

Microbac

KNOXVILLE DIVISION
 505 EAST BROADWAY AVE.
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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 7/18/2009
 Cust P.O.
 Invoice No.
 Cust # C120
 Sample Date 7/18/2009
 Permit No. 0000360

Work Order Number: 0907-00688

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
001 RAW 7/18/09 0630						
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.231 MG/L	J-,N	07/21/2009	19:17	JKD
ANTIMONY	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:17	JKD
ARSENIC	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:17	JKD
BARIUM	EPA 200.7	0.0201 MG/L	J-,N	07/21/2009	19:17	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:17	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
COBALT	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
COPPER	EPA 200.7	0.0035 MG/L	J-	07/21/2009	19:17	JKD
IRON	EPA 200.7	0.199 MG/L	J-,N	07/21/2009	19:17	JKD
LEAD	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:17	JKD
MAGNESIUM	EPA 200.7	3.60 MG/L	J-	07/21/2009	00:58	LL
MANGANESE	EPA 200.7	0.0243 MG/L	J-,N	07/21/2009	19:17	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/22/2009	16:41	JKD
NICKEL	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
SELENIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:17	JKD
SILVER	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:17	JKD
TIN	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:17	JKD
TITANIUM	EPA 200.7	0.0024 MG/L	J-,N	07/21/2009	19:17	JKD
THALLIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:17	JKD
ZINC	EPA 200.7	0.0181 MG/L	J-,N	07/21/2009	19:17	JKD
BORON	EPA 200.7	0.0098 MG/L	J-	07/21/2009	19:17	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	5.42 MG/L		07/20/2009	10:35	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	58.7 MG/L		07/21/2009	00:58	LL

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Test	Method	Result	Qual	Date	Time	Tech
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002 RAW 7/18/09 0630 DISSOLVED METALS

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0143 MG/L	J-,N	07/21/2009	19:40	JKD
ANTIMONY	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:40	JKD
ARSENIC	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:40	JKD
BARIUM	EPA 200.7	0.0183 MG/L	J-,N	07/21/2009	19:40	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:40	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
COBALT	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
COPPER	EPA 200.7	0.0027 MG/L	J-	07/21/2009	19:40	JKD
IRON	EPA 200.7	<0.0060 MG/L	J-,N	07/21/2009	19:40	JKD
LEAD	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:40	JKD
MAGNESIUM	EPA 200.7	3.57 MG/L	J-	07/21/2009	02:14	LL
MANGANESE	EPA 200.7	<0.0050 MG/L	J-,N	07/21/2009	19:40	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/22/2009	16:41	JKD
NICKEL	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
SELENIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:40	JKD
SILVER	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:40	JKD
TIN	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
TITANIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:40	JKD
THALLIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:40	JKD
ZINC	EPA 200.7	0.0075 MG/L	J-,N	07/21/2009	19:40	JKD
BORON	EPA 200.7	0.0109 MG/L	J-	07/21/2009	19:40	JKD
SILICA (SiO2)	EPA 200.7	2.95 MG/L		07/21/2009	02:14	LL



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003 FINISHED 7/18/09 0630

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0605 MG/L	J-,N	07/21/2009	19:47	JKD
ANTIMONY	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:47	JKD
ARSENIC	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:47	JKD
BARIUM	EPA 200.7	0.0182 MG/L	J-,N	07/21/2009	19:47	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:47	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
COBALT	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
COPPER	EPA 200.7	0.0026 MG/L	J-	07/21/2009	19:47	JKD
IRON	EPA 200.7	<0.0060 MG/L	J-,N	07/21/2009	19:47	JKD
LEAD	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:47	JKD
MAGNESIUM	EPA 200.7	3.82 MG/L	J-	07/21/2009	01:05	LL
MANGANESE	EPA 200.7	<0.0050 MG/L	J-,N	07/21/2009	19:47	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/22/2009	16:41	JKD
NICKEL	EPA 200.7	0.0012 MG/L	J-,N	07/21/2009	19:47	JKD
SELENIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:47	JKD
SILVER	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:47	JKD
TIN	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
TITANIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:47	JKD
THALLIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:47	JKD
ZINC	EPA 200.7	0.0022 MG/L	J-	07/21/2009	19:47	JKD
BORON	EPA 200.7	0.0098 MG/L	J-	07/21/2009	19:47	JKD
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		07/20/2009	10:35	KDW



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Test	Method	Result	Qual	Date	Time	Tech
003 FINISHED 7/18/09 0630						
.....continued						
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	62.4 MG/L		07/21/2009	01:05	LL
004 FINISHED 7/18/09 0630 DISSOLVED METALS						
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0601 MG/L	J-,N	07/21/2009	19:54	JKD
ANTIMONY	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:54	JKD
ARSENIC	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:54	JKD
BARIUM	EPA 200.7	0.0188 MG/L	J-,N	07/21/2009	19:54	JKD
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:54	JKD
CADMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD
CHROMIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD
COBALT	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD
COPPER	EPA 200.7	0.0029 MG/L	J-	07/21/2009	19:54	JKD
IRON	EPA 200.7	<0.0060 MG/L	J-,N	07/21/2009	19:54	JKD
LEAD	EPA 200.7	<0.0010 MG/L	M,J-,N	07/21/2009	19:54	JKD
MAGNESIUM	EPA 200.7	3.75 MG/L	J-	07/21/2009	02:21	LL
MANGANESE	EPA 200.7	<0.0050 MG/L	J-,N	07/21/2009	19:54	JKD
MOLYBDENUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD
MERCURY	EPA 245.1	<0.0002 MG/L		07/22/2009	16:41	JKD
NICKEL	EPA 200.7	0.0012 MG/L	J-,N	07/21/2009	19:54	JKD
SELENIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:54	JKD
SILVER	EPA 200.7	<0.0010 MG/L	J-	07/21/2009	19:54	JKD
TIN	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD
TITANIUM	EPA 200.7	<0.0010 MG/L	J-,N	07/21/2009	19:54	JKD

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Test	Method	Result	Qual	Date	Time	Tech
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004 **FINISHED 7/18/09 0630 DISSOLVED METALS**

.....continued

THALLIUM	EPA 200.7	<0.0020 MG/L	M,J-,N	07/21/2009	19:54	JKD
ZINC	EPA 200.7	0.0034 MG/L	J-	07/21/2009	19:54	JKD
BORON	EPA 200.7	0.0106 MG/L	J-	07/21/2009	19:54	JKD
SILICA (SiO2)	EPA 200.7	3.16 MG/L		07/21/2009	02:21	LL

M= THESE SAMPLES ARE REPORTED BY METHOD 200.7 FOR INFORMATIONAL PURPOSES TO PROVIDE QUICKER REPORTING. WHILE THESE REPORTED NUMBERS ARE CONSIDERED ACCURATE, TDEC APPROVED METHODS (EITHER 200.8 OR 200.9) ARE ALSO BEING ANALYZED AS VERIFICATION AND THIS REPORT WILL BE MODIFIED TO REFLECT THE METHOD CHANGE WHEN COMPLETE.

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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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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