# MIDWEST TESTING LABORATORIES

2645 Gravois Avenue. St. Louis, MO 63118. (314) 773-3035 . FAX (314) 773-3519

ANALYTE	EFFLUENT # 004	MDL
Benzo(g,h,l)perylene	ND	0.010
Benzo(k)fluoranthene	ND	0.010
Bis(2-chloroethoxy)methane	ND	0.010
Bis(2-chloroethyl)ether	ND	0.010
Bis(2-chloroisopropyl)ether	ND	0.010
Bis(2-ethylhexyl)phthalate	ND	0.010
Butyl benzyl phthalate	ND	0.010
Chrysene	ND	0.010
Dibenzo(a,h)anthracene	ND	0.010
Diethyl phthalate	ND	0.010
Dimethyl phthalate	ND	0.010
Di-n-butyl phthalate	ND	0.010
Di-n-octyl phthalate	ND	0.010
Fluoranthene	ND	0.010
Fluorene	ND	0.010
Hexachlorobenzene	ND	0.010
Hexachlorobutadiene	ND	0.010
Hexachlorocyclopentadiene	ND	0.021
Hexachloroethane	ND	0.010
Indeno(1,2,3-cd)pyrene	ND	0.010
Isophorone	ND	0.010
Naphthalene	ND	0.010
Nitrobenzene	ND	0.010
N-Nitrosodimethylamine	ND	0.021
N-Nitroso-di-n-propylamine	ND	0.010
N-Nitrosodiphenylamine	ND	0.010
Pentachlorophenol	ND	0.021
Phenanthrene	ND	0.010
Phenol	ND	0.010
Pyrene	ND	0.010

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ND: Not Detected / MDL: Method Dection Limit Identification of tested specimens provided by the client.

MIDWEST TESTING LABORATORIES

DINESH N. SHAH Laboratory Manager

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# MIDWEST TESTING LABORATORIES

2645 Gravois Avenue. St. Louis, MO 63118. (314) 773-3035 . FAX (314) 773-3519

Date: September 1, 2015 Lab. No.: 2015MT0434 Invoice No.: 215304

CITY OF EUREKA City Hall, P.O. Box 125 100 City Hall Drive Eureka, Missouri 63025

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ATTENTION: Mr. Bob Wade

**REPORT OF TESTS** 

SAMPLE MATRIX : Water SAMPLE I.D. : Effluent # 004 SAMPLE TAKEN : 8-18-15 DATE RECEIVED : 8-18-15 DATE ANALYZED : 8-24-15 RESULTS: ug/L OR PARTS PER BILLION (PPB)

VOLATILE ORGANICS EPA 600 METHOD 624 BY GC/MS

ANALYTE	EFFLUENT # 004	MDL
1,1,1-Trichloroethane	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,1,2-Trichloroethane	ND	5.0
1,1-Dichloroethane	ND	5.0
1,1-Dichloroethene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dichloroethane	ND	5.0
1,2-Dichloropropanc	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
2-Chloroethyl vinyl ether	ND	20.0
Acrolein	ND	100
Acrylonitrile	ND	5.0
Benzene	ND	2.0
Bromodichloromethane	ND	5.0
Bromoform	ND	5.0
Bromomethane	ND	10
Carbon tetrachloride	ND	5.0
Chlorobenzene	ND	5.0
Chloroethane	ND	10
Chloroform	ND	5.0
Chloromethane	ND	10
Cis-1,3-Dichloropropene	ND	5.0
Dibromochloromethane	ND	5.0
Ethylbenzene	ND	5.0
M,p-Xylenes	ND	5.0

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# MIDWEST TESTING LABORATORIES

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2645 Gravois Avenue. St. Louis, MO 63118. (314) 773-3035 . FAX (314) 773-3519

ANALYTE	EFFLUENT # 004	MDL
Methylene chloride	ND	5.0
o-Xylene	ND	5.0
Tetrachloroethene	ND	5.0
Toluene	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
Trichloroethene	ND	5.0
Trichlorofluoromethane	ND	5.0
Vinyl chloride	ND	2.0
Xylenes, Total	ND	5.0

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ND: Not Detected / MDL: Method Detection Limit

. . . .

Identification of tested specimens provided by the client.

MIDWEST TESTING LABORATORIES

DINESH N. SHAH Laboratory Manager



Pace Analytical Berriees, Inc. 9606 Loiret Bivd. Lenexa, KS 66219 Phone: 913.599.5665 Fax: 913 599.1759

July 20, 2015

Dinesh Shah Midwest Testing Lab, Inc 2645 Gravois Ave. St. Louis, MO 63118

Re Lab Project Number: 60198426 Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the budy of the report.

If you have any question concerning this report, please feel free to contact me.

Sincerely,

Dim Hanell

Tim Harrell Tim Harrell@pacelabs.com Technical Director

### **REPORT OF LABORATORY ANALYSIS**

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PACE # 60198426

Pace Analytical Services, Inc. 9608 Lairet Bird. Lenexa, KS 66219 Phone: 913.599.5665 Fax: 913.599.1759

# Pace Analytical Services, Inc.

# 808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Dinesh Shah Midwest Testing Lab, Inc 2645 Gravols Ave. St. Louis, MO 63118 1-314-773-3035

Date Reported:	7-20-15
Date Initiated:	
Time Set:	11:30
Date Terminated:	7-17-15

#### **BIOMONITORING STUDY**

#### ACUTE TOXICITY

#### Permit # MO-0039659

#### FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from City of Eureka effluent discharge. Acute toxicity, as defined by significant mortality for at least one of two aquatic test species during a 48 hour period of exposure, was not detected in <u>Ceriodaphnia</u> exposed to the 100% effluent (AEC), and was not detected in fathead minnows exposed to the 100% effluent. The LC50 for the <u>Ceriodaphnia</u> was >100% and >100% for the <u>Pimephales</u>. The test species utilized in this test were the water flea, <u>Ceriodaphnia</u> dubia and the fathead minnow, <u>Pimephales</u> prometas. Detailed results of the toxicity testing are provided in the Acute Foxicity Reports. In addition to the acute toxicity testing, water temperature, pH, dissolved oxygen, total hardness, total alkalinity, conductivity, and chlorine determinations were performed on the effluent and control samples

#### SAMPLING PROCEDURES:

City of Euroka personnel collected a sample at City of Euroka effuent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

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#### INTRODUCTION:

The purpose of this test was to determine the acute toxicity of City of Eureka effluent on the freshwater invertebrate, <u>Ceriodaphnia</u> dubia and the fathead minnow, <u>Pimephalas</u> prometas. These tests were conducted at Pace Analytical Services, Inc., Frontenac, KS.

#### TEST ORGANISMS:

<u>Ceriodaphnia</u> <u>dubla</u>. The genetic stock of <u>Ceriodaphnia</u> <u>dubia</u> used in this scure toxicity Test were originally obtained from a private breeder. <u>Ceriodaphnia</u> are cultured in house at Pace Analytical Services. Inc. Culture methods of <u>Ceriodaphnua</u> were obtained from <u>EPA821-C-02-006</u> November 2002.

<u>Pimephales prometas</u> - The fathead minnows used in this acute toxicity test were cultured in-house at Pace Analytical Services. Inc., Frontenac, KS and/or were obtained from a private breeder. Fathead minnows are maintained at Pace Analytical Services until use for acute toxicity between the ages of 1 and 14 days. Information for culturing fathead minnows was taken from <u>EPA821-C-02-006</u> November 2002.

#### MATERIALS AND METHODS:

Procedures used in the acute toxicity tests are described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (USEPA, 2002).

City of Eureka personnel collected the effluent tested from City of Eureka discharge. Testing was performed using a 100% effluent, a series of dilutions, an upstream, and a synthetic control. The toxicity test was initiated within 36 hours of sample collection.

Effluent and synthetic control test solutions were not aerated during the testing period.

#### Ceriodaphnia ACUTE METHODS:

This static test was ran using 40 ml glass vials containing 25 ml of test solution. Food was administered before the test. Five <u>Corjodaphnia</u> neonates (<24 hr old) were randomly solected and placed in each of 4 replicates of test solution. A total of 20 organisms per concentration were tested. Observations of mortality were made at 24 and 48 hours of exposure.

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PACE # 60198426

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#### Pimephales ACUTE METHODS:

This static toxicity test was conducted using 500 ml polypropylene container as test chambers containing 250 ml of test solution. Food was administered prior to test initiation, but not during the testing period. Ten <u>Pimephales</u>. 1 - 14 days old, from a single spawn, were randomly selected and placed in each of 4 test chambers. A total of 40 organisms were exposed to each test concentration. Observations of mortality were made at 24 and 48 hours of exposure.

#### WATER QUALITY METHODS:

Prior to test initiation, temperature, dissolved uxygen, pH, total alkalinity, total bardness, and total residual chlorine were measured in the effluent and in the controls At 24 and 48 hours of exposure, temperature, dissolved oxygen, pH, and conductance were measured in the effluent sample and the controls.

#### DATA ANALYSIS:

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Statistically significant (p=0.05) mortality is determined by Dunnet's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations (LC50) are calculated using effluent concentrations and their corresponding percent mortality data. The LC50's and the 95% confidence intervals are calculated where appropriate by the Spearman-Karber method. Statistical analysis is accomplished by following steps in EPA/600/4-90/027F, August 1993 and by use of Toxstat version 3.4.

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#### **RESULTS:**

THE <u>Ceriodaphnia</u> MORTALITY RESULTS - There was no significant mortality observed of the freshwater invertebrate. <u>Ceriodaphnia</u> dubia, during the 48 hour exposure period to the 100% effluent concentrations. There was no significant mortality in the synthetic control. The LC50 value of the sample to <u>Ceriodaphnia</u> is approximately >100%

#### Ceriodaphaia MORTALITY DATA

#### # ALIVE

CONC	1 000 4	- NOURE	24 HOURS	ARUOUDE	TE MORT
conc	NEF #	OHOUKS	24 HOURS	46 11/080	7ª MUKI
SYNTHETIC	1	5	5		0
4	2	5	5	5	0
•	T 3	5	5	5	0
	4	5	5	5	0
Upstream	1	5	5	5	0
*	2	5	5	5	0
	3	5	5	5	0
<b>14</b>	4	5	5		0 0
6.25%		5	5	5	
	2	5	5	5	0
"		. 5.	5	5	0
	4		5	5	
12.5%			5		0
		5		S	0
	3	5		5	0 0 0
25%	4 . 4			5	0
4378		3		5	
6			2		0
	1 4				0
34%		5			0
			· · · ·		0
	3		5	5	0
	4	5	5	5	0
50%	1 1	5	5	5	0
	2	s	5	5	0
	3	5		5	0
**	4	5	5_	5	.0
100%	1.1-1	5	5		0
	2	5	5	5	
	1 3			. S	
	1 4	5	5	5	

#### AVG. MORTALITY@AEC (100% EFFLUENT) =0.0%

### REPORT OF LABORATORY ANALYSIS

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THE <u>Pimephales</u> RESULTS - Minnows exposed to effluent collected at City of Eureka effluent discharge exhibited no significant mortality in the 100% effluent concentration during the 48 hr exposure period. The synthetic control showed no significant mortality during the testing period. The LC50 value of the effluent to fathead minnows is estimated to be >100%.

CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORTALITY
SYNTHETIC	1	10	10	10	0
"	2	10	10	10	0
4	3	10	10	10	0
"	4	10	10	10	0
Upstream	1	10	10	10	0
	2	10	10	10	0
	3	10	10	10	0
**	4	10	10	10	0
6.25%	1	10	10	10	0
11	2	10	10	10	0
	3	10	10	10	0
	4	10	10	10	0
12.5%	1	10	10	10	0
	2	10	10	01	0
	3	10	10	10	0
4	4	10	10	10	0
25%	1	10	10	10	0
4	2	10	10	10	0
	3	10	10	10	0
*	4	10	10	10	0
34%	1	10	10	10	0
<b>i</b> 4	2	10	10	10	0
H	3	10	10	10	0
44	4	10	10	10	0
50%	1	10	10	10	0
	2	10	10	10	0
h	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	10	0
"	2	10	10	10	0
	3	10	10	10	0
••	4	10	10	10	0

AVG. MORTALITY @ AEC (100% EFFLUENT) =0.0%

**REPORT OF LABORATORY ANALYSIS** 

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#### WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl2) - The effluent sample from City of Eureka discharge had <0.1 mg/l detectable level of total residual chlorine upon receipt in the laboratory.

Dissolved Oxygen (D.O.) - Dissolved oxygen reading of the 100% effluent sample was 7.80 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.60 mg/l in the 100% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 100% effluent was 7.75 upon receipt in the laboratory and the synthetic control had a 7.72. At termination the pH measurement in the 100% effluent sample was 8.78

Conductance - The conductance of the effluent sample was 1217 umhos and the synthetic control was 316 umhos.

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#### INITIAL WATER QUALITY:

#### Initial Measurements Synthetic Water

pН	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (ong/1)	Alk (mg/l)
7.72	8.10	316	<0.1	25.0	96	62

#### Initial Measurements of Lipstream

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.68	8.50	267	<0.1	25.0	146	128

#### Initial Measurements of 100% Fiffuent

PH	D.O. (mg/l)	Cond. (umhos)	C12 (mg/1)	Temp (C)	Hard (mg/1)	Alk (mg/l)
7.75	7.80	1217	<0.1	25.0	448	252

#### TEST WATER QUALITY:

#### 24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.82	7.40	25.1	362
Upstream	8.11	7.70	25.1	289
6.25%	8.11	7.70	25.1	369
12.5%	8.10	7.70	25.1	408
25%	8.07	7.70	25.1	586
34%	8.06	7.70	25.1	689
50%	8.04	7.70	25.1	847
100%	8.01	7.70	25.1	1465

#### 48-hour Water Quality Measurements

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EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umbos)
Synthetic	7.97	7.30	25.1	388
Upstream	8.52	7.50	25.1	397
6.25%	8.59	7.50	25.1	416
12.5%	8.63	7.50	25 1	438
25%	8.66	7.50	25.1	612
34%	8.69	7.50	25.1	698
50%	8.72	7.50	25.1	866
100%	8.78	7.60	25.1	1515

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#### QUALITY ASSURANCE:

The absence of control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations is nut due to contaminants or variations in test conditions. Reference toxicity tests are routinely performed by staff members of our Toxicology Department.

#### REFERENCE TOXICANT (NaCI) Ceriodaphnia # OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
3.0 g/l	20	2	0
2.5 g/l	20	16	10
2.0 g/1	20	20	20
1.5 g/l	20	20	20
1.0 1/1	20	20	20

LC50 ~ 2.50 g/1 NaCl

#### REFERENCE TOXICANT (NaCl) <u>Pimsphales</u> # OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSUR		
10.0 g/l	40	2	0		
8.0 g/l	40	34	22		
6.0 g/l	40	38	37		
4.0 g/l	40	40	40		
20 g/l	40	40	40		

LC50 = 8.31 g1 NaCl

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Submitted By: ' **Timothy Harrell Technical Director** 

### **REPORT OF LABORATORY ANALYSIS**

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PENALT HUNDREA         PESALT DUTFALL HARRER           COTTECTOR & MAXE         PESALT DUTFAL HUNDRER         PESALT DUTFAL HUNDRER           RECENTED STRUCT CONCENTRATION (ALC)         If // I & IT EVANTE TYPE (CRECE ON )         If // I & IT EVANTE TYPE (CRECE ON )           PESALT ALLOWING EVERY CONCENTRATION (ALC)         If // I & IT EVANTE TYPE (CRECE ON )         If // I & IT EVANTE TYPE (CRECE ON )           PESALT DUTT ONLY MAXED AND IN TAXON (ALC)         UPSTREAM SAMPLE TYPE (CRECE ON )         If // I & IT EVANTE TYPE (CRECE ON )           PERALT DEFRUENCE ON FULLY ONLY MAXED AND INTERVIEW ONLY AND AND AND INTERVIEW ONLY AND AND AND INTERVIEW ONLY AND AND INTERVIEW ONLY AND AND INTERVIEW ONLY AND AND INTERVIEW ONLY AND AND AND AND AND AND AND AND AND INTERVIEW ONLY AND AND AND AND AND AND AND AND AN	FACELITY NAME			DATE AND TIME COLLECTED					
COTHECTOR & MAXE         RECOVERD STIFLAM COLLECTOR BITE AND OF SCREPTION         PERMET ALLOWINGLE BERLUENT CONCENTRATION (ALC)         LAMPLE MLANDER         LAMPLE MLANDER         CHILLENT         LANDALE MLANDER         CHILLENT         LANDALE MLANDER         CHILLENT         LANDAL MLANDAL         CHILLENT         LANDAL         CHILLENT         LANDAL         CHILLENT         LANDAL         CHILLENT         LANDAL         CHILLENT         LANDALENT         LET LUNATION	bridges and men			EFFLUENT UPSTREAM					
RECKMING STREAM COLLECTION BITE AND (G SCHEPTION PERMIT ALLOWINGLE FOR USER CONCENTRATION (AFC)  If ULL ST EAWREE TOPE COMPOSITE GRAB OTHER  PERMIT DEPENDENT ONLY WARKEN SETATORY OF COMPOSITE GRAB OTHER  PERMIT DEPENDENT ONLY WARKEN SETATORY OF COMPLETED IN FULL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE ANALOWING WARKEN  DIBLACAL SERVICES  ACUTE  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORMING LABORATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORM  DUBLA CAL ADDRATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGT ANALER  BUIL BY PERFORM  DUBLA CAL ADDRATORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE  TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  PACE ANALYTICAL SERVICES  ACUTE TESTINGTORY  ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTINGTORY ACUTE TESTI	PERMIT RUNDER			PERMIT OUTFALL MUMBER					
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□ 24 HR COMPOSITE         □ GRAB         □ OTHER	ECLIMING STHEAM COLLECTION BITE AND DE	SCRIPTION		- <u>Lastran</u> tes - Lastra - Lastra - Maria - Maria					
EFFLUENT       UPSTREAM       24 HR COMPOSITE       GRAB       OTHER_         Exercited FFRUDRT DAY MAXADALIN INTATION FOR       AMMACONT CAN MAXIMUM UNITATION FOR       AMMACONT CAN MAXIMUM UNITATION FOR         *ART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY       THET INF       AMMACONT       AMMACONT         *ACE ANALYTICAL SERVICES       Acute       AMMACONT       THET INF         YACE ANALYTICAL SERVICES       Acute       Ital LAMATON         YATEMENT DURA TO ANALYTICAL SERVICES       ACUTE       Ital LAMATON         YATEMENT DURA TO ANALYTICAL SERVICES       ACUTE       Ital LAMATON         YATEMENT DURA TO ANALYTICE       DEPLEMENT       DURA COMATESERVIT	ERMIT ALLOWABLE EFFLUENT CONCENTRAT	ON (AFC)	•••••						
SMATTED BYPAUDIT DAX VAXAALIVI, BATIATION FOR       PERMITTED EPRUENT DAX VAXABLINI, BATIATION FOR       PERMITTED EPRUENT DAX VAXABLINI, BATIATION FOR       DHILDRIVE       DHILDRIVE       DHILDRIVE       DHILDRIVE       DATE OF DE COMPLETED IN FULL BY PERFORMING LABORATORY       DATE OF DE COMPLETED IN FULL BY PERFORMING LABORATORY       DEFORMING LABORATORY       TEST TYPE       Actute       NUMPLE DEFORMING LABORATORY       DEFORMITTED PROR TO ANALYSING TO ANALYSING TO									
CHLORINEmg/L       AMMONIAmg/L         ART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY       Test information         Devolution Laborationy       Test information         ACCE ANALYTICAL SERVICES       Acute         Not REPORT MARER       Itest Laboration         0198428       48 HOURS         ATT ACE ANALYTICAL SERVICES       Test information         ACCE ANALYTICAL SERVICES       Acute         Not REPORT MARER       Itest Laboration         0198428       48 HOURS         ATT AN THE BARFICE RELIANT ILSTAGE       Itest Information         V17/15       EPA 2000 AND 2002         ATT AND THE BARFICE RELIANT ILSTAGE       Itest Information         V17/15       11:30       7/11/15 12:00         AMPLE ANDRALED PROR TO ANALYSISTED YES ID NO       TO STREAM       DUBLA 24 HOURS         FFLUENT       UPSTREAM       DUBLA 24 HOURS IN MARCE       FATHEAD 8 DAYS         AT ACC       DUBLA 24 HOURS IN FROMINE IN BORTALITY       UPSTREAM       DUBLA 24 HOURS IN FROMINE IN CONTRAL IN ACC         IFFLUENT       UPSTREAM       SWITHETE CONTRAL 10 BORTALITY       UPSTREAM       DUBLA 10 BORTALITY         IFFLUENT       UPSTREAM       Iffee BEAT A 1 BCC 10 BORTALITY       UPSTREAM       DUTAT ACC 100 CONTRAL 10 BCANASH REPERCENT MCC 100 CONSH R									
PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY       ENGINEE COMPLETED IN FULL BY PERFORMING LABORATORY       ENGINEE COMPLETED IN FULL BY PERFORMING LABORATORY       TENT INFO       TENT INFO       NOT BLE COMPLETED IN FULL BY PERFORMING LABORATORY       TENT INFORM       INFORMATION       NOT BLE SAMPLITS RECOMPLATE SERVICES       ALL REPORT MARKET       TENT INFORMATION       AND RECOMPLETED IN FULL BY PERFORMING LABORATORY       ITENT INFORMATION       AND RECOMPLETED IN FULL BY PERFORMATION       INFORMATION PERFORMATION PERFORMATION       AND RECOMPLETED IN FULL BY PERFORMATION       INFORM TO ANALYSIST D'PES BY NO       IFFUENT UPSTREAM       DEFILIENT       OPTIME RECOMPAREMENT AND REACE       FATHERO PERCENT MECHANISM PERFORMATION       IFFUENT       UPSTREAM       DEFILIENT       UPSTREAM       DEFILIENT       UPSTREAM		IN FOR			LINETATION FOR				
ACE ANALYTICAL SERVICES     Acute       NAL REPORT NAMEER     Ital LAN JOH       0198428     48 HOURS       ATE AND THE SUMPLY INCLUSANT IT STALL     ITAL REPORT       ATT AND THE SUMPLY STACK MEDIAT LABORATORY     ITAL REPORT       115/15     10:35       ATE AND THE SUMPLY ARCENDIAT LABORATORY     ITAL REPORT       115/15     10:35       ATE AND THE SUMPLY ARCENDIAT LABORATORY     ITEST START DATE AND ADE       INFL DECOLORMATED PRICE TO ANALYSINT [] YES [] NO     ITEST ONGANESM IF AND ADE       FFLUENT     UPSTREAM       UPSTREAM     DUBIA <24 HOURS	ART 8 - TO BE COMPLETED IN	FULL BY PERFOR	RMING LA						
Null REPORT MUMBER         Itest building           0198426         48 HOURS           YITC OF LAT REFERENCE TUREANT ITESTAND         TEST START DATE AND TORE           YITC OF LAT REFERENCE TUREANT ITESTAND         TEST START DATE AND IME.           YITC OF LAT REFERENCE         TEST START DATE AND IME.           YITC OF LAT REFERENCE         TEST START DATE AND IME.           YITS/15 10:35         7/17/15 11:30           WITLE DECK DRINGTO FOR TO ANALYSIST         YES Ø NO           FFLUENT         UPSTREAM           DUBIA <24 HOURS		<b>.</b>							
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7/15/15 10:35       7/15/15 11:30       7/17/15 12:00         AMPLE DECK DRIVATED PRICE TO AMALYSINT □ YES IS NO       TEST ORGANISM IF AND ACE       FATHEAD 8 DAYS         FFLUENT       UPSTREAM       DUBIA <24 HOURS									
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NUPLE FRITBREDI FRUCH TO ANALYSIS*     YES     NO     IS OFFICENT OF CATER SURVAL IN SYMTHETIC CONTROL?     OF UTION WATER USED TO ACTIVE A UPSTREAM       LTER MLSH BLVE SUR / LTER MLSH BLVE SUR / LTER MLSH BLVE SUR / LTER MLSH BLVE SUR /     UPSTREAM     IF UPSTREAM     OFFICENT OF CATER SURVAL IN SYMTHETIC CONTROL?     OFFICENT INORTALITY AT AEC     OFFICENT OF CATER SURVAL IN SYMTHETIC CONTROL?     OFFICENT INORTALITY AT AEC     OFFICENT INORTALITY AT AEC     OFFICENT INORTALITY O     <									
FFLUENT       UPSTREAM       SWITHETIC CONTROL® YES       NO         LTER MLSH BLVE SATE /       EPTLUENT OR CANESAL #1 FLECENT MORTALITY AT AEC       UPSTREAM			T IC PERCE	ENT OR COPATER SURVIVAL IN	DE UTION WATER USED TO ACHE VE AEC				
AT AEC     0     AT AEC       0     UPSTREAM OR/AMBLU F' PERCENT MORTALITY     0       1 YES ⊠ NO     0     0       1 AUUTEOT     YES ⊠ NO     0       1 AUUTEOT     YES ⊠ NO     1       1 YES ⊠ NO     0     0       1 AUUTEOT     YES ⊠ NO     1       1 YES ⊠ NO     1     1       2 PASS     1     FAIL       2 PASS     1     715/15       3 M 2550B     7/15/15     7/15/15       3 M 4500-0 G     7/15/15     7/15/15       3 M 4500-0 G     7/15/15     7/15/15       3 M 4500-0 G     7/15/15     7/15/15	FFLUENT UPSTR		1		1				
0     0       YES ⊠ NO     0       TIST REBUT AT AFC FOR ORGANISM 67 PERCENT MORTALITY     0       TIST REBUT AT AFC FOR ORGANISM 67 PERCENT MORTALITY     0       TIST REBUT AT AFC FOR ORGANISM 67     TIST REBUT AT AFC FOR ORGANISM 67       FFLUENTUPSTREAMUPSTREAM     Image: Statt at AFC FOR ORGANISM 67       ART A - TO BE COMPLETED IN FULL BY PERMITTEE     METHOD       PARAMETER     RESULT     METHOD       PARAMETER     RESULT     METHOD       WHEN ANALYZE     500-01++ B     7/15/15       onductance (Allohs     1217     82EPA 120.1       TIST 15/15     5M 4500-O G     7/15/15       onductance (Allohs     1     SM 4500-O G     7/15/15	LTER MCSH DLVL SUZE /			T ORGANISH & PERCENT MORTALITY	LI FLUT HT ORGANISM IZ PERCEN' NORTALT				
MUME E AERATED DURING IT 6 FING?         UPSTREAM									
Instruction     UPSTREAM     Image: Page of the standard units     UPSTREAM     Image: Page of the standard units       PARAMETER     RESULT     METHOD     WHEN ANALYZE       PARAMETER     RESULT     METHOD     WHEN ANALYZE       emporeture +C     25     SM 2550B     7/15/15       H Standard Units     7.75     SM 4500-H+ B     7/15/15       onductance (Mohs     1217     82EPA 120.1     7/15/15       tesolved Oxygen mg/L     7.80     SM 4500-O G     7/15/15       otal Residual Chlorine mg/L     <.1			UPSTREAM URGANISM ** HI ROL NT MORTALITY		UPSTREAM ORGANISM IS PERCENT MONTAL				
PARAMETER         RESULT         METHOD         WHEN ANALYZE           emperature -C         25         SM 2550B         7/15/15           H Standard Units         7.75         SM 4500-H+ B         7/15/15           conductance julions         1217         82EPA 120.1         7/15/15           Hesolved Oxygen mg/L         7.80         SM 4500-O G         7/15/15           otal Residual Chlorine mg/L         < 1		EAM							
Emperature -C         25         SM 2550B         7/15/15           H Standard Units         7.75         SM 4500-H+ B         7/15/15           onductance µMohs         1217         82EPA 120.1         7/15/15           issolved Oxygen mg/L         7.80         SM 4500-O G         7/15/15           otal Residual Chlorine mg/L         <.1	ART A - TO BE COMPLETED IN	FULL BY PERMIT	TEE						
H Standard Units         7.75         SM 4500-H+B         7/15/15           onductance julions         1217         82EPA 120.1         7/15/15           hasolved Oxygen mg/L         7.80         SM 4500-O G         7/15/15           otal Residual Chlorine mg/L         <.1	PARAMETER			METHOD	WHEN ANALYZED				
Inductance µMohs         1217         82EPA 120.1         7/15/15           Issolved Oxygen mg/L         7.80         SM 4500-O G         7/15/15           Issolved Oxygen mg/L         <.1	emperature -C	25		SM 2550B	7/15/15				
Nasolved Oxygen mg/L         7.80         SM 4500-O G         7/15/15           otal Residual Chlorine mg/L         <.1	H Standard Units	7.75		SM 4500-H+ B	7/15/15				
otal Residual Chlorine mg/L < 1 SM 4500-CL G 7/15/15	ionductance philohs	1217		82EPA 120.1	7/15/15				
	lesolved Oxygen mg/L	7.80		SM 4500-O G					
Inionized Ammonis mg/L	otal Residual Chlorine mg/L I	< <u>.</u>		SM 4500-CL G	7/15/15				
	nionized Ammonis mg/L								
Total Alkelinity mg/L 252 SM 2320 B 7/15/15	Total Alkalinity mg/L	252		SM 2320 B	7/15/15				
Total Hardness mg/L 448 SM2340 C 7/15/15	Total Hardness mg/L	448		SM2340 C	7/15/15				
Recommended by EPA guidence, not a required analysis.	Recommended by EPA guidence, not	a nequired analysis.			9444-3 197				

MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM WHOLE EFFLUENT TOXICITY (WET) TEST REPORT (TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

Page 19 of 21

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- CONTINUED ON PAOL I

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#### WHOLE EFFLUENT TOXICITY (WET) TEST REPORT (Continued) (TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature -C	25	SM 2550B	7/15/15
pH Standard Units	7.6B	SM 4500-H+ B	7/15/15
Conductance philans	267	EPA 120.1	7/15/15
Dissolved Oxygen mg/L	8.50	SM 4500-0 G	7/15/15
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	7/15/15
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	128	SM 2320 B	7/15/15
Total Hardness mg/L	146	SM2340 C	7/15/15

\* Recommended by EPA guidance, not a required analysis

#### PRELIMINARY TEST ACCEPTABILITY MATRIX (FOR USE BY PERMITTEE IN DETERMINING TEST VALIDITY) MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE<sup>3</sup>

PERMIT ALLOWABLE EFFLUENT CONCENTRATION, or AEC: As indicated on permit. Test is invalid otherwise.

EFFLUENT SAMPLE TYPE: As indicated on permit. Test is invalid otherwise.

TEST TYPE: Acute Static Non-Renewel Test or other as indicated on permit Test is invalid otherwise.

TEST DURATION: Forty-eight hours or as indicated on permit. Test is invalid otherwise.

TEST ORGANISMS: As indicated on permit. Test is invalid otherwise.

DILUTION WATER USED TO ACHIEVE AEC: Upstream receiving water required if available.

TEST METHOD: The only acceptable method is the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freatwater and Marine Organisms, or other as specifically assigned by EPA for determining National Pollutant Discharge Elimination System, or NPDES, compliance. Test is invalid otherwise.

TEST START DATE AND TIME: Unless otherwise specified in writing by EPA, if >36 hours lapse between collection and initiation, test is invalid.

FILTER MESH SIEVE SIZE: Unlass otherwise specified in writing by EPA, if sieve size is smaller than 60 microns, test is invalid.

90 PERCENT OR GREATER SURVIVAL IN LABORATORY CONTROL(8) (Y/N): If no, test is invalid.

PARAMETER	RESULT	NOTEB	WHEN ANALYZED
Temperature -C	0-6	Unless received by the laboratory on the same day st	Upon receipt
		collected, values outside this range invalidate the test.	

<sup>3</sup> Where no upstream control is available, enter results from laboratory or synthetic control.

MO 780-1899 (07-08)

PAGE 2

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	OF THIS FORM FOR EACH OL	TFALL		
FACILITY NAME	FLEWICKY HO		0.397.150	
PART E - TOXICITY TESTING	: MO-		•• •	
17. TOXICITY TESTING DA		<del>.</del>	····	· · · • • • • • • • • • • • • • • • • •
	ERVIEW to dotermine whether F			د استاریک
Publicly owned treatment works tasks for agula or obmorph toxicit	s, or POTWs, meeting one or mo ty for each of the facility's dischar	re of the following criteria:	must provide the results o	f whole efficient toxicity
A. POTWs with a desir	in flow rate greater than or equal	to 1 million gallons per da	v	
	eatment program (or those that a			
	the permitting authority to submi			
species (minimu prior to the appli- on the range of r information repo- addition, this dat standard mathod If EPA methods - all of the informe	nece results must include quarter m of two species), or the results cation, provided the results show receiving water dilution. Do not in rted must be based on data collo a must comply with QAQC requi is for analytes not addressed by ware not used, report the reason afon requested below, they may t	from four tests performed a no appreciable toxicity, an folude information about o sted through analysis cont incments of 40 CFR Part 1. 40 CFR Part 135. for using alternative metho be submitted in place of Pa	at least annually in the found teating for acuts or chro ombined server overflows ducted uping 40 CFR Part 36 and other appropriate ( ods. If test summaries are of 5. If no biomonitoring (	ir and one-half years onlo tokiony, depending in this esction. All 120 methous. In DA/QC requirements for a available that contorn data is required, do not
complete Part E.	. Refor to the application overvie	w for directions on which o	wher sections of the form:	lo comptete.
Indicate the number of y belo of	filuent toxicity tests conducted in	· ·	years: chronic	
				etuca
Complete the following chart fo three tests are being reported.	r the last three whole offluent I			s paga I! more than
	Nost	Recon! 24	Most Recent	3"- Most Recent
A. Test Information		<u> </u>		
Test Method Number	· • · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
Final Report Number		· · · · · · · · · · · · · · · · · · ·	<u></u>	
Outfall Number				10-11-11-11-11-11-11-11-11-11-11-11-11-1
Dates Sample Collected Date Test Started		····		
Duration		· · · · · · · · · · · · · · · · · ·	· · ·	
B. Toxicity Test Methods Follow			1 1 <del></del>	
Manual Title				
Edition Number and Year of	Publication	— ······· · · ····	<del></del> i	
Page Number(s)				
C. Sample collection method(s)	) used. For multiple grab sample	s, indicate the number of c	rab samples used	
24-Hour Composite				
Grab				0 100 C C C
	as taken in relation to disinfectio	n (Check a'l that apply for	each)	
Before Disinfection		!□	<u> </u>	
After Disinfection		<u> </u>	<u>_</u>	
After Dechlorination	<u>i.C</u>	<u>_</u>		
	atment process at which the same	plo was collected		
Sample Was Collected:	s intended to assess chronic toxic			
Chronic Toxicity	s intericed to assess chrome toxi	iny, acute toxicity, or both	······	<u></u> .
Acute Toxicity				
G. Provide the type of test perfo			ᆕ 나!	
Static	······································			
Static-renowal	····· ································			
Flow-through	····		· · · · ·	
	aboratory water, specify type; if re	i Lu	<u> </u>	
Laboratory Water				
Receiving Water			╴┈╌──╴╶╴╧╘╧──	······································
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SCHEDULE BEW-2 PAGE 103 of 108

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#### NPDES DISCHARGE MONITORING REPORT WASTEWATER AND/OR STORMWATER

cility Name	Eureka WWTF	TYPE OF REPORT: MONTHLY
rmit Number	MO-0039659	DUE MONTHLY
unty	ST. LOUIS	
charge Type		

is report covers the MONTH of 2015 jan-aug

# DMR Sampling Summary for Outfall #004

Parameter	Units	Daily Minimum	Daily Maximum	Weekly Average	Monthly Average	Percent Removal
EFFLUENT						
Flow	MGD		2.39		1.46	
Biochemical Oxygen Demand (B0D)	mg/L	8		19.54	19.54	
Total Suspended Solids (TSS)	mg/L			17.78	17.78	
***E.coli	#/100 ml			30.81	30.81	
pH - Units	SU	7.68	7.94			8.e
Ammonia as N	mg/L		12.58		2.96	20 20
Oil & Grease	mg/L		6.5		5.43	
INFLUENT						
Biochemical Oxygen Demand (B0D)	mg/L		3			
Total Suspended Solids (TSS)	mg/L	e.				
heck Following Box if No Discharge Occurred du	uring this reporti	ng period				
Hes Collected by:	Date	Phone number		Emeil Address		
sture and Title of individal preparing report	Date	Phone number		Email Address		
rt Approval by Owner or Continuing Authority	Date	Phone number		Email Address		
res Preformed by (leb)		Phone number		Emeil Address		

IR - St. Louis Regional Office, 7545 South Lindbergh, Suite 210, St. Louis MO 63125

Applicable only during the recreational season from April 1 through October 31.

IS FACILITY REQURIES A WHOLE EFFLUENT TOXICITY (WET) TEST TWICE/YEAR (APR-MAY)(JULY-AUGUST)

SCHEDULE BEW-2 PAGE 104 of 108

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	FEB		35.75		2	7.68	7A4	1258	6.5
. !	mar	1.31	28.5	17.5	2	263	786	14,49	6
	Apair	1,43	17,8	17,6		7.55	7.76	3,35	5.5
	may	1.5	15:25		50	765	294	•5	5
	HUNE	2.39	12:25	16 .	36.5	7.53	7,68		5
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#### SCHEDULE BEW-2 PAGE 105 of 108



#### NPDES DISCHARGE MONITORING REPORT WASTEWATER AND/OR STORMWATER

cility Name	Eureka WWTF	TYPE OF REPORT: MONTHLY
rmit Number	MO-0039659	DUE MONTHLY
unty	ST. LOUIS	
charge Type		

is report covers the MONTH of Jan-dec 2014

# DMR Sampling Summary for Outfall #004

Parameter	Units	Daily Minimum	Daily Maximum	Weekly Average	Monthly Average	Percent Removal
EFFLUENT						
Flow	MGD		2.03		1.56	
Biochemical Oxygen Demand (B0D)	mg/L			43.53	43.53	
Total Suspended Solids (TSS)	mg/L			14.55	14.55	
***E.coli	#/100 ml			36.55	36.55	5
pH - Units	SU	7.52	8.24			
Ammonia as N	mg/L		23.15		6.51	
Oil & Grease	mg/L		6		5.2	
INFLUENT						0.00
Biochemical Oxygen Demand (B0D)	mg/L			119.4	119.4	÷
Total Suspended Solids (TSS)	mg/L			121.4	121.4	
heck Following Box if No Discharge Occurred du	uring this reporti	ng period				
sles Collected by:	Date	Phone number		Emeil Address		
sture and Title of individual preparing report	Date	Date Phone number		Email Address		
rt Approval by Owner or Continuing Authority	Date	Phone number		Email Address		
res Preformed by (isb)		Phone number		Email Address	-	

turn this form to:

IR - St. Louis Regional Office, 7545 South Lindbergh, Suite 210, St. Louis MO 63125

Applicable only during the recreational season from April 1 through October 31.

IS FACILITY REQURIES A WHOLE EFFLUENT TOXICITY (WET) TEST TWICE/YEAR (APR-MAY)(JULY-AUGUST)

SCHEDULE BEW-2 PAGE 106 of 108

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			004						
			<b>.</b>			PH	PH		
		Flow				Law		Amou	0
1	Law_	-99		19H		727	794	19,84	
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	MAY JUDE	1.42	24.5			232		ail	
	Lucy	2.03		9.75	24.8	753	787	1,02	
	Λ	1.92		8.25		755	752		
	Sto	1.6	0.5	8.75		763	783		
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1	Not	139	12.5		9	746	824		
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#### NPDES DISCHARGE MONITORING REPORT WASTEWATER AND/OR STORMWATER

cility Name	Eureka WWTF		TYPE OF REPORT: MONTHLY			
rmit Number	MO-0039659		DUE MONTHLY			
unty	ST. LOUIS					
charge Type						
s report covers t	he MONTH of	Jan-dec 2013				

DMD Sampling Summary for Outfall #004

DMR Sampling	Summa	ry for	Outta	II #00	4			
Parameter	Units	Daily Minimum	Daily Maximum	Weekly Average	Monthly Average	Percent Removal		
EFFLUENT								
Flow	MGD		2.08		1.48			
Biochemical Oxygen Demand (B0D)	mg/L			16.94	16.94			
Total Suspended Solids (TSS)	mg/L			14.23	14.23			
***E.coli	#/100 ml			48.08	48.08			
pH - Units	SU	7.38	795			-		
Ammonia as N	mg/L		23.83		6.8			
Oil & Grease	mg/L		7		5.58			
INFLUENT								
Biochemical Oxygen Demand (B0D)	mg/L			136.76	136.76			
Total Suspended Solids (TSS)	mg/L			102.25	102.25			
heck Following Box if No Discharge Occurred duri		ng period						
stes Collected by:	Dute	Phone number		Email Address				
sture and Title of Indiviual preparing report	Oate	Phone number		Email Address				
rt Approval by Owner or Continuing Authority	Date	Phone number		Email Address				
yees Preformed by (leb)		Phone number		Email Address				

IR - St. Louis Regional Office, 7545 South Lindbergh, Suite 210, St. Louis MO 63125 Applicable only during the recreational season from April 1 through October 31. IS FACILITY REQURIES A WHOLE EFFLUENT TOXICITY (WET) TEST TWICE/YEAR (APR-MAY)(JULY-AUGUST)

SCHEDULE BEW-2 PAGE 108 of 108

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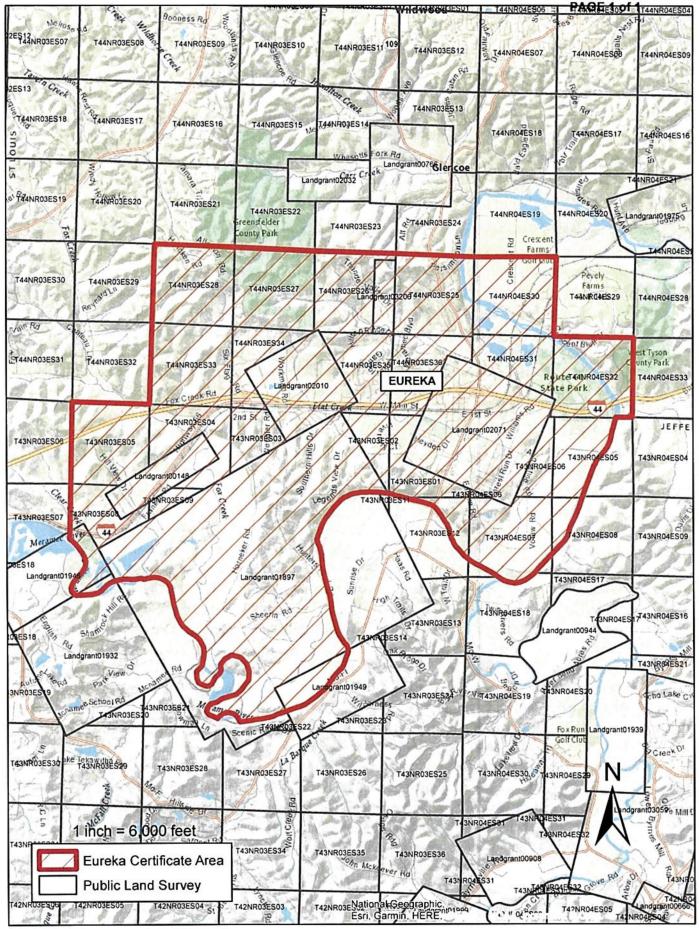
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#### SCHEDULE BWE-3



#### APPENDIX A

#### Legal Description

A tract of land in part of Land grants 148, 1932, 1946, 1949, 2010, 3206, 1897, 2071, Sections 1, 2, 3, 4, 5, 8, 9 and 12, Township 43 North, Range 3 East and Part of Sections 25, 26, 27, 28, 33, 35 and 36, Townships 44 North, Range 3 East and Sections 30, 31, 32 and 33 Township 44 North, Range 4 East and Part of Sections 5, 6 and 7, Township 43 North, Range 4 East, City of Eureka, St. Louis County, Missouri and being more particularly described as follows:

Beginning at the Northwest corner of Section 28, Township 44 North, Range 3 East; thence East along the North line of said Section 28 to the Northeast corner thereof, being also the Northwest corner of Section 27; thence continuing East, along the North line of said Section 27 to the Northeast corner thereof, being also the Northwest corner of Section 26; thence continuing East along the North line of said Section 26 to the Northeast corner thereof, being also the Northwest corner of Section 25; thence continuing East along the North line of said Section 25 to the Northeast corner thereof, being also the Northwest corner of Section 30, Township 44 North, Range 4 East; thence continuing East, along the North line of said Section 30 to the Northeast corner thereof, being also the Northwest corner of Section 29, Township 44 North, Range 4 East; thence South, along the East line of said Section 30 to the Southeast corner thereof, being the common corner of Sections 29, 30, 31 and 32; thence East, along the North line of said Section 32 to the Northeast corner thereof, being also the common corner of Section 28, 29, 32 and 33, thence South, along the East line of said Section 32 to the Southeast corner thereof, being also the Northeast corner of Fractional Section 5, Township 43 North, Range 4 East; thence West, along the North line of said Section 5 to its intersection with the centerline of the Meramec River; thence Southwest, along said center line to its intersection with the South line of said Section 5, being also the North line of Section 8; thence continuing, along said centerline, Southwest to its intersection with the West line of Section 8, being also the East line of Fractional Section 7 of Township 43 North, Range 4 East; thence continuing, along said centerline, Southwest and through said Fractional Section 7 to its intersection with the South line of said Fractional Section 7; thence continuing along said centerline South, West and then Northwest to again intersect with the South line of said Fractional Section 7; thence continuing with said center line, Northwesterly and through said Fractional Section 7 to its intersection with the West line of said Section 7 and the East line of Fractional Section 12, Township 43 North, Range 3 East; thence continuing Northwest, along said centerline of the Meramec River and through said Fractional Section 12 to its intersection with the South line of said Section 1, being also the North line of Section 12; thence continuing Northwest along centerline to its intersection with the East line of Fractional Section 11, Township 43 North, Range 3; thence continuing Northwest, along centerline of Meramec River to the Northwest line of said Fractional Section 11, being also the Northeast line of Land Grant 1897; thence continuing with said centerline Southwest and South through the Land grant 1897 and following the meanders of the Meramec River to a point of intersection with the North line of Land Grant 1949, being also the South line of Lang Gant 1897; thence continuing Southwest along said centerline to a point of intersection with the West line of Land Grant 1949, being also the East line of Land Grant 1897; thence continuing Southwest along centerline of the Meramec River through the Land grant 1897 and following the meanders of the Meramec River to a point of intersection with the Northeast line of Land Grant 1932, being also the Southwest line of Land Grant 1897 thence Southwest along said centerline to a point of intersection with the North line of land Grant 1932,

being also the Southeast line of Land Grant 1946; thence through said Land Grant Northwardly, Northeastwardly and Northwestwardly along said centerline to a point of intersection with the South projection of the West line of Section 8, Township 43 North, Range 3 East; thence North, along said South projection to the intersection of the West line of said Section 8 and the Northwest line of Land Grant 1946, being also the East line of Section 7, Township 43 North, Range 3 East; thence North and along the West line of said Section 8 to the Northwest corner thereof, being also the Southwest corner of Section 5, Township 43 North, Range 3 East; thence continuing North, along the West line of said Section 5 to the Northwest corner thereof; thence East, along the North line of said Section 35 to the Northwest corner thereof, being also the Southwest corner of Section 33, Township 44 North, Range 3 East; thence North, along the West line of said Section 28 to the Southwest corner thereof, being also the Southwest corner thereof, being also the Southwest corner thereof, being also the Southwest corner of Section 33 to the Northwest corner thereof, being also the Southwest corner of Section 33 to the Northwest corner thereof, being also the Southwest corner thereof and the POINT OF BEGINNING.

# SCHEDULE BWE-5 HAS BEEN MARKED CONFIDENTIAL IN ITS ENTIRETY