NWRI
TN 93-22

NATIONAL WATER RESEARCH INSTITUTE

INSTITUT NATIONAL de RECHERCHE sur les EAUX

C. C. I. W.
LIBRARY

Ecosystems Interlaboratory QA Program, Study FP63 for Major Ions & Nutrients and Total Phosphorus in Surface Waters. (July & Aug 1993.)

H. Alkema

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

TD
226
N89
no. 93-22

RESEARCH & APPLICATIONS BRANCH

FINAL REPORT

REPORT NO. RAB-TN-93-22

ECOSYSTEMS INTERLABORATORY QUALITY ASSURANCE PROGRAM

FP/GLAP STUDY 63

for July and August 1993

An Interlaboratory Quality Assurance Study

for Major Ions & Nutrients and Total Phosphorus in Surface Waters *

by

H. Alkema

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

October 1993

* the companion studies (FP63) for Trace Metals are Reports RAB-TN-93-23 and 24

Environment Canada | Environnement Canada
Conservation and Protection | Conservation et Protection

CANADA'S GREEN PLAN
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

6 October 1993

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

Re: Final Report for FP/GLAP Study FP63 - Major Ions & Nutrients and Total P Portion

Dear Participant,

The Institute is pleased to distribute this final report to the FP/GLAP participant laboratories. This report includes results and evaluations for two unique series of samples - one for Major Ions & Nutrients and another for Total Phosphorus. The evaluations in this report are 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 these 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 data 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 905-336-4929 or fax 336-4989. (Please note that our area code is now 905.)

Yours truly,

Harry A

H. Alkema
QA Chemist, Ecosystems QA Pgm.

Attachment: Individual Laboratory Appraisal

Think recycling

Canada

Made from recovered materials | Fait de papiers récupérés

Pensez à recycler

Table of Contents

1. Table 1 — List of Participating Laboratories
2. Table 2 — Comparison of Laboratory Performance in Study 63
   a) Major Ions and Nutrients
   b) Total Phosphorus
3. Table 3 — Summary of Study to Study Performance
   a) Major Ions and Nutrients
   b) Total Phosphorus
4. Table 4 — Sample Design
   a) Major Ions and Nutrients
   b) Total Phosphorus
5. Table 5 — Summary of Interlab Medians
   a) Major Ions and Nutrients
   b) Total Phosphorus
6. Appendix A — Glossary of Terms
7. Appendix B — Data & Evaluation Summary
   1) Major Ions and Nutrients
   2) Total Phosphorus

Table 1

ENVIRONMENT CANADA
National Water Research Institute

Ecosystems Interlaboratory Quality Assurance Program
PARTICIPATION LIST - Study FP/GLAP 63 (July & Aug '93)

Alberta Environmental Centre
ASL Analytical Service Lab Ltd.
Barringer Laboratories Ltd.
Can Test Ltd.
Chemex Labs Alberta Inc.
Chemical & Geological Laboratories Inc.
City of Calgary
Edmonton Public Works
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
Environmental Services Lab, NS
Elemental Research Inc.
Forestry Canada - Sault Ste Marie
Geological Survey of Canada - Ottawa (I)
Geological Survey of Canada - Ottawa (II)
HBT Agra Ltd
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 - Dorset
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
Shell Calgary Research Centre
Sodexen Inc
USEPA, Region 5 - Chicago
Zenon Environmental Inc., BC

Table 2a

COMPARISON OF LABORATORY PERFORMANCE (STUDY 0063)

Major Ions & Nutrients

	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	18	1	5.56	174	7	4.02	9.58
F003	19	1	5.26	190	15	7.89	13.16
F031	14	1	7.14	132	9	6.82	13.96
F035	13	1	7.69	124	11	8.87	16.56
F043	7	0	0.00	60	10	16.67	16.67
F042	16	2	12.50	152	7	4.61	17.11
F048	13	1	7.69	130	15	11.54	19.23
F058	8	1	12.50	80	6	7.50	20.00
F001	17	3	17.65	167	7	4.19	21.84
F020	16	3	18.75	147	14	9.52	28.27
F015	10	2	20.00	97	9	9.28	29.28
F002	14	3	21.43	138	13	9.42	30.85
F008	19	4	21.05	155	16	10.32	31.38
F009	13	3	23.08	124	11	8.87	31.95
F038	20	6	30.00	179	9	5.03	35.03
F010	18	4	22.22	170	22	12.94	35.16
F046	20	4	20.00	190	29	15.26	35.26
F036	15	4	26.67	150	17	11.33	38.00
F007	11	3	27.27	109	12	11.01	38.28
F006	15	3	20.00	136	26	19.12	39.12
F025	16	4	25.00	159	24	15.09	40.09
F014	15	3	20.00	139	30	21.58	41.58
F034	13	3	23.08	118	22	18.64	41.72
F004	7	2	28.57	62	11	17.74	46.31
F016	17	4	23.53	169	39	23.08	46.61
F037	11	3	27.27	110	22	20.00	47.27
F033	16	6	37.50	153	16	10.46	47.96
F030	17	3	17.65	167	62	37.13	54.77
F023	17	4	23.53	162	52	32.10	55.63
F013	10	5	50.00	100	7	7.00	57.00
F062	20	5	25.00	178	67	37.64	62.64
F059	13	6	46.15	124	48	38.71	84.86
F061	17	10	58.82	152	61	40.13	98.96
F060	18	11	61.11	174	83	47.70	108.81
F011	15	12	80.00	141	53	37.59	117.59

THE FOLLOWING PARAMETERS WERE USED IN THE ANALYSIS

Cond	pH	DOC	ALK	DIC	NO3 /2
NH3	TKN	F	HARD	Na	Mg
Si	SO4	Cl	K	Ca	Colour
Tot N	B				

THE FOLLOWING PARAMETERS WERE EXCLUDED

Turb

Table 2b

COMPARISON OF LABORATORY PERFORMANCE (STUDY 0063)

Total Phosphorus

	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
F001	1	0	0.00	10	0	0.00	0.00
F003	1	0	0.00	10	0	0.00	0.00
F004	1	0	0.00	10	0	0.00	0.00
F008	1	0	0.00	10	0	0.00	0.00
F010	1	0	0.00	9	0	0.00	0.00
F011	1	0	0.00	10	0	0.00	0.00
F013	1	0	0.00	10	0	0.00	0.00
F014	1	0	0.00	10	0	0.00	0.00
F015	1	0	0.00	10	0	0.00	0.00
F058	1	0	0.00	10	0	0.00	0.00
F007	1	0	0.00	10	1	10.00	10.00
F034	1	0	0.00	10	1	10.00	10.00
F036	1	0	0.00	10	1	10.00	10.00
F042	1	0	0.00	10	2	20.00	20.00
F002	1	0	0.00	10	3	30.00	30.00
F016	1	0	0.00	10	3	30.00	30.00
F035	1	0	0.00	10	3	30.00	30.00
F020	1	0	0.00	10	4	40.00	40.00
F038	1	0	0.00	10	5	50.00	50.00
F006	1	0	0.00	8	6	75.00	75.00
F033	1	1	100.00	10	2	20.00	120.00
F030	1	1	100.00	10	5	50.00	150.00
F032	1	1	100.00	7	5	71.43	171.43
F046	1	1	100.00	10	9	90.00	190.00
F062	1	1	100.00	10	9	90.00	190.00

Table 3a

SUMMARY OF STUDY TO STUDY PERFORMANCE

Major Ions & Nutrients

LAB CODE	%BIAS AND %FLAGS ON STUDIES 0062	0063	MEDIAN SCORE	COMMENTS
F001	25.0	21.8	23.4	SATISFACTORY
F002	33.4	30.8	32.1	MODERATE
F003	10.1	13.2	11.6	SATISFACTORY
F004	30.2	46.3	38.2	MODERATE
F006	33.9	39.1	36.5	MODERATE
F007	22.3	38.3	30.3	MODERATE
F008	29.1	31.4	30.2	MODERATE
F009	14.6	31.9	23.3	SATISFACTORY
F010	40.2	35.2	37.7	MODERATE
F011	35.0	117.6	76.3	POOR
F013	39.1	57.0	48.0	MODERATE
F014	47.4	41.6	44.5	MODERATE
F015	43.5	29.3	36.4	MODERATE
F016	76.0	46.6	61.3	POOR
F020	21.1	28.3	24.7	SATISFACTORY
F023	-	55.6	-	-
F025	39.5	40.1	39.8	MODERATE
F030	81.3	54.8	68.0	POOR
F031	-	14.0	-	-
F032	16.7	9.6	13.1	SATISFACTORY
F033	26.8	48.0	37.4	MODERATE
F034	63.4	41.7	52.6	MODERATE
F035	57.4	16.6	37.0	MODERATE
F036	22.1	38.0	30.1	MODERATE
F037	133.0	47.3	90.1	POOR
F038	48.9	35.0	42.0	MODERATE
F039	52.8	-	-	-
F042	22.8	17.1	20.0	SATISFACTORY
F043	97.0	16.7	56.8	MODERATE
F046	75.1	35.3	55.2	MODERATE
F048	-	19.2	-	-
F055	39.1	-	-	-
F056	52.0	-	-	-
F057	79.7	-	-	-
F058	-	20.0	-	-
F059	-	84.9	-	-
F060	-	108.8	-	-
F061	-	99.0	-	-
F062	-	62.6	-	-
INTERLAB MEDIAN	39.1	38.0		

THE FOLLOWING CODES WERE EXCLUDED: 00192

STUDY DATES: 0062(11-JAN-93),0063(05-JUL-93),

Table 3b

SUMMARY OF STUDY TO STUDY PERFORMANCE

Total Phoshorus

LAB CODE	%BIAS AND %FLAGS ON STUDIES 0062	0063	MEDIAN SCORE	COMMENTS
F001	0.0	0.0	0.0	SATISFACTORY, WELL DONE
F002	20.0	30.0	25.0	SATISFACTORY
F003	0.0	0.0	0.0	SATISFACTORY, WELL DONE
F004	110.0	0.0	55.0	MODERATE
F006	180.0	75.0	127.5	POOR
F007	0.0	10.0	5.0	SATISFACTORY, WELL DONE
F008	180.0	0.0	90.0	POOR
F010	10.0	0.0	5.0	SATISFACTORY, WELL DONE
F011	20.0	0.0	10.0	SATISFACTORY, WELL DONE
F013	10.0	0.0	5.0	SATISFACTORY, WELL DONE
F014	20.0	0.0	10.0	SATISFACTORY, WELL DONE
F015	20.0	0.0	10.0	SATISFACTORY, WELL DONE
F016	-	30.0	-	-
F020	10.0	40.0	25.0	SATISFACTORY
F025	50.0	-	-	-
F030	190.0	150.0	170.0	POOR
F032	0.0	171.4	85.7	POOR
F033	0.0	120.0	60.0	MODERATE
F034	-	10.0	-	-
F035	0.0	30.0	15.0	SATISFACTORY
F036	0.0	10.0	5.0	SATISFACTORY, WELL DONE
F038	50.0	50.0	50.0	MODERATE
F039	90.0	-	-	-
F042	0.0	20.0	10.0	SATISFACTORY, WELL DONE
F046	50.0	190.0	120.0	POOR
F055	188.9	-	-	-
F058	-	0.0	-	-
F062	-	190.0	-	-
INTERLAB MEDIAN	20.0	10.0		

STUDY DATES: 0062(11-JAN-93),0063(05-JUL-93),

Table 4a

Sample Design - FP/GLAP 63 - July '93

Major Ions & Nutrients

Sample No.	Sample Name	Source (Prov)	Conductance (Study 63)
1	TROI-02	Three Rivers (PQ)	44.0
2	WINN-02	Winnipeg River (MN)	112.
3	HURON-02	Lake Huron	210.
4	ASSUM-01	Assumption R. (PQ)	187.
5	VANNAM-01	Fraser River (N. Arm)	189.
6	MOIR-01	Moire River (MN)	280.
7	VANMA-01	Fraser R. (Main Arm)	445.5
8	SPEN-01	Spencer Cr. (ON)	568.
9	SASK-01	Saskatchewan R. (MN)	276.5
10	ION-96	Grand River (ON)	818.

Table 4b

Sample Design - FP/GLAP 63 - July '93

Total Phosphorus

Sample No.	Sample Name	Conc'n (Study 63)
1	CV-05	0.0065
2	C-3-1	0.014
3	CV-03	0.075
4	C-3-2	0.046
5	C-3-4	0.091
6	C-3-3	0.0655
7	BC-26-1	0.120
8	TOTPE02	0.204
9	TOTPE01	0.138
10	TOTPE03	0.258

Table 5a SUMMARY of Interlaboratory MEDIAN VALUES for Major Ion & Nutrients - STUDY 63

PARAMETER		SAMPLE NUMBER						
		TROI-02 SAMPLE 1	WINN-02 SAMPLE 2	HURON-01 SAMPLE 3	ASSUM-01 SAMPLE 4	VANNAM-01 SAMPLE 5	MOIR-01 SAMPLE 6	VANMA-02 SAMPLE 7
Turbidity	JTU	.1300	.1300	.1200	.7000	.4800	.2600	.3000
Colour	HAZEN UNIT	21.400	17.950	1.5000	19.850	37.850	17.000	22.750
Specific Conductance	UMHO/CM	44.000	112.000	210.000	187.000	189.000	280.000	445.000
pH	PH UNITS	6.9400	7.6900	8.0000	7.5000	7.5800	7.9200	7.5700
Boron	MG/L	.0070	.0100	.0130	.0140	.0200	.0175	.0300
Diss Organic Carbon	MG C/L	4.6000	6.6850	1.7000	3.3100	5.1200	5.7000	4.6000
Total Alkalinity	MG/LCACO3	8.7000	47.200	80.140	34.100	51.000	121.000	51.100
Diss Inorg Carbon	MG C/L	2.0000	10.950	18.800	8.0900	12.150	28.200	12.150
Nitrate + Nitrite	MG N/L	.1500	.1050	.3560	1.7700	.1790	.2155	.1360
Ammonia	MG N/L	.0240	.0095	.0080	.0080	.0070	.0055	.0210
Total N	mg N/L	.2865	.2945	.4625	1.8650	.2995	.3810	.2570
Total Kjeldahl N	MG N/L	.2200	.2400	.1300	.3550	.1900	.3150	.2100
Fluoride	MG/L	.0400	.0500	.0800	.0800	.0600	.1100	.0600
Total Hardness	mg/L	12.000	51.580	98.000	50.800	59.700	136.000	84.000
Sodium	MG/L	3.3950	2.5930	3.4360	14.450	13.100	4.3000	51.600
Magnesium	MG/L	.8000	3.8460	7.3200	3.8000	4.9000	5.0000	9.5360
Silicates	mg SIO2/L	4.7500	.4020	1.5000	5.3200	7.5200	5.5000	6.4750
Sulfate (All Methods)	MG/L	5.2200	5.0000	15.750	12.100	9.4000	12.000	19.100
Chloride (All Methods)	MG/L	3.0550	2.3000	5.8000	22.000	19.200	7.3000	89.000
Potassium	MG/L	.5000	.8400	.9000	2.3300	1.2500	1.2500	2.6000
Calcium	MG/L	3.3800	14.400	27.000	13.900	15.800	46.000	18.000

PARAMETER		SPEN-01 SAMPLE 8	SASK-01 SAMPLE 9	ION-96 SAMPLE 10
Turbidity	JTU	.1300	.1300	.2000
Colour	HAZEN UNIT	34.400	6.3000	20.000
Specific Conductance	UMHO/CM	565.000	276.000	818.000
pH	PH UNITS	8.4300	8.0600	8.3400
Boron	MG/L	.0160	.0200	.0500
Diss Organic Carbon	MG C/L	9.1350	2.7200	5.9000
Total Alkalinity	MG/LCACO3	220.000	85.000	201.000
Diss Inorg Carbon	MG C/L	51.500	19.750	46.700
Nitrate + Nitrite	MG N/L	.6800	.0100	4.6400
Ammonia	MG N/L	.0600	.1180	.0060
Total N	mg N/L	.9890	.1820	4.8500
Total Kjeldahl N	MG N/L	.5000	.2400	.5400
Fluoride	MG/L	.2000	.1200	.1600
Total Hardness	mg/L	293.000	107.000	332.000
Sodium	MG/L	10.400	14.650	43.000
Magnesium	MG/L	30.000	12.000	22.800
Silicates	mg SIO2/L	6.4050	.8000	6.6400
Sulfate (All Methods)	MG/L	50.230	45.000	103.075
Chloride (All Methods)	MG/L	26.900	4.8800	72.400
Potassium	MG/L	1.6000	1.3000	3.9400
Calcium	MG/L	68.200	23.000	95.000

Table 5b

SUMMARY OF INTERLABORATORY MEDIAN VALUES for Total Phosphorus - STUDY 63

PARAMETER		SAMPLE NUMBER						
		CV-05 SAMPLE 1	C-3-1 SAMPLE 2	CV-03 SAMPLE 3	C-3-2 SAMPLE 4	C-3-4 SAMPLE 5	C-3-3 SAMPLE 6	BC-26-1 SAMPLE 7
Total Phosphorus	MG P/L	.0075	.0150	.0750	.0460	.0900	.0650	.1200

PARAMETER		TOTPE02 SAMPLE 8	TOTPE01 SAMPLE 9	TOTPE03 SAMPLE 10
Total Phosphorus	MG P/L	.2022	.1368	.2580

Appendix A

Glossary of Terms

GLOSSARY OF TERMS

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, (α=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 the basic acceptable error has been set as 10 µg/L and the basic acceptable error is 1.0 µg/L, if a target (median) value for a sample is 5 µg/L, then any reported result within the range 5 ± 1.0 or 4.0 to 6.0 µg/L would be considered acceptable. The BAE would define the acceptable result within the 0-10 µg/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* (as a percentage) 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 µg/L, and the *lower limit for use of basic acceptable error* is 10 µg/L, the difference between them is 21-10 = 11 µg/L. Multiplying the difference by the *concentration increment*, say 0.10, which gives 11 µg/L x 0.10, resulting in 1.1 µg/L to determine the acceptable difference 21.0 ± 2.1. Thus the range 18.9 to 23.1 µg/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 value of the maximum difference between a result and
(or Acceptable Deviation) the target value which will not be flagged.

Sept, 1993

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

Appendix B

Laboratory Results

1) Major Ions & Nutrients
2) Total Phosphorus

PARAMETER: 00192 Turbidity JTU

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .2000 BASIC ACCEPTABLE ERROR= .2500 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F003	.20	12.00	.23	12.00	.16	10.00	.75	12.50	.64	14.00	.37	14.00
F004	.08	4.00	.05	2.00	<.01	0.00	.57	1.00	.44	9.00	.26	9.50
F006	.09	5.00	.08	5.50	.03	5.00	.66	7.00	.41	3.50	.12	5.50
F008	.12	7.50	.13	9.00	.05	7.00	.68	8.00	.46	10.00	.26	9.50
F010	.2	12.00	.3	14.50	.2	11.00	1.0 H	18.00	.8 H	17.50	.4	15.50
F011	1.0 EH	19.00	1.1 EH	19.00	1.0 EH	16.00	1.5 EH	20.00	1.5 EH	20.00	1.2 EH	19.00
F016	.07	3.00	.07	4.00	.02	2.50	.62	3.00	.43	6.50	.12	5.50
F020	.2	12.00	.2	11.00	.1	8.00	.6	2.00	.5	11.00	.3	11.00
F023	.75 EH	18.00	.65 EH	18.00	.28	13.00	1.03 H	19.00	.8 H	17.50	.65 VH	18.00
F031	.10	6.00	.13	9.00	.02	2.50	.65	6.00	.40	2.00	.11	3.00
F032	.03	1.00	.03	1.00	<.01	0.00	.70	10.50	.43	6.50	.05	1.00
F033	.13	9.50	.09T	7.00	.03T	5.00	.63	4.00	.42	5.00	.12	5.50
F034	.25	14.50	.28	13.00	.22	12.00	.90	15.50	.79 H	16.00	.32	13.00
F035	.053	2.00	.053	3.00	.005	1.00	.685	9.00	.437	8.00	.104	2.00
F038	.12	7.50	.13	9.00	<.1	0.00	.75	12.50	.58	13.00	.55 H	17.00
F046	.57 VH	17.00	.41 H	17.00	.29	14.00	.87	14.00	.57	12.00	.25	8.00
F048	.13	9.50	.08	5.50	.03	5.00	.64	5.00	.41	3.50	.12	5.50
F060	<.1	0.00	<.1	0.00	<.1	0.00	.7	10.50	.3	1.00	<.1	0.00
F061	.40 H	16.00	.35	16.00	.30	15.00	.9	15.50	.7	15.00	.4	15.50
F062	.25	14.50	.30	14.50	.14	9.00	.99	17.00	.87 H	19.00	.31	12.00
MEDIAN CONC.	.1300		.1300		.1200		.7000		.4800		.2600	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F003	.33	13.00	.23	14.00	.20	12.00	.28	14.50
F004	.17	2.00	.07	4.50	.03	3.00	.24	11.50
F006	.21	5.00	.07	4.50	.05	5.50	.08	2.50
F008	.30	11.00	.12	9.00	.06	7.00	.15	8.00
F010	.4	15.50	.2	12.50	.3	16.50	.2	9.50
F011	1.5 EH	20.00	1.5 EH	19.00	1.5 EH	19.00	1.2 EH	18.00
F016	.21	5.00	.07	4.50	.07	8.50	.11	4.50
F020	.3	11.00	.2	12.50	.2	12.00	.2	9.50
F023	.93 EH	19.00	.55 VH	18.00	.73 EH	18.00	.55 H	17.00
F031	.20	3.00	.08	7.50	.03	3.00	.08	2.50
F032	.21	5.00	.03	1.00	.01	1.00	.04	1.00
F033	.24	8.00	.08T	7.50	.07T	8.50	.11	4.50
F034	.43	17.00	.29	15.00	.25	14.50	.24	11.50
F035	.293	9.00	.041	2.00	.030	3.00	.129	7.00
F038	.30	11.00	.13	10.00	.20	12.00	.25	13.00
F046	.40	15.50	.49 H	17.00	.25	14.50	1.8 EH	19.00
F048	.22	7.00	.07	4.50	.05	5.50	.12	6.00
F060	.1	1.00	<.1	0.00	<.1	0.00	<.1	0.00
F061	.5	18.00	.3	16.00	.3	16.50	.45	16.00
F062	.38	14.00	.17	11.00	.13	10.00	.28	14.50
MEDIAN CONC.	.3000		.1300		.1300		.2000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F003	128.00	12.800	10			TURBIDIMETRIC
F004	46.50	5.167	9			02081
F006	49.00	4.900	10		BIASED LOW	NTU
F008	86.00	8.600	10			Ratio
F010	142.50	14.250	10	H H		HACH
F011	189.00	18.900	10	EHEHEHEHEHEHEHEHEHEH	BIASED HIGH	Meter
F016	47.00	4.700	10		BIASED LOW	Meter
F020	100.00	10.000	10			02074
F023	175.50	17.550	10	EHEH H H VHEHVHEHH	BIASED HIGH	-
F031	44.50	4.450	10		BIASED LOW	Nephelometric
F032	28.00	3.111	9		BIASED LOW	NTU
F033	64.50	6.450	10			NEPHELOMETRY
F034	142.00	14.200	10	H		HACH 2100 A
F035	46.00	4.600	10		BIASED LOW	Neph (NTU)
F038	105.00	11.667	9	H		metric
F046	148.00	14.800	10	VHH H EH		Turbidity Meter
F048	57.00	5.700	10			Nephlometer
F060	12.50	4.167	3		INSUFFICIENT DATA	Turbidimeter
F061	159.50	15.950	10	H	BIASED HIGH	Meter
F062	135.50	13.550	10	H		AWWA

OVERALL AVERAGE RANK IS 10.032

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F032	28.00	3.111	9		BIASED LOW	NTU
F060	12.50	4.167	3		INSUFFICIENT DATA	Turbidimeter
F031	44.50	4.450	10		BIASED LOW	Nephelometric
F035	46.00	4.600	10		BIASED LOW	Neph (NTU)
F016	47.00	4.700	10		BIASED LOW	Meter
F006	49.00	4.900	10		BIASED LOW	NTU
F004	46.50	5.167	9			02081
F048	57.00	5.700	10			Nephlometer
F033	64.50	6.450	10			NEPHELOMETRY
F008	86.00	8.600	10			Ratio
F020	100.00	10.000	10			02074
F038	105.00	11.667	9	H		metric
F003	128.00	12.800	10			TURBIDIMETRIC
F062	135.50	13.550	10	H		AWWA
F034	142.00	14.200	10	H		HACH 2100 A
F010	142.50	14.250	10	HH		HACH
F046	148.00	14.800	10	VHHHEH		Turbidity Meter
F061	159.50	15.950	10	H	BIASED HIGH	Meter
F023	175.50	17.550	10	EHEHHHVHEHVHEHH	BIASED HIGH	-
F011	189.00	18.900	10	EHEHEHEHEHEHEHEHEHEH	BIASED HIGH	Meter

OVERALL AVERAGE RANK IS 10.032

PARAMETER: 00292 Colour HAZEN UNIT

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 5.0000 BASIC ACCEPTABLE ERROR= 5.0000 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F002	40. EH	20.00	30. VH	19.50		0.00	37. EH	20.00	70. EH	20.00	26. H	19.00
F003	20.	7.50	20.	14.50	5.	10.00	20.	12.50	40.	13.50	20.	15.00
F004	15.	3.50	7.5 VL	1.00	<5.	0.00	15.	3.50	25. L	1.50	7.5 L	1.00
F007	20.	7.50	18.	11.00	<4.	0.00	22.	15.00	38.	11.00	15.	8.00
F008	15.	3.50	15.	5.50	<5.	0.00	15.	3.50	30.	4.00	<10. L	0.00
F010	14.	2.00	12.	3.00	<1.	0.00	13.	2.00	25. L	1.50	12.	4.00
F011	10. VL	1.00	10. L	2.00	<5.	0.00	10. L	1.00	35.	6.50	10. L	2.00
F016	27.	16.50	17.	8.50	7.9 H	12.00	33. VH	19.00	42.	15.00	23.	17.00
F023	20.6	9.00	13.3	4.00	<1.	0.00	17.0	6.00	35.4	8.00	11.4	3.00
F031	25.	14.50	21.	16.00	1.	5.50	28. H	17.00	44.	16.00	18.	13.00
F032	22.2	13.00	19.2	13.00	.8	3.50	18.2	9.00	38.4	12.00	17.0	10.50
F034	32. H	19.00	22.	17.00	2.	7.00	29. H	18.00	46.	18.50	20.	15.00
F035	19.0	6.00	16.0	7.00	.5	2.00	18.0	7.50	33.5	5.00	14.5	6.00
F038	17.	5.00	15.	5.50	<5.	0.00	16.	5.00	28.	3.00	14.	5.00
F042	22.	11.50	19.	12.00	0.	1.00	20.	12.50	40.	13.50	15.	8.00
F046	25.	14.50	20.	14.50	5.	10.00	20.	12.50	35.	6.50	20.	15.00
F058	20.8	10.00	17.9	10.00	.8	3.50	19.7	10.00	37.7	10.00	17.4	12.00
F060	30. H	18.00	30. VH	19.50	5.	10.00	25.	16.00	45.	17.00	25. H	18.00
F061	22.	11.50	17.	8.50	1.	5.50	18.	7.50	37.	9.00	15.	8.00
F062	27.00	16.50	23.00	18.00	3.00	8.00	20.00	12.50	46.00	18.50	17.00	10.50
MEDIAN CONC.	21.4000		17.9500		1.5000		19.8500		37.8500		17.0000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F002	40. EH	20.00	63. EH	20.00	8.	12.00	36. EH	19.50
F003	20.	6.00	30.	7.50	5.	4.00	20.	11.50
F004	15. L	2.00	25.	1.50	<5.	0.00	15.	3.00
F007	22.	9.00	28.	5.00	5.	4.00	18.	6.50
F008	15. L	2.00	25.	1.50	<5.	0.00	15.	3.00
F010	16.	4.00	26.	3.00	4.	2.00	14.	1.00
F011	15. L	2.00	30.	7.50	<5.	0.00	15.	3.00
F016	25.	14.50	36.	13.50	10.	14.50	36. EH	19.50
F023	20.6	7.00	28.0	5.00	2.20	1.00	15.1	5.00
F031	27.	16.00	34.	10.00	6.	7.50	24.	15.50
F032	24.2	13.00	37.8	15.00	5.8	6.00	21.8	14.00
F034	32. H	18.00	42.	18.00	7.	10.50	24.	15.50
F035	21.0	8.00	32.5	9.00	5.0	4.00	19.0	8.50
F038	18.	5.00	28.	5.00	25. EH	17.00	18.	6.50
F042	24.	12.00	35.	12.00	6.	7.50	20.	11.50
F046	25.	14.50	40.	17.00	10.	14.50	20.	11.50
F058	22.5	10.00	34.8	11.00	6.3	9.00	20.0	11.50
F060	35. VH	19.00	45. H	19.00	10.	14.50	30. H	18.00
F061	23.	11.00	38.	16.00	7.	10.50	19.	8.50
F062	28.00	17.00	36.00	13.50	10.00	14.50	26.00	17.00
MEDIAN CONC.	22.7500		34.4000		6.3000		20.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F002	170.00	18.889	9	EHVH EHEHH EHEH EH	BIASED HIGH	02011
F003	102.00	10.200	10			VISUAL COMPARISON
F004	17.00	2.125	8	VL L L L	BIASED LOW	02021
F007	77.00	8.556	9			02019
F008	23.00	3.286	7	L L	BIASED LOW	Visual Comp
F010	22.50	2.500	9	L	BIASED LOW	UCV
F011	25.00	3.125	8	VLL L L L	BIASED LOW	Meter
F016	150.00	15.000	10	H VH EH		Colorimetric
F023	48.00	5.333	9			-
F031	131.00	13.100	10	H		Spec - 450 nm
F032	109.00	10.900	10			Colour
F034	156.50	15.650	10	H H H	BIASED HIGH	COLOURIMETRIC
F035	63.00	6.300	10			-
F038	57.00	6.333	9	EH		Spectro
F042	101.50	10.150	10			-
F046	130.50	13.050	10			Meter
F058	97.00	9.700	10			Colorimetric
F060	169.00	16.900	10	H VH H VHH H	BIASED HIGH	Visual Comparison
F061	96.00	9.600	10			Visual
F062	146.00	14.600	10			AWWA-CHLPT

OVERALL AVERAGE RANK IS 10.059

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F004	17.00	2.125	8	VLLLL	BIASED LOW	02021
F010	22.50	2.500	9	L	BIASED LOW	UCV
F011	25.00	3.125	8	VLLLLL	BIASED LOW	Meter
F008	23.00	3.286	7	LL	BIASED LOW	Visual Comp
F023	48.00	5.333	9			-
F035	63.00	6.300	10			-
F038	57.00	6.333	9	EH		Spectro
F007	77.00	8.556	9			02019
F061	96.00	9.600	10			Visual
F058	97.00	9.700	10			Colorimetric
F042	101.50	10.150	10			-
F003	102.00	10.200	10			VISUAL COMPARISON
F032	109.00	10.900	10			Colour
F046	130.50	13.050	10			Meter
F031	131.00	13.100	10	H		Spec - 450 nm
F062	146.00	14.600	10			AWWA-CHLPT
F016	150.00	15.000	10	HVHEH		Colorimetric
F034	156.50	15.650	10	HHH	BIASED HIGH	COLOURIMETRIC
F060	169.00	16.900	10	HVHHVHHH	BIASED HIGH	Visual Comparison
F002	170.00	18.889	9	EHVHEHEHHEHEHEH	BIASED HIGH	02011

OVERALL AVERAGE RANK IS 10.059

PARAMETER: 00392 Specific Conductance UMHO/CM

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 2.0000 CONCENTRATION ERROR INCREMENT= .0500

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	43.3	10.50	111.7	16.00	210.	18.50	187.	16.50	187.	14.50	280.	19.00
F002	42.2	3.50	107.9	5.00	201.	6.00	178.	3.00	180.	4.50	268.	5.00
F003	45.0	24.00	114.	24.00	211.	21.50	188.	20.50	189.	19.50	282.	25.50
F004	43.5	12.00	113.	19.50	210.	18.50	187.	16.50	185.	11.00	280.	19.00
F006	45.	24.00	113.	19.50	213.	26.00	191.	28.00	191.	28.00	280.	19.00
F007	42.7	6.50	109.4	7.00	115.9 EL	1.00	178.1	4.00	180.6	6.00	267.7	4.00
F008	46.40	28.00	116.1	32.00	216.0	31.00	193.0	30.00	193.0	30.50	287.0	31.50
F009	44.	15.50	111.	13.50	205.	12.00	185.	10.50	183.	8.00	275.	11.00
F010	43.0	8.50	113.	19.50	199.	4.00	189.	23.50	192.	29.00	272.	7.50
F011	46.7	29.50	116.	31.00	217.	32.00	194.	31.50	194.	32.00	287.	31.50
F014	44.9	21.50	115.	28.00	213.	26.00	188.	20.50	189.	19.50	283.	27.00
F015	45.	24.00	114.	24.00	211.	21.50	190.	26.00	190.	25.00	285.	29.00
F016	40.5	2.00	97. VL	1.00	202.	8.00	185.	10.50	190.	25.00	285.	29.00
F020	44.	15.50	114.	24.00	213.	26.00	188.	20.50	189.	19.50	281.	23.00
F023	42.2	3.50	109.8	8.00	203.	10.00	184.	9.00	183.	8.00	272.	7.50
F025	44.1	18.00	112.	17.00	215.	29.00	194.	31.50	189.	19.50	277.	13.00
F030	47.7	31.00	104. L	3.00	192. L	3.00	171. L	2.00	174. L	2.00	259. L	2.00
F031	43.	8.50	110.	10.00	208.	13.50	186.	13.00	186.	12.50	278.	15.00
F032	43.9	13.00	111.	13.50	208.	13.50	186.	13.00	186.	12.50	278.	15.00
F033	44.	15.50	111.	13.50	209.	15.50	187.	16.50	189.	19.50	273.	9.00
F034	49. H	32.00	114.	24.00	215.	29.00	192.	29.00	190.	25.00	276.	12.00
F035	45.4	27.00	115.	28.00	215.	29.00	189.	23.50	190.	25.00	285.	29.00
F036	42.5	5.00	106.9	4.00	201.	6.00	179.	5.00	179.	3.00	267.	3.00
F037	46.7	29.50	119.2	33.00	220.0	33.00	195.0	33.00	197.0	33.00	293.0	33.00
F038	44.6	19.50	113.	19.50	210.	18.50	187.	16.50	188.	16.00	280.	19.00
F042	43.3	10.50	108.	6.00	201.	6.00	180.	6.00	180.	4.50	269.	6.00
F046	44.9	21.50	115.	28.00	209.	15.50	190.	26.00	193.	30.50	281.	23.00
F048	44.6	19.50	114.	24.00	212.	23.50	188.	20.50	189.	19.50	281.	23.00
F058	42.7	6.50	111.	13.50	203.	10.00	183.	8.00	183.	8.00	274.	10.00
F059	44.	15.50	110.	10.00	203.	10.00	181.	7.00	184.	10.00	278.	15.00
F060	50.0 H	33.00	110.	10.00	210.	18.50	190.	26.00	190.	25.00	280.	19.00
F061	38. L	1.00	98. VL	2.00	188. VL	2.00	165. VL	1.00	164. EL	1.00	246. EL	1.00
F062	45.10	26.00	115.30	30.00	212.00	23.50	186.00	13.00	187.00	14.50	282.00	25.50
MEDIAN CONC.	44.0000		112.0000		210.0000		187.0000		189.0000		280.0000	

PARAMETER: 00392 Specific Conductance UMHO/CM

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	446.	18.50	571.	20.50	277.	19.50	818.	17.50
F002	427.	6.00	546.	6.00	265.	4.00	787.	5.00
F003	451.	28.50	575.	25.50	279.	24.00	822.	21.00
F004	447.	21.00	573.	23.50	276.	16.50	822.	21.00
F006	446.	18.50	568.	18.00	282.	30.00	813.	15.50
F007	432.0	9.00	558.0	13.00	270.4	7.00	809.8	11.00
F008	456.0	31.00	581.0	31.00	284.0	32.00	827.0	30.00
F009	442.	12.50	550.	10.50	272.	11.00	810.	13.00
F010	445.	16.00	550.	10.50	272.	11.00	790.	8.00
F011	453.	30.00	577.	27.50	283.	31.00	820.	19.00
F014	449.	25.50	577.	27.50	277.	19.50	825.	27.50
F015	462.	33.00	591.	33.00	279.	24.00	833.	32.00
F016	448.	23.50	575.	25.50	280.	27.50	810.	13.00
F020	449.	25.50	571.	20.50	279.	24.00	822.	21.00
F023	412. L	3.00	549.	9.00	279.	24.00	789.	6.50
F025	451.	28.50	578.	29.50	279.	24.00	825.	27.50
F030	409. L	2.00	532. L	3.50	257. L	2.00	761. L	2.00
F031	444.	14.00	563.	15.00	273.	13.00	818.	17.50
F032	440.	11.00	560.	14.00	274.	14.00	802.	9.00
F033	431.	7.50	548.	8.00	272.	11.00	805.	10.00
F034	442.	12.50	564.	16.00	271.	8.50	784.	4.00
F035	445.	16.00	578.	29.50	281.	29.00	813.	15.50
F036	423.	4.00	537.	5.00	262.	3.00	765. L	3.00
F037	461.0	32.00	584.0	32.00	288.0	33.00	826.0	29.00
F038	447.	21.00	572.	22.00	276.	16.50	824.	25.00
F042	426.	5.00	547.	7.00	266.	5.00	789.	6.50
F046	445.	16.00	565.	17.00	275.	15.00	823.	23.00
F048	448.	23.50	57.3 EL	1.00	277.	19.50	824.	25.00
F058	435.	10.00	532. L	3.50	271.	8.50	810.	13.00
F059	431.	7.50	554.	12.00	270.	6.00	841.	33.00
F060	450.	27.00	570.	19.00	280.	27.50	830.	31.00
F061	393. EL	1.00	452. EL	2.00	243. EL	1.00	734. VL	1.00
F062	447.00	21.00	573.00	23.50	277.00	19.50	824.00	25.00
MEDIAN CONC.	445.0000		565.0000		276.0000		818.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	171.00	17.100	10			Cond. meter
F002	48.00	4.800	10		BIASED LOW	02041
F003	234.00	23.400	10			CONDUCTIVITY CELL
F004	178.50	17.850	10			02041
F006	226.50	22.650	10			Cond. meter
F007	68.50	6.850	10	EL	BIASED LOW	Cond. meter
F008	307.00	30.700	10		BIASED HIGH	Cond. meter
F009	117.50	11.750	10			25 C
F010	137.50	13.750	10			Cond. meter
F011	295.00	29.500	10		BIASED HIGH	Radiometer
F014	242.50	24.250	10			-
F015	271.50	27.150	10		BIASED HIGH	AUTO. COND. METER
F016	165.00	16.500	10	VL		Meter
F020	219.50	21.950	10			02041
F023	88.50	8.850	10	L		-
F025	237.50	23.750	10			Conduct. probe
F030	52.50	5.250	10	L L L L L L L L L	BIASED LOW	Naquadat 02041
F031	132.00	13.200	10			Cond. Meter
F032	128.50	12.850	10			Cond. meter
F033	126.00	12.600	10			COND. METER
F034	192.00	19.200	10	H		COND. METER
F035	251.50	25.150	10			Electrode
F036	41.00	4.100	10	L	BIASED LOW	RADIOMETER
F037	320.50	32.050	10		BIASED HIGH	VWR
F038	193.50	19.350	10			Meter
F042	62.50	6.250	10		BIASED LOW	-
F046	215.50	21.550	10			Cond. Meter
F048	199.00	19.900	10	EL		Cond. Meter
F058	91.00	9.100	10	L		Cond. Meter
F059	126.00	12.600	10			STANDARD METHODS
F060	236.00	23.600	10	H		Cond. Meter
F061	13.00	1.300	10	L VLVLVLELELELELELELVL	BIASED LOW	-
F062	221.50	22.150	10			PROBE

OVERALL AVERAGE RANK IS 17.000

Specific Conductance

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F061	13.00	1.300	10	LVLVLVLELELELELELVL	BIASED LOW	-
F036	41.00	4.100	10	L	BIASED LOW	RADIOMETER
F002	48.00	4.800	10		BIASED LOW	02041
F030	52.50	5.250	10	LLLLLLLLL	BIASED LOW	Naquadat 02041
F042	62.50	6.250	10		BIASED LOW	-
F007	68.50	6.850	10	EL	BIASED LOW	Cond. meter
F023	88.50	8.850	10	L		-
F058	91.00	9.100	10	L		Cond. Meter
F009	117.50	11.750	10			25 C
F033	126.00	12.600	10			COND. METER
F059	126.00	12.600	10			STANDARD METHODS
F032	128.50	12.850	10			Cond. meter
F031	132.00	13.200	10			Cond. Meter
F010	137.50	13.750	10			Cond. meter
F016	165.00	16.500	10	VL		Meter
F001	171.00	17.100	10			Cond. meter
F004	178.50	17.850	10			02041
F034	192.00	19.200	10	H		COND. METER
F038	193.50	19.350	10			Meter
F048	199.00	19.900	10	EL		Cond. Meter
F046	215.50	21.550	10			Cond. Meter
F020	219.50	21.950	10			02041
F062	221.50	22.150	10			PROBE
F006	226.50	22.650	10			Cond. meter
F003	234.00	23.400	10			CONDUCTIVITY CELL
F060	236.00	23.600	10	H		Cond. Meter
F025	237.50	23.750	10			Conduct. probe
F014	242.50	24.250	10			-
F035	251.50	25.150	10			Electrode
F015	271.50	27.150	10		BIASED HIGH	AUTO. COND. METER
F011	295.00	29.500	10		BIASED HIGH	Radiometer
F008	307.00	30.700	10		BIASED HIGH	Cond. meter
F037	320.50	32.050	10		BIASED HIGH	VWR

OVERALL AVERAGE RANK IS 17.000

Specific Conductance

PARAMETER: 05091 Boron MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0040 BASIC ACCEPTABLE ERROR= .0040 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F008	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	.05 EH	9.50	<.05	0.00
F009	<.01	0.00	.01	3.50	.01	1.50	.01	1.00	.02	5.00	.01 L	1.50
F010	<.01	0.00	<.01	0.00	.02 H	7.00	.02 H	6.00	.02	5.00	.02	6.50
F020	<.008	0.00	<.008	0.00	.013	4.00	.012	3.50	.017	2.50	.013	3.00
F023	.037 EH	4.00	.016 H	5.00	.030 EH	8.00	.028 EH	7.00	.033 EH	8.00	.024 H	8.50
F025	.005	1.50	.005 L	1.00	.015	6.00	.012	3.50	.026 H	7.00	.024 H	8.50
F030	.39 EH	5.00	.21 EH	6.00	.13 EH	9.00	.07 EH	9.00	.05 EH	9.50	.04 EH	10.00
F033	.007T	3.00	.01T	3.50	.013T	4.00	.014T	5.00	.02T	5.00	.015T	5.00
F038	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00
F046	.005	1.50	.007	2.00	.013	4.00	.011	2.00	.017	2.50	.014	4.00
F059	<.01	0.00	<.01	0.00	.01	1.50	.03 EH	8.00	.01 VL	1.00	.02	6.50
F062	<.01	0.00	<.01	0.00	<.01	0.00	<.01	0.00	<.01 VL	0.00	.01 L	1.50
MEDIAN CONC.	.0070		.0100		.0130		.0140		.0200		.0175	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F008	<.05	0.00	<.05	0.00	<.05	0.00	.07 EH	11.00
F009	.03	6.00	.02	5.00	.02	5.50	.05	6.50
F010	.03	6.00	.04 EH	7.00	.03 VH	9.00	.06 H	9.00
F020	.024	2.00	.010 L	2.00	.016	2.00	.043	3.50
F023	.041 VH	10.00	.016	4.00	.025	8.00	.057	8.00
F025	.032	8.00	.021	6.00	.023	7.00	.061 H	10.00
F030	.04 VH	9.00	<.03	0.00	<.03	0.00	.05	6.50
F033	.029	4.00	.011T	3.00	.017T	3.00	.044	5.00
F038	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00
F046	.025	3.00	.009 L	1.00	.019	4.00	.043	3.50
F059	.03	6.00	<.01 L	0.00	.02	5.50	.04 L	1.50
F062	.02 VL	1.00	<.01 L	0.00	.01 VL	1.00	.04 L	1.50
MEDIAN CONC.	.0300		.0160		.0200		.0500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F008	20.50	10.250	2	EH EH	INSUFFICIENT DATA	Azometh
F009	35.50	3.944	9	L		ICP
F010	55.50	6.938	8	H H EHVHH		ICAP
F020	22.50	2.813	8	L	BIASED LOW	05107
F023	70.50	7.050	10	EHH EHEHEHH VH		-
F025	58.50	5.850	10	L H H H		ICP
F030	64.00	8.000	8	EHEHEHEHEHEHVH	BIASED HIGH	Naquadat 05111
F033	40.50	4.050	10			ICP
F038	0.00	-	0		INSUFFICIENT DATA	ICP
F046	27.50	2.750	10	L	BIASED LOW	ICP
F059	30.00	4.286	7	EHVL L L		ICP
F062	5.00	1.250	4	VLL VLL VLL	INSUFFICIENT DATA	ICP

OVERALL AVERAGE RANK IS 5.000

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F038	0.00	-	0		INSUFFICIENT DATA	ICP
F062	5.00	1.250	4	VLLVLLVLL	INSUFFICIENT DATA	ICP
F046	27.50	2.750	10	L	BIASED LOW	ICP
F020	22.50	2.813	8	L	BIASED LOW	05107
F009	35.50	3.944	9	L		ICP
F033	40.50	4.050	10			ICP
F059	30.00	4.286	7	EHVLLL		ICP
F025	58.50	5.850	10	LHHH		ICP
F010	55.50	6.938	8	HHEHVHH		ICAP
F023	70.50	7.050	10	EHHEHEHEHHVH		-
F030	64.00	8.000	8	EHEHEHEHEHEHVH	BIASED HIGH	Naquadat 05111
F008	20.50	10.250	2	EHEH	INSUFFICIENT DATA	Azometh

OVERALL AVERAGE RANK IS 5.000

Boron

PARAMETER: 01092 pH PH UNITS

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 5.5000 BASIC ACCEPTABLE ERROR= .2000 CONCENTRATION ERROR INCREMENT= 0.0000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	6.92	17.00	7.64	13.50	8.08	26.50	7.39	13.50	7.59	19.00	7.97	21.00
F002	7.12	27.00	7.83	31.00	8.08	26.50	7.58	25.00	7.69	27.00	7.90	13.00
F003	7.12	27.00	7.68	16.50	7.93	13.00	7.37	11.50	7.63	23.00	7.85	8.50
F004	6.78	10.00	7.58	10.00	7.80	8.50	7.37	11.50	7.48	12.00	8.00	23.50
F006	7.0	19.00	7.7	20.00	8.0	18.00	7.5	19.50	7.5	13.50	7.9	13.00
F007	7.28 VH	33.00	7.91 H	33.00	8.20	32.00	7.82 VH	33.00	7.91 VH	33.00	8.25 VH	34.00
F008	6.94	18.00	7.65	15.00	7.95	14.00	7.51	22.00	7.66	25.00	7.90	13.00
F009	7.01	20.00	7.72	22.50	8.05	24.00	7.50	19.50	7.55	17.00	7.92	17.50
F010	7.23 H	31.00	7.68	16.50	7.85	10.50	7.73 H	32.00	7.80 H	32.00	7.93	19.00
F011	6.74	7.00	7.60	11.50	7.85	10.50	7.13 VL	5.00	7.33 L	5.00	7.51 EL	3.50
F013	6.88	13.00	7.20 EL	5.00	7.63 VL	5.00	7.25 L	9.00	7.31 L	4.00	7.51 EL	3.50
F014	7.20 H	29.50	7.96 H	34.00	8.26 H	34.00	7.85 VH	34.50	8.02 EH	34.00	8.13 H	31.00
F015	6.90	15.00	7.70	20.00	8.03	22.00	7.45	16.00	7.54	16.00	7.92	17.50
F016	5.98 EL	3.00	7.16 EL	4.00	7.72 L	6.00	7.30	10.00	7.47	11.00	7.90	13.00
F020	6.9	15.00	7.6	11.50	8.2	32.00	7.5	19.50	7.7	29.00	8.2 H	33.00
F023	6.84	12.00	7.32 VL	7.00	7.78 L	7.00	7.12 VL	4.00	7.34 L	6.00	8.01	26.00
F025	5.86 EL	2.00	6.67 EL	2.00	7.62 VL	4.00	6.40 EL	2.50	6.37 EL	2.00	7.69 L	5.00
F030	6.5 EL	5.00	7.3 VL	6.00	7.6 EL	3.00	7.2 VL	7.00	7.4	8.50	7.8	6.50
F031	7.4 EH	34.00	7.4 L	8.00	8.2	32.00	7.7	31.00	7.7	29.00	8.1	30.00
F032	7.12	27.00	7.79	27.00	8.04	23.00	7.64	30.00	7.71	31.00	8.07	29.00
F033	7.1	24.50	7.9 H	32.00	8.1	29.00	7.6	27.50	7.6	21.00	8.0	23.50
F034	7.9 EH	35.00	7.8	28.50	8.0	18.00	7.6	27.50	7.7	29.00	8.0	23.50
F035	7.10	24.50	7.78	25.50	8.02	21.00	7.39	13.50	7.45	10.00	7.91	16.00
F036	6.90	15.00	7.69	18.00	8.01	20.00	7.54	23.00	7.67	26.00	8.02	27.50
F037	7.04	22.00	7.72	22.50	7.99	15.50	7.50	19.50	7.51	15.00	7.88	10.00
F038	6.75	8.50	7.50	9.00	7.80	8.50	7.20 VL	7.00	7.40	8.50	7.85	8.50
F042	6.83	11.00	7.81	30.00	8.00	18.00	7.57	24.00	7.50	13.50	7.96	20.00
F043	6.7 L	6.00	7.7	20.00	8.1	29.00	7.6	27.50	7.6	21.00	7.8	6.50
F046	7.24 VH	32.00	7.99 VH	35.00	8.30 VH	35.00	7.85 VH	34.50	8.11 EH	35.00	8.32 EH	35.00
F048	7.02	21.00	7.73	24.00	7.92	12.00	7.20 VL	7.00	7.35 L	7.00	7.90	13.00
F058	7.09	23.00	7.78	25.50	8.06	25.00	7.47	17.00	7.58	18.00	8.02	27.50
F059	6.3 EL	4.00	6.8 EL	3.00	6.5 EL	1.00	6.2 EL	1.00	6.3 EL	1.00	6.5 EL	1.00
F060	5.5 EL	1.00	6.4 EL	1.00	6.9 EL	2.00	6.4 EL	2.50	6.5 EL	3.00	7.1 EL	2.00
F061	6.75	8.50	7.64	13.50	7.99	15.50	7.44	15.00	7.64	24.00	8.14 H	32.00
F062	7.20 H	29.50	7.80	28.50	8.10	29.00	7.60	27.50	7.60	21.00	8.00	23.50
MEDIAN CONC.	6.9400		7.6900		8.0000		7.5000		7.5800		7.9200	

PARAMETER: 01092 pH PH UNITS

SAMPLE LAB NO	7 REPORTED VALUE	7 RANK	8 REPORTED VALUE	8 RANK	9 REPORTED VALUE	9 RANK	10 REPORTED VALUE	10 RANK
F001	7.58	18.00	8.51	29.00	8.18	27.00	8.40	28.00
F002	7.70	24.50	8.49	25.50	8.06	17.50	8.36	20.00
F003	7.55	15.50	8.12 VL	3.00	7.98	10.00	8.10 L	2.50
F004	7.52	14.00	8.35	10.50	7.90	6.00	8.23	6.50
F006	7.5	10.50	8.4	14.50	8.1	21.50	8.3	11.00
F007	7.92 VH	33.00	8.57	31.00	8.27 H	30.00	8.48	33.50
F008	7.65	22.00	8.43	17.50	8.02	14.00	8.32	14.00
F009	7.55	15.50	8.45	21.00	8.06	17.50	8.35	19.00
F010	7.72	28.00	8.35	10.50	8.00	11.50	8.40	28.00
F011	7.26 VL	4.00	8.38	12.00	7.94	8.50	8.25	9.00
F013	7.41	8.00	8.40	14.50	8.11	24.00	8.32	14.00
F014	7.82 H	32.00	8.59	32.00	8.33 H	34.00	8.38	23.00
F015	7.48	9.00	8.43	17.50	8.07	19.00	8.32	14.00
F016	7.72	28.00	8.28	6.00	7.88	5.00	8.21	4.50
F020	7.6	20.00	8.2 L	4.50	8.3 H	32.00	8.4	28.00
F023	7.38 L	7.00	8.33	8.50	7.84 L	4.00	8.23	6.50
F025	6.68 EL	3.00	8.31	7.00	7.59 EL	3.00	8.21	4.50
F030	7.5	10.50	8.4	14.50	8.0	11.50	8.3	11.00
F031	7.8 H	31.00	8.5	27.50	8.2	28.50	8.4	28.00
F032	7.75	30.00	8.45	21.00	8.10	21.50	8.37	21.00
F033	7.7	24.50	8.6	33.50	8.2	28.50	8.4	28.00
F034	7.7	24.50	8.4	14.50	8.1	21.50	8.3	11.00
F035	8.44 EH	35.00	8.06 VL	2.00	8.44 VH	35.00	8.33	16.00
F036	7.72	28.00	8.53	30.00	8.14	26.00	8.44	32.00
F037	7.51	12.50	8.49	25.50	8.05	15.50	8.38	23.00
F038	7.33 L	6.00	8.33	8.50	7.94	8.50	8.24	8.00
F042	7.57	17.00	8.44	19.00	8.01	13.00	8.34	17.50
F043	7.6	20.00	8.6	33.50	8.3 H	32.00	8.5	35.00
F046	8.09 EH	34.00	8.71 H	35.00	8.30 H	32.00	8.48	33.50
F048	7.28 VL	5.00	8.47	23.00	8.05	15.50	8.34	17.50
F058	7.51	12.50	8.48	24.00	8.13	25.00	8.38	23.00
F059	6.1 EL	1.00	7.2 EL	1.00	6.7 EL	1.00	7.5 EL	1.00
F060	6.5 EL	2.00	8.2 L	4.50	7.1 EL	2.00	8.1 L	2.50
F061	7.7	24.50	8.45	21.00	7.93	7.00	8.4	28.00
F062	7.60	20.00	8.50	27.50	8.10	21.50	8.40	28.00
MEDIAN CONC.	7.5800		8.4300		8.0600		8.3400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	212.50	21.250	10			pH Meter
F002	237.00	23.700	10			Auto
F003	130.50	13.050	10	VL L		GLASS ELECTRODE
F004	112.50	11.250	10			10301
F006	160.50	16.050	10			Stirred
F007	325.50	32.550	10	VHH VHVHVHVH H	BIASED HIGH	pH Meter
F008	174.50	17.450	10			Meter
F009	193.50	19.350	10			stirred
F010	219.00	21.900	10	H H H		Unstirred
F011	76.00	7.600	10	VLL ELVL	BIASED LOW	Stirred/Radiometer
F013	100.00	10.000	10	ELVLL L EL		pH Stirred
F014	318.00	31.800	10	H H H VHEHH H H	BIASED HIGH	-
F015	166.00	16.600	10			AUTO PH/ALK. TIT'R
F016	90.50	9.050	10	ELELL		pH Meter
F020	224.50	22.450	10	H L H		10301
F023	88.00	8.800	10	VLL VLL L L		-
F025	35.00	3.500	10	ELELVLELELL EL EL	BIASED LOW	pH electrode
F030	83.50	8.350	10	ELVLELVL		Naquadat 10301
F031	279.00	27.900	10	EHL H	BIASED HIGH	Stirred/Electromet
F032	260.50	26.050	10			Stirred
F033	272.00	27.200	10	H		RADIOMETER-STIRRED
F034	233.00	23.300	10	EH		STIRRED
F035	198.50	19.850	10	EHVLVH		Electode (Stirred)
F036	245.50	24.550	10			RADIOMETER
F037	181.00	18.100	10			Fischer
F038	81.00	8.100	10	VL L	BIASED LOW	Meter
F042	183.00	18.300	10			-
F043	230.50	23.050	10	L H		Pot.
F046	341.00	34.100	10	VHVHVHVHEHEHEHH H	BIASED HIGH	Stirred/pH Meter
F048	145.00	14.500	10	VLL VL		Stirred/Glass Elec
F058	220.50	22.050	10			pH Meter
F059	15.00	1.500	10	ELELELELELELELELELEL	BIASED LOW	STIRRED
F060	22.50	2.250	10	ELELELELELELELL ELL	BIASED LOW	Stirred/pH Meter
F061	189.00	18.900	10	H		Stirred
F062	256.00	25.600	10	H		PROBE

OVERALL AVERAGE RANK IS 18.000

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F059	15.00	1.500	10	ELELELELELELELELELEL	BIASED LOW	STIRRED
F060	22.50	2.250	10	ELELELELELELELLELL	BIASED LOW	Stirred/pH Meter
F025	35.00	3.500	10	ELELVLELELLELEL	BIASED LOW	pH electrode
F011	76.00	7.600	10	VLLELVL	BIASED LOW	Stirred/Radiometer
F038	81.00	8.100	10	VLL	BIASED LOW	Meter
F030	83.50	8.350	10	ELVLELVL		Naquadat 10301
F023	88.00	8.800	10	VLLVLLLL		-
F016	90.50	9.050	10	ELELL		pH Meter
F013	100.00	10.000	10	ELVLLLEL		pH Stirred
F004	112.50	11.250	10			10301
F003	130.50	13.050	10	VLL		GLASS ELECTRODE
F048	145.00	14.500	10	VLLVL		Stirred/Glass Elec
F006	160.50	16.050	10			Stirred
F015	166.00	16.600	10			AUTO PH/ALK. TIT'R
F008	174.50	17.450	10			Meter
F037	181.00	18.100	10			Fischer
F042	183.00	18.300	10			-
F061	189.00	18.900	10	H		Stirred
F009	193.50	19.350	10			stirred
F035	198.50	19.850	10	EHVLVH		Electode (Stirred)
F001	212.50	21.250	10			pH Meter
F010	219.00	21.900	10	HHH		Unstirred
F058	220.50	22.050	10			pH Meter
F020	224.50	22.450	10	HLH		10301
F043	230.50	23.050	10	LH		Pot.
F034	233.00	23.300	10	EH		STIRRED
F002	237.00	23.700	10			Auto
F036	245.50	24.550	10			RADIOMETER
F062	256.00	25.600	10	H		PROBE
F032	260.50	26.050	10			Stirred
F033	272.00	27.200	10	H		RADIOMETER-STIRRED
F031	279.00	27.900	10	EHLH	BIASED HIGH	Stirred/Electromet
F014	318.00	31.800	10	HHHVHEHHHH	BIASED HIGH	-
F007	325.50	32.550	10	VHHVHVHVHVHH	BIASED HIGH	pH Meter
F046	341.00	34.100	10	VHVHVHVHEHEHEHHH	BIASED HIGH	Stirred/pH Meter

OVERALL AVERAGE RANK IS 18.000

pH

PARAMETER: 06002 Diss Organic Carbon MG C/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 2.0000 BASIC ACCEPTABLE ERROR= .8000 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	4.25	8.00	6.7	12.00	1.45	7.00	3.28	10.00	4.95	9.00	5.7	11.50
F002	3.6	2.00	5.5	2.00	1.2	3.00	2.6	2.00	4.6	7.00	4.6	1.00
F003	3.41 L	1.00	5.68	3.00	1.73	12.00	2.48	1.00	4.10	2.00	5.30	7.00
F004	4.10	6.50	6.50	8.50	1.65	9.00	3.00	7.00	4.82	8.00	5.70	11.50
F006	5.0	15.50	7.6	17.00	1.7	10.50	3.8	13.50	6.0	17.00	6.5	15.00
F008	<5.	0.00	6.5	8.50	<5.	0.00	<5.	0.00	<5.	0.00	<5.	0.00
F010	3.8	3.00	5.8	4.00	1.1	2.00	2.7	3.00	4.4	3.00	5.1	4.00
F014	4.6	11.50	6.8	13.00	2.0	14.00	3.8	13.50	5.1	10.00	6.6	16.00
F015	4.6	11.50	6.6	10.00	2.1	16.00	3.1	8.00	5.2	14.00	5.1	4.00
F016	4.51	10.00	7.76	18.00	2.09	15.00	3.90	15.50	5.75	16.00	6.17	14.00
F023	11.2 EH	20.50	21.0 EH	22.00	<1.	0.00	12.0 EH	21.00	21.0 EH	21.00	18.0 EH	21.00
F025	4.9	14.00	7.4	16.00	1.7	10.50	3.4	12.00	5.2	14.00	6.0	13.00
F030	6.4 VH	18.00	4.7 VL	1.00	2.9 VH	18.00	4.5 H	18.00	3.3 VL	1.00	8.0 VH	19.00
F032	4.1	6.50	6.3	6.00	1.3	5.50	2.8	4.00	4.5	4.00	5.2	6.00
F036	4.30	9.00	6.67	11.00	1.30	5.50	3.18	9.00	5.19	12.00	5.65	9.00
F038	4.03	5.00	6.20	5.00	1.25	4.00	2.81	5.00	4.54	5.00	5.10	4.00
F042	4.66	13.00	6.89	14.00	1.98	13.00	3.31	11.00	5.20	14.00	5.68	10.00
F046	5.75 H	17.00	6.94	15.00	1.08	1.00	3.90	15.50	5.12	11.00	5.03	2.00
F048	4.01	4.00	6.46	7.00	1.47	8.00	2.89	6.00	4.57	6.00	5.31	8.00
F060	5.0	15.50	8.3 H	19.00	2.2	17.00	4.1	17.00	7.0 VH	18.00	7.3 H	17.00
F061	7. EH	19.00	15. EH	21.00	10. EH	20.00	10. EH	20.00	12. EH	20.00	9. EH	20.00
F062	11.20 EH	20.50	11.50 EH	20.00	3.05 VH	19.00	7.10 EH	19.00	7.50 EH	19.00	7.40 H	18.00
MEDIAN CONC.	4.6000		6.6850		1.7000		3.3100		5.1200		5.7000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	4.5	9.50	8.82	10.00	2.45	10.00	5.58	9.00
F002	3.4 L	1.00	7.8	4.00	1.6 L	2.00	4.1 VL	1.00
F003	3.94	4.00	8.10	6.00	2.81	12.00	5.70	10.00
F004	4.40	7.00	9.10	11.00	2.72	11.00	6.02	12.00
F006	5.8 H	15.00	10.0	16.00	3.0	14.00	7.0	14.00
F008	<5.	0.00	6.0 EL	1.00	<5.	0.00	<5.	0.00
F010	3.8	2.00	7.9	5.00	1.9	3.00	4.8	4.00
F014	4.5	9.50	11. H	17.50	3.4	15.00	7.7 VH	15.00
F015	4.6	11.50	7.4 L	3.00	1.5 L	1.00	4.2 L	2.00
F016	16.2 EH	21.00	57.0 EH	22.00	20.4 EH	20.00	46.2 EH	21.00
F023	11.0 EH	20.00	20.0 EH	21.00	36.0 EH	21.00	20.0 EH	20.00
F025	5.0	14.00	9.9	15.00	2.4	9.00	6.1	13.00
F030	6.0 H	16.00	9.2	13.00	7.2 EH	19.00	9.1 EH	18.00
F032	3.9	3.00	8.3	7.00	2.0	5.00	5.0	5.00
F036	4.42	8.00	9.23	14.00	2.25	6.00	5.33	8.00
F038	4.11	5.00	8.39	8.00	2.27	7.00	5.26	6.00
F042	4.82	13.00	9.17	12.00	2.98	13.00	5.90	11.00
F046	4.60	11.50	7.05 L	2.00	1.93	4.00	4.64 L	3.00
F048	4.25	6.00	8.41	9.00	2.34	8.00	5.27	7.00
F060	6.1 H	17.00	11.0 H	17.50	3.8 H	16.00	7.8 VH	16.00
F061	8. EH	18.00	13. EH	20.00	7. EH	18.00	8. VH	17.00
F062	10.90 EH	19.00	12.45 EH	19.00	5.25 EH	17.00	15.45 EH	19.00
MEDIAN CONC.	4.6000		9.1350		2.7200		5.9000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	96.00	9.600	10			UV AA
F002	25.00	2.500	10	L L VL	BIASED LOW	06107
F003	58.00	5.800	10	L		INFRARED DETECTOR
F004	91.50	9.150	10			06104
F006	147.50	14.750	10	H		UV AA
F008	9.50	4.750	2	EL	INSUFFICIENT DATA	Calc'd
F010	33.00	3.300	10		BIASED LOW	UV Pers Cond
F014	135.00	13.500	10	H VH		-
F015	81.00	8.100	10	L L L		AUTO CARBON ANALYZ
F016	172.50	17.250	10	EHEHEHEH	BIASED HIGH	Hi Temp Cat.
F023	187.50	20.833	9	EHEH EHEHEHEHEHEHEH	BIASED HIGH	-
F025	130.50	13.050	10			-
F030	141.00	14.100	10	VHVLVHH VLVHH EHEH		NaquaDAT 06104
F032	52.00	5.200	10		BIASED LOW	Colour
F036	91.50	9.150	10			AUTOANALYZER
F038	54.00	5.400	10		BIASED LOW	ICP
F042	124.00	12.400	10			-
F046	82.00	8.200	10	H L L		TOC Analyzer
F048	69.00	6.900	10			NPOC
F060	170.00	17.000	10	H VHH H H H VH	BIASED HIGH	Auto UV/S208 OX
F061	193.00	19.300	10	EHEHEHEHEHEHEHEHEHVH	BIASED HIGH	IR
F062	189.50	18.950	10	EHEHVHEHEHH EHEHEHEH	BIASED HIGH	COMB/IR

OVERALL AVERAGE RANK IS 11.057

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F002	25.00	2.500	10	LLVL	BIASED LOW	06107
F010	33.00	3.300	10		BIASED LOW	UV Pers Cond
F008	9.50	4.750	2	EL	INSUFFICIENT DATA	Calc'd
F032	52.00	5.200	10		BIASED LOW	Colour
F038	54.00	5.400	10		BIASED LOW	ICP
F003	58.00	5.800	10	L		INFRARED DETECTOR
F048	69.00	6.900	10			NPOC
F015	81.00	8.100	10	LLL		AUTO CARBON ANALYZ
F046	82.00	8.200	10	HLL		TOC Analyzer
F004	91.50	9.150	10			06104
F036	91.50	9.150	10			AUTOANALYZER
F001	96.00	9.600	10			UV AA
F042	124.00	12.400	10			-
F025	130.50	13.050	10			-
F014	135.00	13.500	10	HVH		-
F030	141.00	14.100	10	VHVLVHHVLVHHEHEH		NaquaDAT 06104
F006	147.50	14.750	10	H		UV AA
F060	170.00	17.000	10	HVHHHHHVH	BIASED HIGH	Auto UV/S208 OX
F016	172.50	17.250	10	EHEHEHEH	BIASED HIGH	Hi Temp Cat.
F062	189.50	18.950	10	EHEHVHEHEHHEHEHEHEH	BIASED HIGH	COMB/IR
F061	193.00	19.300	10	EHEHEHEHEHEHEHEHEHVH	BIASED HIGH	IR
F023	187.50	20.833	9	EHEHEHEHEHEHEHEHEH	BIASED HIGH	-

OVERALL AVERAGE RANK IS 11.057

PARAMETER: 06592 Diss Inorg Carbon MG C/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .5000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .1250

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	1.68	2.00	10.68	5.00	18.8	8.50	7.88	6.00	10.75	5.00	29.5	12.00
F003	2.23	14.00	10.9	8.00	18.8	8.50	8.79	13.00	12.1	8.00	29.2	10.00
F008	<5.0	0.00	12.5	16.00	21.0	17.00	9.0	16.00	13.5	15.50	32.0	17.00
F010	2.0	8.50	11.1	11.00	19.0	10.50	8.4	11.00	12.3	11.50	30.	14.00
F015	2.1	12.00	11.3	12.00	18.0	6.00	8.5	12.00	12.5	13.00	29.4	11.00
F016	2.34	15.00	10.2	4.00	18.5	7.00	7.81	5.00	11.7	6.00	27.7	7.00
F025	1.2 L	1.00	7.4 VL	2.00	13.9 VL	3.00	5.3 VL	2.00	8.1 EL	2.00	19.9 EL	3.00
F030	1.8	3.50	10.7	6.00	16.5	5.00	7.0	4.00	10.4	4.00	27.0	5.00
F032	2.0	8.50	11.0	9.50	19.0	10.50	8.0	7.00	12.2	9.50	28.2	9.00
F036	1.96	5.00	11.60	13.50	19.60	14.00	8.36	10.00	12.20	9.50	30.70	15.00
F038	2.0	8.50	11.6	13.50	19.9	15.00	8.8	14.00	13.5	15.50	30.9	16.00
F042	1.97	6.00	11.0	9.50	19.3	12.00	8.07	8.00	12.3	11.50	27.5	6.00
F046	1.80	3.50	11.75	15.00	20.8	16.00	8.93	15.00	13.2	14.00	29.6	13.00
F058	2.03	11.00	10.88	7.00	19.55	13.00	8.11	9.00	11.89	7.00	27.81	8.00
F060	2.2	13.00	9.0 L	3.00	16.3	4.00	6.9	3.00	9.3 L	3.00	26.3	4.00
F061	2.	8.50	2. EL	1.00	2. EL	2.00	2. EL	1.00	6. EL	1.00	2. EL	1.00
F062	<1.00 L	0.00	<1.00 EL	0.00	1.00 EL	1.00	<1.00 EL	0.00	<1.00 EL	0.00	2.90 EL	2.00
MEDIAN CONC.	2.0000		10.9500		18.8000		8.0900		12.1500		28.2000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	11.8	6.00	49.75	7.00	19.75	9.00	45.8	5.00
F003	12.3	9.50	52.9	13.00	20.2	11.00	49.2	13.50
F008	14.0	16.00	56.0	16.00	22.5	17.00	51.0	16.50
F010	12.3	9.50	52.	12.00	19.4	7.00	49.	12.00
F015	12.6	11.50	51.5	9.00	20.5	12.00	47.6	10.00
F016	1.15 EL	1.00	2.80 EL	2.00	2.39 EL	3.00	6.29 EL	2.00
F025	8.2 EL	3.00	36.0 EL	4.00	14.5 VL	4.00	33.0 EL	4.00
F030	10.4	4.00	47.5	5.00	17.9	5.00	48.5	11.00
F032	12.0	8.00	48.6	6.00	20.0	10.00	46.2	7.00
F036	12.60	11.50	53.60	15.00	20.90	13.00	49.20	13.50
F038	13.4	14.00	56.5	17.00	22.1	15.50	51.0	16.50
F042	13.4	14.00	51.8	11.00	21.4	14.00	46.3	8.00
F046	13.4	14.00	53.1	14.00	22.1	15.50	49.4	15.00
F058	11.99	7.00	51.69	10.00	19.65	8.00	45.84	6.00
F060	10.5	5.00	50.6	8.00	18.2	6.00	46.7	9.00
F061	2. EL	2.00	2. EL	1.00	2. EL	2.00	2. EL	1.00
F062	<1.00 EL	0.00	6.60 EL	3.00	1.80 EL	1.00	7.60 EL	3.00
MEDIAN CONC.	12.1500		51.5000		19.7500		46.7000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	65.50	6.550	10			Auto Col
F003	108.50	10.850	10			INFRARED DETECTOR
F008	147.00	16.333	9		BIASED HIGH	IR
F010	107.00	10.700	10			Cond
F015	108.50	10.850	10			AUTO CARBON ANALYZ
F016	52.00	5.200	10	ELELELEL		Cond
F025	28.00	2.800	10	L VLVLVLELELELELVLEL	BIASED LOW	-
F030	52.50	5.250	10			Naquadat 06502
F032	85.00	8.500	10			Colour
F036	120.00	12.000	10			AUTOANALYZER
F038	145.50	14.550	10		BIASED HIGH	Colour
F042	100.00	10.000	10			-
F046	135.00	13.500	10		BIASED HIGH	TOC Analyzer
F058	86.00	8.600	10			Colorimetric
F060	58.00	5.800	10	L L		Autoanalyzer - IR
F061	20.50	2.050	10	ELELELELELELELELEL	BIASED LOW	IR
F062	10.00	2.000	5	L ELELELELELELELELEL	BIASED LOW	COMB/IR

OVERALL AVERAGE RANK IS 8.713

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F062	10.00	2.000	5	LELELELELELELELELEL	BIASED LOW	COMB/IR
F061	20.50	2.050	10	ELELELELELELELELEL	BIASED LOW	IR
F025	28.00	2.800	10	LVLVLVLELELELELVLEL	BIASED LOW	-
F016	52.00	5.200	10	ELELELEL		Cond
F030	52.50	5.250	10			Naquadat 06502
F060	58.00	5.800	10	LL		Autoanalyzer - IR
F001	65.50	6.550	10			Auto Col
F032	85.00	8.500	10			Colour
F058	86.00	8.600	10			Colorimetric
F042	100.00	10.000	10			-
F010	107.00	10.700	10			Cond
F015	108.50	10.850	10			AUTO CARBON ANALYZ
F003	108.50	10.850	10			INFRARED DETECTOR
F036	120.00	12.000	10			AUTOANALYZER
F046	135.00	13.500	10		BIASED HIGH	TOC Analyzer
F038	145.50	14.550	10		BIASED HIGH	Colour
F008	147.00	16.333	9		BIASED HIGH	IR

OVERALL AVERAGE RANK IS 8.713

Diss Inorg Carbon

PARAMETER: 06192 Total Alkalinity MG/LCACO3

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .0700

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	10. H	25.00	49.	27.00	81.	21.00	35.	23.50	52.	23.50	123.	26.00
F002	7.9	8.00	46.0	7.50	78.0	6.00	33.2	9.00	49.9	8.00	119.5	10.00
F003	8.2	11.00	46.1	9.00	79.8	13.00	33.1	8.00	50.2	10.50	120.	12.00
F006	<10.	0.00	49.	27.00	81.	21.00	35.	23.50	52.	23.50	122.	21.50
F007	7.7	6.00	45.5	5.00	78.4	8.00	32.3	6.00	49.2	7.00	118.7	7.00
F008	9.18	20.00	48.0	20.50	80.4	17.00	34.6	19.00	51.5	22.00	122.	21.50
F009	9.	17.50	17. EL	2.00	78.	6.00	35.	23.50	51.	17.00	117.	3.50
F010	7.8	7.00	47.2	14.50	81.	21.00	32.	4.00	49.	6.00	123.	26.00
F011	6.3 EL	3.00	45.3	4.00	76.8	4.00	31.2 L	2.00	48.0	3.00	118.	5.50
F013	6.97 VL	4.00	44.32	3.00	76.69	3.00	31.87	3.00	47.81	2.00	116.5	2.00
F014	8.31	12.00	47.2	14.50	80.0	14.50	33.5	12.00	50.9	14.00	122.	21.50
F015	8.0	9.00	46.	7.50	78.	6.00	33.	7.00	50.	9.00	120.	12.00
F016	8.5	13.00	46.8	11.00	78.7	10.00	34.1	16.50	48.9	5.00	119.	8.50
F020	8.1	10.00	46.7	10.00	81.1	24.00	33.3	10.00	52.2	26.50	122.	21.50
F023	7.40 L	5.00	45.6	6.00	78.5	9.00	32.2	5.00	48.2	4.00	117.	3.50
F025	9.1	19.00	47.2	14.50	79.5	12.00	34.1	16.50	50.5	12.00	119.	8.50
F030	4.0 EL	2.00	53. VH	30.50	76.	2.00	34.	14.00	51.	17.00	118.	5.50
F031	10. H	25.00	48.	20.50	79.	11.00	34.	14.00	51.	17.00	120.	12.00
F032	9.82 H	23.00	48.5	23.00	81.3	26.00	35.0	23.50	52.2	26.50	123.	26.00
F033	9.8 H	22.00	48.3	22.00	81.4	27.00	34.8	21.00	52.1	25.00	122.	21.50
F035	<10.	0.00	50.0	29.00	84.	30.00	35.3	27.00	54.2	29.00	126.	31.00
F036	.1543 EL	1.00	.9316 EL	1.00	1.6082 EL	1.00	.6785 EL	1.00	1.0128 EL	1.00	2.443 EL	1.00
F038	8.7	15.50	48.7	24.00	81.2	25.00	35.1	26.00	51.2	20.00	125.	29.50
F042	8.65	14.00	47.6	17.50	80.8	18.00	33.4	11.00	50.7	13.00	122.	21.50
F046	10.0 H	25.00	47.6	17.50	81.0	21.00	35.6	28.00	51.0	17.00	121.	15.50
F048	11.27 EH	27.00	48.96	25.00	81.89	28.00	37.19 H	30.00	52.22	28.00	121.55	17.00
F058	9.53	21.00	47.66	19.00	80.14	16.00	34.33	18.00	51.37	21.00	120.9	14.00
F059	13. EH	29.00	53. VH	30.50	88. H	31.00	38. H	31.00	60. EH	31.00	125.	29.50
F060	9.	17.50	47.	12.00	80.	14.50	34.	14.00	51.	17.00	121.	15.50
F061	12. EH	28.00	49.	27.00	82.	29.00	37. H	29.00	57. VH	30.00	124.	28.00
F062	8.70	15.50	47.20	14.50	81.00	21.00	34.70	20.00	50.20	10.50	121.95	18.00
MEDIAN CONC.	8.7000		47.2000		80.1400		34.1000		51.0000		121.0000	

PARAMETER: 06192 Total Alkalinity MG/LCACO3

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	53.	27.50	222.	23.50	87.	26.00	203.	22.00
F002	51.5	19.50	219.1	14.50	82.4	6.00	197.2	5.00
F003	50.4	9.00	215.	5.50	84.5	13.00	199.	6.50
F006	53.	27.50	220.	17.50	88.	29.00	203.	22.00
F007	48.9	5.00	213.9	4.00	81.7	3.00	197.1	4.00
F008	51.5	19.50	220.	17.50	86.0	22.00	202.	18.00
F009	51.	13.00	210.	2.00	83.	8.00	199.	6.50
F010	48.	2.00	220.	17.50	81.	2.00	200.	10.50
F011	48.2	3.00	216.	7.50	81.9	4.00	197.	3.00
F013	48.76	4.00	213.6	3.00	82.67	7.00	195.7	2.00
F014	50.8	11.00	222.	23.50	84.7	14.00	203.	22.00
F015	50.	7.00	218.	10.00	84.	11.50	200.	10.50
F016	51.1	15.50	221.	20.00	87.2	27.00	200.	10.50
F020	52.2	24.50	223.	27.50	86.2	23.50	203.	22.00
F023	50.6	10.00	215.	5.50	83.3	9.00	201.	16.50
F025	51.4	18.00	219.	12.50	85.0	15.50	200.	10.50
F030	52.	23.00	216.	7.50	82.	5.00	212.	31.00
F031	51.	13.00	218.	10.00	84.	11.50	201.	16.50
F032	52.2	24.50	222.	23.50	86.4	25.00	203.	22.00
F033	52.5	26.00	223.	27.50	86.2	23.50	204.	26.00
F035	54.4	30.00	225.	30.50	91.0	31.00	205.	28.50
F036	1.0337 EL	1.00	4.4562 EL	1.00	1.7443 EL	1.00	4.0968 EL	1.00
F038	49.2	6.00	222.	23.50	83.8	10.00	204.	26.00
F042	51.1	15.50	224.	29.00	85.6	20.50	204.	26.00
F046	51.6	22.00	218.	10.00	85.6	20.50	200.	10.50
F048	51.33	17.00	222.53	26.00	85.05	17.00	202.75	19.00
F058	51.52	21.00	219.1	14.50	85.13	18.00	200.5	14.00
F059	55.	31.00	225.	30.50	88.	29.00	205.	28.50
F060	51.	13.00	219.	12.50	85.	15.50	200.	10.50
F061	54.	29.00	220.	17.50	88.	29.00	208.	30.00
F062	50.10	8.00	221.80	21.00	85.35	19.00	200.80	15.00
MEDIAN CONC.	51.1000		220.0000		85.0000		201.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	245.00	24.500	10	H	BIASED HIGH	Titrn
F002	93.50	9.350	10			Gran
F003	97.50	9.750	10			POTENTIOMETRIC TIT
F006	212.50	23.611	9			Titrn
F007	55.00	5.500	10		BIASED LOW	Titrn
F008	197.00	19.700	10			Potentiom.
F009	99.00	9.900	10	EL		titration
F010	110.50	11.050	10			Titrn Cond
F011	39.00	3.900	10	EL L	BIASED LOW	Radiometer Titr'n
F013	33.00	3.300	10	VL	BIASED LOW	Titrn
F014	159.00	15.900	10			-
F015	89.50	8.950	10			AUTO TITRATION
F016	137.00	13.700	10			Titrn
F020	199.50	19.950	10			10101
F023	73.50	7.350	10	L	BIASED LOW	-
F025	139.00	13.900	10			Titration
F030	137.50	13.750	10	ELVH		Naquadat 10101
F031	150.50	15.050	10	H		Titration
F032	243.00	24.300	10	H		Titrn
F033	241.50	24.150	10	H		AUTOTITRATION
F035	266.00	29.556	9		BIASED HIGH	Colourimetry
F036	10.00	1.000	10	ELELELELELELELELELEL	BIASED LOW	TITROPROCESSOR
F038	205.50	20.550	10			Colour
F042	186.00	18.600	10			-
F046	187.00	18.700	10	H		Titration
F048	234.00	23.400	10	EH H		Titration
F058	176.50	17.650	10			Auto Titrat.
F059	301.00	30.100	10	EHVHH H EH	BIASED HIGH	STD.METHODS(TITR'N
F060	142.00	14.200	10			Autotitrator
F061	276.50	27.650	10	EH H VH	BIASED HIGH	Titrn
F062	162.50	16.250	10			AUTO-TIT

OVERALL AVERAGE RANK IS 15.906

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F036	10.00	1.000	10	ELELELELELELELELELEL	BIASED LOW	TITROPROCESSOR
F013	33.00	3.300	10	VL	BIASED LOW	Titrn
F011	39.00	3.900	10	ELL	BIASED LOW	Radiometer Titr'n
F007	55.00	5.500	10		BIASED LOW	Titrn
F023	73.50	7.350	10	L	BIASED LOW	-
F015	89.50	8.950	10			AUTO TITRATION
F002	93.50	9.350	10			Gran
F003	97.50	9.750	10			POTENTIOMETRIC TIT
F009	99.00	9.900	10	EL		titration
F010	110.50	11.050	10			Titrn Cond
F016	137.00	13.700	10			Titrn
F030	137.50	13.750	10	ELVH		Naquadat 10101
F025	139.00	13.900	10			Titration
F060	142.00	14.200	10			Autotitrator
F031	150.50	15.050	10	H		Titration
F014	159.00	15.900	10			-
F062	162.50	16.250	10			AUTO-TIT
F058	176.50	17.650	10			Auto Titrat.
F042	186.00	18.600	10			-
F046	187.00	18.700	10	H		Titration
F008	197.00	19.700	10			Potentiom.
F020	199.50	19.950	10			10101
F038	205.50	20.550	10			Colour
F048	234.00	23.400	10	EHH		Titration
F006	212.50	23.611	9			Titrn
F033	241.50	24.150	10	H		AUTOTITRATION
F032	243.00	24.300	10	H		Titrn
F001	245.00	24.500	10	H	BIASED HIGH	Titrn
F061	276.50	27.650	10	EHHVH	BIASED HIGH	Titrn
F035	266.00	29.556	9		BIASED HIGH	Colourimetry
F059	301.00	30.100	10	EHVHHHEH	BIASED HIGH	STD.METHODS(TITR'N

OVERALL AVERAGE RANK IS 15.906

Total Alkalinity

PARAMETER: 07092 Nitrate + Nitrite MG N/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0200 BASIC ACCEPTABLE ERROR= .0200 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.146	7.00	.103	13.50	.356	17.00	1.77	18.00	.163	13.00	.194	13.00
F002	.15	14.50	.11	22.50	.35	10.00	1.74	9.00	.13 L	4.50	.04 EL	2.00
F003	.137	4.00	.099	5.00	.361	22.00	1.76	13.50	.190	22.50	.237	26.00
F004	.157	22.00	.111	26.00	.356	17.00	1.77	18.00	.125 VL	3.00	.203	14.00
F006	.13	3.00	.08	2.00	.32	1.50	1.76	13.50	.16	11.50	.18	11.00
F008	.15	14.50	.11	22.50	.35	10.00	1.81	26.00	.18	18.00	.12 EL	6.00
F009	.15	14.50	.10	8.00	.35	10.00	1.71	8.00	.12 VL	2.00	.14 EL	7.00
F010	.150	14.50	.105	16.50	.37	24.50	1.70	6.50	.180	18.00	.115 EL	5.00
F011	.147	8.00	.100	8.00	.360	20.00	1.56 L	4.00	.104 EL	1.00	<.008 EL	0.00
F013	.16	25.50	.11	22.50	.38	26.00	1.8	24.00	.18	18.00	.090 EL	3.50
F014	.08 EL	1.50	.09	3.50	.37	24.50	1.3 EL	2.00	.19	22.50	.22	17.50
F015	.148	9.50	.103	13.50	.351	15.00	1.91	28.50	.156	9.00	.211	15.00
F016	.16	25.50	.11	22.50	.35	10.00	1.80	24.00	.20	26.00	.23	23.00
F020	.16	25.50	.10	8.00	.36	20.00	1.78	21.50	.17	15.00	.22	17.50
F023	.16	25.50	.11	22.50	.34	3.00	1.75	10.50	.19	22.50	.22	17.50
F025	.148	9.50	.101	11.50	.350	10.00	1.76	13.50	.158	10.00	.223	20.00
F030	.17	29.00	.12	28.00	.35	10.00	1.91	28.50	.23 VH	28.00	.09 EL	3.50
F031	.15	14.50	.11	22.50	.35	10.00	1.78	21.50	.16	11.50	.17 L	8.00
F032	.155	19.00	.105	16.50	.350	10.00	1.77	18.00	.190	22.50	.230	23.00
F033	.152	18.00	.106	18.00	.356	17.00	1.8	24.00	.196	25.00	.175 L	9.00
F034	.163	28.00	.122	29.00	.386	27.00	1.70	6.50	.284 EH	29.00	.272 VH	27.00
F036	.149	11.00	.104	15.00	.347	5.00	1.77	18.00	.188	20.00	.226	21.00
F037	.080 EL	1.50	.034 EL	1.00	.789 EH	31.00	1.418 EL	3.00	.152	8.00	.743 EH	30.00
F038	.157	22.00	.107	19.00	.366	23.00	1.75	10.50	.165	14.00	.176 L	10.00
F042	.157	22.00	.101	11.50	.346	4.00	1.68	5.00	.179	16.00	.220	17.50
F043	.15	14.50	.10	8.00	.35	10.00	1.77	18.00	.13 L	4.50	.01 EL	1.00
F046	.14	5.50	.10	8.00	.32	1.50	1.76	13.50	.15	6.50	.19	12.00
F058	.156	20.00	.115	27.00	.360	20.00	1.836	27.00	.205	27.00	.232	25.00
F060	.14	5.50	.09	3.50	.40	28.00	1.93	30.00	.15	6.50	.23	23.00
F061	.31 EH	30.00	.28 EH	30.00	.54 EH	30.00	3.7 EH	31.00	.38 EH	31.00	.41 EH	28.50
F062	.67 EH	31.00	.54 EH	31.00	.49 EH	29.00	1.07 EL	1.00	.35 EH	30.00	.41 EH	28.50
MEDIAN CONC.	.1500		.1050		.3560		1.7700		.1790		.2155	

PARAMETER: 07092 Nitrate + Nitrite MG N/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.141	22.00	.686	18.50	.010	9.00	4.74	21.00
F002	.13	10.00	.69	21.00	<.01	0.00	4.69	17.50
F003	.136	16.50	.686	18.50	.006	1.00	4.72	20.00
F004	.113	6.00	.072 EL	1.00	.011	12.50	4.60	14.00
F006	.11	5.00	.59 L	4.50	.02	17.00	4.27	5.00
F008	.14	19.50	.68	15.00	.02	17.00	4.57	11.50
F009	.09 VL	3.00	.59 L	4.50	.01	9.00	4.6	14.00
F010	.135	14.50	.54 VL	2.00	.010	9.00	3.8 EL	2.00
F011	.088 VL	2.00	.690	21.00	<.008	0.00	4.34	6.00
F013	.14	19.50	.7	24.00	.009	4.50	4.8	24.50
F014	.14	19.50	.70	24.00	<.05	0.00	4.0 VL	3.00
F015	.13	10.00	.666	11.00	.009	4.50		0.00
F016	.15	24.50	.63	7.00	<.1	0.00	4.8	24.50
F020	.14	19.50	.68	15.00	<.02	0.00	4.75	22.00
F023	.2 EH	29.00	.7	24.00	.02	17.00	4.6	14.00
F025	.124	8.00	.656	8.00	.008	2.00	4.57	11.50
F030	.15	24.50	.62	6.00	.04 H	20.00	4.84	26.00
F031	.13	10.00	.72	27.00	.01	9.00	4.98	28.00
F032	.135	14.50	.685	17.00	.010	9.00	4.69	17.50
F033	.143	23.00	.69	21.00	.01W	0.00	4.76	23.00
F034	.164	28.00	.743	30.00	.032 H	19.00	4.70	19.00
F036	.136	16.50	.663	10.00	.009	4.50	4.68	16.00
F037	.057 EL	1.00	.580 L	3.00	.013	14.00	4.552	10.00
F038	.132	12.00	.702	26.00	.018	15.00	.245 EL	1.00
F042	.133	13.00	.669	12.00	.011	12.50	4.55	9.00
F043	.10 L	4.00	.74	29.00	<.01	0.00	4.46	8.00
F046	.16	27.00	.66	9.00	<.05	0.00	4.36	7.00
F058	.155	26.00	.675	13.00	.009	4.50	4.870	27.00
F060	.12	7.00	.73	28.00	<.05	0.00	5.55 EH	29.00
F061	.30 EH	30.00	.97 EH	31.00	<.05	0.00	6.7 EH	30.00
F062	.34 EH	31.00	.68	15.00	.18 EH	21.00	4.03 VL	4.00
MEDIAN CONC.	.1360		.6800		.0100		4.6400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	152.00	15.200	10			Cd, AA
F002	111.00	12.333	9	L EL		IC
F003	149.00	14.900	10			COLORIMETRIC-CD RE
F004	133.50	13.350	10	VL EL		07110
F006	74.00	7.400	10	L	BIASED LOW	AA
F008	160.00	16.000	10	EL		Cd, FIA
F009	80.00	8.000	10	VLELVLL		TRAACS
F010	112.50	11.250	10	EL VL EL		Col Hydrazine
F011	70.00	8.750	8	L ELELVL		Tech. AA
F013	192.00	19.200	10	EL		Cd, Auto
F014	118.00	13.111	9	EL EL VL		-
F015	116.00	12.889	9			AUTO CD REDUCTION
F016	187.00	20.778	9			AA
F020	164.00	18.222	9			07110
F023	185.50	18.550	10	EH		-
F025	104.00	10.400	10			Cd reduction
F030	203.50	20.350	10	VHEL H		Naquadat 07110
F031	162.00	16.200	10	L		I.C.
F032	167.00	16.700	10			Colour
F033	178.00	19.778	9	L		AUTOCOLORIMETRIC
F034	242.50	24.250	10	EHVH H	BIASED HIGH	COLOURIMETRIC
F036	137.00	13.700	10			AUTOANALYZER
F037	102.50	10.250	10	ELELEHEL EHELL		IC
F038	152.50	15.250	10	L EL		Colour
F042	122.50	12.250	10			-
F043	97.00	10.778	9	L ELL		IC
F046	90.00	10.000	9			IC
F058	216.50	21.650	10			Colorimetric
F060	160.50	17.833	9	EH		Autoanalyzer - Col
F061	271.50	30.167	9	EHEHEHEHEHEHEHEH EH	BIASED HIGH	IC
F062	221.50	22.150	10	EHEHEHELEHEHEH EHVL		AUTO-ColOUR

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F006	74.00	7.400	10	L	BIASED LOW	AA
F009	80.00	8.000	10	VLELVLL		TRAACS
F011	70.00	8.750	8	LELELVL		Tech. AA
F046	90.00	10.000	9			IC
F037	102.50	10.250	10	ELELEHELEHELL		IC
F025	104.00	10.400	10			Cd reduction
F043	97.00	10.778	9	LELL		IC
F010	112.50	11.250	10	ELVLEL		Col Hydrazine
F042	122.50	12.250	10			-
F002	111.00	12.333	9	LEL		IC
F015	116.00	12.889	9			AUTO CD REDUCTION
F014	118.00	13.111	9	ELELVL		-
F004	133.50	13.350	10	VLEL		07110
F036	137.00	13.700	10			AUTOANALYZER
F003	149.00	14.900	10			COLORIMETRIC-CD RE
F001	152.00	15.200	10			Cd, AA
F038	152.50	15.250	10	LEL		Colour
F008	160.00	16.000	10	EL		Cd, FIA
F031	162.00	16.200	10	L		I.C.
F032	167.00	16.700	10			Colour
F060	160.50	17.833	9	EH		Autoanalyzer - Col
F020	164.00	18.222	9			07110
F023	185.50	18.550	10	EH		-
F013	192.00	19.200	10	EL		Cd, Auto
F033	178.00	19.778	9	L		AUTOCOLORIMETRIC
F030	203.50	20.350	10	VHELH		Naquadat 07110
F016	187.00	20.778	9			AA
F058	216.50	21.650	10			Colorimetric
F062	221.50	22.150	10	EHEHEHELEHEHEHEHVL		AUTO-ColOUR
F034	242.50	24.250	10	EHVHH	BIASED HIGH	COLOURIMETRIC
F061	271.50	30.167	9	EHEHEHEHEHEHEHEHEH	BIASED HIGH	IC

OVERALL AVERAGE RANK IS 15.547

Nitrate + Nitrite

PARAMETER: 07192 Ammonia MG N/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0040 BASIC ACCEPTABLE ERROR= .0040 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.024	11.50	.004 L	4.00	.003 L	1.00		0.00		0.00	.006	5.00
F003	.022	6.50	.001 VL	1.50	.007	5.50	.002 L	3.00	.001 L	1.50	.002	2.50
F004	.060 EH	20.00	<.005	0.00	<.005	0.00	<.005	0.00	<.005	0.00	<.005	0.00
F006	.03	17.00	.02 EH	10.50	<.02	0.00	<.02	0.00	<.02	0.00	<.02	0.00
F008	.030	17.00	.009	6.00	.008	7.00	.68 EH	8.00	.005	5.00	.005	4.00
F010	.020	4.00	<.010	0.00	<.010	0.00	<.010	0.00	<.010	0.00	<.010	0.00
F011	.022	6.50	<.002 VL	0.00	.004	2.00	<.002 L	0.00	.002 L	4.00	<.002	0.00
F014	.023	9.00	<.01	0.00	<.01	0.00	<.01	0.00	<.01	0.00	<.01	0.00
F015	.033 H	19.00	.012	8.00	.012 H	9.50	.007	4.00	.015 VH	9.00	<.002	0.00
F020	.028	14.50	.005	5.00	.017 EH	11.00	<.005	0.00	<.005	0.00	<.005	0.00
F030	.17 EH	21.00	.11 EH	12.00	.12 EH	12.00	.11 EH	7.00	.09 EH	10.00	.06 EH	8.00
F031	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00
F032	.014 VL	2.00	<.002 VL	0.00	<.002 L	0.00	<.002 L	0.00	<.002 L	0.00	<.002	0.00
F033	.024T	11.50	.01W	0.00	.01W	0.00	.01W	0.00	.01W	0.00	.01W	0.00
F034	.03	17.00	.02 EH	10.50	<.01	0.00	<.01	0.00	<.01	0.00	<.01	0.00
F035	.023	9.00	<.005	0.00	.007	5.50	<.005	0.00	<.005	0.00	<.005	0.00
F036	.0204	5.00	.0011 VL	3.00	.0066	4.00	.0018 L	2.00	.0018 L	3.00	.0010 L	1.00
F038	.023	9.00	<.005	0.00	<.005	0.00	<.005	0.00	<.005	0.00	<.005	0.00
F042	<.039	0.00	<.039	0.00	<.039	0.00	<.039	0.00	<.039	0.00	<.039	0.00
F046	.028	14.50	<.01	0.00	.012 H	9.50	<.01	0.00	.012 H	8.00	<.01	0.00
F058	.026	13.00	.001 VL	1.50	.005	3.00	.001 VL	1.00	.001 L	1.50	.002	2.50
F060	.019	3.00	.014	9.00	<.005	0.00	.009	5.00	.009	6.00	.014 EH	7.00
F061	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F062	.01 EL	1.00	.01	7.00	.01	8.00	.01	6.00	.01	7.00	.01 H	6.00
MEDIAN CONC.	.0240		.0095		.0075		.0080		.0070		.0055	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.003 EL	1.00	.062	17.00	.119	13.00		0.00
F003	.037 EH	13.50	.058	6.50	.110	7.50	.003	2.00
F004	<.005 EL	0.00	.059	8.50	.118	12.00	.010	7.50
F006	.02	7.00	.06	12.50	.12	15.50	<.02	0.00
F008	.037 EH	13.50	.069	23.00	.125	21.00	.006	4.50
F010	<.010 VL	0.00	.045 VL	3.00	.110	7.50	<.010	0.00
F011	<.002 EL	0.00	.028 EL	2.00	.083 EL	2.00	<.002	0.00
F014	<.01 VL	0.00	.058	6.50	.121	18.00	<.01	0.00
F015	<.002 EL	0.00	.061	16.00	.116	11.00	.009	6.00
F020	.005 EL	2.00	.068	21.50	.122	19.00	.006	4.50
F030	.11 EH	15.00	.06	12.50	.10 L	3.50	<.05	0.00
F031	<.05	0.00	.06	12.50	.10 L	3.50	<.05	0.00
F032	.034 EH	11.00	.060	12.50	.120	15.50	<.002	0.00
F033	.021T	8.00	.064	19.50	.124	20.00	.01W	0.00
F034	.03 VH	9.00	.06	12.50	.12	15.50	<.10	0.00
F035	.035 EH	12.00	.051	4.00	.106	5.00	<.005	0.00
F036	.0304 VH	10.00	.0524	5.00	.1123	10.00	.0023	1.00
F038	<.005 EL	0.00	.059	8.50	.110	7.50	<.005	0.00
F042	<.039	0.00	.06	12.50	.11	7.50	<.039	0.00
F046	.013 L	4.00	.064	19.50	.12	15.50	.012 H	9.00
F058	.015 L	5.00	.063	18.00	.167 EH	22.00	.004	3.00
F060	.019	6.00	.068	21.50	.230 EH	23.00	<.005	0.00
F061	<.1	0.00	<.1	0.00	<.1 L	0.00	<.1	0.00
F062	.01 VL	3.00	.01 EL	1.00	.01 EL	1.00	.01	7.50
MEDIAN CONC.	.0210		.0600		.1180		.0060	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	52.50	7.500	7	L L EL		Auto Col
F003	50.00	5.000	10	VL L L EH	BIASED LOW	COLORIMETRIC-PHENA
F004	48.00	12.000	4	EH EL	INSUFFICIENT DATA	07540
F006	62.50	12.500	5	EH		Auto Col
F008	109.00	10.900	10	EH EH		AA, Phenate
F010	14.50	4.833	3	VLVL	INSUFFICIENT DATA	Col Berth
F011	16.50	3.300	5	VL L L ELELEL	BIASED LOW	Tech. AA
F014	33.50	11.167	3	VL	INSUFFICIENT DATA	-
F015	82.50	10.313	8	H H VH EL		AUTO PHENYL HYPOCH
F020	77.50	11.071	7	EH EL		07555
F030	101.00	11.222	9	EHEHEHEHEHEHEH L		Naquadat 07561
F031	16.00	8.000	2	L	INSUFFICIENT DATA	S.I. Electrode
F032	41.00	10.250	4	VLVLL L L EH	INSUFFICIENT DATA	Colour
F033	59.00	14.750	4		INSUFFICIENT DATA	AUTOCOLORIMETRIC
F034	64.50	12.900	5	EH VH		COLOURIMETRIC
F035	35.50	7.100	5	EH		Colourimetry
F036	44.00	4.400	10	VL L L L VH	BIASED LOW	AUTOANALYZER
F038	25.00	8.333	3	EL	INSUFFICIENT DATA	Colour
F042	20.00	10.000	2		INSUFFICIENT DATA	-
F046	80.00	11.429	7	H H L H		Colour Phenate Mth
F058	70.50	7.050	10	VL VLL L EH		Colorimetric
F060	80.50	10.063	8	EH EH		Autoanalyzer - Col
F061	0.00	-	0	L	INSUFFICIENT DATA	Electrode
F062	47.50	4.750	10	EL H VLELEL	BIASED LOW	Auto-Colour

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F061	0.00	-	0	L	INSUFFICIENT DATA	Electrode
F011	16.50	3.300	5	VLLLELELEL	BIASED LOW	Tech. AA
F036	44.00	4.400	10	VLLLLVH	BIASED LOW	AUTOANALYZER
F062	47.50	4.750	10	ELHVLELEL	BIASED LOW	Auto-Colour
F010	14.50	4.833	3	VLVL	INSUFFICIENT DATA	Col Berth
F003	50.00	5.000	10	VLLLEH	BIASED LOW	COLORIMETRIC-PHENA
F058	70.50	7.050	10	VLVLLLEH		Colorimetric
F035	35.50	7.100	5	EH		Colourimetry
F001	52.50	7.500	7	LLEL		Auto Col
F031	16.00	8.000	2	L	INSUFFICIENT DATA	S.I. Electrode
F038	25.00	8.333	3	EL	INSUFFICIENT DATA	Colour
F042	20.00	10.000	2		INSUFFICIENT DATA	-
F060	80.50	10.063	8	EHEH		Autoanalyzer - Col
F032	41.00	10.250	4	VLVLLLLEH	INSUFFICIENT DATA	Colour
F015	82.50	10.313	8	HHVHEL		AUTO PHENYL HYPOCH
F008	109.00	10.900	10	EHEH		AA, Phenate
F020	77.50	11.071	7	EHEL		07555
F014	33.50	11.167	3	VL	INSUFFICIENT DATA	-
F030	101.00	11.222	9	EHEHEHEHEHEHEHL		Naquadat 07561
F046	80.00	11.429	7	HHLH		Colour Phenate Mth
F004	48.00	12.000	4	EHEL	INSUFFICIENT DATA	07540
F006	62.50	12.500	5	EH		Auto Col
F034	64.50	12.900	5	EHVH		COLOURIMETRIC
F033	59.00	14.750	4		INSUFFICIENT DATA	AUTOCOLORIMETRIC

OVERALL AVERAGE RANK IS 8.730

PARAMETER: 07293 Total N mg N/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0500 BASIC ACCEPTABLE ERROR= .0500 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F002	.27	4.00	.27	3.00	.47	5.00	1.87	5.00	.30	5.00	.31	2.00
F003	.303	5.00	.315	6.00	.501	8.00	1.65	2.00	.201 L	2.00	.342	4.00
F004	.220	1.00	.189 L	1.00	.395	2.00	1.86	4.00	.200 L	1.00	.319	3.00
F010	.25	2.00	.21	2.00	.41	3.00	1.81	3.00	.25	3.00	.23 VL	1.00
F038	.37	7.00	.32	7.00	.50	6.50	2.08	8.00	.36	7.50	.47	7.00
F042	.350	6.00	.309	5.00	.455	4.00	2.07	7.00	.299	4.00	.447	6.00
F046	.26	3.00	.28	4.00	.39	1.00	2.01	6.00	.32	6.00	2.92 EH	8.00
F062	.68 EH	8.00	.55 EH	8.00	.50	6.50	1.08 EL	1.00	.36	7.50	.42	5.00
MEDIAN CONC.	.2865		.2945		.4625		1.8650		.2995		.3810	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F002	.24	4.00	.88	4.00	.16	2.50	5.2	8.00
F003	.173 L	1.00	1.28 VH	8.00	.184	5.00	4.75	3.00
F004	.190	2.00	.855	3.00	.105 L	1.00	4.91	6.00
F010	.22	3.00	.66 VL	1.00	.16	2.50	4.8	4.00
F038	.28	6.00	1.15	7.00	.25	8.00	.75 EL	1.00
F042	.274	5.00	1.098	5.00	.245	7.00	5.02	7.00
F046	.44 EH	8.00	1.13	6.00	.18	4.00	4.90	5.00
F062	.35 H	7.00	.69 VL	2.00	.19	6.00	4.04 L	2.00
MEDIAN CONC.	.2570		.9890		.1820		4.8500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F002	42.50	4.250	10			UV Auto
F003	44.00	4.400	10	L L VH		AUTOCLAVE DIG-N2H4
F004	24.00	2.400	10	L L L	BIASED LOW	07651
F010	24.50	2.450	10	VL VL	BIASED LOW	Col Hydrazine
F038	65.00	6.500	10	EL	BIASED HIGH	Calcd
F042	56.00	5.600	10			-
F046	51.00	5.100	10	EHEH		Calculation
F062	53.00	5.300	10	EHEH EL H VL L		-

OVERALL AVERAGE RANK IS 4.500

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F004	24.00	2.400	10	LLL	BIASED LOW	07651
F010	24.50	2.450	10	VLVL	BIASED LOW	Col Hydrazine
F002	42.50	4.250	10			UV Auto
F003	44.00	4.400	10	LLVH		AUTOCLAVE DIG-N2H4
F046	51.00	5.100	10	EHEH		Calculation
F062	53.00	5.300	10	EHEHELHVLL		-
F042	56.00	5.600	10			-
F038	65.00	6.500	10	EL	BIASED HIGH	Calcd

OVERALL AVERAGE RANK IS 4.500

Total N

PARAMETER: 07392 Total Kjeldahl N MG N/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON, ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0500 BASIC ACCEPTABLE ERROR= .0500 CONCENTRATION ERROR INCREMENT= .1500

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.18	5.00	.23	8.00	.08	3.00	.31	6.00	.19	6.50	.29	3.50
F003	.342 VH	14.00	.261	13.00	.110	4.50	.510 VH	14.00	.235	10.00	.361	12.00
F006	.4 EH	15.00	.5 EH	15.50	.4 EH	14.00	.5 VH	13.00	.6 EH	14.00	.6 EH	14.00
F008	<.2	0.00	<.2	0.00	<.2	0.00	<.2 VL	0.00	<.2	0.00	<.2 L	0.00
F014	.28	11.00	.21	6.00	<.20	0.00	.38	9.50	<.20	0.00	.32	9.50
F016	.19	7.00	.24	10.00	.12	7.00	.24 L	3.00	.24	11.50	.26	2.00
F020	.12 L	1.50	.19	2.00	.07	2.00	.18 VL	1.00	.16	1.00	.25	1.00
F023	.24	10.00	.24	10.00	.18	12.00	.23 L	2.00	.24	11.50	.31	7.00
F032	.22	9.00	.26	12.00	.14	10.00	.38	9.50	.20	9.00	.34	11.00
F033	.18	5.00	.21	6.00	.13	8.50	.39	11.50	.18	4.00	.31	7.00
F034	.29	12.00	.20	3.00	.17	11.00	.39	11.50	.19	6.50	.31	7.00
F035	.18	5.00	.24	10.00	.11	4.50	.32	7.00	.19	6.50	.32	9.50
F036	.162	3.00	.209	4.00	.115	6.00	.262	5.00	.174	3.00	.294	5.00
F038	.21	8.00	.21	6.00	.13	8.50	.33	8.00	.19	6.50	.29	3.50
F046	.12 L	1.50	.18	1.00	.067 L	1.00	.25 L	4.00	.17	2.00	2.73 EH	15.00
F060	.33 H	13.00	.39 VH	14.00	.33 EH	13.00	1.50 EH	15.00	.44 EH	13.00	.44 H	13.00
F061	25.1 EH	17.00	.5 EH	15.50	2.3 EH	16.00	<.1 EL	0.00	1.7 EH	15.00	11.1 EH	16.00
F062	1.35 EH	16.00	5.45 EH	17.00	1.85 EH	15.00	3.55 EH	16.00	<.05 VL	0.00	<.05 EL	0.00
MEDIAN CONC.	.2200		.2400		.1300		.3550		.1900		.3150	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.17	4.50	.46	6.00	.23	4.50	.44	2.00
F003	.236	10.00	1.18 EH	16.00	.223	3.00	1.10 EH	16.00
F006	.4 EH	16.00	.8 EH	15.00	.4 EH	14.00	.7 H	15.00
F008	<.2	0.00	.31 VL	1.00	<.2	0.00	.31 VL	1.00
F014	.28	12.50	.50	9.00	.24	7.50	.65	14.00
F016	.25	11.00	.54	11.00	.27	10.00	.62	13.00
F020	.12 L	1.00	.44	3.50	.21	2.00	.56	10.50
F023	.17	4.50	.42	2.00	.30	13.00	.54	8.00
F032	.20	7.50	.56	13.00	.28	11.00	.60	12.00
F033	.18	6.00	.52	10.00	.24	7.50	.53	6.00
F034	.21	9.00	.58	14.00	.29	12.00	.50	3.50
F035	.20	7.50	.55	12.00	.25	9.00	.54	8.00
F036	.162	3.00	.473	8.00	.234	6.00	.517	5.00
F038	.15	2.00	.45	5.00	.23	4.50	.50	3.50
F046	.28	12.50	.47	7.00	.18	1.00	.54	8.00
F060	.33 VH	15.00	.44	3.50	.44 EH	15.00	.56	10.50
F061	.3 H	14.00	3.0 EH	17.00	<.1 VL	0.00	<.1 EL	0.00
F062	38.50 EH	17.00	<.05 EL	0.00	<.05 EL	0.00	<.05 EL	0.00
MEDIAN CONC.	.2100		.5000		.2400		.5400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	49.00	4.900	10			Dig., Auto
F003	112.50	11.250	10	VH VH EH EH		BLOCK DIGESTION
F006	145.50	14.550	10	EHEHEHVHEHEHEHEHEHH	BIASED HIGH	Dig., Auto
F008	2.00	1.000	2	VL L VL VL	INSUFFICIENT DATA	AA, Phenate
F014	79.00	9.875	8			-
F016	85.50	8.550	10	L		AA
F020	25.50	2.550	10	L VL L	BIASED LOW	07016
F023	80.00	8.000	10	L		-
F032	104.00	10.400	10			Colour
F033	71.50	7.150	10			DIG/COLORIMETRIC
F034	89.50	8.950	10			BLOCK DIG-COL.
F035	79.00	7.900	10			Colourimetry
F036	48.00	4.800	10			B.D.-AUTOANALYZER
F038	55.50	5.550	10			SIE
F046	53.00	5.300	10	L L L EH		Digestion-Dist-Col
F060	125.00	12.500	10	H VHEHEHEHH VH EH		Block Digestion, A
F061	110.50	15.786	7	EHEHEHELEHEHH EHVLEL	BIASED HIGH	Dig. Elect
F062	81.00	16.200	5	EHEHEHEHVLELEHELELEL	BIASED HIGH	Die-Auto-Colour

OVERALL AVERAGE RANK IS 8.617

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F008	2.00	1.000	2	VLLVLVL	INSUFFICIENT DATA	AA, Phenate
F020	25.50	2.550	10	LVLL	BIASED LOW	07016
F036	48.00	4.800	10			B.D.-AUTOANALYZER
F001	49.00	4.900	10			Dig., Auto
F046	53.00	5.300	10	LLLEH		Digestion-Dist-Col
F038	55.50	5.550	10			SIE
F033	71.50	7.150	10			DIG/COLORIMETRIC
F035	79.00	7.900	10			Colourimetry
F023	80.00	8.000	10	L		-
F016	85.50	8.550	10	L		AA
F034	89.50	8.950	10			BLOCK DIG-COL.
F014	79.00	9.875	8			-
F032	104.00	10.400	10			Colour
F003	112.50	11.250	10	VHVHEHEH		BLOCK DIGESTION
F060	125.00	12.500	10	HVHEHEHEHHVHEH		Block Digestion, A
F006	145.50	14.550	10	EHEHEHVHEHEHEHEHEHH	BIASED HIGH	Dig., Auto
F061	110.50	15.786	7	EHEHEHELEHEHHEHVLEL	BIASED HIGH	Dig. Elect
F062	81.00	16.200	5	EHEHEHEHVLELEHELELEL	BIASED HIGH	Die-Auto-Colour

OVERALL AVERAGE RANK IS 8.617

Total Kjeldahl N

PARAMETER: 09092 Fluoride MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0300 BASIC ACCEPTABLE ERROR= .0300 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.03	5.00	.05	6.50	.07	5.50	.07	6.50	.05	5.50	.11	12.50
F003	.04	10.00	.05	6.50	.08	11.00	.07	6.50	.06	11.00	.12	19.50
F006	<.05	0.00	<.05	0.00	.06	2.50	.05	3.00	.05	5.50	.11	12.50
F008	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F009	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	.08	3.00
F010	.04	10.00	.06	11.50	.10	16.50	.08	12.00	.06	11.00	.11	12.50
F011	.02	1.50	.03	2.00	.06	2.50	.04 L	2.00	.03	2.00	.11	12.50
F014	<.10	0.00	.10 VH	16.00	.12 H	19.00	.12 H	18.50	.11 VH	17.50	.18 VH	25.00
F015	.02	1.50	.05	6.50	.07	5.50	.07	6.50	.06	11.00	.11	12.50
F016	.04	10.00	.06	11.50	.09	13.50	.08	12.00	.06	11.00	.12	19.50
F020	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	.11	12.50
F023	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	.10	6.00
F025	<.05	0.00	.05	6.50	.09	13.50	.08	12.00	.05	5.50	.12	19.50
F030	.05	13.00	.06	11.50	.07	5.50	.15 EH	20.00	.06	11.00	.10	6.00
F031	.03	5.00	.05	6.50	.08	11.00	.08	12.00	.06	11.00	.12	19.50
F032	.04	10.00	.06	11.50	.10	16.50	.08	12.00	.06	11.00	.12	19.50
F033	.04T	10.00	.01T L	1.00	.03T L	1.00	.03T L	1.00	.02T L	1.00	.12	19.50
F034	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F037	.0545	14.00	.0619	14.00	.0772	9.00	.0734	9.00	.0639	15.00	.0640 L	1.00
F038	.03	5.00	.05	6.50	.07	5.50	.07	6.50	.05	5.50	.10	6.00
F043	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00	<.1	0.00
F046	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	<.05	0.00	.074	2.00
F048	.03	5.00	.07	15.00	.08	11.00	.09	15.00	.08	16.00	.12	19.50
F058	.030	5.00	.049	3.00	.074	8.00	.063	4.00	.047	3.00	.102	9.00
F059	<.1	0.00	<.1	0.00	.1	16.50	.1	16.50	<.1	0.00	.1	6.00
F060	.10 VH	15.00	.11 VH	17.00	.13 H	20.00	.12 H	18.50	.11 VH	17.50	.16 H	24.00
F061	<.1	0.00	<.1	0.00	.1	16.50	.1	16.50	<.1	0.00	.1	6.00
F062	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	<.10	0.00	.12	19.50
MEDIAN CONC.	.0400		.0500		.0800		.0800		.0600		.1100	

PARAMETER: 09092 Fluoride MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.04	3.00	.20	15.00	.11	10.50	.17	17.00
F003	.06	11.50	.20	15.00	.12	16.00	.17	17.00
F006	.05	7.50	.20	15.00	.11	10.50	.16	12.50
F008	<.1	0.00	.18	6.50	.12	16.00	.16	12.50
F009	.13 EH	20.00	.24	25.50	.12	16.00	.23 VH	27.00
F010	.07	14.50	.23	24.00	.13	20.50	.19	21.50
F011	.03	1.00	.19	9.50	.11	10.50	.16	12.50
F014	.12 VH	18.50	.24	25.50	.18 VH	25.00	.21 H	25.50
F015	.06	11.50	.21	19.50	.12	16.00	.17	17.00
F016	.07	14.50	.12 VL	1.00	.21 EH	27.50	.17	17.00
F020	<.10	0.00	.20	15.00	.12	16.00	.17	17.00
F023	<.10	0.00	.17	2.50	.10	4.50	.14	5.50
F025	.06	11.50	.22	22.00	.13	20.50	.19	21.50
F030	.05	7.50	.18	6.50	.10	4.50	.14	5.50
F031	.06	11.50	.20	15.00	.11	10.50	.16	12.50
F032	.04	3.00	.18	6.50	.10	4.50	.14	5.50
F033	.04T	3.00	.17	2.50	.09	1.00	.13	3.00
F034	<.1	0.00	.22	22.00	.13	20.50	.20	24.00
F037	.0982 H	16.00	.177	4.00	.116	13.00	.144	8.00
F038	.05	7.50	.18	6.50	.10	4.50	.15	9.00
F043	<.1	0.00	<.1 EL	0.00	.21 EH	27.50	<.1 L	0.00
F046	<.05	0.00	.19	9.50	.19 VH	26.00	.14	5.50
F048	.05	7.50	.21	19.50	.13	20.50	.19	21.50
F058	.047	5.00	.198	11.00	.107	8.00	.152	10.00
F059	.1 H	17.00	.2	15.00	.1	4.50	.1 L	1.50
F060	.12 VH	18.50	.25 H	27.00	.17 H	24.00	.21 H	25.50
F061	<.1	0.00	.2	15.00	.1	4.50	.1 L	1.50
F062	<.10	0.00	.22	22.00	.14	23.00	.19	21.50
MEDIAN CONC.	.0600		.2000		.1200		.1600	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	87.00	8.700	10			Auto Col
F003	124.00	12.400	10			AUTOMATED I.S.E.
F006	69.00	8.625	8			ISE
F008	35.00	11.667	3		INSUFFICIENT DATA	ISE
F009	91.50	18.300	5	EH VH		Technicon
F010	154.00	15.400	10			Col Alizarin
F011	56.00	5.600	10	L	BIASED LOW	Radiometer - Probe
F014	190.50	21.167	9	VHH H VHVHVH VHH	BIASED HIGH	-
F015	107.50	10.750	10			ISE AUTOMATED
F016	137.50	13.750	10	VLEH		SIE
F020	60.50	15.125	4		INSUFFICIENT DATA	09105
F023	18.50	4.625	4		INSUFFICIENT DATA	-
F025	132.50	14.722	9			Specific
F030	91.00	9.100	10	EH		Naquadat 09105
F031	114.50	11.450	10			S.I. Electrode
F032	100.00	10.000	10			Colour
F033	43.00	4.300	10	L L L L	BIASED LOW	ISE
F034	66.50	22.167	3		INSUFFICIENT DATA	SPECIFIC ION
F037	103.00	10.300	10	L H		Electrode(F)
F038	62.50	6.250	10		BIASED LOW	SIE
F043	27.50	27.500	1	ELEHL	INSUFFICIENT DATA	IC
F046	43.00	10.750	4	VH	INSUFFICIENT DATA	IC
F048	150.50	15.050	10			Ion Select/Spike
F058	66.00	6.600	10		BIASED LOW	Ion Elect.
F059	77.00	11.000	7	H L		ION ELECTRODE
F060	207.00	20.700	10	VHVHH H VHH VHH H H	BIASED HIGH	I.S.E.
F061	60.00	10.000	6	L		Electrode
F062	86.00	21.500	4		INSUFFICIENT DATA	Probe

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F033	43.00	4.300	10	LLLL	BIASED LOW	ISE
F023	18.50	4.625	4		INSUFFICIENT DATA	-
F011	56.00	5.600	10	L	BIASED LOW	Radiometer - Probe
F038	62.50	6.250	10		BIASED LOW	SIE
F058	66.00	6.600	10		BIASED LOW	Ion Elect.
F006	69.00	8.625	8			ISE
F001	87.00	8.700	10			Auto Col
F030	91.00	9.100	10	EH		Naquadat 09105
F032	100.00	10.000	10			Colour
F061	60.00	10.000	6	L		Electrode
F037	103.00	10.300	10	LH		Electrode(F)
F015	107.50	10.750	10			ISE AUTOMATED
F046	43.00	10.750	4	VH	INSUFFICIENT DATA	IC
F059	77.00	11.000	7	HL		ION ELECTRODE
F031	114.50	11.450	10			S.I. Electrode
F008	35.00	11.667	3		INSUFFICIENT DATA	ISE
F003	124.00	12.400	10			AUTOMATED I.S.E.
F016	137.50	13.750	10	VLEH		SIE
F025	132.50	14.722	9			Specific
F048	150.50	15.050	10			Ion Select/Spike
F020	60.50	15.125	4		INSUFFICIENT DATA	09105
F010	154.00	15.400	10			Col Alizarin
F009	91.50	18.300	5	EHVH		Technicon
F060	207.00	20.700	10	VHVHHHVHHVHHHH	BIASED HIGH	I.S.E.
F014	190.50	21.167	9	VHHHVHVHVHVHH	BIASED HIGH	-
F062	86.00	21.500	4		INSUFFICIENT DATA	Probe
F034	66.50	22.167	3		INSUFFICIENT DATA	SPECIFIC ION
F043	27.50	27.500	1	ELEHL	INSUFFICIENT DATA	IC

OVERALL AVERAGE RANK IS 11.802

Fluoride

PARAMETER: 10692 Total Hardness mg/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= 1.0000 CONCENTRATION ERROR INCREMENT= .0700

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	12.	16.50	51.	9.00	96.	8.50	51.	16.00	58.	7.00	133.	8.00
F003	11.6	9.50	51.1	11.50	96.6	10.00	49.7	7.50	58.9	8.50	135.	10.50
F006	13.	25.00	48.	5.00	99.	16.50	50.	10.50	59.	10.50	136.	13.50
F007	12.0	16.50	52.6	21.00	99.8	21.00	51.3	22.00	61.7	22.00	141.9	21.00
F008	11.7	12.00	52.7	22.00	99.3	19.00	51.1	19.00	60.5	19.50	138.	18.00
F009	11.	4.00	52.	18.00	97.	11.00	51.	16.00	60.	16.00	136.	13.50
F011	12.	16.50	47. L	3.00	89. L	1.00	46. L	1.00	55.	1.50	127.	2.50
F013	12.56	23.00	55.32	26.00	103.9	25.00	53.10	25.00	63.0	24.50	145.0	22.00
F014	11.4	6.50	51.9	16.50	100.	22.00	51.1	19.00	60.5	19.50	140.	19.00
F016	11.	4.00	50.	7.00	98.	14.00	50.	10.50	59.	10.50	135.	10.50
F020	11.7	12.00	51.9	16.50	98.0	14.00	50.8	14.00	60.4	18.00	151. H	26.50
F023	9.18 VL	1.00	46.3 L	1.00	92.2	4.00	46.1 L	2.00	56.1	4.00	129.	6.00
F025	10.6	2.00	46.9 L	2.00	94.1	6.00	46.8	3.00	55.0	1.50	132.	7.00
F030	12.0	16.50	51.3	13.00	95.0	7.00	49.4	6.00	58.9	8.50	141.	20.00
F031	13.	25.00	51.	9.00	98.	14.00	50.	10.50	60.	16.00	136.	13.50
F032	11.6	9.50	51.8	15.00	99.0	16.50	49.7	7.50	59.1	12.00	128.	5.00
F033	12.	16.50	54.	25.00	103.	24.00	53.	24.00	63.	24.50	147. H	24.50
F034	13.8 H	27.00	52.4	20.00	91.9	3.00	52.4	23.00	57.5	5.00	126.4	1.00
F035	12.	16.50	51.	9.00	96.	8.50	50.	10.50	60.	16.00	134.	9.00
F037	11.51	8.00	51.58	14.00	93.72	5.00	48.06	5.00	57.57	6.00	127.81	4.00
F038	12.2	21.00	53.7	24.00	99.6	20.00	51.0	16.00	62.7	23.00	137.	17.00
F046	11.4	6.50	51.1	11.50	99.2	18.00	51.1	19.00	59.3	13.00	136.	13.50
F048	12.3	22.00	52.1	19.00	97.7	12.00	50.3	13.00	59.7	14.00	136.7	16.00
F059	13.	25.00	57. H	27.00	110. VH	27.00	58. VH	27.00	68. VH	27.00	151. H	26.50
F060	11.7	12.00	47.7	4.00	107. H	26.00	54.3	26.00	63.9	26.00	147. H	24.50
F061	11.	4.00	49.	6.00	91.	2.00	48.	4.00	56.	3.00	127.	2.50
F062	12.07	20.00	53.64	23.00	100.64	23.00	51.18	21.00	60.62	21.00	146.77 H	23.00
MEDIAN CONC.	12.0000		51.5800		98.0000		50.8000		59.7000		136.0000	

PARAMETER: 10692 Total Hardness mg/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	80.	6.50	293.	14.00	107.	13.50	327.	7.50
F003	81.5	8.00	290.	8.50	106.	9.00	329.	9.00
F006	87.	25.00	287.	7.00	107.	13.50	331.	11.50
F007	86.3	23.00	301.7	19.00	108.8	19.00	339.6	18.00
F008	85.6	20.50	291.	10.00	108.	17.00	327.	7.50
F009	84.	14.00	290.	8.50	107.	13.50	330.	10.00
F011	77. L	3.00	341. EH	27.00	99.	2.00	312.	3.00
F013	86.29	22.00	307.0	21.00	112.4	24.00	343.2	21.00
F014	85.6	20.50	301.	17.50	109.	20.00	341.	20.00
F016	84.	14.00	292.	12.00	106.	9.00	334.	15.00
F020	84.7	18.50	311.	22.00	108.	17.00	353.	25.00
F023	76.3 L	2.00	266. L	1.00	99.3	3.00	60.5 EL	1.00
F025	77.3	4.00	283.	6.00	105.	7.00	321.	5.00
F030	83.8	12.00	277.	3.00	103.	5.00	331.	11.50
F031	84.	14.00	292.	12.00	106.	9.00	332.	14.00
F032	83.3	11.00	282.	5.00	107.	13.50	339.	16.00
F033	49. EL	1.00	318. H	25.00	116. H	26.50	355.	26.00
F034	84.2	16.00	304.3	20.00	110.6	22.00	339.2	17.00
F035	82.	9.00	292.	12.00	104.	6.00	326.	6.00
F037	79.97	5.00	281.37	4.00	110.18	21.00	302.76 L	2.00
F038	86.8	24.00	301.	17.50	111.	23.00	340.	19.00
F046	84.7	18.50	297.	16.00	108.	17.00	444. EH	27.00
F048	83.0	10.00	293.5	15.00	106.3	11.00	331.2	13.00
F059	91. H	27.00	316. H	23.50	116. H	26.50	345.	22.00
F060	88.3	26.00	316. H	23.50	114.	25.00	351.	23.00
F061	80.	6.50	271. L	2.00	100.	4.00	313.	4.00
F062	84.52	17.00	318.31 H	26.00	55.28 EL	1.00	352.75	24.00
MEDIAN CONC.	84.0000		293.0000		107.0000		332.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	106.50	10.650	10			Calc'd
F003	92.00	9.200	10			CALCULATED
F006	138.00	13.800	10			Calc'd
F007	202.50	20.250	10			10603
F008	164.50	16.450	10			Calc'd
F009	124.50	12.450	10			Calculation
F011	60.50	6.050	10	L L L L EH	BIASED LOW	Calculation
F013	233.50	23.350	10		BIASED HIGH	Calc'd
F014	180.50	18.050	10			-
F016	106.50	10.650	10			Titrn
F020	183.50	18.350	10	H		10602
F023	25.00	2.500	10	VLL L L L EL	BIASED LOW	-
F025	43.50	4.350	10	L	BIASED LOW	Calculated
F030	102.50	10.250	10			Naquadat 10605
F031	137.00	13.700	10			Titration
F032	111.00	11.100	10			AAS
F033	217.00	21.700	10	H ELH H	BIASED HIGH	TITRATION
F034	154.00	15.400	10	H		CALCULATED
F035	102.50	10.250	10			Calculated
F037	74.00	7.400	10	L		Calculation
F038	204.50	20.450	10			Calcd
F046	160.00	16.000	10	EH		ICP - Calc.
F048	145.00	14.500	10			EDTA Titration
F059	258.50	25.850	10	H VHVHVHH H H H	BIASED HIGH	CALCULATED
F060	216.00	21.600	10	H H H	BIASED HIGH	Calculation
F061	38.00	3.800	10	L	BIASED LOW	Calcd
F062	199.00	19.900	10	H H EL		CalcFrCa,Mg

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F023	25.00	2.500	10	VLLLLLEL	BIASED LOW	-
F061	38.00	3.800	10	L	BIASED LOW	Calcd
F025	43.50	4.350	10	L	BIASED LOW	Calculated
F011	60.50	6.050	10	LLLLEH	BIASED LOW	Calculation
F037	74.00	7.400	10	L		Calculation
F003	92.00	9.200	10			CALCULATED
F030	102.50	10.250	10			Naquadat 10605
F035	102.50	10.250	10			Calculated
F016	106.50	10.650	10			Titrn
F001	106.50	10.650	10			Calc'd
F032	111.00	11.100	10			AAS
F009	124.50	12.450	10			Calculation
F031	137.00	13.700	10			Titration
F006	138.00	13.800	10			Calc'd
F048	145.00	14.500	10			EDTA Titration
F034	154.00	15.400	10	H		CALCULATED
F046	160.00	16.000	10	EH		ICP - Calc.
F008	164.50	16.450	10			Calc'd
F014	180.50	18.050	10			-
F020	183.50	18.350	10	H		10602
F062	199.00	19.900	10	HHEL		CalcFrCa,Mg
F007	202.50	20.250	10			10603
F038	204.50	20.450	10			Calcd
F060	216.00	21.600	10	HHH	BIASED HIGH	Calculation
F033	217.00	21.700	10	HELHH	BIASED HIGH	TITRATION
F013	233.50	23.350	10		BIASED HIGH	Calc'd
F059	258.50	25.850	10	HVHVHVHHHHH	BIASED HIGH	CALCULATED

OVERALL AVERAGE RANK IS 14.000

Total Hardness

PARAMETER: 11091 Sodium MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	3.1	3.00	2.4	5.50	3.2	3.50	14.0	9.50	12.6	7.50	4.2	10.50
F002	3.53	24.00	2.62	19.50	3.66	23.00	14.8	23.00	13.3	21.00	4.46	23.00
F003	3.39	15.50	2.57	14.50	3.44	17.00	14.3	14.50	12.9	11.50	4.32	19.00
F006	3.	1.50	2.	1.00	2. EL	1.00	15.	26.00	13.	14.50	4.	2.00
F007	3.23	6.00	2.46	8.50	3.43	15.00	13.4	4.00	11.7	3.00	4.51	24.00
F008	3.39	15.50	2.62	19.50	3.48	20.00	14.5	18.50	13.4	24.00	4.35	20.00
F009	3.6	25.50	3.0	29.00	3.8	28.00	16.	30.00	14.	27.00	4.9	31.00
F010	3.44	20.00	2.68	22.50	3.39	9.00	13.55	6.00	12.73	10.00	4.29	15.00
F011	3.4	17.00	2.5	10.50	3.4	11.00	14.5	18.50	13.2	17.50	4.2	10.50
F013	3.77	29.00	2.84	28.00	3.79	26.00	15.39	27.00	14.11	28.00	4.64	26.00
F014	3.50	23.00	2.60	17.00	3.74	25.00	14.5	18.50	13.2	17.50	4.39	21.00
F016	3.18	4.00	2.46	8.50	3.12	2.00	12.5 L	1.00	11.6 L	2.00	3.99	1.00
F020	3.6	25.50	2.8	26.50	3.8	28.00	14.9	24.50	13.6	25.00	4.7	28.00
F023	3.30	10.00	2.38	3.00	3.41	13.00	14.2	13.00	13.0	14.50	4.30	16.50
F025	3.31	12.50	2.52	12.00	3.42	14.00	14.1	11.50	13.0	14.50	4.30	16.50
F030	3.7	28.00	2.8	26.50	3.7	24.00	13.8	7.00	12.9	11.50	4.6	25.00
F031	3.41	18.50	2.56	13.00	3.40	11.00	16.2 H	32.00	14.3	30.50	4.22	13.00
F032	3.45	21.00	2.57	14.50	3.47	19.00	14.4	16.00	13.3	21.00	4.31	18.00
F033	3.63	27.00	2.78	25.00	3.82	30.00	15.67	28.00	14.28	29.00	4.69	27.00
F034	4.1 H	30.00	2.7	24.00	3.8	28.00	14.3	14.50	13.7	26.00	4.8	29.00
F035	3.3	10.00	2.5	10.50	3.5	21.00	14.7	21.50	13.3	21.00	4.2	10.50
F036	3.346	14.00	2.586	16.00	3.432	16.00	13.086	3.00	12.303	5.00	4.262	14.00
F037	5.45 EH	32.00	3.18	30.00	3.92	31.00	16.12 H	31.00	15.00 H	32.00	4.87	30.00
F038	3.21	5.00	3.35 H	31.00	3.28	6.00	13.9	8.00	12.6	7.50	4.10	4.50
F042	3.41	18.50	2.61	18.00	3.46	18.00	14.7	21.50	13.3	21.00	4.15	7.00
F043	3.3	10.00	2.4	5.50	3.4	11.00	13.5	5.00	12.2	4.00	4.2	10.50
F046	3.27	7.00	2.44	7.00	3.31	7.00	14.1	11.50	12.7	9.00	4.13	6.00
F048	3.28	8.00	2.39	4.00	3.26	5.00	14.9	24.50	12.35	6.00	4.18	8.00
F059	3.0	1.50	2.3	2.00	3.2	3.50	14.	9.50	13.	14.50	4.1	4.50
F060	4.4 H	31.00	3.6 VH	32.00	4.5 VH	32.00	15.7	29.00	14.3	30.50	5.3 H	32.00
F061	3.31	12.50	2.68	22.50	3.33	8.00	12.6 L	2.00	11.4 L	1.00	4.05	3.00
F062	3.48	22.00	2.63	21.00	3.57	22.00	14.50	18.50	13.30	21.00	4.41	22.00
MEDIAN CONC.	3.3950		2.5930		3.4360		14.4500		13.1000		4.3000	

PARAMETER: 11091 Sodium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	51.	12.00	10.	5.50	14.	10.00	42.	7.50
F002	52.0	18.50	11.0	25.50	15.1	25.00	44.0	23.50
F003	51.6	16.50	10.4	16.50	14.6	16.00	41.9	6.00
F006	51.	12.00	10.	5.50	14.	10.00	43.	16.50
F007	46.9 L	1.00	10.7	23.00	13.0 L	4.00	41.8	5.00
F008	52.6	23.00	10.5	20.50	14.7	18.00	43.9	22.00
F009	60. VH	32.00	11.5	29.00	16.	30.00	46.	29.50
F010	52.	18.50	10.15	12.00	14.97	22.00	39.7	3.00
F011	52.5	22.00	10.4	16.50	14.7	18.00	42.1	9.00
F013	54.0	28.00	11.15	27.00	15.69	27.00	45.46	27.00
F014	52.4	21.00	10.5	20.50	14.8	20.50	43.2	19.00
F016	50.0	5.50	8.90 L	1.00	12.8 L	1.50	36.0 VL	1.00
F020	53.5	25.00	11.0	25.50	15.1	25.00	42.9	15.00
F023	49.6	4.00	10.4	16.50	13.5	6.00	42.5	12.00
F025	47.6	2.00	10.2	13.00	14.3	14.00	43.0	16.50
F030	50.6	9.50	10.1	10.00	13.8	7.00	41.4	4.00
F031	55.3	29.00	10.7	23.00	16.7 H	31.00	42.7	14.00
F032	52.1	20.00	10.4	16.50	14.8	20.50	43.8	21.00
F033	55.87	30.00	11.19	28.00	15.87	28.00	45.55	28.00
F034	50.5	7.50	12.2 H	32.00	15.0	23.00	43.6	20.00
F035	51.3	14.00	10.4	16.50	14.7	18.00	43.1	18.00
F036	53.15	24.00	10.044	8.00	13.887	8.00	44.65	26.00
F037	58.74 VH	31.00	11.83 H	31.00	16.99 H	32.00	48.85 VH	32.00
F038	50.0	5.50	10.0	5.50	14.1	12.00	42.3	10.00
F042	51.6	16.50	10.1	10.00	14.5	15.00	42.6	13.00
F043	53.9	26.50	9.7	3.00	13.1	5.00	46.0	29.50
F046	50.5	7.50	10.1	10.00	14.2	13.00	42.0	7.50
F048	50.6	9.50	10.4	16.50	12.85 L	3.00	47.5 H	31.00
F059	51.	12.00	10.	5.50	14.	10.00	44.	23.50
F060	53.9	26.50	11.7 H	30.00	15.9	29.00	44.4	25.00
F061	48.7	3.00	9.64	2.00	12.8 L	1.50	39.4	2.00
F062	51.40	15.00	10.70	23.00	15.10	25.00	42.40	11.00
MEDIAN CONC.	51.6000		10.4000		14.6500		43.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	74.50	7.450	10		BIASED LOW	AAS
F002	226.00	22.600	10			Flame Ph
F003	147.00	14.700	10			FLAME PHOTOMETRIC
F006	90.00	9.000	10	EL		AAS
F007	93.50	9.350	10	L L		ICAP
F008	201.00	20.100	10			ICAP
F009	291.00	29.100	10	VH	BIASED HIGH	ICP
F010	138.00	13.800	10			ICAP
F011	150.50	15.050	10			Flame AA
F013	273.00	27.300	10		BIASED HIGH	ICP
F014	203.00	20.300	10			-
F016	27.50	2.750	10	L L L L VL	BIASED LOW	AAS
F020	248.00	24.800	10			11104
F023	108.50	10.850	10			-
F025	126.50	12.650	10			Flume Photometer
F030	152.50	15.250	10			Naquadat 11007
F031	215.00	21.500	10	H H		Flame AAS, Direct
F032	187.50	18.750	10			AAS
F033	280.00	28.000	10		BIASED HIGH	ICP
F034	234.00	23.400	10	H H		A.A.
F035	161.00	16.100	10			ICP
F036	134.00	13.400	10			FLAME AA
F037	312.00	31.200	10	EH H H VHH H VH	BIASED HIGH	ICP
F038	95.00	9.500	10	H		FAES
F042	158.50	15.850	10			-
F043	110.00	11.000	10			FAAS
F046	85.50	8.550	10			ICP
F048	115.50	11.550	10	L H		I.C.
F059	86.50	8.650	10			ICP
F060	297.00	29.700	10	H VHVH H H	BIASED HIGH	ICP - Direct
F061	57.50	5.750	10	L L L	BIASED LOW	AAS
F062	200.50	20.050	10			Flame/ICP

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F016	27.50	2.750	10	LLLLVL	BIASED LOW	AAS
F061	57.50	5.750	10	LLL	BIASED LOW	AAS
F001	74.50	7.450	10		BIASED LOW	AAS
F046	85.50	8.550	10			ICP
F059	86.50	8.650	10			ICP
F006	90.00	9.000	10	EL		AAS
F007	93.50	9.350	10	LL		ICAP
F038	95.00	9.500	10	H		FAES
F023	108.50	10.850	10			-
F043	110.00	11.000	10			FAAS
F048	115.50	11.550	10	LH		I.C.
F025	126.50	12.650	10			Flume Photometer
F036	134.00	13.400	10			FLAME AA
F010	138.00	13.800	10			ICAP
F003	147.00	14.700	10			FLAME PHOTOMETRIC
F011	150.50	15.050	10			Flame AA
F030	152.50	15.250	10			Naquadat 11007
F042	158.50	15.850	10			-
F035	161.00	16.100	10			ICP
F032	187.50	18.750	10			AAS
F062	200.50	20.050	10			Flame/ICP
F008	201.00	20.100	10			ICAP
F014	203.00	20.300	10			-
F031	215.00	21.500	10	HH		Flame AAS, Direct
F002	226.00	22.600	10			Flame Ph
F034	234.00	23.400	10	HH		A.A.
F020	248.00	24.800	10			11104
F013	273.00	27.300	10		BIASED HIGH	ICP
F033	280.00	28.000	10		BIASED HIGH	ICP
F009	291.00	29.100	10	VH	BIASED HIGH	ICP
F060	297.00	29.700	10	HVHVHHH	BIASED HIGH	ICP - Direct
F037	312.00	31.200	10	EHHHVHHHVH	BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 16.500

PARAMETER: 12091 Magnesium MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .5000 BASIC ACCEPTABLE ERROR= .2000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.5 L	2.00	3.5	3.50	7.3	14.00	3.8	15.50	4.9	14.00	4.6	2.50
F002	.75	5.00	3.70	7.50	7.20	8.50	3.70	7.00	4.80	5.00	5.0	16.50
F003	.78	12.00	3.80	12.50	7.32	16.00	3.77	12.00	4.90	14.00	5.00	16.50
F006	1.	31.00	4.	27.00	8.	29.00	4.	28.50	5.	19.50	5.	16.50
F007	.848	27.00	3.97	24.50	7.44	19.00	3.91	23.50	5.00	19.50	5.19	26.00
F008	.18 EL	1.00	3.88	18.00	7.56	23.00	3.80	15.50	5.00	19.50	5.02	20.00
F009	.8	17.50	3.9	20.00	7.2	8.50	3.8	15.50	5.0	19.50	5.0	16.50
F010	.75	5.00	3.73	9.00	7.26	10.00	3.72	9.00	4.83	8.00	4.78	6.00
F011	.8	17.50	3.7	7.50	7.0	4.00	3.6	3.50	4.7	3.00	4.8	7.00
F013	.85	28.00	4.13	29.00	7.76	28.00	3.99	27.00	5.20	28.00	5.27	28.00
F014	.82	23.50	3.90	20.00	7.59	25.00	3.88	21.00	5.06	24.00	5.18	25.00
F016	.79	13.50	4.5 H	31.00	3.29 EL	1.00	3.36	1.00	5.05	23.00	5.04	21.00
F020	.82	23.50	3.92	22.00	7.50	22.00	3.84	20.00	5.11	26.00	5.07	22.00
F023	.77	10.00	3.82	14.00	7.67	26.50	3.83	19.00	4.88	11.00	4.87	11.00
F025	.76	8.00	3.50	3.50	7.00	4.00	3.60	3.50	4.50	1.00	4.60	2.50
F030	.75	5.00	3.93	23.00	7.27	11.00	3.73	10.50	4.90	14.00	5.57 H	30.00
F031	.79	13.50	3.75	10.00	7.12	6.00	3.71	8.00	4.90	14.00	4.65	5.00
F032	.77	10.00	3.84	15.00	7.34	17.00	3.78	13.00	4.94	17.00	5.01	19.00
F033	.80	17.50	3.97	24.50	7.67	26.50	3.98	26.00	5.17	27.00	5.20	27.00
F034	.9	29.50	3.9	20.00	7.0	4.00	4.0	28.50	4.8	5.00	4.1 VL	1.00
F035	.8	17.50	3.8	12.50	7.3	14.00	3.8	15.50	4.9	14.00	4.9	12.00
F036	.813	21.00	3.846	16.00	7.452	20.00	3.808	18.00	4.860	10.00	4.973	13.00
F037	.758	7.00	3.793	11.00	7.158	7.00	3.655	6.00	4.807	7.00	4.867	10.00
F038	.822	26.00	4.06	28.00	7.58	24.00	3.89	22.00	5.27	29.00	5.08	23.00
F042	.80	17.50	3.86	17.00	7.37	18.00	3.91	23.50	5.03	22.00	4.98	14.00
F046	.72	3.00	3.61	6.00	7.28	12.00	3.73	10.50	4.80	5.00	4.86	9.00
F048	.77	10.00	3.4	2.00	7.3	14.00	3.63	5.00	4.84	9.00	4.83	8.00
F059	.9	29.50	4.2	30.00	8.4 H	31.00	4.4 H	31.00	5.5 H	31.00	5.8 H	31.00
F060	.8	17.50	2.7 EL	1.00	8.1 H	30.00	4.1	30.00	5.3	30.00	5.4	29.00
F061	.82	23.50	3.54	5.00	6.8	2.00	3.56	2.00	4.52	2.00	4.62	4.00
F062	.82	23.50	3.99	26.00	7.46	21.00	3.94	25.00	5.08	25.00	5.14	24.00
MEDIAN CONC.	.8000		3.8460		7.3200		3.8000		4.9000		5.0000	

PARAMETER: 12091 Magnesium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	9.4	12.50	30.1	21.50	11.9	12.50	23.1	22.50
F002	9.4	12.50	28.7	5.00	11.6	7.50	22.2	7.50
F003	9.36	10.00	29.6	11.50	11.9	12.50	22.5	11.50
F006	10.	28.50	30.	18.00	12.	16.50	23.	20.00
F007	9.66	23.00	30.0	18.00	12.0	16.50	23.4	26.50
F008	9.82	26.00	29.2	7.00	12.2	22.50	22.2	7.50
F009	9.6	19.50	30.	18.00	12.	16.50	22.	4.50
F010	9.50	15.00	29.8	14.00	11.74	11.00	22.8	16.00
F011	8.9	2.00	29.0	6.00	11.6	7.50	21.8	2.00
F013	9.70	24.00	30.68	27.00	12.46	27.00	22.95	18.00
F014	9.74	25.00	30.6	26.00	12.3	24.50	23.2	24.50
F016	9.61	21.00	27.9	2.00	11.4	4.00	22.1	6.00
F020	9.60	19.50	30.3	24.50	12.3	24.50	23.2	24.50
F023	9.64	22.00	29.5	10.00	11.7	10.00	22.5	11.50
F025	8.70	1.00	30.0	18.00	12.0	16.50	23.0	20.00
F030	9.29	8.00	28.0	3.00	11.5	5.00	22.0	4.50
F031	9.30	9.00	28.1	4.00	12.1	20.50	23.0	20.00
F032	9.48	14.00	30.3	24.50	12.0	16.50	23.4	26.50
F033	9.84	27.00	32.35	29.00	13.47 H	31.00	24.08	29.00
F034	9.0	4.00	29.6	11.50	12.2	22.50	22.4	10.00
F035	9.2	6.00	29.3	8.50	11.6	7.50	21.9	3.00
F036	9.536	16.00	30.175	23.00	11.30	2.00	23.10	22.50
F037	9.185	5.00	29.883	15.00	12.305	26.00	22.733	15.00
F038	10.1	30.50	31.2	28.00	12.7	28.00	24.0	28.00
F042	9.39	11.00	29.3	8.50	11.6	7.50	22.6	13.50
F046	9.58	18.00	30.1	21.50	12.1	20.50	22.9	17.00
F048	9.27	7.00	29.7	13.00	11.33	3.00	22.3	9.00
F059	10.	28.50	33. H	31.00	13.	29.50	25. H	31.00
F060	10.1	30.50	32.9 H	30.00	13.0	29.50	24.4	30.00
F061	8.99	3.00	27.2 L	1.00	11.1	1.00	21.3	1.00
F062	9.55	17.00	30.00	18.00	12.00	16.50	22.60	13.50
MEDIAN CONC.	9.5360		30.0000		12.0000		22.8000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	120.50	12.050	10	L		AAS
F002	82.00	8.200	10			AAS
F003	128.50	12.850	10			FLAME A.A.
F006	234.50	23.450	10			AAS
F007	223.50	22.350	10			ICAP
F008	160.00	16.000	10	EL		ICAP / AAS
F009	156.00	15.600	10			ICP
F010	103.00	10.300	10			ICAP
F011	60.00	6.000	10		BIASED LOW	Flame AA
F013	264.00	26.400	10		BIASED HIGH	ICP
F014	238.50	23.850	10			-
F016	123.50	12.350	10	H EL		AAS
F020	228.50	22.850	10			12111 - ICP
F023	145.00	14.500	10			-
F025	78.00	7.800	10			AA
F030	114.00	11.400	10	H		Naquadat 12005
F031	110.00	11.000	10			Flame AAS, Direct
F032	172.50	17.250	10			AAS
F033	264.50	26.450	10	H	BIASED HIGH	ICP
F034	136.00	13.600	10	VL		A.A.
F035	110.50	11.050	10			ICP
F036	161.50	16.150	10			FLAME AA
F037	109.00	10.900	10			ICP
F038	266.50	26.650	10		BIASED HIGH	ICP
F042	152.50	15.250	10			-
F046	122.50	12.250	10			ICP
F048	80.00	8.000	10			I.C.
F059	303.50	30.350	10	H H H H H H	BIASED HIGH	ICP
F060	257.50	25.750	10	ELH H	BIASED HIGH	ICP - Direct
F061	44.50	4.450	10	L	BIASED LOW	AAS
F062	209.50	20.950	10			ICP

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F061	44.50	4.450	10	L	BIASED LOW	AAS
F011	60.00	6.000	10		BIASED LOW	Flame AA
F025	78.00	7.800	10			AA
F048	80.00	8.000	10			I.C.
F002	82.00	8.200	10			AAS
F010	103.00	10.300	10			ICAP
F037	109.00	10.900	10			ICP
F031	110.00	11.000	10			Flame AAS, Direct
F035	110.50	11.050	10			ICP
F030	114.00	11.400	10	H		Naquadat 12005
F001	120.50	12.050	10	L		AAS
F046	122.50	12.250	10			ICP
F016	123.50	12.350	10	HEL		AAS
F003	128.50	12.850	10			FLAME A.A.
F034	136.00	13.600	10	VL		A.A.
F023	145.00	14.500	10			-
F042	152.50	15.250	10			-
F009	156.00	15.600	10			ICP
F008	160.00	16.000	10	EL		ICAP / AAS
F036	161.50	16.150	10			FLAME AA
F032	172.50	17.250	10			AAS
F062	209.50	20.950	10			ICP
F007	223.50	22.350	10			ICAP
F020	228.50	22.850	10			12111 - ICP
F006	234.50	23.450	10			AAS
F014	238.50	23.850	10			-
F060	257.50	25.750	10	ELHH	BIASED HIGH	ICP - Direct
F013	264.00	26.400	10		BIASED HIGH	ICP
F033	264.50	26.450	10	H	BIASED HIGH	ICP
F038	266.50	26.650	10		BIASED HIGH	ICP
F059	303.50	30.350	10	HHHHHH	BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 16.000

PARAMETER: 14091 Silicates mg SiO2/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .1000 BASIC ACCEPTABLE ERROR= .0250 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	4.81	16.00	.42	12.00	1.56	16.00	5.4	14.00	7.54	12.00	5.57	17.00
F002	4.76	14.50	.40	8.50	1.56	16.00	5.45	15.50	7.56	13.00	5.58	18.00
F003	4.69	5.00	.47 H	13.00	1.50	8.50	5.32	11.00	7.49	10.00	5.52	14.00
F008	4.7	8.00	.4	8.50	1.5	8.50	5.3	8.00	7.6	14.50	5.5	11.50
F009	4.7	8.00	.4	8.50	1.5	8.50	6.0 VH	19.00	7.7	18.50	5.6	19.00
F010	4.75	12.00	.40	8.50	1.55	14.00	5.3	8.00	7.5	11.00	5.4	6.00
F011	2.98 EL	1.00	.3 EL	1.50	1.26 VL	1.00	3.39 EL	1.00	5.29 EL	1.00	3.70 EL	1.00
F016	5.13	22.00	1.20 EH	20.00	1.78 EH	22.00	6.42 EH	21.00	8.34 H	21.00	6.12 H	21.00
F020	4.7	8.00	<.5	0.00	1.4	2.00	5.2	5.00	7.4	6.50	5.4	6.00
F023	4.26 L	2.00	.52 EH	16.00	1.47	4.00	5.45	15.50	7.08	3.00	5.13	3.00
F025	4.75	12.00	.36	4.00	1.50	8.50	5.34	12.00	7.61	16.00	5.55	16.00
F030	4.91	19.00	.86 EH	19.00	1.59	18.50	5.10	3.00	6.95	2.00	4.92 L	2.00
F032	4.75	12.00	.39	5.50	1.54	13.00	5.31	10.00	7.44	8.00	5.48	10.00
F033	4.7	8.00	.39	5.50	1.5	8.50	5.1	3.00	7.3	5.00	5.4	6.00
F036	4.84	17.00	.404	11.00	1.56	16.00	5.39	13.00	7.66	17.00	5.54	15.00
F038	4.9	18.00	<1.0	0.00	1.5	8.50	<1.0 EL	0.00	7.7	18.50	5.7	20.00
F042	4.70	8.00	.34 L	3.00	1.50	8.50	5.26	6.00	7.40	6.50	5.41	8.00
F046	4.76	14.50	.53 EH	17.00	1.59	18.50	5.81 H	18.00	7.77	20.00	5.51	13.00
F048	5.01	20.00	.76 EH	18.00	1.60	20.00	5.49	17.00	7.46	9.00	5.45	9.00
F059	4.4	3.00	.5 VH	14.50	1.5	8.50	5.3	8.00	7.6	14.50	5.5	11.50
F060	5.1	21.00	.5 VH	14.50	1.7 H	21.00	6.4 EH	20.00	8.5 VH	22.00	6.3 VH	22.00
F062	4.60	4.00	.30 EL	1.50	1.44	3.00	5.10	3.00	7.26	4.00	5.31	4.00
MEDIAN CONC.	4.7500		.4020		1.5000		5.3200		7.5200		5.5000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	6.53	12.00	6.41	12.50	.8	9.50	6.65	12.00
F002	6.65	16.00	6.50	16.50	.81	12.00	6.81	19.00
F003	6.76	18.50	6.27	6.00	.83	14.00	6.50	6.00
F008	6.4	7.50	6.4	10.50	.8	9.50	6.6	8.00
F009	6.8	20.00	6.8	20.00	1.1 EH	19.00	6.8	17.50
F010	6.4	7.50	6.4	10.50	.8	9.50	6.7	15.50
F011	4.55 EL	1.00	4.75 EL	1.00	.629 EL	1.00	5.85 L	1.00
F016	7.29 VH	21.00	6.78	19.00	1.11 EH	20.00	7.42 H	21.00
F020	6.4	7.50	6.3	8.00	.7 L	3.00	6.6	8.00
F023	6.14	3.00	6.21	5.00	1.01 EH	18.00	6.24	3.00
F025	6.64	15.00	6.43	14.00	.78	7.00	6.68	13.00
F030	6.13	2.00	6.09	2.00	1.22 EH	21.00	6.17	2.00
F032	6.42	11.00	6.33	9.00	.77	5.50	6.63	11.00
F033	6.4	7.50	6.2	4.00	.77	5.50	6.4	5.00
F036	6.57	13.50	6.45	15.00	.813	13.00	6.69	14.00
F038	6.7	17.00	6.5	16.50	<1.0	0.00	6.8	17.50
F042	6.41	10.00	6.28	7.00	.75	4.00	6.60	8.00
F046	6.76	18.50	6.65	18.00	.99 EH	16.00	6.84	20.00
F048	6.57	13.50	6.41	12.50	.96 VH	15.00	6.61	10.00
F059	6.3	5.00	6.9	21.00	.8	9.50	6.7	15.50
F060	7.3 VH	22.00	7.2 VH	22.00	1.0 EH	17.00	7.5 VH	22.00
F062	6.20	4.00	6.15	3.00	.69 L	2.00	6.39	4.00
MEDIAN CONC.	6.4750		6.4050		.8000		6.6400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	133.00	13.300	10			Auto Col
F002	149.00	14.900	10			Auto Col
F003	106.00	10.600	10	H		COLORIMETRIC
F008	94.50	9.450	10			AA, Mo
F009	158.00	15.800	10	VH EH		ICP
F010	102.50	10.250	10			Col
F011	10.50	1.050	10	ELELVLELELELELELELL	BIASED LOW	Tech. AA
F016	208.00	20.800	10	EHEHEHH H VH EHH	BIASED HIGH	ICP
F020	54.00	6.000	9	L		14105
F023	72.50	7.250	10	L ÉH EH		-
F025	117.50	11.750	10			Colorimetric
F030	90.50	9.050	10	EH L EH		Naquadat 14111
F032	95.00	9.500	10			Colour
F033	58.00	5.800	10			MOLYBDATE
F036	144.50	14.450	10			AUTOANALYZER
F038	116.00	16.571	7	EL		Colour
F042	69.00	6.900	10	L		-
F046	173.50	17.350	10	EH H EH	BIASED HIGH	ICP
F048	144.00	14.400	10	EH VH		Spectrophotometer
F059	111.00	11.100	10	VH		ICP
F060	203.50	20.350	10	VHH EHVHVHVHVHEHVH	BIASED HIGH	ICP - Direct calc.
F062	32.50	3.250	10	EL L	BIASED LOW	Auto-Colour

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F011	10.50	1.050	10	ELELVLELELELELELELL	BIASED LOW	Tech. AA
F062	32.50	3.250	10	ELL	BIASED LOW	Auto-Colour
F033	58.00	5.800	10			MOLYBDATE
F020	54.00	6.000	9	L		14105
F042	69.00	6.900	10	L		-
F023	72.50	7.250	10	LEHEH		-
F030	90.50	9.050	10	EHLEH		Naquadat 14111
F008	94.50	9.450	10			AA, Mo
F032	95.00	9.500	10			Colour
F010	102.50	10.250	10			Col
F003	106.00	10.600	10	H		COLORIMETRIC
F059	111.00	11.100	10	VH		ICP
F025	117.50	11.750	10			Colorimetric
F001	133.00	13.300	10			Auto Col
F048	144.00	14.400	10	EHVH		Spectrophotometer
F036	144.50	14.450	10			AUTOANALYZER
F002	149.00	14.900	10			Auto Col
F009	158.00	15.800	10	VHEH		ICP
F038	116.00	16.571	7	EL		Colour
F046	173.50	17.350	10	EHHEH	BIASED HIGH	ICP
F060	203.50	20.350	10	VHHEHVHVHVHVHEHVH	BIASED HIGH	ICP - Direct calc.
F016	208.00	20.800	10	EHEHEHHHVHEHH	BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 11.310

PARAMETER: 16092 Sulfate (All Methods) MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	6.	27.00	7. EH	28.50	15.	5.50	12.	12.50	10.	22.50	10. L	2.00
F002	5.2	14.00	4.9	10.50	15.9	18.00	12.6	24.00	9.4	16.50	12.0	13.50
F003	5.4	20.50	4.7	7.50	15.7	14.50	12.6	24.00	9.8	20.00	11.8	8.00
F006	<10.	0.00	<10.	0.00	14. L	3.00	10. VL	1.00	<10.	0.00	<10. L	0.00
F007	5.6	22.50	5.5	24.00	16.6	28.00	13.3	26.00	10.8 H	28.00	13.4 H	28.50
F008	5.77	24.00	5.38	23.00	16.2	26.00	12.6	24.00	10.1	24.00	12.5	21.50
F009	5.0	6.00	4.9	10.50	15.4	8.50	12.0	12.50	8.8	5.00	11.3	7.00
F010	5.0	6.00	4.0 L	2.00	13.0 VL	1.00	10.5 L	2.00	7.0 EL	1.00	7.5 EL	1.00
F011	7. EH	30.00	7. EH	28.50	16.	22.50	14. H	30.50	12. EH	29.00	13.	25.00
F013	5.23	17.00	5.09	19.00	15.69	12.00	12.35	20.00	9.34	12.00	12.13	20.00
F014	3.90 VL	1.00	2.75 EL	1.00	13.3 L	2.00	11.9	9.00	8.66	2.00	10.3 L	3.00
F015	4.7	2.00	4.4	3.00	15.4	8.50	11.7	6.00	9.2	11.00	11.	5.00
F016	5.2	14.00	4.5	5.00	16.	22.50	12.	12.50	9.7	19.00	12.	13.50
F020	5.3	18.00	5.2	21.00	16.0	22.50	13.4	27.00	10.2	25.00	12.5	21.50
F023	6.18 H	29.00	23.8 EH	31.00	17.9 H	30.00	13.8 H	29.00	10.6 H	27.00	13.3	27.00
F025	5.2	14.00	5.0	16.50	15.6	10.50	12.1	16.50	9.4	16.50	12.0	13.50
F030	18.1 EH	31.00	16.5 EH	30.00	22.2 EH	32.00	20.6 EH	32.00	18.1 EH	31.00	22.2 EH	31.00
F031	5.09	9.50	4.87	9.00	15.8	17.00	11.6	3.50	9.37	13.50	12.6	23.00
F032	4.9	4.00	5.0	16.50	15.2	7.00	11.6	3.50	8.7	4.00	11.2	6.00
F033	5.04	8.00	4.92	12.00	15.6	10.50	12.	12.50	9.08	10.00	11.9	9.50
F035	6.1 H	28.00	6.0 H	26.50	18.2 H	31.00	14.0 H	30.50	12.2 EH	30.00	13.7 H	30.00
F036	4.826	3.00	4.493	4.00	14.482	4.00	11.680	5.00	8.675	3.00	10.985	4.00
F037	5.3416	19.00	4.6088	6.00	15.9327	19.00	11.7581	7.00	9.0655	8.00	12.1256	19.00
F038	5.8	25.50	5.2	21.00	15.7	14.50	12.2	18.50	9.0	7.00	12.1	17.50
F042	5.09	9.50	4.94	13.00	16.0	22.50	11.8	8.00	9.07	9.00	11.9	9.50
F043	5.1	11.50	5.0	16.50	16.0	22.50	12.2	18.50	9.4	16.50	12.1	17.50
F046	5.22	16.00	4.97	14.00	15.7	14.50	12.1	16.50	9.37	13.50	12.0	13.50
F048	5.60	22.50	5.53	25.00	16.48	27.00	12.36	21.00	9.89	21.00	12.86	24.00
F059	5.	6.00	5.	16.50	15.	5.50	12.	12.50	10.	22.50	12.	13.50
F060	5.8	25.50	6.0 H	26.50	17.3	29.00	13.6 H	28.00	10.4	26.00	13.4 H	28.50
F061	5.4	20.50	5.2	21.00	16.	22.50	12.	12.50	9.4	16.50	12.	13.50
F062	5.10	11.50	4.70	7.50	15.70	14.50	12.50	22.00	8.90	6.00	13.10	26.00
MEDIAN CONC.	5.2200		5.0000		15.7500		12.1000		9.4000		12.0000	

PARAMETER: 16092 Sulfate (All Methods) MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	18.	4.50	47.	3.00	45.	16.50	102.	13.50
F002	19.3	21.00	51.4	23.00	46.1	26.00	103.3	17.00
F003	19.1	17.00	47.0	3.00	44.7	13.00	100.	7.50
F006	17. L	1.00	48.	6.50	44.	8.00	99.	4.00
F007	20.0	24.50	52.1	25.00	44.5	11.00	104.1	22.00
F008	24. EH	31.00	53.8	29.00	51. H	31.00	129. EH	32.00
F009	18.2	6.50	48.	6.50	43.	3.00	101.	9.50
F010	17.5	2.00	36. EL	1.00	42.	2.00	95.	2.00
F011	20.	24.50	51.	20.50	46.	24.00	104.	19.50
F013	19.08	15.00	49.82	12.00	45.34	21.00	101.4	11.00
F014	18.7	10.00	50.0	13.50	45.0	16.50	108.	29.00
F015	18.	4.50	51.	20.50	40. L	1.00	94.1 L	1.00
F016	20.	24.50	55. H	30.00	46.	24.00	105.	23.50
F020	19.9	22.00	52.0	24.00	45.5	22.00	105.	23.50
F023	21.5 H	29.00	50.6	19.00	43.8	6.00	104.	19.50
F025	18.9	12.50	49.0	9.50	45.3	20.00	100.	7.50
F030	46.9 EH	32.00	60.1 EH	32.00	52.7 VH	32.00	110.	31.00
F031	18.5	8.00	50.0	13.50	45.1	19.00	102.	13.50
F032	18.2	6.50	49.6	11.00	44.4	10.00	102.	13.50
F033	19.1	17.00	50.1	15.00	44.9	14.00	107.	27.00
F035	21.2 H	28.00	48.5	8.00	43.5	4.00	102.	13.50
F036	17.780	3.00	47.40	5.00	43.63	5.00	96.64	3.00
F037	19.1990	19.00	50.261	17.00	43.8992	7.00	99.9	6.00
F038	18.6	9.00	51.2	22.00	46.3	27.00	107.	27.00
F042	18.9	12.50	50.2	16.00	45.0	16.50	104.	19.50
F043	22.0 H	30.00	50.4	18.00	44.3	9.00	99.4	5.00
F046	19.2	20.00	49.0	9.50	45.0	16.50	101.	9.50
F048	18.77	11.00	52.34	27.00	46.56	28.00	108.43	30.00
F059	19.	14.00	53.	28.00	47.	29.00	107.	27.00
F060	20.4	27.00	52.3	26.00	47.3	30.00	106.	25.00
F061	20.	24.50	57. VH	31.00	46.	24.00	104.	19.50
F062	19.10	17.00	47.00	3.00	44.65	12.00	102.85	16.00
MEDIAN CONC.	19.1000		50.2305		45.0000		103.0750	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	135.50	13.550	10	EH L		Auto Col
F002	183.50	18.350	10			IC
F003	135.00	13.500	10			COLORIMETRIC-MTB
F006	23.50	3.917	6	L VL L L	BIASED LOW	Auto Col
F007	239.50	23.950	10	H H		AA
F008	265.50	26.550	10	EH H EH	BIASED HIGH	AA, MTB
F009	75.00	7.500	10		BIASED LOW	Dionex
F010	20.00	2.000	10	L VLL ELEL EL	BIASED LOW	Calmagite
F011	254.00	25.400	10	EHEH H EH	BIASED HIGH	Tech. AA
F013	159.00	15.900	10			ICP
F014	87.00	8.700	10	VLELL L		-
F015	62.50	6.250	10	L L	BIASED LOW	AUTO METHYL. BLUE
F016	188.50	18.850	10	H		IC
F020	226.50	22.650	10			16306
F023	246.50	24.650	10	H EHH H H H		-
F025	137.00	13.700	10			IC
F030	314.00	31.400	10	EHEHEHEHEHEHEHEHVH	BIASED HIGH	Naquadat 16301
F031	129.50	12.950	10			I.C.
F032	82.00	8.200	10			IC
F033	135.50	13.550	10			IC
F035	229.50	22.950	10	H H H H EHH H		Colourimetry MTB
F036	39.00	3.900	10		BIASED LOW	DIONEX I.C.
F037	127.00	12.700	10			ICP
F038	189.00	18.900	10			Turb.
F042	136.00	13.600	10			-
F043	165.00	16.500	10	H		IC
F046	143.50	14.350	10			IC
F048	236.50	23.650	10			I.C.
F059	174.50	17.450	10			ION CHROMATOGRAPHY
F060	271.50	27.150	10	H H H	BIASED HIGH	ICP - Direct
F061	205.50	20.550	10	VH		IC
F062	135.50	13.550	10			Auto-Turbid

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F010	20.00	2.000	10	LVLLELELEL	BIASED LOW	Calmagite
F036	39.00	3.900	10		BIASED LOW	DIONEX I.C.
F006	23.50	3.917	6	LVLLL	BIASED LOW	Auto Col
F015	62.50	6.250	10	LL	BIASED LOW	AUTO METHYL. BLUE
F009	75.00	7.500	10		BIASED LOW	Dionex
F032	82.00	8.200	10			IC
F014	87.00	8.700	10	VLELLL		-
F037	127.00	12.700	10			ICP
F031	129.50	12.950	10			I.C.
F003	135.00	13.500	10			COLORIMETRIC-MTB
F033	135.50	13.550	10			IC
F001	135.50	13.550	10	EHL		Auto Col
F062	135.50	13.550	10			Auto-Turbid
F042	136.00	13.600	10			-
F025	137.00	13.700	10			IC
F046	143.50	14.350	10			IC
F013	159.00	15.900	10			ICP
F043	165.00	16.500	10	H		IC
F059	174.50	17.450	10			ION CHROMATOGRAPHY
F002	183.50	18.350	10			IC
F016	188.50	18.850	10	H		IC
F038	189.00	18.900	10			Turb.
F061	205.50	20.550	10	VH		IC
F020	226.50	22.650	10			16306
F035	229.50	22.950	10	HHHHEHHH		Colourimetry MTB
F048	236.50	23.650	10			I.C.
F007	239.50	23.950	10	HH		AA
F023	246.50	24.650	10	HEHHHHH		-
F011	254.00	25.400	10	EHEHHEH	BIASED HIGH	Tech. AA
F008	265.50	26.550	10	EHHEH	BIASED HIGH	AA, MTB
F060	271.50	27.150	10	HHH	BIASED HIGH	ICP - Direct
F030	314.00	31.400	10	EHEHEHEHEHEHEHEHVH	BIASED HIGH	Naquadat 16301

OVERALL AVERAGE RANK IS 16.304

PARAMETER: 17092 Chloride (All Methods) MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	3.0	12.50	2.2	11.00	5.6	9.00	21.5	9.00	18.6	8.50	7.0	8.00
F002	3.1	21.00	2.2	11.00	5.8	17.00	22.1	21.00	19.4	22.00	7.3	16.50
F003	3.1	21.00	2.3	18.00	5.9	21.00	21.9	15.00	19.2	18.50	7.2	12.00
F006	<2. VL	0.00	<2.	0.00	4. EL	2.00	20.	2.50	18.	5.50	6. L	1.50
F007	3.14	25.00	2.41	25.50	5.62	12.00	21.69	12.00	18.69	10.00	7.11	11.00
F008	3.2	27.50	2.3	18.00	5.8	17.00	21.	5.50	18.	5.50	7.3	16.50
F009	2.8	5.00	2.1	5.50	5.5	6.00	21.	5.50	18.	5.50	6.6	4.00
F010	3.6	31.00	2.6	28.00	5.1	4.00	22.	18.00	19.	14.00	7.7	26.50
F011	3.07	17.50	2.26	14.00	5.95	24.00	21.6	11.00	19.0	14.00	7.52	23.00
F013	3.5	30.00	2.6	28.00	5.8	17.00	22.0	18.00	19.0	14.00	7.5	21.50
F014	2.27 L	2.00	1.18 VL	1.00	4.69 L	3.00	22.3	22.50	18.6	8.50	6.04 L	3.00
F015	2.8	5.00	2.	2.50	5.7	13.50	22.5	24.50	20.	30.00	7.5	21.50
F016	3.3	29.00	2.6	28.00	7.0 H	32.00	22.6	26.50	19.4	22.00	9.9 EH	33.00
F020	3.1	21.00	2.3	18.00	6.0	25.50	22.0	18.00	19.4	22.00	7.7	26.50
F023	.98 EL	1.00	2.41	25.50	6.07	27.00	22.6	26.50	19.2	18.50	7.24	14.00
F025	2.88	7.00	2.27	15.00	5.93	23.00	22.5	24.50	19.7	27.00	7.57	24.00
F030	2.9	8.50	3.5 VH	31.00	3.5 EL	1.00	20.1	4.00	17.8	3.00	6.0 L	1.50
F031	3.07	17.50	2.19	8.00	6.10	28.00	22.0	18.00	19.2	18.50	7.22	13.00
F032	3.2	27.50	2.3	18.00	5.9	21.00	21.7	13.50	19.0	14.00	7.4	19.00
F033	3.1	21.00	2.2	11.00	5.9	21.00	23.	29.50	20.	30.00	7.3	16.50
F034	5.8 EH	32.00	4.0 EH	32.00	7.8 EH	33.00	23.4	31.00	20.9	33.00	9.8 EH	32.00
F035	3.1	21.00	2.2	11.00	5.8	17.00	21.7	13.50	18.9	11.00	7.3	16.50
F036	3.035	15.00	2.009	4.00	5.360	5.00	21.500	9.00	19.410	24.00	6.720	5.00
F037	3.1856	26.00	2.3314	22.00	6.1912	29.00	23.5582	32.00	19.4737	25.00	7.6498	25.00
F038	3.0	12.50	2.3	18.00	5.8	17.00	22.3	22.50	19.5	26.00	7.0	8.00
F042	2.91	10.00	2.16	7.00	5.61	11.00	19.8 L	1.00	17.7	2.00	6.82	6.00
F043	2.9	8.50	2.4	24.00	6.4	30.00	20.0	2.50	18.0	5.50	7.9	28.00
F046	3.11	24.00	2.38	23.00	5.56	7.00	21.4	7.00	19.2	18.50	7.43	20.00
F048	3.04	16.00	2.31	21.00	6.57	31.00	23.93	33.00	20.87	32.00	8.84 VH	31.00
F059	3.	12.50	2.	2.50	6.	25.50	22.	18.00	17. L	1.00	7.	8.00
F060	2.8	5.00	2.1	5.50	5.6	9.00	21.5	9.00	19.8	28.00	8.1	29.00
F061	3.	12.50	2.2	11.00	5.7	13.50	23.	29.50	19.	14.00	8.3	30.00
F062	2.70	3.00	3.10 H	30.00	5.60	9.00	22.80	28.00	20.00	30.00	7.10	10.00
MEDIAN CONC.	3.0550		2.3000		5.8000		22.0000		19.2000		7.3000	

PARAMETER: 17092 Chloride (All Methods) MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	87.9	13.00	26.2	8.00	4.5	4.00	71.4	12.50
F002	93.	28.50	27.1	22.00	4.9	19.50	73.3	22.00
F003	90.8	23.50	26.4	12.00	4.7	8.00	71.3	11.00
F006	87.	9.00	30. H	31.00	4. L	2.00	82. VH	32.00
F007	86.79	8.00	26.29	9.00	4.80	14.00	69.89	6.00
F008	89.	16.00	27.	19.50	4.9	19.50	72.	15.50
F009	89.	16.00	26.	6.50	4.4	3.00	72.	15.50
F010	92.	25.50	29.	29.00	5.4	28.00	73.	20.00
F011	92.7	27.00	26.5	13.50	4.94	24.00	73.9	26.50
F013	95.0	31.00	26.8	15.50	5.0	25.00	75.0	29.00
F014	93.0	28.50	27.6	24.00	4.91	22.00	73.6	24.00
F015	89.7	19.00	27.8	25.50	4.7	8.00	72.5	18.00
F016	86.	6.00	27.	19.50	6.1 VH	32.00	70.	7.50
F020	90.0	21.50	27.0	19.50	5.1	26.00	72.4	17.00
F023	95.5	32.00	20.1 EL	1.00	4.74	10.00	67.5	3.00
F025	89.0	16.00	26.3	10.50	4.83	16.00	71.4	12.50
F030	87.2	12.00	24.0 L	2.00	2.4 EL	1.00	73.2	21.00
F031	86.6	7.00	26.9	17.00	4.88	17.00	70.6	9.50
F032	90.0	21.50	26.5	13.50	4.9	19.50	73.5	23.00
F033	94.	30.00	28.	27.00	4.9	19.50	77.	31.00
F034	90.8	23.50	30.2 H	32.00	7.5 EH	33.00	74.6	28.00
F035	89.2	18.00	26.8	15.50	4.8	14.00	71.5	14.00
F036	62.650 EL	1.00	25.60	4.00	4.648	5.00	76.720	30.00
F037	65.8487 EL	2.00	31.4654 VH	33.00	4.7762	12.00	65.2 L	1.50
F038	89.8	20.00	27.4	23.00	4.7	8.00	73.9	26.50
F042	87.1	10.50	24.8	3.00	4.93	23.00	69.5	5.00
F043	83.5	4.00	25.7	5.00	5.2	27.00	65.2 L	1.50
F046	87.1	10.50	26.3	10.50	4.76	11.00	70.6	9.50
F048	100.71 VH	33.00	29.13	30.00	5.47	29.00	91.51 EH	33.00
F059	88.	14.00	27.	19.50	6. H	30.50	70.	7.50
F060	83.6	5.00	27.8	25.50	6.0 H	30.50	72.7	19.00
F061	80. L	3.00	26.	6.50	4.8	14.00	69.	4.00
F062	92.00	25.50	28.30	28.00	4.65	6.00	73.80	25.00
MEDIAN CONC.	89.0000		26.9000		4.8800		72.4000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	95.50	9.550	10			Auto Col
F002	200.50	20.050	10			IC
F003	160.00	16.000	10			COLORIMETRIC-SCN
F006	85.50	10.688	8	VL EL L H L VH		Auto Col
F007	132.50	13.250	10			AA
F008	160.50	16.050	10			Thiocy. FIA
F009	72.50	7.250	10		BIASED LOW	Dionex
F010	224.00	22.400	10			Cond Titrn
F011	194.50	19.450	10			Tech. AA
F013	229.00	22.900	10			AA, Hg
F014	138.50	13.850	10	L VLL L		-
F015	167.50	16.750	10			AUTO SCN COMB.REAG
F016	235.50	23.550	10	H EH VH		IC
F020	215.00	21.500	10			17203
F023	158.50	15.850	10	EL EL		-
F025	175.50	17.550	10			IOn Chromatography
F030	85.00	8.500	10	VHEL L L EL		Naquadat 17201
F031	153.50	15.350	10			I.C.
F032	190.50	19.050	10			Colour
F033	236.50	23.650	10			THIOCYANATE
F034	309.50	30.950	10	EHEHEH EH H EH	BIASED HIGH	AUTO-TITRALZER
F035	151.50	15.150	10			Colourimetry
F036	102.00	10.200	10	EL		DIONEX I.C.
F037	207.50	20.750	10	ELVH L		ICP
F038	181.50	18.150	10			Colour
F042	78.50	7.850	10	L		-
F043	136.00	13.600	10	L		IC
F046	141.00	14.100	10			IC
F048	289.00	28.900	10	VHVH EH	BIASED HIGH	I.C.
F059	139.00	13.900	10	L H		ION CHROMATOGRAPHY
F060	165.50	16.550	10	H		Autoanalyzer - Col
F061	138.00	13.800	10	L		IC
F062	194.50	19.450	10	H		Auto-Colour

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F009	72.50	7.250	10		BIASED LOW	Dionex
F042	78.50	7.850	10	L		-
F030	85.00	8.500	10	VHELLLEL		Naquadat 17201
F001	95.50	9.550	10			Auto Col
F036	102.00	10.200	10	EL		DIONEX I.C.
F006	85.50	10.688	8	VLELLHLVH		Auto Col
F007	132.50	13.250	10			AA
F043	136.00	13.600	10	L		IC
F061	138.00	13.800	10	L		IC
F014	138.50	13.850	10	LVLLL		-
F059	139.00	13.900	10	LH		ION CHROMATOGRAPHY
F046	141.00	14.100	10			IC
F035	151.50	15.150	10			Colourimetry
F031	153.50	15.350	10			I.C.
F023	158.50	15.850	10	ELEL		-
F003	160.00	16.000	10			COLORIMETRIC-SCN
F008	160.50	16.050	10			Thiocy. FIA
F060	165.50	16.550	10	H		Autoanalyzer - Col
F015	167.50	16.750	10			AUTO SCN COMB.REAG
F025	175.50	17.550	10			IOn Chromatography
F038	181.50	18.150	10			Colour
F032	190.50	19.050	10			Colour
F011	194.50	19.450	10			Tech. AA
F062	194.50	19.450	10	H		Auto-Colour
F002	200.50	20.050	10			IC
F037	207.50	20.750	10	ELVHL		ICP
F020	215.00	21.500	10			17203
F010	224.00	22.400	10			Cond Titrn
F013	229.00	22.900	10			AA, Hg
F016	235.50	23.550	10	HEHVH		IC
F033	236.50	23.650	10			THIOCYANATE
F048	289.00	28.900	10	VHVHEH	BIASED HIGH	I.C.
F034	309.50	30.950	10	EHEHEHEHHEH	BIASED HIGH	AUTO-TITRALZER

OVERALL AVERAGE RANK IS 16.902

Chloride (All Methods)

PARAMETER: 19091 Potassium MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .5000 BASIC ACCEPTABLE ERROR= .2000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.42	5.00	.72	3.00	.8	5.50	2.22	5.00	1.2	9.00	1.14	5.00
F002	.53	23.00	.82	12.00	.90	18.50	2.40	21.00	1.30	24.50	1.22	13.00
F003	.47	8.00	.77	7.00	.83	9.00	2.28	7.50	1.22	12.00	1.18	7.50
F006	.5	15.00	.9	27.00	.9	18.50	2.3	12.00	1.2	9.00	1.2	10.50
F007	.521	21.00	.889	24.00	.900	18.50	2.45	25.00	1.26	17.00	1.36	30.00
F008	.49	10.00	.84	17.00	.90	18.50	2.4	21.00	1.3	24.50	1.3	25.00
F010	.50	15.00	.85	21.00	.85	10.50	2.28	7.50	1.24	13.50	1.27	20.00
F011	.3	1.00	.6 L	1.00	.7	1.00	2.4	21.00	.4 EL	1.00	1.0	2.00
F013	.56	26.50	.85	21.00	.96	26.50	2.32	14.50	1.18	6.00	1.31	27.00
F014	.42	5.00	.73	4.50	.77	3.00	2.29	9.50	1.15	5.00	1.17	6.00
F016	.40	2.50	.68	2.00	.74	2.00	2.18	2.00	1.11	4.00	1.08	3.00
F020	.6	29.00	.9	27.00	1.0	28.50	2.5	27.00	1.3	24.50	1.3	25.00
F023	.51	19.50	.84	17.00	.85	10.50	2.32	14.50	1.25	15.50	1.25	17.00
F025	.43	7.00	.73	4.50	.82	8.00	2.23	6.00	1.20	9.00	1.18	7.50
F030	.6	29.00	.8	9.00	.8	5.50	2.2	3.50	1.1	3.00	1.1	4.00
F031	.48	9.00	.83	13.00	.93	25.00	2.36	17.50	1.30	24.50	1.26	19.00
F032	.50	15.00	.84	17.00	.90	18.50	2.36	17.50	1.27	18.50	1.25	17.00
F033	.51	19.50	.84	17.00	.91	23.00	2.65	30.00	1.46	31.00	1.29	22.50
F034	.6	29.00	.9	27.00	.9	18.50	2.2	3.50	1.2	9.00	1.2	10.50
F035	.5	15.00	.9	27.00	.9	18.50	2.4	21.00	1.3	24.50	1.3	25.00
F036	.493	11.00	.836	14.00	.890	14.00	2.417	24.00	1.293	21.00	1.279	21.00
F037	.56	26.50	.96	30.00	1.04	30.00	2.59	28.00	1.43	30.00	1.29	22.50
F038	.42	5.00	.75	6.00	.80	5.50	2.29	9.50	1.28	20.00	1.25	17.00
F042	.53	23.00	.87	23.00	.96	26.50	2.66	31.00	1.42	29.00	1.32	28.00
F043	.50	15.00	.80	9.00	.87	12.50	2.3	12.00	1.2	9.00	1.2	10.50
F046	.55	25.00	.84	17.00	.90	18.50	2.30	12.00	1.24	13.50	1.23	14.00
F048	.53	23.00	.85	21.00	.92	24.00	2.46	26.00	1.27	18.50	1.33	29.00
F059	.5	15.00	.9	27.00	1.0	28.50	2.6	29.00	1.4	28.00	1.4	31.00
F060	<.20 VL	0.00	<.20 EL	0.00	<.20 EL	0.00	1.60 EL	1.00	.69 EL	2.00	.51 EL	1.00
F061	.5	15.00	.8	9.00	.8	5.50	2.4	21.00	1.3	24.50	1.2	10.50
F062	.40	2.50	.81	11.00	.87	12.50	2.33	16.00	1.25	15.50	1.24	15.00
MEDIAN CONC.	.5000		.8400		.9000		2.3300		1.2500		1.2500	

PARAMETER: 19091 Potassium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	2.44	6.00	1.5	6.00	1.2	4.50	3.7	4.00
F002	2.70	24.50	1.61	20.00	1.35	24.50	3.84	10.00
F003	2.55	12.50	1.52	7.50	1.26	9.50	3.94	17.00
F006	2.5	8.50	1.6	16.50	1.3	14.50	3.8	8.00
F007	2.87	27.00	1.67	23.00	1.35	24.50	4.00	20.00
F008	2.6	18.50	1.6	16.50	1.3	14.50	3.9	14.00
F010	2.67	23.00	1.52	7.50	1.33	21.50	3.88	11.50
F011	1.9 VL	2.00	1.4	3.50	.4 EL	1.00	3.4 L	2.00
F013	2.55	12.50	1.61	20.00	1.32	20.00	4.08	21.00
F014	2.50	8.50	1.48	5.00	1.20	4.50	3.97	19.00
F016	2.22 L	4.00	1.36	2.00	1.08	3.00	3.88	11.50
F020	2.7	24.50	1.7	25.00	1.4	28.50	4.1	22.50
F023	2.60	18.50	1.57	12.00	1.25	8.00	3.63	3.00
F025	2.58	15.00	1.53	9.00	1.26	9.50	3.79	6.00
F030	2.3	5.00	1.4	3.50	1.3	14.50	3.8	8.00
F031	2.60	18.50	1.58	13.50	1.22	7.00	3.72	5.00
F032	2.54	11.00	1.58	13.50	1.31	18.00	3.96	18.00
F033	2.96 H	29.00	1.89 H	31.00	1.39	27.00	4.23	26.00
F034	2.5	8.50	1.7	25.00	1.3	14.50	5.3 EH	30.00
F035	2.5	8.50	1.7	25.00	1.3	14.50	3.9	14.00
F036	2.605	21.00	1.629	22.00	1.319	19.00	3.913	16.00
F037	2.71	26.00	1.80	28.50	1.36	26.00	4.39 H	27.00
F038	2.66	22.00	1.61	20.00	1.34	23.00	3.90	14.00
F042	3.04 H	30.00	1.78	27.00	1.48	30.00	4.48 H	28.00
F043	2.6	18.50	1.6	16.50	1.3	14.50	3.8	8.00
F046	2.59	16.00	1.56	11.00	1.28	11.00	4.12	24.00
F048	2.08 L	3.00	1.54	10.00	1.21	6.00	6.5 EH	31.00
F059	3.3 VH	31.00	1.8	28.50	1.5	31.00	4.7 VH	29.00
F060	1.78 EL	1.00	.84 EL	1.00	.44 EL	2.00	2.47 EL	1.00
F061	2.9	28.00	1.6	16.50	1.4	28.50	4.1	22.50
F062	2.57	14.00	1.82	30.00	1.33	21.50	4.14	25.00
MEDIAN CONC.	2.5900		1.6000		1.3000		3.9130	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	53.00	5.300	10		BIASED LOW	Auto Flame
F002	191.00	19.100	10			Flame Ph
F003	97.50	9.750	10			FLAME-PHOTOMETRIC
F006	139.50	13.950	10			AAS
F007	230.00	23.000	10			AAS
F008	179.50	17.950	10			AAS
F010	151.00	15.100	10			ICAP
F011	35.50	3.550	10	L EL VL ELL	BIASED LOW	Flame AA
F013	195.00	19.500	10			ICP
F014	70.00	7.000	10		BIASED LOW	-
F016	36.00	3.600	10	L	BIASED LOW	AAS
F020	261.50	26.150	10		BIASED HIGH	19103
F023	135.50	13.550	10			-
F025	81.50	8.150	10			Flume Photometer
F030	85.00	8.500	10			Naquadat 19002
F031	152.00	15.200	10			Flame AAS, Direct
F032	164.00	16.400	10			AAS
F033	256.00	25.600	10	H H	BIASED HIGH	ICP
F034	175.50	17.550	10	EH		A.A.
F035	193.00	19.300	10			ICP
F036	183.00	18.300	10			FLAME AA
F037	274.50	27.450	10	H	BIASED HIGH	ICP
F038	142.00	14.200	10			FAES
F042	275.50	27.550	10	H H	BIASED HIGH	-
F043	125.50	12.550	10			FAAS
F046	162.00	16.200	10			Atomic Emission
F048	191.50	19.150	10	L EH		I.C.
F059	278.00	27.800	10	VH VH	BIASED HIGH	FAE
F060	9.00	1.286	7	VLELELELELELELELELEL	BIASED LOW	Flame Photometer
F061	181.00	18.100	10			AAS
F062	163.00	16.300	10			ICP/Flame

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F060	9.00	1.286	7	VLELELELELELELELELEL	BIASED LOW	Flame Photometer
F011	35.50	3.550	10	LELVLELL	BIASED LOW	Flame AA
F016	36.00	3.600	10	L	BIASED LOW	AAS
F001	53.00	5.300	10		BIASED LOW	Auto Flame
F014	70.00	7.000	10		BIASED LOW	-
F025	81.50	8.150	10			Flume Photometer
F030	85.00	8.500	10			Naquadat 19002
F003	97.50	9.750	10			FLAME-PHOTOMETRIC
F043	125.50	12.550	10			FAAS
F023	135.50	13.550	10			-
F006	139.50	13.950	10			AAS
F038	142.00	14.200	10			FAES
F010	151.00	15.100	10			ICAP
F031	152.00	15.200	10			Flame AAS, Direct
F046	162.00	16.200	10			Atomic Emission
F062	163.00	16.300	10			ICP/Flame
F032	164.00	16.400	10			AAS
F034	175.50	17.550	10	EH		A.A.
F008	179.50	17.950	10			AAS
F061	181.00	18.100	10			AAS
F036	183.00	18.300	10			FLAME AA
F002	191.00	19.100	10			Flame Ph
F048	191.50	19.150	10	LEH		I.C.
F035	193.00	19.300	10			ICP
F013	195.00	19.500	10			ICP
F007	230.00	23.000	10			AAS
F033	256.00	25.600	10	HH	BIASED HIGH	ICP
F020	261.50	26.150	10		BIASED HIGH	19103
F037	274.50	27.450	10	H	BIASED HIGH	ICP
F042	275.50	27.550	10	HH	BIASED HIGH	-
F059	278.00	27.800	10	VHVH	BIASED HIGH	FAE

OVERALL AVERAGE RANK IS 15.853

Potassium

PARAMETER: 20091 Calcium MG/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - MI & Nuts

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .2000 CONCENTRATION ERROR INCREMENT= .0800

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	3.0	2.50	13.9	8.50	27.0	16.50	13.7	12.50	15.4	11.00	45.4	12.00
F002	3.1	5.50	13.9	8.50	26.7	13.00	13.60	9.00	15.3	10.00	46.0	16.50
F003	3.38	16.50	14.2	11.50	26.6	11.00	13.7	12.50	15.5	13.00	45.8	14.00
F006	4. VH	30.00	13. L	3.50	26.	7.50	13.	4.00	16.	23.00	46.	16.50
F007	3.64	27.00	14.6	22.50	27.6	23.50	14.2	22.50	16.0	23.00	47.5	24.50
F008	3.37	14.50	14.7	25.00	27.3	19.00	14.2	22.50	16.0	23.00	46.9	21.50
F009	3.3	10.00	14.5	20.50	27.	16.50	14.4	25.50	15.8	16.00	46.	16.50
F010	3.10	5.50	13.80	7.00	26.63	12.00	13.58	8.00	15.18	8.00	44.27	7.00
F011	3.3	10.00	12.8 L	2.00	24.0 L	2.00	12.5 L	2.00	14.3 L	2.00	43.1	2.50
F013	3.63	26.00	15.35	30.00	28.83	29.00	14.69	27.00	16.66	27.00	49.40	26.00
F014	3.23	7.00	14.4	17.00	27.6	23.50	14.1	21.00	15.9	20.00	47.5	24.50
F016	3.91 H	29.00	14.6	22.50	26.4	10.00	14.0	18.50	15.0	5.00	46.0	16.50
F020	3.41	19.00	14.4	17.00	28.5	27.00	14.0	18.50	15.9	20.00	51.0 H	30.50
F023	1.98 EL	1.00	9.91 EL	1.00	18.5 EL	1.00	9.20 EL	1.00	10.5 EL	1.00	40.4 L	1.00
F025	3.00	2.50	13.0 L	3.50	26.1	9.00	12.8	3.00	14.6	3.00	45.1	9.00
F030	3.50	23.00	14.1	10.00	26.0	7.50	13.7	12.50	15.5	13.00	47.2	23.00
F031	3.53	24.50	14.3	14.00	25.6	5.00	13.4	7.00	15.2	9.00	46.9	21.50
F032	3.37	14.50	14.4	17.00	27.5	21.50	13.7	12.50	15.5	13.00	43.1	2.50
F033	3.46	20.00	15.16	29.00	28.6	28.00	14.81	28.00	16.70	28.00	50.22 H	28.00
F034	4.1 VH	31.00	14.7	25.00	25.3	4.00	14.4	25.50	15.1	6.00	43.9	6.00
F035	3.3	10.00	14.2	11.50	26.8	14.50	13.9	15.50	15.8	16.00	45.5	13.00
F036	3.285	8.00	14.28	13.00	27.19	18.00	13.90	15.50	15.84	18.00	45.18	10.00
F037	3.36	13.00	14.40	17.00	25.73	6.00	13.22	5.00	15.13	7.00	43.16	4.00
F038	3.53	24.50	14.8	27.00	27.4	20.00	14.0	18.50	16.4	26.00	46.5	20.00
F042	3.47	21.00	14.4	17.00	27.5	21.50	15.9 VH	30.00	17.4 H	30.00	45.2	11.00
F046	3.38	16.50	14.5	20.50	27.7	25.00	14.3	24.00	15.8	16.00	46.4	19.00
F048	3.31	12.00	13.3	5.00	26.8	14.50	13.61	10.00	16.39	25.00	44.4	8.00
F059	3.9 H	28.00	16. H	31.00	30. H	31.00	16. VH	31.00	18. VH	31.00	51. H	30.50
F060	3.4	18.00	14.7	25.00	29.6 H	30.00	15.0	29.00	16.8	29.00	50.0 H	27.00
F061	3.09	4.00	13.7	6.00	25.1	3.00	13.3	6.00	14.9	4.00	43.4	5.00
F062	3.48	22.00	14.90	28.00	28.00	26.00	14.00	18.50	15.90	20.00	50.30 H	29.00
MEDIAN CONC.	3.3800		14.4000		27.0000		13.9000		15.8000		46.0000	

PARAMETER: 20091 Calcium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	17.4	8.00	67.6	12.50	22.6	10.50	93.1	11.00
F002	17.6	10.00	66.0	8.50	22.6	10.50	92.5	8.50
F003	17.2	6.00	67.3	10.00	22.7	13.00	94.8	15.00
F006	18.	16.00	66.	8.50	23.	15.50	95.	16.50
F007	18.4	25.00	70.7	23.00	22.4	8.00	94.5	14.00
F008	18.1	19.50	68.5	16.50	23.2	20.00	94.4	13.00
F009	18.2	23.00	70.	21.00	23.	15.50	95.	16.50
F010	17.66	12.00	64.7	6.00	22.70	13.00	91.	6.00
F011	16.0 L	2.00	88.7 EH	31.00	20.6 L	3.00	88.8	3.00
F013	18.57	26.00	72.37	25.00	24.48	29.00	99.61	27.00
F014	18.2	23.00	69.9	20.00	23.6	23.00	98.2	24.00
F016	18.2	23.00	68.2	15.00	23.1	18.50	88.	2.00
F020	18.0	16.00	75.8 H	29.00	23.8	24.00	103. H	30.00
F023	11.9 EL	1.00	59.4 VL	1.00	15.7 EL	2.00	93.0	10.00
F025	16.6	3.00	64.0	5.00	22.4	8.00	90.5	5.00
F030	17.6	10.00	64.8	7.00	22.4	8.00	96.1	19.00
F031	16.8	4.00	67.4	11.00	21.9	6.00	92.2	7.00
F032	17.7	13.00	63.0	2.00	23.1	18.50	97.3	23.00
F033	18.97	29.00	74.21 H	28.00	24.08	26.00	102.3	29.00
F034	18.9	28.00	73.1	27.00	24.2	27.00	99.2	26.00
F035	17.6	10.00	68.5	16.50	22.7	13.00	94.1	12.00
F036	17.93	14.00	68.18	14.00	23.02	17.00	95.22	18.00
F037	16.88	5.00	63.40	3.00	23.83	25.00	83.76 L	1.00
F038	18.1	19.50	69.1	18.00	23.5	22.00	96.8	20.50
F042	22.2 EH	31.00	70.2	22.00	24.6	30.00	99.0	25.00
F046	18.1	19.50	69.3	19.00	23.4	21.00	96.8	20.50
F048	18.0	16.00	67.6	12.50	21.6	4.00	92.5	8.50
F059	20. H	30.00	72.	24.00	25. H	31.00	97.	22.00
F060	18.8	27.00	72.4	26.00	24.4	28.00	100.	28.00
F061	17.3	7.00	63.7	4.00	21.8	5.00	90.1	4.00
F062	18.10	19.50	78.00 VH	30.00	2.35 EL	1.00	104.00 H	31.00
MEDIAN CONC.	18.0000		68.5000		23.0000		95.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F001	105.00	10.500	10			Auto Flame
F002	100.00	10.000	10			AAS
F003	122.50	12.250	10			FLAME A.A.
F006	141.00	14.100	10	VHL		Titrn
F007	213.00	21.300	10			ICAP
F008	194.50	19.450	10			ICAP / AAS
F009	181.00	18.100	10			ICP
F010	84.50	8.450	10			ICAP
F011	59.50	5.950	10	L L L L L EHL	BIASED LOW	Flame AA
F013	272.00	27.200	10		BIASED HIGH	ICP
F014	203.00	20.300	10			-
F016	160.00	16.000	10	H		AAS
F020	231.00	23.100	10	H H H		20103 - ICP
F023	20.00	2.000	10	ELELELELELL ELVLEL	BIASED LOW	-
F025	51.00	5.100	10	L	BIASED LOW	Atomic Absorption
F030	133.00	13.300	10			Naquadat 20005
F031	109.00	10.900	10			Flame AAS, Direct
F032	137.50	13.750	10			AAS
F033	273.00	27.300	10	H H	BIASED HIGH	ICP
F034	205.50	20.550	10	VH		A.A.
F035	132.00	13.200	10			ICP
F036	145.50	14.550	10			FLAME AA
F037	86.00	8.600	10	L		ICP
F038	216.00	21.600	10			ICP
F042	238.50	23.850	10	VHH EH		-
F046	201.00	20.100	10			ICP
F048	115.50	11.550	10			I.C.
F059	289.50	28.950	10	H H H VHVHH H H	BIASED HIGH	ICP
F060	267.00	26.700	10	H H	BIASED HIGH	ICP - Direct
F061	48.00	4.800	10		BIASED LOW	AAS
F062	225.00	22.500	10	H VHELH		ICP

OVERALL AVERAGE RANK IS 16.000

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
F023	20.00	2.000	10	ELELELELELLELVLEL	BIASED LOW	-
F061	48.00	4.800	10		BIASED LOW	AAS
F025	51.00	5.100	10	L	BIASED LOW	Atomic Absorption
F011	59.50	5.950	10	LLLLLEHL	BIASED LOW	Flame AA
F010	84.50	8.450	10			ICAP
F037	86.00	8.600	10	L		ICP
F002	100.00	10.000	10			AAS
F001	105.00	10.500	10			Auto Flame
F031	109.00	10.900	10			Flame AAS, Direct
F048	115.50	11.550	10			I.C.
F003	122.50	12.250	10			FLAME A.A.
F035	132.00	13.200	10			ICP
F030	133.00	13.300	10			Naquadat 20005
F032	137.50	13.750	10			AAS
F006	141.00	14.100	10	VHL		Titrn
F036	145.50	14.550	10			FLAME AA
F016	160.00	16.000	10	H		AAS
F009	181.00	18.100	10			ICP
F008	194.50	19.450	10			ICAP / AAS
F046	201.00	20.100	10			ICP
F014	203.00	20.300	10			-
F034	205.50	20.550	10	VH		A.A.
F007	213.00	21.300	10			ICAP
F038	216.00	21.600	10			ICP
F062	225.00	22.500	10	HVHELH		ICP
F020	231.00	23.100	10	HHH		20103 - ICP
F042	238.50	23.850	10	VHHEH		-
F060	267.00	26.700	10	HH	BIASED HIGH	ICP - Direct
F013	272.00	27.200	10		BIASED HIGH	ICP
F033	273.00	27.300	10	HH	BIASED HIGH	ICP
F059	289.50	28.950	10	HHHVHVHHHH	BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 16.000

Calcium

PARAMETER: 15092 Total Phosphorus MG P/L

RESEARCH AND APPLICATIONS BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

FP/GLAP INTERLAB STUDY 63 - TP Portion

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0040 BASIC ACCEPTABLE ERROR= .0040 CONCENTRATION ERROR INCREMENT= .1000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.006	8.00	.014	10.00	.073	10.50	.049	17.00	.096	18.00	.068	16.50
F002	.005	5.50	.011	6.00	.080	21.50	.041	6.00	.100	22.00	.065	12.00
F003	.007	10.50	.018	19.50	.0762	17.00	.0488	14.00	.0874	10.00	.0686	18.00
F004	.008	14.00	.017	18.00	.076	15.50	.049	17.00	.099	21.00	.072	23.00
F006	<.02	0.00	<.02	0.00	.06 L	5.50	.02 EL	1.50	.08	5.00	.05 L	3.00
F007	.006	8.00	.015	13.50	.076	15.50	.049	17.00	.081	6.00	.070	20.00
F008	.008	14.00	.018	19.50	.081	23.00	.052	22.00	.101	23.00	.073	24.00
F010	<.010	0.00	.015	13.50	.075	13.00	.045	11.50	.090	13.00	.065	12.00
F011	.005	5.50	.015	13.50	.075	13.00	.049	17.00	.098	19.50	.070	20.00
F013	.009	17.50	.012	7.50	.084	24.00	.046	13.00	.098	19.50	.065	12.00
F014	.008	14.00	.014	10.00	.073	10.50	.049	17.00	.095	16.50	.068	16.50
F015	.006	8.00	.016	16.50	.079	19.50	.051	21.00	.102	24.00	.071	22.00
F016	.05 EH	22.00	.05 EH	24.00	.067	9.00	.045	11.50	.088	12.00	.063	10.00
F020	.009	17.50	.014	10.00	.053 VL	4.00	.040	5.00	.087	9.00	.055	4.00
F030	.03 EH	20.00	.03 EH	22.00	.08	21.50	.08 EH	25.00	.07 VL	4.00	.07	20.00
F032		0.00	.012	7.50	.004T EL	1.00	.044	9.00	.026 EL	2.00	.024 EL	1.00
F033	.004T	3.50	.010	3.50	.061 L	7.00	.038	4.00	.085	7.00	.059	7.00
F034	.008	14.00	.016	16.50	.044 EL	3.00	.044	9.00	.094	15.00	.066	14.00
F035	.004	3.50	.008 L	1.00	.06 L	5.50	.035 L	3.00	.091	14.00	.058	6.00
F036	.0032	2.00	.0102	5.00	.0635 L	8.00	.0420	7.00	.0875	11.00	.0602	8.00
F038	.003 L	1.00	.009 L	2.00	.078	18.00	.044	9.00	.004 EL	1.00	.061	9.00
F042	.008	14.00	.021 H	21.00	.075	13.00	.057 H	23.00	.095	16.50	.067	15.00
F046	.032 EH	21.00	.033 EH	23.00	.11 EH	25.00	.068 EH	24.00	.12 EH	25.00	.097 EH	25.00
F058	.007	10.50	.015	13.50	.079	19.50	.050	20.00	.086	8.00	.057	5.00
F062	.02 EH	19.00	.01	3.50	.03 EL	2.00	.02 EL	1.50	.04 EL	3.00	.04 EL	2.00
MEDIAN CONC.	.0075		.0150		.0750		.0460		.0900		.0650	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
F001	.120	12.00	.194	8.00	.138	16.00	.262	16.00
F002	.14 H	21.50	.23 H	23.50	.15	23.50	.31 VH	22.50
F003	.1202	14.00	.2088	16.00	.1368	13.00	.2478	9.00
F004	.125	18.00	.210	18.50	.146	21.50	.265	17.00
F006	.15 VH	23.50	.21	18.50	.09 EL	4.00	.22 L	2.50
F007	.121	15.00	.215	21.00	.137	14.00	.379 EH	24.00
F008	.128	19.00	.207	15.00	.143	19.00	.256	12.00
F010	.115	8.50	.190	5.50	.130	9.50	.245	7.00
F011	.122	16.00	.202	12.00	.138	16.00	.250	10.50
F013	.124	17.00	.200	10.00	.140	18.00	.273	19.00
F014	.12	12.00	.20	10.00	.13	9.50	.26	14.00
F015	.13	20.00	.209	17.00	.145	20.00	.279	20.00
F016	.11	4.50	.23 H	23.50	.12	5.00	.26	14.00
F020	.084 EL	3.00	.181	3.00	.053 EL	2.00	.222 L	4.00
F030	.14 H	21.50	.22	22.00	.15	23.50	.28	21.00
F032	.016 EL	1.00		0.00	.008T EL	1.00		0.00
F033	.115	8.50	.192	7.00	.128	7.50	.220 L	2.50
F034	.114	6.50	.20	10.00	.146	21.50	.26	14.00
F035	.114	6.50	.205	14.00	.128	7.50	.272	18.00
F036	.1190	10.00	.2025	13.00	.1350	12.00	.2450	7.00
F038	.199 EH	25.00	.124 EL	2.00	.131	11.00	.245	7.00
F042	.120	12.00	.212	20.00	.138	16.00	.250	10.50
F046	.15 VH	23.50	.19	5.50	.18 EH	25.00	.31 VH	22.50
F058	.110	4.50	.182	4.00	.126	6.00	.230	5.00
F062	.06 EL	2.00	.09 EL	1.00	.07 EL	3.00	.13 EL	1.00
MEDIAN CONC.	.1200		.2022		.1368		.2580	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
0001	132.00	13.200	10			Dig. Auto
0002	164.00	16.400	10	H H VH		Colour
0003	141.00	14.100	10			AA
0004	183.50	18.350	10			15423
0006	63.50	7.938	8	L EL L VH ELL		Block, AA
0007	154.00	15.400	10	EH		AA
0008	190.50	19.050	10			Auto, MTB
0010	93.50	10.389	9			UV Dig. Col
0011	143.00	14.300	10			Tech. AA
0013	157.50	15.750	10			AA Ascorb
0014	130.00	13.000	10			
0015	188.00	18.800	10			AUTO PERS. MOLYB.
0016	135.50	13.550	10	EHEH H		AA
0020	61.50	6.150	10	VL EL ELL		15301
0030	200.50	20.050	10	EHEH EHVL H	BIASED HIGH	Naquadat 15420
0032	22.50	3.214	7	EL ELELEL EL	BIASED LOW	Colour
0033	57.50	5.750	10	L L	BIASED LOW	COLORIMETRIC
0034	123.50	12.350	10	EL		
0035	79.00	7.900	10	L L L		Colour
0036	83.00	8.300	10	L		B.D.-AUTOANALYZER
0038	85.00	8.500	10	L L EL EHEL		Colour
0042	161.00	16.100	10	H H		
0046	219.50	21.950	10	EHEHEHEHEHEHVH EHVH	BIASED HIGH	Tech. AA
0058	96.00	9.600	10			Colorimetric
0062	38.00	3.800	10	EH ELELELELELELELEL	BIASED LOW	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
0032	22.50	3.214	7	ELELELELEL	BIASED LOW	Colour
0062	38.00	3.800	10	EHELELELELELELELEL	BIASED LOW	
0033	57.50	5.750	10	LL	BIASED LOW	COLORIMETRIC
0020	61.50	6.150	10	VLELELL		15301
0035	79.00	7.900	10	LLL		Colour
0006	63.50	7.938	8	LELLVHELL		Block, AA
0036	83.00	8.300	10	L		B.D.-AUTOANALYZER
0038	85.00	8.500	10	LLELEHEL		Colour
0058	96.00	9.600	10			Colorimetric
0010	93.50	10.389	9			UV Dig. Col
0034	123.50	12.350	10	EL		
0014	130.00	13.000	10			
0001	132.00	13.200	10			Dig. Auto
0016	135.50	13.550	10	EHEHH		AA
0003	141.00	14.100	10			AA
0011	143.00	14.300	10			Tech. AA
0007	154.00	15.400	10	EH		AA
0013	157.50	15.750	10			AA Ascorb
0042	161.00	16.100	10	HH		
0002	164.00	16.400	10	HHVH		Colour
0004	183.50	18.350	10			15423
0015	188.00	18.800	10			AUTO PERS. MOLYB.
0008	190.50	19.050	10			Auto, MTB
0030	200.50	20.050	10	EHEHEHVLH	BIASED HIGH	Naquadat 15420
0046	219.50	21.950	10	EHEHEHEHEHEHVHEHVH	BIASED HIGH	Tech. AA

OVERALL AVERAGE RANK IS 12.717

Total Phosphorus

R7559

ENVIRONMENT CANADA LIBRARY, BURLINGTON
3 9055 1016 6338 2

NATIONAL WATER RESEARCH INSTITUTE
P.O. BOX 5050, BURLINGTON, ONTARIO L7R 4A6

Environment Canada Environnement Canada

Canada

INSTITUT NATIONAL DE RECHERCHE SUR LES EAUX
C.P. 5050, BURLINGTON (ONTARIO) L7R 4A6

Think Recycling!

Pensez à recycler !