STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

W-20 Village Apartments LLC
750 Bagnell Dam Blvd., Suite B
Lake Ozark, MO 65049

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your State Operating Permit to discharge from CDC W-20, Miller County, Missouri.

Please read your permit and enclosed Standard Conditions. They contain important information on monitoring requirements, effluent limitations, sampling frequencies and reporting requirements.

Monitoring reports required by the special conditions must be submitted on a periodic basis. The required forms are enclosed. Please make copies for your use. Completed forms should be mailed to this office.

This permit is both your Federal NPDES Permit and your new Missouri State Operating Permit and replaces all previous State Operating Permits issued for this facility under this permit number. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.

Please be aware that nothing in this permit relieves the permittee of any other legal obligations or restrictions, such as other federal or state laws, court orders, or county or other local ordinances or restrictions.

If you were adversely affected by this decision, you may be entitled to an appeal before the administrative hearing commission pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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 administrative hearing commission. Any appeal shall be directed to: Administrative Hearing Commission, Truman Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, MO 65102, Phone: 573-751-2422, Fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have questions concerning this permit please contact Mr. Joshua L. Grosvenor, EI of my staff by calling 417-891-4300 or via mail at Southwest Regional Office, 2040 W. Woodland, Springfield, MO 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE

Cynthia S. Davies
Regional Director

CSD/jgk

Enclosures

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STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0135976
Owner:	W-20 Village Apartments, LLC
Address:	750 Bagnell Dam Blvd. Ste B, Lake Ozark, MO 65049
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	CDC W-20 WWTF
Facility Address:	20 Village Marina Rd, Eldon MO 65026
Legal Description:	SE¼, SW¼, SE¼, Sec. 11, T40N, R16W, Miller County
UTM (X/Y):	529471 / 4231555
Receiving Stream:	Unnamed Tributary to Lake of the Ozarks (U) (Losing)
First Classified Stream and ID:	Lake of the Ozarks (L2) (07205) 303(d)
USGS Basin & Sub-watershed No.:	(10290109-0407)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 - Subdivision - SIC # 8641
The use or operation of this facility does not require a CERTIFIED OPERATOR.

Septic tanks as part of a Septic Tank Effluent Gravity (STEG) system / recirculating sand or pea gravel filter system / chlorination / dechlorination / post-aeration / sludge disposal by a contractor hauler.

Design organic population equivalent is 163.
Design average daily flow is 0.01449 MGD.
Design sludge production is 1.45 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

February 9, 2012
Effective Date

Sara Parker Pauley, Director, Department of Natural Resources

February 8, 2017
Expiration Date

Cynthia S. Davies, Regional Director, Southwest Regional Office

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Flow	MGD	*		*	once/month**	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		15	10	once/month**	****
Total Suspended Solids	mg/L		20	15	once/month**	****
pH – Units	SU	***		***	once/month**	grab
E. coli **(Note 1)**	#/100 ml	126		126	once/month**	grab
Total Residual Chlorine as Cl_2	mg/L	0.016 **(Note 2)** (0.13 ML)		0.0082 **(Note 2)** (0.13ML)	once/month**	grab
Ammonia as N (April 1 – Sept 30) (Oct 1 – March 31)	mg/L	 3.6 7.5		 1.4 2.9	once/month**	grab

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	DAILY MINIMUM	WEEKLY AVERAGE MINIMUM	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Dissolved Oxygen	mg/L	5.0		5.0	once/month**	grab

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE **March 28, 2012**. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** Reports shall be submitted by the 28th day of the month following the reporting period, e.g. Reporting period is the month of March (samples collected monthly), report due by April 28th.

*** pH is measured in pH units and is not to be averaged. The pH for all facilities except lagoons is limited to the range of 6.5-9.0 pH units.

**** A composite sample made up from a minimum of four grab samples collected within a 24-hour period with a minimum of two hours between each grab sample. A person may physically collect the four grab samples or a composite sampler may be set up to collect the four grab samples.

Note 1 – Final effluent limits of 126 cfu per 100 ml daily maximum and monthly average applicable year round due to losing stream designation.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Note 2 - This permit contains a Total Residual Chlorine (TRC) limit.

(a) This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 0.13 mg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 0.13 mg/L will be considered violations of the permit and values less than the minimum quantification level of 0.13 mg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.

(b) Disinfection is required year-round unless the permit specifically states that "Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31." If your permit does not require disinfection during the non-recreational months, do not chlorinate in those months.

(c) Do not chemically dechlorinate **if it is not needed to meet the limits in your permit.**

(d) If no chlorine was used in a given sampling period, an actual analysis is not necessary. Simply report as "0 mg/L" TRC.

D. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:

(a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

(1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

(2) controls any pollutant not limited in the permit.

(b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.

(c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.

4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"

(1) One hundred micrograms per liter (100 µg/L);

(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

D. SPECIAL CONDITIONS (continued)

(3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;

(4) The level established in Part A of the permit by the Director.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Report as no-discharge when a discharge does not occur during the report period.

6. Water Quality Standards

(a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.

(b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

(1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;

(2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;

(3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;

(4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;

(5) There shall be no significant human health hazard from incidental contact with the water;

(6) There shall be no acute toxicity to livestock or wildlife watering;

(7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;

(8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

Missouri Department of Natural Resources
Statement of Basis
CDC W-20 WWTF
MSOP #: MO-MO-0135976
Miller County

A Statement of Basis (Statement) gives pertinent information regarding the applicable regulations and rational for the development of the NPDES Missouri State Operating Permit (operating permit). This Statement includes Wasteload Allocations, Water Quality Based Effluent Limitations, and Reasonable Potential Analysis calculations as well as any other calculations that effect the effluent limitations of this operating permit. This Statement does not pertain to operating permits that include sewage sludge land application plans and variance procedures, and does not include the public comment process for this operating permit.

A Statement is not an enforceable part of an operating permit.

Part I – Facility Information

Facility Type: (NON-POTW)
Facility SIC Code(s): 8641

Septic tanks as part of a Septic Tank Effluent Gravity (STEG) system / recirculating sand or pea gravel filter system / chlorination / dechlorination / post-aeration / sludge disposal by a contractor hauler.

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.025	Secondary	Domestic, New	~0.29

Receiving Water Body's Water Quality & Facility Performance History:
New facility, no discharge history

Part II – Operator Certification Requirements

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.010(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

Not Applicable ☒; This facility is not required to have a certified operator.

Part III – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
As per Missouri's Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category list effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

Missouri or Mississippi River [10 CSR 20-7.015(2)]: ☐
Lake or Reservoir [10 CSR 20-7.015(3)]: ☐
Losing [10 CSR 20-7.015(4)]: ☒
Metropolitan No-Discharge [10 CSR 20-7.015(5)]: ☐
Special Stream [10 CSR 20-7.015(6)]: ☐
Subsurface Water [10 CSR 20-7.015(7)]: ☐
All Other Waters [10 CSR 20-7.015(8)]: ☐

10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Unnamed Tributary to Lake of the Ozarks	U	---	Losing, General.	10290109	Ozarks / Osage
Lake of the Ozarks	L2	07205	LWW, AQL, WBC(A)		

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND).
** - Ecological Drainage Unit

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed Tributary to Lake of the Ozarks	0	0	0

MIXING CONSIDERATIONS
Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

Part IV – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:
As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

Applicable ☒;
If applicable, then please explain. This facility discharges to a losing stream segment as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], and has submitted alternative evaluations including discharge to a regional treatment facility, piping past the losing segment and land application. All treatment alternatives were deemed economically infeasible and/or easements were not available or unattainable.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

☒ - New facility.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:
As per [10 CSR 20-6.010(8)(A)10.], when a Continuing Authority under paragraph 10 CSR 20-6.010(3)(B)1. or 2. is expected to be available for connection within the next five (5) years, any operating permit issued to a permittee under this paragraph, located within the service area of the paragraph (3)(B)1. or 2. facility, shall contain the following special condition… This language is contained in Special Condition #3 of this operating permit.

ANTIDEGRADATION:
Policies which ensure protection of water quality for a particular water body where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation requirements are consistent with 40 CFR 131.12 that outlines methods used to assess activities that may impact the integrity of a water and protect existing uses. This policy may compel the state to maintain a level of water quality above those mandated by criteria.

Applicable ☒;

Please see **APPENDIX B – ANTIDEGRADATION ANALYSIS.**

APPLICABLE PERMIT PARAMETERS:
Effluent parameters for conventional, non-conventional, and toxic pollutants have been obtained from the technology based effluent limits, water quality based limits, and from appropriate sections of the application.

Bio-solids, Sludge, & Sewage Sludge:
Bio-solids are solid materials resulting from wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sludge is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

Not Applicable ☒
This condition is not applicable to the permittee for this specific facility.

COMPLIANCE AND ENFORCEMENT:
Action taken by the department to resolve violations of the Missouri Clean Water Law, its implementing regulations, and/or any terms and condition of an operating permit.

Not Applicable ☒;
The permittee/facility is not under enforcement action and is considered to be in compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and condition of an operating permit.

PRETREATMENT PROGRAM:
The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Not Applicable ☒;
At this time, the permittee is not required to implement and enforce a Pretreatment Program.

REASONABLE POTENTIAL ANALYSIS (RPA):
Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above the Missouri Water Quality Standards.

Not Applicable ☒;
A RPA was not conducted for this facility.

REMOVAL EFFICIENCY:
Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD_5) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs). Please see the United States Environmental Protection

Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm

Applicable ☒;
This wastewater treatment facility is not a POTW; however, influent monitoring is being required to determine percent removal as required by the WQAR in Appendix B.

SANITARY SEWER OVERFLOWS (SSOS), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:
Sanitary Sewer Systems (SSSs) are municipal wastewater collection system that convey domestic, commercial, and industrial wastewater, and limited amounts of infiltrated groundwater and storm water (i.e. I&I), to a POTW. SSSs are not designed to collect large amounts of storm water runoff from precipitation events.

Untreated or partially treated discharges from SSSs are commonly referred to as SSOs. SSOs have a variety of causes including blockages, line breaks, sewer defects that allow excess storm water and ground water to overload the system, lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. A SSOs is defined as an untreated or partially treated sewage release from a SSS. SSOs can occur at any point in an SSS, during dry weather or wet weather. SSOs include overflows that reach waters of the state. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations. SSSs can back up into buildings, including private residences. When sewage backups are caused by problems in the publicly-owned portion of an SSS, they are considered SSOs.

Not Applicable ☒;
This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):
A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

Not Applicable ☒;
This permit does not contain a SOC.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities: (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* [EPA 832-R-92-006] (Storm Water Management), BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

Not Applicable ☒;
At this time, the permittee is not required to develop and implement a SWPPP.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:
As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the department to release into a given stream after the department has determined to total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable ☒;
Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

WLA MODELING:

Not Applicable ☒;
A WLA study was either not submitted or determined not applicable by department staff.

WATER QUALITY STANDARDS:
Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:
A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Not Applicable ☒;
At this time, the permittee is not required to conduct WET test for this facility.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):
Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

Applicable ☒;
Lake of the Ozarks- Osage Arm is listed on the 2010 Missouri 303(d) List for nitrogen.

☒ – This facility is considered to be a source of or has the potential to contribute to the above listed pollutant(s). When the nutrient implementation procedure is approved, the permit may be reopened and modified to include nutrient monitoring. Once a TMDL is developed, the permit will be modified to include WLAs from the TMDL.

Adjusted Design Flow:
10 CSR 20-6.011(1)(B)1. provides for an Adjusted Design Flow when calculating permit fees on human sewage treatment facilities. If the average flow is sixty percent (60%) or less than the system's design flow, the average flow may be substituted for the design flow when calculating the permit fee on human sewage treatment facilities. If the facility's actual average flow is consistently 60% or less than the permitted design flow, the facility may qualify for a reduction in your fee when:

- The facility has a valid permit, or has applied for re-issuance, is in compliance with the terms, conditions and effluent limitations of the permit, and the facility has a good compliance history; and
- Flow is not expected to exceed 60% of design flow for the remaining term of the existing operating permit.

Not Applicable ☒;
At this time, the permittee has not requested an Adjusted Design Flow modification.

Outfall #001 – Main Facility Outfall
EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1, 6	*		*	****	****
BOD_5	MG/L	1, 6		15	10	****	****
TSS	MG/L	1, 6		20	15	****	****
PH (S.U.)	SU	1, 6	6.5-9.0		6.5-9.0	****	****
AMMONIA AS N (Summer)	MG/L	5, 6	3.6		1.4	****	****
AMMONIA AS N (Winter)	MG/L	5, 6	7.5		2.9	****	****
E. COLI	***	1,2,3	126		126	****	****
CHLORINE, TOTAL RESIDUAL	MG/L	1, 6	0.019		0.0095	****	****
DISSOLVED OXYGEN	MG/L	6 , 11	5.0		5.0	****	****
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

- Monitoring requirement only
*** - # of colonies/100mL; the Monthly Average for Fecal Coliform is a geometric mean.
**** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Lagoon Policy
5. Ammonia Policy
6. Antidegradation Policy
7. Water Quality Model
8. Best Professional Judgment
9. TMDL or Permit in lieu of TMDL
10. WET test Policy
11. Dissolved Oxygen Policy

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

Flow. In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification.

Biochemical Oxygen Demand (BOD_5).
☒ – 15 mg/L Weekly Average and 10 mg/L Monthly Average effluent limitations, as per [10 CSR 20-7.015].

Total Suspended Solids (TSS).
☒ – 20 mg/L Weekly Average and 15 mg/L Monthly Average effluent limitations, as per [10 CSR 20-7.015].

pH.
☒ – pH shall be maintained in the range from six to nine (6.0 – 9.0) standard units [10 CSR 20-7.015 (4)(B)2.]

Total Ammonia Nitrogen. Water Quality Based Effluent Limits provided below using the mass balance equation calculates the summer MDL and AML at 3.6 mg/L and 1.4mg/L respectively. The winter limits are calculated to be 7.5 mg/L and 2.9mg/L for MDL and AML respectively. The Technology Limits provided in the application (Appendix B) set the AML for summer and winter to 1.4 and 3.0 respectively. Due to Water Quality Based Effluent Limits being more stringent, the final effluent limits are based on water quality standards. Data cited by the applicant indicates recirculating rock filters are capable of producing effluents with ammonia concentrations ranging from 0 to 15 mg/L. Given this large range of performance, the department is requiring weekly testing to ensure the proposed technology will achieve water quality standards. Ammonia decay was not taken into consideration due to the proximity between the discharge location and the classified segment.

Summer

$C_e = (((Q_e + Q_s)*C) - (Q_s*C_s))/Q_e$

Chronic WLA: $C_e = ((.0253 + 0.0)1.5 – (0.0 * 0.01))/.0253$
$C_e = 1.5$ mg/L

Acute WLA: $C_e = ((.0253 + 0.0)12.1 – (0.0 * 0.01))/.0253$
$C_e = 12.1$ mg/L

LTA_c = 1.5 mg/L (0.780) = 1.17 mg/L [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 1.17 mg/L (3.11) = 3.64 mg/L [CV = 0.6, 99th Percentile]
AML = 1.17 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: $C_e = ((.0253 + 0.0)3.1 – (0.0 * 0.01))/.0253$
$C_e = 3.1$ mg/L

Acute WLA: $C_e = ((.0253 + 0.0)12.1 – (0.0 * 0.01))/.0253$
$C_e = 12.1$ mg/L

$LTA_c = 3.1$ mg/L (0.780) = 2.42 mg/L [CV = 0.6, 99th Percentile, 30 day avg.]
$LTA_a = 12.1$ mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 2.42 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.42 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.6	1.4
Winter	7.5	2.9

Fecal Coliform. *E. coli* has replaced fecal coliform at the applicable bacteria criteria in Missouri's water quality standards.

Escherichia coli (E. coli). Monthly average of 126 per 100 mL and a daily maximum of 126 per 100 mL. Per 10 CSR 20-7.031 (4)(C) the *E. coli* count shall not exceed 126 per 100 mL at any time in a losing stream.

Total Residual Chlorine (TRC). Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

((Qe + Qs)*C-(Qs*Cs))/Qe

Acute: $C_e = ((0.025219827+0)*0.019-(0*0)) / 0.025219827 = 0.019$
$WLA_a = 0.019$ mg/L

Chronic: $C_e = ((0.025219827 +0)*0.01-(0*0)) / 0.025219827 = 0.01$
$WLA_c = 0.01$ mg/L

$LTA_a = 0.019$ (0.321)= 0.0061 mg/L [CV = 0.6, 99th Percentile]
$LTA_c = 0.01$ (0.5274)= 0.005274 mg/L [CV = 0.6, 99th Percentile]

MDL = 0.005274(3.114)= **0.016 mg/L** [CV = 0.6, 99th Percentile]
AML = 0.005274(1.55)= **0.0082 mg/L** [CV = 0.6, 95th Percentile, n = 4]

Dissolved Oxygen: Dissolved oxygen in the stream is dependent upon the wastewater treatment plant effluent concentration of dissolved oxygen. There are currently no models available for discharges in losing streams therefore a D.O. level of 5.0 mg/L will be required, per 10 CSR 20-7.031(4)(J), for the effluent.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
FLOW	MONTHLY	MONTHLY
BOD_5	MONTHLY	MONTHLY
TSS	MONTHLY	MONTHLY
PH (S.U.)	MONTHLY	MONTHLY
AMMONIA AS N	MONTHLY	MONTHLY
E. COLI	MONTHLY	MONTHLY
CHLORINE, TOTAL RESIDUAL	MONTHLY	MONTHLY
DISSOLVED OXYGEN	MONTHLY	MONTHLY

Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

Date of Factsheet: June 23, 2009 (*Modified February 1, 2012)*

Megan L. Hart
WP Engineering Unit
(417) 891-4300
megan.hart@dnr.mo.gov

APPENDIX A– ANTIDEGRADATION ANALYSIS:

STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Mark N. Templeton, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

AUG 3 2009

Mr. Cody Davidson
750 Bagnell Dam, Suite B
Lake of the Ozarks, MO 65049

RE: Water Quality Review / Antidegradation Review Preliminary Determination on *Antidegradation Report for CDC W-20 Wastewater Treatment Facility.*

Dear Mr. Davidson:

Enclosed please find the finalized Water Quality and Antidegradation Review (WQAR) for the *CDC W-20* Waste Water Treatment Facility (WWTF) in Miller County. The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Rule and Implementation Procedure* (AIP) dated May 7, 2008, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resource's (department's) initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a complete application for a construction permit. The department will not be conducting any further review of this project until a submittal is received. These submittals must reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited.

Following the department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are

received or comments are resolved without another public notice, these findings and determinations will be considered final.

Following issuance of the construction permit and completion of the actual facility construction, the department will proceed with the issuance of the operating permit.

If you should have questions regarding the enclosed WQAR, please contact Greg Brossier by telephone at (573) 751-2908, by e-mail at Greg.Brossier@dnr.mo.gov, or by mail at the Missouri Department of Natural Resources, Water Protection Program, PO Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

Robert K. Morrison, P.E., Chief
Water Pollution Control Branch

RKM:gbl

Enclosure

c: Kristen Pattinson, Unit Chief, Southwest Regional Office
Brian Spencer, Miller/Lindsey Engineering
U.S. Environmental Protection Agency, Region VII

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to the
Unclassified stream to Birdsong Hollow Cove to The Lake of the Ozarks

July 29, 2009

CDC W-20 WWTF
26 Village Marina Rd.
Eldon, MO 65026

Table of Contents

Water Quality and Antidegradation Review (WQAR)

For the Protection of Water Quality and Determination of Effluent Limits

FACILITY INFORMATION

FACILITY NAME: CDC W-20 NPDES #: N/A (NEW FACILITY)

FACILITY TYPE/DESCRIPTION: Facility will take domestic wastewater from eleven (11) multiple family units that house up to four (4) families per unit. The preferred alternative of the submitted alternatives analysis (AA) was a recirculation rock filter with disinfection. The facility will discharge into an unclassified stream then to the Birdsong Hollow Cove of The Lake of the Ozarks (The Lake) (See Appendix D and E). The proposed design flow of the facility is 14,490gpd (0.0145 MGD).

EDU: Ozark/Osage 8-DIGIT HUC: 10290109 COUNTY: Miller

LEGAL DESCRIPTION: SE ¼ , Sec. 11, T40N, R16W LATITUDE/LONGITUDE: N 38°13'53.0" / W -92°39'43.2"

WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, a facility is required to use *Missouri's Antidegradation Rule and Implementation Procedure (AIP)* for new and expanded wastewater discharges.

WATER QUALITY HISTORY:

New discharge, no existing water quality history.

OUTFALL CHARACTERISTICS

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT
001	.0225	Secondary	Unclassified tributary to Birdsong Hollow Cove of The Lake	0.29 mi

RECEIVING WATERBODY INFORMATION

WATERBODY	CLASS	WBID	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Unclassified tributary	U	----	0.0	0.0	0.1	General Criteria (losing)
Lake of the Ozarks	L2	206	-	-	-	LWW, AQL, WBC(A)

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warm water Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

RECEIVING WATER BODY SEGMENT #1: Unclassified tributary

Upper end segment* UTM or Lat/Long coordinates: 38.23139/ - 92.66303 (Outfall)

Lower end segment* UTM or Lat/Long coordinates: 38.22719/ - 92.662 (Confluence with The Lake)

RECEIVING WATER BODY SEGMENT #2: Lake of the Ozarks
Upper end segment* UTM or Lat/Long coordinates: 38.22719/ - 92.662 (Confluence with The Lake)
Lower end segment* UTM or Lat/Long coordinates: 38.2245/-92.66281 (approximately 1000ft from confluence)**

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.
**SEE APPENDIX D FOR UPPER AND LOWER SEGMENTS OF BOTH RECEIVING WATERS

GENERAL COMMENTS

Miller/Lindsey Engineering prepared, on behalf of Davidson Construction the *CDC W-20* Antidegradation Report dated May 2009. This report is to be kept on file at the Department Central Office. The geohydrological evaluation was submitted with the request (Appendix A). The report assumed Tier 2 with Significant Degradation for all Pollutants of Concern (Appendix B). Dissolved Oxygen (D.O.) modeling analysis was not submitted or possible because the discharge being located in an unclassified losing stream. Maintaining a D.O of 5.0 mg/L at the end of pipe is protective of The Lake. Information found in the submitted report and in the summary forms provided by the applicant in Appendix B was used to develop this review document. Additional documentation including a National Heritage Review and topography map can be found in Appendices C and E, respectively. The Lake is on the EPA 2006 303(d) List. The cause for The Lake being on the EPA 2006 303(d) List is fish trauma caused by the Truman Dam. This discharge will not contribute to this impairment.

The original submission was based on a design flow of 16,300 gpd. This is a reflection of the maximum flow per person located in 10 CSR 8.020(11)(B)3. An addendum was submitted requesting a new design flow of 14,490 gpd, to reflect a more precise engineering design made by Miller/Lindsey Engineering. This addendum does not change the expected cost of the facility or the alternative facilities, and will also not change any limits that were found based on the previous design flow.

ANTIDEGRADATION REVIEW INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the department was to develop a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, a facility is required to use *Missouri's Antidegradation Rule and Implementation Procedure (AIP)*. This procedure is applicable to new and expanded wastewater facilities. The following is a review of the *CDC W-20* Antidegradation Report dated May 2009.

TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants "proposed for discharge that affect beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7). The POC's were assumed to cause significant degradation to the losing stream and to the Birdsong Hollow Cove of The Lake and therefore will be considered Tier 2 POC's. Any POC's deemed Tier 2 and assumed to cause significant degradation are subject to an alternatives analysis.

TABLE 1. POLLUTANTS OF CONCERN AND TIER DETERMINATION

POLLUTANTS OF CONCERN	TIER	DEGRADATION	COMMENT
Ammonia as Nitrogen	2	Significant	
Biochemical Oxygen Demand/Dissolved Oxygen	2	Significant	
Bacteria (E. Coli & Fecal Coliform)	2	Significant	
pH	**	-	
Total Suspended Solids ***	2	Significant	

* No in-stream standards for these parameters, therefore tier determination was not possible.
** Standards for these parameters are ranges or and therefore tier determination was not possible.
*** Narrative criteria.

The following Antidegradation Review Summary attachments in Appendix B were used by the applicant:

☒ Tier Determination and Effluent Summary
For pollutants of concern, the attachments are:
☒ Attachment A, Tier 2 with significant degradation.
☐ Attachment B, Tier 2 with minimal degradation.
☐ Attachment D, Tier 1 Review. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment

EXISTING WATER QUALITY

No existing water quality data was submitted.

ASSIMILATIVE CAPACITY CALCULATIONS

This antidegradation review assumed significant degradation for all Pollutants of Concern so there is no need to calculate the assimilative capacity for this review.

ALTERNATIVES ANALYSIS

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance included in the *CDC W-20* Antidegradation Report dated May 2009. There were a total of three (3) no discharge alternatives and four (4) discharging alternatives reviewed in the report. The no discharge alternatives were: Land application, sub-surface irrigation and discharge to a regional wastewater collection and treatment system. The applicant concluded that the cost of land acquisition and the construction cost both land application and subsurface irrigation made these options infeasible. Discharging to a regional wastewater treatment facility was also infeasible due to distance and construction costs. The four discharging alternatives are recirculating rock filtration, intermittent sand filter, extended aeration, and membrane bioreactor. The membrane bioreactor and the intermittent sand filter, while offering the highest levels of treatment, were cost prohibitive. Extended aeration and recirculating rock filtration both provide the same level of treatment but recirculating rock filtration provides the treatment at a significantly lower cost, as shown in Table 2 (Please see the full CDC W-20 Alternatives Analysis for a more detailed discussion of the proposed alternatives). All discharging alternatives meet Water Quality Standards. The preferred alternative is the recirculating rock filter.

TABLE 2: TECHNOLOGY BASED EFFLUENT LIMIT AND COST COMPARISON

DISCHARGING ALTERNATIVES	BOD_5 (MG/L)	TSS (MG/L)	FECAL (/100 ML)	DO (MG/L)	NH_4 (MG/L)	PRESENT WORTH COST*	RATIO
RECIRCULATING SAND FILTER	10	10	400	5	1.4	$243,240	BASE
INTERMITTENT SAND FILTER	3	3	400	5	1.4	$891,020	3.6
EXTENDED AERATION	10	15	400	5	1.4	$503,564	2.1
MEMBRANE BIOREACTOR	5	1	400	5	1.0	$763,564	3.1

* Present Worth Cost: 20 year design life and 7% interest

DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

The project has necessity to provide wastewater treatment to the forty-four (44) newly constructed homes in the area. With a future expansion, the facility would have the capability to take on more homes from the area, many of which have sub-standard septic systems. The homes will provide a lower cost alternative to the higher priced homes in the region, which will allow the permanent residents of the region more affordable housing. Finally the land value is currently assessed at approximately $16,000. With the addition of the homes, the estimated value will be $3.3 million. This will provide a substantial tax base increase for the region which will help fund more services.

PRELIMINARY DETERMINATION

The proposed construction of the CDC W-20 WWTF (0.0145 MGD) which will discharge to The Lake is assumed to result in significant degradation for all POCs in both the unclassified tributary leading to The Lake and in The Lake. The effluent limits in this review were developed to be protective of beneficial uses. MDNR has determined that the submitted report is sufficient and meets the requirement of the AIP. No further analysis is needed for this discharge.

GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supercede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.

8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

MIXING CONSIDERATIONS

Mixing Zone (MZ): Not allowed, 7Q10 less than 0.1 cfs [10 CSR 20-7.031(4)(A)4.B.(I)(a)].

Zone of Initial Dilution (ZID): Not allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

$$A.E.C.\% = \left(\frac{DesignFlow + ZIDFlow}{DesignFlow} \right)^{-1} \times 100$$

PERMIT LIMITS AND INFORMATION

TMDL WATERSHED: (Y OR N)	W.L.A. STUDY CONDUCTED: (Y OR N)	DISINFECTION REQUIRED: (Y OR N)	USE ATTAINABILITY ANALYSIS: (Y OR N)
N	N	Y	N

OUTFALL #001– Main Facility Outfall

WET TEST (Y OR N): N FREQUENCY: N/A A.E.C. 100% METHOD: N/A

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	WQBEL (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*	FSR	Once/Month
BIOCHEMICAL OXYGEN DEMAND (BOD_5)**	MG/L		15	10	FSR	Once/Month
TOTAL SUSPENDED SOLIDS**	MG/L		15	10	FSR	Once/Month
DISSOLVED OXYGEN	MG/L	5.0 (MINIMUM)		5.0 (MINIMUM)		Once/Month
PH	SU	6.0 - 9.0		6.0 - 9.0	FSR	Once/Month
FECAL COLIFORM	***	1000		400	FSR	Once/Month
ESCHERICHIA COLIFORM (E. COLI)	**PLEASE SEE THE E. COLI DISCUSSION IN THE DERIVATION & DISCUSSION OF LIMITS SECTION OF THIS WQAR BELOW.**					
TOTAL AMMONIA N (MAY 1 – OCTOBER 31)	MG/L	3.6		1.4	TBEL	Once/Week
TOTAL AMMONIA N (NOVEMBER 1 – APRIL 31)	MG/L	7.5		2.9	TBEL	Once/Week

Note 1– Water Quality-based Effluent Limitation --WQBEL; or Minimally Degrading Effluent Limit--MDEL; or Technology-based Effluent Limit-TBEL; or No Degradation Limit--NDL; or FSR --Federal/State Regulation; or N/A--Not Applicable. Also, please see the **General Assumptions of the WQAR #4 & #5.**

* – Monitoring Requirement Only

** – This facility is required to meet a removal efficiency of 85% or more for BOD_5 and TSS. Influent BOD_5 and TSS data shall be reported to ensure removal efficiency requirements are met.

*** – colonies/100 mL

RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations were calculated using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Outfall #001 – Main Facility Outfall

*All limits proposed below are subject to change at the permit writer's discretion if it can be shown that the available Technology Based Effluent Limits are more protective of the watersheds than the current Technology Based Effluent Limits or the Water Quality Based Effluent Limits.

- **Biochemical Oxygen Demand (BOD_5).** Water Quality Based Effluent Limit proposed is 10 mg/L monthly average, 15 mg/L weekly limit [10 CSR 20-7.015(4)(B)1]. 85% removal efficiency is required for this facility.

- **Total Suspended Solids (TSS).** Technology based effluent limit proposed. According to EPA, because TSS and BOD are closely correlated, the same limits are applied for TSS as BOD. Influent monitoring may be required for this facility in its Missouri State Operating Permit. 85% removal efficiency is required for this facility.

- **Dissolved Oxygen.** Dissolved oxygen in the stream is dependent upon the wastewater treatment plant effluent concentration of dissolved oxygen. There are currently no models available for discharges in losing streams therefore a D.O. level of 5.0 mg/L will be required, per 10 CSR 20-7.031(4)(J), for the effluent.

- **pH.** pH shall be maintained in the range from six to nine (6.0 – 9.0) standard units [10 CSR 20-7.015 (4)(B)2.]

- **Fecal Coliform.** Discharge shall not contain more than a monthly geometric mean of 400 colonies/ 100 mL and a daily maximum of 1000 colonies/100 mL [10 CSR 20-7.015(4)(B)4] Future renewals of the facility operating permit will contain effluent limitations for E. coli which will replace fecal coliform as the applicable bacteria criteria in Missouri's water quality standards.

- **Esherichia Coliform (E. Coli).** In the near future, the operating permit for this facility will contain effluent limitations for E. coli. E. coli will replace fecal coliform as the applicable bacteria criteria in Missouri's water quality standards when Missouri adopts the implementation of the E. coli standards. Also, please see GENERAL ASSUMPTIONS OF THE WQRS #7.

- **Total Ammonia Nitrogen.** Water Quality Based Effluent Limits provided below using the mass balance equation calculates the summer MDL and AML at 3.6 mg/L and 1.4mg/L respectively. The winter limits are calculated to be 7.5 mg/L and 2.9mg/L for MDL and AML respectively. The Technology Limits provided in the application (Appendix B) set the AML for summer and winter to 1.4 and 3.0 respectively. Due to Water Quality Based Effluent Limits being more stringent, the final effluent limits are based on water quality standards. Data cited by the applicant indicates recirculating rock filters are capable of producing effluents with ammonia concentrations ranging from 0 to 15 mg/L. Given this large range of performance, the department is requiring weekly testing to ensure the proposed technology will achieve water quality standards. After one year of ammonia monitoring, the applicant may petition the department to reduce the monitoring frequency from once per week to once per month provided the data demonstrates that the water quality standards are being consistently achieved. Ammonia decay was not taken into consideration due to the proximity between the discharge location and the classified segment.

  Summer

  $C_e = (((Q_e + Q_s)*C) - (Q_s*C_s))/Q_e$

  Chronic WLA: $C_e = ((.0225 + 0.0)1.5 – (0.0 * 0.01))/.0225$
  $C_e = 1.5$ mg/L

  Acute WLA: $C_e = ((.0225 + 0.0)12.1 – (0.0 * 0.01))/.0225$
  $C_e = 12.1$ mg/L

  $LTA_c = 1.5$ mg/L (0.780) = **1.17 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
  $LTA_a = 12.1$ mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

  MDL = **1.17 mg/L** (3.11) = 3.64 mg/L [CV = 0.6, 99th Percentile]
  AML = **1.17 mg/L** (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

  Winter

  Chronic WLA: $C_e = ((.0225 + 0.0)3.1 – (0.0 * 0.01))/.0225$
  $C_e = 3.1$ mg/L

  Acute WLA: $C_e = ((.0225 + 0.0)12.1 – (0.0 * 0.01))/.0225$
  $C_e = 12.1$ mg/L

  $LTA_c = 3.1$ mg/L (0.780) = **2.42 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
  $LTA_a = 12.1$ mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

  MDL = **2.42 mg/L** (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
  AML = **2.42 mg/L** (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.6	1.4
Winter	7.5	2.8

ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed facility discharge, CDC W-20 WWTF, .0225 (cfs) will result in significant degradation of the unclassified tributary leading to the Birdsong Hollow Cove of the Lake of the Ozarks and the Birdsong Hollow Cove itself. Miller/Lindsey assumed significant degradation for the segments mentioned above and provided an alternatives analysis which showed that a recirculating rock filtration plant would be the most economically efficient and practicable option for treatment. The Social and Economic Importance of the proposed facility will support homes which will provide more affordable housing for local residents and provide a significant tax base increase for the area. This document is in accordance with the AIP, and the limits derived in the provided document are protective of beneficial uses and attain the highest statutory and regulatory requirements. MDNR has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is need for this discharge.

Reviewer: Greg Brossier GB
Date: July 29, 2009
Unit Chief: John Rustige

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or anecdotal information are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.

Appendix A

Missouri Department Of Natural Resources
Division of Geology and Land Survey
P.O. Box 250
Rolla, Missouri 65402-0250
Phone - 573.368.2161 Fax - 573.368.2111
E-mail - gspgeol@dnr.mo.gov

Project ID Number
LWE09067
County
MILLER

Geohydrologic Evaluation of Liquid-Waste Treatment Site

Project **CDC W-20 WWTP** Quadrangle **LAKE OZARK**
Location **SE1/4 SW1/4 SE1/4** Section **11** Township **40 N** Range **16 W**
Additional Location Information **26 Village Marina Road, Eldon, MO 65026**
Latitude **38** Deg **13** Min **52** Sec Longitude **92** Deg **39** Min **49** Sec

Owner Davidson Construction

750 Bagnell Dam Blvd., Suite 13, Lake Ozark, MO 65049

Requestor Miller/Lindsay, Inc.
Brian Spencer
P.O. Box 282, Osage Beach, MO 65065
(573) 348-9799

Previous Reports ☑ Not Applicable
Date
Identification Number
Fiscal Year

Facility Type
- ○ Mechanical treatment plant
- ◉ Recirculating filter bed
- ○ Earthen lagoon with discharge
- ○ Earthen holding basin
- ○ Land application
- ○ Other type of facility

Type of Waste
- ○ Animal
- ◉ Human
- ○ Process or industrial
- ○ Leachate
- ○ Other waste type

Funding Source
- ◉ PPG
- ○ WWLF-SRF
- ○ Non-Point Source

Other Information
- ○ Plans were submitted
- ○ Site was investigated by NRCS
- ○ Soil or geotechnical data were submitted

Date of Field Visit 12/19/2008 **Stream Classification** ○ Gaining ◉ Losing ○ No discharge

Overall Geologic Limitations
- ○ Slight
- ○ Moderate
- ◉ Severe

Collapse Potential
- ○ Not applicable
- ○ Slight
- ◉ Moderate
- ○ Severe

Topography
- ○ < 4%
- ○ 4% to 8%
- ◉ 8% to 15%
- ○ > 15%

Landscape Position
- ○ Broad uplands
- ○ Ridgetop
- ◉ Hillslope
- ○ Narrow ravine
- ○ Floodplain
- ○ Alluvial plain
- ○ Terrace
- ○ Sinkhole

Bedrock The uppermost bedrock is composed of Ordovician-age Gasconade Dolomite.

Surficial Materials Surficial soils on site consist of 5-10 feet of silty clay residuum with colluvial gravels.

Appendix A

Project ID Number **LWE09067**

Recommended Construction Procedures

- ○ Installation of clay pad
- ○ Diversion of subsurface flow
- ○ Rock excavation
- ○ Compaction
- ○ Artificial sealing
- ○ Limit excavation depth

Required Geologic Exploration

(Missouri Clean Water Commission - 10 CSR 20 - 8.200 Wastewater Treatment Ponds)

Determine Overburden Properties

- ○ Partical size analysis
- ○ Standard Proctor density
- ○ Permeability coefficient for undisturbed sample
- ○ Atterburg limits
- ○ Overburden thickness
- ○ Permeability coefficient for remolded sample

Determine Hydrologic Conditions

- ○ Groundwater elevation
- ○ Direction of groundwater flow
- ○ 25-year flood level
- ○ 100-year flood level

Notify Geologist

- ○ Before exploration
- ○ During construction
- ○ After construction
- ◉ Not necessary

Remarks

On December 19, 2008, a site evaluation was performed on a proposed recirculating filter bed for CDC W-20 WWTP. The purpose of the site visit was to observe the geologic and hydrologic elements of the site and determine how they relate to facility construction, geologic collapse potential, and the potential for groundwater contamination in the event that treatment failure occurs.

The proposed facility is reported to be discharging. The discharged effluent will be into an unnamed tributary into Lake of the Ozarks. The unnamed tributary was determined to be losing to approximately the confluence with the Lake of the Ozarks. Lake of the Ozarks is classified as a gaining setting.

The uppermost bedrock is composed of Ordovician-age Gasconade Dolomite. The bedrock unit is a cherty, light grey to brown, medium to coarsely crystalline, stromatolitic dolomite that exhibits moderate to high primary and secondary permeability. The Gasconade Dolomite can exhibit karst features such as caves, sinkholes and losing streams. No springs or sinkholes were identified on the site.

Surficial materials on site consist of 5-10 feet of silty to gravelly clay residuum originating from the weathered Roubidoux Formation and Gasconade Dolomite. These materials typically exhibit moderate to high permeabilities due to the high percentage of residual and colluvial gravels.

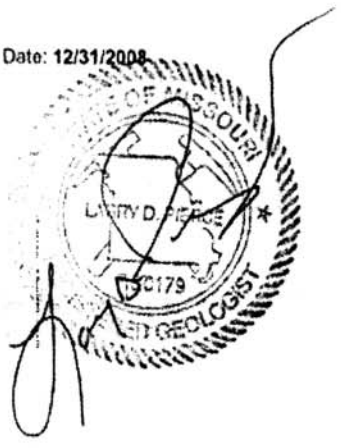
Based on geologic and hydrologic characteristics observed, the site receives a severe overall geologic limitations rating and a moderate collapse potential rating.

This document is a preliminary report. It is not a permit. Additional data may be required by the Department of Natural Resources prior to the issuance of a permit. This report is valid only at the above location and becomes invalid one year after the report date below.

Report By: **Sherri Stoner**

Report Date: **12/31/2008**

CC **WPP, SWRO**



Appendix B

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

WATER QUALITY REVIEW ASSISTANCE/ANTIDEGRADATION REVIEW REQUEST

PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

TYPE OF PROJECT
☐ Grant ☐ SRF Loan ☒ All Other Projects

REQUESTER	TELEPHONE NUMBER WITH AREA CODE
ROCKNE C. MILLER, PE	573.348.9799
PERMITTEE	**TELEPHONE NUMBER WITH AREA CODE**
DAVIDSON CONSTRUCTION	

REASON FOR REQUEST

☒ New Discharge (See Instruction #9) ☐ Upgrade (No expansion) (See AIP) ☐ Expansion

DESCRIPTION OF PROPOSED ACTIVITY:
WWTF TO SERVE 44 SINGLE FAMILY RESIDENCES

FACILITY INFORMATION

FACILITY NAME	MSOP NUMBER (IF APPLICABLE)
CDC W-20 WWTP	
COUNTY	**SIC / NAICS CODE**
MILLER	

METHOD OF BACTERIA COMPLIANCE
☒ Chlorine Disinfection ☐ Ultraviolet Disinfection ☐ Ozone ☐ Not Applicable

WATER QUALITY ISSUES

Water quality issues include: effluent limit compliance issues, notice (s) of violation, water body beneficial uses not attained or supported, etc.

OUTFALL	LOCATION (LAT/LONG OR LEGAL DESCRIPTION)	MAPPED[1] (CHECK)	RECEIVING WATER BODY[2]
1	N38D13M53.0S / W92D39M43.2S	☒	LAKE OF THE OZARKS
		☐	
		☐	

[1] Attach topographic map (See www.dnr.mo.gov/internetmapviewer/) with outfall location(s) clearly marked. For additional outfalls, attach a separate form.
[2] See general instructions for discharges to streams.

OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
1	.0183	RECIRCULATING ROCK FILTER	DOMESTIC

* Describe predominating character of effluent. Example: domestic wastewater, municipal wastewater, industrial wastewater, storm water, mining leachate, etc.
** If expansion, indicate new design flow.

☒ Checked for rare or endangered species and provided determination with this request. See Instruction #8.

ANTIDEGRADATION REVIEW SUBMISSION:

See attached Antidegradation instructions. Applicant supplied a summary within:
☒ Tier Determination and Effluent Limit Summary
☒ Attachment A – Significant Degradation
☐ Attachment B – Minimal Degradation
☐ Attachment C – Temporary degradation
☐ Attachment D – Tier 1 Review
☐ No Degradation Evaluation – Conclusion of Antidegradation Review

MO 780-1693 (03-09)

Appendix B

RECEIVED
MAY 07 2009
WATER PROTECTION PROGRAM

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
ANTIDEGRADATION REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

1. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE
CDC W-20 WWTP		
ADDRESS (PHYSICAL)	CITY	STATE / ZIP CODE
26 VILLAGE MARINA RD.	ELDON	MO / 65026

2. RECEIVING WATER BODY SEGMENT #1

NAME: UNNAMED TRIBUTRARY HOLLOW TO LAKE OF THE OZARKS

2.1 UPPER END OF SEGMENT (Location of discharge)
UTM _____ OR Lat N38D13M53.0S, Long W92D39M46.9S

2.2 LOWER END OF SEGMENT
UTM _____ OR Lat N38D13M37.9S, Long W92D39M43.2S

Per the Missouri Antidegradation Rule and Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME: PART OF LAKE OF THE OZARKS

3.1 UPPER END OF SEGMENT
UTM _____ OR Lat 38D13M37.9S, Long W92D39M43.2S

3.2 LOWER END OF SEGMENT
UTM _____ OR Lat N38D13M28.2S, Long W92D39M46.1S

4. WATER BODY SEGMENT #3 (IF APPLICABLE)

NAME:

4.1 UPPER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

4.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

5. PROJECT INFORMATION

Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto?

☐ Yes ☒ No

In Tables D and E of 10 CSR 20-7.031, Outstanding National Resource Waters and Outstanding State Resource Water are listed. Per the Antidegradation Implementation Procedure Section 1.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.

Will the proposed discharge of all pollutants of concern, or POCs, result in no net increase in the ambient water quality concentration of the receiving water after mixing?

☐ Yes ☒ No

If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.

Will the discharge result in temporary degradation?

☐ Yes ☒ No

If yes, complete Attachment C.

Has the project been determined as non-degrading?

☐ Yes ☒ No

If yes, complete No Degradation Evaluation – Conclusion of Antidegradation Review form.
Submit with the appropriate Construction Permit Application as no antidegradation review is required.

If yes to one of the above questions, skip to Section 8 - Wet Weather.

Appendix B

6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data by approved the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section.

Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section:

Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:

Approval date of the project sampling plan by the Water Quality Monitoring and Assessment Section:

Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:

Comments/Discussion:

7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(S)

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.S. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

Water Body Segment One
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
		BOD-5 *
		TSS *
		AMMONIA *
		FECAL *
		DO *

Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.

Water Body Segment Two
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
		BOD-5 *
		TSS *
		AMMONIA *
		FECAL *
		DO *

- For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A.
- For pollutants of concern that are Tier 2 with minimal degradation, complete Attachment B.
- For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment.

8. WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 1

Wet Weather Design Summary:

Appendix B

9. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

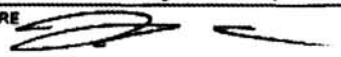
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L		10	
TSS	MG/L		10	
Dissolved Oxygen	MG/L		5	
Ammonia				
Bacteria (E. Coli)				
AMMONIA (SUMMER)	MG/L		1.4	
AMMONIA (WINTER)	MG/L		3.0	
BACTERIA (FECAL)	/100ML		400	

These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.

SIGNATURE  DATE 5/6/09

NAME AND OFFICIAL TITLES
ROCKNE C. MILLER PE

COMPANY NAME
MILLER/LINDSAY INC.

ADDRESS
P.O. BOX 282
65065

CITY
OSAGE BEACH

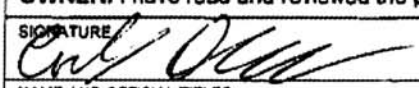
STATE
MO

ZIP CODE

TELEPHONE NUMBER WITH AREA CODE
573.348.9799

E-MAIL ADDRESS

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE 5-6-09

NAME AND OFFICIAL TITLES
CODY DAVIDSON

ADDRESS
750 BAGNELL DAM BLVD, SUITE B

CITY
LAKE OZARK

STATE
MO

ZIP CODE
65049

TELEPHONE NUMBER WITH AREA CODE

E-MAIL ADDRESS

CONTINUING AUTHORITY: Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf.

I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE

DATE

NAME AND OFFICIAL TITLES

ADDRESS

CITY

STATE

ZIP CODE

Appendix B

STATE OF MISSOURI
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER POLLUTION CONTROL PROGRAM
ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION
UNDER MISSOURI CLEAN WATER LAW

1.00 FACILITY

NAME		PHONE	
CDC W-20 WWTP			
ADDRESS (PHYSICAL)	CITY	STATE	ZIP
26 Village marina Rd.	Eldon	MO	65026

2.00 RECEIVING WATER BODY SEGMENT (WBS) #1

NAME
Unnamed tributary hollow to Lake of the Ozarks

3.00 WATER BODY SEGMENT (WBS) #2 (IF APPLICABLE)

NAME
Lake of the Ozarks

4.00 IDENTIFYING ALTERNATIVES:

Please supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the AIP Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Please attach all supportive documentation in the Antidegradation Review report.

Non-degrading alternatives: Land Application, Subsurface irrigation, Discharge to regional system, alternative discharge location

Alternatives ranging from less-degrading to degrading including Preferred Alternative (All must meet Water Quality Standards):

Alternatives	Level of treatment attainable for each POC					
	BOD	TSS	Ammonia as N	Bacteria (fecal)	Dissolved Oxygen	
	(mg/L)	(mg/L)	(mg/L)	(#/100mL)	mg/l	
Membrane Biological Reactor	5	1	1	400	5	
Intermittent Sand Filter	3	3	1.4	400	5	
Recirculating Rock Filter	10	15	1.4	400	5	
Extended aeration	10	15	1.4	400	5	

Identifying Alternatives Summary: The base technology for protection of beneficial use is the Recirculating Rock Filter. The attached report discusses all non-degrading through degrading options considered. The report details why non-degrading and less degrading options were not chosen to be proposed based on practicality, economic and other issues.

Appendix B

5.00 DETERMINATION FO THE REASONABLE ALTERNATIVE:

Per the AIP Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient, and affordable." Please provide basis and supporting documentation in the Antidegradation Review report.

Practicability Summary:

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the AIP Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the AIP Section II.B.2.a.

Land application was found to be not technically feasible. Subsurface application and onsite treatment was found to be not reliable for the necessary length of operation. Connecting the project site to an existing regional treatment facility was found to be not technically feasible. Alternative discharge location was found to be not practical. Recirculating rock filter, Extended aeration with effluent filtration, Intermittent sand filter and Membrane biological reactor were all found to meet effective and reliability issues based on technical and reliability issues as well as environmental factors.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the AIP Section II.B.2.b.

Present worth economic analysis showed the cost effective alternative to be Recirculating Rock Filter. Extended aeration with no improvement in discharge quality at 207 percent of base cost. Membrane biological reactor at 314 percent of base cost and intermittent sand filter at 633 percent of base cost were deemed not cost effective..

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the AIP Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

Affordability analysis was not performed

Preferred Chosen Alternative:

Recirculating Rock Filter Bed

Reasons for Rejecting the other Evaluated Alternatives:

Extended aeration treatment plant with effluent filtration, intermittent sand filter and Membrane biological reactor were not economically efficient.

Comments/Discussion:

All alternatives were capable of meeting water quality standards and able to protect existing uses.

Appendix B

SOCIAL AND ECONOMIC IMPORTANCE (SEI) OF THE PREFERRED ALTERNATIVE:

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the AIP Section II.E. SEI is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.

Identify the affected community:

The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located.: Per the AIP Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

Land owners in the Lake of the Ozarks area.

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the AIP Section II.E.1., but specific community examples are encouraged.

Residential locations within reasonable driving distance. Increase to available housing to community. Increase tax base to community

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the AIP Section II.E.1.

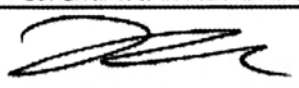
Relocation option to people on failing unmonitored onsite septic systems.

PROPOSED PROJECT SUMMARY:

Provide housing for forty-four working class families within a reasonable driving distance to employers in the Lake of the Ozarks. Provide monitored sewage treatment at acceptable discharge levels utilizing recirculating rock filter treatment technology.

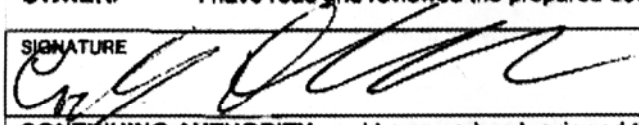
Please attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed, and dated by a registered professional engineer of Missouri.

CONSULTANT: I have prepared/reviewed this from and all attached reports and documentation. The conclusion proposed in consistent with the AIP and current state and federal regulations.

SIGNATURE	DATE
	5/6/09

PRINT NAME	LICENSE # :
Rockne C. Miller, PE	E-26097
TELEPHONE NUMBER	**E-MAIL ADDRESS**
573.348.9799	

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE
	5-6-09

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE

Appendix B

See general instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. Revised submittal will be considered a new submittal.

SIGNATURE	DATE
Cody Davidson	5-6-04
PRINT NAME	
Cody Davidson	
E-MAIL ADDRESS	
ccody0164@yahoo.com	

Submit request to:

Missouri Department of Natural Resources
Water Protection Program
Attn: Permits and Engineering Section
P.O. Box 176
Jefferson City, MO 65102-0176
Phone: 573-751-1300
Fax: 573-522-9920

The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream. Limits can be calculated by the permittee and submitted for review the department.

GENERAL INSTRUCTIONS

1. Please attach:
   A. A list of pollutants expected to be discharged.
   B. The location of each outfall clearly shown on map(s). A U.S. Geological Survey topographic map is available at www.dnr.mo.gov/internetmapviewer/.
2. Discharge(s) to all gaining streams: Applicant must submit dissolved oxygen analysis (i.e., using Missouri Department of Natural Resources approved models such as Streeter Phelps (www.ecy.wa.gov/programs/eap/pwspread/pwspread.html) or Qual2K/Qual2E (Q2K/Q2E) stream water quality study (www.epa.gov/athens/wwqtsc/index.html)) indicating that the preferred alternative's BOD_5 effluent limitations from the alternative analysis or the technology-based/regulatory BOD_5 effluent limits are protective of Missouri's water quality standard for dissolved oxygen. **Note:** If Q2K/Q2E is used, wasteload allocation for ammonia must be assumed. All Q2K/Q2E studies must have department approved Quality Assurance Project Plans. Recommended modeling procedures from the department (may differ with discharge) for this analysis are available upon request.
3. Discharge(s) to unclassified gaining stream: Applicant may provide the time of travel to the confluence with the classified stream segment for modeling pollutant decay (See *Total Ammonia Nitrogen Criteria Implementation Guidance Policy* at www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm). Otherwise, the applicant may determine limits based on no decay of discharge pollutants, which typically results in lower permit limits. Please use the TR-55 method (*Natural Resource Conservation Service, Urban Hydrology for Small Watersheds, Technical Release No. 55, June 1986*) for time of travel determination (http://directives.sc.egov.usda.gov/22162.wba). Please include a map, schematic or description of flow segments with your calculations. A worksheet with instructions is available upon request.
4. For all discharges, the chronic water quality criteria point of compliance is the classified stream or the confluence with the classified stream. No mixing is allowed for streams with seven-day Q10 low flow less than 0.1 cfs (10 CSR 20-7.031(4)(A)B(I)), while mixing is allowed for streams with seven-day Q10 low flow greater than 0.1 cfs (10 CSR 20-7.031(4) (A)B(II)).
5. For industrial facilities, a list of all chemicals, compounds, elements, etc. found in the discharge must be submitted with the request. Proprietary names of chemicals are not sufficient, as these chemicals may contain several pollutants for which the department must evaluate separate effluent limits. A pre-construction review meeting is highly recommended.
6. Do not submit water quality review assistance requests for renewals. All water quality-based effluent limits will be determined during the renewal process.
7. 10 CSR 20-7.015(8)(B)3. allows alternative limitations (i.e., lagoon or trickling filters) if a water quality impact study is conducted. This impact study should indicate that equivalent to secondary treatment for lagoons or trickling filters are protective of Missouri Water Quality standards for dissolved oxygen and ammonia.
8. Applicant must check for rare and endangered aquatic species that may be affected by the discharge at http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm.
9. Additional requirements for new facilities:
   A. Division of Geology and Land Survey Geohydrologic Evaluations must be submitted with the request.
   B. Coordinates of outfall (s) in lat/long or in the public land survey system must be provided.
   C. Please submit a letter with project timeframe.

Note: Lack of response for additional informational within a reasonable timeframe will result in return of request.

MO 780-1893 (03-09)

Appendix C

Natural Heritage Review
On-line LEVEL 1 REPORT

Print this page and use/attach as documentation that your project has consulted with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service about species of conservation concern. No further consultation about this project is necessary.

January 30, 2009

Your login and project information below:

User ID: 907
First Name: Brian
Last Name: Spencer
Email Address: millerlindsay@charterinternet.com
Business: Miller Lindsay
Project: Wastewater

Your query information below:

User ID	Response Level	Township	Range	Section	Direction	Latitude	Longitude	Point Line	UTM North	UTM East	Rectangle	TimeStamp
907		40	16	11	W	0	0		0	0		1/30/2009 2:49:39 PM

Wastewater

Wastewater – storm sewer, sanitary sewer, treatment plant, discharge

Clean Water Act permits issued by other agencies regulate both construction and operation of wastewater and storm water systems, and provide many important protections for fish and wildlife resources throughout the project area and at some distance downstream.

Fish and wildlife almost always benefit when unnatural pollutants are removed from water, and concerns are minimal if (a) the project area includes no protected species or restricted habitat identified in this report, and (b) construction is managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions.

Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with of native plant species compatible with the local landscape and for wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.

Management Recommendations for Construction Projects Affecting Missouri Streams and Rivers is a Conservation Department publication available at http://www.mdc.mo.gov/documents/nathis/endangered/streams.pdf

Cautions related to species/habitats of concern or project type. Please reflect these concerns and recommendations in your plans :

- Even if records of species/habitats of concern do not exist, there is a possibility that your project will encounter a species of concern that is not on record. In Missouri, 93% of the land is in private ownership, and most of that has never been checked for endangered species. Animals move over varying ranges, and in time both animal and plant populations can move.

- If your project encounters and potentially affects a federally-listed species, immediately report it to the U.S. Fish and Wildlife Service or Missouri Department of Conservation.

No further consultation with the U.S. Fish and Wildlife Service or the Missouri Department of Conservation is necessary. Print this document to establish compliance with requirements to consult with U.S. Fish and Wildlife Service and the Missouri Department of Conservation about this project.

If you need additional information, please contact:

MDC Natural Heritage Review
Policy Coordination Unit

or

U.S. Fish and Wildlife Service Ecological Services
101 Park DeVille Drive , Suite A

Appendix C

P.O. Box 180
Jefferson City , MO 65102-0180
(Phone 573-522-4115 ext. 3250)
www.mdc.mo.gov

Columbia , Missouri 65203-0007
(Phone 573-234-2132)

A HERITAGE REVIEW provides information about species and habitats of concern that could be affected by the project. Heritage records note things that were positively identified at some date and time, marked at a location that may be more or less precise. Animals move quickly but plant communities can move also. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean the project may not encounter something. Because of this, reports include information about records near but not necessarily on the project site. Three different kinds of information are provided.

• FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia , Missouri 65203-0007 ; Phone 573-234-2132; Fax 573-234-2181) for consultation.

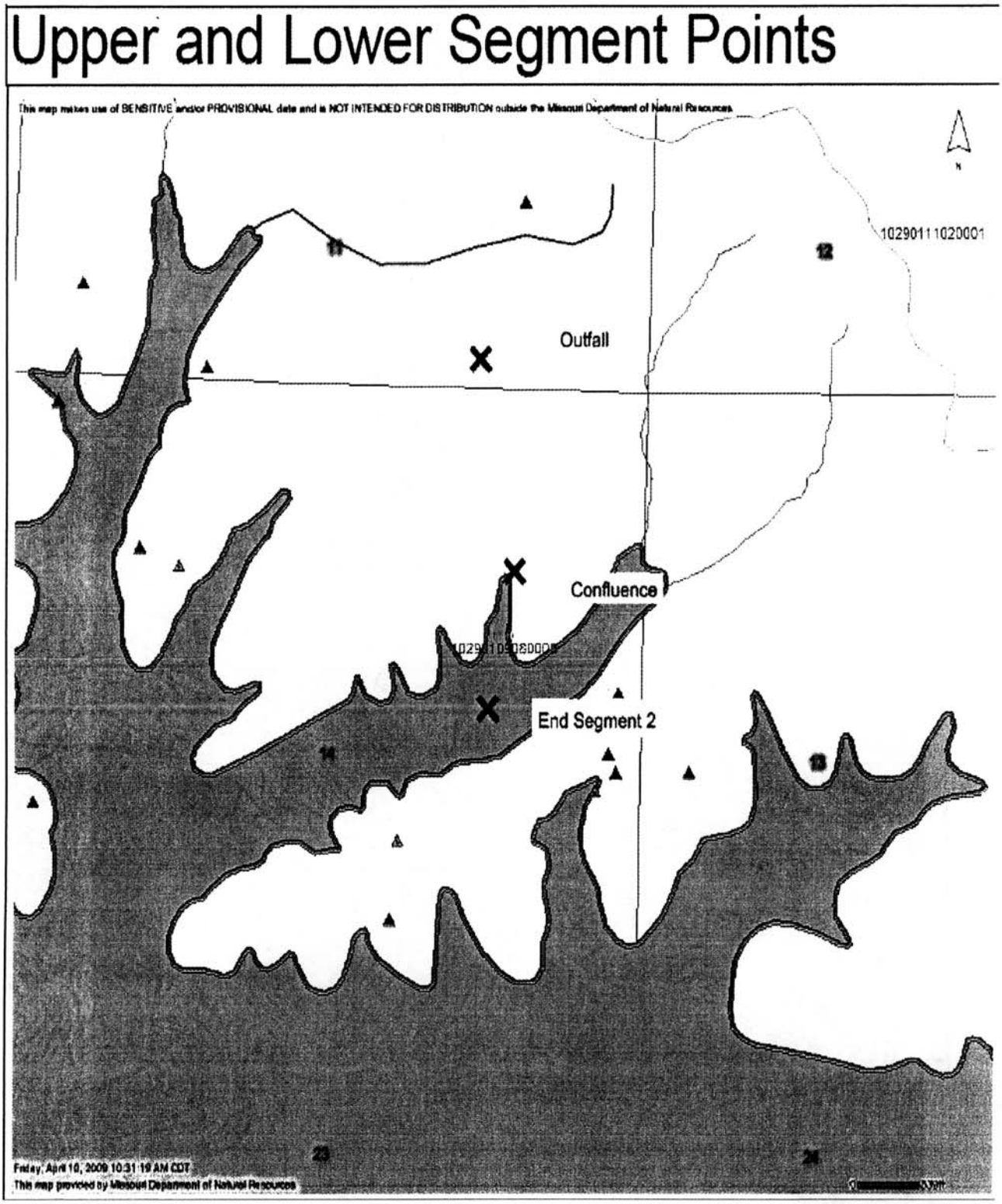
• STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and protected under the Wildlife Code of Missouri (RSMo 3 CSR 10). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR10-4.111. "State Rank" is numeric rank of relative rarity, protected under general provisions of the Wildlife Code but not endangered.

• "Concerns & management recommendations" are things for which one might prudently look. There is no specific heritage record, but our knowledge of the surrounding landscape suggests consideration. 93% of Missouri's land is in private ownership, so most sites have never been carefully inspected by conservation professionals.

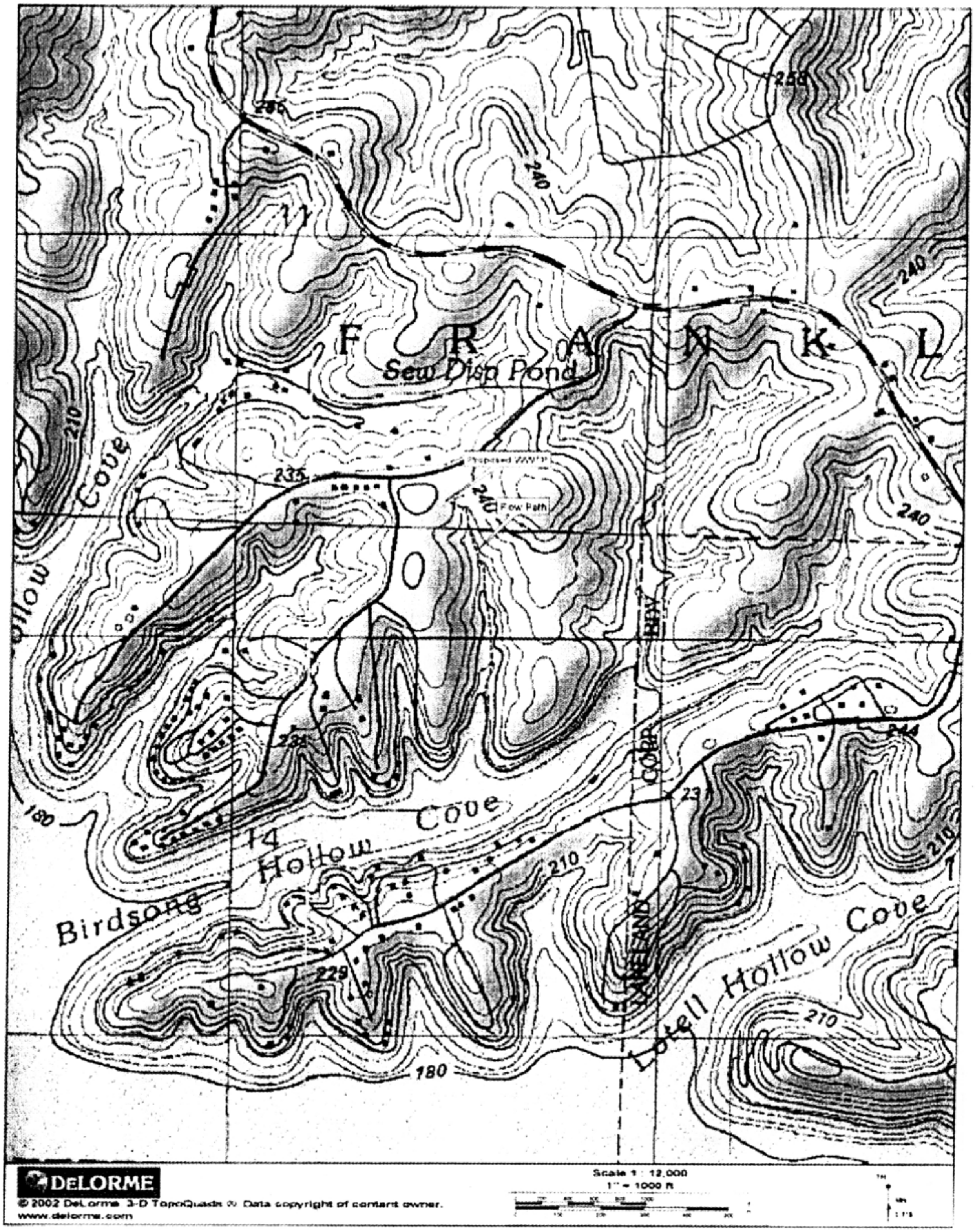
This report is not a site clearance letter. Rather, it provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from our Heritage Database into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive natural resources. However, the Heritage Database is only one reference that should be used to evaluate potential adverse impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information and species biological characteristics would additionally ensure that species of conservation concern are appropriately identified and addressed.

Additional information on rare, endangered and watched species may be found at http://www.mdc.mo.gov/nathis/endangered/ Detailed information about species mentioned may be accessed at http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx . If you would like printed copies of best management practices cited as Internet URLs, please contact us.

Appendix D


Upper and Lower Segment Points
This map makes use of SENSITIVE and/or PROVISIONAL data and is NOT INTENDED FOR DISTRIBUTION outside the Missouri Department of Natural Resources
N
10290111020001
11
12
Outfall
Confluence
End Segment 2
14
23
24
Friday, April 10, 2009 10:31:19 AM CDT
This map provided by Missouri Department of Natural Resources

Appendix E


F R A N K L
Sew Disp Pond
Flow Path
235
240
210
180
229
244
Cove
Birdsong
Hollow
Cove
14
Hollow Cove
DELORME
Scale 1 : 12,000
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www.delorme.com