

Microbac

KNOXVILLE DIVISION
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STATE CERT ID.
 TN 02017

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS
 WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

CERTIFICATE OF ANALYSIS
PRELIMINARY REPORT

CITY OF KINGSTON
 CHUCK MOORE
 125 W. CUMBERLAND ST.
 KINGSTON, TN 37763

Date Reported
 Date Received 3/17/2009
 Cust P.O.
 Invoice No.
 Cust # C120
 Sample Date 3/17/2009
 Permit No.

Work Order Number: 0903-00653

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
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001 **RAW 3/17/09 0630**

[TAL METALS]

					00:00	JKD
ALUMINUM	EPA 200.7	0.127 MG/L		03/23/2009	03:13	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/23/2009	16:14	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/23/2009	16:14	MCD
BARIUM	EPA 200.7	0.0247 MG/L		03/23/2009	03:13	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
COBALT	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
COPPER	EPA 200.7	0.0035 MG/L		03/23/2009	03:13	JKD
IRON	EPA 200.7	0.151 MG/L		03/23/2009	03:13	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/23/2009	16:14	MCD
MAGNESIUM	EPA 200.7	6.17 MG/L	J+	03/28/2009	12:45	JKD
MANGANESE	EPA 200.7	0.0312 MG/L		03/23/2009	03:13	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/30/2009	12:03	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/23/2009	16:14	MCD
SILVER	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
TITANIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:13	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/23/2009	16:14	MCD
ZINC	EPA 200.7	0.0240 MG/L		03/23/2009	03:13	JKD
BORON	EPA 200.7	0.0138 MG/L		03/23/2009	03:13	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540.D.	5.33 MG/L		03/18/2009	13:00	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340.B.	88.6 MG/L	J+	03/28/2009	12:45	JKD

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002 **RAW 3/17/09 0630 DISSOLVED METALS**

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0160 MG/L		03/23/2009	03:19	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/23/2009	16:18	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/23/2009	16:18	MCD
BARIUM	EPA 200.7	0.0240 MG/L		03/23/2009	03:19	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
COBALT	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
COPPER	EPA 200.7	0.0051 MG/L		03/23/2009	03:19	JKD
IRON	EPA 200.7	0.0126 MG/L		03/23/2009	03:19	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/23/2009	16:18	MCD
MAGNESIUM	EPA 200.7	6.10 MG/L	J+	03/28/2009	12:52	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L		03/23/2009	03:19	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/27/2009	14:26	LL
NICKEL	EPA 200.7	0.0016 MG/L		03/23/2009	03:19	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/23/2009	16:18	MCD
SILVER	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/23/2009	03:19	JKD
TITANIUM	EPA 200.7	0.00068 MG/L		03/23/2009	03:19	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/23/2009	16:18	MCD
ZINC	EPA 200.7	0.0423 MG/L		03/23/2009	03:19	JKD
BORON	EPA 200.7	0.0227 MG/L		03/23/2009	03:19	JKD
SILICA (SiO2)	EPA 200.7	3.46 MG/L		03/20/2009	13:49	JKD

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003 **FINISHED 3/17/09 0630**

[TAL METALS]

ALUMINUM	EPA 200.7	0.0309 MG/L		03/23/2009	03:26	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/24/2009	14:43	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/24/2009	14:43	MCD
BARIUM	EPA 200.7	0.0224 MG/L		03/23/2009	03:26	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
COBALT	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
COPPER	EPA 200.7	0.0049 MG/L		03/23/2009	03:26	JKD
IRON	EPA 200.7	<0.0030 MG/L		03/23/2009	03:26	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/24/2009	14:43	MCD
MAGNESIUM	EPA 200.7	5.89 MG/L	J+	03/28/2009	13:11	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L		03/23/2009	03:26	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/27/2009	14:29	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/24/2009	14:43	MCD
SILVER	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
TITANIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:26	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/24/2009	14:43	MCD
ZINC	EPA 200.7	0.0034 MG/L		03/23/2009	03:26	JKD
BORON	EPA 200.7	0.0132 MG/L		03/23/2009	03:26	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<1.00 MG/L		03/18/2009	13:00	KDW

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003 **FINISHED 3/17/09 0630**

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HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	85.4 MG/L	J+	03/28/2009	13:11	JKD
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004 **FINISHED 3/17/09 0630 DISSOLVED METALS**

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0441 MG/L		03/23/2009	03:32	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/23/2009	16:44	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/23/2009	16:44	MCD
BARIUM	EPA 200.7	0.0237 MG/L		03/23/2009	03:32	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
COBALT	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
COPPER	EPA 200.7	0.0059 MG/L		03/23/2009	03:32	JKD
IRON	EPA 200.7	<0.0030 MG/L		03/23/2009	03:32	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/23/2009	16:44	MCD
MAGNESIUM	EPA 200.7	5.94 MG/L	J+	03/28/2009	13:43	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L		03/23/2009	03:32	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/31/2009	14:17	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/23/2009	16:44	MCD
SILVER	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/23/2009	03:32	JKD
TITANIUM	EPA 200.7	0.00095 MG/L		03/23/2009	03:32	JKD

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004 **FINISHED 3/17/09 0630 DISSOLVED METALS**

.....continued

THALLIUM	EPA 200.8	<0.002 MG/L		03/23/2009	16:44	MCD
ZINC	EPA 200.7	0.0074 MG/L		03/23/2009	03:32	JKD
BORON	EPA 200.7	0.0170 MG/L		03/23/2009	03:32	JKD
SILICA (SiO2)	EPA 200.7	3.94 MG/L		03/20/2009	14:40	JKD

REVISED REPORT TO CONTAIN BACK-UP STATE CERTIFIED DATA FOR SB, AS, PB, SE AND TL. ANALYSIS SUBCONTRACTED TO MICROBAC LABORATORIES CHICAGOLAND DIVISION (TN LAB ID#04017). JN 3-31-9.

RESPECTFULLY SUBMITTED: _____

MICROBAC LABORATORIES, INC.

Thank you for your business. We invite your feedback on our level of service to you. Please contact the Laboratory Director, James Nokes, at 865-977-1200, the COO, Robert Morgan, at rmorgan@microbac.com or the CEO, Trevor Boyce, at tboyce@microbac.com with any comments or suggestions.

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As regulatory limits change frequently, Microbac advises the recipient of this report to confirm such limits with the appropriate Federal, state, or local authorities before acting in reliance on the regulatory limits provided.

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QUALIFIER DEFINITIONS:

- B = Detected in the associated Method Blank
- C = As Tons CaCO₃, equivalent per 1,000 tons material
- D = Surrogate recoveries not calculated due to matrix interference and resulting sample dilution
- E1 = Elevated detection limits due to sample matrix interference
- E2 = Elevated detection limits due to high analyte concentration
- H = Analyte was prepared and/or analyzed outside of the analytical method holding time
- I = Spike recovery outside control limits due to sample matrix interference or high analyte concentration
- J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample
- J+ = The result is an estimated quantity, but the result may be biased high
- J- = The result is an estimated quantity, but the result may be biased low
- UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise
- K = Analyte concentration estimated due to sample matrix interference and/or high analyte concentration interference
- L1 = Liquid portion of dual phase sample analyzed only
- L2 = Solid portion of dual phase sample analyzed only
- M = Miscellaneous (see entry below analytical results)
- N = Analyte acceptable but matrix spike/matrix spike duplicate outside accepted recovery criteria
- * = Matrix Spike/Matrix Spike Duplicate RPD is outside acceptable limits
- P = Sample received improperly preserved
- R = Relative Percent Duplicate (RPD) outside accepted recovery limits
- S1 = Spike recovery outside recovery limits
- S2 = Surrogate recovery outside of control limits. The data was accepted based on the valid recovery of remaining surrogate.
- U = Undetected
- V = Elevated reporting limits due to insufficient sample volume
- W = Results reports on dry weight basis

ABBREVIATIONS:

- TNTC = Too Numerous To Count
- UG/L = Micrograms per Liter (PPB)
- UG/KG = Micrograms per Kilogram (PPB)
- MG/L = Milligrams per Liter (PPM)
- MG/KG = Milligrams per Kilogram (PPM)
- CFU = Colony Forming Unit
- ND = Not Detected at or below the reporting limit
- TIC = Tentatively Identified Compound



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