West Virginia

Department of Environmental Protection

hereby certifies

Microbac – Ohio Valley Division

to perform analyses for the purpose of determining compliance with the requirements of the state's natural resources and environmental programs when required by an order issued by the agency or required by statute.

This certificate does not guarantee the validity of data generated, but indicates the methodology, equipment, quality control procedures, records, and proficiency of the laboratory have been examined and found to be acceptable.

This certificate is the property of the Department of Environmental Protection

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Certificate number

October 7, 2008

Date Issued

Certification originally granted 4/30/1993

Quality Assurance Officer

Director

ATTACHMENT I

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER AND WASTE MANAGEMENT

List of Certified Parameters
for

MICROBAC LABORATORIES, INC. OHIO VALLEY DIVISION

MARIETTA, OHIO

PARAMETERS CERTIFIED

NONPOTABLE WATER INORGANIC NONMETALS

ANALYTE	METHOD	TECHNOLOGY
Acidity	SM2310 B-11	Titrimetric
Alkalinity	EPA310.2 Rev 2.2-1974	Colorimetric
Alkalinity	SM2320 B-11	Titrimetric
Ammonia	EPA350.1 Rev 2.0-1993	Spectrophotometric
Bromide	EPA300.0 Rev 2.1-1993	IC
Bromide	SW9056	IC
Bromide	SW9056A	IC
Carbon, Total Organic (TOC)	SM5310 C-11	Oxidation
Carbon, Total Organic (TOC)	SW9060A	Oxidation
Chloride	EPA300.0 Rev 2.1-1993	IC
Chloride	SM4500-Cl E-11	Spectrophotometric
Chloride	SW9056	IC
Chloride	SW9056A	IC
Chlorine, Residual	SM4500-Cl G-11	Spectrophotometric
Chromium, Hexavalent	SM3500-Cr B-11	Spectrophotometric
Chromium, Hexavalent	SW3060A	Digestion
Chromium, Hexavalent	SW7196A	Spectrophotometric
Color	SM2120 B-11	Visual Comparison
Conductance, Specific	EPA120.1 Rev 1982	Probe
Conductance, Specific	SM2510 B-11	Probe
Cyanide, Amenable to Chlorination	SM4500-CN E-11	Spectrophotometric
Cyanide, Amenable to Chlorination	SM4500-CN G-11	Digestion
Cyanide, Amenable to Chlorination	SW9010C	Distillation
Cyanide, Total	SM4500-CN C-11	Distillation
Cyanide, Total	SM4500-CN E-11	Spectrophotometric
Cyanide, Total	SW9010C	Distillation
Cyanide, Total	SW9014	Spectrophotometric
Cyanide, Weak Acid Dissociable	SM4500-CN E-11	Spectrophotometric
Cyanide, Weak Acid Dissociable	SM4500-CN I-11	Distillation
Fluoride	EPA300.0 Rev 2.1-1993	IC
Fluoride	SM4500-F B-11	Distillation

ANALYTE	METHOD	TECHNOLOGY
Fluoride	SM4500-F C-11	ISE
Fluoride	SW9056	IC
Fluoride	SW9056A	IC
Hardness, Calcium	SM2340 B-11	Calculation
Hardness, Total	EPA130.2 Rev 1978	Titrimetric
Hardness, Total	SM2340 B-11	Calculation
Hardness, Total	SM2340 C-11	Titrimetric
Nitrate	EPA300.0 Rev 2.1-1993	IC
Nitrate	EPA353.2 Rev 2.0-1993	Calculation
Nitrate	SW9056	IC
Nitrate	SW9056A	IC
Nitrate-Nitrite	EPA353.2 Rev 2.0-1993	Spectrophotometric
Nitrate-Nitrite	SM4500-NO3 F-00	Spectrophotometric
Nitrite	EPA300.0 Rev 2.1-1993	IC
Nitrite	SM4500-NO2 B-11	Spectrophotometric
Nitrite	SW9056	IC
Nitrite	SW9056A	IC
Nitrogen, Total Kjeldahl (TKN)	EPA351.2 Rev 2.0-1993	Colorimetric
Oil & Grease	EPA1664 A	Gravimetric
Oxygen Demand, Biochemical (BOD)	SM5210 B-11	Probe
Oxygen Demand, Carbonaceous Biochemical (CBOD)	SM5210 B-11	Probe
Oxygen Demand, Chemical (COD)	HACH 8000	Spectrophotometric
Oxygen, Dissolved	SM4500-O C-11	Probe
Perchlorate	SW6850	HPLC/ESI/MS
pH (Hydrogen Ion)	SM4500-H B-11	Electrode
pH (Hydrogen Ion)	SW9040C	Electrode
Phenolics, Total	EPA420.1 Rev 1978	Spectrophotometric
Phosphorus, Ortho	SM4500-P E-11	Spectrophotometric
Phosphorus, Total	EPA365.4 Rev 1974	Spectrophotometric
Solids, Dissolved	SM2540 C-11	Gravimetric
Solids, Settleable	SM2540 F-11	Imhoff
Solids, Suspended	SM2540 D-11	Gravimetric
Solids, Total	SM2540 B-11	Gravimetric
Solids, Volatile	EPA160.4	Gravimetric
Sulfate	EPA300.0 Rev 2.1-1993	IC
Sulfate	SM4500-SO4 E-11	Turbidimetric
Sulfate	SW9056	IC
Sulfate	SW9056A	IC
Sulfide	SM4500-S F-11	Titrimetric
Sulfide	SW9030B	Distillation
Surfactants (MBAS)	SM5540 C-11	Spectrophotometric
Turbidity	SM2130 B-11	Turbidimetric

NONPOTABLE WATER TRACE METALS

METAL	METHOD	TECHNOLOGY
Aluminum	EPA200.7 Rev 4.4-1994	ICP
Aluminum	SW6010B	ICP
Aluminum	SW6010C	ICP
Antimony	EPA200.7 Rev 4.4-1994	ICP
Antimony	EPA200.8 Rev 5.4-1994	ICP-MS

METAL	METHOD	TECHNOLOGY
Antimony	SW6010B	ICP
Antimony	SW6010C	ICP
Antimony	SW6020	ICP-MS
Antimony	SW6020A	ICP-MS
Arsenic	EPA200.7 Rev 4.4-1994	ICP
Arsenic	EPA200.8 Rev 5.4-1994	ICP-MS
Arsenic	SW6010B	ICP
Arsenic	SW6010C	ICP
Arsenic	SW6020	ICP-MS
Arsenic	SW6020A	ICP-MS
Barium	EPA200.7 Rev 4.4-1994	ICP
Barium	EPA200.8 Rev 5.4-1994	ICP-MS
Barium	SW6010B	ICP
Barium	SW6010C	ICP
Barium	SW6020	ICP-MS
Barium	SW6020A	ICP-MS
Beryllium	EPA200.7 Rev 4.4-1994	ICP
Beryllium	EPA200.8 Rev 5.4-1994	ICP-MS
Beryllium	SW6010B	ICP
Beryllium	SW6010C	ICP
Boron	EPA200.7 Rev 4.4-1994	ICP
Boron	SW6010B	ICP
Boron	SW6010C	ICP
Cadmium	EPA200.7 Rev 4.4-1994	ICP
Cadmium	EPA200.8 Rev 5.4-1994	ICP-MS
Cadmium	SW6010B	ICP
Cadmium	SW6010C	ICP
Cadmium	SW6020	ICP-MS
Cadmium	SW6020A	ICP-MS
Calcium	EPA200.7 Rev 4.4-1994	ICP
Calcium	SW6010B	ICP
Calcium	SW6010C	ICP
Chromium	EPA200.7 Rev 4.4-1994	ICP
Chromium	EPA200.8 Rev 5.4-1994	ICP-MS
Chromium	SW6010B	ICP
Chromium	SW6010C	ICP
Chromium	SW6020	ICP-MS
Chromium	SW6020A	ICP-MS
Cobalt	EPA200.7 Rev 4.4-1994	ICP
Cobalt	EPA200.8 Rev 5.4-1994	ICP-MS
Cobalt	SW6010B	ICP
Cobalt	SW6010C	ICP
Cobalt	SW6020	ICP-MS
Cobalt	SW6020A	ICP-MS
Copper	EPA200.7 Rev 4.4-1994	ICP
Copper	EPA200.8 Rev 5.4-1994	ICP-MS
Copper	SW6010B	ICP
Copper	SW6010C	ICP
Copper	SW6020	ICP-MS
Copper	SW6020A	ICP-MS
Iron	EPA200.7 Rev 4.4-1994	ICP
Iron	SW6010B	ICP

METAL	METHOD	TECHNOLOGY
Iron	SW6010C	ICP
Lead	EPA200.7 Rev 4.4-1994	ICP
Lead	EPA200.8 Rev 5.4-1994	ICP-MS
Lead	SW6010B	ICP
Lead	SW6010C	ICP
Lead	SW6020	ICP-MS
Lead	SW6020A	ICP-MS
Lithium	SW6010B	ICP
Lithium	SW6010C	ICP
Magnesium	EPA200.7 Rev 4.4-1994	ICP
Magnesium	SW6010B	ICP
Magnesium	SW6010C	ICP
Manganese	EPA200.7 Rev 4.4-1994	ICP
Manganese	EPA200.8 Rev 5.4-1994	ICP-MS
Manganese	SW6010B	ICP
Manganese	SW6010C	ICP
Manganese	SW6020	ICP-MS
Manganese	SW6020A	ICP-MS
Mercury	EPA245.1 Rev 3.0-1994	CVAA
Mercury	SW7470A	CVAA
Metals	SW3015A	Digestion
Molybdenum	EPA200.7 Rev 4.4-1994	ICP
Molybdenum	SW6010B	ICP
Molybdenum	SW6010C	ICP
Nickel	EPA200.7 Rev 4.4-1994	ICP
Nickel	EPA200.8 Rev 5.4-1994	ICP-MS
Nickel	SW6010B	ICP
Nickel	SW6010C	ICP
Nickel	SW6020	ICP-MS
Nickel	SW6020A	ICP-MS
Phosphorus	EPA200.7 Rev 4.4-1994	ICP
Phosphorus	SW6010B	ICP
Phosphorus	SW6010C	ICP
Potassium	EPA200.7 Rev 4.4-1994	ICP
Potassium	SW6010B	ICP
Potassium	SW6010C	ICP
Selenium	EPA200.7 Rev 4.4-1994	ICP
Selenium	EPA200.8 Rev 5.4-1994	ICP-MS
Selenium	SM3114 B-11 (Modified)	GHAF
Selenium	SW6010B	ICP
Selenium	SW6010C	ICP
Selenium	SW6020	ICP-MS
Selenium	SW6020A	ICP-MS
Silica	SW6010B	Calculation
Silica	SW6010C	Calculation
Silicon	SW6010B	ICP
Silicon	SW6010C	ICP
Silver	EPA200.7 Rev 4.4-1994	ICP
Silver	EPA200.8 Rev 5.4-1994	ICP-MS
Silver	SW6010B	ICP
Silver	SW6010C	ICP
Silver	SW6020	ICP-MS

METAL	METHOD	TECHNOLOGY
Silver	SW6020A	ICP-MS
Sodium	EPA200.7 Rev 4.4-1994	ICP
Sodium	SW6010B	ICP
Sodium	SW6010C	ICP
Strontium	SW6010B	ICP
Strontium	SW6010C	ICP
Thallium	EPA200.7 Rev 4.4-1994	ICP
Thallium	EPA200.8 Rev 5.4-1994	ICP-MS
Thallium	SW6010B	ICP
Thallium	SW6010C	ICP
Thallium	SW6020	ICP-MS
Thallium	SW6020A	ICP-MS
Tin	EPA200.7 Rev 4.4-1994	ICP
Tin	SW6010B	ICP
Tin	SW6010C	ICP
Titanium	EPA200.7 Rev 4.4-1994	ICP
Titanium	SW6010B	ICP
Titanium	SW6010C	ICP
Uranium	SW6020	ICP-MS
Uranium	SW6020A	ICP-MS
Vanadium	EPA200.7 Rev 4.4-1994	ICP
Vanadium	SW6010B	ICP
Vanadium	SW6010C	ICP
Vanadium	SW6020	ICP-MS
Vanadium	SW6020A	ICP-MS
Zinc	EPA200.7 Rev 4.4-1994	ICP
Zinc	EPA200.8 Rev 5.4-1994	ICP-MS
Zinc	SW6010B	ICP
Zinc	SW6010C	ICP
Zinc	SW6020	ICP-MS
Zinc	SW6020A	ICP-MS

NONPOTABLE WATER MICROBIOLOGY

GROUP	METHOD	TECHNOLOGY
Coliform, Fecal (MF)	SM9222 D-06	Membrane Filter
Coliform, Total (MF)	SM9222 B-06	Membrane Filter
E.Coli	mColiBlue-24	Single step

NONPOTABLE WATER VOLATILE ORGANIC CHEMICALS

GROUP	METHOD	TECHNOLOGY
Closed System Purge & Trap	SW5035A	Extraction
Dissolved Gases	RSK175	GC
Headspace, Equilibrium Analysis	SW5021	Extraction
Purgables	EPA624.1	GC/MS
Purge & Trap For Aqueous Samples	SW5030B	Extraction
Purge & Trap For Aqueous Samples	SW5030C	Extraction
Total Petroleum Hydrocarbons (GRO)	SW8015C	GC/FID
Total Petroleum Hydrocarbons (GRO)	SW8015D	GC/FID
Volatile Organic Compounds	SW8260B	GC/MS
Volatile Organic Compounds	SW8260C	GC/MS

NONPOTABLE WATER EXTRACTABLE AND SEMI-VOLATILE ORGANIC CHEMICALS

GROUP	METHOD	TECHNOLOGY
Base/Neutrals & Acids	EPA625.1	GC/MS
Carbonyl Compounds	SW8315A	HPLC
Chlorinated Herbicides	SW8151A	GC
Continuous Liquid-Liquid	SW3520C	Extraction
EDB & DBCP	SW8011	GC/ECD
Florisil Cleanup	SW3620C	Cleanup
Glycols	SW8015C	GC/FID
Glycols	SW8015D	GC/FID
Nitroaromatics & Nitramines	SW8330B	HPLC
Organic Extraction & Sample Preparatic	SW3500C	Extraction
Organochlorine Pesticides	SW8081A	GC
Organochlorine Pesticides	SW8081B	GC
Organochlorine Pesticides & PCBs	EPA608.3	GC
Polychlorinated Biphenyls	SW8082	GC
Polychlorinated Biphenyls	SW8082A	GC
Semivolatile Organic Compounds	SW8270C	GC/MS
Semivolatile Organic Compounds	SW8270C	SIM
Semivolatile Organic Compounds	SW8270D	GC/MS
Separatory Funnel Liquid-Liquid	SW3510C	Extraction
Silica Gel Cleanup	SW3630C	Cleanup
Solid Phase Extraction	SW3535A	Extraction
Sulfur Cleanup	SW3660B	Cleanup
Sulfuric Acid/Permanganate Cleanup	SW3665A	Cleanup
Total Petroleum Hydrocarbons (DRO)	SW8015C	GC/FID
Total Petroleum Hydrocarbons (DRO)	SW8015D	GC/FID

HAZARDOUS WASTE CHARACTERISTICS

PROCEDURE	METHOD	TECHNOLOGY
Corrosivity	SW9045D	Electrode
Ignitability	SW1010A	Closed Cup
Paint Filter Test	SW9095B	Gravimetric
SPLP- Metals & Organics	SW1312	Extraction
TCLP- Metals & Organics	SW1311	Extraction

SOLID AND CHEMICAL INORGANIC NONMETALS

ANALYTE	METHOD	TECHNOLOGY
Bromide	SW9056	IC
Bromide	SW9056A	IC
Chloride	SW9056	IC
Chloride	SW9056A	IC
Fluoride	SW9056	IC
Fluoride	SW9056A	IC
Halides, Total	SW5050	Digestion
Nitrate	SW9056	IC
Nitrate	SW9056A	IC
Nitrite	SW9056	IC
Nitrite	SW9056A	IC
Percent Solids	ASTM D2216-90	Gravimetric

ANALYTE	METHOD	TECHNOLOGY
Perchlorate	SW6850	HPLC/ESI/MS
Sulfate	SW9056	IC
Sulfate	SW9056A	IC
Sulfide	SW9034	Titrimetric

SOLID AND CHEMICAL TRACE METALS

METAL	METHOD	TECHNOLOGY
Aluminum	SW6010B	ICP
Aluminum	SW6010C	ICP
Antimony	SW6010B	ICP
Antimony	SW6010C	ICP
Antimony	SW6020	ICP-MS
Antimony	SW6020A	ICP-MS
Arsenic	SW6010B	ICP
Arsenic	SW6010C	ICP
Arsenic	SW6020	ICP-MS
Arsenic	SW6020A	ICP-MS
Barium	SW6010B	ICP
Barium	SW6010C	ICP
Barium	SW6020	ICP-MS
Barium	SW6020A	ICP-MS
Beryllium	SW6010B	ICP
Beryllium	SW6010C	ICP
Boron	SW6010B	ICP
Boron	SW6010C	ICP
Cadmium	SW6010B	ICP
Cadmium	SW6010C	ICP
Cadmium	SW6020	ICP-MS
Cadmium	SW6020A	ICP-MS
Calcium	SW6010B	ICP
Calcium	SW6010C	ICP
Chromium	SW6010B	ICP
Chromium	SW6010C	ICP
Chromium	SW6020	ICP-MS
Chromium	SW6020A	ICP-MS
Cobalt	SW6010B	ICP
Cobalt	SW6010C	ICP
Cobalt	SW6020	ICP-MS
Cobalt	SW6020A	ICP-MS
Copper	SW6010B	ICP
Copper	SW6010C	ICP
Copper	SW6020	ICP-MS
Copper	SW6020A	ICP-MS
Iron	SW6010B	ICP
Iron	SW6010C	ICP
Lead	SW6010B	ICP
Lead	SW6010C	ICP
Lead	SW6020	ICP-MS
Lead	SW6020A	ICP-MS
Magnesium	SW6010B	ICP
Magnesium	SW6010C	ICP

METAL	METHOD	TECHNOLOGY
Manganese	SW6010B	ICP
Manganese	SW6010C	ICP
Manganese	SW6020	ICP-MS
Manganese	SW6020A	ICP-MS
Mercury	SW7471A	CVAA
Mercury	SW7471B	CVAA
Metals, Total	SW3051A	Digestion
Molybdenum	SW6010B	ICP
Molybdenum	SW6010C	ICP
Nickel	SW6010B	ICP
Nickel	SW6010C	ICP
Nickel	SW6020	ICP-MS
Nickel	SW6020A	ICP-MS
Phosphorus	SW6010B	ICP
Phosphorus	SW6010C	ICP
Potassium	SW6010B	ICP
Potassium	SW6010C	ICP
Selenium	SW6010B	ICP
Selenium	SW6010C	ICP
Selenium	SW6020	ICP-MS
Selenium	SW6020A	ICP-MS
Silver	SW6010B	ICP
Silver	SW6010C	ICP
Silver	SW6020	ICP-MS
Silver	SW6020A	ICP-MS
Sodium	SW6010B	ICP
Sodium	SW6010C	ICP
Strontium	SW6010B	ICP
Strontium	SW6010C	ICP
Thallium	SW6010B	ICP
Thallium	SW6010C	ICP
Thallium	SW6020	ICP-MS
Thallium	SW6020A	ICP-MS
Tin	SW6010B	ICP
Tin	SW6010C	ICP
Titanium	SW6010B	ICP
Titanium	SW6010C	ICP
Uranium	SW6020	ICP-MS
Uranium	SW6020A	ICP-MS
Vanadium	SW6010B	ICP
Vanadium	SW6010C	ICP
Vanadium	SW6020	ICP-MS
Vanadium	SW6020A	ICP-MS
Zinc	SW6010B	ICP
Zinc	SW6010C	ICP
Zinc	SW6020	ICP-MS
Zinc	SW6020A	ICP-MS

SOLID AND CHEMICAL VOLATILE ORGANIC CHEMICALS

GROUP	METHOD	TECHNOLOGY
Closed System Purge & Trap	SW5035A	Extraction
Headspace, Equilibrium Analysis	SW5021	Extraction
Total Petroleum Hydrocarbons (GRO)	SW8015C	GC/FID
Total Petroleum Hydrocarbons (GRO)	SW8015D	GC/FID
Volatile Organic Compounds	SW8260B	GC/MS
Volatile Organic Compounds	SW8260C	GC/MS

SOLID AND CHEMICAL EXTRACTABLE AND SEMI-VOLATILE ORGANIC CHEMICALS

GROUP	METHOD	TECHNOLOGY
Chlorinated Herbicides	SW8151A	GC/ECD
Microwave Extraction	SW3546	Extraction
Nitroaromatics & Nitramines	SW8330B	HPLC
Organochlorine Pesticides	SW8081A	GC
Organochlorine Pesticides	SW8081B	GC
Polychlorinated Biphenyls	SW8082	GC
Polychlorinated Biphenyls	SW8082A	GC
Pressurized Fluid (PFE)	SW3545A	Extraction
Semivolatile Organic Compounds	SW8270C	GC/MS
Semivolatile Organic Compounds	SW8270D	GC/MS
Silica Gel Cleanup	SW3630C	Cleanup
Total Petroleum Hydrocarbons (DRO)	SW8015C	GC/FID
Total Petroleum Hydrocarbons (DRO)	SW8015D	GC/FID
Ultrasonic	SW3550B	Extraction
Ultrasonic	SW3550C	Extraction
Waste Dilution	SW3580A	Dilution

This laboratory may test **ONLY** for those environmental parameters listed above for compliance reporting purposes. All testing must be by the test method cited in the current application for certification.

This Certification Expires June 30, 2019.

Certificate No 361

Issued on July 25, 2018

Tommy W. Smith II
Quality Assurance Officer

This certified parameter list supersedes all previously issued parameter lists for this certificate number.