PERMIT BOOK

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 012014-010

Project Number: 2013-10-052
Installation Number:183-0029

Parent Company: Reckitt Benckiser

Parent Company Address: Morris Corporate Center, 399 Interpace Parkway, Parsipanny, NJ 07054

Installation Name: Reckitt Benckiser

Installation Address: 30 Arrowhead Industrial Park, St. Peters, MO 63376

Location Information: St. Charles County, S23, T47N, R3E

Application for Authority to Construct was made for:
on-site wastewater treatment system. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.*

☑ Standard Conditions (on reverse) are applicable to this permit.

☐ Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JAN 27 2014

EFFECTIVE DATE

Kyra L Moore

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW
Project Number: 2013-10-052
Installation ID Number: 183-0029
Permit Number:

Reckitt Benckiser
Morris Corporate Center
399 Interpace Parkway
Parsipanny, NJ 07054

Complete: October 22, 2013

Parent Company:
Reckitt Benckiser
30 Arrowhead Industrial Park
St. Peters, MO 63376

St. Charles County, S23, T47N, R3E

REVIEW SUMMARY

- Reckitt Benckiser has applied for authority to construct an on-site wastewater treatment system.

- HAP emissions are expected from the proposed equipment, but only in insignificant amounts.

- None of the New Source Performance Standards (NSPS) apply to the installation.

- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.

- No air pollution control devices are proposed for the emission units in this permit.

- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

- This installation is located in St. Charles County, a nonattainment area for the 8-hour ozone standard and the PM-2.5 standard and an attainment area for all other criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year for all nonattainment pollutants and fugitive emissions are not counted toward major source applicability.

- Ambient air quality modeling was not performed for this project. The emission rates are below the deminimis and screening model action levels.
- Emissions testing is not required for the emission units.

- A Basic Operating Permit amended application is required for this installation within 30 days of equipment startup.

- Approval of this permit is recommended without special conditions.

INSTALLATION DESCRIPTION

Reckitt Benckiser produces household cleaning products and air fresheners in St. Peters, Missouri. This installation is an existing minor source of Volatile Organic Compounds (VOC) and a de minimis source for all other criteria air pollutants. A Basic Operating Permit (Project Number 2011-01-051) was issued March 18, 2011. Reckitt Benckiser has had the following projects regarding the Air Pollution Control Program.

Table 1: Project History

Project Number	Permit Number	Description
2012-07-060		Add units
2011-12-004		Natural Gas Boiler
2011-08-064		Amend for new permit
2011-07-059	072011-015	New Product and Packaging
2011-01-051		Household Cleaning Products
2010-06-028		Process Tanks
2009-02-024	092002-021A	Process Changes
2009-02-045		Eliminate EP8 and EP9
2007-07-061		New Processes
2006-05-005		Household Cleaning Products
2006-06-078		New production lines
2002-01-068	042002-015	Air Freshener Line
2002-04-162	092002-021	Detergent Manufacturing
2000-07-013		Household Cleaning Products
1999-01-060		New 300 hp Natural Gas Boiler
1998-06-042		Liquid household cleaning products
1998-09-065		Plastics Manufacturing
4160-0029-005	0896-006	300 hp replacement boiler

PROJECT DESCRIPTION

Reckitt Benckiser is in the process of installing an onsite wastewater treatment system (refer to Attachment A for the process flow diagram). The facility has chosen the BIOSHAFT Turbo MBBR (T-MBBR) System. The new system has a large number of biomass carriers instead of suspension which enables the aeration tank to be operated at high biomass content (15-30 Kg/m^3) compared to the conventional aeration process (2.5-3 Kg/m^3).

The wastewater discharge is pumped through the ozone treatment tank, where the process is bubbling air into the wastewater to create foam. However, there is no chemical breakup of the foam. A type of coalescing filter is used to break the foam and convert it to a liquid. These liquid surfactants that are being removed from the wastewater (135 gals per day) are pumped into the surfactant residue tank (EP140). The liquid surfactant will be hauled off-site by Reckitt Benckiser for disposal elsewhere.

Wastewater is then pumped through the peroxide treatment tank where hydrogen peroxide (50%) is pumped from an existing tank and ferric chloride (33%) is pumped from 55-gallon drums in the wastewater treatment room. From there the wastewater is then pumped into the mixing tank where chemical conditioning occurs. At this stage, 55-gallon drums of sodium carbonate, calcium nitrate, potassium di-hydrogen phosphate and disodium hydrogen phosphate, all at 20% concentrations are pumped directly into the mixing tank from the wastewater treatment room. At this point, an additional 145 gals per day has been converted to biomass.

Wastewater then flows through an anaerobic tank, aerobic tank, and then to the Turbo Reactor (T-MBBR) treatment tank. During this process, the organic load is reduced. The unique design of these series of tanks results in anoxic decomposition taking place within the series of tanks on the inner surface, while on the outside corrugated surface, the process is aerobic. The oxygen demand for the decomposition process is provided by the central air lift aerator providing micro bubbles inside the central pipe which saturate the wastewater with oxygen and simultaneously force the wastewater up to the surface. This oxygen rich fluid then passes downward into the aeration chamber in intimate contact with the carriers. Because the carriers have a Relative Density less than one, they will always try to rise towards the surface, but are constantly forced downward under the pressure of the aerated wastewater. These two forces ensure that there is constant upward and downward motion of the carriers within the aeration chamber. The purified water rises up the outer compartment of the Turbo Reactor to the effluent flange and flows by gravity to the Clarifier tank for final settlement before discharge. Any remaining biomass will settle to the bottom of the clarifier tank and will be continuously recycled back to the mixing tank.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the EPA WebFIRE for SCC number 50100701, engineering calculations or manufacturer supplied rates. Engineering emission factors were calculated by taking the total VOCs, which are 2.95% of the liquid and dividing by the total liquids used at Reckitt Benckiser. This assumes 100% volatilization of all VOCs in the raw liquids as a worst-case scenario. Manufacturer's emission rates are supplied by BioShaft.

The following table provides an emissions summary for this project. Existing potential emissions were taken from the annual emission reporting. Please note that two emission units (MoEIS IDs: EU07 and EU10) are included in the potential to emit and actual emission values that do not emit to the atmosphere. Existing actual emissions were taken from the installation's 2012 MoEIS/EIQ. Potential emissions of the

application represent the potential of the new equipment/modified equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emissions (2012 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	39.18[1]	--[2]	--	39.18
PM_{10}	15.0	39.18[3]	0.56	--	39.18
$PM_{2.5}$	10.0	39.18[4]	0.56	--	39.18
SOx	40.0	0.02	--	--	0.02
NOx	40.0	9.12	--	--	9.12
VOC	40.0	0.74	0.24	12.56	13.30
CO	100.0	4.51	--	--	4.51
GHG (CO_2e)	75,000 / 100,000	9,358.40	1,556.25	472.16	9,830.56
GHG (mass)	0.0 / 100.0 / 250.0	9,303.47	1,547.12	67.09	9,370.56
HAPs	10.0/25.0	--	--	0.03	--

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants for this project are below de minimis levels.

APPLICABLE REQUIREMENTS

Reckitt Benckiser shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information,* 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065

[1] PM potential and actual emissions include two emission units that do not emit to atmosphere.
[2] "--" indicates not applicable or not determined.
[3] PM_{10} potential and actual emissions include two emission units that do not emit to atmosphere.
[4] $PM_{2.5}$ potential and actual emissions include two emission units that do not emit to atmosphere.

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted without special conditions.

_____ _____

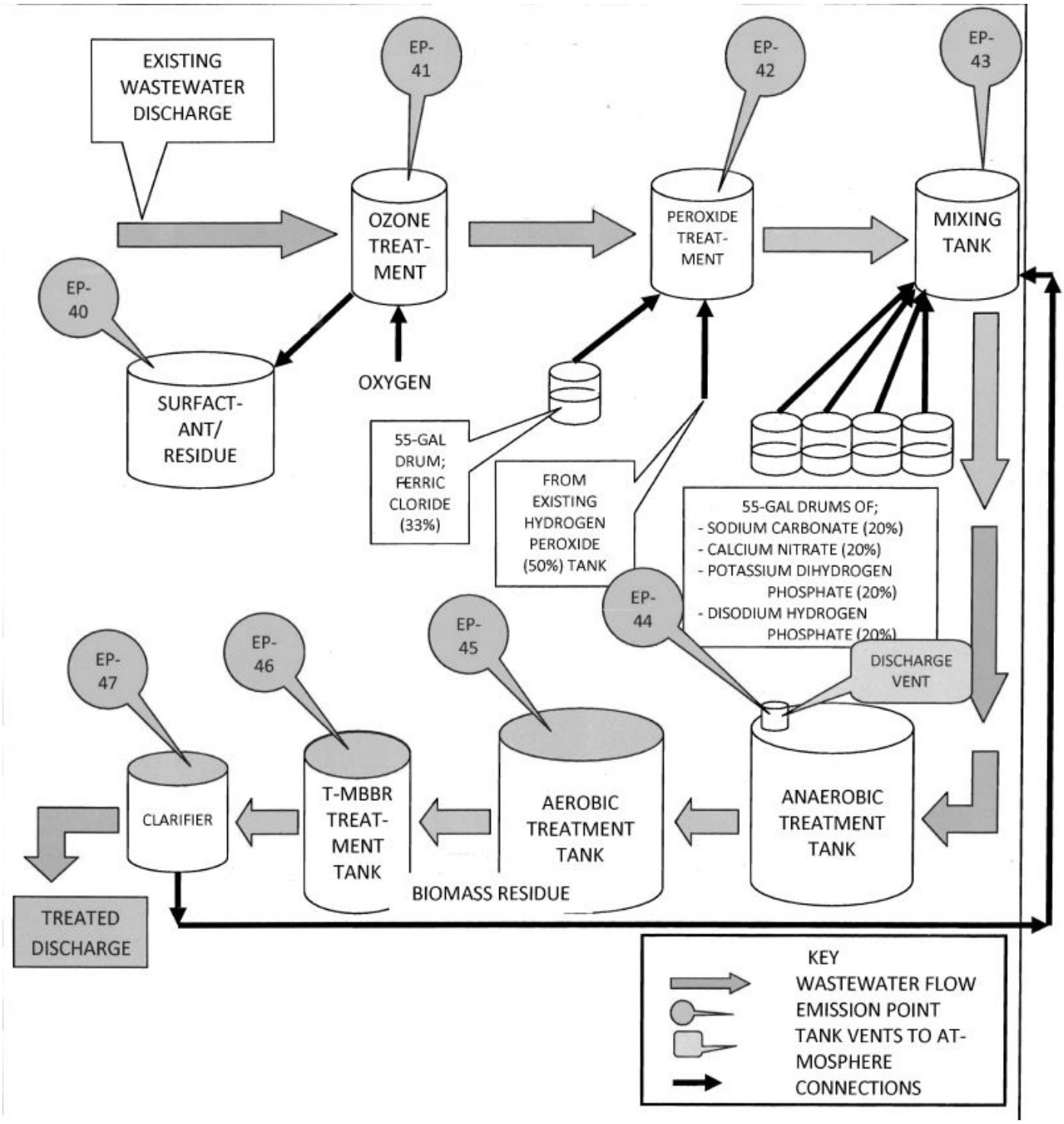
Randy Raymond Date
New Source Review Unit

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The *Application for Authority to Construct* form, dated October 18, 2013, received October 22, 2013, designating Reckitt Benckiser as the owner and operator of the installation.

Attachment A – Project Process Flow Diagram

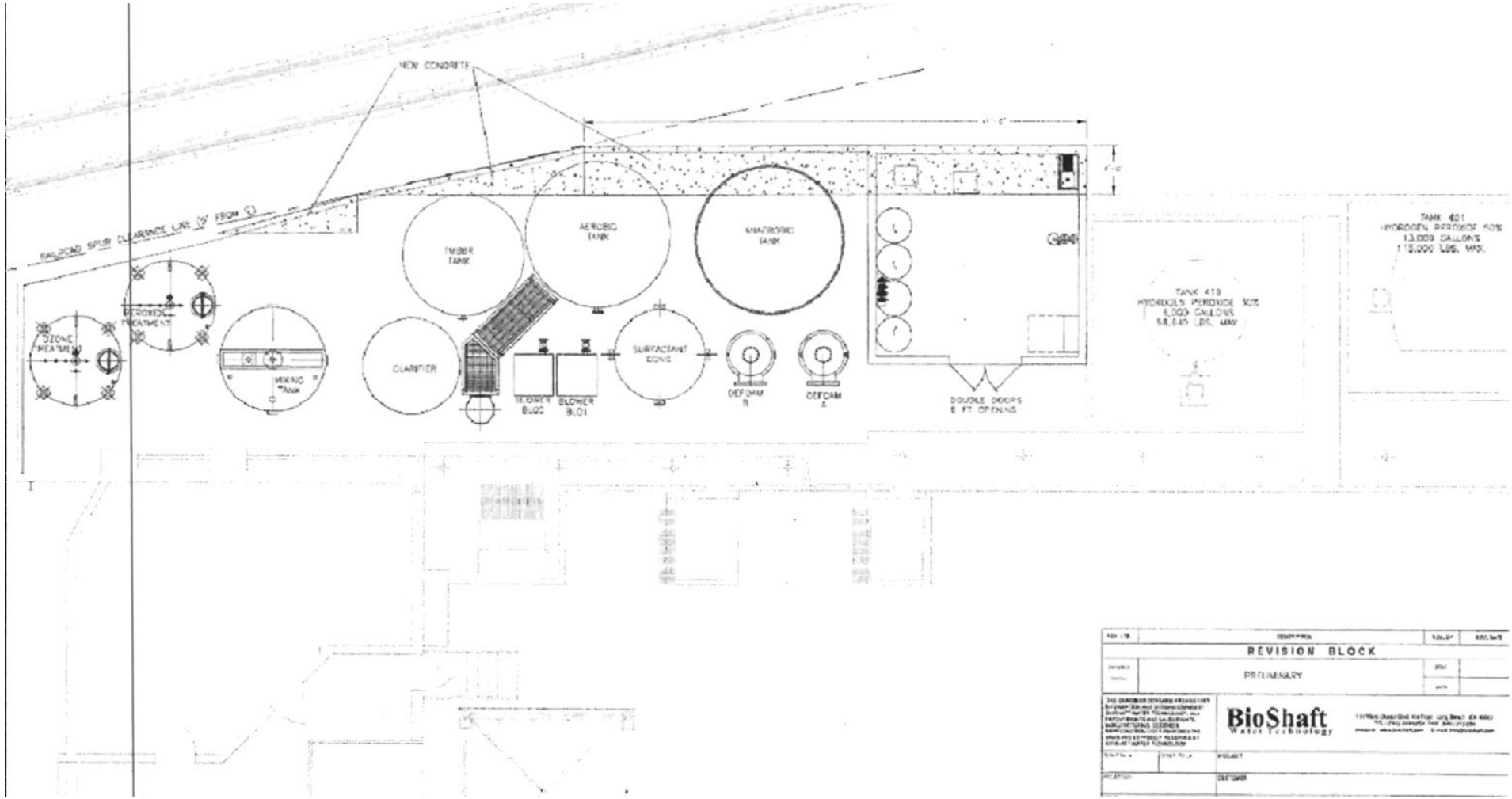


Attachment B – Project Emissions Summary

Emission Point	Description	Material	Throughput (TP)	MHDR	MHDR (TP Units)	Pollutant	Uncontrolled Emissions (lb/hr)	Control Device	Total Emissions (lb/hr)	Total Emissions (TPY)
EP-40	SURFACTANT RESIDUE TANK (2500 GAL)	surfactant residue	49.1	0.0056	1000 gals	VOC	5.0063E-05		0.0001	0.0002
EP-41	OZONE TREATMENT TANK (2500 GAL) - BREATHING LOSS	wastewater	2.5	0.0003	1000 gals	VOC	7.0449E-05		0.0001	0.0003
	OZONE TREATMENT TANK (2500 GAL) WORKING LOSS		14,550.7	1.6656			4.1003E-01	none	0.4100	1.7959
EP-42	PEROXIDE TREATMENT TANK (2500 GAL) - BREATHING LOSS	wastewater	2.5	0.0003	1000 gals	VOC	7.0449E-05		0.0001	0.0003
	PEROXIDE TREATMENT TANK (2500 GAL) - WORKING LOSS		14,534.3	1.6637			4.0957E-01		0.4096	1.7939

Emission Point	Description	Material	Throughput (TP)	MHDR	MHDR (TP Units)	Pollutant	Uncontrolled Emissions (lb/hr)	Control Device	Total Emissions (lb/hr)	Total Emissions (TPY)
EP 43	MIXING TANK (3000 GAL) - BREATHING LOSS	wastewater	3.0	0.0003	1000 gals	VOC	8.4539E-05		0.0001	0.0004
	MIXING TANK (3000 GAL) - WORKING LOSS		14,534.3	1.6637			4.0957E-01		0.4096	1.7939
EP-44	ANAEROBIC TREATMENT TANK (18,000 GAL)	wastewater	18.0	0.0021	1000 gals	VOC	5.0723E-04		0.0005	0.0022
						Methane	4.7663E-03		0.0048	0.0209
						CO2	1.4181E-02		0.0142	0.0621
						Ammonia	4.7748E-06		0.0000	0.0000
						H2S	4.7748E-06		0.0000	0.0000
	ANAEROBIC TREATMENT TANK (18,000 GAL)	wastewater	14,534.3	1.6637	1000 gals	VOC	4.0957E-01		0.4096	1.7939
						Methane	3.8486E+00		3.8486	16.8569
						CO2	1.1450E+01		11.4503	50.1510
						Ammonia	3.8555E-03		0.0039	0.0169
						H2S	3.8555E-03		0.0039	0.0169
EP-45	AEROBIC TREATMENT TANK- OPEN (18,000 GAL)	wastewater	14,534.3	1.6637	1000 gals	VOC	4.0957E-01		0.4096	1.7939
EP-46	T-MBBR TREATMENT TANK-OPEN (9,000 GAL)	wastewater	14,534.3	1.6637	1000 gals	VOC	4.0957E-01		0.4096	1.7939
EP-47	CLARIFIER TANK -OPEN (3000 GAL)	wastewater	14,534.3	1.6637	1000 gals	VOC	4.0957E-01		0.4096	1.7939

Attachment C – Equipment Layout



APPENDIX A

Abbreviations and Acronyms

% ..... percent
ºF ..... degrees Fahrenheit
acfm ..... actual cubic feet per minute
BACT ..... Best Available Control Technology
BMPs ..... Best Management Practices
Btu..... British thermal unit
CAM ..... Compliance Assurance Monitoring
CAS..... Chemical Abstracts Service
CEMS ..... Continuous Emission Monitor System
CFR ..... Code of Federal Regulations
CO ..... carbon monoxide
CO_2..... carbon dioxide
CO_2e..... carbon dioxide equivalent
COMS..... Continuous Opacity Monitoring System
CSR..... Code of State Regulations
dscf ..... dry standard cubic feet
EIQ ..... Emission Inventory Questionnaire
EP..... Emission Point
EPA ..... Environmental Protection Agency
EU..... Emission Unit
fps ..... feet per second
ft ..... feet
GACT ..... Generally Available Control Technology
GHG ..... Greenhouse Gas
gpm..... gallons per minute
gr..... grains
GWP..... Global Warming Potential
HAP..... Hazardous Air Pollutant
hr..... hour
hp ..... horsepower
lb ..... pound
lbs/hr..... pounds per hour
MACT ..... Maximum Achievable Control Technology
µg/m^3..... micrograms per cubic meter
m/s ..... meters per second
Mgal ..... 1,000 gallons
MW ..... megawatt
MHDR..... maximum hourly design rate
MMBtu.... Million British thermal units
MMCF..... million cubic feet
MSDS ..... Material Safety Data Sheet
NAAQS... National Ambient Air Quality Standards
NESHAPs ..... National Emissions Standards for Hazardous Air Pollutants
NO_x..... nitrogen oxides
NSPS..... New Source Performance Standards
NSR..... New Source Review
PM ..... particulate matter
$PM_{2.5}$..... particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}..... particulate matter less than 10 microns in aerodynamic diameter
ppm ..... parts per million
PSD ..... Prevention of Significant Deterioration
PTE..... potential to emit
RACT..... Reasonable Available Control Technology
RAL ..... Risk Assessment Level
SCC..... Source Classification Code
scfm ..... standard cubic feet per minute
SIC..... Standard Industrial Classification
SIP..... State Implementation Plan
SMAL ..... Screening Model Action Levels
SO_x..... sulfur oxides
SO_2..... sulfur dioxide
tph..... tons per hour
tpy ..... tons per year
VMT..... vehicle miles traveled
VOC..... Volatile Organic Compound

Ms. Lynn Feagan-Wilson
Principal Contact
Reckitt Benckiser
30 Arrowhead Industrial Park
St. Peters, MO 63376

RE: New Source Review Permit - Project Number: 2013-10-052

Dear Ms. Feagan-Wilson:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. The document entitled, "Review of Application for Authority to Construct", is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Randy Raymond, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:rrl

Enclosures

c: St. Louis Regional Office
PAMS File: 2013-10-052

Permit Number: