



KNOXVILLE DIVISION
 505 EAST BROADWAY AVE.
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 E-Mail: knoxville@microbac.com

STATE CERT ID.
 TN 02017

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

CERTIFICATE OF ANALYSIS

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

Date Reported 7/29/2009
 Date Received 7/22/2009
 Cust P.O.
 Invoice No. 70591
 Cust # C120
 Sample Date 7/22/2009
 Permit No.

Work Order Number: 0907-00796

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
001 RAW 7/22/09 0630						
[TAL METALS]				07/27/2009	16:38	JKD
ALUMINUM	EPA 200.7	0.140 MG/L		07/24/2009	15:22	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		07/27/2009	16:38	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		07/27/2009	16:38	MCD
BARIUM	EPA 200.7	0.0200 MG/L		07/24/2009	15:22	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
COBALT	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
COPPER	EPA 200.7	0.0030 MG/L		07/24/2009	15:22	JKD
IRON	EPA 200.7	0.0764 MG/L		07/24/2009	15:22	JKD
LEAD	EPA 200.8	<0.005 MG/L		07/27/2009	16:38	MCD
MAGNESIUM	EPA 200.7	9.41 MG/L		07/24/2009	14:00	JKD
MANGANESE	EPA 200.7	0.0162 MG/L		07/24/2009	15:22	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/24/2009	14:00	JKD
NICKEL	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		07/27/2009	16:38	MCD
SILVER	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
TIN	EPA 200.7	<0.0010 MG/L		07/24/2009	15:22	JKD
TITANIUM	EPA 200.7	0.0012 MG/L		07/24/2009	15:22	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		07/27/2009	16:38	MCD
ZINC	EPA 200.7	0.0101 MG/L		07/24/2009	15:22	JKD
BORON	EPA 200.7	0.0120 MG/L		07/24/2009	15:22	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		07/22/2009	10:55	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	134.5 MG/L		07/24/2009	14:00	JKD

002 RAW 7/22/09 0630 DISSOLVED METALS





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Test Method Result Qual Date Time Tech

002 RAW 7/22/09 0630 DISSOLVED METALS

.....continued

[TAL METALS]

Table with 7 columns: Test, Method, Result, Qual, Date, Time, Tech. Rows include ALUMINUM, ANTIMONY, ARSENIC, BARIUM, BERYLLIUM, CADMIUM, CHROMIUM, COBALT, COPPER, IRON, LEAD, MAGNESIUM, MANGANESE, MOLYBDENUM, MERCURY, NICKEL, SELENIUM, SILVER, TIN, TITANIUM, THALLIUM, ZINC, BORON, SILICA (SiO2).

003 FINISHED 7/22/09 0630





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Test	Method	Result	Qual	Date	Time	Tech
003 FINISHED 7/22/09 0630						
.....continued						
[TAL METALS]				07/27/2009	16:45	JKD
ALUMINUM	EPA 200.7	0.0466 MG/L		07/24/2009	15:35	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		07/27/2009	16:45	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		07/27/2009	16:45	MCD
BARIUM	EPA 200.7	0.0207 MG/L		07/24/2009	15:35	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
COBALT	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
COPPER	EPA 200.7	0.0049 MG/L		07/24/2009	15:35	JKD
IRON	EPA 200.7	<0.0060 MG/L		07/24/2009	15:35	JKD
LEAD	EPA 200.8	<0.005 MG/L		07/27/2009	16:45	MCD
MAGNESIUM	EPA 200.7	4.76 MG/L		07/24/2009	15:01	JKD
MANGANESE	EPA 200.7	<0.0050 MG/L		07/24/2009	15:35	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/24/2009	16:29	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		07/27/2009	16:45	MCD
SILVER	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
TIN	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
TITANIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:35	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		07/27/2009	16:45	MCD
ZINC	EPA 200.7	0.0029 MG/L		07/24/2009	15:35	JKD
BORON	EPA 200.7	0.0123 MG/L		07/24/2009	15:35	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		07/22/2009	10:55	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	72.1 MG/L		07/24/2009	15:01	JKD

004 **FINISHED 7/22/09 0630 DISSOLVED METALS**





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Test	Method	Result	Qual	Date	Time	Tech
004 FINISHED 7/22/09 0630 DISSOLVED METALS						
[TAL METALS]				07/27/2009	16:48	JKD
ALUMINUM	EPA 200.7	0.0457 MG/L		07/24/2009	15:42	JKD
ANTIMONY	EPA 200.8	<0.005 MG/L		07/27/2009	16:48	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		07/27/2009	16:48	MCD
BARIUM	EPA 200.7	0.0208 MG/L		07/24/2009	15:42	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
COBALT	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
COPPER	EPA 200.7	0.0049 MG/L		07/24/2009	15:42	JKD
IRON	EPA 200.7	<0.0060 MG/L		07/24/2009	15:42	JKD
LEAD	EPA 200.8	<0.005 MG/L		07/27/2009	16:48	MCD
MAGNESIUM	EPA 200.7	4.78 MG/L		07/24/2009	15:15	JKD
MANGANESE	EPA 200.7	<0.0050 MG/L		07/24/2009	15:42	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/24/2009	16:29	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
SELENIUM	EPA 200.8	<0.005 MG/L		07/27/2009	16:48	MCD
SILVER	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
TIN	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
TITANIUM	EPA 200.7	<0.0010 MG/L		07/24/2009	15:42	JKD
THALLIUM	EPA 200.8	<0.002 MG/L		07/27/2009	16:48	MCD
ZINC	EPA 200.7	0.0036 MG/L		07/24/2009	15:42	JKD
BORON	EPA 200.7	0.0120 MG/L		07/24/2009	15:42	JKD
SILICA (SiO2)	EPA 200.7	4.29 MG/L		07/24/2009	15:15	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). JL 7-29-09.





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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 = Inter-element correction applied due to high concentration of non-target analyte
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

