ICP 20X
F047	40.00	4.000	10		BIASED LOW	I.C.P.-M.S. 1X
F013	31.50	6.300	5			ICP DA
F033	78.50	7.850	10			I.C.P.-O.E.S.
F040	80.00	8.000	10			I.C.P.-M.S.
F001	83.50	8.350	10			ICP 5X
F015	77.00	9.625	8			I.C.P.
F039	99.00	9.900	10			I.C.P. 4X CONC'N
F030	103.50	10.350	10			I.C.P. 5X
F003	104.00	10.400	10			CR/E-ICP (MG/L)
F020	106.00	10.600	10			I.C.P.
F038	111.50	11.150	10			I.C.P./G.F.A.A.
F025	113.00	11.300	10	LHH		I.C.P.
F011	114.50	11.450	10			AA-SE
F024	116.50	11.650	10	HVH		I.C.P. 5X
F043	129.50	12.950	10			I.C.P.-M.S.
F037	131.00	13.100	10	EH		FURNACE
F008	135.50	13.550	10			A.A.-GRAPHITE FURN
F010	149.50	14.950	10			I.C.A.P.
F016	133.50	16.688	8	VHH		I.C.P. 4X
F055	190.00	19.000	10	HVHHVHH	BIASED HIGH	FLAME A.A.
F046	194.00	19.400	10	EHHVHEVH	BIASED HIGH	I.C.P. CONC.

OVERALL AVERAGE RANK IS 11.081

Chromium

PARAMETER: 25091 Manganese

MG/L

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BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0015 BASIC ACCEPTABLE ERROR= .0015 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.014	6.50	.146	4.00	.105	7.00	.515	10.00	.114	14.50	.0057	8.00
F002	.015	11.00	.163	25.00	.123 H	26.00	.55	22.50	.128 H	26.00		0.00
F003	.0156	13.00	.154	17.00	.110	15.50	.522	15.00	.115	17.00	.0055	6.00
F008	<.02	0.00	.16	22.00	.11	15.50	.55	22.50	.12	22.50	<.02	0.00
F010	.015	11.00	.152	15.00	.107	19.50	.524	16.00	.114	14.50	.006	13.00
F011	.017	23.00	.151	12.50	.111	19.00	.499	5.00	.112	9.50	.007	19.00
F013	<.02	0.00	.152	15.00	.109	12.00	.515	10.00	.112	9.50		0.00
F014	.02 VH	24.00	.16	22.00	.11	15.50	.54	20.00	.12	22.50	<.01	0.00
F015	.016	18.00	.156	19.00	.11	15.50	.527	17.00	.114	14.50	.006	13.00
F016	.016	18.00	.158	20.00	.114	22.50	.541	21.00	.116	18.50	.006	13.00
F020	.0146	9.00	.151	12.50	.107	9.50	.518	12.00	.116	18.50	.007	19.00
F024	.015	11.00	.18 VH	26.00	.12	25.00	.58 H	26.00	.12	22.50	.005	2.50
F025	.016	18.00	.160	22.00	.113	21.00	.552	24.00	.120	22.50	.007	19.00
F030	.016	18.00	.161	24.00	.114	22.50	.554	25.00	.121	25.00	.006	13.00
F032	.0136	4.00	.1322 L	2.00	.0960 L	2.00	.4502 L	1.00	.0941 VL	1.00	.0053	5.00
F033	.014	6.50	.152	15.00	.108	11.00	.52	13.50	.114	14.50	.0057	8.00
F036	.0157	14.00	.1555	18.00	.1111	20.00	.5339	19.00	.1132	12.00	.0062	16.00
F037	-.002W EL	1.00	.132T L	1.00	.093T L	1.00	.514	8.00	.107T	3.00	-.017W EL	1.00
F038	.016	18.00	.15	8.00	.11	15.50	.53	18.00	.11	6.00	.007	19.00
F039	.0134	3.00	.145	3.00	.103	5.00	.494	4.00	.102	2.00	.0052	4.00
F040	.0161	22.00	.150	8.00	.106	8.00	.509	7.00	.113	11.00	.0059	10.00
F043	.013	2.00	.15	8.00	.10	3.50	.50	6.00	.11	6.00	.005	2.50
F044	.014	6.50	.150	8.00	.104	6.00	.485	2.00	.110	6.00	.0057	8.00
F046	.016	18.00	.15	8.00	.11	15.50	.52	13.50	.11	6.00	.007	19.00
F047	.014	6.50	.15	8.00	.10	3.50	.49	3.00	.11	6.00	.0060	13.00
F055	.016	18.00	.150	8.00	.115	24.00	.515	10.00	.118	20.00	.008 H	22.00
MEDIAN CONC.	.0153		.1515		.1100		.5200		.1140		.0060	

PARAMETER: 25091 Manganese

MG/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.0081	16.00	.015 L	3.00	.003	12.00	.011	13.50
F002	.012 VH	23.00	.019	15.00	.019	0.00	.011	13.50
F003	.0080	12.50	.0180	9.00	.0029	7.50	.0107	7.00
F008	<.02	0.00	.02	21.00	<.02	0.00	<.02	0.00
F010	.008	12.50	.019	15.00	.003	12.00	.012	19.00
F011	.007	3.00	.022	24.50	.004	17.00	.013	23.00
F013		0.00		0.00		0.00		0.00
F014	<.01	0.00	.02	21.00	<.01	0.00	.01	4.50
F015	.008	12.50	.019	15.00	.003	12.00	.011	13.50
F016	.009	19.50	.020	21.00	<.005	0.00	.011	13.50
F020	.008	12.50	.0145 L	2.00	.005 H	19.00	.011	13.50
F024	.008	12.50	.020	21.00	.003	12.00	.012	19.00
F025	.009	19.50	.020	21.00	.004	17.00	.013	23.00
F030	.009	19.50	.019	15.00	.004	17.00	.012	19.00
F032	.0072	5.00	.0158	4.00	.0026	3.00	.0099	2.00
F033	.0079	9.00	.018	9.00	.0028T	6.00	.011	13.50
F036	.0092	22.00	.0192	18.00	.0030	12.00	.0120	19.00
F037	-.095W EL	1.00	.014T VL	1.00	<.015T EH	20.00	.003W EL	1.00
F038	.007	3.00	.018	9.00	<.005	0.00	.010	4.50
F039	.0073	6.00	.0172	5.00	.0027	4.00	.0108	8.50
F040	.0082	17.00	.0183	12.00	.0030	12.00	.0109	10.00
F043	.007	3.00	.018	9.00	.002	1.50	.010	4.50
F044	.0078	8.00	.0177	6.00	.0029	7.50	.0108	8.50
F046	.009	19.50	.019	15.00	.003	12.00	.012	19.00
F047	.0077	7.00	.018	9.00	.0027	5.00	.010	4.50
F055	.008	12.50	.022	24.50	.002	1.50	.013	23.00
MEDIAN CONC.	.0080		.0190		.0030		.0110	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	94.50	9.450	10			ICP 5X
F002	162.00	20.250	8	H H VH ^L	BIASED HIGH	25304
F003	119.50	11.950	10		BIASED HIGH	MN/E-ICP (MG/L)
F008	103.50	20.700	5			I.C.A.P.
F010	137.50	13.750	10			I.C.A.P.
F011	155.50	15.550	10			A.A.S.
F013	46.50	11.625	4		INSUFFICIENT DATA	ICP DA
F014	129.50	18.500	7	VH		I.C.P.
F015	150.00	15.000	10			I.C.P.
F016	167.00	18.556	9			I.C.P. 4X
F020	127.50	12.750	10	VH H L H		I.C.P.
F024	177.50	17.750	10		BIASED HIGH	I.C.P. 5X
F025	207.00	20.700	10		BIASED HIGH	I.C.P.
F030	198.00	19.800	10		BIASED HIGH	I.C.P. 5X
F032	29.00	2.900	10	L L L VL	BIASED LOW	ICP 20X
F033	106.00	10.600	10			I.C.P.-O.E.S.
F036	170.00	17.000	10	ELL L ELELVLEHEL	BIASED LOW	I.C.P.-5 GRAPH.
F037	38.00	3.800	10			I.C.P.
F038	101.00	11.222	9		BIASED LOW	I.C.P.
F039	44.50	4.450	10			I.C.P. 4X CONC'N
F040	117.00	11.700	10		BIASED LOW	I.C.P.-M.S.
F043	46.00	4.600	10		BIASED LOW	I.C.P.-E.S.
F044	66.50	6.650	10			I.C.P.-M.S.
F046	145.50	14.550	10			I.C.P. CONC.
F047	65.50	6.550	10			I.C.P.-M.S. 1X
F055	163.50	16.350	10	H		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	29.00	2.900	10	LLLVL	BIASED LOW	ICP 20X
F037	38.00	3.800	10	ELLLELELVLEHEL	BIASED LOW	I.C.P.
F039	44.50	4.450	10		BIASED LOW	I.C.P. 4X CONC'N
F043	46.00	4.600	10		BIASED LOW	I.C.P.-E.S.
F047	65.50	6.550	10			I.C.P.-M.S. 1X
F044	66.50	6.650	10			I.C.P.-M.S.
F001	94.50	9.450	10	L		ICP 5X
F033	106.00	10.600	10			I.C.P.-O.E.S.
F038	101.00	11.222	9		INSUFFICIENT DATA	I.C.P.
F013	46.50	11.625	4			ICP DA
F040	117.00	11.700	10			I.C.P.-M.S.
F003	119.50	11.950	10	LH		MN/E-ICP (MG/L)
F020	127.50	12.750	10			I.C.P.
F010	137.50	13.750	10			I.C.A.P.
F046	145.50	14.550	10			I.C.P. CONC.
F015	150.00	15.000	10			I.C.P.
F011	155.50	15.550	10	H		A.A.S.
F055	163.50	16.350	10			FLAME A.A.
F036	170.00	17.000	10	VHH		I.C.P.-5 GRAPH.
F024	177.50	17.750	10	VH		I.C.P. 5X
F014	129.50	18.500	7			I.C.P.
F016	167.00	18.556	9			I.C.P. 4X
F030	198.00	19.800	10	HHVH	BIASED HIGH	I.C.P. 5X
F002	162.00	20.250	8		BIASED HIGH	25304
F025	207.00	20.700	10		BIASED HIGH	I.C.P.
F008	103.50	20.700	5		BIASED HIGH	I.C.A.P.

OVERALL AVERAGE RANK IS 12.678

Manganese

PARAMETER: 26091 Iron

MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0030 BASIC ACCEPTABLE ERROR= .0030 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.057	5.50	.334	7.00	.247	10.00	2.710	12.00	.940	10.00	.004	2.00
F002	.063	11.50	.245 EL	1.00	.219 L	3.00	1.97 EL	1.00	.942	12.00	.0063	5.00
F003	.064	13.00	.360	20.50	.270	23.00	2.78	16.00	.975	18.50	.0047	3.00
F008	.06	8.50	.35	14.00	.26	19.50	2.78	16.00	.94	10.00	<.02	9.00
F010	.049 VL	1.00	.325	4.00	.229	4.00	2.65	7.00	.898	5.00	.002T VL	1.00
F011	.067	18.00	.333	6.00	.239	6.00	2.690	9.00	.874	3.00	.009	11.50
F013	<.1	0.00	.363	22.00	.266	22.00	2.83	21.00	.975	18.50		0.00
F014	.07	20.00	.36	20.50	.26	19.50	2.9	23.00	.98	20.00	<.01	0.00
F015	.063	11.50	.351	17.00	.253	13.50	2.7	10.50	.918	7.00	<.005	0.00
F016	.071	21.00	.367	23.00	.275	24.00	2.88	22.00	.993	22.00	<.010	0.00
F020	.0657	15.00	.350	14.00	.258	17.00	2.755	13.00	.966	16.00	.007	6.50
F024	.066	16.50	.37	24.00	.31 EH	25.00	3.0	25.00	1.1 VH	25.00	.005	4.00
F025	.057	5.50	.356	19.00	.256	15.00	2.92	24.00	.992	21.00	<.01	0.00
F030	.062	10.00	.355	18.00	.257	16.00	2.82	20.00	.959	14.00	.007	6.50
F032	.0565	4.00	.2969 L	3.00	.2169 L	2.00	2.510	3.00	.7900 VL	1.00	.0073	8.00
F033	.060	8.50	.35	14.00	.26	19.50	2.8	18.50	.97	17.00	.008T	9.00
F036	.0587	7.00	.3360	8.00	.2453	9.00	2.591	5.00	.8892	4.00	.0083	10.00
F037	.066T	16.50	.25 EL	2.00	.17 EL	1.00	2.70	10.50	.95	13.00	.054T EH	15.00
F038	.065	14.00	.35	14.00	.26	19.50	2.76	14.00	.94	10.00	<.030	0.00
F039	.108 EH	24.00	.338	9.00	.253	13.50	2.57	4.00	1.00	24.00	.023 EH	14.00
F043	.050 L	2.00	.33	9.00	.24	7.00	2.6	6.00	.91	6.00	<.007	0.00
F044	.073 H	22.00	.441 EH	25.00	.245	8.00	2.669	8.00	.997	23.00	.010	13.00
F046	.069	19.00	.34	10.50	.25	11.50	2.78	16.00	.96	15.00	<.03	0.00
F047	.054 L	3.00	.35	14.00	.25	11.50	2.8	18.50	.92	8.00	<.005	0.00
F055	.075 H	23.00	.340	10.50	.230	5.00	2.40 L	2.00	.820 L	2.00	.009	11.50
MEDIAN CONC.	.0635		.3500		.2530		2.7550		.9500		.0073	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.011	3.00	.005 L	2.00	.004	3.50	.022	8.50
F002	.014	9.00	.010	8.50	.0052	9.00	.024	14.00
F003	.0136	7.00	.0088	4.00	.0044	5.00	.0230	11.00
F008	<.02	0.00	<.02	0.00	<.02	0.00	.02	6.50
F010	.005 EL	1.00	.003 VL	1.00	.003	2.00	.016 L	5.00
F011	.018	15.50	.013	15.00	.009 H	14.00	.028	22.00
F013		0.00		0.00		0.00		0.00
F014	.01 L	2.00	<.01	0.00	<.01	0.00	.02	6.50
F015	.013	5.00	.011	12.50	<.005	0.00	.022	8.50
F016	.013	5.00	.010	8.50	.010 VH	15.50	.026	20.00
F020	.016	13.50	.007	3.00	.005	7.00	.025	18.00
F024	.013	5.00	.009	5.00	.004	3.50	.024	14.00
F025	<.01 L	0.00	<.01	0.00	<.01	0.00	.010 EL	2.50
F030	.015	10.50	.010	8.50	.005	7.00	.024	14.00
F032	.0138	8.00	.0096	6.00	.0053	10.50	.0227	10.00
F033	.019T H	17.00	.012T	14.00	.007T	12.50	.024T	14.00
F036	.0159	12.00	.0109	11.00	.0053	10.50	.0271	21.00
F037	.037T EH	18.00	.028T EH	17.00	.102W EL	1.00	.009W EL	1.00
F038	<.030	0.00	<.030	0.00	<.030	0.00	<.030	0.00
F039	.015	10.50	.015 H	16.00	.010 VH	15.50	.025	18.00
F043	<.007 VL	0.00	<.007	0.00	<.007	0.00	.010 EL	2.50
F044	.016	13.50	.010	8.50	.005	7.00	.024	14.00
F046	<.03	0.00	<.03	0.00	<.03	0.00	<.03	0.00
F047	<.005 EL	0.00	<.005 L	0.00	<.005	0.00	.013 EL	4.00
F055	.018	15.50	.011	12.50	.007	12.50	.025	18.00
MEDIAN CONC.	.0145		.0100		.0051		.0235	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	63.50	6.350	10			ICP 5X
F002	74.00	7.400	10	ELL EL		26305/04
F003	121.00	12.100	10			FE/E-ICP (MG/L)
F008	74.50	12.417	6			I.C.A.P.
F010	31.00	3.100	10	VL	BIASED LOW	I.C.A.P.
F011	120.00	12.000	10		INSUFFICIENT DATA	A.A.S.
F013	83.50	20.875	4			ICP DA
F014	111.50	15.929	7			I.C.P.
F015	85.50	10.688	8			I.C.P.
F016	161.00	17.889	9		BIASED HIGH	I.C.P. 4X
F020	123.00	12.300	10			I.C.P.
F024	147.00	14.700	10	EH VH		I.C.P. 5X
F025	87.00	14.500	6			I.C.P.
F030	124.50	12.450	10			I.C.P. 5X
F032	55.50	5.550	10	L L VL	BIASED LOW	ICP 20X
F033	144.00	14.400	10			I.C.P.-O.E.S.
F036	97.50	9.750	10			I.C.P.-5 GRAPH.
F037	95.00	9.500	10	ELEL		I.C.P.
F038	71.50	14.300	5			I.C.P.
F039	148.50	14.850	10	EH	BIASED LOW	I.C.P. 4X CONC'N
F043	28.50	4.750	6	L		I.C.P.-E.S.
F044	142.00	14.200	10	H EH		I.C.P.-M.S.
F046	72.00	14.400	5			I.C.P. CONC.
F047	59.00	9.833	6	L		I.C.P.-M.S. 1X
F055	112.50	11.250	10	H L L		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F010	31.00	3.100	10	VLVLELVLL	BIASED LOW	I.C.A.P.
F043	28.50	4.750	6	LVLEL	BIASED LOW	I.C.P.-E.S.
F032	55.50	5.550	10	LLVL	BIASED LOW	ICP 20X
F001	63.50	6.350	10	L		ICP 5X
F002	74.00	7.400	10	ELEL		26305/04
F037	95.00	9.500	10	ELELEHEHEHELEL		I.C.P.
F036	97.50	9.750	10			I.C.P.-5 GRAPH.
F047	59.00	9.833	6	LELEL		I.C.P.-M.S. 1X
F015	85.50	10.688	8			I.C.P.
F055	112.50	11.250	10	HLL		FLAME A.A.
F011	120.00	12.000	10	H		A.A.S.
F003	121.00	12.100	10			FE/E-ICP (MG/L)
F020	123.00	12.300	10			I.C.P.
F008	74.50	12.417	6			I.C.A.P.
F030	124.50	12.450	10			I.C.P. 5X
F044	142.00	14.200	10	HEH		I.C.P.-M.S.
F038	71.50	14.300	5			I.C.P.
F033	144.00	14.400	10	H		I.C.P.-O.E.S.
F046	72.00	14.400	5			I.C.P. CONC.
F025	87.00	14.500	6	LEL		I.C.P.
F024	147.00	14.700	10	EHVH		I.C.P. 5X
F024	147.00	14.700	10	EHEHVH		I.C.P. 4X CONC'N
F039	148.50	14.850	10	L		I.C.P.
F014	111.50	15.929	7			I.C.P.
F016	161.00	17.889	9	VH	BIASED HIGH	I.C.P. 4X
F013	83.50	20.875	4		INSUFFICIENT DATA	ICP DA

OVERALL AVERAGE RANK IS 11.476

Iron

PARAMETER: 27091 Cobalt

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.053	5.00	.052	4.00	.099	5.00	.187	6.00	.135	11.50	.005	10.00
F003	.056	13.00	.053	7.00	.103	12.00	.188	7.50	.132	8.00	.0045	3.50
F008	.052	3.00	.050	2.00	.096	3.00	.18	2.50	.13	4.50	.006	15.00
F010	.058	17.50	.057	19.00	.103	12.00	.190	11.50	.133	9.00	.008 H	18.00
F011	.058	17.50	.052	4.00	.111	20.00	.192	15.00	.136	14.00	.007	17.00
F015	.055	10.00	.054	9.50	.103	12.00	.184	4.00	.13	4.50	<.005	0.00
F016	.056	13.00	.053	7.00	.104	15.00	.193	16.00	.134	10.00	<.012	0.00
F020	.0545	8.00	.0546	12.00	.101	8.50	.190	11.50	.136	14.00	.005	10.00
F024	.057	16.00	.052	4.00	.10	6.50	.20	19.50	.14	18.50	.005	10.00
F025	.054	6.00	.054	9.50	.101	8.50	.189	9.00	.135	11.50	<.003	0.00
F030	.056	13.00	.055	13.50	.106	16.50	.198	18.00	.140	18.50	.005	10.00
F032	.0518	1.00	.0454 L	1.00	.0881 L	1.00	.1681 L	1.00	.1110 VL	1.00	.0042	2.00
F033	.052	3.00	.056	16.00	.106	16.50	.195	17.00	.139	16.00	.0045T	3.50
F036	.0564	15.00	.0542	11.00	.1031	14.00	.1904	14.00	.1293	2.00	.0051	13.00
F038	.061	20.00	.061	21.00	.10	6.50	.19	11.50	.14	18.50	.006	15.00
F039	.0544	7.00	.0567	18.00	.0986	4.00	.185	5.00	.131	7.00	.0047	6.00
F043	.059	19.00	.056	16.00	.11	18.50	.20	19.50	.14	18.50	.005	10.00
F044	.055	10.00	.055	13.50	.102	10.00	.188	7.50	.136	14.00	.0049	7.00
F046	.055	10.00	.056	16.00	.11	18.50	.19	11.50	.13	4.50	.006	15.00
F047	.052	3.00	.053	7.00	.093	2.00	.18	2.50	.13	4.50	.0046	5.00
F055	.064 H	21.00	.060	20.00	.130 EH	21.00	.240 EH	21.00	.156 H	21.00	.004	1.00
MEDIAN CONC.	.0550		.0542		.1030		.1900		.1350		.0050	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.008	11.00	.0105	3.00	.019	10.00	.003	3.00
F003	.0073	4.00	.0119	5.00	.0176	4.00	.0033	5.00
F008	.009	17.00	.012	7.50	.019	10.00	<.005	0.00
F010	.012 VH	20.00	.015	20.00	.020	15.50	.005	15.50
F011	.009	17.00	.013	13.00	.020	15.50	.004	12.50
F015	.009	17.00	.013	13.00	.018	5.50	<.005	0.00
F016	<.012	0.00	.012	7.50	.019	10.00	<.012	0.00
F020	.008	11.00	.010	2.00	.019	10.00	.004	12.50
F024	.008	11.00	.013	13.00	.020	15.50	.003	3.00
F025	.003 VL	1.00	.006 EL	1.00	.016	1.50	<.003	0.00
F030	.007	2.50	.012	7.50	.016	1.50	.003	3.00
F032	.0070	2.50	.0115	4.00	.0170	3.00	.0039	9.50
F033	.0075	5.00	.012	7.50	.019	10.00	.0035T	6.00
F036	.0078	8.00	.0131	16.00	.0196	13.00	.0038	8.00
F038	.009	17.00	.015	20.00	.022	19.50	.004	12.50
F039	.0081	14.00	.0133	17.00	.0203	18.00	.0066 H	17.00
F043	.008	11.00	.013	13.00	.020	15.50	.004	12.50
F044	.0077	7.00	.0127	7.00	.0189	7.00	.0037	7.00
F046	.009	17.00	.015	20.00	.023 H	21.00	.005	15.50
F047	.0076	6.00	.013	13.00	.018	5.50	.0039	9.50
F055	.008	11.00	.014	18.00	.022	19.50	.002	1.00
MEDIAN CONC.	.0080		.0130		.0190		.0039	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	68.50	6.850	10			ICP 5X
F003	69.00	6.900	10			CO/E-ICP (MG/L)
F008	64.50	7.167	9			A.A.-GRAPHITE FURN
F010	158.00	15.800	10	H VH		I.C.A.P.
F011	145.50	14.550	10			AA-SE
F015	75.50	9.438	8			I.C.P.
F016	78.50	11.214	7			I.C.P. 4X
F020	99.50	9.950	10			I.C.P./GFAA 16,17,
F024	117.00	11.700	10			I.C.P. 5X
F025	48.00	6.000	8	VLEL		SOLVENT ENT'N A.A.
F030	104.00	10.400	10			I.C.P. 5X
F032	26.00	2.600	10	L L L VL	BIASED LOW	ICP 20X
F033	100.50	10.050	10			I.C.P.-O.E.S.
F036	114.00	11.400	10			I.C.P. ONLY
F038	161.50	16.150	10			I.C.P./G.F.A.A.
F039	113.00	11.300	10		H	I.C.P. 4X CONC'N
F043	153.50	15.350	10			I.C.P.-M.S.
F044	93.00	9.300	10		H	I.C.P.-M.S.
F046	149.00	14.900	10			I.C.P. CONC.
F047	58.00	5.800	10			I.C.P.-M.S. 1X
F055	154.50	15.450	10	H EHEHH		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	26.00	2.600	10	LLLVL	BIASED LOW	ICP 20X
F047	58.00	5.800	10			I.C.P.-M.S. 1X
F025	48.00	6.000	8	VLEL		SOLVENT ENT'N A.A.
F001	68.50	6.850	10			ICP 5X
F003	69.00	6.900	10			CO/E-ICP (MG/L)
F008	64.50	7.167	9			A.A.-GRAPHITE FURN
F044	93.00	9.300	10			I.C.P.-M.S.
F015	75.50	9.438	8			I.C.P.
F020	99.50	9.950	10			I.C.P./GFAA 16,17,
F033	100.50	10.050	10			I.C.P.-O.E.S.
F030	104.00	10.400	10			I.C.P. 5X
F016	78.50	11.214	7			I.C.P. 4X
F039	113.00	11.300	10	H		I.C.P. 4X CONC'N
F036	114.00	11.400	10			I.C.P. ONLY
F024	117.00	11.700	10			I.C.P. 5X
F011	145.50	14.550	10			AA-SE
F046	149.00	14.900	10	H		I.C.P. CONC.
F043	153.50	15.350	10			I.C.P.-M.S.
F055	154.50	15.450	10	HEHEHH		FLAME A.A.
F010	158.00	15.800	10	HVH		I.C.A.P.
F038	161.50	16.150	10			I.C.P./G.F.A.A.
OVERALL AVERAGE RANK IS		10.649				Cobalt

PARAMETER: 28091 Nickel

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.066	4.50	.081	4.50	.166	3.00	.477	6.00	.181	7.00	.006	8.50
F002	.069	9.50	.083	10.50	.18	15.50	.49	14.50	.20	20.50	.0063	14.00
F003	.070	13.50	.082	7.00	.180	15.50	.491	16.50	.179	4.00	.0055	2.00
F008	.070	13.50	.080	2.50	.17	5.50	.48	9.00	.18	5.50	.006	8.50
F010	.070	13.50	.083	10.50	.171	7.00	.488	13.00	.186	8.50	.007	16.50
F011	.071	17.50	.083	10.50	.169	4.00	.452	3.00	.168 L	2.00	.006	8.50
F013	.070	13.50	.083	10.50	.180	15.50	.485	12.00	.187	10.50	.006	8.50
F014	.07	13.50	.09	21.00	.18	15.50	.52	23.50	.20	20.50	.02 EH	22.00
F015	.06 L	1.00	.08	2.50	.17	5.50	.47	4.00	.18	5.50	<.02	0.00
F016	.068	7.00	.088	17.50	.186	20.00	.518	21.00	.195	16.00	<.010	0.00
F020	.070	13.50	.085	13.00	.175	9.00	.491	16.50	.196	17.00	.007	16.50
F024	.068	7.00	.087	15.50	.19	23.00	.52	23.50	.20	20.50	.006	8.50
F025	.074	19.50	.101 VH	24.00	.184	19.00	.512	20.00	.206	24.00	.006	8.50
F030	.068	7.00	.107 EH	25.00	.190	23.00	.522	25.00	.198	18.00	.008	20.00
F032	.0638	2.00	.0703 L	1.00	.1504 L	2.00	.4294 L	1.00	.1555 VL	1.00	.0058	4.00
F033	.066	4.50	.082	7.00	.177	10.50	.48	9.00	.187	10.50	.006	8.50
F036	.0748	21.00	.0933	23.00	.1878	21.00	.5199	22.00	.2006	23.00	.0061	13.00
F038	.074	19.50	.088	17.50	.18	15.50	.48	9.00	.19	13.50	.006	8.50
F039	.069	9.50	.082	7.00	.172	8.00	.471	5.00	.186	8.50	.007	16.50
F040	.0751	22.00	.0865	14.00	.179	12.00	.494	18.00	.193	15.00	.0079	19.00
F043	.076	23.50	.089	19.00	.19	23.00	.48	9.00	.20	20.50	.006	8.50
F044	.071	17.50	.087	15.50	.177	10.50	.480	9.00	.189	12.00	.0057	3.00
F046	.076	23.50	.090	21.00	.18	15.50	.49	14.50	.19	13.50	.007	16.50
F047	.064	3.00	.081	4.50	.15 VL	1.00	.44	2.00	.17	3.00	.0050	1.00
F055	.080 H	25.00	.090	21.00	.200 H	25.00	.510	19.00	.220 H	25.00	.010 VH	21.00
MEDIAN CONC.	.0700		.0850		.1800		.4880		.1900		.0060	

PARAMETER: 28091 Nickel

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.008	9.50	.008	3.00	.004	12.00	.019	13.00
F002	.0093	16.00	.010	12.00	.0036	11.00	.0184	10.00
F003	.0077	4.00	.0086	5.00	.0028	3.00	.0166	3.00
F008	.008	9.50	.010	12.00	<.005	0.00	.017	5.00
F010	.010	18.00	.011	17.50	.005	14.50	.019	13.00
F011	.009	14.50	.011	17.50	.003	6.50	.020	16.50
F013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F014	.02 EH	22.00	.02 EH	23.00	.02 EH	17.00	.03 EH	23.00
F015	<.02	0.00	<.02	0.00	<.02	0.00	<.02	0.00
F016	<.010	0.00	.011	17.50	<.010	0.00	.020	16.50
F020	.009	14.50	.006 L	1.50	<.005	0.00	.019	13.00
F024	.008	9.50	.010	12.00	.003	6.50	.020	16.50
F025	.007	2.00	.006 L	1.50	.010 EH	16.00	.016	2.00
F030	.013 VH	21.00	.012	20.00	<.002	0.00	.022	20.50
F032	.0071	3.00	.0094	6.00	.0031	9.00	.0157	1.00
F033	.008	9.50	.010	12.00	.003T	6.50	.018	7.50
F036	.0080	9.50	.0099	7.50	.0034	10.00	.0185	11.00
F038	.008	9.50	.010	12.00	.003	6.50	.017	5.00
F039	.008	9.50	.015 VH	22.00	<.006	0.00	.022	20.50
F040	.0105	20.00	.0127	21.00	.0045	13.00	.0219	19.00
F043	.008	9.50	.010	12.00	.002	1.00	.018	7.50
F044	.0078	5.00	.0099	7.50	.0029	4.00	.0181	9.00
F046	.010	18.00	.011	17.50	.005	14.50	.023 H	22.00
F047	.0068	1.00	.0082	4.00	.0027	2.00	.017	5.00
F055	.010	18.00	.010	12.00	<.005	0.00	.020	16.50
MEDIAN								
CONC.	.0080		.0100		.0031		.0190	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	71.00	7.100	10			ICP 5X
F002	133.50	13.350	10			28302/01
F003	73.50	7.350	10			NI/E-ICP (MG/L)
F008	71.00	7.889	9			A.A.-GRAPHITE FURN
F010	132.00	13.200	10			I.C.A.P.
F011	100.50	10.050	10			AA-SE
F013	62.00	12.400	5	L		ICP DA
F014	201.00	20.100	10			I.C.P.
F015	18.50	3.700	5	L		I.C.P.
F016	115.50	16.500	7			I.C.P. 4X
F020	114.50	12.722	9			I.C.P./GFAA 16-20
F024	142.50	14.250	10			I.C.P. 5X
F025	136.50	13.650	10			SOLVENT ENT'N A.A.
F030	179.50	19.944	9	VH EH		I.C.P. 5X
F032	30.00	3.000	10	L L L VL		ICP 20X
F033	85.50	8.550	10			I.C.P.-O.E.S.
F036	161.00	16.100	10			I.C.P.-5 GRAPH.
F038	116.50	11.650	10			I.C.P./G.F.A.A.
F039	106.50	11.833	9			I.C.P. 4X CONC'N
F040	173.00	17.300	10	VH		I.C.P.-M.S.
F043	133.50	13.350	10			I.C.P.-M.S.
F044	93.00	9.300	10			I.C.P.-M.S.
F046	176.50	17.650	10			I.C.P. CONC.
F047	26.50	2.650	10			I.C.P.-M.S. 1X
F055	182.50	20.278	9	H VL H H H VH		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F047	26.50	2.650	10	VL	BIASED LOW	I.C.P.-M.S. 1X
F032	30.00	3.000	10	LLVL	BIASED LOW	ICP 20X
F015	18.50	3.700	5	L	BIASED LOW	I.C.P.
F001	71.00	7.100	10			ICP 5X
F003	73.50	7.350	10			NI/E-ICP (MG/L)
F008	71.00	7.889	9			A.A.-GRAPHITE FURN
F033	85.50	8.550	10			I.C.P.-O.E.S.
F044	93.00	9.300	10			I.C.P.-M.S.
F011	100.50	10.050	10	L		AA-SE
F038	116.50	11.650	10			I.C.P./G.F.A.A.
F039	106.50	11.833	9	VH		I.C.P. 4X CONC'N
F013	62.00	12.400	5			ICP DA
F020	114.50	12.722	9	L		I.C.P./GFAA 16-20
F010	132.00	13.200	10			I.C.A.P.
F002	133.50	13.350	10			28302/01
F043	133.50	13.350	10			I.C.P.-M.S.
F025	136.50	13.650	10			SOLVENT ENT'N A.A.
F024	142.50	14.250	10	VHLEH		I.C.P. 5X
F036	161.00	16.100	10			I.C.P.-5 GRAPH.
F016	115.50	16.500	7			I.C.P. 4X
F040	173.00	17.300	10			I.C.P.-M.S.
F046	176.50	17.650	10	H		I.C.P. CONC.
F030	179.50	19.944	9	EHVH	BIASED HIGH	I.C.P. 5X
F014	201.00	20.100	10	EHEHEHEH	BIASED HIGH	I.C.P.
F055	182.50	20.278	9	HHVH	BIASED HIGH	FLAME A.A.

OVERALL AVERAGE RANK IS 12.224

Nickel

PARAMETER: 29091 Copper

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.024	7.00	.134	3.50	.123	4.00	.457	7.00	.249	5.00	.007	13.50
F002	.0255	13.00	.153	20.00	.125	8.00	.462	10.50	.263	17.00	.0076	16.00
F003	.025	10.00	.145	10.50	.136	24.00	.480	20.00	.255	10.50	.0068	11.00
F008	.03	23.00	.15	15.50	.13	15.50	.48	20.00	.26	14.00	<.01	0.00
F010	.025	10.00	.134	3.50	.122	2.00	.455	6.00	.235	2.00	.008	17.50
F011	.028	20.50	.179 VH	25.00	.201 EH	25.00	.502	24.00	.297 H	25.00	.006	4.00
F013	.027	17.50	.154	21.00	.131	20.00	.476	17.00	.270	20.50		0.00
F014	.03	23.00	.16	23.50	.13	15.50	.48	20.00	.28	23.00	.03 EH	23.00
F015	.026	14.50	.147	12.00	.132	21.00	.475	15.50	.252	8.50	.007	13.50
F016	.030	23.00	.151	18.50	.133	22.50	.487	23.00	.264	18.50	<.010	0.00
F020	.025	10.00	.149	13.00	.127	9.00	.464	12.00	.264	18.50	.009	20.50
F024	.023	4.50	.14	6.50	.13	15.50	.48	20.00	.26	14.00	.005	2.00
F025	.027	17.50	.151	18.50	.128	10.00	.475	15.50	.262	16.00	.006	4.00
F030	.027	17.50	.155	22.00	.133	22.50	.515	25.00	.272	22.00	.007	13.50
F032	.0225	3.00	.1210 VL	2.00	.1057 VL	1.00	.3951 VL	1.00	.2042 EL	1.00	.0067	9.00
F033	.023	4.50	.140	6.50	.124	7.00	.46	9.00	.25	6.50	.0067	9.00
F036	.0235	6.00	.1427	9.00	.1232	6.00	.4580	8.00	.2456	4.00	.0066	7.00
F037	.015T EL	1.00	.269 EH	26.00	.277 EH	26.00	.557 VH	26.00	.478 EH	26.00	-.014W EL	1.00
F038	.026	14.50	.15	15.50	.13	15.50	.47	13.50	.26	14.00	.008	17.50
F039	.025	10.00	.145	10.50	.123	4.00	.447	3.50	.252	8.50	.006	4.00
F040	.0304 H	25.00	.0148 EL	1.00	.129	11.00	.462	10.50	.255	10.50	.0089	19.00
F043	.028	20.50	.16	23.50	.13	15.50	.45	5.00	.27	20.50	.007	13.50
F044	.025	10.00	.150	15.50	.123	4.00	.447	3.50	.257	12.00	.0067	9.00
F046	.035 EH	26.00	.14	6.50	.13	15.50	.47	13.50	.25	6.50	.010 H	22.00
F047	.022	2.00	.14	6.50	.13	15.50	.43	2.00	.24	3.00	.0061	6.00
F055	.027	17.50	.150	15.50	.130	15.50	.480	20.00	.290 H	24.00	.009	20.50
MEDIAN CONC.	.0257		.1495		.1300		.4700		.2600		.0070	

PARAMETER: 29091 Copper

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.009	11.00	.021 VL	1.00	.007	10.00	.013	8.00
F002	.0093	15.00	.029	17.50	.0077	13.00	.015	17.00
F003	.0088	7.00	.0256	6.00	.0065	6.00	.0132	10.00
F008	<.01	0.00	.03	19.50	<.01	0.00	.01 L	1.00
F010	.010	17.50	.027	11.00	.008	15.50	.014	13.00
F011	.009	11.00	.028	14.00	.007	10.00	.015	17.00
F013		0.00		0.00		0.00		0.00
F014	.03 EH	24.00	.04 EH	24.00	.02 EH	22.00	.04 EH	24.00
F015	.01	17.50	.028	14.00	.006	3.00	.012	3.00
F016	.010	17.50	.028	14.00	<.010	0.00	.014	13.00
F020	.009	11.00	.022 L	2.00	.008	15.50	.015	17.00
F024	.007	3.00	.026	7.50	.006	3.00	.012	3.00
F025	.007	3.00	.028	14.00	.008	15.50	.013	8.00
F030	.009	11.00	.025	4.50	.005	1.00	.012	3.00
F032	.0077	5.00	.0229 L	3.00	.0063	5.00	.0123	5.00
F033	.0092	14.00	.026	7.50	.0069	7.50	.013	8.00
F036	.0084	6.00	.0264	10.00	.0073	12.00	.0129	6.00
F037	-.017W EL	1.00	.220 EH	25.00	.084 EH	23.00	.082 EH	25.00
F038	.016 EH	23.00	.030	19.50	.008	15.50	.014	13.00
F039	.007	3.00	.025	4.50	.006	3.00	.015	17.00
F040	.0103	20.00	.0314	22.00	.0087	18.00	.0160	20.50
F043	.009	11.00	.028	14.00	.007	10.00	.015	17.00
F044	.0089	8.00	.0261	9.00	.0069	7.50	.0139	11.00
F046	.011	21.00	.031	21.00	.009	19.50	.016	20.50
F047	.010	17.50	.029	17.50	.011 H	21.00	.022 EH	22.50
F055	.015 EH	22.00	.032	23.00	.009	19.50	.022 EH	22.50
MEDIAN CONC.	.0090		.0280		.0073		.0140	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	70.00	7.000	10	VL		ICP 5X
F002	147.00	14.700	10			29305/06
F003	115.00	11.500	10			CU/E-ICP (MG/L)
F008	108.50	15.500	7			I.C.A.P.
F010	98.00	9.800	10			I.C.A.P.
F011	175.50	17.550	10	VHEH H		AA-SE
F013	96.00	19.200	5		BIASED HIGH	ICP DA
F014	222.00	22.200	10	EHEHEHEHEH		I.C.P.
F015	122.50	12.250	10			I.C.P.
F016	150.00	18.750	8			I.C.P. 4X
F020	128.50	12.850	10	L		I.C.P.
F024	79.00	7.900	10			I.C.P. 5X
F025	122.00	14.200	10			SOLVENT ENT'N A.A.
F030	142.00	14.200	10	VLVLVLEL L	BIASED LOW	I.C.P. 5X
F032	35.00	3.500	10			ICP 20X
F033	79.50	7.950	10			I.C.P.-O.E.S.
F036	74.00	7.400	10			I.C.P.-5 GRAPH.
F037	180.00	18.000	10	ELEHEHVHEHELELEHEHEH		I.C.P.
F038	161.50	16.150	10	EH		I.C.P./G.F.A.A.
F039	68.00	6.800	10	H EL		I.C.P. 4X CONC'N
F040	157.50	15.750	10			I.C.P.-M.S.
F043	150.50	15.050	10			I.C.P.-M.S.
F044	89.50	8.950	10			I.C.P.-M.S.
F046	172.00	17.200	10	EH H H EH		I.C.P. CONC.
F047	113.50	11.350	10		BIASED HIGH	I.C.P.-M.S. 1X
F055	200.00	20.000	10	H EH EH EH		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	35.00	3.500	10	VLVLVLELL	BIASED LOW	ICP 20X
F039	68.00	6.800	10	VL		I.C.P. 4X CONC'N
F001	70.00	7.000	10			ICP 5X
F036	74.00	7.400	10			I.C.P.-5 GRAPH.
F024	79.00	7.900	10			I.C.P. 5X
F033	79.50	7.950	10			I.C.P.-O.E.S.
F044	89.50	8.950	10			I.C.P.-M.S.
F010	98.00	9.800	10	HEH		I.C.A.P.
F047	113.50	11.350	10			I.C.P.-M.S. 1X
F003	115.00	11.500	10			CU/E-ICP (MG/L)
F025	122.00	12.200	10			SOLVENT ENT'N A.A.
F015	122.50	12.250	10			I.C.P.
F020	128.50	12.850	10	L		I.C.P.
F030	142.00	14.200	10			I.C.P. 5X
F002	147.00	14.700	10			29305/06
F043	150.50	15.050	10			I.C.P.-M.S.
F008	108.50	15.500	7	L		I.C.A.P.
F040	157.50	15.750	10	HEL		I.C.P.-M.S.
F038	161.50	16.150	10	EH		I.C.P./G.F.A.A.
F046	172.00	17.200	10	EHH		I.C.P. CONC.
F011	175.50	17.550	10	VHEHH		AA-SE
F037	180.00	18.000	10	ELEHEHVHEHELELEHEHEH		I.C.P.
F016	150.00	18.750	8			I.C.P. 4X
F013	96.00	19.200	5		BIASED HIGH	ICP DA
F055	200.00	20.000	10	HEHEH	BIASED HIGH	FLAME A.A.
F014	222.00	22.200	10	EHEHEHEHEH		I.C.P.

OVERALL AVERAGE RANK IS 13.028

Copper

PARAMETER: 30091 Zinc

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.027	5.50	.171	5.00	.092	7.00	.487	9.00	.113	10.00	.007	7.50
F002	.027	5.50	.177	8.00	.091	5.00	.48	7.00	.11	6.00		0.00
F003	.029	17.00	.185	19.00	.100	21.00	.510	18.50	.117	16.50	.0071	10.50
F008	.03	21.00	.18	12.50	.10	21.00	.51	18.50	.12	21.00	<.01	0.00
F010	.028	10.50	.176	6.50	.094	10.00	.492	13.00	.113	10.00	.008	13.50
F011	.030	21.00	.170	3.00	.086	2.50	.453	3.00	.115	14.50	.007	7.50
F013	.029	17.00	.184	18.00	.095	13.00	.504	16.00	.115	14.50		0.00
F014	.03	21.00	.19	21.00	.10	21.00	.52	22.00	.12	21.00	.01 H	18.00
F015	.029	17.00	.176	6.50	.092	7.00	.477	6.00	.109	4.00	.007	7.50
F016	.028	10.50	.187	20.00	.098	17.50	.516	20.00	.118	18.50	<.010	0.00
F020	.0273	7.00	.180	12.50	.095	13.00	.500	14.50	.118	18.50	.009	16.00
F024	.028	10.50	.20 H	24.00	.10	21.00	.53	24.50	.12	21.00	.006	2.50
F025	.025	1.50	.178	9.00	.092	7.00	.491	12.00	.112	8.00	.006	2.50
F030	.028	10.50	.191	22.00	.098	17.50	.530	24.50	.117	16.50	.007	7.50
F032	.0267	4.00	.1547 L	1.00	.0820 L	1.00	.4407 L	1.00	.0963 L	1.00	.0071	10.50
F033	.026	3.00	.183	17.00	.097	15.00	.50	14.50	.121	23.00	.0073	12.00
F036	.0281	14.00	.1800	12.50	.0971	16.00	.5181	21.00	.1144	13.00	.0121 VH	20.00
F037	.057 EH	25.00	.228 EH	25.00	.132 EH	25.00	.528	23.00	.176 EH	26.00	.042 EH	22.00
F038	.029	17.00	.18	12.50	.094	10.00	.49	10.50	.11	6.00	.008	13.50
F039	.0301	23.00	.170	3.00	.0870	4.00	.461	4.00	.107	3.00	.0068	4.50
F040	.120 EH	26.00	.197	23.00	.104	24.00	.508	17.00	.123	24.00	.0182 EH	21.00
F043	.040 EH	24.00	.28 EH	26.00	.14 EH	26.00	.45	2.00	.17 EH	25.00	.009	16.00
F044	.028	10.50	.182	16.00	.094	10.00	.482	8.00	.113	10.00	.0068	4.50
F046	.028	10.50	.18	12.50	.095	13.00	.49	10.50	.11	6.00	.011 VH	19.00
F047	.025	1.50	.17	3.00	.086	2.50	.47	5.00	.10 L	2.00	.0053	1.00
F055	.029	17.00	.180	12.50	.100	21.00	.610 EH	26.00	.114	12.00	.009	16.00
MEDIAN CONC.	.0281		.1800		.0950		.4960		.1147		.0072	

PARAMETER: 30091 Zinc

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.005	10.50	.006	3.00	.014	15.00	.024	9.00
F002		0.00		0.00	.014	15.00	.023	4.50
F003	.0054	12.50	.0076	11.00	.0134	12.00	.0237	7.00
F008	<.01	0.00	<.01	0.00	.01 L	2.50	.02 L	1.00
F010	.006	16.50	.008	14.50	.014	15.00	.026	17.00
F011	.004	4.50	.006	3.00	.013	9.50	.028	20.00
F013		0.00		0.00		0.00		0.00
F014	.004	4.50	.010	19.00	.014	15.00	.029	22.00
F015	.005	10.50	.008	14.50	.013	9.50	.025	13.50
F016	<.010	0.00	<.010	0.00	.014	15.00	.026	17.00
F020	.006	16.50	.006	3.00	.015	20.50	.025	13.50
F024	.003	2.00	.007	8.00	.010 L	2.50	.024	9.00
F025	.004	4.50	.004 L	1.00	.015	20.50	.028	20.00
F030	.004	4.50	.008	14.50	.005 EL	1.00	.028	20.00
F032	.0048	8.00	.0056	7.00	.0124	6.00	.0221	3.00
F033	.0055	14.00	.0078	12.00	.013	9.50	.024	9.00
F036	.0044	7.00	.0064	6.00	.0101 L	4.00	.0230	4.50
F037	.058 EH	21.00	.068 EH	21.00	.045 EH	25.00	.052 EH	24.00
F038	.006	16.50	.008	14.50	.015	20.50	.025	13.50
F039	.0049	9.00	.0075	10.00	.0143	18.00	.0246	11.00
F040	.0154 EH	20.00	.0207 EH	20.00	.0310 EH	24.00	.0537 EH	25.00
F043	.006	16.50	.009	17.50	.019 VH	23.00	.036 EH	23.00
F044	.0054	12.50	.0072	9.00	.0126	7.00	.0232	6.00
F046	<.01	0.00	<.01	0.00	.013	9.50	.025	13.50
F047	.0021 L	1.00	.0063	5.00	.011	5.00	.022	2.00
F055	.007	19.00	.009	17.50	.015	20.50	.026	17.00
MEDIAN CONC.	.0050		.0076		.0140		.0250	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	81.50	8.150	10			ICP 5X
F002	51.00	7.286	7			30304
F003	145.00	14.500	10			ZN/E-ICP (MG/L)
F008	97.50	13.929	7	L L		I.C.A.P.
F010	126.50	12.650	10			I.C.A.P.
F011	88.50	8.850	10			AA-SE
F013	78.50	15.700	5			ICP DA
F014	184.50	18.450	10	H		I.C.P. & G.F
F015	96.00	9.600	10			I.C.P.
F016	118.50	16.929	7			I.C.P. 4X
F020	135.00	13.500	10			I.C.P.
F024	125.00	12.500	10	H		I.C.P. 5X
F025	86.00	8.600	10	L		SOLVENT ENT'N A.A.
F030	138.50	13.850	10	L EL		I.C.P. 5X
F032	42.50	4.250	10	L L L L	BIASED LOW	ICP 20X
F033	129.00	12.900	10			I.C.P.-O.E.S.
F036	118.00	11.800	10	VH L		I.C.P.-5 GRAPH.
F037	237.00	23.700	10	EHEHEH EHEHEHEHEH	BIASED HIGH	I.C.P.
F038	134.50	13.450	10			I.C.P.
F039	89.50	8.950	10			I.C.P. 4X CONC'N
F040	224.00	22.400	10	EH EHEHEHEHEH	BIASED HIGH	I.C.P.-M.S.
F043	199.00	19.900	10	EHEHEH EH VHEH	BIASED HIGH	I.C.P.-M.S.
F044	93.50	9.350	10			I.C.P.-M.S.
F046	94.50	11.813	8			I.C.P. CONC.
F047	28.00	2.800	10	L VH L		I.C.P.-M.S. 1X
F055	178.50	17.850	10	EH	BIASED LOW	FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F047	28.00	2.800	10	LL	BIASED LOW	I.C.P.-M.S. 1X
F032	42.50	4.250	10	LLLL	BIASED LOW	ICP 20X
F002	51.00	7.286	7			30304
F001	81.50	8.150	10			ICP 5X
F025	86.00	8.600	10	L		SOLVENT ENT'N A.A.
F011	88.50	8.850	10			AA-SE
F039	89.50	8.950	10			I.C.P. 4X CONC'N
F044	93.50	9.350	10			I.C.P.-M.S.
F015	96.00	9.600	10			I.C.P.
F036	118.00	11.800	10	VHL		I.C.P.-5 GRAPH.
F046	94.50	11.813	8	VH		I.C.P. CONC.
F024	125.00	12.500	10	HL		I.C.P. 5X
F010	126.50	12.650	10			I.C.A.P.
F033	129.00	12.900	10			I.C.P.-O.E.S.
F038	134.50	13.450	10			I.C.P.
F020	135.00	13.500	10			I.C.P.
F030	138.50	13.850	10	EL		I.C.P. 5X
F008	97.50	13.929	7	LL		I.C.A.P.
F003	145.00	14.500	10			ZN/E-ICP (MG/L)
F013	78.50	15.700	5			ICP DA
F016	118.50	16.929	7			I.C.P. 4X
F055	178.50	17.850	10	EH	BIASED HIGH	FLAME A.A.
F014	184.50	18.450	10	H		I.C.P. & G.F
F043	199.00	19.900	10	EHEHEHEHVHEH	BIASED HIGH	I.C.P.-M.S.
F040	224.00	22.400	10	EHEHEHEHEHEH	BIASED HIGH	I.C.P.-M.S.
F037	237.00	23.700	10	EHEHEHEHEHEHEHEH	BIASED HIGH	I.C.P.

OVERALL AVERAGE RANK IS 12.787

Zinc

PARAMETER: 38091 Strontium

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0015 BASIC ACCEPTABLE ERROR= .0015 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F003	.160	14.00	.054	14.00	.290	12.00	.673	11.00	.0463	11.00	.166	9.50
F010	.13 L	1.00	.03 EL	1.00	.25 L	2.50	.63	3.00	.05	15.00	.15	1.50
F015	.147	8.00	.046	4.00	.28	9.00	.664	7.00	.041	2.50	.164	8.00
F016	.155	13.00	.052	11.50	.297	15.00	.715	15.00	.044	6.50	.178	15.00
F020	.141	7.00	.049	7.00	.269	4.00	.651	5.00	.049	14.00	.163	7.00
F024	.17 H	16.00	.057 H	15.50	.31 H	16.00	.74 H	16.00	.051 H	16.00	.18	16.00
F025	.17	12.00	.052	11.50	.291	14.00	.698	13.00	.047	12.00	.177	14.00
F030	.153	11.00	.052	11.50	.290	12.00	.705	14.00	.046	10.00	.166	9.50
F032	.152	11.00	.0439	3.00	.2496 L	1.00	.6153	1.00	.0383 L	1.00	.1556	3.00
F033	.1404	6.00	.049	7.00	.27	5.50	.65	4.00	.044	6.50	.160	5.00
F038	.140	3.50	.042 L	2.00	.28	9.00	.67	9.00	.042	4.00	.17	11.50
F039	.14	3.50	.0496	9.00	.278	7.00	.662	6.00	.0440	6.50	.150	1.50
F043	.148	9.00	.052	11.50	.28	9.00	.67	9.00	.045	9.00	.17	11.50
F046	.15	10.00	.049	7.00	.27	5.50	.67	9.00	.044	6.50	.16	5.00
F047	.14	3.50	.048	5.00	.25 L	2.50	.62	2.00	.041	2.50	.16	5.00
F055	.162	15.00	.057 H	15.50	.290	12.00	.690	12.00	.048	13.00	.176	13.00
MEDIAN CONC.	.1475		.0493		.2800		.6700		.0445		.1650	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F003	.0472	10.00	.245	11.00	.113	12.00	.450	11.00
F010	.05	13.50	.21 L	2.00	.11	8.50	.42	4.00
F015	.043	4.00	.239	7.00	.109	4.50	.44	8.50
F016	.049	12.00	.253	15.00	.115	13.00	.467	13.00
F020	.046	8.50	.182 EL	1.00	.109	4.50	.433	6.00
F024	.051	15.00	.26	16.00	.12	16.00	.48	15.00
F025	.048	11.00	.250	13.50	.116	14.00	.466	12.00
F030	.046	8.50	.241	10.00	.110	8.50	.434	7.00
F032	.0413	1.00	.2134 L	3.00	.1018	3.00	.4054	1.00
F033	.044	5.00	.23	5.00	.110	8.50	.41	2.50
F038	.042	2.50	.24	8.50	.11	8.50	.44	8.50
F039	.0456	7.00	.250	13.50	.0994	2.00	.443	10.00
F043	.050	13.50	.24	8.50	.11	8.50	.49 H	16.00
F046	.045	6.00	.23	5.00	.11	8.50	.43	5.00
F047	.042	2.50	.23	5.00	.099	1.00	.41	2.50
F055	.052 H	16.00	.248	12.00	.119	15.00	.470	14.00
MEDIAN CONC.	.0460		.2400		.1100		.4400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F003	115.50	11.550	10			SR/E-ICP (MG/L)
F010	52.00	5.200	10			A.A.
F015	62.50	6.250	10	L ELL		I.C.P.
F016	129.00	12.900	10		BIASED HIGH	I.C.P. 4X
F020	64.00	6.400	10			I.C.P.
F024	157.50	15.750	10	H H H H H	BIASED HIGH	I.C.P. 5X
F025	127.00	12.700	10			I.C.P.
F030	102.00	10.200	10			I.C.P. 5X
F032	23.00	2.300	10		BIASED LOW	ICP 20X
F033	52.50	5.250	10	L L L		I.C.P.-O.E.S.
F038	67.00	6.700	10	L		I.C.P.
F039	71.50	7.150	10			I.C.P. 4X CONC'N
F043	106.50	10.650	10			I.C.P.-M.S.
F046	61.00	6.100	10			I.C.P. CONC.
F047	31.50	3.150	10	L		I.C.P.-M.S. 1X
F055	137.50	13.750	10	H L H	BIASED LOW BIASED HIGH	FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	23.00	2.300	10	LLL	BIASED LOW	ICP 20X
F047	31.50	3.150	10	L	BIASED LOW	I.C.P.-M.S. 1X
F010	52.00	5.200	10	LELLL		A.A.
F033	52.50	5.250	10			I.C.P.-O.E.S.
F046	61.00	6.100	10			I.C.P. CONC.
F015	62.50	6.250	10			I.C.P.
F020	64.00	6.400	10	EL		I.C.P.
F038	67.00	6.700	10	L		I.C.P.
F039	71.50	7.150	10			I.C.P.
F030	102.00	10.200	10			I.C.P. 4X CONC'N
F043	106.50	10.650	10			I.C.P. 5X
F003	115.50	11.550	10	H		I.C.P.-M.S.
F025	127.00	12.700	10			SR/E-ICP (MG/L)
F016	129.00	12.900	10		BIASED HIGH	I.C.P.
F055	137.50	13.750	10	HH	BIASED HIGH	I.C.P. 4X
F024	157.50	15.750	10	HHHHH	BIASED HIGH	FLAME A.A.
						I.C.P. 5X

OVERALL AVERAGE RANK IS 8.500

Strontium

PARAMETER: 42091 Molybdenum

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.173	6.00	.072	6.00	.390	9.50	.599	9.00	.065	8.50	.006	3.50
F003	.184	14.00	.077	11.50	.395	11.00	.605	13.00	.065	8.50	.0061	6.00
F008	.30 EH	19.00	.10 EH	18.00	.50 EH	19.00	.70 VH	19.00	<.1	0.00	<.1	0.00
F010	.183	13.00	.079	14.00	.386	7.00	.622	14.00	.078 VH	16.00	.013 EH	14.00
F015	.18	10.50	.07	3.00	.4	13.50	.6	10.50	.06	2.50	<.01	0.00
F016	.180	10.50	.072	6.00	.388	8.00	.587	5.00	.065	8.50	<.010	0.00
F020	.174	7.00	.076	10.00	.384	6.00	.588	6.00	.071	13.00	.008	10.00
F024	.25 EH	18.00	.090 H	17.00	.45 H	18.00	.67 H	18.00	.080 VH	17.00	.010 H	13.00
F025	.194	15.00	.080	15.00	.416	16.00	.637	15.00	.070	11.50	.009	12.00
F030	.178	8.00	.073	8.00	.399	12.00	.601	12.00	.065	8.50	.006	3.50
F032	.1633	2.00	.0643 L	1.00	.3325 L	2.00	.4636 EL	1.00	.0528 L	1.00	.0049	1.00
F033	.170	4.00	.078	13.00	.40	13.50	.60	10.50	.070	11.50	.0063	7.00
F036	.2022 H	17.00	.0827	16.00	.4326 H	17.00	.6500	17.00	.0716	14.00	.0086	11.00
F038	.17	4.00	.070	3.00	.39	9.50	.59	7.50	.062	4.50	.007	8.00
F039	.117 EL	1.00	.290 EH	19.00	.329 L	1.00	.529 L	2.00	.213 EH	18.00	.0467 EH	16.00
F043	.18	10.50	.072	6.00	.38	4.50	.59	7.50	.062	4.50	.006	3.50
F046	.17	4.00	.077	11.50	.37	3.00	.56	3.00	.076 H	15.00	.006	3.50
F047	.18	10.50	.074	9.00	.38	4.50	.58	4.00	.063	6.00	.0071	9.00
F055	.20 H	16.00	.07	3.00	.41	15.00	.64	16.00	.06	2.50	.02 EH	15.00
MEDIAN CONC.	.1800		.0760		.3900		.6000		.0650		.0071	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.005	4.50	.006 L	1.50	.0034	2.50	.018	8.00
F003	.0054	7.50	.0083	8.00	.0034	2.50	.0175	5.00
F008	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F010	.008	13.00	.010	12.00	.005T	11.00	.017	3.50
F015	<.01	0.00	.01	12.00	<.01	0.00	.02	14.00
F016	<.010	0.00	<.010	0.00	<.010	0.00	.018	8.00
F020	.005	4.50	.006 L	1.50	<.004	0.00	.018	8.00
F024	.008	13.00	.012 H	15.00	.004	7.00	.024 VH	17.00
F025	.008	13.00	.009	9.50	.005	11.00	.021	16.00
F030	.005	4.50	.007	4.00	<.004	0.00	.020	14.00
F032	.0039	1.00	.0063 L	3.00	.0029	1.00	.0157	1.00
F033	.0054	7.50	.0082	7.00	.0036	5.00	.018	8.00
F036	.0064	11.00	.0101	14.00	.0049	9.00	.0194	12.00
F038	.006	9.50	.009	9.50	.004	7.00	.019	11.00
F039	.0195 EH	16.00	.0150 EH	16.00	.0091 EH	13.00	.0163	2.00
F043	.005	4.50	.008	6.00	.004	7.00	.017	3.50
F046	.006	9.50	.010	12.00	.005	11.00	.020	14.00
F047	.0046	2.00	.0077	5.00	.0035	4.00	.018	8.00
F055	.01 VH	15.00	.02 EH	17.00	.02 EH	14.00	.03 EH	18.00
MEDIAN CONC.	.0057		.0090		.0040		.0180	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	59.00	5.900	10	L		ICP 5X
F003	87.00	8.700	10			MO/E-ICP (MG/L)
F008	75.00	18.750	4	EHEHEHVH	INSUFFICIENT DATA	FLAME A.A.
F010	117.50	11.750	10	VHEH		I.C.A.P.
F015	66.00	9.429	7			I.C.P.
F016	46.00	7.667	6			I.C.P. 4X
F020	66.00	7.333	9			I.C.P.
F024	153.00	15.300	10	EHH H H VHH H VH	BIASED HIGH	I.C.P. 5X
F025	134.00	13.400	10			I.C.P.
F030	74.50	8.278	9			I.C.P. 5X
F032	14.00	1.400	10	L L ELL L	BIASED LOW	ICP 20X
F033	87.00	8.700	10			I.C.P.-O.E.S.
F036	138.00	13.800	10	H H		I.C.P. ONLY
F038	73.50	7.350	10			I.C.P./G.F.A.A.
F039	104.00	10.400	10	ELEHL L EHEHEHEH		I.C.P. 4X CONC'N
F043	57.50	5.750	10			I.C.P.-M.S.
F046	86.50	8.650	10	H		I.C.P. CONC.
F047	62.00	6.200	10			I.C.P.-M.S. 1X
F055	131.50	13.150	10	H EHVHEHEH		FLAME A.A.
OVERALL AVERAGE RANK IS		9.326				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	14.00	1.400	10	LLELLL	BIASED LOW	ICP 20X
F043	57.50	5.750	10			I.C.P.-M.S.
F001	59.00	5.900	10	L		ICP 5X
F047	62.00	6.200	10			I.C.P.-M.S. 1X
F020	66.00	7.333	9	L		I.C.P.
F038	73.50	7.350	10			I.C.P./G.F.A.A.
F016	46.00	7.667	6			I.C.P. 4X
F030	74.50	8.278	9			I.C.P. 5X
F046	86.50	8.650	10	H		I.C.P. CONC.
F033	87.00	8.700	10			I.C.P.-O.E.S.
F003	87.00	8.700	10			MO/E-ICP (MG/L)
F015	66.00	9.429	7			I.C.P.
F039	104.00	10.400	10	ELEHLEHEHEHEH		I.C.P. 4X CONC'N
F010	117.50	11.750	10	VHEH		I.C.A.P.
F055	131.50	13.150	10	HEHVHEHEH		FLAME A.A.
F025	134.00	13.400	10			I.C.P.
F036	138.00	13.800	10	HH		I.C.P. ONLY
F024	153.00	15.300	10	EHHHHVHHHVH	BIASED HIGH	I.C.P. 5X
F008	75.00	18.750	4	EHEHEHVH	INSUFFICIENT DATA	FLAME A.A.
OVERALL AVERAGE RANK IS		9.326				

Molybdenum

PARAMETER: 48091 Cadmium

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0015 BASIC ACCEPTABLE ERROR= .0015 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.012	4.00	.0248	7.00	.0345	8.00	.0626	6.00	.040	9.00	.005	12.50
F002	.012	4.00	.025	9.50	.037	15.50	.068	17.00	.043	20.00	.0052	17.50
F003	.013	13.50	.025	9.50	.036	13.00	.065	11.00	.039	6.50	.0045	5.00
F008	.013	13.50	.026	17.00	.039	19.50	.07	21.00	.04	9.00	.005	12.50
F010	.012	4.00	.024	5.50	.034	7.00	.062	4.50	.038	4.50	.005	12.50
F011	.0134	17.00	.0260	17.00	.0328	4.00	.068	17.00	.0411	16.00	.0052	17.50
F014	.014	19.50	.030 H	23.00	.042 H	22.50	.076 H	23.00	.048 H	22.00	.004	1.00
F015	.013	13.50	.024	5.50	.035	9.00	.064	9.00	.037	2.50	.006	20.50
F016	.014	19.50	.029	22.00	.040	21.00	.067	14.50	.041	14.00	<.010	0.00
F020	.0130	13.50	.026	17.00	.036	13.00	.066	12.00	.042	18.00	.0055	19.00
F024	.014	19.50	.026	17.00	.037	15.50	.067	14.50	.043	20.00	.007 H	22.50
F025	.015	22.50	.02 L	1.00	.038	18.00	.069	19.50	.041	14.00	.005	12.50
F030	.013	13.50	.025	9.50	.030 L	1.00	.064	9.00	.040	9.00	.005	12.50
F032	.0115	1.00	.0211 L	2.00	.0301 L	2.00	.0558 L	1.00	.0330 L	1.00	.0042	2.00
F033	.012	4.00	.025	9.50	.036	13.00	.064	9.00	.041	14.00	.0047	7.00
F036	.0125	7.50	.0259	14.00	.0378	17.00	.0713	22.00	.0412	17.00	.0044	4.00
F037	.0258 EH	26.00	.0363 EH	25.00	.0450 VH	25.00	.0851 EH	25.00	.0570 EH	24.50	.0085 VH	25.00
F038	.014	19.50	.028	20.50	.033	5.50	.061	3.00	.038	4.50	.0047	7.00
F039	.0125	7.50	.0215 L	3.00	.0305 L	3.00	.0581 L	2.00	.131 EH	26.00	.0047	7.00
F040	.0213 EH	25.00	.0431 EH	26.00	.0521 EH	26.00	.0950 EH	26.00	.0570 EH	24.50	.0079 VH	24.00
F043	.017 VH	24.00	.032 VH	24.00	.045 VH	24.00	.079 VH	24.00	.051 VH	23.00	.006	20.50
F044	.0126	9.00	.0254	12.00	.0351	10.00	.0629	7.00	.0406	11.00	.0048	9.00
F045	.0127	10.00	.0255	13.00	.0359	11.00	.0661	13.00	.0408	12.00	.0051	16.00
F046	.015	22.50	.028	20.50	.039	19.50	.069	19.50	.043	20.00	.007 H	22.50
F047	.012	4.00	.023	4.00	.033	5.50	.062	4.50	.037	2.50	.0043	3.00
F055	.013	13.50	.026	17.00	.042 H	22.50	.068	17.00	.039	6.50	.005	12.50
MEDIAN CONC.	.0130		.0257		.0360		.0665		.0410		.0050	

PARAMETER: 48091 Cadmium

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.0024	8.50	.0062	5.00	.0125	14.00	.0169	15.00
F002	.0027	15.00	.0075	14.00	.013	16.50	.0164	13.00
F003	.0022	5.00	.0069	7.00	.0116	8.00	.0147	4.00
F008	.002	2.50	.007	9.50	.013	16.50	.016	9.50
F010	.0024	8.50	.007	9.50	.012	10.50	.016	9.50
F011	.0025	12.00	.0076	15.00	.0138	21.00	.0177	18.00
F014	.003	18.00	.006	1.50	.007 EL	1.00	.008 EL	1.00
F015	<.005	0.00	.008	19.50	.011	5.50	.015	5.50
F016	<.010	0.00	<.010	0.00	.013	16.50	.018	19.50
F020	.0027	15.00	.006	1.50	.014	22.50	.017	16.50
F024	.004	21.50	.011 VH	23.00	.018 EH	25.00	.024 EH	24.00
F025	.002	2.50	.007	9.50	.012	10.50	.016	9.50
F030	<.002	0.00	.008	19.50	.012	10.50	.018	19.50
F032	.0021	4.00	.0061	3.50	.0110	5.50	.0141	2.00
F033	.0024	8.50	.0072	12.00	.012	10.50	.016	9.50
F036	.0025	12.00	.0061	3.50	.0088 L	2.00	.0144	3.00
F037	.0041 H	23.00	.0175 EH	25.00	.0191 EH	26.00	.0275 EH	26.00
F038	.0023	6.00	.0078	17.00	.014	22.50	.019	21.00
F039	.0027	15.00	.0063	6.00	.0109	3.00	.0150	5.50
F040	.0030	20.00	.0089	21.00	.0131	19.50	.0248 EH	25.00
F043	.003	18.00	.009	22.00	.016 H	24.00	.020 H	22.00
F044	.0024	8.50	.0073	13.00	.0122	13.00	.0160	9.50
F045	.0025	12.00	.0078	17.00	.0131	19.50	.0168	14.00
F046	.004	21.50	.013 EH	24.00	.013	16.50	.017	16.50
F047	.0017	1.00	.0078	17.00	.011	5.50	.016	9.50
F055	.003	18.00	.007	9.50	.011	5.50	.021 H	23.00
MEDIAN CONC.	.0025		.0073		.0123		.0166	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	89.00	8.900	10			ICP 5X
F002	142.00	14.200	10			48302/01
F003	82.50	8.250	10			CD/E-ICP (MG/L)
F008	130.50	13.050	10			A.A.-GRAPHITE FURN
F010	76.00	7.600	10			I.C.A.P.
F011	154.50	15.450	10			AA-SE
F014	132.50	13.250	10	H H H H		G.F.
F015	90.50	9.056	9			I.C.P.
F016	127.00	12.700	7			I.C.P. 4X
F020	148.00	14.800	10			I.C.P./GFAA 17
F024	202.50	20.250	10		BIASED HIGH	I.C.P. 5X
F025	119.50	11.950	10	L		SOLVENT EXT'N A.A.
F030	104.00	10.400	9	L L L L		I.C.P. 5X
F032	24.00	2.400	10		BIASED LOW	ICP 20X
F033	97.00	9.700	10			I.C.P.-O.E.S.
F036	102.00	10.200	10			I.C.P.-5 GRAPH.
F037	250.50	25.050	10	EHEHVHEHEHVHH EHEHEH	BIASED HIGH	FURNACE
F038	126.50	12.650	10			I.C.P./G.F.A.A.
F039	78.00	7.800	10	L L L EH		I.C.P. 4X CONC'N
F040	237.00	23.700	10	EHEHEHEHEHVH	BIASED HIGH	I.C.P.-M.S.
F043	225.50	22.550	10	VHVHVHVHVH	BIASED HIGH	I.C.P.-M.S.
F044	102.00	10.200	10			I.C.P.-M.S.
F045	137.50	13.750	10			I.C.P.-M.S.
F046	203.00	20.300	10		BIASED HIGH	I.C.P.-M.S.
F047	56.50	5.650	10		BIASED LOW	I.C.P. CONC.
F055	145.00	14.500	10	H		I.C.P.-M.S. 1X
						FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	24.00	2.400	10	LLLL	BIASED LOW	ICP 20X
F047	56.50	5.650	10		BIASED LOW	I.C.P.-M.S. 1X
F010	76.00	7.600	10			I.C.A.P.
F039	78.00	7.800	10	L L L E H		I.C.P. 4X CONC'N
F003	82.50	8.250	10			CD/E-ICP (MG/L)
F001	89.00	8.900	10			ICP 5X
F033	97.00	9.700	10			I.C.P.-O.E.S.
F015	90.50	9.056	9			I.C.P.
F036	102.00	10.200	10	L		I.C.P.-5 GRAPH.
F044	102.00	10.200	10			I.C.P.-M.S.
F030	104.00	10.400	9	L		I.C.P. 5X
F025	119.50	11.950	10	L		SOLVENT EXT'N A.A.
F038	126.50	12.650	10			I.C.P./G.F.A.A.
F008	130.50	13.050	10			A.A.-GRAPHITE FURN
F014	132.50	13.250	10	H H H E L E L		G.F.
F045	137.50	13.750	10			I.C.P.-M.S.
F002	142.00	14.200	10			48302/01
F055	145.00	14.500	10	H H		FLAME A.A.
F020	148.00	14.800	10			I.C.P./GFAA 17
F011	154.50	15.450	10			AA-SE
F016	127.00	12.700	7			I.C.P. 4X
F024	202.50	20.250	10	H V H E H E H	BIASED HIGH	I.C.P. 5X
F046	203.00	20.300	10	H E H	BIASED HIGH	I.C.P. CONC.
F043	225.50	22.550	10	V H V H V H V H V H H H	BIASED HIGH	I.C.P.-M.S.
F040	237.00	23.700	10	E H E H E H E H V H E H	BIASED HIGH	I.C.P.-M.S.
F037	250.50	25.050	10	E H E H V H E H E H V H H E H E H E H	BIASED HIGH	FURNACE
OVERALL AVERAGE RANK IS		13.267				

Cadmium

PARAMETER: 56091 Barium

MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.207	6.00	.043	13.50	.271	10.00	.656	9.00	.072	9.50	.023	13.00
F003	.220	13.00	.0417	10.00	.290	16.00	.680	13.50	.0723	11.00	.0219	4.00
F008	.22	13.00	<.05	0.00	.29	16.00	.70	17.00	.08	19.00	<.05	0.00
F010	.22	13.00	.04	5.00	.27	7.50	.66	10.00	.07	5.00	.02	3.00
F015	.225	17.00	.043	13.50	.285	12.00	.689	16.00	.074	14.00	.024	15.50
F016	.217	10.00	.043	13.50	.287	14.00	.662	11.00	.071	7.50	.022	7.50
F020	.201	5.00	.0399	2.00	.257	3.00	.622	2.00	.072	9.50	.022	7.50
F024	.25 H	20.00	.045	18.00	.30	20.00	.72	20.00	.080	19.00	.023	13.00
F025	.224	16.00	.043	13.50	.286	13.00	.686	15.00	.074	14.00	.023	13.00
F030	.226	18.00	.045	18.00	.291	18.00	.702	19.00	.074	14.00	.022	7.50
F032	.1949	2.00	.0352 L	1.00	.2355 L	1.00	.5679 L	1.00	.0589 L	1.00	.0198	2.00
F033	.20	3.50	.040	5.00	.27	7.50	.64	5.50	.071	7.50	.022	7.50
F037	.185 L	1.00	.04T	5.00	.245 L	2.00	.628	3.00	.06T L	2.00	0.000W EL	1.00
F038	.22	13.00	.045	18.00	.28	11.00	.68	13.50	.073	12.00	.028 H	18.00
F039	.213	9.00	.0407	8.00	.269	5.00	.636	4.00	.0665	3.00	.0221	11.00
F043	.22	13.00	.042	11.00	.27	7.50	.65	7.50	.075	16.00	.022	7.50
F045	.228	19.00	.0448	16.00	.295	19.00	.701	18.00	.0765	17.00	.0240	15.50
F046	.21	7.50	.041	9.00	.27	7.50	.67	12.00	.070	5.00	.022	7.50
F047	.21	7.50	.040	5.00	.26	4.00	.65	7.50	.070	5.00	.027 H	17.00
F055	.20	3.50	.04	5.00	.29	16.00	.64	5.50	.08	19.00	.03 VH	19.00
MEDIAN CONC.	.2185		.0417		.2755		.6610		.0721		.0220	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.013	10.50	.052 L	3.00	.009	8.50	.030	8.50
F003	.0129	6.00	.0647	11.00	.0091	13.00	.0301	11.00
F008	<.05	0.00	.07	19.00	<.05	0.00	<.05	0.00
F010	.01	2.00	.07	19.00	.01T	17.00	.03	8.50
F015	.014	15.50	.068	15.00	.009	8.50	.031	14.00
F016	.013	10.50	.067	13.00	.010	17.00	.032	18.00
F020	.013	10.50	.048 VL	2.00	.009	8.50	.029	4.50
F024	.014	15.50	.069	17.00	.009	8.50	.031	14.00
F025	.013	10.50	.067	13.00	.009	8.50	.031	14.00
F030	.013	10.50	.061	6.00	.010	17.00	.031	14.00
F032	.0113	3.00	.0559	4.50	.0080	2.00	.0267	2.00
F033	.013	10.50	.062	7.50	.009	8.50	.029	4.50
F037	-.012W EL	1.00	.040T EL	1.00	-.019W EL	1.00	.01T EL	1.00
F038	.017 H	18.00	.067	13.00	.010	17.00	.031	14.00
F039	.0130	10.50	.0559	4.50	.0088	4.00	.0293	6.00
F043	.012	4.50	.063	9.50	.009	8.50	.030	8.50
F045	.0141	17.00	.0683	16.00	.0097	14.00	.0318	17.00
F046	.013	10.50	.063	9.50	.009	8.50	.030	8.50
F047	.012	4.50	.062	7.50	.0087	3.00	.028	3.00
F055	.02 EH	19.00	.07	19.00	.01	17.00	.04 EH	19.00
MEDIAN CONC.	.0130		.0638		.0090		.0300	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	91.50	9.150	10	L		ICP 5X
F003	108.50	10.850	10		BIASED HIGH	BA/E-ICP (MG/L)
F008	84.00	16.800	5			I.C.A.P.
F010	90.00	9.000	10			I.C.A.P.
F015	141.00	14.100	10			I.C.P. 4X
F016	122.00	12.200	10	VL		I.C.P.
F020	54.50	5.450	10		BIASED HIGH	I.C.P. 5X
F024	165.00	16.500	10	H		I.C.P.
F025	130.50	13.050	10			I.C.P. 5X
F030	142.00	14.200	10		BIASED LOW	ICP 20X
F032	19.50	1.950	10	L L L L		I.C.P.-O.E.S.
F033	67.50	6.750	10		BIASED LOW	I.C.P.
F037	18.00	1.800	10	L L L L E L E L E L E L		I.C.P.
F038	147.50	14.750	10	H H		I.C.P. 4X CONC'N
F039	65.00	6.500	10			I.C.P.-M.S.
F043	93.50	9.350	10		BIASED HIGH	I.C.P.-M.S.
F045	168.50	16.850	10			I.C.P. CONC.
F046	85.50	8.550	10			I.C.P.-M.S. 1X
F047	64.00	6.400	10	H		FLAME A.A.
F055	142.00	14.200	10	VHEH EH		
OVERALL AVERAGE RANK IS		10.256				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F037	18.00	1.800	10	L L L E L E L E L E L	BIASED LOW	I.C.P.
F032	19.50	1.950	10	L L L L	BIASED LOW	ICP 20X
F020	54.50	5.450	10	VL		I.C.P.
F047	64.00	6.400	10	H		I.C.P.-M.S. 1X
F039	65.00	6.500	10			I.C.P. 4X CONC'N
F033	67.50	6.750	10			I.C.P.-O.E.S.
F046	85.50	8.550	10			I.C.P. CONC.
F010	90.00	9.000	10			I.C.A.P.
F001	91.50	9.150	10	L		ICP 5X
F043	93.50	9.350	10			I.C.P.-M.S.
F003	108.50	10.850	10			BA/E-ICP (MG/L)
F016	122.00	12.200	10			I.C.P. 4X
F025	130.50	13.050	10			I.C.P.
F015	141.00	14.100	10			I.C.P.
F030	142.00	14.200	10			I.C.P. 5X
F055	142.00	14.200	10	VHEHEH		FLAME A.A.
F038	147.50	14.750	10	HH	BIASED HIGH	I.C.P.
F024	165.00	16.500	10	H	BIASED HIGH	I.C.P. 5X
F008	84.00	16.800	5		BIASED HIGH	I.C.A.P.
F045	168.50	16.850	10			I.C.P.-M.S.
OVERALL AVERAGE RANK IS		10.256				Barium

PARAMETER: 82091 Lead

mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0020 BASIC ACCEPTABLE ERROR= .0020 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.127	13.50	.250	14.00	.270	10.00	.606	10.00	.297	9.00	.0050	11.50
F002	.126	11.50	.249	12.00	.345 EH	25.00	.646	24.00	.328	24.00	.0054	16.00
F003	.128	15.50	.247	11.00	.282	18.00	.614	14.00	.289	5.00	.0043	5.50
F008	.14	24.50	.26	19.00	.28	16.00	.64	22.00	.32	21.00	.0055	17.00
F010	.138	23.00	.264	21.00	.296	21.00	.644	23.00	.318	19.00	.0040	4.00
F011	.113	4.00	.232	4.00	.256	3.00	.561	2.00	.280	2.00	.0056	18.00
F013	.136	22.00	.270	24.00	.300	23.00	.656	25.00	.325	23.00		0.00
F014	.21 EH	27.00	.33 EH	27.00	.35 EH	27.00	.61	12.00	.37 EH	27.00	.006	21.00
F015	.13	18.50	.25	14.00	.27	10.00	.61	12.00	.3	12.50	<.05	0.00
F016	.128	15.50	.251	16.00	.280	16.00	.634	21.00	.299	10.00	<.010	0.00
F020	.127	13.50	.260	19.00	.289	19.00	.628	18.00	.314	18.00	.005	11.50
F024	.13	18.50	.27	24.00	.30	23.00	.68 H	26.00	.32	21.00	.006	21.00
F025	.116	5.00	.240	6.00	.267	5.00	.616	15.00	.288	4.00	.002 L	1.50
F030	.11 L	1.50	.27	24.00	.29	20.00	.63	19.50	.32	21.00	<.01	0.00
F032	.110 L	3.00	.1999 VL	1.00	.233 L	1.00	.625 L	1.00	.32	21.00	.0020 L	1.50
F033	.120	8.00	.23	3.00	.27	10.00	.60	8.00	.241 VL	1.00	.005T	11.50
F036	.1488 VH	26.00	.3175 EH	26.00	.3456 EH	26.00	.7905 EH	27.00	.30	12.50	.0022 L	3.00
F037	.1196	6.00	.2692	22.00	.2740	14.00	.6000	8.00	.3312	25.00	.0043T	5.50
F038	.13	18.50	.22 L	2.00	.27	10.00	.60	8.00	.30	12.50	.005	11.50
F039	.134	21.00	.250	14.00	.268	6.00	.599	6.00	.300	12.50	<.017	0.00
F040	.124	10.00	.243	9.00	.270	10.00	.590	5.00	.293	8.00	.0046	7.00
F043	.13	18.50	.24	6.00	.27	10.00	.61	12.00	.29	6.50	.005	11.50
F044	.120	8.00	.241	8.00	.266	4.00	.585	4.00	.287	3.00	.0047	8.00
F045	.126	11.50	.258	17.00	.280	16.00	.627	17.00	.312	17.00	.0051	15.00
F046	.14	24.50	.26	19.00	.30	23.00	.62	16.00	.31	15.50	.006	21.00
F047	.12	8.00	.24	6.00	.27	10.00	.63	19.50	.31	15.50	.0057	19.00
F055	.110 L	1.50	.245	10.00	.255	2.00	.575	3.00	.290	6.50	.005	11.50
MEDIAN CONC.	.1270		.2500		.2740		.6140		.3000		.0050	

PARAMETER: 82091 Lead

mg/L

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.003	8.00	.018 L	5.50	.0071	14.50	.012	5.50
F002	.0037	17.00	.023	16.50	.0076	17.00	.014	15.00
F003	.0027	4.50	.0211	9.00	.0067	8.00	.0125	7.00
F008	.0035	14.50	.0250	20.00	.0080	19.50	.0140	15.00
F010	.0027	4.50	.0222	14.00	.0065	6.50	.0136	11.50
F011	.0035	14.50	.0221	13.00	.0077	18.00	.0145	18.00
F013		0.00		0.00		0.00		0.00
F014	.004	19.00	.023	16.50	.007	11.50	.015	21.00
F015	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00
F016	<.010	0.00	.015 VL	3.50	<.010	0.00	.014	15.00
F020	.003	8.00	.015 VL	3.50	.007	11.50	.012	5.50
F024	.004	19.00	.026	22.00	.009	21.00	.015	21.00
F025	<.002	0.00	.009 EL	1.00	.002 VL	1.00	.006 EL	1.00
F030	<.01	0.00	<.01 EL	0.00	<.01	0.00	.01 L	3.50
F032	.0006 L	1.00	.0180 L	5.50	.0058	3.00	.0100 L	3.50
F033	.003T	8.00	.022	11.00	.0065T	6.50	.013	10.00
F036	.0018	2.00	.0141 VL	2.00	.0040 L	2.00	.0079 VL	2.00
F037	.0023T	3.00	.0828 EH	24.00	.0064	5.00	.0732 EH	24.00
F038	.003	8.00	.025	20.00	.008	19.50	.015	21.00
F039	<.017	0.00	.022	11.00	<.017	0.00	<.017	0.00
F040	.0032	11.50	.0207	8.00	.0068	9.00	.0127	9.00
F043	.003	8.00	.022	11.00	.007	11.50	.014	15.00
F044	.0032	11.50	.0200	7.00	.0062	4.00	.0126	8.00
F045	.0034	13.00	.0230	16.50	.0074	16.00	.0136	11.50
F046	.004	19.00	.0230	23.00	.007	11.50	.015	21.00
F047	.0036	16.00	.027 H	23.00	.0071	14.50	.014	15.00
F055	.010 EH	21.00	.023	16.50	.0071	14.50	.015	21.00
MEDIAN			.025	20.00	.010 H	22.00		
CONC.	.0032		.0221		.0070		.0138	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	101.50	10.150	10			SE-FAAS
F002	178.00	17.800	10			82302/01
F003	97.50	9.750	10	EH		PB/E-ICP (MG/L)
F008	188.50	18.850	10			I.C.A.P.
F010	147.50	14.750	10			I.C.A.P.
F011	96.50	9.650	10			AA-SE
F013	117.00	11.700	5		BIASED HIGH	ICP DA
F014	209.00	20.900	10	EHEHEH EH	BIASED HIGH	I.C.P.
F015	67.00	6.700	5			I.C.P.
F016	97.00	9.700	7			I.C.P. 4X
F020	127.50	12.750	10			I.C.P./GFAA 16-20
F024	216.50	21.650	10	H	BIASED HIGH	I.C.P. 5X
F025	39.50	3.950	9	L L ELVLEL	BIASED LOW	SOLVENT EXT'N A.A.
F030	89.50	8.950	6	L EL L		I.C.P. 5X
F032	21.50	2.150	10	L VLL L VLL L L L	BIASED LOW	ICP 20X
F033	88.50	8.850	10			I.C.P.-O.E.S.
F036	142.00	14.200	10	VHEHEHEHL VLL VL		I.C.P.-5 GRAPH.
F037	136.50	13.650	10			FURNACE
F038	131.00	13.100	10	L EH EH		I.C.P./G.F.A.A.
F039	70.50	7.050	6			I.C.P. 4X CONC'N
F040	86.50	8.650	10			I.C.P.-M.S.
F043	110.00	11.000	10			I.C.P.-M.S.
F044	65.50	6.550	10			I.C.P.-M.S.
F045	150.50	15.050	10		BIASED LOW	I.C.P.-M.S.
F046	193.50	19.350	10			I.C.P. CONC.
F047	140.00	14.000	10			I.C.P.-M.S. 1X
F055	118.50	11.850	10	L EH H		FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	21.50	2.150	10	LVLLLVLLLL	BIASED LOW	ICP 20X
F025	39.50	3.950	9	LELVLEL	BIASED LOW	SOLVENT EXT'N A.A.
F044	65.50	6.550	10		BIASED LOW	I.C.P.-M.S.
F040	86.50	8.650	10			I.C.P.-M.S.
F033	88.50	8.850	10			I.C.P.-O.E.S.
F011	96.50	9.650	10			AA-SE
F003	97.50	9.750	10			PB/E-ICP (MG/L)
F001	101.50	10.150	10	L		SE-FAAS
F043	110.00	11.000	10			I.C.P.-M.S.
F039	70.50	7.050	6			I.C.P. 4X CONC'N
F055	118.50	11.850	10	LEHH		FLAME A.A.
F020	127.50	12.750	10	VL		I.C.P./GFAA 16-20
F038	131.00	13.100	10	L		I.C.P./G.F.A.A.
F015	67.00	6.700	5			I.C.P.
F037	136.50	13.650	10	EHEH		FURNACE
F016	97.00	9.700	7	VL		I.C.P. 4X
F047	140.00	14.000	10			I.C.P.-M.S. 1X
F036	142.00	14.200	10	VHEHEHEHLVLLVL		I.C.P.-5 GRAPH.
F010	147.50	14.750	10			I.C.A.P.
F030	89.50	8.950	6	LELL		I.C.P. 5X
F045	150.50	15.050	10			I.C.P.-M.S.
F002	178.00	17.800	10	EH		82302/01
F008	188.50	18.850	10			I.C.A.P.
F046	193.50	19.350	10	H		I.C.P. CONC.
F014	209.00	20.900	10	EHEHEHEH	BIASED HIGH	I.C.P.
F024	216.50	21.650	10	H	BIASED HIGH	I.C.P. 5X
F013	117.00	11.700	5		BIASED HIGH	ICP DA

OVERALL AVERAGE RANK IS 13.012

Lead

PARAMETER: 22095 Titanium

ug/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00
F044		0.00		0.00		0.00		0.00		0.00	.6	0.00
MEDIAN CONC.												1.00

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	11.	2.00	2.	1.00	2.	2.00	14.	2.00
F044	6.6	1.00	2.6	2.00	1.1	1.00	7.7	1.00
MEDIAN CONC.								

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
F001	7.00	1.750	4	
F044	6.00	1.200	5	
OVERALL RANK IS		1.444		

BIAS STATEMENT
INSUFFICIENT DATA
METHOD CODING
ICP 5X
I.C.P.-M.S.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
F044	6.00	1.200	5	
F001	7.00	1.750	4	
OVERALL RANK IS		1.444		

BIAS STATEMENT
INSUFFICIENT DATA
METHOD CODING
I.C.P.-M.S.
ICP 5X

Titanium

PARAMETER: 33095 Arsenic

ug/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	<.1	0.00	.14	1.00	<.1	0.00	<.1 L	0.00	.18	2.00	.12	2.00
F002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F008	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00
F010	1.T	3.00	1.T	7.00	1.T	4.00	1.T	3.00	1.T	6.00	1.T	6.00
F011	<.3	0.00	.4	5.00	<.3	0.00	<.3	0.00	.3	4.50	.3	5.00
F014	<3.0	0.00	<3.0	0.00	<3.0	0.00	<3.0	0.00	<3.0	0.00	<3.0	0.00
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00
F020	<40.	0.00	<40.	0.00	<40.	0.00	<40.	0.00	<40.	0.00	<1.	0.00
F025	<.2	0.00	<.2	2.50	<.2	0.00	<.2	0.00	<.2	3.00	<.2	0.00
F030	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00
F033	.2W	0.00	.2W	0.00	.2W	0.00	.2W	0.00	.2W	0.00	.2W	0.00
F036	20.90 EH	5.00	20.50 EH	9.00	50.00 EH	6.00	87.70 EH	6.00	31.70 EH	9.00	3.300 EH	7.00
F037	-.42W L	1.00	-.29T	4.00	-.34W L	1.00	-.05W L	1.00	-.54W	1.00	-.09W	1.00
F038	<.1	0.00	.2	2.50	.1	2.00	.2	2.00	.3	4.50	.2	4.00
F039	<2.1	0.00	<2.1	0.00	<2.1	0.00	<2.1	0.00	<2.1	0.00	<2.1	0.00
F040	.24	2.00	.76	6.00	.56	3.00	1.24	4.00	1.35 H	7.00	.19	3.00
F043	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00
F046	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00
F047	1.3	4.00	2.3 VH	8.00	2.6 VH	5.00	2.4 H	5.00	2.6 EH	8.00	<1.	0.00
F055	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
MEDIAN CONC.	1.0000		.4000		.7800		1.1200		.3000		.2000	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	8.7	5.00	.82	2.00	2.7	7.00	4.3	8.50
F002	9.0	7.00	1.0	7.00	2.6	5.00	4.0	5.50
F008	10.	12.50	1.0	7.00	3.0	12.00	4.0	5.50
F010	11.	15.50	1.1	7.00	4.	18.50	5.	13.50
F011	9.6	9.00	<3.0	12.00	2.7	7.00	4.4	10.00
F014	11.5	17.00	<3.0	0.00	3.2	16.00	5.6	17.50
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	10.0	12.50	1.0	7.00	3.0	12.00	4.7	12.00
F020	9.	7.00	1.	7.00	4.	18.50	4.	5.50
F025	8.2	4.00	1.4	15.00	2.3	1.00	3.9	3.00
F030	6.5 L	1.00	1.2	13.00	2.7	7.00	3.2	1.00
F033	8.0	3.00	.9T	3.00	3.0	12.00	4.0	5.50
F036	12.70 H	20.00	6.200 EH	17.00	3.100	15.00	9.100 EH	20.00
F037	9.96	11.00	1.01T	11.00	2.88T	9.00	5.11	15.00
F038	9.7	10.00	1.0	7.00	3.0	12.00	4.3	8.50
F039	10.1	14.00	<2.1	0.00	2.5	2.50	4.6	11.00
F040	12.2 H	19.00	1.34	14.00	2.59	4.00	6.23 H	19.00
F043	12.	18.00	<2.	0.00	3.5	17.00	5.6	17.50
F046	9.	7.00	1.	7.00	3.	12.00	5.	13.50
F047	11.	15.50	3.3 EH	16.00	4.5 H	20.00	5.5	16.00
F055	7.5 L	2.00	.5	1.00	2.5	2.50	3.5	2.00
MEDIAN CONC.	9.8300		1.0000		3.0000		4.5000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	27.50	3.929	7	L	BIASED LOW	HYDRIDE AAS
F002	24.50	6.125	4		INSUFFICIENT DATA	33007
F008	37.00	9.250	4		INSUFFICIENT DATA	HYDRIDE GEN.
F010	83.50	8.350	10			A.A. HYD
F011	52.50	7.500	7			AA-HYDRIDE
F014	50.50	16.833	3		INSUFFICIENT DATA	G.F.
F015	0.00	*****	0		INSUFFICIENT DATA	I.C.P.
F016	43.50	10.875	4		INSUFFICIENT DATA	DIGN. HYDRIDE
F020	38.00	9.500	4		INSUFFICIENT DATA	I.C.P.
F025	28.50	4.750	6	L	INSUFFICIENT DATA	HYDRIDE-A.A.
F030	22.00	5.500	4		INSUFFICIENT DATA	A.A.-HYDRIDE
F033	23.50	5.875	4		INSUFFICIENT DATA	HYDRIDE-A.A.S.
F036	114.00	11.400	10	EHEHEHEHEHH EH EH		I.C.P. ONLY
F037	35.00	5.500	10	L L L		FURNACE
F038	52.50	5.833	9		INSUFFICIENT DATA	H.G.A.A.
F039	27.50	9.167	3		INSUFFICIENT DATA	H.G.A.A.S.
F040	81.00	8.100	10	H H H	INSUFFICIENT DATA	I.C.P.-M.S.
F043	52.50	17.500	3		INSUFFICIENT DATA	I.C.P.-M.S.
F046	39.50	9.875	4		INSUFFICIENT DATA	G.F.A.A. CONC.
F047	97.50	10.833	9	VHVHH EH EHH	INSUFFICIENT DATA	I.C.P.-M.S. 1X
F055	7.50	1.875	4	L	INSUFFICIENT DATA	HYDRIDE A.A.
OVERALL AVERAGE RANK IS		8.050				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F015	0.00	*****	0		INSUFFICIENT DATA	I.C.P.
F055	7.50	1.875	4	L	INSUFFICIENT DATA	HYDRIDE A.A.
F001	27.50	3.929	7	L	BIASED LOW	HYDRIDE AAS
F025	28.50	4.750	6			HYDRIDE-A.A.
F030	22.00	5.500	4	L	INSUFFICIENT DATA	A.A.-HYDRIDE
F037	35.00	5.500	10	LLL		FURNACE
F038	52.50	5.833	9		INSUFFICIENT DATA	H.G.A.A.
F033	23.50	5.875	4		INSUFFICIENT DATA	HYDRIDE-A.A.S.
F002	24.50	6.125	4			33007
F011	52.50	7.500	7			AA-HYDRIDE
F040	81.00	8.100	10	HHH		I.C.P.-M.S.
F010	83.50	8.350	10			A.A. HYD
F039	27.50	9.167	3		INSUFFICIENT DATA	H.G.A.A.S.
F008	37.00	9.250	4		INSUFFICIENT DATA	HYDRIDE GEN.
F020	38.00	9.500	4		INSUFFICIENT DATA	I.C.P.
F046	39.50	9.875	4		INSUFFICIENT DATA	G.F.A.A. CONC.
F047	97.50	10.833	9	VHVHHEHH	INSUFFICIENT DATA	I.C.P.-M.S. 1X
F016	43.50	10.875	4		INSUFFICIENT DATA	DIGN. HYDRIDE
F036	114.00	11.400	10	EHEHEHEHEHHEHEH	INSUFFICIENT DATA	I.C.P. ONLY
F014	50.50	16.833	3		INSUFFICIENT DATA	G.F.
F043	52.50	17.500	3		INSUFFICIENT DATA	I.C.P.-M.S.
OVERALL AVERAGE RANK IS		8.050				Arsenic

PARAMETER: 34095 Selenium

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F008	<1.0	0.00	<1.0	0.00	2.0 H	4.00	2.0	4.00	<1.0	0.00	<1.0	0.00
F010	1.T	3.00	1.T	2.00	1.T	3.00	1.T	2.00	1.T	3.00	1.T	2.00
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00	<1.0	0.00
F020	<30.	0.00	<30.	0.00	<30.	0.00	<30.	0.00	<30.	0.00	<5.	0.00
F025	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00
F030	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00
F033	.2W	1.00	.2W	1.00	.3T	1.00	.2W	1.00	.2W	1.00	.2W	0.00
F037	.43T	2.00	1.01T	3.00	.96T	2.00	1.01T	3.00	.31T	2.00	.14T	1.00
F038	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
F039	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
F043	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00
F046	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F047	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
F055	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
MEDIAN CONC.	.4300		1.0000		.9800		1.0050		.3100			

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F008	1.0	5.00	2.0	6.50	4.0	7.00	7.0	6.00
F010	1.	5.00	2.	6.50	4.	7.00	7.	6.00
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	1.5	8.00	2.1	9.00	4.0	7.00	7.9	9.00
F020	<5.	0.00	<5.	0.00	<5.	0.00	5. L	1.00
F025	.9	2.50	1.4	3.00	3.3	4.00	5.1 L	2.00
F030	.9	2.50	1.3	2.00	3.0	2.50	5.7	3.00
F033	.8T	1.00	1.0	1.00	3.0	2.50	6.0	4.00
F037	2.54T VH	9.00	3.35T H	11.00	2.76T	1.00	8.26	11.00
F038	1.3	7.00	2.0	6.50	4.3	9.00	7.1	8.00
F039	<.4	0.00	<.4	0.00	5.	10.50	10. VH	12.00
F043	2.6 VH	10.00	2.6	10.00	6.8 VH	12.00	13. EH	13.00
F046	<.1	0.00	2.	6.50	5.	10.50	8.	10.00
F047	<.5	0.00	<.5	0.00	<.5	0.00	<.5. L	0.00
F055	1.0	5.00	1.5	4.00	3.5	5.00	7.0	6.00
MEDIAN CONC.	1.0000		2.0000		4.0000		7.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F008	32.50	5.417	6	H
F010	39.50	3.950	10	
F015	0.00	*****	0	
F016	33.00	8.250	4	
F020	1.00	1.000	1	L
F025	11.50	2.875	4	L
F030	10.00	2.500	4	
F033	13.50	1.500	9	
F037	45.00	4.500	10	VHH
F038	30.50	7.625	4	
F039	22.50	11.250	2	VH VH
F043	45.00	11.250	4	VH VHEH
F046	27.00	9.000	3	
F047	0.00	*****	0	L
F055	20.00	5.000	4	
OVERALL AVERAGE RANK IS				5.092

BIAS STATEMENT	METHOD CODING
BIASED LOW	HYDRIDE GEN.
INSUFFICIENT DATA	A.A. HYD
INSUFFICIENT DATA	I.C.P.
INSUFFICIENT DATA	DIGN. HYDRIDE
INSUFFICIENT DATA	I.C.P. HYDRIDE
INSUFFICIENT DATA	HYDRIDE-A.A.
INSUFFICIENT DATA	A.A.-HYDRIDE
BIASED LOW	HYDRIDE-A.A.S.
	FURNACE
INSUFFICIENT DATA	H.G.A.A.
INSUFFICIENT DATA	H.G.A.A.S.
INSUFFICIENT DATA	I.C.P.-M.S.
INSUFFICIENT DATA	G.F.A.A. CONC.
INSUFFICIENT DATA	I.C.P.-M.S. 1X
INSUFFICIENT DATA	HYDRIDE A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F015	0.00	*****	0	
F047	0.00	*****	0	L
F020	1.00	1.000	1	L
F033	13.50	1.500	9	
F030	10.00	2.500	4	
F025	11.50	2.875	4	L
F010	39.50	3.950	10	
F037	45.00	4.500	10	VHH
F055	20.00	5.000	4	
F008	32.50	5.417	6	H
F038	30.50	7.625	4	
F016	33.00	8.250	4	
F046	27.00	9.000	3	
F039	22.50	11.250	2	VH
F043	45.00	11.250	4	VHVHEH
OVERALL AVERAGE RANK IS				5.092

BIAS STATEMENT	METHOD CODING
INSUFFICIENT DATA	I.C.P.
INSUFFICIENT DATA	I.C.P.-M.S. 1X
INSUFFICIENT DATA	I.C.P. HYDRIDE
BIASED LOW	HYDRIDE-A.A.S.
INSUFFICIENT DATA	A.A.-HYDRIDE
INSUFFICIENT DATA	HYDRIDE-A.A.
BIASED LOW	A.A. HYD
	FURNACE
INSUFFICIENT DATA	HYDRIDE A.A.
	HYDRIDE GEN.
INSUFFICIENT DATA	H.G.A.A.
INSUFFICIENT DATA	DIGN. HYDRIDE
INSUFFICIENT DATA	G.F.A.A. CONC.
INSUFFICIENT DATA	H.G.A.A.S.
INSUFFICIENT DATA	I.C.P.-M.S.

Selenium

PARAMETER: 47095 Silver

ug/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	<.01	0.00	.01	2.00	<.01	0.00	<.01	0.00	<.01	0.00	<.01	0.00
F003	.1	1.50	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F008	<20.	0.00	<20.	0.00	<20.	0.00	<20.	0.00	<20.	0.00	<20.	0.00
F010	.1T	1.50	.1T	3.00	.1T	1.00	.1T	1.00	.1T	2.00	.1T	1.00
F015	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00
F016	<12.0	0.00	<12.0	0.00	<12.0	0.00	<12.0	0.00	<12.0	0.00	<12.0	0.00
F020	<10.	0.00	<10.	0.00	<10.	0.00	<10.	0.00	<10.	0.00	<5	0.00
F030	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00
F033	.5W	0.00	.5W	0.00	.5W	0.00	.6T	3.00	.5W	0.00	.5W	0.00
F037	.26T	3.00	.31W	1.00	.20T	2.00	.48T	2.00	.59W	1.00	.23T	2.00
F038	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F039	<1.9	0.00	<1.9	0.00	<1.9	0.00	<1.9	0.00	<1.9	0.00	<1.9	0.00
F043	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00	<2.	0.00
F046	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00	<1.	0.00
F047	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00	<.2	0.00
F055	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00	<.5	0.00
MEDIAN CONC.	.1000		.0100				.4800					

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	3.41	7.00	1.76	2.00	.51	4.00	8.17	8.00
F003	3.2	5.00	2.4	6.50	.5	3.00	20. EH	13.00
F008	<20.	0.00	<20.	0.00	<20.	0.00	<20.	0.00
F010	4.5	10.50	3.4	11.00	.9	6.50	11.2 VH	12.00
F015	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00
F016	<12.0	0.00	<12.0	0.00	<12.0	0.00	<12.0	0.00
F020	4.	8.50	2.	4.50	.7	5.00	9.5	11.00
F030	<2.	0.00	<2.	0.00	<2.	0.00	5. L	3.00
F033	2.0T	2.00	2.0T	4.50	.9T	6.50	4.0 VL	1.00
F037	1.29T L	1.00	1.73T	1.00	3.53T EH	10.00	7.19	5.00
F038	2.6	4.00	1.8	3.00	.4	1.00	7.8	7.00
F039	<1.9 L	0.00	2.4	6.50	1.9 H	9.00	4.4 VL	2.00
F043	2.5	3.00	<2.	0.00	<2.	0.00	6.9	4.00
F046	4.	8.50	3.	10.00	<1.	0.00	9.	9.50
F047	3.3	6.00	2.6	9.00	.47	2.00	7.5	6.00
F055	4.5	10.50	2.5	8.00	1.5	8.00	9.0	9.50
MEDIAN CONC.	3.3000		2.4000		.8000		7.8000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	23.00	4.600	5			ICP-MS
F003	29.00	5.800	5			AG-EXT (MG/L)
F008	0.00	*****	0			FLAME A.A.
F010	49.50	4.950	10			G.F.A.
F015	0.00	*****	0			I.C.P.
F016	0.00	*****	0			I.C.P. 4X
F020	29.00	7.250	4			I.C.P./GFAA
F030	3.00	3.000	1			I.C.P. 5X
F033	17.00	3.400	5			I.C.P.-O.E.S.
F037	28.00	2.800	10	L	EH	FURNACE
F038	15.00	3.750	4			I.C.P./G.F.A.A.
F039	17.50	5.833	3			I.C.P. 4X CONC'N
F043	7.00	3.500	2	L	H VL	I.C.P.-M.S.
F046	28.00	9.333	3			G.F.A.A. CONC.
F047	23.00	5.750	4			I.C.P.-M.S. 1X
F055	36.00	9.000	4			FLAME A.A.
OVERALL AVERAGE RANK IS		5.083				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F008	0.00	*****	0			FLAME A.A.
F015	0.00	*****	0			I.C.P.
F016	0.00	*****	0			I.C.P. 4X
F037	28.00	2.800	10	LEH		FURNACE
F030	3.00	3.000	1	L		I.C.P. 5X
F033	17.00	3.400	5	VL		I.C.P.-O.E.S.
F043	7.00	3.500	2			I.C.P.-M.S.
F038	15.00	3.750	4			I.C.P./G.F.A.A.
F001	23.00	4.600	5			ICP-MS
F010	49.50	4.950	10			G.F.A.
F047	23.00	5.750	4			I.C.P.-M.S. 1X
F003	29.00	5.800	5			AG-EXT (MG/L)
F008	0.00	*****	0			FLAME A.A.
F039	17.50	5.833	3			I.C.P. 4X CONC'N
F020	29.00	7.250	4			I.C.P./GFAA
F055	36.00	9.000	4			FLAME A.A.
F046	28.00	9.333	3			G.F.A.A. CONC.
OVERALL AVERAGE RANK IS		5.083				

Silver

PARAMETER: 51095 Antimony

ug/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	12.	8.00	.12	1.00	20.	7.00	47.	7.00	.16	1.00	.05	1.00
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	5.4 EL	2.00	<1.0	0.00	5.3 EL	2.00	9.9 EL	2.00	<1.0	0.00	2.0 VH	4.00
F020	<15.	0.00	<15.	0.00	22.	10.50	49.	9.00	<15.	0.00	<15.	0.00
F025	9.5	3.00	<.2	0.00	25. H	12.00	43.	4.00	<.2	0.00	<.2	0.00
F030	1.6 EL	1.00	.6	3.00	1.9 EL	1.00	5.6 EL	1.00	.4	2.00	.1	2.00
F033	11.0	5.50	<.2W	0.00	20.0	7.00	48.0	8.00	.2W	0.00	.2W	0.00
F038	12.	8.00	<.1	0.00	20.	7.00	53.	12.00	<.1	0.00	<.1	0.00
F039	12.2	10.00	<.7	0.00	19.3	4.00	50.5	10.00	<.7	0.00	.8	3.00
F043	13.	11.00	<2.	0.00	22.	10.50	52.	11.00	<2.	0.00	<2.	0.00
F046	11.	5.50	<1.	0.00	20.	7.00	45.	5.00	<1.	0.00	<1.	0.00
F047	12.	8.00	.21	2.00	20.	7.00	46.	6.00	<.2	0.00	<.2	0.00
F055	10.5	4.00	<.5	0.00	18.5	3.00	42.0	3.00	<.5	0.00	<.5	0.00
MEDIAN CONC.	11.0000		.2100		20.0000		46.5000				.4500	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	4.4	6.00	6.28	3.00	14.6	6.00	1.52	3.00
F015	<50.0	0.00	<50.0	0.00	<50.0	0.00	<50.0	0.00
F016	1.0 EL	2.00	2.2 EL	2.00	2.9 EL	2.00	<1.0	0.00
F020	<15.	0.00	<15.	0.00	20. VH	12.00	<15.	0.00
F025	3.9	3.00	8.3	10.00	14.	3.50	1.9	5.00
F030	.2 EL	1.00	8.2 EL	1.00	.9 EL	1.00	<.1 L	0.00
F033	4.0	4.50	8.0	7.00	14.0	3.50	1.9T	1.00
F038	4.7	8.50	7.6	5.00	16.	10.50	1.6	4.00
F039	4.8	10.00	9.6	11.00	14.5	5.00	2.5	7.50
F043	4.7	8.50	8.2	9.00	16.	10.50	<2.	0.00
F046	4.	4.50	8.	7.00	15.	8.00	2.	6.00
F047	4.5	7.00	8.0	7.00	15.	8.00	1.5	2.00
F055	5.0	11.00	7.0	4.00	15.0	8.00	2.5	7.50
MEDIAN CONC.	4.4000		8.0000		14.8000		1.7500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	43.00	4.300	10			ICP-MS
F015	0.00	*****	0		INSUFFICIENT DATA	I.C.P.
F016	16.00	2.286	7	EL ELEL VHELELEL	BIASED LOW	DIGN. A.A.S. HYDRI
F020	31.50	10.500	3		INSUFFICIENT DATA	I.C.P.
F025	40.50	5.786	7	H		HYDRIDE-A.A.
F030	13.00	1.444	9	EL ELEL ELELELL	BIASED LOW	A.A. HYDRIDE
F033	36.50	5.214	7			HYDRIDE-A.A.S.
F038	55.00	7.857	7			H.G.A.A.
F039	60.50	7.563	8			H.G.A.A.S.
F043	60.50	10.083	6		BIASED HIGH	I.C.P.-M.S.
F046	43.00	6.143	7			G.F.A.A. CONC.
F047	47.00	5.875	8			I.C.P.-M.S. 1X
F055	40.50	5.786	7			HYDRIDE A.A.
OVERALL AVERAGE RANK IS		5.663				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F015	0.00	*****	0			I.C.P.
F030	13.00	1.444	9	ELELELELELELL	INSUFFICIENT DATA	A.A. HYDRIDE
F016	16.00	2.286	7	ELELELVHELELEL	BIASED LOW	DIGN. A.A.S. HYDRI
F001	43.00	4.300	10		BIASED LOW	ICP-MS
F033	36.50	5.214	7			HYDRIDE-A.A.S.
F025	40.50	5.786	7	H		HYDRIDE-A.A.
F055	40.50	5.786	7			HYDRIDE A.A.
F047	47.00	5.875	8			I.C.P.-M.S. 1X
F046	43.00	6.143	7			G.F.A.A. CONC.
F039	60.50	7.563	8			H.G.A.A.S.
F038	55.00	7.857	7		BIASED HIGH	H.G.A.A.
F043	60.50	10.083	6		INSUFFICIENT DATA	I.C.P.-M.S.
F020	31.50	10.500	3	VH		I.C.P.
OVERALL AVERAGE RANK IS		5.663				

Antimony

PARAMETER: 83095 Bismuth

ug/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F016	93.	3.00	<10.0	0.00	383.	6.00	536.	3.00	<10.0	0.00	<10.0	0.00
F020	78. L	1.00	<20.	0.00	314. L	2.00	467.	2.00	<20.	0.00	<20.	0.00
F038	110.	7.00	<100.	0.00	380.	4.50	560.	5.50	<100.	0.00	<100.	0.00
F039	103.	5.00	117.	2.00	393.	7.00	599.	7.00	140.	2.00	<21.	0.00
F043	100.	4.00	<2.	0.00	380.	4.50	540.	4.00	<2.	0.00	<2.	0.00
F046	<500.	0.00	<500.	0.00	<500.	0.00	<500.	0.00	<500.	0.00	<500.	0.00
F047	92.	2.00	.13	1.00	360.	3.00	560.	5.50	.67	1.00	.27	1.00
F055	104.	6.00	<.5	0.00	305. L	1.00	450. L	1.00	<.5	0.00	<.5	0.00
MEDIAN CONC.	100.0000				380.0000		540.0000					

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F016	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00
F020	<20.	0.00	<20.	0.00	<20.	0.00	<20.	0.00
F038	<100.	0.00	<100.	0.00	<100.	0.00	<100.	0.00
F039	<21.	0.00	<21.	0.00	<21.	0.00	<21.	0.00
F043	4.4	2.00	9.4	2.00	2.8	3.00	6.5	2.00
F046	<500.	0.00	<500.	0.00	<500.	0.00	<500.	0.00
F047	4.2	1.00	8.3	1.00	2.4	1.00	5.6	1.00
F055	4.5	3.00	10.0	3.00	2.5	2.00	7.0	3.00
MEDIAN CONC.	4.4000		9.4000		2.5000		6.5000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F016	12.00	4.000	3	
F020	5.00	1.667	3	L L
F038	17.00	5.667	3	
F039	23.00	4.600	5	
F043	21.50	3.071	7	
F046	0.00	*****	0	
F047	17.50	1.750	10	
F055	19.00	2.714	7	L L
OVERALL AVERAGE RANK IS		3.026		

BIAS STATEMENT	METHOD CODING
INSUFFICIENT DATA	I.C.P. 4X
INSUFFICIENT DATA	I.C.P.
INSUFFICIENT DATA	I.C.P.
	I.C.P. 4X CONC'N
	I.C.P.-M.S.
INSUFFICIENT DATA	I.C.P. CONC.
BIASED LOW	I.C.P.-M.S. 1X
	HYDRIDE A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F046	0.00	*****	0	
F020	5.00	1.667	3	LL
F047	17.50	1.750	10	
F055	19.00	2.714	7	LL
F043	21.50	3.071	7	
F016	12.00	4.000	3	
F039	23.00	4.600	5	
F038	17.00	5.667	3	
OVERALL AVERAGE RANK IS		3.026		

BIAS STATEMENT	METHOD CODING
INSUFFICIENT DATA	I.C.P. CONC.
INSUFFICIENT DATA	I.C.P.
BIASED LOW	I.C.P.-M.S. 1X
	HYDRIDE A.A.
	I.C.P.-M.S.
INSUFFICIENT DATA	I.C.P. 4X
	I.C.P. 4X CONC'N
INSUFFICIENT DATA	I.C.P.

Bismuth

PARAMETER: 93095 Lithium

ug/L

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ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.5000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001		0.00		0.00		0.00		0.00		0.00	1.6	2.00
F003	5.	4.00	<1.	0.00	16.	9.00	23.	9.50	1.	2.00	.5	1.00
F010	10. EH	8.50	<10.	0.00	10. L	1.00	20.	4.00	10. T EH	5.00	<10.	0.00
F016	<10.0	0.00	<10.0	0.00	13.6	4.00	21.0	5.50	<10.0	0.00	<10.0	0.00
F025	4.	1.50	1.	1.00	13.	3.00	19.	2.00	1.	2.00	<1.	0.00
F030	7.	7.00	<4.	0.00	15.	5.50	23.	9.50	<4.	0.00	<4.	0.00
F038	<15.	0.00	<15.	0.00	15.	5.50	21.	5.50	<15.	0.00	<15.	0.00
F039	5.0	4.00	<1.4	0.00	15.2	7.00	19.7	3.00	<1.4	0.00	<1.4	0.00
F043	6.1	6.00	2.2	2.00	16.	9.00	22.	7.50	2.0	4.00	2.0	3.50
F046	5.	4.00	<5.	0.00	16.	9.00	22.	7.50	<5.	0.00	<5.	0.00
F047	4.0	1.50	<.4	0.00	12.	2.00	18.	1.00	<.4	0.00	<.4	0.00
F055	10.0 EH	8.50	<1.0	0.00	20.0 H	11.00	28.0 VH	11.00	1.0	2.00	2.0	3.50
MEDIAN CONC.	5.0000				15.0000		21.0000		1.0000		1.8000	

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	3.8	6.00	6.76	3.00	5.77	8.00	10.7	6.50
F003	3.1	4.00	7.5	5.50	5.2	6.00	10.7	6.50
F010	10. T EH	8.00	10. H	10.00	10. T EH	10.00	10.	4.50
F016	<10.0	0.00	<10.0	0.00	<10.0	0.00	14.6 H	11.00
F025	3.	2.50	6.	2.00	4.	2.00	9.	2.50
F030	<4.	0.00	7.	4.00	5.	3.50	9.	2.50
F038	<15.	0.00	<15.	0.00	<15.	0.00	<15.	0.00
F039	3.0	2.50	7.5	5.50	3.1	5.00	10.0	4.50
F043	3.4	5.00	7.8	7.00	5.6	7.00	11.	8.50
F046	<5.	0.00	9.	8.50	5.	3.50	12.	10.00
F047	1.8	1.00	5.6	1.00	3.1	1.00	7.9	1.00
F055	4.0	7.00	9.0	8.50	6.0	9.00	11.0	8.50
MEDIAN CONC.	3.2500		7.5000		5.1500		10.7000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F001	25.50	5.100	5	
F003	47.50	5.278	9	
F010	51.00	6.375	8	EH L EH EHH EH H
F016	20.50	6.833	3	
F025	18.50	2.056	9	
F030	32.00	5.333	6	
F038	11.00	5.500	2	
F039	31.50	4.500	7	
F043	59.50	5.950	10	
F046	42.50	7.083	6	
F047	8.50	1.214	7	
F055	69.00	7.667	9	EH H VH
OVERALL AVERAGE RANK IS		5.148		

BIAS STATEMENT

INSUFFICIENT DATA
BIASED LOW
INSUFFICIENT DATA

BIASED LOW

METHOD CODING

ICP-MS
LI/E-ICP (MG/L)
A.A.
I.C.P. 4X
I.C.P.
I.C.P. 5X
I.C.P.
A.A.S.
I.C.P.-E.S.
ATOMIC EMISSION
I.C.P.-M.S. 1X
FLAME A.A.

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
F047	8.50	1.214	7	
F025	18.50	2.056	9	
F039	31.50	4.500	7	
F001	25.50	5.100	5	
F003	47.50	5.278	9	
F030	32.00	5.333	6	
F038	11.00	5.500	2	
F043	59.50	5.950	10	
F010	51.00	6.375	8	EHLEHEHHEH
F016	20.50	6.833	3	H
F046	42.50	7.083	6	
F055	69.00	7.667	9	EHHVH
OVERALL AVERAGE RANK IS		5.148		

BIAS STATEMENT

BIASED LOW
BIASED LOW

INSUFFICIENT DATA

INSUFFICIENT DATA

METHOD CODING

I.C.P.-M.S. 1X
I.C.P.
A.A.S.
ICP-MS
LI/E-ICP (MG/L)
I.C.P. 5X
I.C.P.
I.C.P.-E.S.
A.A.
I.C.P. 4X
ATOMIC EMISSION
FLAME A.A.

Lithium

PARAMETER: 94095 Beryllium

ug/L

RESEARCH AND APPLICATIONS BRANCH
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BURLINGTON ONTARIO

ECOSYSTEMS INTERLAB STUDY FP62 - TM Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE LAB NO	1		2		3		4		5		6	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	7.	7.50	14.9	4.00	21.	9.50	27.	9.50	5.3	10.50	<.5	0.00
F003	8.4	14.00	16.6	16.00	23.9	15.00	28.7	13.00	5.6	13.00	<.05	0.00
F010	7.	7.50	14.	2.00	20.	6.50	25.	6.50	5.	6.00	5.T	3.00
F015	7.0	7.50	15.	7.00	20.	6.50	24.	4.50	4.0	1.00	<1.0	0.00
F016	<10.0	0.00	15.9	11.50	22.8	14.00	30.0	15.00	<10.0	0.00	<10.0	0.00
F020	6.8	4.50	14.1	3.00	19.1	3.00	22.7	1.00	5.1	9.00	<1.	0.00
F025	8.	12.00	16.	14.00	22.	12.00	29.	14.00	6.	14.50	<1.	0.00
F030	8.	12.00	16.	14.00	22.	12.00	28.	12.00	5.	6.00	<1.	0.00
F032	6.73	3.00	13.1	1.00	18.0	1.00	23.3	2.50	4.3	3.00	0.0	1.00
F033	6.	1.00	15.	7.00	20.	6.50	24.	4.50	5.T	6.00	1.W	0.00
F038	8.	12.00	16.	14.00	22.	12.00	27.	9.50	6.	14.50	<5.	0.00
F039	6.7	2.00	15.9	11.50	19.4	4.00	23.3	2.50	4.20	2.00	<.4	0.00
F043	7.5	10.00	15.	7.00	21.	9.50	27.	9.50	5.3	10.50	<.4	0.00
F046	7.	7.50	15.	7.00	20.	6.50	27.	9.50	5.	6.00	<3.	0.00
F047	6.8	4.50	15.	7.00	19.	2.00	25.	6.50	5.0	6.00	<3.	0.00
F055	9.0 H	15.00	15.5	10.00	24.0	16.00	32.0 H	16.00	5.5	12.00	<.22	2.00
MEDIAN CONC.	7.0000		15.0000		20.5000		27.0000		5.0000		<.5	0.00

SAMPLE LAB NO	7		8		9		10	
	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.5	4.00	5.6	2.00	1.5	4.50	3.3	8.00
F003	.48	2.00	6.83	6.00	1.54	6.00	3.28	7.00
F010	5.T EH	8.00	7.	9.00	5.T EH	12.00	5.T H	14.00
F015	<1.0	0.00	7.0	9.00	1.0	1.00	3.0	2.50
F016	<10.0	0.00	<10.0	0.00	<10.0	0.00	<10.0	0.00
F020	<1.	0.00	5.3	1.00	1.6	7.50	3.4	9.00
F025	1.	7.00	7.	9.00	2.	10.00	4.	11.50
F030	<1.	0.00	6.	3.50	<1.	0.00	4.	11.50
F032	1.4	1.00	6.0	3.50	1.4	3.00	3.1	5.00
F033	1.W	0.00	7.	9.00	2.T	10.00	3.T	3.50
F038	<5.	0.00	<7.	0.00	<5.T	0.00	<5.	0.00
F039	<.4	0.00	6.4	9.00	1.3	2.00	3.0	2.50
F043	.5	4.00	7.2	12.00	1.6	7.50	3.5	10.00
F046	<3.	0.00	7.	9.00	<3.	0.00	3.	2.50
F047	.62	6.00	7.4	13.00	1.5	4.50	3.2	6.00
F055	.5	4.00	7.5	14.00	2.0	10.00	4.5	13.00
MEDIAN CONC.	.5000		7.0000		1.5700		3.2900	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	59.50	6.611	9			ICP 5X
F003	92.00	10.222	9			BE/E-ICP (MG/L)
F010	74.50	7.450	10	EH EHH		I.C.A.P.
F015	39.00	4.875	8		INSUFFICIENT DATA	I.C.P.
F016	40.50	13.500	3			I.C.P. 4X
F020	38.00	4.750	8		BIASED HIGH	I.C.P.
F025	104.00	11.556	9		BIASED LOW	I.C.P. 5X
F030	71.00	10.143	7			ICP 20X
F032	24.00	2.400	10			I.C.P.-O.E.S.
F033	46.50	5.813	8		BIASED HIGH	I.C.P.
F038	62.00	12.400	5		BIASED LOW	I.C.P. 4X CONC'N
F039	31.50	3.938	8			I.C.P.-E.S.
F043	80.00	8.889	9			I.C.P. CONC.
F046	48.00	6.857	7			I.C.P.-M.S. 1X
F047	57.50	5.750	10	H H	BIASED HIGH	FLAME A.A.
F055	110.00	12.222	9			
OVERALL AVERAGE RANK IS		7.581				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	24.00	2.400	10		BIASED LOW	ICP 20X
F039	31.50	3.938	8		BIASED LOW	I.C.P. 4X CONC'N
F020	38.00	4.750	8			I.C.P.
F015	39.00	4.875	8			I.C.P.
F047	57.50	5.750	10			I.C.P.-M.S. 1X
F033	46.50	5.813	8			I.C.P.-O.E.S.
F001	59.50	6.611	9			ICP 5X
F046	48.00	6.857	7			I.C.P. CONC.
F010	74.50	7.450	10	EHEHH		I.C.A.P.
F043	80.00	8.889	9			I.C.P.-E.S.
F030	71.00	10.143	7			I.C.P. 5X
F003	92.00	10.222	9			BE/E-ICP (MG/L)
F025	104.00	11.556	9		BIASED HIGH	I.C.P.
F055	110.00	12.222	9	HH	BIASED HIGH	FLAME A.A.
F038	62.00	12.400	5		BIASED HIGH	I.C.P.
F016	40.50	13.500	3		INSUFFICIENT DATA	I.C.P. 4X
OVERALL AVERAGE RANK IS		7.581				

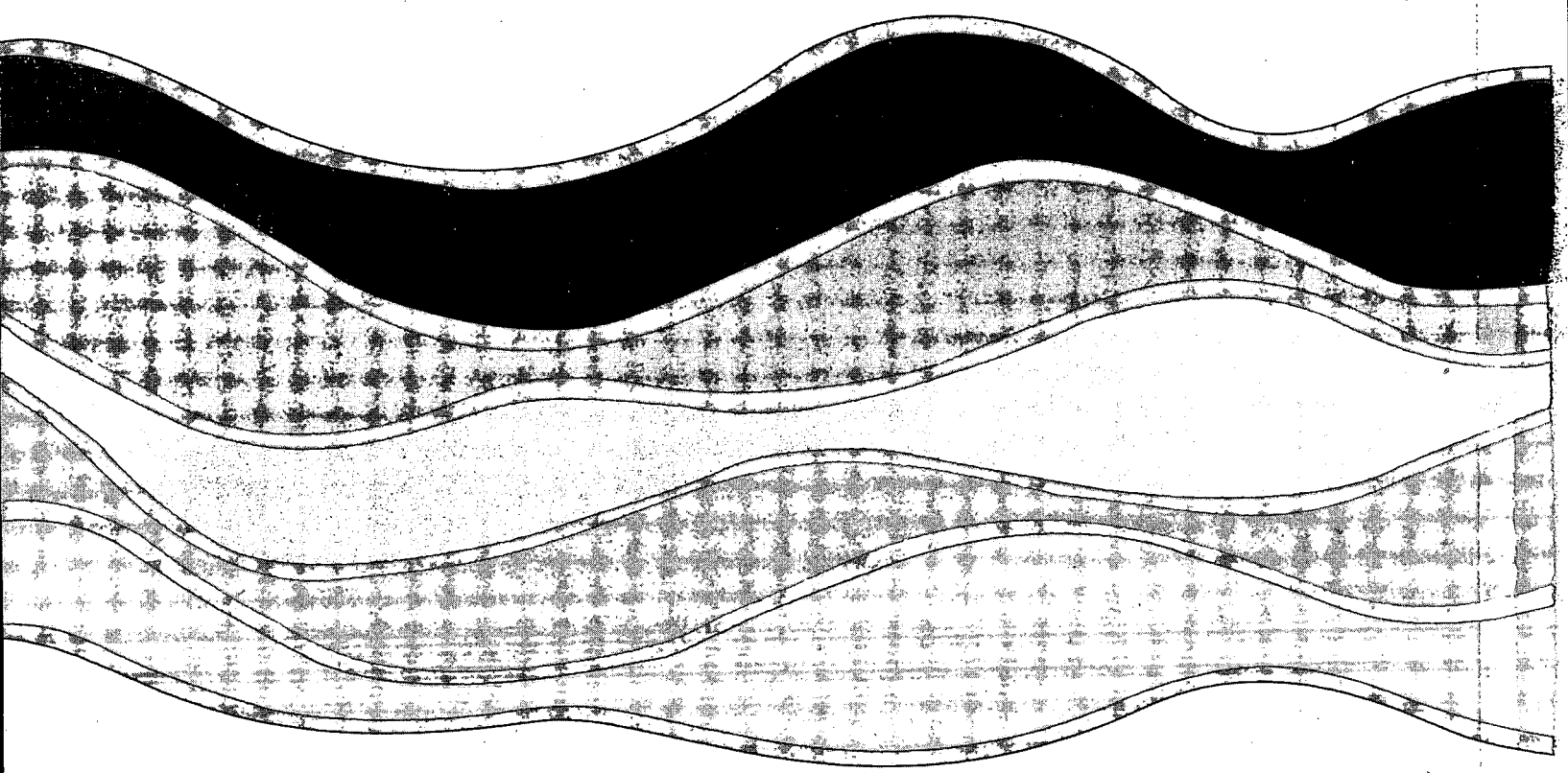
Beryllium

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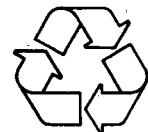


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