

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 3/14/2009
 Cust P.O.
 Invoice No.
 Cust # C120
 Sample Date 3/14/2009
 Permit No.

Work Order Number: 0903-00589

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
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001 **RAW 3/14/09 0630**

[TAL METALS]

00:00

ALUMINUM	EPA 200.7	0.124 MG/L	N	03/31/2009	23:07	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/20/2009	11:49	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/20/2009	11:49	MCD
BARIUM	EPA 200.7	0.0256 MG/L	N	03/31/2009	23:07	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:07	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:07	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:07	JKD
COBALT	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:07	JKD
COPPER	EPA 200.7	0.0034 MG/L		03/20/2009	07:16	JKD
IRON	EPA 200.7	0.162 MG/L		03/20/2009	07:16	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/20/2009	11:49	MCD
MAGNESIUM	EPA 200.7	6.11 MG/L		03/20/2009	06:12	JKD
MANGANESE	EPA 200.7	0.0370 MG/L	N	03/31/2009	23:07	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:16	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/30/2009	11:05	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/20/2009	07:16	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/20/2009	11:49	MCD
SILVER	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:07	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/20/2009	07:16	JKD
TITANIUM	EPA 200.7	0.0025 MG/L		03/20/2009	07:16	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/20/2009	11:49	MCD
ZINC	EPA 200.7	0.0289 MG/L	N	03/31/2009	23:07	JKD
BORON	EPA 200.7	0.0120 MG/L		03/20/2009	07:16	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540.D.	5 MG/L		03/13/2009	14:30	AHT
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340.B.	87.8 MG/L		03/20/2009	06:12	JKD

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002 **RAW 3/14/09 0630 DISSOLVED METALS**

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0070 MG/L	N	03/31/2009	22:15	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/19/2009	13:16	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/19/2009	13:16	MCD
BARIUM	EPA 200.7	0.0236 MG/L	N	03/31/2009	22:15	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:15	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:15	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:15	JKD
COBALT	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:15	JKD
COPPER	EPA 200.7	0.0033 MG/L		03/20/2009	07:22	JKD
IRON	EPA 200.7	0.0073 MG/L		03/20/2009	07:22	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/19/2009	13:16	MCD
MAGNESIUM	EPA 200.7	6.07 MG/L		03/20/2009	06:19	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L	N	03/31/2009	22:15	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:22	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/29/2009	16:17	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/20/2009	07:22	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/19/2009	13:16	MCD
SILVER	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:15	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/20/2009	07:22	JKD
TITANIUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:22	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/19/2009	13:16	MCD
ZINC	EPA 200.7	0.0259 MG/L	N	03/31/2009	22:15	JKD
BORON	EPA 200.7	0.0135 MG/L		03/20/2009	07:22	JKD
SILICA (SiO2)	EPA 200.7	3.67 MG/L		03/20/2009	06:19	JKD

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003 **FINISHED 3/14/09 0630**

[TAL METALS]

ALUMINUM	EPA 200.7	0.0407 MG/L	N	03/31/2009	23:13	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/19/2009	13:19	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/19/2009	13:19	MCD
BARIUM	EPA 200.7	0.0225 MG/L	N	03/31/2009	23:13	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:13	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:13	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:13	JKD
COBALT	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:13	JKD
COPPER	EPA 200.7	0.0036 MG/L		03/20/2009	07:29	JKD
IRON	EPA 200.7	0.0053 MG/L		03/20/2009	07:29	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/19/2009	13:19	MCD
MAGNESIUM	EPA 200.7	5.79 MG/L		03/20/2009	06:25	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L	N	03/31/2009	23:13	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:29	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/29/2009	16:20	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/20/2009	07:29	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/19/2009	13:19	MCD
SILVER	EPA 200.7	<0.00050 MG/L	N	03/31/2009	23:13	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/20/2009	07:29	JKD
TITANIUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:29	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		03/19/2009	13:19	MCD
ZINC	EPA 200.7	0.0030 MG/L	N	03/31/2009	23:13	JKD
BORON	EPA 200.7	0.0120 MG/L		03/20/2009	07:29	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	1 MG/L		03/13/2009	14:30	AHT

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003 **FINISHED 3/14/09 0630**

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HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	83.9 MG/L		03/20/2009	06:25	JKD
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004 **FINISHED 3/14/09 0630 DISSOLVED METALS**

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0305 MG/L	N	03/31/2009	22:22	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		03/19/2009	13:23	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		03/19/2009	13:23	MCD
BARIUM	EPA 200.7	0.0233 MG/L	N	03/31/2009	22:22	JKD
BERYLLIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:22	JKD
CADMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:22	JKD
CHROMIUM	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:22	JKD
COBALT	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:22	JKD
COPPER	EPA 200.7	0.0037 MG/L		03/20/2009	07:35	JKD
IRON	EPA 200.7	<0.0030 MG/L		03/20/2009	07:35	JKD
LEAD	EPA 200.8	<0.005 MG/L		03/19/2009	13:23	MCD
MAGNESIUM	EPA 200.7	5.90 MG/L		03/20/2009	06:32	JKD
MANGANESE	EPA 200.7	<0.0025 MG/L	N	03/31/2009	22:22	JKD
MOLYBDENUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:35	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		03/29/2009	16:22	LL
NICKEL	EPA 200.7	<0.00050 MG/L		03/20/2009	07:35	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		03/19/2009	13:23	MCD
SILVER	EPA 200.7	<0.00050 MG/L	N	03/31/2009	22:22	JKD
TIN	EPA 200.7	<0.00050 MG/L		03/20/2009	07:35	JKD
TITANIUM	EPA 200.7	<0.00050 MG/L		03/20/2009	07:35	JKD

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004 **FINISHED 3/14/09 0630 DISSOLVED METALS**

.....continued

THALLIUM	EPA 200.8	<0.002 MG/L		03/19/2009	13:23	MCD
ZINC	EPA 200.7	0.0238 MG/L	N	03/31/2009	22:22	JKD
BORON	EPA 200.7	0.0125 MG/L		03/20/2009	07:35	JKD
SILICA (SiO2)	EPA 200.7	3.65 MG/L		03/20/2009	06:32	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 4-1-09.

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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