



REF: 812/02/02/1/677

DATE: 30 November 2006

ATTENTION: LAB MANAGER

SUBJECT: 147<sup>th</sup> INTER-LABORATORY PROFICIENCY TESTING PROGRAM

We are pleased to present the results of the 147<sup>th</sup> Inter-laboratory Proficiency Testing Program involving the determination of Water Analysis Using ULTRAcHECK™ Quality Check Samples. As in previous programs, we have assigned code numbers to participating laboratories in order to protect their identities. For this particular program please contact Dr. Yaser (Tel. No. 3027074) or Mrs. Raniah (Tel. No. 3027069) to inform you which code number has been assigned to you.

You are also requested to pay to Dubai Accreditation Centre (DAC), an amount of (Dhs 418) in return for your participation in the Inter-laboratory Proficiency Testing Program (please note that the governmental laboratories are exempted from participation fees). We would like to draw your attention that payment can be made through DCLD counter- ground floor by credit card. Should you intend to pay by cheque please address the cheque to Dubai Municipality. After payment, please submit a copy of the invoice to the Accreditation Center (Mrs. Raniah El Dili in the administration building on the second floor office no. 310).

You are kindly requested to pay the amount within one month from the date in which the result is posted on our website.

We thank you for your participation and we would welcome any comments or suggestions on this and on future programs. Please do not hesitate to contact us if you need any clarification on the report.

*Kind Regards*

Eng. Lina Qudah

Head of Accreditation Decisions Section

رؤيتنا: بناء مدينة متميزة تتوفر فيها رفاهية العيش ومقومات النجاح

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### **Report on 147<sup>th</sup> Laboratory Proficiency Testing Water Analysis Using Ultracheck™ Quality Check Samples**

**30 November 2006**

#### **1. INTRODUCTION**

This document presents the results of the 147<sup>th</sup> inter-laboratory proficiency-testing program conducted during the month of November involving the analysis of quality check samples for wastewater analysis with eight (8) DM-accredited laboratories participating.

This program is part of the Interlaboratory Comparison Programs organized by the Accreditation Center of DM for monitoring the validity of test results of laboratories operating in Dubai as a requirement of the Local Order 52/1990 and ISO/IEC 17011: 2004.

#### **2. EXPERIMENTAL DESIGN**

##### **2.1 Participants:**

Eight private laboratories (accredited by DM for environmental wastewater analysis) participated in this program.

##### **2.2 Samples tested:**

The following samples were distributed

###### **2.2.1 ULTRAcHeck™ Demand Quality Check Sample**

Catalog No. QCI-735

This consist of ampules with instructions for dilution and preparation

Tests to be carried out: Biochemical oxygen demand (BOD) as per APHA-5210B and Chemical oxygen demand as per APHA-5220 B / APHA-5220 C / APHA-5220 D

###### **2.2.2 ULTRAcHeck™ Trace Metals Quality Check Sample**

Catalog No. QCI-700A

This consist of ampules with instructions for dilution and preparation

Tests to be carried out: Trace metals, Cu, Cd, Pb, Ni, Zn, Cr, Co, Fe, Mn, Ag as per APHA-3030 (3111/3113/3120)

###### **2.2.3 ULTRAcHeck™ Solids Quality Check Sample**

Catalog No. QCI-711

This consist of ready-to-use water samples

Tests to be carried out: Total dissolved solids (TDS) as per APHA-2540C and Total suspended solids (TSS) as per APHA-2540D



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### 2.2.4 ULTRAcHECK™ Oil & Grease Quality Check Sample

Catalog No. QCI-770

This consist of ampules with instructions for dilution and preparation

Tests to be carried out: Oil & grease as per APHA-5520 B / APHA-5520 C / APHA-5520 D

### 2.3 Sample preparation:

As per the enclosed ULTRAcHECK™ instructions.

## 3. CONFIDENTIALITY

Each laboratory is given a code number to maintain confidentiality of results and to protect their identities. Only the concerned laboratory knows its code number.

## 4. TEST METHOD

Instructions were given to the participants to test the samples for APHA-AWWA-WEF 20<sup>th</sup> Ed. 1998.

## 5. TEST RESULTS

- 5.1 Upon receipt of the test results from the participating laboratories, the sealed envelopes containing the Certificate of Analysis of the samples distributed were opened. The certified “Reference value” and “Advisory Range” as given in the Certificates are shown in the first half of Table (1). Copies of the Certificates of Analysis are given in the Appendices.
- 5.2 The test results submitted by the participating laboratories are given in the second half of Table (1). In order to protect the identities of the participating laboratories, each one was assigned a code number.
- 5.3 Table (1) also indicates whether the participating laboratory’s results are within (Pass) or outside (Fail) the “Advisory Range”.



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### 6. EVALUATION OF RESULTS

#### 6.1 Outliers Results

Test Parameter	Labs with Outlier Results
TSS	Lab 4
Oil & Grease	Lab 2 & Lab 4
COD	Lab 1; Lab 6 & Lab 7
Trace Metal Chromium (Cr)	Lab 8
Trace Metal Iron (Fe)	Lab 8
Trace Metal Lead (Pb)	Lab 1
Trace Metal Silver (Ag)	Lab 2; Lab 3; Lab 4; Lab 7 & Lab 8

### 7. CONCLUSION AND RECOMMENDATIONS

The test results provided by the above mentioned laboratories are outside the advisory limits. The above mentioned laboratories are requested to investigate the root cause of the outlier results, implement corrective action and email a report within 2 weeks to Accreditation Decisions Section of the Dubai Accreditation Center to the following address: [lmqudah@dm.gov.ae](mailto:lmqudah@dm.gov.ae).

### 8. APPENDICES

- 8.1. Appendix D: Table (1) Summary of results
- 8.2. Appendix E: ULTRA Scientific Certificate of Analysis for QCI-700A Code No. 75990
- 8.3. Appendix F: ULTRA Scientific Certificate of Analysis for QCI-711 Code No. 72853
- 8.4. Appendix G: ULTRA Scientific Certificate of Analysis for QCI-735 Code No. 78038
- 8.5. Appendix H: ULTRA Scientific Certificate of Analysis for QCI-770 Code No. 79618

Appendix D : Table (1) Summary of Results

S. No.	Test	ULTRA Check Samples		Participant's Result							
		Reference Value	Advisory Range	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8
1	TDS	1170 ± 9 mg/L	1000 - 1340	1128	1158	1014	1124	1199	1166	1171	1201
2	TSS	159 ± 12 mg/L	142 - 167	148	155	164	141	148	165	153	146
3	Oil& Grease	80.1 ± 0.1mg/L	61.3 - 82.3	80	60	62.5	50	75	80.1	73.5	66
4	BOD	120 ± 1 mg/L	51 - 132	68	90	64	77	68	68	79	52
5	COD	123 ± 1 mg/L	101 - 135	98	122	104	120	120	146	139	131
6	Metal-Cd	200 ± 2 µg/L	0.180-0.220 mg	0.209	0.20	0.207	0.22	0.21	0.2008	0.199	0.20
7	Metal-Cr	900 ± 9 µg/L	0.810-0.990 mg	0.850	0.87	0.946	0.95	0.91	0.9039	0.973	1.0
8	Metal-Co	500 ± 5 µg/L	0.450-0.550 mg	0.493	0.50	0.544	0.53	0.51	0.5072	0.492	0.51
9	Metal-Cu	800 ± 8 µg/L	0.720-0.880 mg	0.805	0.80	0.856	0.82	0.82	0.7999	0.770	0.77
10	Metal-Fe	900 ± 9 µg/L	0.810-0.990 mg	0.950	0.90	0.988	0.91	0.88	0.8960	0.864	1.03
11	Metal-Pb	200 ± 2 µg/L	0.180-0.220 mg	LT 0.5	0.21	0.213	0.21	0.20	0.2046	0.197	0.20
12	Metal-Mn	200 ± 2 µg/L	0.180-0.220 mg	0.203	0.20	0.213	0.21	0.22	0.2019	0.191	0.20
13	Metal-Ni	500 ± 5µg/L	0.450-0.550 mg	0.495	0.52	0.542	0.52	0.51	0.5010	0.503	0.45
14	Metal-Ag	100 ± 1 µg/L	0.090-0.110 mg	0.105	0.16	0.114	0.16	0.11	0.0975	0.138	0.12
15	Metal-Zn	700 ± 7 µg/L	0.630-0.771 mg	0.685	0.71	0.686	0.74	0.72	0.6990	0.663	0.72

Number of parameters determined correctly out of 15	13	13	14	12	15	14	13	12
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# Certificate of Analysis

Trace Metals Sample

Catalog Number: QCI-700A

Code Number: 75990

This ULTRAcheck™ sample was gravimetrically prepared, and the analyte concentrations were confirmed using the analytical technique listed. Concentrations are traceable to the NIST standard reference materials (SRMs) listed. The true values represent the gravimetrically determined values when the sample has been prepared according to instructions. Uncertainties are calculated as two times the manufacturing precision of the concentrates.

Analyte	Assigned Value	Analytical Method	NIST SRM	Advisory Range*
aluminum	600 ± 6 µg/L	ICP	3101a	513 - 685
antimony	100 ± 1 µg/L	ICP	3102a	70 - 114
arsenic	100 ± 1 µg/L	ICP	3103a	86 - 113
barium	200 ± 2 µg/L	ICP	3104a	180 - 220
beryllium	50.0 ± 0.5 µg/L	ICP	3105a	43.8 - 55.0
boron	600 ± 6 µg/L	ICP	3107	538 - 668
cadmium	200 ± 2 µg/L	ICP	3108	180 - 220
chromium	900 ± 9 µg/L	ICP	3112a	810 - 990
cobalt	500 ± 5 µg/L	ICP	3113	450 - 550
copper	800 ± 8 µg/L	ICP	3114	720 - 880
iron	900 ± 9 µg/L	ICP	3126a	810 - 990
lead	200 ± 2 µg/L	ICP	3128	180 - 220
manganese	200 ± 2 µg/L	ICP	3132	180 - 220
molybdenum	700 ± 7 µg/L	ICP	3134	630 - 770
nickel	500 ± 5 µg/L	ICP	3136	450 - 550
selenium	100 ± 1 µg/L	ICP	3149	83 - 110
silver	100 ± 1 µg/L	ICP	3151	90 - 110
strontium	600 ± 6 µg/L	ICP	3153a	540 - 660
thallium	100 ± 1 µg/L	ICP	3158	70 - 124
vanadium	200 ± 2 µg/L	ICP	3165	180 - 220
zinc	700 ± 7 µg/L	ICP	3168a	630 - 771

\* Calculated from the NELAC Non-Potable Water Fields of Testing Document, effective 6/1/05.

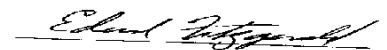


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Dr. Edward Fitzgerald,  
Senior Scientist

# Certificate of Analysis

**Solids Sample**

**Catalog Number: QCI-711**

**Code Number: 72853**

This ULTRACheck™ sample was gravimetrically prepared, and the analyte concentrations were confirmed using the analytical technique listed. Concentrations are traceable to the NIST standard reference materials (SRMs) listed. Reference values are determined experimentally when the sample has been prepared according to instructions.

Test	Reference Value	Analytical Method	NIST Traceability	Advisory Range*
filterable residue (TDS)	1170 ± 9 mg/L	EPA Method 160.1	gravimetric	1000 - 1340
non-filterable residue (TSS)	159 ± 12 mg/L	EPA Method 160.2	gravimetric	142 - 167
total residue (TS)	1350 ± 19 mg/L	EPA Method 160.3	gravimetric	1290 - 1380

\* Calculated from "National Standards for Water Proficiency Testing Studies Criteria Document," US EPA, December, 1998, at the 95% confidence level.

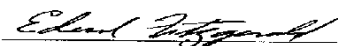


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Senior Scientist

# Certificate of Analysis

**WP & DMR-QA Demands Sample**

**Catalog Number: QCI-735**

**Code Number: 78038**

This ULTRACheck(TM) sample was gravimetrically prepared, and the analyte concentrations were confirmed using the analytical technique listed. Concentrations are traceable to the NIST standard reference materials (SRMs) listed. The reference value represents the determined value when the sample has been prepared according to instructions.

Analyte	Assigned Value	Analytical Method	NIST SRM	Advisory Range *
TOC	48.5 ± 0.5 mg/L	EPA Method 415.1	N/A	43.0 - 53.3
COD	123 ± 1 mg/L	EPA Method 410.4	N/A	101 - 135
BOD	120 ± 1 mg/L	EPA Method 405.1	N/A	51 - 132
CBOD	120 ± 1 mg/L	EPA Method 405.1	N/A	41 - 132

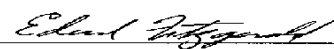
Note, the assigned values for BOD and CBOD represent the actual concentration of glucose and glutamic acid present in the sample after preparation. The advisory range represents the range of acceptable values for these parameters based upon the initial concentration of glucose and glutamic acid..

\* Calculated from "National Standards for Water Proficiency Testing Studies Criteria Document," US EPA, December, 1998, at the 95% confidence level.



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# Certificate of Analysis

**Oil and Grease Sample**

**Catalog Number: QCI-770**

**Code Number: 79618**

This ULTRACheck(TM) sample was gravimetrically prepared, and the analyte concentrations were confirmed using the analytical technique listed. Concentrations are traceable to the NIST standard reference materials (SRMs) listed. The reference value represents the determined value when the sample has been prepared according to instructions.

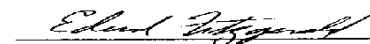
Test	Reference Value	Analytical Method	NIST Traceability	Advisory Range*
Total Grease and Oil	80.1 ± 0.1 mg/L	EPA Method 1664	gravimetric	61.3 - 82.3

\* Calculated from "National Standards for Water Proficiency Testing Studies Criteria Document," US EPA, December 1998, at the 95% confidence level.



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