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-0097551
Owner:	Missouri Department of Natural Resources, Division of State Parks
Address:	P.O. Box 176, Jefferson City, MO 65102
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	MDNR, Lake of the Ozarks State Park WWTF
Facility Address:	Highway 42, Kaiser, MO 65047
Legal Description:	See Page 2 through 5
UTM Coordinates:	
Receiving Stream:	See Page 2 through 5
First Classified Stream and ID:	
USGS Basin & Sub-watershed No.:	

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

FACILITY DESCRIPTION

See pages 2 through 5

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 621.250 RSMo, Section 640.013 RSMo and Section 644.051.6 of the Law.

June 1, 2014
Effective Date

Sara Parker Pauley, Director, Department of Natural Resources

March 31, 2017
Expiration Date

John Madras, Director, Water Protection Program

FACILITY DESCRIPTION
Outfall #001 – 004 – Campgrounds SIC #7033 / Sewerage Works SIC #4952
The use or operation of this facility does not require supervision of a Certified Operator.

Outfall #001 – Camp Clover Point

No Discharge System
Two cell storage lagoon / primary cell is aerated / sludge is retained in lagoon.
Design population is 152.
Design sludge production is 4.7 dry tons per year

Legal Description:	SW¼, NW¼, Sec. 24, T39N, R16W, Camden County
UTM Coordinates:	X= 531520, Y= 4217513

Receiving Stream:	Tributary to Lake of the Ozarks (U)
First Classified Stream and ID:	Lake of the Ozarks (L2) (7205)
USGS Basin & Sub-watershed No.:	10290109-0312

Receiving Stream Watershed: a gaining stream setting that flows into Lake of the Ozarks.

Facility Type: No-discharge Storage System for year seasonal flows into Lake of the Ozarks. Wastewater is pumped from the lagoon by truck and hauled to Outfalls #002, #003 or #004 at the park's discretion based on operational needs.

Design Basis:	**Average Annual**	**Recreational Season (April – October)**
Design dry weather flows:	1,440* gpd	2,500*gpd
Design with 1-in-10 year flows:	1,710* gpd	2,770* gpd
Design PE: 152		

* 210 days of occupancy per year

Storage Basin / Tanks:

Freeboard for basin:	1 foot
Storage volume (minimum to maximum water levels):	329,000 gallons

Days of Storage

Storage capacity:	**Recreational Season***
Design for Dry Weather Flows:	132 days
Design with 1-in-10 year flows:	119 days

FACILITY DESCRIPTION (continued)

Outfall #002 – Camp Red Bud

No Discharge System
Septic Tank / storage tank / irrigation / sludge is removed by permittee.
Design population is 18.
Design sludge production is 0.6 dry tons per year

Legal Description:	SW¼, SW¼, Sec. 07, T39N, R15W, Camden County
UTM Coordinates:	X= 533112, Y= 4220032
Receiving Stream:	Tributary to Lake of the Ozarks (U)
First Classified Stream and ID:	Lake of the Ozarks (L2) (7205)
USGS Basin & Sub-watershed No.:	10290109-0312

Receiving Stream Watershed: a gaining stream setting that flows into Lake of the Ozarks.

Facility Type: No-discharge storage and irrigation system for year seasonal flows into Lake of the Ozarks.

Design Basis:	**Average Annual**	**Recreational Season (April – October)**
Design dry weather flows:	506* gpd	880* gpd
Design with 1-in-10 year flows:	506* gpd	880* gpd
Design PE: 152		

* 210 days of occupancy per year

Storage Tank:
Storage volume (minimum to maximum water levels): 7,180 gallons

Days of Storage

Storage capacity:	**Recreational Season***
Design for Dry Weather Flows:	8.2 days
Design with 1-in-10 year flows:	8.2 days

* 210 days of occupancy per year

Land Application:
Irrigation Volume / year: 184,800 gallons (including 1-in-10 year flows)
Irrigation areas: 0.9 acres at design loading (0.9 acres total available)
Application rates / acre: 0.5 inch/hour; 1 inch/day; 3 inches/week; 10 inches/year
Field slopes: less than 7 percent
Equipment type: sprinklers
Vegetation: grass
Application rate is based on hydraulic loading

FACILITY DESCRIPTION (continued)

Outfall #003 – Camp Pin Oak

No Discharge System
Septic Tank / storage tank / irrigation / sludge is removed by permittee.
Design population is 31.
Design sludge production is 1.0 dry tons per year

Legal Description:	NE¼, SE¼, Sec. 13, T39N, R16W, Camden County
UTM Coordinates:	X= 532713 Y= 4218859
Receiving Stream:	Tributary to Lake of the Ozarks (U)
First Classified Stream and ID:	Lake of the Ozarks (L2) (7205)
USGS Basin & Sub-watershed No.:	10290109-0312

Receiving Stream Watershed: a gaining stream setting that flows into Lake of the Ozarks.

Facility Type: No-discharge storage and irrigation system for year seasonal flows into Lake of the Ozarks.

Design Basis:	**Average Annual**	**Recreational Season (April – October)**
Design dry weather flows:	1,438* gpd	2,500*gpd
Design with 1-in-10 year flows:	1,438* gpd	2,500*gpd
Design PE: 31		

* 210 days of occupancy per year

Storage Tank:
Storage volume (minimum to maximum water levels): 9,537 gallons

Days of Storage

Storage capacity:	**Recreational Season***
Design for Dry Weather Flows:	3.8 days
Design with 1-in-10 year flows:	3.8 days

* 210 days of occupancy per year

Land Application:
Irrigation Volume / year: 525,000 gallons (including 1-in-10 year flows)
Irrigation areas: 1.1 acres at design loading (1.1 acres total available)
Application rates / acre: 0.5 inch/hour; 1 inch/day; 3 inches/week; 24 inches/year
Field slopes: less than 10 percent
Equipment type: sprinklers
Vegetation: grass
Application rate is based on hydraulic loading

FACILITY DESCRIPTION (continued)

Outfall #004 – Camp Rising Sun

No Discharge System
Trickling filter / open storage tank / irrigation / sludge is removed by permittee.
Design population is 55.
Design sludge production is 1.0 dry tons per year

Legal Description:	NE¼, SW¼, Sec. 19, T39N, R15W, Camden County
UTM Coordinates:	X= 533677, Y= 4217035
Receiving Stream:	Tributary to Lake of the Ozarks (U)
First Classified Stream and ID:	Lake of the Ozarks (L2) (7205)
USGS Basin & Sub-watershed No.:	10290109-0312

Receiving Stream Watershed: a gaining stream setting that flows into Lake of the Ozarks.

Facility Type: No-discharge storage and irrigation system for year seasonal flows into Lake of the Ozarks.

Design Basis:	**Average Annual**	**Recreational Season (April – October)**
Design dry weather flows:	3,163* gpd	5,500*gpd
Design with 1-in-10 year flows:	3,173* gpd	5,510*gpd
Design PE: 31		

* 210 days of occupancy per year

Storage Tank:
Storage volume (minimum to maximum water levels): 22,216 gallons

Days of Storage

Storage capacity:	**Recreational Season***
Design for Dry Weather Flows:	22.2 days
Design with 1-in-10 year flows:	22.0 days

* 210 days of occupancy per year

Land Application:
Irrigation Volume / year: 211,470 gallons (including 1-in-10 year flows)
Irrigation areas: 1.2 acres at design loading (1.2 acres total available)
Application rates / acre: 0.5 inch/hour; 1 inch/day; 3 inches/week; 10 inches/year
Field slopes: less than 10 percent
Equipment type: sprinklers
Vegetation: grass
Application rate is based on hydraulic loading

PERMITTED FEATURE #001 – 004	TABLE A IRRIGATION SYSTEM LIMITATIONS AND MONITORING REQUIREMENTS	

The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective **June 1, 2014**, and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Storage Basin Operational Monitoring (Notes 1& 2)						
Storage Basin Freeboard (Note 3)	feet	*			once/month	measured
Precipitation	inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE OCTOBER 28, 2014.						

EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Land Application Operational Monitoring (Note 2)						
Irrigation Period	hours	*			daily	total
Volume Irrigated	gallons	*			daily	total
Application Area	acres	*			daily	total
Application Rate	inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE OCTOBER 28, 2014.						

* Monitoring requirement only.

Note 1 - **No-discharge facility requirements:** Wastewater shall be stored and land applied during suitable conditions so that there is no discharge from the storage basin(s) or irrigation site. An emergency discharge may occur when excess wastewater has accumulated above feasible irrigation rates due to precipitation exceeding the 1-in-10-year, 365-day rainfall or the 25-year, 24-hour storm event.

Note 2 - Records shall be maintained and summarized into an annual operating report, which shall be submitted by January 28th of each year for the previous calendar year period using report forms approved by the Department. The summarized annual report is in addition to the reporting requirements listed in Table A. The summarized annual report shall include the following:

a. Record of maintenance and repairs performed during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year;
b. The number of days the storage basin(s) has discharged during the year, the discharge flow, the reasons discharge occurred and effluent analysis performed; and
c. A summary of the irrigation operations including freeboard at the start and end of the irrigation season, the number of days of irrigation for each month, the total gallons irrigated, the total acres used, crops grown, crop yields per acre, the application rate in inches/acre per day and for the year, the monthly and annual precipitation received at the facility, a summary of testing results for wastewater and soils, and calculations for nitrogen applied and crop removal of nitrogen.

Note 3 - Storage Basin freeboard shall be reported as Storage Basin water level in feet below the overflow level. See Special Conditions for Wastewater Irrigation System requirements.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated November 1, 2013, May 1, 2013, and March 1, 2014, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Emergency Discharge. An emergency discharge from wastewater storage structures may only occur if rainfall exceeds the 1 in 10 year (Data taken from the Missouri Climate Atlas) or the 24 hour, 25 year (Data taken from NRCS Urban Hydrology for Small Watersheds) rainfall events. **Discharge for any other reason shall constitute a permit violation and shall be reported in accordance with Standard Conditions, Part 1, Section B.2.b.** Monitoring shall take place once in the first six (6) hours of discovery of the discharge and then once per day following the initial sampling period until the discharge ceases. The facility shall submit test results, along with the number of days the storage basin(s) has discharged during the month, to the Southwest Regional Office by the 28th day of the month after the discharge ceases. Permittee shall monitor for the following constituents:

Constituent	Units
Flow	MGD
Biochemical Oxygen Demand$_5$	mg/L
Total Suspended Solids	mg/l
Ammonia as N	mg/L
pH – Units	SU
E. coli	#/100mL

2. 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.
   (d) Incorporate the requirement to develop a pretreatment program pursuant to 40 CFR 403.8(a) when the Director of the Water Protection Program determines that a pretreatment program is necessary due to any new introduction of pollutants into the Publically Owned Treatment Works or any substantial change in the volume or character of pollutants being introduced.

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

3. All permitted features s must be clearly marked in the field. The permitted features and land application fields shall also be marked on the aerial or topographic site map included with the Operation and Maintenance manual.

4. Permittee will cease discharge by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) within 90 days of notice of its availability.

5. Water Quality Standards
   (a) To the extent required by law, 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;

D. SPECIAL CONDITIONS

(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.

6. 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;
   (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
   (4) The level established by the Director in accordance with 40 CFR 122.44(f).

(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.

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

8. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

9. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. If a modification of the monitoring frequencies listed in 10 CSR 20-9 is needed, the permittee shall submit a written request to the department for review and, if deemed necessary, approval.

10. The permittee shall submit a report annually in January to the Southwest Regional Office with the Discharge and Monitoring reports which address measures taken to locate and eliminate sources of infiltration and inflow into the collection system serving the facility for the previous year.

11. Bypasses are not authorized at this facility and are subject to 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3)(i), and with Standard Condition Part I, Section B, subsection 2.b. Bypasses are to be reported to the Southwest Regional Office.

12. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

13. A least one gate must be provided to access the wastewater treatment facility and provide for maintenance and mowing. The gate shall remain locked except when opened by the permittee to perform operational monitoring, sampling, maintenance, mowing, or for inspections by the Department.

14. At least one (1) warning sign shall be placed on each side of the facility enclosure in such positions as to be clearly visible from all directions of approach. There shall also be one (1) sign placed for every five hundred feet (500') (150 m) of the perimeter fence. A sign shall also be placed on each gate. Minimum wording shall be SEWAGE TREATMENT FACILITY—KEEP OUT. Signs shall be made of durable materials with characters at least two inches (2") high and shall be securely fastened to the fence, equipment or other suitable locations.

15. The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and land application systems, including key operating procedures, an aerial or topographic site map with the permitted features, land application fields, and irrigation buffer zones marked, and a brief summary of the operation of the facility. The O & M manual shall be made available to the operator. The O&M Manual shall be reviewed and updated at least every five years.

16. An all-weather access road shall be provided to the treatment facility.

17. The berms of the storage basin(s) shall be mowed and kept free of any deep-rooted vegetation, animal dens, or other potential sources of damage to the berms.

D. SPECIAL CONDITIONS

18. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion into the storage basin(s) and to divert stormwater runoff around the storage basin(s) and protect embankments from erosion.

19. Wastewater Irrigation System.
    (a) Discharge Reporting. Any unauthorized discharge from the storage basin(s) or irrigation system shall be reported to the department as soon as possible but always within 24 hours. Discharge is allowed only as described in the Facility Description and Effluent Limitations sections of this permit.
    (b) Storage Basin Operating Levels - No-discharge Systems. The minimum and maximum operating water levels for the storage basin(s) shall be clearly marked. Each storage basin shall be operated so that the maximum water elevation does not exceed two feet below the Emergency Spillway except due to exceedances of the 1-in-10 year, 365-day or 25-year, 24-hour storm events according to National Weather Service data. Wastewater shall be land applied whenever feasible based on soil and weather conditions and permit requirements. Storage basin(s) shall be lowered to the minimum operating level prior to each winter by November 30.
    (c) Emergency Spillway. Lagoons and earthen storage basins should have an emergency spillway to protect the structural integrity of earthen structures during operation at near full water levels and in the event of overflow conditions. The spillway shall be at least one foot below top of berm.
    (d) General Irrigation Requirements. The wastewater irrigation system shall be operated so as to provide uniform distribution of irrigated wastewater over the entire irrigation site. A complete ground cover of vegetation shall be maintained on the irrigation site unless the system is approved for row crop irrigation. **Wastewater shall be land applied only during daylight hours.** The wastewater irrigation system shall be capable of irrigating the annual design flow during an application period of less than 100 days or 800 hours per year.
    (e) Saturated/Frozen Conditions. There shall be no irrigation during ground frost, frozen, snow covered, or saturated soil conditions, or when precipitation is imminent or occurring.
    (f) Buffer Zones. There shall be no irrigation within 300 feet of any down gradient pond, lake, sinkhole, losing stream or water supply withdrawal; 100 feet of gaining streams or tributaries; 150 feet of dwelling or public use areas; or 50 feet of the property line.
    (g) Public Access Restrictions. Public access shall not be allowed to public use area irrigation sites when application is occurring.
    (h) Irrigated Wastewater Disinfection. Wastewater shall be disinfected prior to land application (not storage) to public use areas.
    (i) Nitrogen Loading Rates. Wastewater irrigation rates shall not exceed a nitrogen application rate of 150 pounds total nitrogen per acre per year, and the applied wastewater shall not exceed ten (10) mg/l of nitrate nitrogen as N.
    (j) Equipment Checks during Irrigation. The irrigation system and application site shall be visually inspected at least once/day during wastewater irrigation to check for equipment malfunctions and runoff from the irrigation site.

20. Land Application Sites. To add additional land application sites or convert any of the land to public use areas, a construction permit and permit modification may be required. The facility shall contact the Department for a written determination. Additionally, the O&M Manual shall be updated to include the additional land application site(s) and a copy of the updated sections of the O&M Manual shall be submitted to the Southwest Regional Office in accordance with Special Condition #15.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0097551
MDNR, LAKE OF THE OZARKS STATE PARK WWTF

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

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

This Factsheet is for Minor.

Part I – Facility Information

Facility Type: POTW Campgrounds SIC #7033 / Sewerage Works SIC #4952

Facility Description:
No Discharge System
Outfall #001 – Two cell storage lagoon / primary cell is aerated / sludge retained in lagoon.
Outfall #002 – Septic Tank / storage tank / irrigation / sludge removed by permittee.
Outfall #003 – Septic Tank / storage tank / irrigation / sludge removed by permittee.
Outfall #004 – Trickling filter / open storage tank / irrigation / sludge removed by permittee.

No changes have occurred at this facility or in the receiving water body that effects effluent limit derivation.

Application Date: 09/26/2012
Expiration Date: 03/07/2013

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS) [DRY WEATHER]	TREATMENT LEVEL	EFFLUENT TYPE
#001	0.0022	Land Application	Domestic
#002	0.0008	Land Application	Domestic
#003	0.0022	Land Application	Domestic
#004	0.005	Land Application	Domestic

Facility Performance History:
The facility has no history of non-compliance or enforcement action

Part II – Operator Certification Requirements

This facility is not required to have a certified operator.

Part III– Operational Monitoring

As per [10 CSR 20-9.010(4))], the facility is not required to conduct operational monitoring.

Part IV – Receiving Stream Information

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: OUTFALLS #001, 002, 003 & 004

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Tributary to Lake of the Ozarks	U	---	General Criteria	10290109-0312	#001 – 0.12 #002 – 0.09 #003 – 0.05 #004 – 0.24
Lake of the Ozarks	L2	7205	LWW, AQL, WBC (A), SCR		

* - 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), Groundwater (GRW).

RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Tributary to Lake of the Ozarks	0.0	0.0	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)].

Receiving Water Body's Water Quality
No water quality issues were found.

Part V – 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.

☒ Not Applicable; The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

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.

☒ All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.

ANTIDEGRADATION:
In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

☒ No degradation proposed and no further review necessary. Facility did not apply for authorization to increase pollutant loading or to add additional pollutants to their discharge.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:
As per [10 CSR 20-6.010(3)(B)], …An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

BIOSOLIDS & SEWAGE SLUDGE:
Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). 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. Additional information regarding biosolids and sludge is located at the following web address: http://dnr.mo.gov/env/wpp/pub/index.html, items WQ422 through WQ449.

☒ Permittee is not authorized to land apply biosolids. Sludge/biosolids are removed by contract hauler, incinerated, stored in the lagoon, etc.

COMPLIANCE AND ENFORCEMENT:
Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

☒ Not Applicable; The permittee/facility is not currently under Water Protection Program enforcement action.

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)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:
- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

☒ Not Applicable; The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

REASONABLE POTENTIAL ANALYSIS (RPA):
Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any given pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

☒ 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)/municipals.

☒ Not Applicable; Influent monitoring is not being required to determine percent removal. / Influent monitoring is not being required as facility has no discharge, therefore percent removal is not applicable.

SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):
Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1 mandates that the Department require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities.

☒ Applicable; In accordance with Missouri RSMo §644.026.1.(15) and 40 CFR Part 122.41(e), the permittee is required to develop and/or implement a program for maintenance and repair of the collection system and shall be required in this operating permit by either means of a Special Condition or Schedule of Compliance. In addition, the Department considers the development of this program as an implementation of this condition. Additionally, 40 CFR Part 403.3(o) defines a POTW to include any device and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant.

At this time, the Department recommends the US EPA's Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs At Sanitary Sewer Collection Systems (Document # EPA 305-B-05-002). The CMOM identifies some of the criteria used by the EPA to evaluate a collection system's management, operation, and maintenance and was intended for use by the EPA, state, regulated community, and/or third party entities. The CMOM is applicable to small, medium, and large systems; both public and privately owned; and both regional and satellite collection systems. The CMOM does not substitute for the Clean Water Act, the Missouri Clean Water Law, and both federal and state regulations, as it is not a regulation.

SCHEDULE OF COMPLIANCE (SOC):
Per 644.051.4 RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement, or if prohibited by other statute or regulation. A SOC includes 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. *See also* Section 502(17) of the Clean Water Act, and 40 CFR §122.2. For new effluent limitations, the permit includes interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR § 122.47(a)(1) and 10 CSR 20-7.031(10), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, a SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the 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 *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], 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.

VARIANCE:
As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

☒ Not Applicable; This operating permit is not drafted under premises of a petition for variance.

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 total amount of pollutant that may be discharged into that stream without endangering its water quality.

☒ Not Applicable; Wasteload allocations were not calculated.

WLA MODELING:
There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

☒ 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.

40 CFR 122.41(M) - BYPASSES:
The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from "bypassing" untreated or partially treated sewage (wastewater) beyond the headworks. A bypass is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation 10 CSR 20-2.010(11) defines a bypass as the diversion of wastewater from any portion of wastewater treatment facility or sewer system to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in 40 CFR 122.41(m)(4)(i)(A), (B), & (C). Any bypasses from this facility are subject to the reporting required in 40 CFR 122.41(l)(6) and per Missouri's Standard Conditions I, Section B, part 2.b. Additionally, Anticipated Bypasses include bypasses from peak flow basins or similar devices designed for peak wet weather flows.

☒ Not Applicable; This facility does not anticipate bypassing.

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

☒ Not Applicable; This facility does not discharge to a 303(d) listed stream.

Part VI – Effluent Limits Determination

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 lists 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.

☒ Lake or Reservoir [10 CSR 20-7.015(3)]
☒ All Other Waters [10 CSR 20-7.015(8)]

PERMITTED FEATURES #001, 002, 003, & 004
Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

EMERGENCY DISCHARGE TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	9	*			NO	*
Biochemical Oxygen Demand$_5$	mg/L	9	*			YES	30/20
Total Suspended Solids	mg/L	9	*			YES	30/20
Ammonia as N	mg/L	9	*			NO	*
pH	SU	9	*			YES	≥ 6.0
E.coli	**	9	*			YES	1000/400 Fecal
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 *E. coli* is a geometric mean.

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 Review
7. Antidegradation Policy
8. Water Quality Model
9. Best Professional Judgment
10. TMDL or Permit in lieu of TMDL
11. WET Test Policy

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/day while discharging	Test results are due on the 28th day of the month after the cessation of the discharge
Biochemical Oxygen Demand$_5$	once/day while discharging	
Total Suspended Solids	once/day while discharging	
Ammonia as N	once/day while discharging	
pH	once/day while discharging	
E.coli	once/day while discharging	

PERMITTED FEATURES #001, 002, 003, & 004 – STORAGE BASINS

Irrigation limitations derived and established in the below Irrigation Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

IRRIGATION LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Freeboard	feet	1	*			NO	*
Precipitation	inches	1	*			NO	*
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.
** - 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 Review
7. Antidegradation Policy
8. Water Quality Model
9. Best Professional Judgment
10. TMDL or Permit in lieu of TMDL
11. WET Test Policy

PERMITTED FEATURES #001, 002, 003, & 004 – DERIVATION AND DISCUSSION OF LIMITS:

- **Freeboard.** Monitoring requirement only.
- **Precipitation.** Monitoring requirement only.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Freeboard	once/month	once/year
Precipitation	once/day	once/year

PERMITTED FEATURES #001, 002, 003, & 004 – IRRIGATION FIELD:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Irrigation Period	hours	1	*			NO	*
Volume Irrigated	gallons	1	*			NO	*
Application Area	acres	1	*			NO	*
Application Rate	inches/acre	1	*			NO	*
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.

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 Review
7. Antidegradation Policy
8. Water Quality Model
9. Best Professional Judgment
10. TMDL or Permit in lieu of TMDL
11. WET Test Policy

- **Irrigation Period.** Monitoring requirement only. Monitoring for the Irrigation Period is included to determine if proper application is occurring on the land application fields.

- **Volume Irrigated**. Monitoring requirement only. Monitoring for the Volume Irrigated is included to determine if proper application is occurring on the land application fields.

- **Application Area.** Monitoring requirement only. Monitoring for the Application Area is included to determine if proper application is occurring on the land application fields.

- **Application Rate**. Monitoring requirement only. Monitoring for the Application Rate is included to determine if proper application is occurring on the land application fields.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Irrigation Period	once/day	once/year
Volume Irrigated	once/day	once/year
Application Area	once/day	once/year
Application Rate	once/day	once/year

Sampling Frequency Justification:
Sampling frequency has been retained from the previous permit cycle.

Sampling Type Justification
Due to the discharge being from irrigation, grab sample is more appropriate.

Part VII – Finding of Affordability

Pursuant to Section 644.145, RSMo., the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

☒ Not Applicable; The Department is not required to determine findings of affordability because the permit contains no new conditions or requirements that convey a new cost to the facility.

Part VIII – 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.

PERMIT SYNCHRONIZATION:
The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

PUBLIC NOTICE:
The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

☒ The Public Notice period for this operating permit was from February 12 to April 14, 2014. No comments were received.

DATE OF FACT SHEET: JANUARY 16, 2014

COMPLETED BY:

JOHNNY O'DELL, ENVIRONMENTAL SPECIALIST III
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WATER PROTECTION PROGRAM
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STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
NOVEMBER 1, 2013

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions
Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
   a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.

2. **Monitoring Requirements**.
   a. Records of monitoring information shall include:
      i. The date, exact place, and time of sampling or measurements;
      ii. The individual(s) who performed the sampling or measurements;
      iii. The date(s) analyses were performed;
      iv. The individual(s) who performed the analyses;
      v. The analytical techniques or methods used; and
      vi. The results of such analyses.
   b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.

3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

4. **Test Procedures**. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is "sufficiently sensitive" when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.

5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
   a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
   b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
   a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
      i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
      ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1);
      iii. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
      iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.

2. **Twenty-Four Hour Reporting.**
   a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph.
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
   ii. Any upset which exceeds any effluent limitation in the permit.
   iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.

c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.

3. **Sanitary Sewer Overflow Reporting.** The following requirements solely reflect reporting obligations, and reporting does not necessarily reflect noncompliance, which may depend on the circumstances of the incident reported.
   a. Twenty-Four Hour (24-Hour) Reporting. The permittee or owner shall report any incident in which wastewater escapes the collection system such that it reaches waters of the state or it may pose an imminent or substantial endangerment to the health or welfare of persons. Relevant information shall be provided orally or via the current electronic method approved by the Department within 24 hours from the time the permittee becomes aware of the incident. A written submission shall also be provided within five (5) business days of the time the permittee or owner becomes aware of the incident. The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. The five (5) day reports may be provided via the current electronic method approved by the Department.
   b. Incidents Reported via Discharge Monitoring Reports (DMRs). The permittee or owner shall report any event in which wastewater escapes the collection system, which does not enter waters of the state and is not expected to pose an imminent or substantial endangerment to the health or welfare of persons, which occur typically during wet weather events. Relevant information shall be provided with the permittee's or owner's DMRs.

4. **Anticipated Noncompliance**. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.

5. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.

6. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, 4, and 7 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.

7. **Other Information**. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

8. **Discharge Monitoring Reports.**
   a. Monitoring results shall be reported at the intervals specified in the permit.
   b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
   c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.

Section C – Bypass/Upset Requirements

1. **Definitions.**
   a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility.
   b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
   c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. **Bypass Requirements.**
   a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.
   b. Notice.
      i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
      ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
   c. Prohibition of bypass.
      i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
         1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
         2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         3. The permittee submitted notices as required under paragraph 2. b. of this section.
      ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.

3. **Upset Requirements.**
   a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      ii. The permitted facility was at the time being properly operated; and
      iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
   c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
   a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
   b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
   c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
   d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed $10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

2. **Duty to Reapply.**
   a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
   b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
   c. A permittees with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. **Proper Operation and Maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

6. **Permit Actions.**
   a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
      i. Violations of any terms or conditions of this permit or the law;
      ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
      iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
      iv. Any reason set forth in the Law or Regulations.
   b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Permit Transfer.**
   a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
   b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
   c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.

8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
   a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
   d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

12. **Closure of Treatment Facilities.**
   a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
   b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.

13. **Signatory Requirement.**
   a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
   b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
   c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
MAY 1, 2013

PART II - SPECIAL CONDITIONS – PUBLICLY OWNED TREATMENT WORKS
SECTION A – INDUSTRIAL USERS

1. Definitions

Definitions as set forth in the Missouri Clean Water Laws and approved by the Missouri Clean Water Commission shall apply to terms used herein.

Significant Industrial User (SIU). Except as provided in the *General Pretreatment Regulation* 10 CSR 20-6.100, the term Significant Industrial User means:

1. All Industrial Users subject to Categorical Pretreatment Standards; and
2. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the Publicly-Owned Treatment Works (POTW) (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's or for violating any Pretreatment Standard or requirement.

Clean Water Act (CWA) is the the federal Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002).

2. Identification of Industrial Discharges

Pursuant to 40 CFR 122.44(j)(1), all POTWs shall identify, in terms of character and volume of pollutants, any Significant Industrial Users discharging to the POTW subject to Pretreatment Standards under section 307(b) of the CWA and 40 CFR 403.

3. Application Information

Applications for renewal or modification of this permit must contain the information about industrial discharges to the POTW pursuant to 40 CFR 122.21(j)(6)

4. Notice to the Department

Pursuant to 40 CFR 122.42(b), all POTWs must provide adequate notice of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging these pollutants; and
2. Any substantial change into the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on:
   i. the quality and quantity of effluent introduced into the POTW, and
   ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

For POTWs without an approved pretreatment program, the notice of industrial discharges which was not included in the permit application shall be made as soon as practicable. For POTWs with an approved pretreatment program, notice is to be included in the annual pretreatment report required in the special conditions of this permit. Notice may be sent to:

Missouri Department of Natural Resources
Water Protection Program
Attn: Pretreatment Coordinator
P.O. Box 176
Jefferson City, MO 65102

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
March 1, 2014

PART III – SLUDGE AND BIOSOLIDS FROM DOMESTIC AND INDUSTRIAL WASTEWATER TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. This permit pertains to sludge requirements under the Missouri Clean Water Law and regulation for domestic wastewater and industrial process wastewater. This permit also incorporates applicable federal sludge disposal requirements under 40 CFR 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR 503 for domestic wastewater. EPA has reviewed and accepted these standard sludge conditions. EPA may choose to issue a separate sludge addendum to this permit or a separate federal sludge permit at their discretion to further address the federal requirements.
2. These PART III Standard Conditions apply only to sludge and biosolids generated at domestic wastewater treatment facilities, including public owned treatment works (POTW), privately owned facilities and sludge or biosolids generated at industrial facilities.
3. Sludge and Biosolids Use and Disposal Practices:
    a. The permittee is authorized to operate the sludge and biosolids treatment, storage, use, and disposal facilities listed in the facility description of this permit.
    b. The permittee shall not exceed the design sludge volume listed in the facility description and shall not use sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
    c. The permittee is authorized to operate the storage, treatment or generating sites listed in the Facility Description section of this permit.
4. Sludge Received from other Facilities:
    a. Permittees may accept domestic wastewater sludge from other facilities including septic tank pumpings from residential sources as long as the design sludge volume is not exceeded and the treatment facility performance is not impaired.
    b. The permittee shall obtain a signed statement from the sludge generator or hauler that certifies the type and source of the sludge
5. These permit requirements do not supersede nor remove liability for compliance with county and other local ordinances.
6. These permit requirements do not supersede nor remove liability for compliance with other environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Actor under Chapter 644 RSMo.
8. In addition to STANDARD CONDITIONS, the department may include sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Alternate Limits in the Site Specific Permit.
   Where deemed appropriate, the department may require an individual site specific permit in order to authorize alternate limitations:
    a. A site specific permit must be obtained for each operating location, including application sites.
    b. To request a site specific permit, an individual permit application, permit fee, and supporting documents shall be submitted for each operating location. This shall include a detailed sludge/biosolids management plan or engineering report.
10. Exceptions to these Standard Conditions may be authorized on a case-by-case basis by the department, as follows:

a. The department will prepare a permit modification and follow permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR 124.10, and 40 CFR 501.15(a)(2)(ix)(E). This includes notification of the owner of the property located adjacent to each land application site, where appropriate.
b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR 503.

SECTION B – DEFINITIONS

1. Best Management Practices include agronomic loading rates, soil conservation practices and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge..
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PFRP) in accordance with 40 CFR 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Industrial wastewater means any wastewater, also known as process water, not defined as domestic wastewater. Per 40 CFR Part 122, process water means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.
8. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including septic tanks, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological discs, and other similar facilities. It does not include wastewater treatment lagoons and constructed wetlands for wastewater treatment.
9. Operating location as defined in 10 CSR 20-2.010 is all contiguous lands owned, operated or controlled by one (1) person or by two (2) or more persons jointly or as tenants in common.
10. Plant Available Nitrogen (PAN) is the nitrogen that will be available to plants during the growing seasons after biosolids application.
11. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
12. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs)
13. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
14. Septage is the material pumped from residential septic tanks and similar treatment works (with a design population of less than 150 people). The standard for biosolids from septage is different from other sludges.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and sludge conditions of this permit.
2. The permittee shall operate the facility so that there is no sludge discharged to waters of the state.
3. Mechanical treatment plants shall have separate sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove sludge from these storage compartments on the required design schedule is a violation of this permit.

SECTION D – SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR CONTRACT HAULER

1. This section applies to permittees that haul sludge to another treatment facility for disposal or use contract haulers to remove and dispose of sludge.
2. Permittees that use contract haulers are responsible for compliance with all the terms of this permit including final disposal, unless the hauler has a separate permit for sludge or biosolids disposal issued by the department; or the hauler transports the sludge to another permitted treatment facility.
3. Haulers who land apply septage must obtain a state permit.
4. Testing of sludge, other than total solids content, is not required if sludge is hauled to a municipal wastewater treatment facility or other permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Sludge incineration facilities shall comply with the requirements of 40 CFR 503 Subpart E; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or if the ash is determined to be hazardous with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, quantity of sludge incinerated, quantity of ash generated, quantity of ash stored, and ash used or disposal method, quantity, and location. Permittee shall also provide the name of the disposal facility and the applicable permit number.

SECTION F – SURFACE DISPOSAL SITES AND SLUDGE LAGOONS

1. Surface disposal sites of domestic facilities shall comply with the requirements in 40 CFR 503 Subpart C; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
2. Sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain sludge storage lagoons as storage facilities, accumulated sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of sludge removed will be dependent on sludge generation and accumulation in the facility. Enough sludge must be removed to maintain adequate storage capacity in the facility.
    a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of sludge on the bottom of the lagoon, upon prior approval of the department; or
    b. Permittee shall close the lagoon in accordance with Section H.

SECTION G – LAND APPLICATION

1. The permittee shall not land apply sludge or biosolids unless land application is authorized in the facility description or the special conditions of the issued NPDES permit.
2. Land application sites within a 20 miles radius of the wastewater treatment facility are authorized under this permit when biosolids are applied for beneficial use in accordance with these standard conditions unless otherwise specified in a site specific permit. If the permittee's land application site is greater than a 20 mile radius of the wastewater treatment facility, approval must be granted from the department.
3. Land application shall not adversely affect a threatened or endangered species or its designated critical habitat.
4. Biosolids shall not be applied unless authorized in this permit or exempted under 10 CSR 20, Chapter 6.
    a. This permit does not authorize the land application of domestic sludge except for when sludge meets the definition of biosolids.
    b. This permit authorizes "Class A or B" biosolids derived from domestic wastewater and/or process water sludge to be land applied onto grass land, crop land, timber or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.

5. Public Contact Sites:

Permittees who wish to apply Class A biosolids to public contact sites must obtain approval from the department after two years of proper operation with acceptable testing documentation that shows the biosolids meet Class A criteria. A shorter length of testing will be allowed with prior approval from the Department. Authorization for land applications must be provided in the special conditions section of this permit or in a separate site specific permit.

a. After Class B biosolids have been land applied, public access must be restricted for 12 months.
b. Class B biosolids are only land applied to root crops, home gardens or vegetable crops whose edible parts will not be for human consumption.

6. Agricultural and Silvicultural Sites:

Septage – Based on Water Quality guide 422(WQ422) published by the University of Missouri

a. Haulers that land apply septage must obtain a state permit

b. Do not apply more than 30,000 gallons of septage per acre per year.

c. Septage tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to other mechanical type treatment facilities.

d. To meet Class B sludge requirements, maintain septage at 12 pH for at least thirty (30) minutes before land application. 50 pounds of hydrated lime shall be added to each 1,000 gallons of septage in order to meet pathogen and vector stabilization for septage biosolids applied to crops, pastures or timberland.

e. Lime is to added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.

Biosolids - Based on Water Quality guide 423, 424, and 425 (WQ423, WQ424, WQ425) published by the University of Missouri;

a. Biosolids shall be monitored to determine the quality for regulated pollutants

b. The number of samples taken is directly related to the amount of sludge produced by the facility (See Section I of these Standard Conditions). Report as dry weight unless otherwise specified in the site specific permit. Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable department approved material to reach the maximum concentration of pollutants allowed.

c. Table 1 gives the maximum concentration allowable to protect water quality standards

TABLE 1

Biosolids ceiling concentration[1]	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

[1]Land application is not allowed if the sludge concentration exceeds the maximum limits for any of these pollutants

d. The low metal concentration biosolids has reduced requirements because of its higher quality and can safely be applied for 100 years or longer at typical agronomic loading rates. (See Table 2)

TABLE 2

Biosolids Low Metal Concentration[1]	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	36
Zinc	2,800

[1]You may apply low metal biosolids without tracking cumulative metal limits, provided the cumulative application of biosolids does not exceed 500 dry tons per acre.

e. Each pollutant in Table 3 has an annual and a total cumulative loading limit, based on the allowable pounds per acre for various soil categories.

TABLE 3

Pollutant	CEC 15+		CEC 5 to 15		CEC 0 to 5	
	Annual	Total[1]	Annual	Total[1]	Annual	Total[1]
Arsenic	1.8	36.0	1.8	36.0	1.8	36.0
Cadmium	1.7	35.0	0.9	9.0	0.4	4.5
Copper	66.0	1,335.0	25.0	250.0	12.0	125.0
Lead	13.0	267.0	13.0	267.0	13.0	133.0
Mercury	0.7	15.0	0.7	15.0	0.7	15.0
Nickel	19.0	347.0	19.0	250.0	12.0	125.0
Selenium	4.5	89.0	4.5	44.0	1.6	16.0
Zinc	124.0	2,492.0	50.0	500.0	25.0	250.0

[1]Total cumulative loading limits for soils with equal or greater than 6.0 pH (salt based test) or 6.5 pH (water based test)

TABLE 4 - Guidelines for land application of other trace substances[1]

Cumulative Loading	
Pollutant	Pounds per acre
Aluminum	4,000[2]
Beryllium	100
Cobalt	50
Fluoride	800
Manganese	500
Silver	200
Tin	1,000
Dioxin	(10 ppt in soil)[3]
Other	[4]

[1]Design of land treatment systems for Industrial Waste, 1979. Michael Ray Overcash, North Carolina State University and Land Treatment of Municipal Wastewater, EPA 1981.)
[2]This applies for a soil with a pH between 6.0 and 7.0 (salt based test) or a pH between 6.5 to 7.5 (water based test). Case-by-case review is required for higher pH soils.

[3]Total Dioxin Toxicity Equivalents (TEQ) in soils, based on a risk assessment under 40 CFR 744, May 1998.

[4]Case by case review. Concentrations in sludge should not exceed the 95th percentile of the National Sewage Sludge Survey, EPA, January 2009.

Best Management Practices – Based on Water Quality guide 426(WQ426) published by the University of Missouri

a. Use best management practices when applying biosolids.
b. Biosolids cannot discharge from the land application site
c. Biosolid application is subject to the Missouri Department of Agriculture State Milk Board concerning grazing restrictions of lactating dairy cattle.
d. Biosolid application must be in accordance with section 4 of the Endangered Species Act.
e. Do not apply more than the agronomic rate of nitrogen needed.
f. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil and crop removals unless the nitrogen content of the biosolids does not exceed 50,000 milligrams per kilogram of total nitrogen on a dry weight basis and biosolids application rate is less than two dry tons per acre per year.
    i. PAN can be determined as follows and is in accordance with WQ426

(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).

[1] Volatilization factor is 0.7 for surface application and 1 for subsurface application.

g. Buffer zones are as follows:
    i. 300 feet of a water supply well, sinkhole, lake, pond, water supply reservoir or water supply intake in a stream;
    ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
    iii. 150 feet if dwellings;
    iv. 100 feet of wetlands or permanent flowing streams;
    v. 50 feet of a property line or other waters of the state, including intermittent flowing streams.
h. Slope limitation for application sites are as follows;
    i. A slope 0 to 6 percent has no rate limitation
    ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels
    iii. Slopes > 12, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.
i. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
j. Do not apply biosolids to sites with soil that is snow covered, frozen or saturated with liquid without prior approval by the department.
k. Biosolids / sludge applicators must keep detailed records up to five years.

SECTION H – CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical, industrial, and lagoons) and sludge or biosolids storage and treatment facilities and incineration ash ponds. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain department approval of a closure plan which addresses proper removal and disposal of all residues, including sludge, biosolids. Mechanical plants, sludge lagoons, ash ponds and other storage structures must obtain approval of a closure plan from the department. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6. 010 and 10 CSR 20 – 6.015.
3. Residuals that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:

a. Residuals shall meet the monitoring and land application limits for agricultural rates as referenced in Section H of these standard conditions.
b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre.
    i. PAN can be determined as follows:

(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).

[1] Volatilization factor is 0.7 for surface application and 1 for subsurface application.

4. When closing a domestic wastewater treatment lagoon with a design treatment capacity equal or less than 150 persons, the residuals are considered "septage" under the similar treatment works definition. See Section B of these standard conditions. Under the septage category, residuals may be left in place as follows:
    a. Testing for metals or fecal coliform is not required
    b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
    c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Residuals left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, the lagoon berm shall be demolished, and the site shall be graded and contain ≥70% vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion.
6. Lagoons and/or earthen structure and/or ash pond closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200
7. When closing a mechanical wastewater and/or industrial process wastewater plant; all sludge must be cleaned out and disposed of in accordance with the department approved closure plan before the permit for the facility can be terminated.
    a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain ≥70% vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion.
    b. Per 10 CSR 20-6.015(4)(B)6, Hazardous Waste shall not be land applied or disposed during industrial and mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations under 10 CSR 25.
    c. After demolition of the mechanical plant / industrial plant, the site must only contain clean fill defined in RSMo 260.200 (5) as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the department for fill or other beneficial use. Other solid wastes must be removed.
8. If sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or H, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR 503, Subpart C.

SECTION I – MONITORING FREQUENCY

1. At a minimum, sludge or biosolids shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

TABLE 5

Design Sludge Production (dry tons per year)	Monitoring Frequency (See notes 1 and 2)			
	Metals, Pathogens and Vectors	Nitrogen TKN[1]	Nitrogen PAN[2]	Priority Pollutants and TCLP[3]
0 to100	1 per year	1 per year	1 per month	1 per year
101 to 200	biannual	biannual	1 per month	1 per year
201 to 1,000	quarterly	quarterly	1 per month	1 per year
1,001 to 10,000	1 per month	1 per month	1 per week	--[4]
10,001 +	1 per week	1 per week	1 per day	--[4]

[1] Test total Kjeldahl nitrogen, if biosolids application is 2 dry tons per acre per year or less
[2] Calculate plant available nitrogen, if biosolids application is more than 2 dry tons per acre per year.
[3] Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) and toxicity characteristic leaching procedure (40 CFR 261.24) is required only for permit holders that must have a pre-treatment program.
[4] One sample for each 1,000 dry tons of sludge.

Note 1 : Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.
Note 2 : Total Phosphorus: Total phosphorus and total potassium shall be tested at the same monitoring frequency as metals.

2. If you own a wastewater treatment lagoon or sludge lagoon that is cleaned out once a year or less, you may choose to sample only when the sludge is removed or the lagoon is closed. Test one composite sample for each 100 dry tons of sludge or biosolids removed from the lagoon during the year within the lagoon at closing. Composite sample must represent various areas at one-foot depth.

3. Additional testing may be required in the special conditions or other sections of the permit. Permittees receiving industrial wastewater may be required to conduct additional testing upon request from the department.

4. At this time, the Department recommends monitoring requirements shall be performed in accordance with, "POTW Sludge Sampling and Analysis Guidance Document," United States Environmental Protection Agency, August 1989, and the subsequent revisions.

SECTION J – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in these standard conditions and any additional items in the Special Conditions section of this permit. This shall include dates when the sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
   a. By January 28th of each year, an annual report shall be submitted for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and sludge or biosolids disposal facilities.
   b. Permittees with wastewater treatment lagoons shall submit the above annual report only when sludge or biosolids are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Forms. The annual report shall be submitted on report forms provided by the department or equivalent forms approved by the department.
4. Reports shall be submitted as follows:
   Major facilities (those serving 10,000 persons or 1 million gallons per day) shall report to both the department and EPA. Other facilities need to report only to the department. Reports shall be submitted to the addresses listed as follows:

   DNR regional office listed in your permit
   (see cover letter of permit)
   ATTN: Sludge Coordinator

EPA Region VII
Water Compliance Branch (WACM)
Sludge Coordinator
11201 Renner Blvd.
Lenexa, KS 66219

5. Annual report Contents. The annual report shall include the following:
    a. Sludge and biosolids testing performed. Include a copy or summary of all test results, even if not required by the permit.
    b. Sludge or biosolids quantity shall be reported as dry tons for quantity generated by the wastewater treatment facility, the quantity stored on site at the end of the year, and the quantity used or disposed.
    c. Gallons and % solids data used to calculate the dry ton amounts.
    d. Description of any unusual operating conditions.
    e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
        i. This must include the name, address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
        ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
    f. Contract Hauler Activities
    If contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate sludge or biosolids use permit.
    g. Land Application Sites:
        i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. If biosolids application exceeds 2 dry tons/acre/year, reports biosolids nitrogen results, Plant Available Nitrogen (PAN) in pounds/acre, crop nitrogen requirement.
        ii. If the “Low Metals” criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
        iii. Report the method used for compliance with pathogen and vector attraction requirements.
        iv. Report soil test results for pH, CEC, and phosphorus. If none was tested during the year, report the last date when tested and results.

C10204
AP13360

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
FORM B – APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT FOR FACILITIES WHICH RECEIVE PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day) UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER No fee required	
DATE RECEIVED 9/24/12	FEE SUBMITTED Ø

RECEIVED
SEP 26 2012
WATER PROTECTION PROGRAM

NOTE ▶ PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1. This application is for:
   - ☐ An operating permit and antidegradation review public notice.
   - ☐ A construction permit following an appropriate operating permit and antidegradation review public notice.
   - ☐ A construction permit and a concurrent operating permit and antidegradation review public notice.
   - ☐ A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required).
   - ☐ An operating permit for a new or unpermitted facility. Construction Permit # _____
   - ☑ An operating permit renewal: Permit #MO- 0097551 Expiration Date 03/06/2013
   - ☐ An operating permit modification: Permit #MO- _____ Reason: _____

1.1 Is this a Federal/State Funded Project? ☐ YES ☐ NO Funding Agency/Project #: _____

1.2 Is the appropriate fee included with the application (See instructions for appropriate fee)? ☐ YES ■ NO

2. FACILITY (Outfall 001 of 004) Camp Clover Point

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS (PHYSICAL)	CITY	STATE / ZIP CODE
403 Highway 134	Kaiser	MO / 65047

2.1 **LEGAL DESCRIPTION:** ¼, SW ¼, NW ¼, Sec. 24 , T 39N, R 16W County Camden

2.2 UTM Coordinates Easting (X):_____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Un. Trib. to Lake of the Ozarks

3. OWNER

NAME	E-MAIL ADDRESS	TELEPHONE WITH AREA CODE
MDNR, Division of State Parks		(573) 751-0761
ADDRESS	CITY	STATE / ZIP CODE
P. O. Box 176	Jefferson City	MO / 65102

3.1 Request review of draft permit prior to Public Notice? ☑ YES ☐ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS	CITY	STATE / ZIP CODE
403 Highway 134	Kaiser	MO / 65047

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE WITH AREA CODE
Dwayne Thompson	5387	(573) 348-2696

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE WITH AREA CODE
Bill Arnold	Park Superintendent	(573) 348-2696

7.0 ADDITIONAL FACILITY INFORMATION

7.1 Description of facilities (Attach additional sheet if required). Attach a 1" = 2,000' scale U.S. Geological Survey topographic map showing location of all outfalls and downstream landowners. (See Item 9.)

7.2 Facility SIC code 9512/4512 Discharge SIC code: _____; Facility NAICS code: _____; Discharge NAICS code: _____.

7.3 Number of people presently connected or population equivalent (P.E.) max 170 Design P.E. 152
Number of units presently connected: Homes _____ Trailers _____ Apartments _____ Other 14
see permit Design flow for this outfall: _____ Total design flow for the facility: _____ Actual flow for this outfall: _____
Commercial Establishment: Daily number of employees working _____ Daily number of customers/guests 37

7.4 Length of pipe in the sewer collection system? 2055 feet/miles (Please denote which unit is appropriate.)

7.5 Does any bypassing occur in the collection system or at the treatment facility? ☐Yes ☑ No (If yes, attach explanation.)

7.6 Does significant infiltration occur in the collection system? ☐Yes ☑ No (If yes, attach explanation and proposed repair.)

7.7 Is industrial waste discharged to the facility identified in Item 2? ☐Yes ☑ No (If yes, see instructions.)

7.8 Will the discharge be continuous through the year? ☐Yes ☑ No
   a. Discharge will occur during the following months: No Discharge
   b. How many days of the week will the discharge occur? No Discharge

7.9 Is wastewater land applied? ☑Yes ☐ No (If yes, attach Form I.)

7.10 Will chlorine be added to the effluent? ☐Yes ☑ No
   a. If chlorine is added, what is the resulting residual? _____ µg/l (micrograms per liter)

7.11 Does this facility discharge to a losing stream or sinkhole? ☐Yes ☑ No

7.12 Attach a flow chart showing all influents, treatment facilities and outfalls.

7.13 Has a waste load allocation study been completed for this facility? ☐Yes ☑ No

7.14 List all permit violations, including effluent limit exceedances in the last five years. Attach a separate sheet if necessary. If none, write none. None

8. SLUDGE HANDLING, USE AND DISPOSAL

8.1 Is the sludge a hazardous waste as defined by 10 CSR 25? ☐ Yes ☑ No

8.2 Sludge Production, including sludge received from others: 4.7 Design Dry Tons/Year _____ Actual Dry Tons/Year

8.3 Capacity of sludge holding structures:
Sludge storage provided: _____ cubic feet; _____ days of storage; _____ average percent solids of sludge;
☐ No sludge storage is provided.

8.4 Type of Storage:
☐ Holding tank ☐ Building
☐ Basin ☐ Other (Please describe) _____
☐ Concrete Pad

8.5 Sludge Treatment:
☐ Anaerobic Digester ☐ Lagoon ☐ Composting
☐ Storage Tank ☐ Aerobic Digester ☐ Other (Attach description)
☐ Lime Stabilization ☐ Air or Heat Drying

8.6 Sludge Use or Disposal:
☐ Land Application ☐ Surface Disposal (Sludge Disposal Lagoon, Sludge held for more than two years)
☐ Contract Hauler ☐ Incineration
☐ Hauled to Another Treatment Facility ☑ Sludge Retained in Wastewater treatment lagoon
☐ Other _____ Attach explanation sheet.
☐ Solid Waste Landfill

8.7 PERSON RESPONSIBLE FOR HAULING SLUDGE TO DISPOSAL FACILITY
☐ By Applicant ☑ By Others (complete below)

NAME			
Amos Septic Service Inc.			
ADDRESS: P. O. Box 565	CITY: Osage Beach	STATE: MO	ZIP CODE: 65065
CONTACT PERSON: Dan Hanks	TELEPHONE WITH AREA CODE: (573) 346-5992	PERMIT NO.: MO- 0126543	

8.8 SLUDGE USE OR DISPOSAL FACILITY
☐ By Applicant ☑ By Others (Please complete below.)

NAME			
Amos Septic Service Inc.			
ADDRESS: P. O. Box 565	CITY: Osage Beach	STATE: MO	ZIP CODE: 65065
CONTACT PERSON: Dan Hanks	TELEPHONE WITH AREA CODE: (573) 346-5992	PERMIT NO.: MO- 0126543	

8.9 Does the sludge or biosolids disposal comply with federal sludge regulations under 40 CFR 503?
☑ Yes ☐ No (Please attach explanation)

9. DOWNSTREAM LANDOWNER (S). ATTACH ADDITIONAL SHEETS AS NECESSARY. SEE INSTRUCTIONS.

NAME			
Ameren UE Shoreline Management Office			
ADDRESS: 1028 Bagnell Dam Blvd.	CITY: Lake Ozark	STATE: MO	ZIP CODE: 65049

10. DRINKING WATER SUPPLY INFORMATION

10.1 WHAT IS THE SOURCE OF YOUR DRINKING WATER SUPPLY:
A. Public supply (municipal or water district water) MO5122664
If public, please give name of the public supply _____
B. Private well _____
C. Surface water (lake, pond or stream) _____

10.2 Does your drinking water source serve at least 25 people at least 60 days per year (not necessarily consecutive days)?
☑ Yes ☐ No

10.3 Does your supply serve housing which is occupied year round by the same people? This does not include housing which is occupied seasonally? ☐ Yes ☑ No

11. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE WITH AREA CODE
Martin Kator, Environmental Specialist IV	(573) 522-6380
SIGNATURE	DATE SIGNED: 09/24/2012

Missouri State Parks

Like 4 Send

Camp Clover Point

at Lake of the Ozarks State Park

Camp Clover Point includes a dining hall with a kitchen, sleeping barracks with modern restrooms and showers, a recreation hall, volleyball and basketball playcourts and a waterfront. Camp capacity is 170 people, with a minimum of 75.

The kitchen includes the following: commercial cooler, chest freezer, refrigerator, commercial stove, convection oven, commercial dishwasher, coffee pot, commercial mixer, pots and pans, mixing bowls, skillets, sheet pans, cake pans, stock pots, plates, bowls, water glasses, pitchers, serving bowls, coffee cups and utensils.

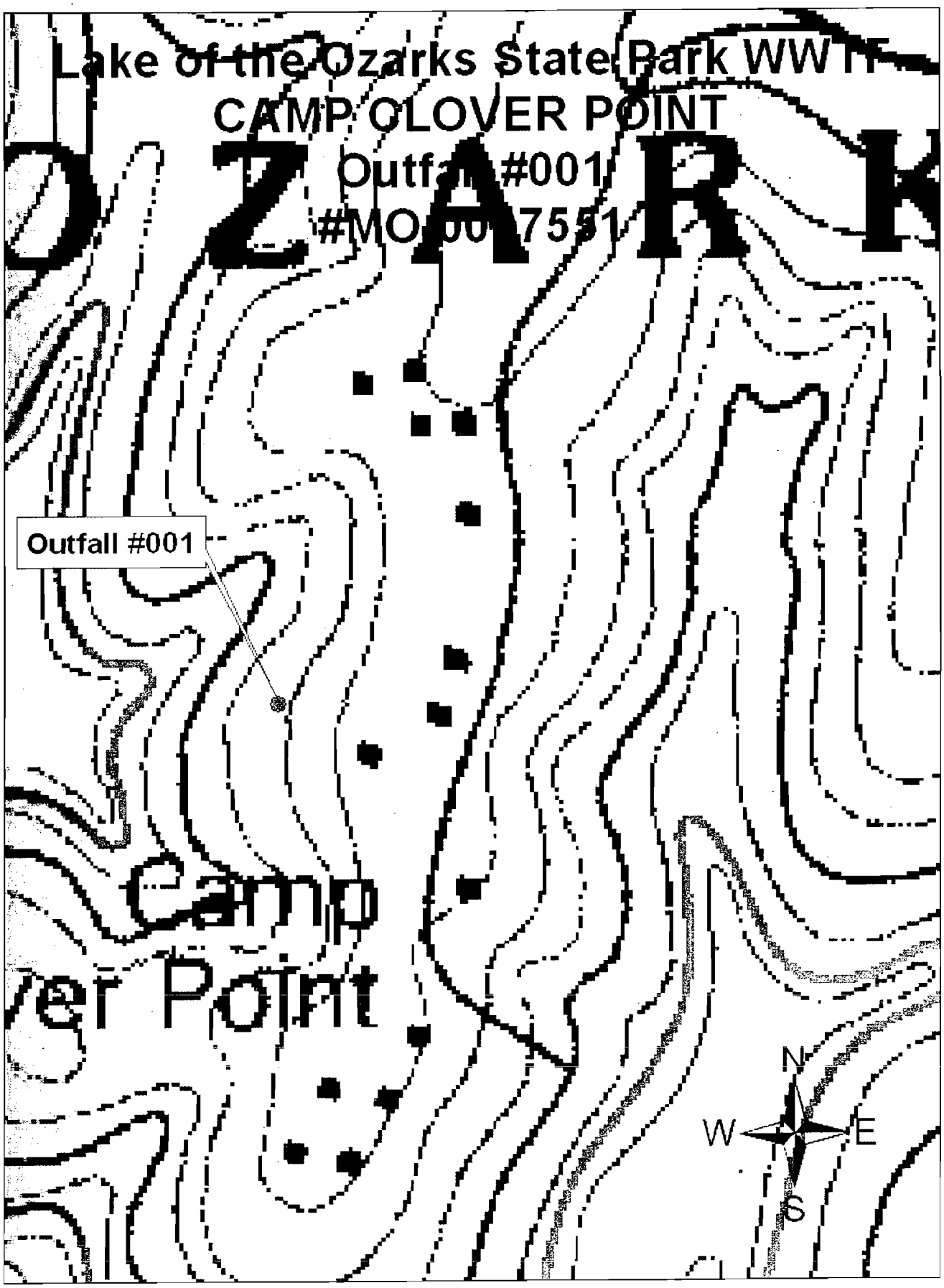
	# of Rooms	Sleeping Capacity	Restroom Facilities
Central Camp Area			
Dining Lodge and Kitchen	2	--	1 toilet; 1 lavatory; hot water
Recreation Building	3	--	2 toilets; 2 lavatories
Craft House	2	--	1 toilet; 1 lavatory
Administrative Building and Infirmary	3	3	1 toilet; 1 lavatory; 1 shower; hot water
Sleeping Units			
Barracks A1-A4, B1-B4	3 each	18 each	2 toilets; 2 lavatories; 3 showers; hot water
Staff Cabin A5	8 (cubicle style)	8 total	2 toilets; 2 lavatories; 3 showers; hot water
Staff Cabin B5	4	15	2 toilets; 3 lavatories; 3 showers; hot water

Recreational Facilities:
Waterfront (beach, swim dock, boat dock, vault toilet)
Lighted, paved playcourts (volleyball and basketball)
Amphitheater
Playfields

Like 4 Send

Advisories

Lake of the Ozarks State Park WWTF
CAMPER RIVER POINT
Outfall #001
MO-0092551
Outfall #001


Lake of the Ozarks State Park WWTF
CAMP CLOVER POINT
Outfall #001
#MO-00 7551
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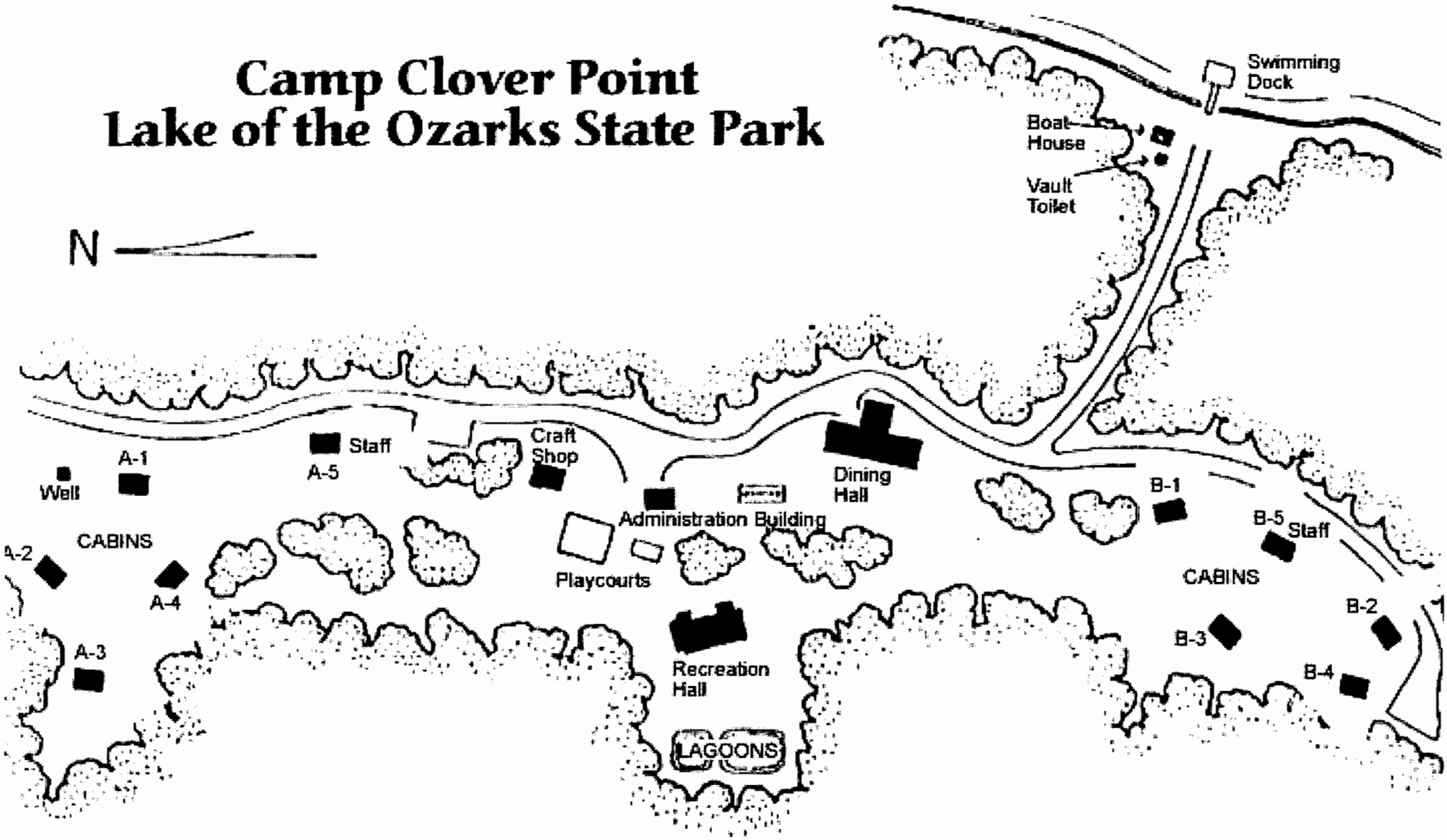
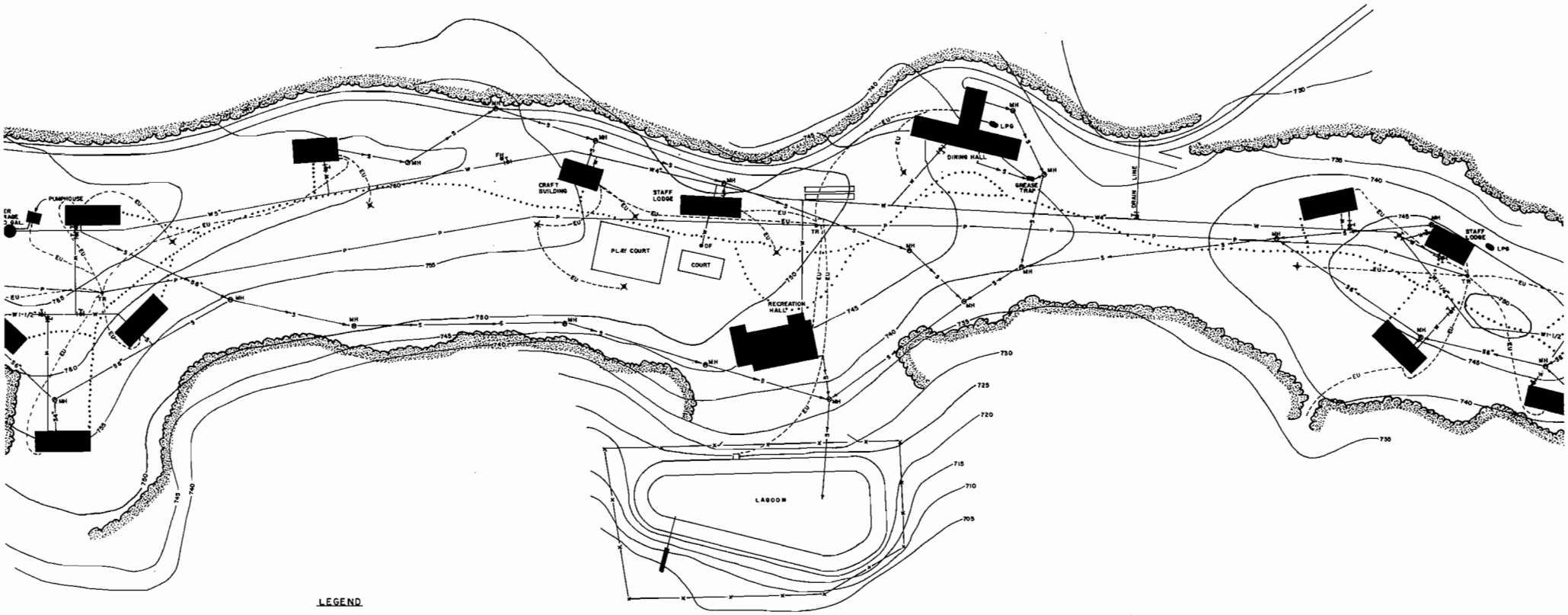
Camp Clover Point
Lake of the Ozarks State Park





LEGEND

UNDERGROUND ELECTRIC, PRIMARY	—— P ——
UNDERGROUND ELECTRIC, SECONDARY	- - - EU - - -
ELECTRICAL LOAD CENTER	TR
WATER MAIN	—— W ——
SEWER LINE	—— S ——
4' BLACKTOP WALK	• • • • • • • • • •
MANHOLE	MH
WATER VALVE	
CONTOURS	750
FENCE	x x x
LIGHT ON POLE	
FIRE HYDRANT	FH
MAJOR TIMBER LINE	
ROAD	
LPG GAS TANK	LPG

N

SCALE IN FEET

SCALE: 1" = 50'

NOTE: NAME OF DIVISION CHANGED 8/19/85.

MISSOURI
DEPARTMENT of NATURAL RE
DIVISION of PARKS,
RECREATION, and HISTORIC PRES

LAKE OF THE OZARKS STAT
CAMP CLOVER POIN

FIELD CHECK BY	TRACED BY	DATE 3/11/85
DRAWN BY Don Wahlner	CHECKED BY	REVISIONS

APPROVED BY DIVISION OF PARKS, RECREATION, AND HISTORIC PRESER

DIRECTOR

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

FORM B – APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT FOR FACILITIES WHICH RECEIVE PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day) UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER: No Fee requires	
DATE RECEIVED: 9/26/12	FEE SUBMITTED: Ø

(10)

RECEIVED SEP 26 2012 WATER PROTECTION PROGRAM

NOTE ▶ PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1. This application is for:

- ☐ An operating permit and antidegradation review public notice.
- ☐ A construction permit following an appropriate operating permit and antidegradation review public notice.
- ☐ A construction permit and a concurrent operating permit and antidegradation review public notice.
- ☐ A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required).
- ☐ An operating permit for a new or unpermitted facility. Construction Permit #
- ☑ An operating permit renewal: Permit #MO- 0097551 Expiration Date 03/06/2013
- ☐ An operating permit modification: Permit #MO- _____ Reason: _____

1.1 Is this a Federal/State Funded Project? ☐ YES ☐ NO Funding Agency/Project #: _____

1.2 Is the appropriate fee included with the application (See instructions for appropriate fee)? ☐ YES ■ NO

2. FACILITY (Outfall 002 of 004) Camp Red Bud

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS (PHYSICAL): 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

2.1 LEGAL DESCRIPTION: ¼, SW ¼, SW ¼, Sec. 07 , T 39N, R 15W County Camden

2.2 UTM Coordinates Easting (X):_____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Un-Trib. to Lake of the Ozarks

3. OWNER

NAME	E-MAIL ADDRESS	TELEPHONE WITH AREA CODE
MDNR, Division of State Parks		(573) 751-0761
ADDRESS: P. O. Box 176	CITY: Jefferson City	STATE: MO / ZIP CODE: 65102

3.1 Request review of draft permit prior to Public Notice? ☑ YES ☐ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS: 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE WITH AREA CODE
Dwayne Thompson	5387	(573) 348-2696

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE WITH AREA CODE
Bill Arnold	Park Superintendent	(573) 348-2696

7.0 ADDITIONAL FACILITY INFORMATION

7.1 Description of facilities (Attach additional sheet if required). Attach a 1" = 2,000' scale U.S. Geological Survey topographic map showing location of all outfalls and downstream landowners. (See Item 9.)

7.2 Facility SIC code: 15/4/52 Discharge SIC code: _____; Facility NAICS code: _____; Discharge NAICS code: _____.

7.3 Number of people presently connected or population equivalent (P.E.) max 44 Design P.E. 18
Number of units presently connected: Homes _____ Trailers _____ Apartments _____ Other 2
See permit Design flow for this outfall: _____ Total design flow for the facility: _____ Actual flow for this outfall: _____
Commercial Establishment: Daily number of employees working _____ Daily number of customers/guests 7

7.4 Length of pipe in the sewer collection system? 750 feet/miles (Please denote which unit is appropriate.)

7.5 Does any bypassing occur in the collection system or at the treatment facility? ☐Yes ☑ No (If yes, attach explanation.)

7.6 Does significant infiltration occur in the collection system? ☐Yes ☑ No (If yes, attach explanation and proposed repair.)

7.7 Is industrial waste discharged to the facility identified in Item 2? ☐Yes ☑ No (If yes, see instructions.)

7.8 Will the discharge be continuous through the year? ☐Yes ☑ No
a. Discharge will occur during the following months: No Discharge
b. How many days of the week will the discharge occur? No Discharge

7.9 Is wastewater land applied? ☑Yes ☐ No (If yes, attach Form I.)

7.10 Will chlorine be added to the effluent? ☐Yes ☑ No
a. If chlorine is added, what is the resulting residual? _____ µg/l (micrograms per liter)

7.11 Does this facility discharge to a losing stream or sinkhole? ☐Yes ☑ No

7.12 Attach a flow chart showing all influents, treatment facilities and outfalls.

7.13 Has a waste load allocation study been completed for this facility? ☐Yes ☑ No

7.14 List all permit violations, including effluent limit exceedances in the last five years. Attach a separate sheet if necessary. If none, write none. None

8. SLUDGE HANDLING, USE AND DISPOSAL

8.1 Is the sludge a hazardous waste as defined by 10 CSR 25? ☐ Yes ☑ No

8.2 Sludge Production, including sludge received from others: 0.6 Design Dry Tons/Year _____ Actual Dry Tons/Year

8.3 Capacity of sludge holding structures: 600
Sludge storage provided: ~~960~~ cubic feet; _____ days of storage; _____ average percent solids of sludge;
☐ No sludge storage is provided.

8.4 Type of Storage:
☑ Holding tank ☐ Building
☐ Basin ☐ Other (Please describe) _____
☐ Concrete Pad

8.5 Sludge Treatment:
☐ Anaerobic Digester ☐ Lagoon ☐ Composting
☑ Storage Tank ☐ Aerobic Digester ☐ Other (Attach description)
☐ Lime Stabilization ☐ Air or Heat Drying

8.6 Sludge Use or Disposal:
☐ Land Application ☐ Surface Disposal (Sludge Disposal Lagoon, Sludge held for more than two years)
☑ Contract Hauler ☐ Incineration
☐ Hauled to Another Treatment Facility ☐ Sludge Retained in Wastewater treatment lagoon
☐ Other _____ Attach explanation sheet.
☐ Solid Waste Landfill

8.7 PERSON RESPONSIBLE FOR HAULING SLUDGE TO DISPOSAL FACILITY
☐ By Applicant ☑ By Others (complete below)

NAME			
Amos Septic Service Inc.			
ADDRESS	CITY	STATE	ZIP CODE
P. O. Box 565	Osage Beach	MO	65065
CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.	
Dan Hanks	(573) 346-5992	MO- 0126543	

8.8 SLUDGE USE OR DISPOSAL FACILITY
☐ By Applicant ☑ By Others (Please complete below.)

NAME			
Amos Septic Service Inc.			
ADDRESS	CITY	STATE	ZIP CODE
P. O. Box 565	Osage Beach	MO	65065
CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.	
Dan Hanks	(573) 346-5992	MO- 0126543	

8.9 Does the sludge or biosolids disposal comply with federal sludge regulations under 40 CFR 503?
☑ Yes ☐ No (Please attach explanation)

9. DOWNSTREAM LANDOWNER (S). ATTACH ADDITIONAL SHEETS AS NECESSARY. SEE INSTRUCTIONS.

NAME			
Ameren UE Shoreline Management Office			
ADDRESS	CITY	STATE	ZIP CODE
1028 Bagnell Dam Blvd.	Lake Ozark	MO	65049

10. DRINKING WATER SUPPLY INFORMATION

10.1 WHAT IS THE SOURCE OF YOUR DRINKING WATER SUPPLY:
A. Public supply (municipal or water district water) MO5122667
If public, please give name of the public supply _____
B. Private well _____
C. Surface water (lake, pond or stream) _____

10.2 Does your drinking water source serve at least 25 people at least 60 days per year (not necessarily consecutive days)?
☑ Yes ☐ No

10.3 Does your supply serve housing which is occupied year round by the same people? This does not include housing which is occupied seasonally? ☐ Yes ☑ No

11. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE WITH AREA CODE
Martin Kator, Environmental Specialist IV	(573) 522-6380
SIGNATURE	DATE SIGNED
	09/24/2012

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

FORM I – PERMIT APPLICATION FOR CONSTRUCTION AND OPERATION OF WASTEWATER IRRIGATION SYSTEMS

FOR AGENCY USE ONLY
PERMIT NUMBER MO -
DATE RECEIVED

INSTRUCTIONS: The following forms must be submitted with Form I: FORM B for domestic wastewater. **Submit FORMS E and G** for land disturbance permit if construction areas total one acre or more.

RECEIVED
SEP 26 2012
WATER PROTECTION PROGRAM

1.00 FACILITY INFORMATION

1.10 Facility Name
MDNR, Lake of the Ozarks State Park WWTF

1.20 Application for:
- ☐ Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8)
- ☐ Operating Permit (if no construction permit, attach engineering documents)
  Date Irrigation System Began Operation: _____
- ☑ Operating Permit Renewal

1.30 Type of wastewater to be irrigated: ☑ Domestic ☐ Municipal ☑ State/National Park ☐ Seasonal business
☐ Municipal with Pretreatment Program or Significant Industrial Users ☐ Other (explain) _____
SIC Codes (list all that apply, in order of importance) 9512, 4952

1.40 Months when the business or enterprise will operate or generate wastewater:
☐ 12 months per year ☑ Part of year (list Months): April - October

1.50 This system is designed for:
☑ No-discharge ☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreation season (April – October) and discharge during November – March.
☐ Other (explain) _____

1.60 List the Facility outfalls which will be applicable to the irrigation system from outfalls listed on Form B.
Outfall Nos. 001 002 _ _ _ _ _

2.00 STORAGE BASINS

2.10 Number of storage basins: 4 Type of basin: ☐ Steel ☑ Concrete #002 (x2) ☐ Fiberglass ☑ Earthen #001 (x2)
☐ Earthen with membrane liner

2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
(Complete Attachment A: Profile Sketch)

#002 { L 7.5' x W 10' x D 8'
L 4.5' x W 10' x D 8'

#001 { Basin #1: Length 120' Width 75' Depth 3' Freeboard 1' Berm Width _____ % Slope 3:1
Basin #2: Length 45' Width 45' Depth 3' Freeboard 1' Berm Width _____ % Slope 3:1

2.30 Storage Basin operating levels (report as feet below emergency overflow level)
Basin #1: Maximum water level 2.5 ft. Minimum operating water level 1 ft.
Basin #2: Maximum water level 2.5 ft. Minimum operating water level 1 ft.

2.40 Depth of sludge in lagoons and storage basins ~0.5 ft.
Total sludge stored _____ dry tons _____ cu. ft.

3.00 LAND APPLICATION SYSTEM

3.10 Number of irrigation sites 1 Total Acres 0.9 Maximum % field slopes <5%
Location: ___ ¼, SW ¼, SW ¼, 07 Sec. 39N T 15W R Camden County 0.9 Acres
Location: ___ ¼, ___ ¼, ___ ¼, ___ Sec. ___ T ___ R _____ County ___ Acres

3.11 Type of vegetation: ☐ Grass hay ☐ Pasture ☑ Timber ☐ Row crops ☐ Other (describe) _____

3.20 Wastewater flow (dry weather) gallons/day:
Average annual: 85,000 gal. Seasonal _____ Off-season _____
Months of seasonal flow: April-October
Human Population Equivalent: _____

3.21 Land Application rate per acre (design flow including 1 in 10 year storm water flows):
Design: 10 inches/year 0.5 inches/hour 1 inches/day 3 inches/week
Actual: 3.5 inches/year ____ inches/hour ____ inches/day ____ inches/week
Total Irrigation per year (gallons): 184,800 Design 85,000 Actual
Actual months used for Irrigation (check): ☐ Jan ☐ Feb ☐ Mar ☑ Apr ☑ May ☑ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec

3.22 Land Application Rate is based on:
☐ Nutrient Management Plan (N&P)
☑ Hydraulic Loading
☐ Other (describe) _____

3.30 Equipment type: ☑ Sprinklers ☐ Gated pipe ☐ Center pivot ☐ Traveling gun ☐ Other (describe) _____
Equipment Flow Capacity: 4680 Gallons per hour _____ Total hours of operation per year

3.40 Public Access Restrictions for irrigation sites: ☑ Site is Fenced ☐ Wastewater disinfection prior to irrigation
☐ Other (describe): _____

3.50 Separation distance (in feet) from the outside edge of the wetted irrigation area to down gradient features:
____ Permanent flowing stream ____ Losing Stream ____ Intermittent (wet weather) stream ____ Lake or pond
____ Property boundary ____ Dwellings ____ Water supply well ____ Other (describe) _____

3.60 SOILS INFORMATION: Use information from the County Soil Survey, NRCS, or professional soil scientist.
Soil Series Name _____ Depth of bedrock ____ Feet Depth of water table ____ Feet see "coop soil survey"
Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:
____ In/hr for 0-12 in soil depth ____ In/hr for 12-24 inch soil depth ____ In/hr for 24-60 inch soil depth

3.70 Include a recent Geologic Report by the Department's Geological Survey and Resource Assessment Division with your construction permit.

3.80 Attach a current copy of the Operation and Maintenance (O&M) Plan for the irrigation system. Date of O&M Plan: 2012

3.81 Attach a site map showing topography, storage basins, irrigation sites, property boundary, streams, wells, roads, dwellings and other pertinent features.

3.82 Attach a facility sketch showing treatment units, storage basins, pipelines, irrigation equipment, application sites and other features.

4.00 CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment.

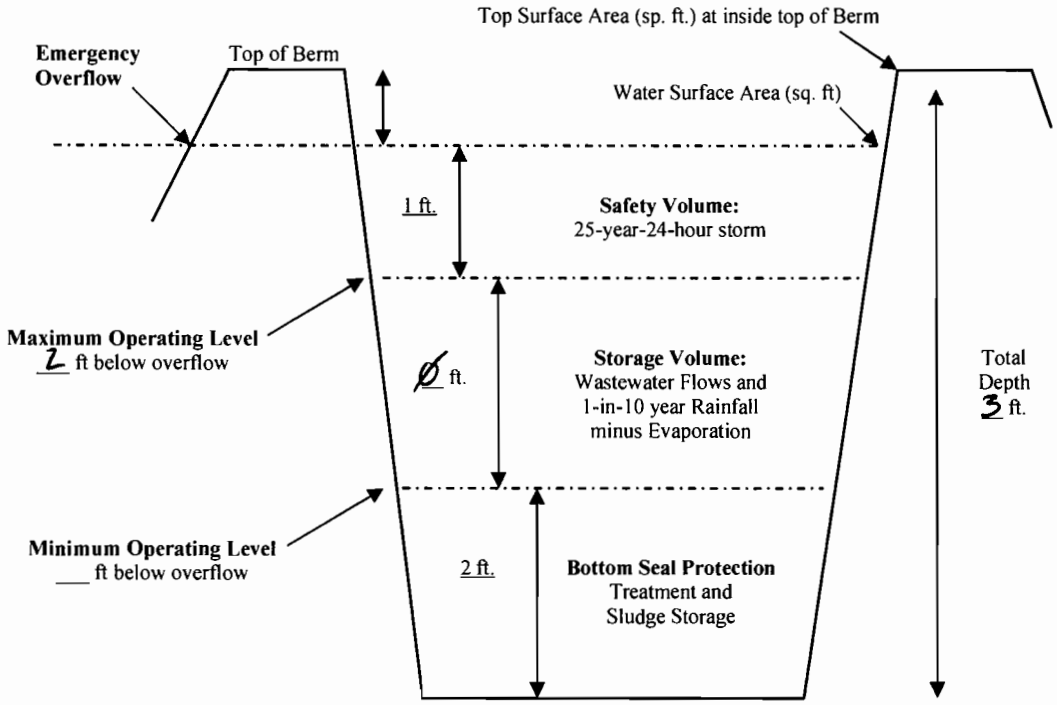
CONSULTING ENGINEER – Name, Official Title and Engineering Firm (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
SIGNATURE	DATE SIGNED
OWNER OR AUTHORIZED REPRESENTATIVE – Name and Official Title (TYPE OR PRINT) Martin Kator, Environmental Specialist IV	TELEPHONE NUMBER (area code and number) (573) 522-6380
SIGNATURE	DATE SIGNED 09/24/2012

ATTACHMENT A

(To be included with Form I)

Lagoon or Storage Basin

PROFILE SKETCH



DEFINITION OF TERMS (REFER TO THE PROFILE SKETCH ABOVE).

a. Freeboard is depth from top of berm to emergency spillway (minimum 1 foot);

b. Safety Volume is depth for 25-year, 24-hour storm (minimum of 1 foot);

c. Maximum Operating Level is at bottom of the safety volume (minimum of 2 feet below top of berm).

d. Minimum Operating Level is 2 feet above bottom of lagoon for seal protection per 10 CSR 20-8.
The minimum operating level may be greater than 2 feet when additional treatment volume is included.

e. Storage Volume and days storage are based on the volume between Minimum and Maximum Operating Levels.

f. Total Depth is from top of berm to bottom of basin including freeboard.

Missouri State Parks

Like 2 Send

Camp Red Bud

at Lake of the Ozarks State Park

Camp Red Bud includes a dining hall with a kitchen, sleeping cabins, modern central restrooms and showers, volleyball and basketball playcourts and a waterfront. Camp capacity is 44 people, with a minimum of 20.

The kitchen includes the following: commercial cooler, freezer, commercial stove, coffee pot, mixer, pots and pans, mixing bowls, skillets, sheet pans, cake pans, stock pots, plates, bowls, water glasses, pitchers, serving bowls, coffee cups and utensils.

	# of Rooms	Sleeping Capacity	Restroom Facilities
Central Camp Area			
Dining Lodge and Kitchen	2	--	1 toilet; 1 lavatory; hot water
Central Restroom	4	--	6 toilets; 4 lavatories; 8 showers; hot water
Sleeping Units			
Cabins 4 and 5	1	4 each	--
Cabins 1-3 and 6-8	1	6 each	--

Recreational Facilities
Waterfront (beach, swim dock)
Lighted, paved playcourt

Like 2 Send

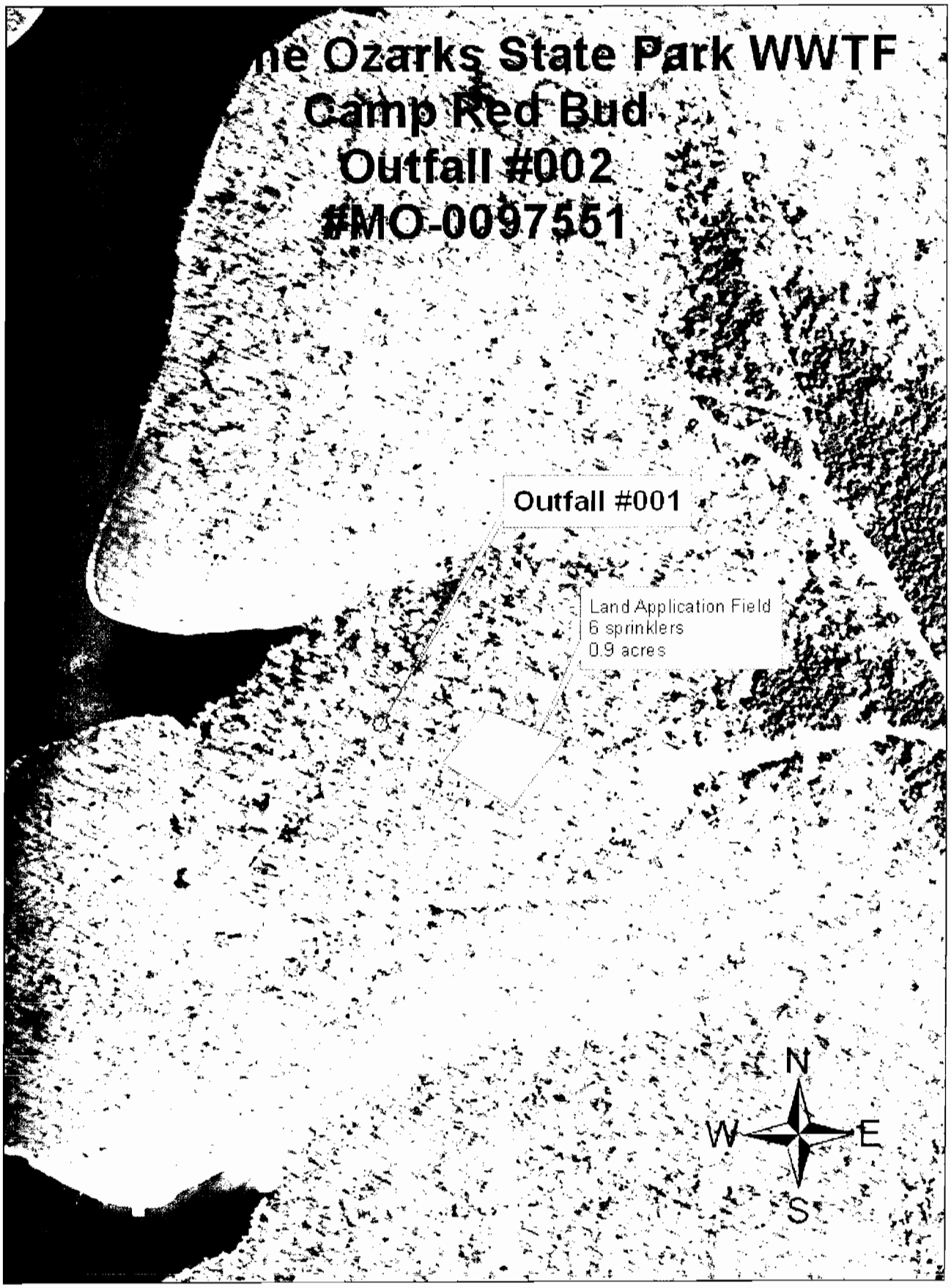
Advisories

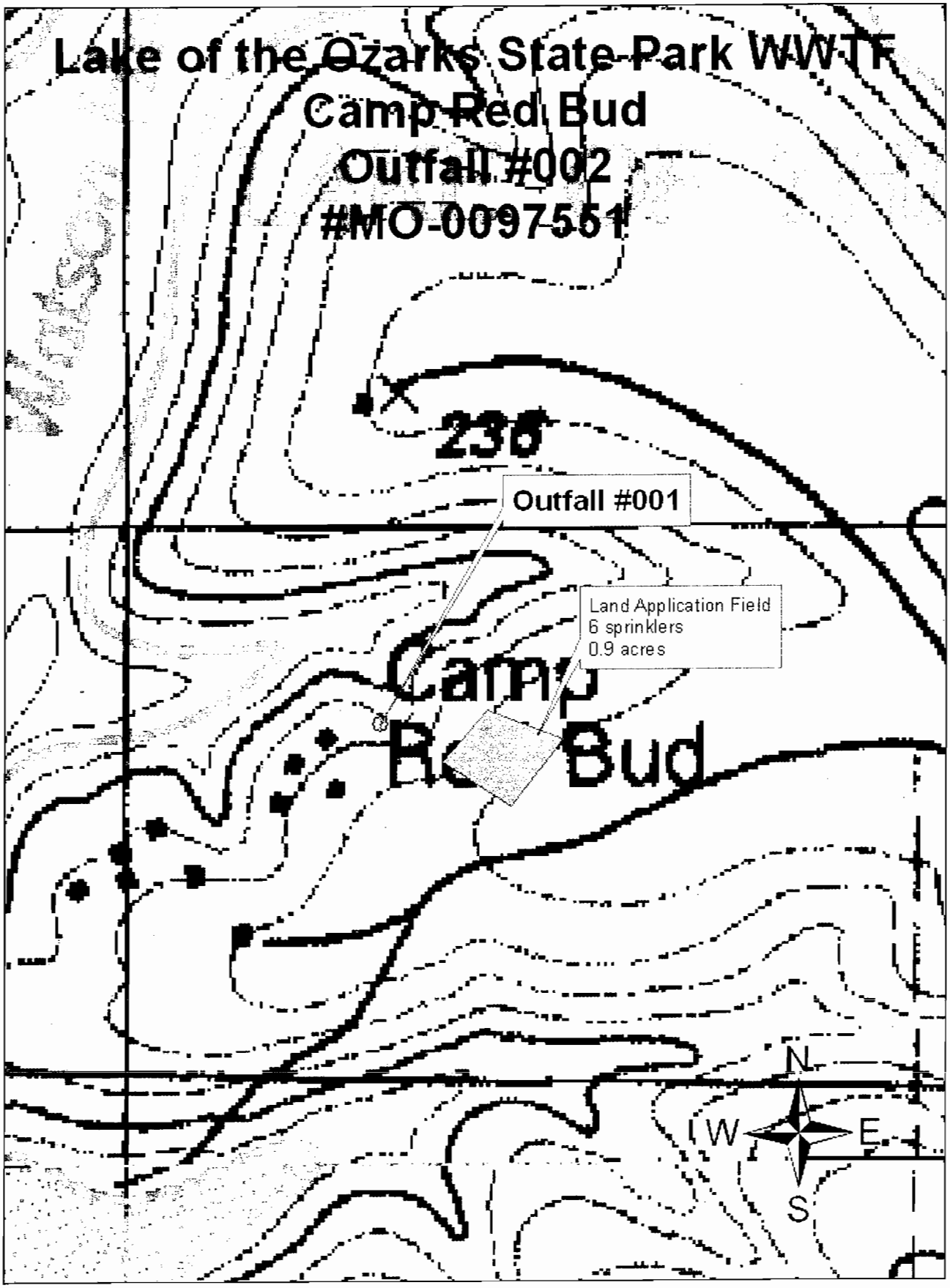
Statewide Open Fire Burn Ban
Camp Pin Oak Temporarily Closed - Lake of the Ozarks State Park
Firewood Advisory

Related Content

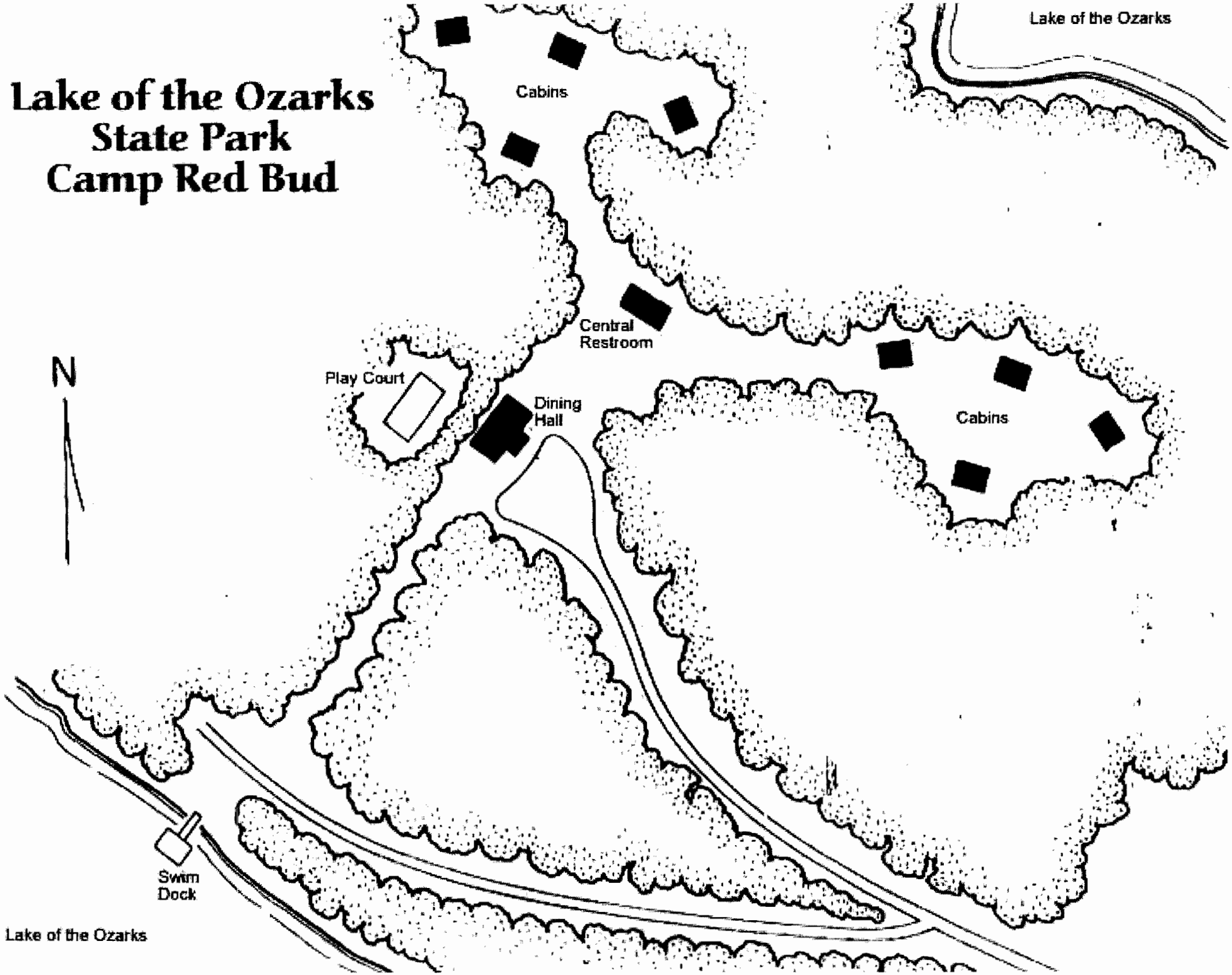
- Organized Group Camps

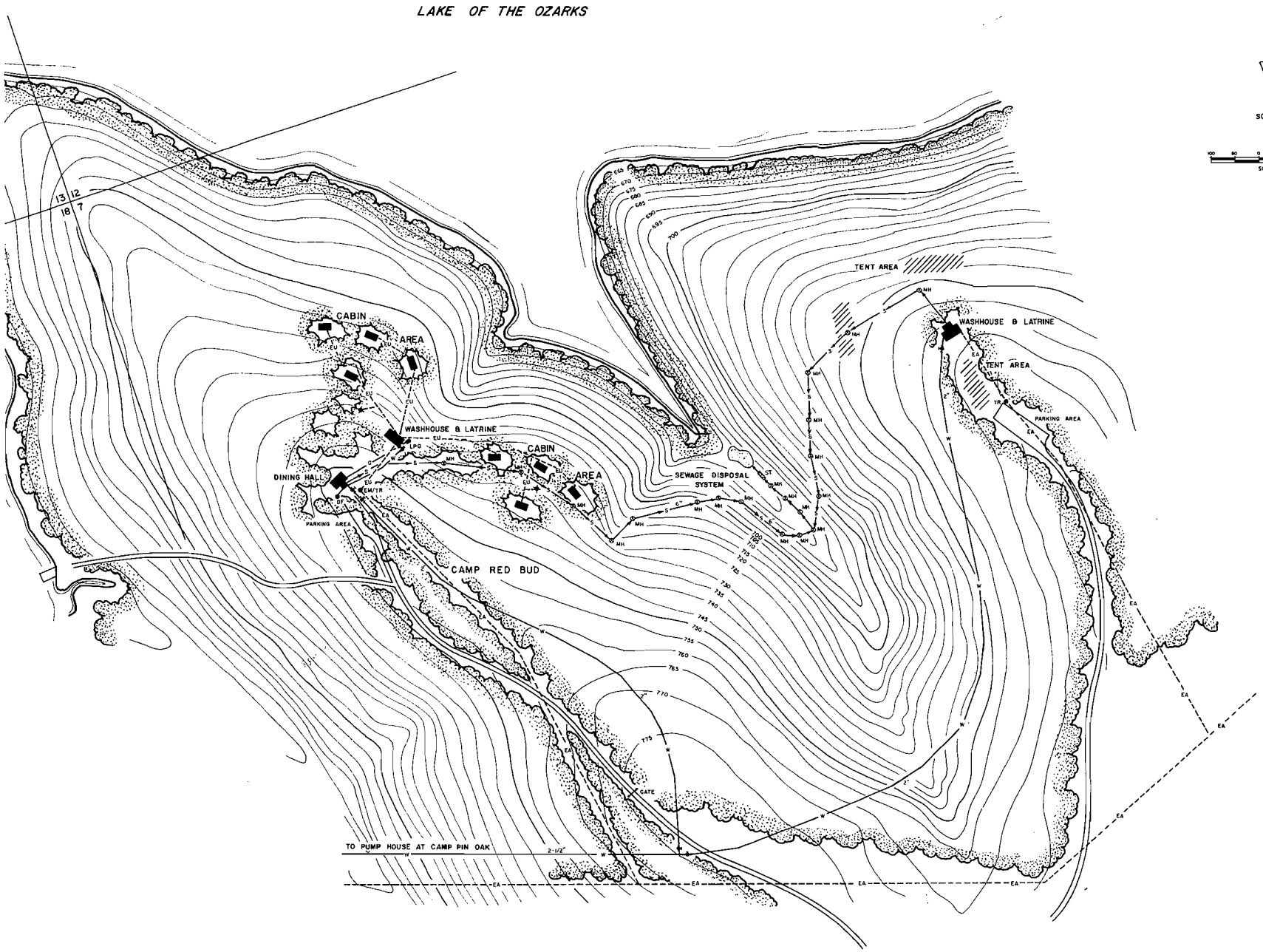
Downloadable Resources


ne Ozarks State Park WWTF
Camp Red Bud
Outfall #002
#MO-0097551
Outfall #001
Land Application Field
6 sprinklers
0.9 acres
N
W
E
S


Lake of the Ozarks State Park WWTF
Camp Red Bud
Outfall #002
#MO-0097551
236
Outfall #001
Land Application Field
6 sprinklers
0.9 acres
Camp
Red Bud
N
W
E
S

Lake of the Ozarks State Park Camp Red Bud





N

SCALE: 1" = 100'

SCALE IN FEET

LEGEND

WATER LINES	W
VALVES	
DRINKING FOUNTAIN	DF
SEWER LINES	S
MANHOLE	MH
SEPTIC TANK	ST
ELECTRIC LINE ABOVE GROUND	EA
ELECTRIC LINE UNDERGROUND	EU
ELECTRIC METER	EM
TRANSFORMER	TR
LIGHT	
TIMBER LINE	
LP GAS TANK	LPG
GAS LINE	G

NOTE: NAME OF DIVISION CHANGED 8/19/85.

MISSOURI
DEPARTMENT OF NATURAL RES
DIVISION of PARKS,
RECREATION, and HISTORIC PRES
LAKE OF THE OZARKS STAT
CAMP RED BUD ARE

FIELD CHECK BY Pierce III	TRACED BY	DATE 3-19-84
DRAWN BY D. Hacker	CHECKED BY	REVISIONS

APPROVED BY DIVISION OF PARKS, RECREATION, AND HISTORIC PRESERV
DIRECTOR

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
FORM B – APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT FOR FACILITIES WHICH RECEIVE PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day) UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER: NO FEE required	
DATE RECEIVED: 9/26/12	FEE SUBMITTED: Ø

NOTE ▶ PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.

RECEIVED SEP 26 2012 WATER PROTECTION PROGRAM

1. This application is for:
- ☐ An operating permit and antidegradation review public notice.
- ☐ A construction permit following an appropriate operating permit and antidegradation review public notice.
- ☐ A construction permit and a concurrent operating permit and antidegradation review public notice.
- ☐ A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required).
- ☐ An operating permit for a new or ~~unpermitted facility~~ — Construction Permit #
- ☑ An operating permit renewal ~~Permit~~ #MO- 0097551 — Expiration Date 03/06/2013
- ☐ An operating permit modification: Permit #MO- ____ — Reason: ____

1.1 Is this a Federal/State Funded Project? ☐ YES ☐ NO Funding Agency/Project #: ____

1.2 Is the appropriate fee included with the application (See instructions for appropriate fee)? ☐ YES ■ NO

2. FACILITY (Outfall 003 of 004) Camp Pin Oak

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS (PHYSICAL): 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

2.1 LEGAL DESCRIPTION: ¼, NE ¼, SE ¼, Sec. 13 , T 39N , R 16W County Camden

2.2 UTM Coordinates Easting (X):____ Northing (Y): ____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Un-Trib. to Lake of the Ozarks

3. OWNER

NAME	E-MAIL ADDRESS	TELEPHONE WITH AREA CODE
MDNR, Division of State Parks		(573) 751-0761
ADDRESS: P. O. Box 176	CITY: Jefferson City	STATE: MO / ZIP CODE: 65102

3.1 Request review of draft permit prior to Public Notice? ☑ YES ☐ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS: 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE WITH AREA CODE
Dwayne Thompson	5387	(573) 348-2696

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE WITH AREA CODE
Bill Arnold	Park Superintendent	(573) 348-2696

7.0 ADDITIONAL FACILITY INFORMATION

7.1 Description of facilities (Attach additional sheet if required). Attach a 1" = 2,000' scale U.S. Geological Survey topographic map showing location of all outfalls and downstream landowners. (See Item 9.)

7.2 Facility SIC code: 9512/440 Discharge SIC code: ____; Facility NAICS code: ____; Discharge NAICS code: ____.

7.3 Number of people presently connected or population equivalent (P.E.) max 125 Design P.E. 31
Number of units presently connected: Homes ____ Trailers ____ Apartments ____ Other 6
see permit Design flow for this outfall: ____ Total design flow for the facility: ____ Actual flow for this outfall: ____
Commercial Establishment: Daily number of employees working ____ Daily number of customers/guests 6,743

7.4 Length of pipe in the sewer collection system? 2292 feet/miles (Please denote which unit is appropriate.)

7.5 Does any bypassing occur in the collection system or at the treatment facility? ☐Yes ☑ No (If yes, attach explanation.)

7.6 Does significant infiltration occur in the collection system? ☐Yes ☑ No (If yes, attach explanation and proposed repair.)

7.7 Is industrial waste discharged to the facility identified in Item 2? ☐Yes ☑ No (If yes, see instructions.)

7.8 Will the discharge be continuous through the year? ☐Yes ☑ No
a. Discharge will occur during the following months: No Discharge
b. How many days of the week will the discharge occur? No Discharge

7.9 Is wastewater land applied? ☑Yes ☐ No (If yes, attach Form I.)

7.10 Will chlorine be added to the effluent? ☐Yes ☑ No
a. If chlorine is added, what is the resulting residual? ____ µg/l (micrograms per liter)

7.11 Does this facility discharge to a losing stream or sinkhole? ☐Yes ☑ No

7.12 Attach a flow chart showing all influents, treatment facilities and outfalls.

7.13 Has a waste load allocation study been completed for this facility? ☐Yes ☑ No

7.14 List all permit violations, including effluent limit exceedances in the last five years. Attach a separate sheet if necessary.
If none, write none. None

8. SLUDGE HANDLING, USE AND DISPOSAL

8.1 Is the sludge a hazardous waste as defined by 10 CSR 25? ☐ Yes ☑ No

8.2 Sludge Production, including sludge received from others: 1.0 Design Dry Tons/Year _____ Actual Dry Tons/Year

8.3 Capacity of sludge holding structures:
Sludge storage provided: 1275 cubic feet; _____ days of storage; _____ average percent solids of sludge;
☐ No sludge storage is provided.

8.4 Type of Storage:
☑ Holding tank ☐ Building
☐ Basin ☐ Other (Please describe) _____
☐ Concrete Pad

8.5 Sludge Treatment:
☐ Anaerobic Digester ☐ Lagoon ☐ Composting
☑ Storage Tank ☐ Aerobic Digester ☐ Other (Attach description)
☐ Lime Stabilization ☐ Air or Heat Drying

8.6 Sludge Use or Disposal:
☐ Land Application ☐ Surface Disposal (Sludge Disposal Lagoon, Sludge held for more than two years)
☑ Contract Hauler ☐ Incineration
☐ Hauled to Another Treatment Facility ☐ Sludge Retained in Wastewater treatment lagoon
☐ Other _____ Attach explanation sheet.
☐ Solid Waste Landfill

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☐ By Applicant ☑ By Others (complete below)

NAME			
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ADDRESS	CITY	STATE	ZIP CODE
P. O. Box 565	Osage Beach	MO	65065
CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.	
Dan Hanks	(573) 346-5992	MO- 0126543	

8.8 SLUDGE USE OR DISPOSAL FACILITY
☐ By Applicant ☑ By Others (Please complete below.)

NAME			
Amos Septic Service Inc.			
ADDRESS	CITY	STATE	ZIP CODE
P. O. Box 565	Osage Beach	MO	65065
CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.	
Dan Hanks	(573) 346-5992	MO- 0126543	

8.9 Does the sludge or biosolids disposal comply with federal sludge regulations under 40 CFR 503?
☑ Yes ☐ No (Please attach explanation)

9. DOWNSTREAM LANDOWNER (S). ATTACH ADDITIONAL SHEETS AS NECESSARY. SEE INSTRUCTIONS.

NAME			
Ameren UE Shoreline Management Office			
ADDRESS	CITY	STATE	ZIP CODE
1028 Bagnell Dam Blvd.	Lake Ozark	MO	65049

10. DRINKING WATER SUPPLY INFORMATION

10.1 WHAT IS THE SOURCE OF YOUR DRINKING WATER SUPPLY:
A. Public supply (municipal or water district water) MO5122666
If public, please give name of the public supply _____
B. Private well _____
C. Surface water (lake, pond or stream) _____

10.2 Does your drinking water source serve at least 25 people at least 60 days per year (not necessarily consecutive days)?
☑ Yes ☐ No

10.3 Does your supply serve housing which is occupied year round by the same people? This does not include housing which is occupied seasonally? ☐ Yes ☑ No

11. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE WITH AREA CODE
Martin Kator, Environmental Specialist IV	(573) 522-6380
SIGNATURE	DATE SIGNED
	09/24/2012

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

FORM I – PERMIT APPLICATION FOR CONSTRUCTION AND OPERATION OF WASTEWATER IRRIGATION SYSTEMS

FOR AGENCY USE ONLY
PERMIT NUMBER MO -
DATE RECEIVED

INSTRUCTIONS: The following forms must be submitted with Form I: FORM B for domestic wastewater. **Submit FORMS E and G** for land disturbance permit if construction areas total one acre or more.

RECEIVED
SEP 26 2012
WATER PROTECTION PROGRAM

1.00 FACILITY INFORMATION

1.10 Facility Name

MDNR, Lake of the Ozarks State Park WWTF

1.20 Application for:
- ☐ Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8)
- ☐ Operating Permit (if no construction permit, attach engineering documents)
  Date Irrigation System Began Operation: _____
- ☑ Operating Permit Renewal

1.30 Type of wastewater to be irrigated: ☑ Domestic ☐ Municipal ☑ State/National Park ☐ Seasonal business
☐ Municipal with Pretreatment Program or Significant Industrial Users ☐ Other (explain) _____
SIC Codes (list all that apply, in order of importance) 9512, 4952

1.40 Months when the business or enterprise will operate or generate wastewater:
☐ 12 months per year ☑ Part of year (list Months): April - October

1.50 This system is designed for:
☑ No-discharge ☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreation season (April – October) and discharge during November – March.
☐ Other (explain) _____

1.60 List the Facility outfalls which will be applicable to the irrigation system from outfalls listed on Form B.
Outfall Nos. 003 * _ _ _ _ _ _
* Wastewater may be hauled from Outfall #001 to this system (see Form I for #002)

2.00 STORAGE BASINS

2.10 Number of storage basins: 2 Type of basin: ☐ Steel ☑ Concrete ☐ Fiberglass ☐ Earthen
☐ Earthen with membrane liner

2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
(Complete Attachment A: Profile Sketch)

	Length	Width	Depth	Freeboard	Berm Width	% Slope
Basin #1:	15'	10'	8.5'	_____	_____	_____
Basin #2:	15'	10'	8.5'	_____	_____	_____

2.30 Storage Basin operating levels (report as feet below emergency overflow level)
Basin #1: Maximum water level _____ ft. Minimum operating water level _____ ft.
Basin #2: Maximum water level _____ ft. Minimum operating water level _____ ft.

2.40 Depth of sludge in lagoons and storage basins _____ ft.
Total sludge stored _____ dry tons _____ cu. ft.

3.00 LAND APPLICATION SYSTEM

3.10 Number of irrigation sites 1 Total Acres 1.1 Maximum % field slopes <5%
Location: ___ ¼, NE ¼, SE ¼, 13 Sec. 39N T 16W R Camden County 1.1 Acres
Location: ___ ¼, ___ ¼, ___ ¼, ___ Sec. ___ T ___ R _____ County ___ Acres

3.11 Type of vegetation: ☐ Grass hay ☐ Pasture ☑ Timber ☐ Row crops ☐ Other (describe) _____

3.20 Wastewater flow (dry weather) gallons/day:
Average annual: 183,000 Seasonal _____ Off-season _____
Months of seasonal flow: 7 mos
Human Population Equivalent: _____

3.21 Land Application rate per acre (design flow including 1 in 10 year storm water flows):
Design: 24 inches/year 0.5 inches/hour 1 inches/day 3 inches/week
Actual: 6.1 inches/year ____ inches/hour ____ inches/day ____ inches/week
Total Irrigation per year (gallons): 525,000 Design 183,000 Actual
Actual months used for Irrigation (check): ☐ Jan ☐ Feb ☐ Mar ☑ Apr ☑ May ☑ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec

3.22 Land Application Rate is based on:
☐ Nutrient Management Plan (N&P)
☑ Hydraulic Loading
☐ Other (describe) _____

3.30 Equipment type: ☑ Sprinklers ☐ Gated pipe ☐ Center pivot ☐ Traveling gun ☐ Other (describe) _____
Equipment Flow Capacity: 5460 Gallons per hour _____ Total hours of operation per year

3.40 Public Access Restrictions for irrigation sites: ☑ Site is Fenced ☐ Wastewater disinfection prior to irrigation
☐ Other (describe): _____

3.50 Separation distance (in feet) from the outside edge of the wetted irrigation area to down gradient features:
____ Permanent flowing stream ____ Losing Stream ____ Intermittent (wet weather) stream ____ Lake or pond
____ Property boundary ____ Dwellings ____ Water supply well ____ Other (describe) _____

3.60 SOILS INFORMATION: Use information from the County Soil Survey, NRCS, or professional soil scientist.
Soil Series Name _____ Depth of bedrock ____ Feet Depth of water table ____ Feet See "Coop Soil Survey"
Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:
____ In/hr for 0-12 in soil depth ____ In/hr for 12-24 inch soil depth ____ In/hr for 24-60 inch soil depth

3.70 Include a recent Geologic Report by the Department's Geological Survey and Resource Assessment Division with your construction permit.

3.80 Attach a current copy of the Operation and Maintenance (O&M) Plan for the irrigation system. Date of O&M Plan: 2012

3.81 Attach a site map showing topography, storage basins, irrigation sites, property boundary, streams, wells, roads, dwellings and other pertinent features.

3.82 Attach a facility sketch showing treatment units, storage basins, pipelines, irrigation equipment, application sites and other features.

4.00 CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment.

CONSULTING ENGINEER – Name, Official Title and Engineering Firm (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
SIGNATURE	DATE SIGNED
OWNER OR AUTHORIZED REPRESENTATIVE – Name and Official Title (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
Martin Kator, Environmental Specialist IV	(573) 522-6380
SIGNATURE	DATE SIGNED
	09/24/2012

Missouri State Parks

Like 0 Send

Camp Pin Oak

at Lake of the Ozarks State Park

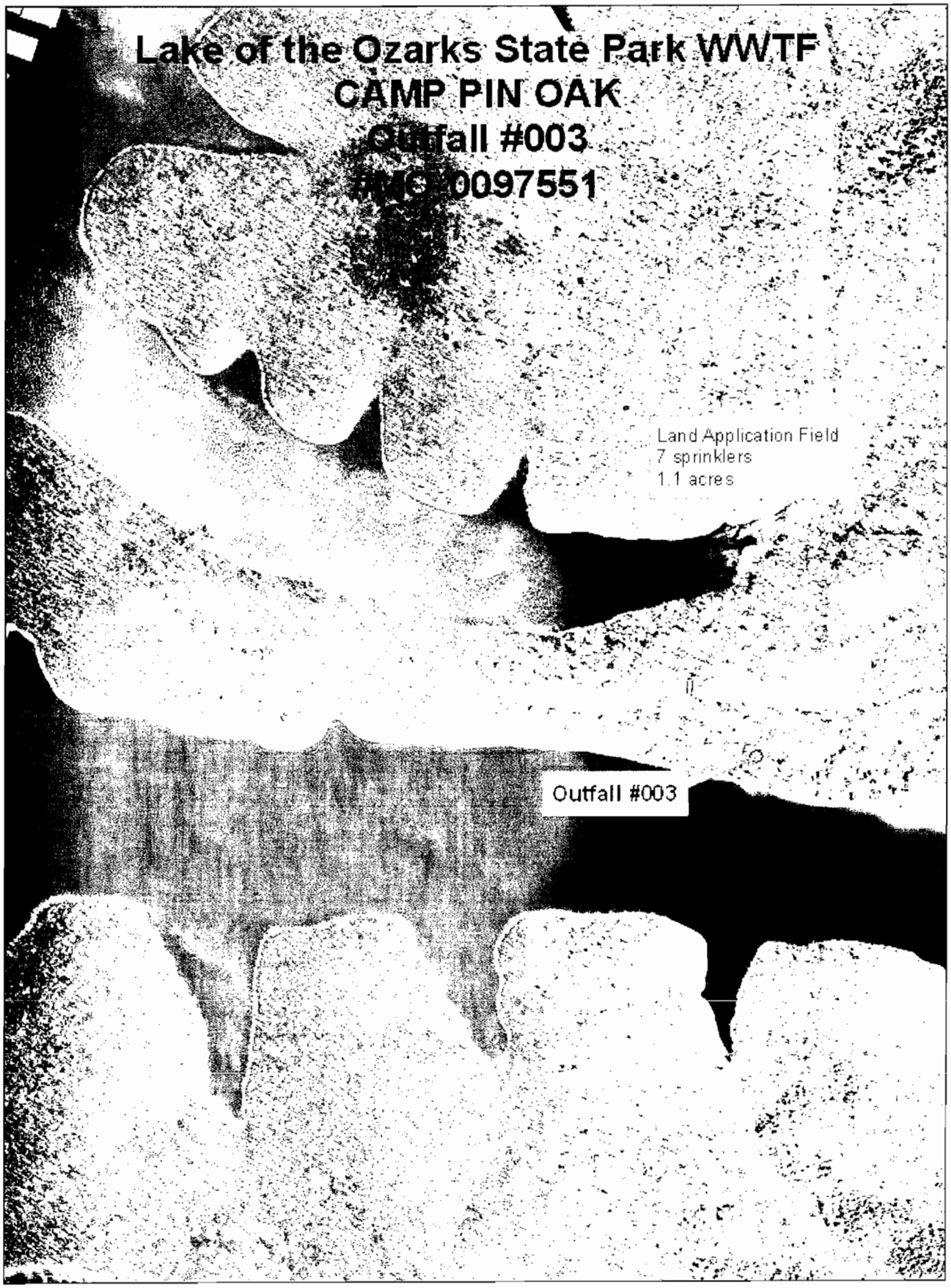
Camp Pin Oak includes sleeping cabins, modern central restrooms and showers, a sand volleyball court, recreation lodges and a waterfront. Camp capacity is 125 people, with a minimum of 55.

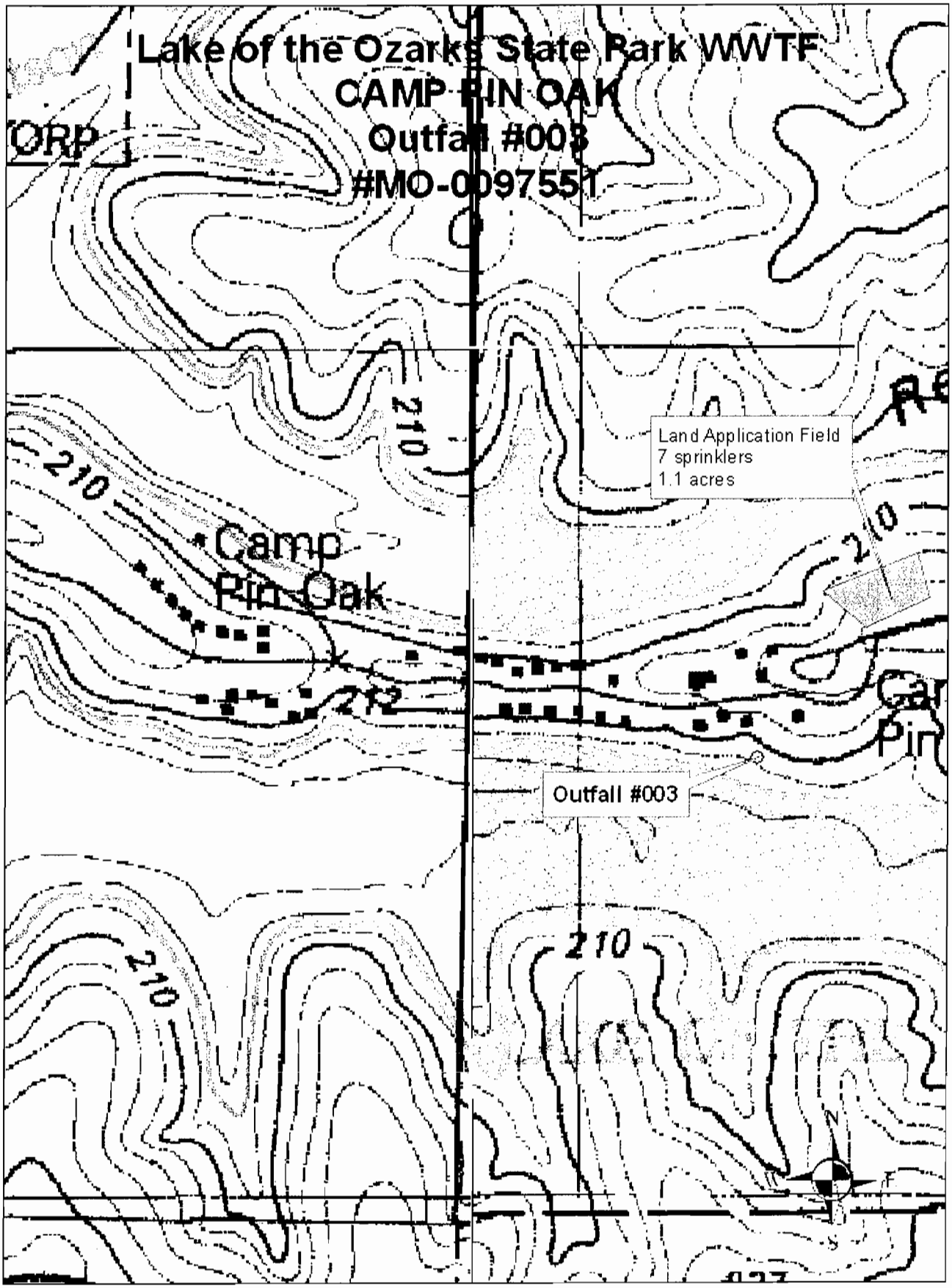
	# of Rooms	Sleeping Capacity	Restroom Facilities
Central Camp Area			
Office	2	--	--
Infirmary	5	6	1 toilet; 2 lavatories; 1 shower; hot water
Craft House	2	--	1 toilet; 1 lavatory
Staff Quarters No. 1	3	4	1 toilet; 2 lavatories; 1 shower; hot water
Staff Quarters No. 2	2	4	1 toilet; 1 lavatory; 1 shower; hot water
Staff Quarters No. 3	1	4	1 toilet; 1 lavatory
Units 1 and 2 Central Restroom	3	--	6 toilets; 6 lavatories; 6 showers; hot water
Units 3 and 4 Central Restroom	3	--	6 toilets; 6 lavatories; 6 showers; hot water
Sleeping Units -- There are four units in this camp. Each unit includes the following.			
Five Camper Cabins	1	4 each	--
Staff Cabin A5	1	4 each	--
Staff Cabin B5	1	--	--
Outdoor Kitchen	1	--	--

Recreational Facilities
Waterfront (beach, swim dock, boat dock, vault toilet)
Sand volleyball court
Amphitheater

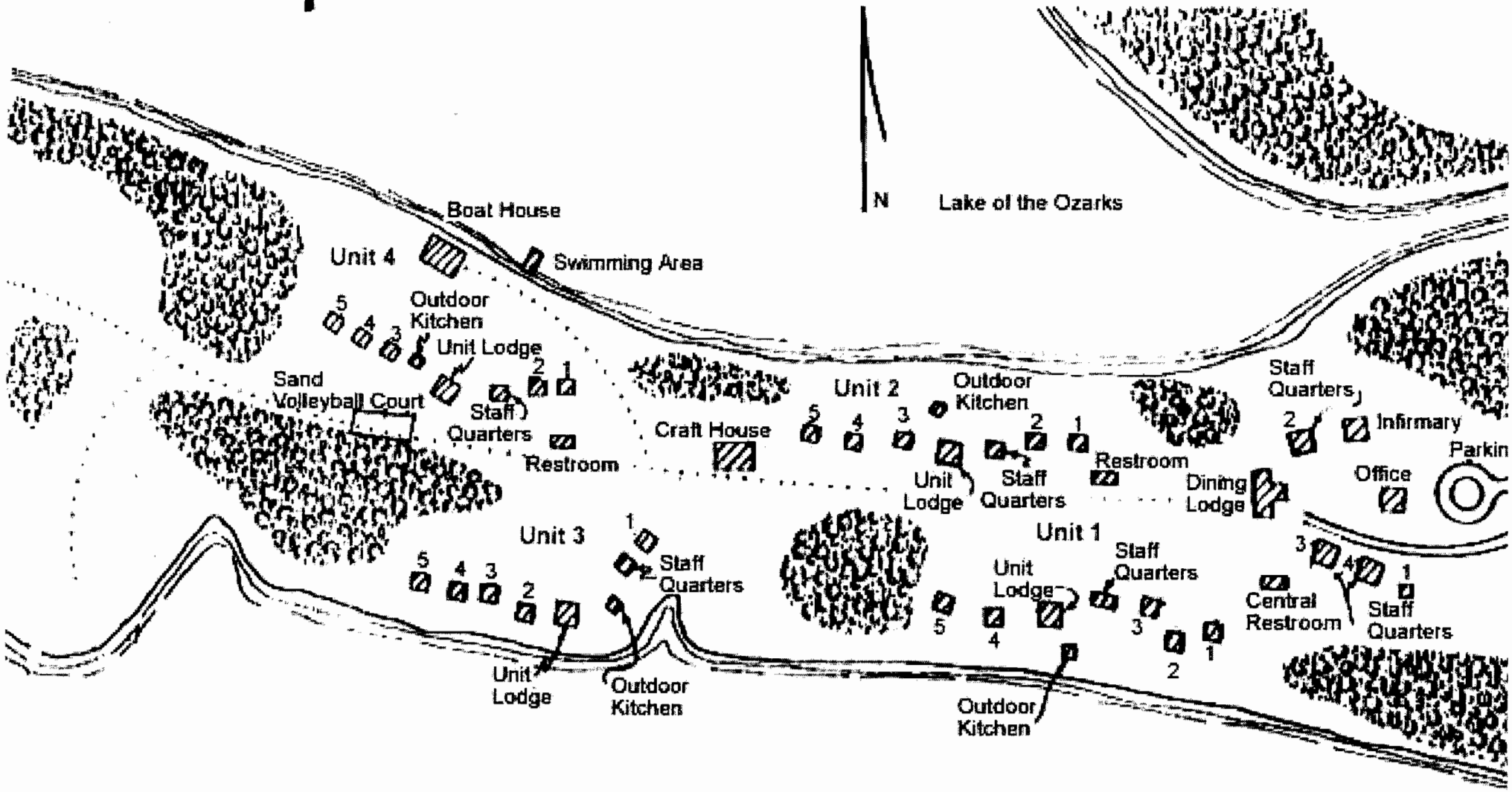
Like 0 Send

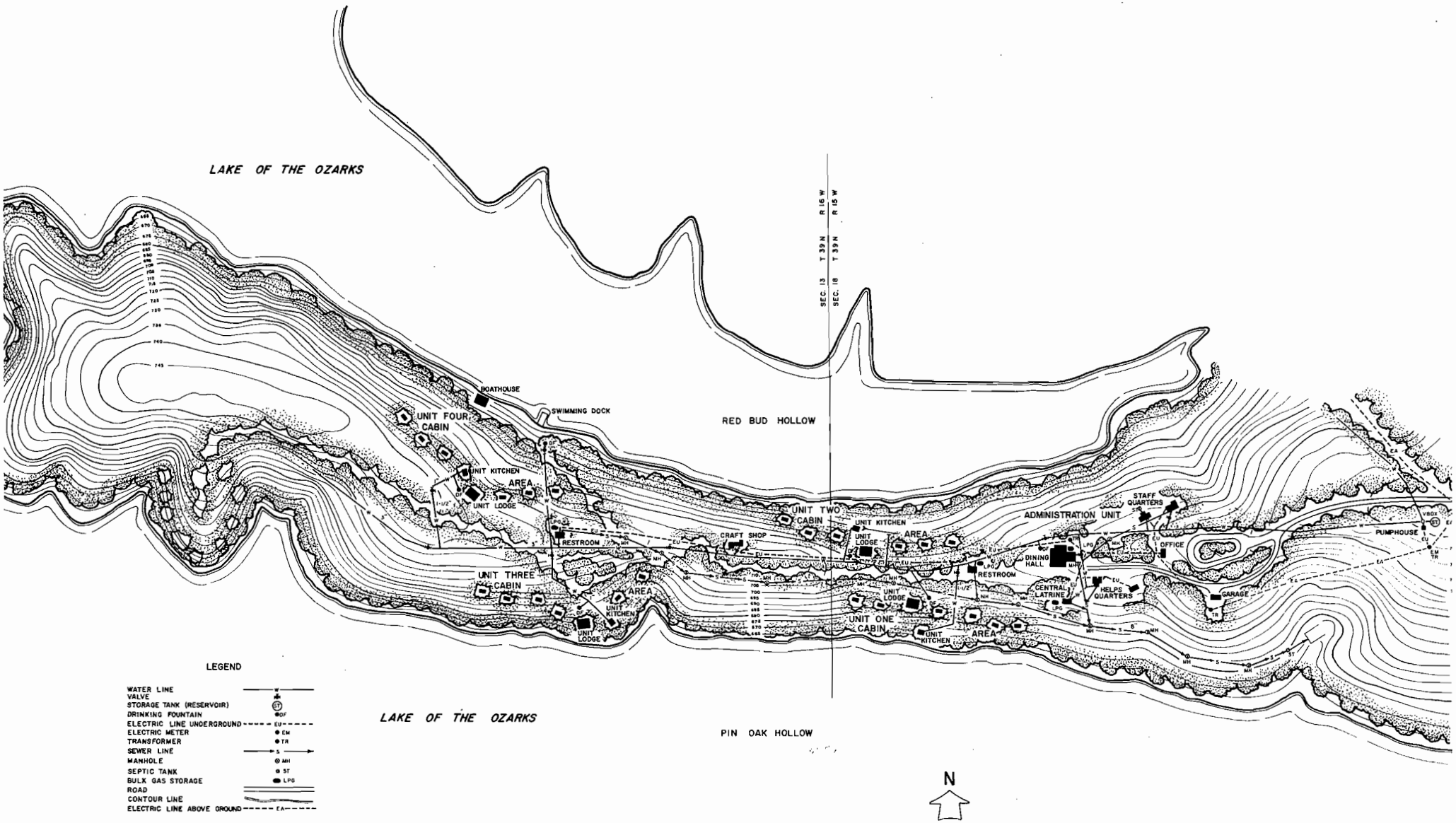
Advisories


Lake of the Ozarks State Park WWTF
CAMP PIN OAK
Outfall #003
#MO 0097551
Land Application Field
7 sprinklers
1.1 acres
Outfall #003


Lake of the Ozarks State Park WWTF
CAMP PIN OAK
Outfall #003
#MO-0097551
Land Application Field
7 sprinklers
1.1 acres
Camp
Pin Oak
Outfall #003
210
212

Lake of the Ozarks State Park
Camp Pin Oak





LEGEND

WATER LINE	W
VALVE	
STORAGE TANK (RESERVOIR)	ST
DRINKING FOUNTAIN	DF
ELECTRIC LINE UNDERGROUND	EU
ELECTRIC METER	EM
TRANSFORMER	TR
SEWER LINE	S
MANHOLE	MH
SEPTIC TANK	ST
BULK GAS STORAGE	LPG
ROAD	
CONTOUR LINE	
ELECTRIC LINE ABOVE GROUND	EA

NOTE: NAME OF DIVISION CHANGED 6/19/86.

MISSOURI
DEPARTMENT of NATURAL RE
DIVISION of PARKS,
RECREATION, and HISTORIC PRES
LAKE OF THE OZARKS STAT
CAMP PIN OAK

FIELD CHECK BY Mayan III	TRACED BY	DATE 3-19-86
DRAWN BY U Mayan	CHECKED BY	REVISIONS

APPROVED, BY DIVISION OF PARKS, RECREATION, AND HISTORIC PRESER
DIRECTOR

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

FORM B – APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT FOR FACILITIES WHICH RECEIVE PRIMARILY DOMESTIC WASTE (≤100,000 gallons per day) UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER: NO FEE required	
DATE RECEIVED: 9/26/12	FEE SUBMITTED: Ø

RECEIVED SEP 26 2012 WATER PROTECTION PROGRAM

NOTE ▶ PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1. This application is for:

- ☐ An operating permit and antidegradation review public notice.
- ☐ A construction permit following an appropriate operating permit and antidegradation review public notice.
- ☐ A construction permit and a concurrent operating permit and antidegradation review public notice.
- ☐ A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required).
- ☐ An operating permit for a new or ~~unpermitted facility~~; Construction Permit #
- ☑ An operating permit renewal: Permit #MO- 0097551 Expiration Date 03/06/2013
- ☐ An operating permit modification: Permit #MO- _____ Reason: _____

1.1 Is this a Federal/State Funded Project? ☐ YES ☐ NO Funding Agency/Project #: _____

1.2 Is the appropriate fee included with the application (See instructions for appropriate fee)? ☐ YES ■ NO

2. FACILITY (Outfall 004 of 004) Camp Rising Sun

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS (PHYSICAL): 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

2.1 LEGAL DESCRIPTION: ¼, NE ¼, SW ¼, Sec. 19 , T 39N , R 15W County Camden

2.2 UTM Coordinates Easting (X):_____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Un-Trib. to Lake of the Ozarks

3. OWNER

NAME	E-MAIL ADDRESS	TELEPHONE WITH AREA CODE
MDNR, Division of State Parks		(573) 751-0761
ADDRESS: P. O. Box 176	CITY: Jefferson City	STATE: MO / ZIP CODE: 65102

3.1 Request review of draft permit prior to Public Notice? ☑ YES ☐ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME		TELEPHONE WITH AREA CODE
MDNR, Lake of the Ozarks State Park WWTF		(573) 348-2696
ADDRESS: 403 Highway 134	CITY: Kaiser	STATE: MO / ZIP CODE: 65047

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE WITH AREA CODE
Dwayne Thompson	5387	(573) 348-2696

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE WITH AREA CODE
Bill Arnold	Park Superintendent	(573) 348-2696

7.0 ADDITIONAL FACILITY INFORMATION

7.1 Description of facilities (Attach additional sheet if required). Attach a 1" = 2,000' scale U.S. Geological Survey topographic map showing location of all outfalls and downstream landowners. (See Item 9.)

7.2 Facility SIC code: 5812/7032 Discharge SIC code: _____; Facility NAICS code: _____; Discharge NAICS code: _____.

7.3 Number of people presently connected or population equivalent (P.E.) max 200 Design P.E. 55
Number of units presently connected: Homes _____ Trailers _____ Apartments _____ Other 14
see permit Design flow for this outfall: _____ Total design flow for the facility: _____ Actual flow for this outfall: _____
Commercial Establishment: Daily number of employees working _____ Daily number of customers/guests 53

7.4 Length of pipe in the sewer collection system? 2565 feet/miles (Please denote which unit is appropriate.)

7.5 Does any bypassing occur in the collection system or at the treatment facility? ☐Yes ☑ No (If yes, attach explanation.)

7.6 Does significant infiltration occur in the collection system? ☐Yes ☑ No (If yes, attach explanation and proposed repair.)

7.7 Is industrial waste discharged to the facility identified in Item 2? ☐Yes ☑ No (If yes, see instructions.)

7.8 Will the discharge be continuous through the year? ☐Yes ☑ No
a. Discharge will occur during the following months: No Discharge
b. How many days of the week will the discharge occur? No Discharge

7.9 Is wastewater land applied? ☑Yes ☐ No (If yes, attach Form I.)

7.10 Will chlorine be added to the effluent? ☐Yes ☑ No
a. If chlorine is added, what is the resulting residual? _____ µg/l (micrograms per liter)

7.11 Does this facility discharge to a losing stream or sinkhole? ☐Yes ☑ No

7.12 Attach a flow chart showing all influents, treatment facilities and outfalls.

7.13 Has a waste load allocation study been completed for this facility? ☐Yes ☑ No

7.14 List all permit violations, including effluent limit exceedances in the last five years. Attach a separate sheet if necessary.
If none, write none. None

8. SLUDGE HANDLING, USE AND DISPOSAL

8.1 Is the sludge a hazardous waste as defined by 10 CSR 25? ☐ Yes ☑ No

8.2 Sludge Production, including sludge received from others: 1.0 Design Dry Tons/Year _____ Actual Dry Tons/Year

8.3 Capacity of sludge holding structures:
Sludge storage provided: 3300 cubic feet; _____ days of storage; _____ average percent solids of sludge;
☐ No sludge storage is provided.

8.4 Type of Storage:
☑ Holding tank ☐ Building
☐ Basin ☐ Other (Please describe) _____
☐ Concrete Pad

8.5 Sludge Treatment:
☐ Anaerobic Digester ☐ Lagoon ☐ Composting
☑ Storage Tank ☐ Aerobic Digester ☐ Other (Attach description)
☐ Lime Stabilization ☐ Air or Heat Drying

8.6 Sludge Use or Disposal:
☐ Land Application ☐ Surface Disposal (Sludge Disposal Lagoon, Sludge held for more than two years)
☑ Contract Hauler ☐ Incineration
☐ Hauled to Another Treatment Facility ☐ Sludge Retained in Wastewater treatment lagoon
☐ Other _____ Attach explanation sheet.
☐ Solid Waste Landfill

8.7 PERSON RESPONSIBLE FOR HAULING SLUDGE TO DISPOSAL FACILITY
☐ By Applicant ☑ By Others (complete below)

NAME			
Amos Septic Service Inc.			
ADDRESS: P. O. Box 565	CITY: Osage Beach	STATE: MO	ZIP CODE: 65065
CONTACT PERSON: Dan Hanks	TELEPHONE WITH AREA CODE: (573) 346-5992	PERMIT NO.: MO- 0126543	

8.8 SLUDGE USE OR DISPOSAL FACILITY
☐ By Applicant ☑ By Others (Please complete below.)

NAME			
Amos Septic Service Inc.			
ADDRESS: P. O. Box 565	CITY: Osage Beach	STATE: MO	ZIP CODE: 65065
CONTACT PERSON: Dan Hanks	TELEPHONE WITH AREA CODE: (573) 346-5992	PERMIT NO.: MO- 0126543	

8.9 Does the sludge or biosolids disposal comply with federal sludge regulations under 40 CFR 503?
☑ Yes ☐ No (Please attach explanation)

9. DOWNSTREAM LANDOWNER (S). ATTACH ADDITIONAL SHEETS AS NECESSARY. SEE INSTRUCTIONS.

NAME			
Ameren UE Shoreline Management Office			
ADDRESS: 1028 Bagnell Dam Blvd.	CITY: Lake Ozark	STATE: MO	ZIP CODE: 65049

10. DRINKING WATER SUPPLY INFORMATION

10.1 WHAT IS THE SOURCE OF YOUR DRINKING WATER SUPPLY:
A. Public supply (municipal or water district water) MO5122663
If public, please give name of the public supply _____
B. Private well _____
C. Surface water (lake, pond or stream) _____

10.2 Does your drinking water source serve at least 25 people at least 60 days per year (not necessarily consecutive days)?
☑ Yes ☐ No

10.3 Does your supply serve housing which is occupied year round by the same people? This does not include housing which is occupied seasonally? ☐ Yes ☑ No

11. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE WITH AREA CODE
Martin Kator, Environmental Specialist IV	(573) 522-6380
SIGNATURE	DATE SIGNED
	09/24/2012

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

FORM I – PERMIT APPLICATION FOR CONSTRUCTION AND OPERATION OF WASTEWATER IRRIGATION SYSTEMS

FOR AGENCY USE ONLY
PERMIT NUMBER MO -
DATE RECEIVED

INSTRUCTIONS: The following forms must be submitted with Form I: FORM B for domestic wastewater. **Submit FORMS E and G** for land disturbance permit if construction areas total one acre or more.

RECEIVED
SEP 26 2012
WATER PROTECTION PROGRAM

1.00 FACILITY INFORMATION

1.10 Facility Name

MDNR, Lake of the Ozarks State Park WWTF

1.20 Application for:
- ☐ Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8)
- ☐ Operating Permit (if no construction permit, attach engineering documents)
  Date Irrigation System Began Operation: _____
- ☑ Operating Permit Renewal

1.30 Type of wastewater to be irrigated: ☑ Domestic ☐ Municipal ☑ State/National Park ☐ Seasonal business
☐ Municipal with Pretreatment Program or Significant Industrial Users ☐ Other (explain) _____
SIC Codes (list all that apply, in order of importance) 9512, 4952

1.40 Months when the business or enterprise will operate or generate wastewater:
☐ 12 months per year ☑ Part of year (list Months): April - October

1.50 This system is designed for:
☑ No-discharge ☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreation season (April – October) and discharge during November – March.
☐ Other (explain) _____

1.60 List the Facility outfalls which will be applicable to the irrigation system from outfalls listed on Form B.
Outfall Nos. 004* _ _ _ _ _ _ * may also include flows from #001 via pump & haul (see Form I for #002)

2.00 STORAGE BASINS

2.10 Number of storage basins: 1 Type of basin: ☐ Steel ☑ Concrete ☐ Fiberglass ☐ Earthen
☐ Earthen with membrane liner

2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
(Complete Attachment A: Profile Sketch)

	Length	Width	Depth	Freeboard	Berm Width	% Slope
Basin #1:	20'	15'	11'	1'		
Basin #2:						

2.30 Storage Basin operating levels (report as feet below emergency overflow level)
Basin #1: Maximum water level _____ ft. Minimum operating water level _____ ft.
Basin #2: Maximum water level _____ ft. Minimum operating water level _____ ft.

2.40 Depth of sludge in lagoons and storage basins _____ ft.
Total sludge stored _____ dry tons _____ cu. ft.

3.00 LAND APPLICATION SYSTEM

3.10 Number of irrigation sites 1 Total Acres 1.2 Maximum % field slopes <5%
Location: ___ ¼, NE ¼, SW ¼, 19 Sec. 39N T 15W R Camden County 1.2 Acres
Location: ___ ¼, ___ ¼, ___ ¼, ___ Sec. ___ T ___ R _____ County ___ Acres

3.11 Type of vegetation: ☐ Grass hay ☐ Pasture ☑ Timber ☐ Row crops ☐ Other (describe) _____

3.20 Wastewater flow (dry weather) gallons/day:
Average annual: 144,000 Seasonal _____ Off-season _____
Months of seasonal flow: 7 mos.
Human Population Equivalent: _____

3.21 Land Application rate per acre (design flow including 1 in 10 year storm water flows):
Design: 10 inches/year 0.5 inches/hour 1 inches/day 3 inches/week
Actual: 4.4 inches/year ____ inches/hour ____ inches/day ____ inches/week
Total Irrigation per year (gallons): ~~144,000~~ Design 144,000 Actual
Actual months used for Irrigation (check): ☐ Jan ☐ Feb ☐ Mar ☑ Apr ☑ May ☑ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec

3.22 Land Application Rate is based on:
☐ Nutrient Management Plan (N&P)
☑ Hydraulic Loading
☐ Other (describe) _____

3.30 Equipment type: ☑ Sprinklers ☐ Gated pipe ☐ Center pivot ☐ Traveling gun ☐ Other (describe) _____
Equipment Flow Capacity: 7,800 Gallons per hour _____ Total hours of operation per year

3.40 Public Access Restrictions for irrigation sites: ☐ Site is Fenced ☐ Wastewater disinfection prior to irrigation
☑ Other (describe): signs

3.50 Separation distance (in feet) from the outside edge of the wetted irrigation area to down gradient features:
____ Permanent flowing stream ____ Losing Stream ____ Intermittent (wet weather) stream ____ Lake or pond
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CONSULTING ENGINEER – Name, Official Title and Engineering Firm (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
SIGNATURE	DATE SIGNED
OWNER OR AUTHORIZED REPRESENTATIVE – Name and Official Title (TYPE OR PRINT) Martin Kator, Environmental Specialist IV	TELEPHONE NUMBER (area code and number) (573) 522-6380
SIGNATURE	DATE SIGNED 09/24/2012

Missouri State Parks

Like 3 Send

Camp Rising Sun

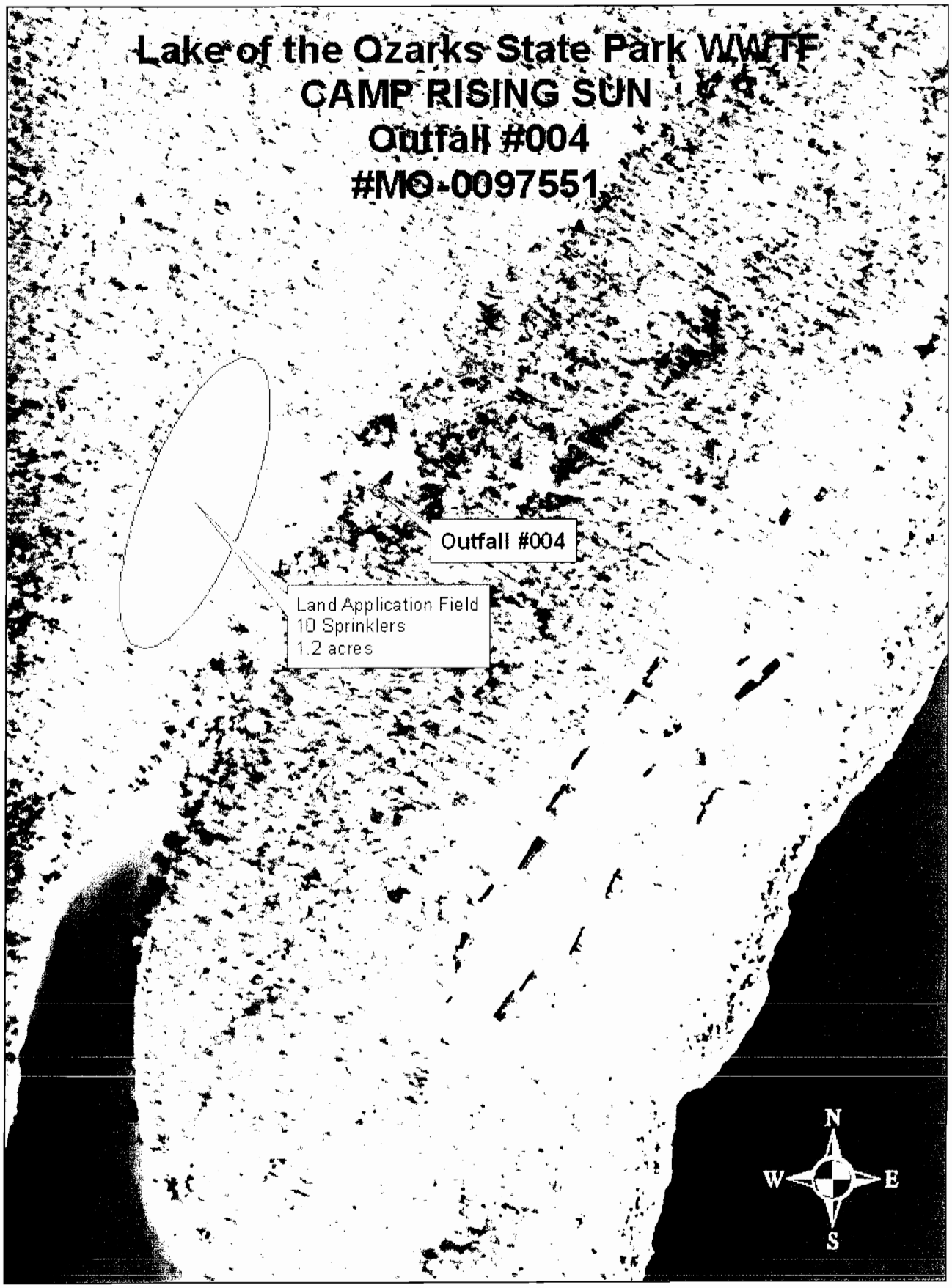
at Lake of the Ozarks State Park

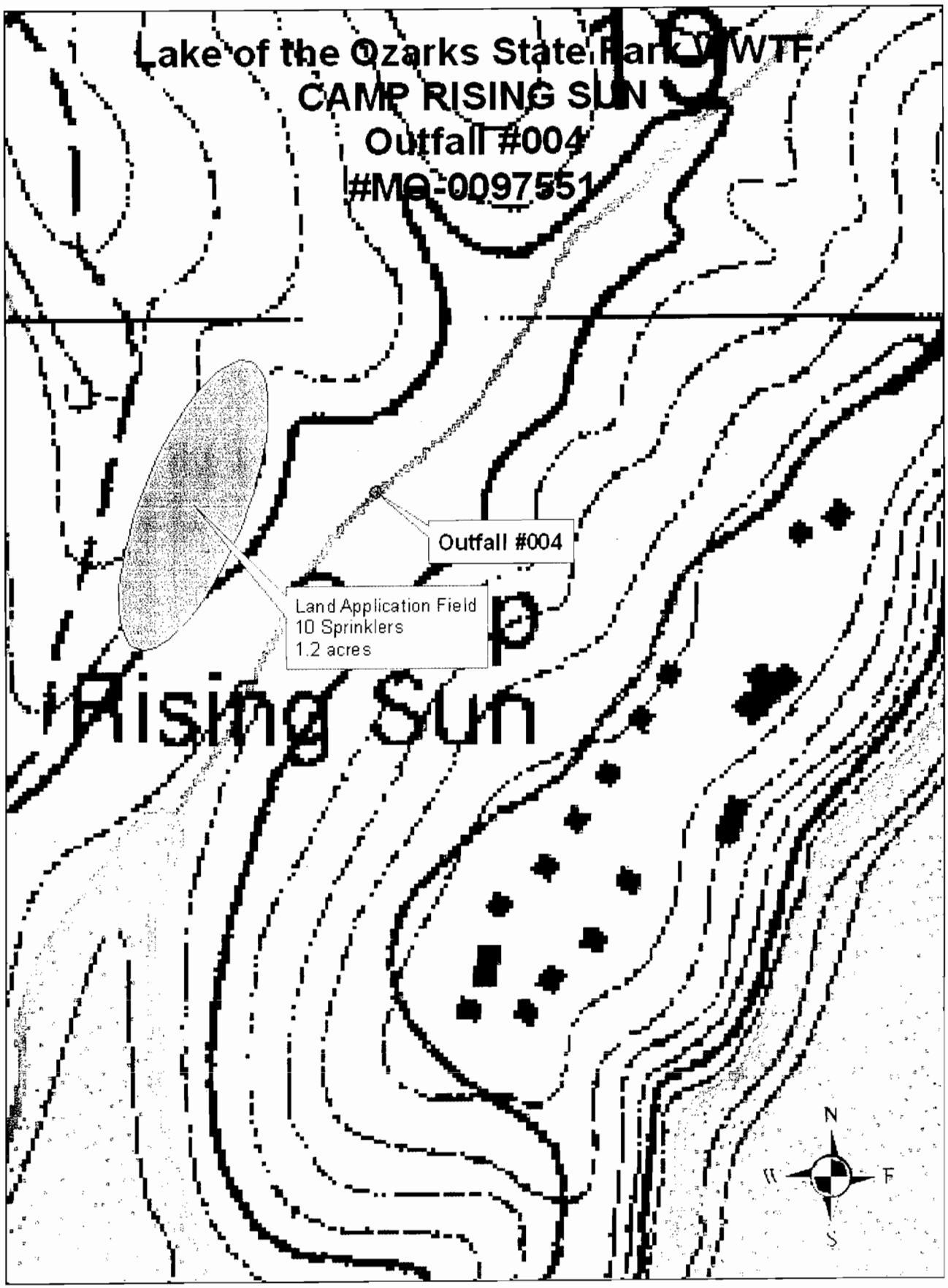
Camp Rising Sun includes a dining hall with kitchen, sleeping barracks with modern restrooms and showers, a recreation hall, volleyball and basketball playcourts and a waterfront. Camp capacity is 200 people, with a minimum of 75.

The kitchen includes the following: two commercial coolers, chest freezer, commercial stove, convection oven, commercial dishwasher, coffee pot, commercial mixer, pots and pans, mixing bowls, skillets, sheet pans, cake pans, stock pots, plates, bowls, water glasses, pitchers, serving bowls, coffee cups and utensils.

	# of Rooms	Sleeping Capacity	Restroom Facilities
Central Camp Area			
Dining Lodge and Kitchen	2	--	1 toilet; 1 lavatory; hot water
Recreation Building	4	--	
Office and Staff Quarters	3	14	2 toilets; 2 lavatories; 2 showers; hot water
Central Restroom (men and women)	2	--	2 toilets; 2 lavatories; 3 showers; hot water
Sleeping Units			
Barracks 1-8	2 each	18 each	2 toilets; 2 lavatories; 3 showers; hot water
Cooks Quarters 1	2	3	1 toilet; 1 lavatory; 1 shower; hot water
Cooks Quarters 2	2	4	1 toilet; 1 lavatory; 1 shower; hot water
Staff Quarters 3	2	16	2 toilets; 2 lavatories; 2 showers; hot water
Staff Quarters 4	2	26	2 toilets; 2 lavatories; 2 showers; hot water

Recreational Facilities
Waterfront (beach, swim dock, boat dock, vault toilet)
Lighted, paved playcourts (basketball and volleyball)
Amphitheater


Lake of the Ozarks State Park WWTF
CAMP RISING SUN
Outfall #004
#MO-0097551
Outfall #004
Land Application Field
10 Sprinklers
1.2 acres
N
W
E
S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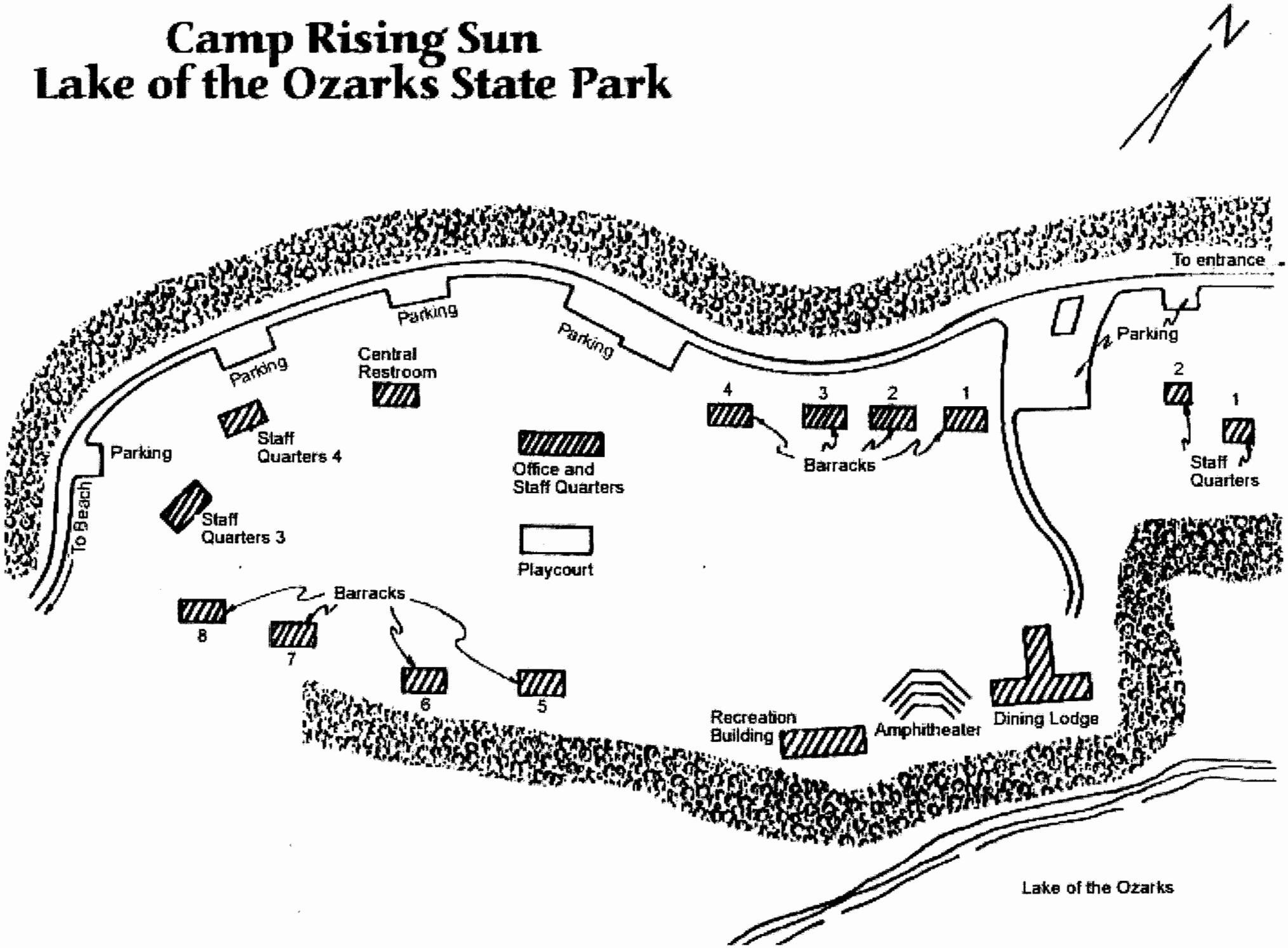
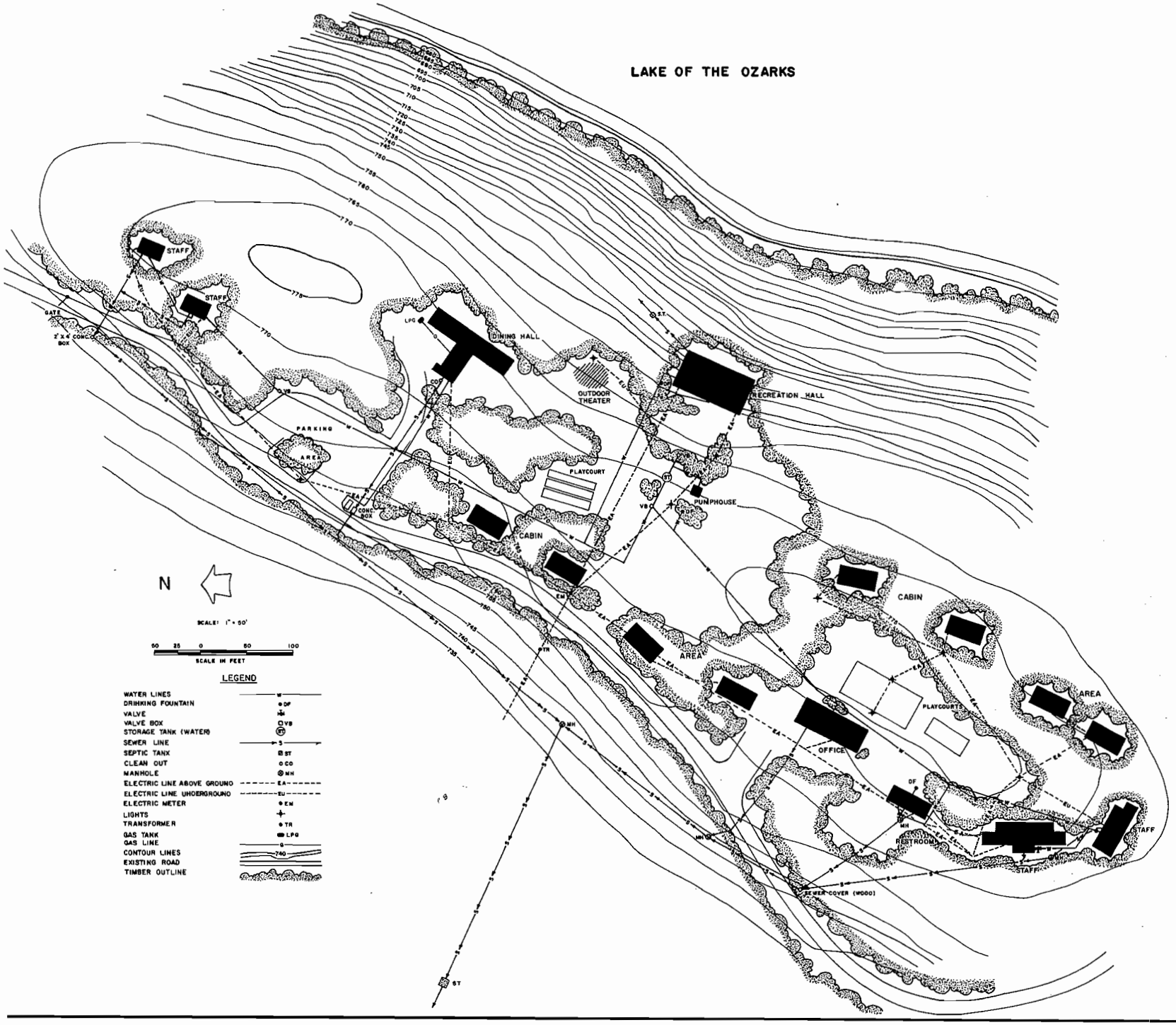
Camp Rising Sun
Lake of the Ozarks State Park



LAKE OF THE OZARKS



NOTE: NAME OF DIVISION CHANGED 6/19/85.

MISSOURI
DEPARTMENT of NATURAL RES
DIVISION of PARKS,
RECREATION, and HISTORIC PRESE
LAKE OF THE OZARKS STATE
CAMP RISING SUN

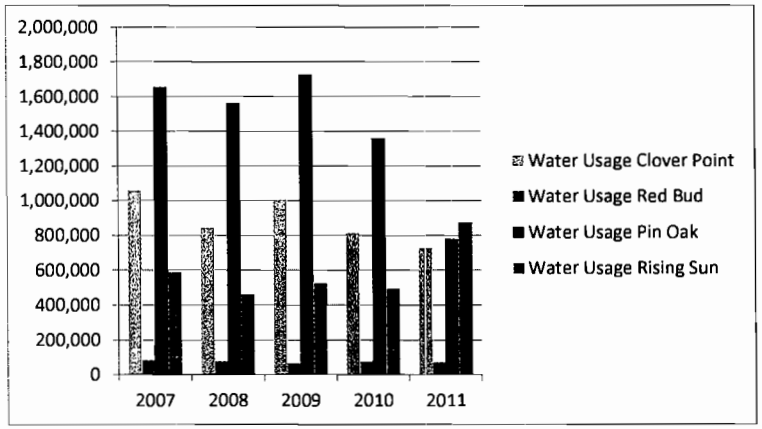
FIELD CHECK BY REGION III 1984	TRACED BY	DATE 5/8/85
DRAWN BY Don Wolther	CHECKED BY	REVISIONS

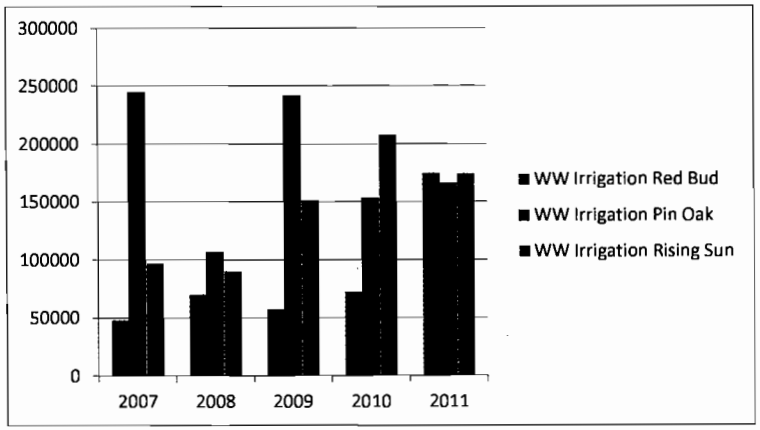
APPROVED BY DIVISION OF PARKS, RECREATION, AND HISTORIC PRESERVA
DIRECTOR

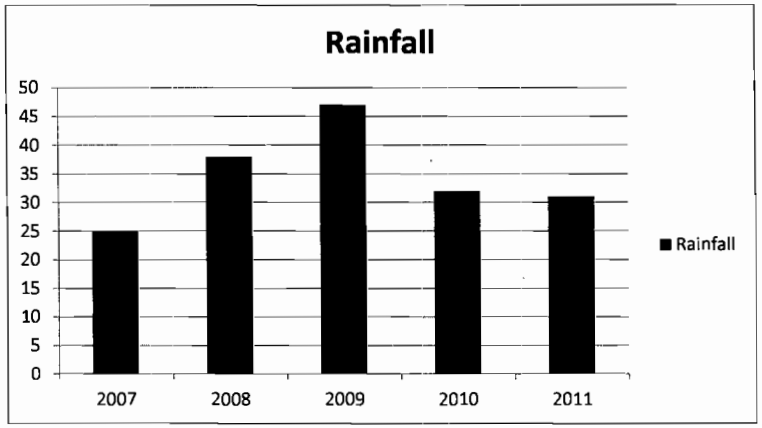
MDNR, Lake of the Ozarks State Park WWTF

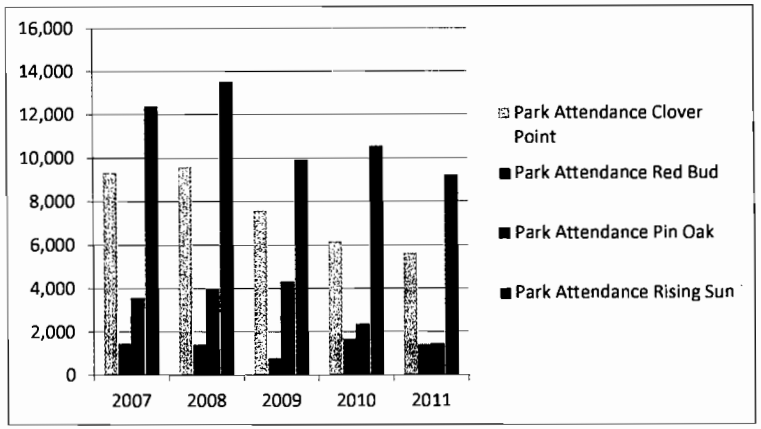
Seasonal April - October (210 days)

		2007	2008	2009	2010	2011	Units
Rainfall		25	38	47	32	31	*in.*
Park Attendance	Clover Point	9,374	9,616	7,610	6,196	5,670	*per.*
	Red Bud	1,486	1,437	817	1,704	1,446	
	Pin Oak	3,593	4,037	4,338	2,362	1,464	
	Rising Sun	12,417	13,557	9,953	10,598	9,286	
Water Usage	Clover Point	1,059,300	845,100	1,005,900	815,100	728,900	*gal.*
	Red Bud	83,700	78,300	65,200	77,000	70,900	
	Pin Oak	1,653,600	1,562,700	1,724,000	1,359,300	780,100	
	Rising Sun	589,500	466,000	528,100	495,800	874,900	
WW Irrigation	Red Bud	48,272	70,675	57,744	73,008	174,816	*gal.*
	Pin Oak	245,160	106,884	241,920	153,552	166,068	
	Rising Sun	97,085	90,237	151,702	208,291	174,705	









The Cooperative Soil Survey

Soil Data Map Unit Interpretation Report

73042 - Niangua-Bardley complex, 15 to 50 percent slopes, extremely stony (in Camden County, Missouri)

The spatial extent of this map unit is 132,232 acres (206.6mi^2), comprising 29.2% of the total survey area

Map Unit Characteristics

This well drained mapunit is not hydric and is classed in Hydrologic Group C. No seasonal water table is present. Ponding is present 0-14% of the time. This is not a flood plain unit. The average slope gradient is 33%. Camden County, Missouri

View Map Unit Distribution

Avail H_2O Cap (in)

Depth	Water
0-10 in	1.2
0-20 in	2.2
0-40 in	3.6
0-60 in	4.4

Major Map Unit Component

Niangua Series - Very-fine, mixed, active, mesic Typic Hapludalfs

These soils are formed in gravelly colluvium over clayey residuum weathered from dolostone located on hills under tree cover and intermixed conifers and hardwoods, and comprise approximately 60% of the map unit. The surface water runoff class is very high and the natural drainage condition of the soil is well drained. The seasonal high water table is at a depth of more than 6 feet. This mapunit component is assigned to the nonirrigated land capability classification 7e.

Annual Precip: 39 - 49 inches

Frost Free: 172 - 232 days

Precipation Effectiveness*: 83.39

Erosion Class: Class 1

Slope Gradient: 15 - 50%

USLE T Factor: 3 tons/acre-year

Wind Erodibility Group: 8

Hydric: No

Annual Air Temp: 54 - 59 °F (12 - 15°C)

Dry Albedo (rep): 0.16

Climate Factor:** 2.54

Runoff Class: Very high

USLE Slope Length (rep): 75 ft (23 M)

Drainage Class: Well drained

Wind Erodibility Index: 0

Land Capability Class: 7e

* Thornthwaite Precipitation-Effectiveness index: PE = 87*(annual average precipitation$_{in}$ * annual average temperature^{o}F)$^{1.1111}$

** Climate Factor: C = 34.48 * V^3 / PE^2 – V = average annual wind velocity (6 mph used here)

View Series Distribution: CSS Site SEMTOOL OSD (NRCS)

Horizon Data: Key Physical and Chemical Properties (representative values)

Name	Depth	Clay	Silt	Sand	Frags 2mm-3"	Frags 3"-10"	Frags >10"	OM	$CaCO_3$	pH (H_2O)	D_b(Dry)	CEC-7
A	0 - 3 in	11%	71.9%	17.1%	55%	0%	0%	2.2%	0%	5.5	1.34g/cm^3	8.2
E	3 - 14 in	14.2%	71.6%	14.2%	70%	0%	0%	0.85%	0%	5.2	1.64g/cm^3	6.8
2Bt	14 - 52 in	72%	23%	5%	25%	0%	0%	0.75%	0%	5.4	1.69g/cm^3	51
2R	52 - 80 in	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Horizon Data: Moisture Characteristics (representative values)

Name	Depth	K_{sat}	AWC	H_2O sat	H_2O .33 bar	H_2O 15 bar	D_b .1 bar	D_b .33 bar	D_b 15 bar	LEP	Liquid Limit	Plast Index
A	0 - 3 in	1.28in/hr	0.14in/in	31%	15.2%	5.2%	N/A	1.25g/cm^3	1.34g/cm^3	1.5	27	6
E	3 - 14 in	1.28in/hr	0.12in/in	18%	11%	4.2%	N/A	1.48g/cm^3	1.37g/cm^3	1.5	27	9
2Bt	14 - 52 in	0.03in/hr	0.09in/in	45%	40.7%	32.3%	N/A	1.2g/cm^3	1.54g/cm^3	10.5	81	53
2R	52 - 80 in	0.03in/hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Horizon Data: Physical Properties

Name	Depth	Texture	AASHTO Class	UNIFIED Class	Kf	Kw
A	0 - 3 in	**GRV-SIL**	A-1-b , A-7-6 , **A-2-4**	GC , **GC-GM**	.37	.15
E	3 - 14 in	GRX-SIL , **GRV-SIL** , GRV-SIL	A-1-b , A-6 , **A-2-4**	**GC** , GC-GM	.37	.15
2Bt	14 - 52 in	GR-C , **C**	**A-7-6**	**CH**	.28	.20
2R	52 - 80 in	**BR**	N/A	N/A	N/A	N/A

* Bold type indicates the representative rating for the horizon.

Forest Productivity - Site Index - Production (yr^3/acre-year) Conservation Tree Shrub Group: 4

white oak (Quercus alba) 54 - 43ft^3/ac-yr **black oak** (Quercus velutina) 56 - 43ft^3/ac-yr

Soil in CTSG 4 are moderately well to well drained with some or all horizons that are clayey or clayey skeletal or fine and very fine. The depth to a water table during the growing season is at least 1.5 feet. Flooding frequency ranges from none to rare. The available water capacity is at least 6 inches. Soil depth is at least 40 inches to a restrictive layer. Sodium adsorption rates are less than 1.

Trees to Manage

common serviceberry (Amelanchier arborea)
persimmon (Diospyros virginiana)
blackjack oak (Quercus marilandica)
mockernut hickory (Carya alba)
white ash (Fraxinus americana)
chinkapin oak (unknown scientific name)
bitternut hickory (Carya cordiformis)
eastern redcedar (Juniperus virginiana)
northern red oak (Quercus rubra)
cockspur hawthorn (Crataegus crus-galli)
shingle oak (Quercus imbricaria)
shagbark hickory (Carya ovata)
shortleaf pine (Pinus echinata)
black oak (Quercus velutina)
black hickory (Carya texana)
scarlet oak (Quercus coccinea)
sassafras (Sassafras albidum)
flowering dogwood (Cornus florida)
southern red oak (Quercus falcata)
pignut hickory (Carya glabra)
blackgum (Nyssa sylvatica)
post oak (Quercus stellata)

Windbreaks and Environmental Plantings (rep hts at 20 yrs)

shagbark hickory (Carya ovata)	31ft	**honeylocust** (Gleditsia triacanthos)	31ft
black locust (Robinia pseudoacacia)	31ft	**eastern white pine** (Pinus strobus)	37ft
wild hydrangea (Hydrangea arborescens)	7ft	**roughleaf dogwood** (Cornus drummondi)	14ft
pawpaw (Asimina triloba)	14ft	**spicebush** (Lindera benzoin)	14ft
common serviceberry (Amelanchier arborea)	14ft	**black cherry** (Prunus serotina)	20ft
white oak (Quercus alba)	31ft	**mockernut hickory** (Carya alba)	31ft
honeylocust (Gleditsia triacanthos)	31ft	**American basswood** (Tilia americana)	31ft
American hazelnut (Corylus americana)	7ft	**common ninebark** (Physocarpus opulifolius)	7ft
American plum (Prunus americana)	14ft	**flowering dogwood** (Cornus florida)	14ft
common chokecherry (Prunus virginiana)	14ft	**persimmon** (Diospyros virginiana)	14ft
black walnut (Juglans nigra)	31ft	**northern red oak** (Quercus rubra)	31ft
American beech (Fagus grandifolia)	31ft	**Shumard's oak** (Quercus shumardii)	31ft
Norway spruce (Picea abies)	31ft	**fragrant sumac** (Rhus aromatica)	7ft
flameleaf sumac (Rhus copallinum)	7ft	**eastern hophornbeam** (Ostrya virginiana)	14ft
gray dogwood (Cornus racemosa)	14ft	**blackhaw** (Viburnum prunifolium)	14ft
red mulberry (Morus rubra)	14ft	**white ash** (Fraxinus americana)	31ft
bitternut hickory (Carya cordiformis)	31ft	**white ash** (Fraxinus americana)	31ft
black oak (Quercus velutina)	31ft	**arborvitae** (Thuja occidentalis)	20ft
Downy Arrowwood (Viburnum rafinesquianum)	7ft	**coralberry** (Symphoricarpos orbiculatus)	7ft
eastern redbud (Cercis canadensis)	14ft	**Washington hawthorn** (Crataegus phaenopyrum)	14ft
rusty blackhaw (Viburnum rufidulum)	14ft	**blackgum** (Nyssa sylvatica)	20ft
yellow poplar (Liriodendron tulipifera)	31ft		

Common Plant Species Forage Suitability Group: **GNS**

post oak(Quercus stellata)
black oak(Quercus velutina)
sassafras(Sassafras albidum)
coralberry(Symphoricarpos orbiculatus)
eastern redcedar(Juniperus virginiana)
white oak(Quercus alba)
blackjack oak(Quercus marilandica)

Group GNS (Generally Not Suited). The soils in this group generally are not suited to pasture and hay. The suitability for forage species and the use of equipment are limited by the slope, by a high content of rock fragments, or by both of these.

Interpretations **Rating** (Score - Low - ***Rep*** - High)

(AWM) - Animal Waste Management

1 Irrigation Disposal of Wastewater Rating: Very limited (***1.00***)

Reason 1: Slow water movement (***1.00***)
Reason 2: Too steep for surface application (***1.00***)
Reason 3: Too steep for sprinkler application (***1.00***)
Reason 4: Too acid (0.00 - ***0.77*** - 1.00)

27 Sanitary Landfill (Trench) Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Depth to bedrock (*1.00*)
Reason 3: Too clayey (*1.00*)

28 Septic Tank Absorption Fields Rating: Very limited (*1.00*)
Reason 1: Slow water movement (*1.00*)
Reason 2: Slope (*1.00*)
Reason 3: Depth to bedrock (0.27 - *0.69* - 1.00)

29 Septic Tank Absorption Fields Potential (MO) Rating: Severe Limitation (*0.10*)
Reason 1: Permeability: 0.00-0.06: Drip soil adsorption system may be allowed, check Missouri State DHSS regulations (*0.50*)
Reason 2: Slope: 30-45%: Design an alternative system (*0.30*)
Reason 3: Depth to Bedrock: 48-72": Two foot of seperation above bedrock is required (*0.10*)

30 Sewage Lagoons Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Seepage (0.00 - *0.50* - 1.00)
Reason 3: Depth to hard bedrock (*0.26*)

31 Shallow Excavations Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Too clayey (*1.00*)
Reason 3: Depth to hard bedrock (*0.26*)
Reason 4: Cutbanks cave (*0.10*)

32 Small Commercial Buildings Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Shrink-swell (*1.00*)

(FOR) - Forestry and Silviculture

33 Black Walnut Suitability Index (MO) Not rated (- Not rated -)
Not rated () - Not rated ()

34 Conservation Tree/Shrub Groups Rating: CTSG 5A (0.00 - *0.51* - 0.51)
Reason 1: CTSG 5A (0.00 - *1.00* - 1.00)

35 Construction Limitations for Haul Roads/Log Landings Rating: Severe (0.50 - *1.00* - 1.00)
Reason 1: Slope (0.50 - *1.00* - 1.00)
Reason 2: Stoniness (*0.50*)
Reason 3: Low strength (0.00 - *0.50* - 0.50)

36 Hand Planting Suitability Rating: Moderately suited (*0.50*)
Reason 1: Rock fragments (*0.50*)

37 Harvest Equipment Operability Rating: Moderately suited (0.50 - *0.50* - 1.00)
Reason 1: Slope (0.00 - *0.50* - 1.00)
Reason 2: Rock fragments (*0.50*)

38 Log Landing Suitability Rating: Poorly suited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Rock fragments (*0.50*)

39 Mechanical Planting Suitability Rating: Unsuited (0.50 - *1.00* - 1.00)
Reason 1: Slope (0.50 - *1.00* - 1.00)
Reason 2: Rock fragments (0.50 - *0.75* - 0.75)

40 Mechanical Site Preparation (Deep) Rating: Poorly suited (0.50 - *0.50* - 1.00)
Reason 1: Slope (0.50 - *0.50* - 1.00)
Reason 2: Rock fragments (*0.50*)

41 Mechanical Site Preparation (Surface) Rating: Poorly suited (0.50 - *0.50* - 1.00)
Reason 1: Slope (0.50 - *0.50* - 1.00)
Reason 2: Rock fragments (*0.50*)

42 Potential Erosion Hazard (Off Rating: Moderate (0.50 - *0.50* - 0.75)
Reason 1: Slope/erodibility (0.50 - *0.50* - 0.75)

43 Potential Erosion Hazard (Road/Trail) Rating: Severe (0.50 - *0.95* - 0.95)
Reason 1: Slope/erodibility (0.50 - *0.95* - 0.95)

44 Potential Fire Damage Hazard Rating: High (0.00 - *1.00* - 1.00)
Reason 1: Texture/slope/surface depth/rock fragments (0.00 - *1.00* - 1.00)

45 Potential Seedling Mortality Rating: Moderate (0.00 - *0.50* - 0.50)
Reason 1: Available water (0.00 - *0.50* - 0.50)

46 Road Suitability (Natural Surface) Rating: Poorly suited (*1.00*)

Reason 1: Slope (*1.00*)
Reason 2: Rock fragments (*0.50*)

47 Soil Rutting Hazard Rating: Slight (*0.10*)
Reason 1: Strength (*0.10*)

(GRL) - Grazing and Range Management

48 Fencing, Post Depth =<24 inches Rating: Very limited (*1.00*)
Reason 1: > 45% Clay (*1.00*)
Reason 2: Shrink-swell, LEP * depth of thickest layer =>180 (*1.00*)
Reason 3: >15% slope (*1.00*)
Reason 4: =>50% by weight, 2mm to 3 inch fragments in 0-24 inches (0.50 - *1.00* - 1.00)

49 Fencing, Post Depth =<36 inches Rating: Very limited (*1.00*)
Reason 1: >45% Clay (*1.00*)
Reason 2: Shrink-swell, LEP * depth of thickest layer =>180 (*1.00*)
Reason 3: >15% slope (*1.00*)
Reason 4: =>50% by weight, 2mm to 3 inch fragments in 0-36 inches (0.50 - *1.00* - 1.00)

(HYDS) - Hydric Rating

50 HYDRIC SOILS LIST Rating: No (*0.00*)

(MIL) - Military

51 Bivouac Areas (DOD) Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Percs slowly (*1.00*)
Reason 3: Too gravelly (0.50 - *1.00* - 1.00)
Reason 4: Too acid (0.00 - *0.13* - 0.88)

52 Excavations Crew-Served Weapon Fighting Position (DOD) Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Too clayey (0.60 - *0.94* - 1.00)
Reason 3: Possible caving (*0.29*)

53 Excavations for Individual Fighting Position (DOD) Rating: Somewhat limited (0.60 - *0.94* - 1.00)
Reason 1: Too clayey (0.60 - *0.94* - 1.00)

54 Excavations for Vehicle Fighting Position (DOD) Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Too clayey (0.60 - *0.94* - 1.00)
Reason 3: Depth to hard bedrock (*0.92*)
Reason 4: Possible caving (*0.29*)

55 Helicopter Landing Zones (DOD) Rating: Very limited (*1.00*)
Reason 1: Slope (*1.00*)
Reason 2: Dusty (*0.10*)

56 Trafficability Veh. Type 1 1-pass wet season (DOD) Rating: Good (0.50 - *0.78* - 0.85)
Reason 1: Slope (0.50 - *0.78* - 0.96)
Reason 2: Sticky (*0.85*)
Reason 3: Slippery (*0.85*)
Reason 4: Large surface stones (0.85 - *0.91* - 0.97)
Reason 5: Low strength (*0.99*)

57 Trafficability Veh. Type 1 50-passes wet season (DOD) Rating: Good (0.50 - *0.78* - 0.85)
Reason 1: Slope (0.50 - *0.78* - 0.96)
Reason 2: Sticky (*0.85*)
Reason 3: Slippery (*0.85*)
Reason 4: Large surface stones (0.85 - *0.91* - 0.97)
Reason 5: Low strength (*0.97*)

58 Trafficability Veh. Type 1 dry season (DOD) Rating: Good (0.50 - *0.78* - 0.96)
Reason 1: Slope (0.50 - *0.78* - 0.96)
Reason 2: Large surface stones (0.85 - *0.91* - 0.97)

59 Trafficability Veh. Type 2 1-pass wet season (DOD) Rating: Good (0.50 - *0.78* - 0.85)
Reason 1: Slope (0.50 - *0.78* - 0.96)
Reason 2: Sticky (*0.85*)
Reason 3: Slippery (*0.85*)

Reason 1: Depth to water (**1.00**)

85 Furrow Irrigation (TX) Rating: Very limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Droughty (0.77 - **1.00** - 1.00)

86 Pond Reservoir Area Rating: Somewhat limited (0.06 - ***0.64*** - 1.00)
Reason 1: Slope (0.03 - **0.64** - 1.00)
Reason 2: Depth to bedrock (**0.06**)

87 Sprinkler Irrigation (TX) Rating: Very limited (***1.00***)
Reason 1: Slopes, sprinkler irrigation (**1.00**)
Reason 2: Droughty (0.77 - **1.00** - 1.00)

Bardley Series - Very-fine, mixed, active, mesic Typic Hapludalfs

These soils are formed in gravelly colluvium over clayey residuum weathered from dolostone located on hills under tree cover and intermixed conifers and hardwoods, and comprise approximately 30% of the map unit. The surface water runoff class is very high and the natural drainage condition of the soil is well drained. The seasonal high water table is at a depth of more than 6 feet. This mapunit component is assigned to the nonirrigated land capability classification 7e.

Annual Precip: 39 - 49 inches
Frost Free: 172 - 232 days
Precipation Effectiveness*: 83.39
Erosion Class: Class 1
Slope Gradient: 15 - 50%
USLE T Factor: 2 tons/acre-year
Wind Erodibility Group: 8
Hydric: No

Annual Air Temp: 54 - 59 °F (12 - 15°C)
Dry Albedo (rep): 0.3
Climate Factor:** 2.54
Runoff Class: Very high
USLE Slope Length (rep): 75 ft (23 M)
Drainage Class: Well drained
Wind Erodibility Index: 0
Land Capability Class: 7e

* Thornthwaite Precipitation-Effectiveness index: $PE = 87*(\text{annual average precipitation}_{in} * \text{annual average temperature}^{9}_{F})^{1.1111}$
** Climate Factor: $C = 34.48 * V^3 / PE^2$ – V = average annual wind velocity (8 mph used here)

View Series Distribution: CSS Site SEMTOOL OSD (NRCS)

Horizon Data: Key Physical and Chemical Properties (representative values)

Name	Depth	Clay	Silt	Sand	Frags 2mm-3"	Frags 3"-10"	Frags >10"	OM	$CaCO_3$	pH (H_2O)	D_b(Dry)	CEC-7
A	0 - 4 in	22.6%	67.6%	9.8%	50%	0%	0%	2%	0%	6	1.59g/cm³	23.1
E	4 - 8 in	20.1%	58.5%	21.4%	75%	0%	0%	1%	0%	5.8	1.67g/cm³	6.5
2Bt	8 - 27 in	85%	12%	3%	0%	0%	0%	0.75%	0%	6	1.75g/cm³	45
2R	27 - 80 in	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Horizon Data: Moisture Characteristics (representative values)

Name	Depth	K_{sat}	AWC	H_2O sat	H_2O .33 bar	H_2O 15 bar	D_b .1 bar	D_b .33 bar	D_b 15 bar	LEP	Liquid Limit	Plast Index
A	0 - 4 in	1.28in/hr	0.15in/in	26%	19.6%	10.3%	N/A	1.48g/cm³	1.59g/cm³	1.5	38	15
E	4 - 8 in	1.28in/hr	0.07in/in	15%	10.6%	5%	N/A	1.48g/cm³	1.67g/cm³	1.5	32	13
2Bt	8 - 27 in	0.03in/hr	0.1in/in	48%	46.5%	45.3%	N/A	1.3g/cm³	1.61g/cm³	10.5	92	63
2R	27 - 80 in	0.03in/hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Horizon Data: Physical Properties

Name	Depth	Texture	AASHTO Class	UNIFIED Class	Kf	Kw
A	0 - 4 in	**GRV-SIL**	**A-6** , A-2-6 , A-7-6	**GC** , GM	.37	.28
E	4 - 8 in	GRV-L , **GRX-SIL**	**A-2-6** , A-2-7	GP-GC , **GC**	.37	.28
2Bt	8 - 27 in	GR-C , **C**	**A-7-6** , A-7-5	**CH**	.28	.28
2R	27 - 80 in	**BR**	N/A	N/A	N/A	N/A

* Bold type indicates the representative rating for the horizon.

Forest Productivity - Site Index - Production (yr³/acre-year) Conservation Tree Shrub Group: **10**

white oak (Quercus alba) 42 - 29ft³/ac-yr **post oak** (Quercus stellata) 45 - 29ft³/ac-yr
black oak (Quercus velutina) 54 - 43ft³/ac-yr

Soils in CTSG 10 have one or more characteristics that are severely limiting to the planting and growth of trees and shrubs. Soil depth is less than 20 inches; available water capacity is less than 3 inches; depth to a water table during the growing season is less than 0.5 feet; pH is less than 4.0 or greater than 8.5, sodium adsorption rate is greater than 25; CaCO3 percentages equal or exceed 40%; flooding duration is very long. This group also includes urban land and water.

Interpretations **Rating** (Score - Low - ***Rep*** - High)

(AWM) - Animal Waste Management

1 Irrigation Disposal of Wastewater Rating: Very limited (***1.00***)
Reason 1: Slow water movement (**1.00**)
Reason 2: Too steep for surface application (**1.00**)
Reason 3: Too steep for sprinkler application (**1.00**)
Reason 4: Droughty (0.97 - **1.00** - 1.00)
Reason 5: Depth to bedrock (0.00 - **0.71** - 1.00)

2 Land Application of Municipal Sewage Sludge Rating: Very limited (***1.00***)
Reason 1: Slow water movement (**1.00**)
Reason 2: Low adsorption (**1.00**)
Reason 3: Slope (**1.00**)
Reason 4: Droughty (0.97 - **1.00** - 1.00)
Reason 5: Depth to bedrock (0.00 - **0.71** - 1.00)

3 Manure and Food Processing Waste Rating: Very limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Slow water movement (**1.00**)
Reason 3: Large stones content (**1.00**)
Reason 4: Droughty (0.97 - **1.00** - 1.00)
Reason 5: Depth to bedrock (0.00 - **0.71** - 1.00)

4 Overland Flow Process Treatment of Wastewater Rating: Very limited (***1.00***)
Reason 1: Too steep for surface application (**1.00**)
Reason 2: Seepage (1.00 - **1.00** - 1.00)
Reason 3: Depth to bedrock (1.00 - **1.00** - 1.00)
Reason 4: Too acid (0.00 - **0.21** - 1.00)

5 Rapid Infiltration Disposal of Wastewater Rating: Very limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Slow water movement (**1.00**)
Reason 3: Depth to bedrock (**1.00**)

6 Slow Rate Process Treatment of Wastewater Rating: Very limited (***1.00***)
Reason 1: Slow water movement (**1.00**)
Reason 2: Too steep for surface application (**1.00**)
Reason 3: Too steep for sprinkler irrigation (**1.00**)
Reason 4: Depth to bedrock (1.00 - **1.00** - 1.00)
Reason 5: Too acid (0.00 - **0.21** - 1.00)

(DHS) - Department of Homeland Security

7 Catastrophic Mortality, Large Animal Disposal, Pit Rating: Very limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Depth to bedrock (**1.00**)
Reason 3: Cutbanks cave (**1.00**)
Reason 4: Clay content (**0.80**)
Reason 5: Adsorption (**0.25**)

8 Catastrophic Mortality, Large Animal Disposal, Trench Rating: Very limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Depth to bedrock (**1.00**)
Reason 3: Cutbanks cave (**1.00**)
Reason 4: Clay content (**0.80**)
Reason 5: Adsorption (**0.25**)

9 Potential for Radioactive Bioaccumulation Rating: Low bioaccumulation potential (0.00 - ***0.03*** - 0.10)
Reason 1: Bioavailability high due to low CEC, pH, or organic sorption (0.00 - **0.00** - 0.05)
Reason 2: Gains bioavailable material (0.00 - **0.02** - 0.05)

10 Potential for Radioactive Sequestration Rating: Moderately high sequestration potential (0.46 - ***0.89*** - 0.82)
Reason 1: Adsorption by clay (0.00 - **0.87** - 1.00)
Reason 2: Sequestration due to fertility effects (0.48 - **0.96** - 0.98)
Reason 3: Loses material (0.02 - **0.08** - 0.18)

11 Rubble and Debris Disposal, Large-Scale Event Rating: Severely limited (***1.00***)
Reason 1: Slope (**1.00**)
Reason 2: Depth to bedrock (**1.00**)

40 Mechanical Site Preparation (Deep) Rating: Poorly suited (0.50 - ***0.50*** - 1.00)
Reason 1: Slope (0.50 - ***0.50*** - 1.00)
Reason 2: Rock fragments (***0.50***)
Reason 3: Restrictive layer (0.00 - ***0.50*** - 0.50)

41 Mechanical Site Preparation (Surface) Rating: Poorly suited (0.50 - ***0.50*** - 1.00)
Reason 1: Slope (0.50 - ***0.50*** - 1.00)
Reason 2: Rock fragments (***0.50***)
Reason 3: Stickiness; high plasticity index (***0.50***)

42 Potential Erosion Hazard (Off Rating: Moderate (0.50 - ***0.50*** - 0.75)
Reason 1: Slope/erodibility (0.50 - ***0.50*** - 0.75)

43 Potential Erosion Hazard (Road/Trail) Rating: Severe (***0.95***)
Reason 1: Slope/erodibility (***0.95***)

44 Potential Fire Damage Hazard Rating: High (0.00 - ***1.00*** - 1.00)
Reason 1: Texture/slope/surface depth/rock fragments (0.00 - ***1.00*** - 1.00)

45 Potential Seedling Mortality Rating: Moderate (0.00 - ***0.50*** - 0.50)
Reason 1: Available water (0.00 - ***0.50*** - 0.50)

46 Road Suitability (Natural Surface) Rating: Poorly suited (***1.00***)
Reason 1: Slope (***1.00***)
Reason 2: Rock fragments (***0.50***)

47 Soil Rutting Hazard Rating: Moderate (***0.50***)
Reason 1: Low strength (***0.50***)

(GRL) - Grazing and Range Management

48 Fencing, Post Depth =<24 inches Rating: Very limited (***1.00***)
Reason 1: > 45% Clay (***1.00***)
Reason 2: =>50% by weight, 2mm to 3 inch fragments in 0-24 inches (***1.00***)
Reason 3: Shrink-swell, LEP * depth of thickest layer =>180 (***1.00***)
Reason 4: >15% slope (***1.00***)
Reason 5: Moderately Sandy, >5 & <20% passing the #200 sieve (0.00 - ***0.22*** - 0.78)

49 Fencing, Post Depth =<36 inches Rating: Very limited (***1.00***)
Reason 1: >45% Clay (***1.00***)
Reason 2: Shrink-swell, LEP * depth of thickest layer =>180 (***1.00***)
Reason 3: =>50% by weight, 2mm to 3 inch fragments in 0-36 inches (***1.00***)
Reason 4: >15% slope (***1.00***)
Reason 5: <36 inches to bedrock (0.00 - ***1.00*** - 1.00)

(HYDS) - Hydric Rating

50 HYDRIC SOILS LIST Rating: No (***0.00***)

(MIL) - Military

51 Bivouac Areas (DOD) Rating: Very limited (***1.00***)
Reason 1: Slope (***1.00***)
Reason 2: Percs slowly (***1.00***)
Reason 3: Too gravelly (0.68 - ***1.00*** - 1.00)

52 Excavations Crew-Served Weapon Fighting Position (DOD) Rating: Very limited (***1.00***)
Reason 1. Depth to hard bedrock (***1.00***)
Reason 2: Slope (***1.00***)
Reason 3: Too clayey (0.60 - ***1.00*** - 1.00)
Reason 4: Possible caving (***0.29***)

53 Excavations for Individual Fighting Position (DOD) Rating: Very limited (0.60 - ***1.00*** - 1.00)
Reason 1: Too clayey (0.60 - ***1.00*** - 1.00)

54 Excavations for Vehicle Fighting Position (DOD) Rating: Very limited (***1.00***)
Reason 1: Depth to hard bedrock (***1.00***)
Reason 2: Slope (***1.00***)
Reason 3: Too clayey (0.60 - ***1.00*** - 1.00)
Reason 4: Possible caving (***0.29***)

55 Helicopter Landing Zones (DOD) Rating: Very limited (***1.00***)
Reason 1: Slope (***1.00***)
Reason 2: Dusty (***0.10***)

56 Trafficability Veh. Type 1 1-pass wet season (DOD) Rating: Good (0.50 - ***0.78*** - 0.85)

Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Sticky (***0.85***)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.99***)

57 Trafficability Veh. Type 1 50-passes wet season (DOD) Rating: Good (0.50 - ***0.78*** - 0.85)
Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Sticky (***0.85***)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.97***)

58 Trafficability Veh. Type 1 dry season (DOD) Rating: Good (0.50 - ***0.78*** - 0.96)
Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Large surface stones (0.85 - ***0.91*** - 0.97)

59 Trafficability Veh. Type 2 1-pass wet season (DOD) Rating: Good (0.50 - ***0.78*** - 0.85)
Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Sticky (***0.85***)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.99***)

60 Trafficability Veh. Type 2 50-passes wet season (DOD) Rating: Good (0.50 - ***0.78*** - 0.85)
Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Sticky (***0.85***)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.95***)

61 Trafficability Veh. Type 2 dry season (DOD) Rating: Good (0.50 - ***0.78*** - 0.96)
Reason 1: Slope (0.50 - ***0.78*** - 0.96)
Reason 2: Large surface stones (0.85 - ***0.91*** - 0.97)

62 Trafficability Veh. Type 3 1-pass wet season (DOD) Rating: Fair (0.28 - ***0.65*** - 0.65)
Reason 1: Sticky (***0.85***)
Reason 2: Slope (0.28 - ***0.66*** - 0.93)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.99***)

63 Trafficability Veh. Type 3 50-passes wet season (DOD) Rating: Fair (0.28 - ***0.65*** - 0.65)
Reason 1: Sticky (***0.85***)
Reason 2: Slope (0.28 - ***0.66*** - 0.93)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.95***)

64 Trafficability Veh. Type 3 dry season (DOD) Rating: Fair (0.28 - ***0.66*** - 0.93)
Reason 1: Slope (0.28 - ***0.66*** - 0.93)
Reason 2: Large surface stones (0.85 - ***0.91*** - 0.97)

65 Trafficability Veh. Type 4 1-pass wet season (DOD) Rating: Fair (0.28 - ***0.65*** - 0.65)
Reason 1: Sticky (***0.85***)
Reason 2: Slope (0.28 - ***0.66*** - 0.93)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.99***)

66 Trafficability Veh. Type 4 50-passes wet season (DOD) Rating: Fair (0.28 - ***0.65*** - 0.65)
Reason 1: Sticky (***0.85***)
Reason 2: Slope (0.28 - ***0.66*** - 0.93)
Reason 3: Slippery (***0.85***)
Reason 4: Large surface stones (0.85 - ***0.91*** - 0.97)
Reason 5: Low strength (***0.95***)

67 Trafficability Veh. Type 4 dry season (DOD) Rating: Fair (0.28 - ***0.66*** - 0.93)

The Cooperative Soil Survey

Soil Data Map Unit Interpretation Report

73019 - Poynor very gravelly silt loam, 1 to 8 percent slopes (in Camden County, Missouri)

The spatial extent of this map unit is 87,739 acres (137.1mi^2), comprising 19.4% of the total survey area

Map Unit Characteristics

This well drained mapunit is not hydric and is classed in Hydrologic Group C. No seasonal water table is present. Ponding is present 0-14% of the time. This is not a flood plain unit. The average slope gradient is 6%. Camden County, Missouri

View Map Unit Distribution

Avail H_2O Cap (in)

Depth	Water
0-10 in	1.2
0-20 in	1.8
0-40 in	1.8
0-60 in	1.8

Major Map Unit Component

Poynor Series - Loamy-skeletal over clayey, siliceous, semiactive, mesic Typic Paleudults

These soils are formed in gravelly slope alluvium derived from chert over clayey residuum weathered from dolomite located on hills on uplands under grass/herbaceous cover and tame pastureland, and comprise approximately 90% of the map unit. The surface water runoff class is medium and the natural drainage condition of the soil is well drained. The seasonal high water table is at a depth of more than 6 feet. This mapunit component is assigned to the nonirrigated land capability classification 3e.

Annual Precip: 39 - 49 inches
Frost Free: 172 - 232 days
Precipation Effectiveness*: 83.39
Erosion Class: Class 1
Slope Gradient: 1 - 8%
USLE T Factor: 4 tons/acre-year
Wind Erodibility Group: 5
Hydric: No

Annual Air Temp: 54 - 59 °F (12 - 15°C)
Dry Albedo (rep): 0.23
Climate Factor:** 2.54
Runoff Class: Medium
USLE Slope Length (rep): 102 ft (31 M)
Drainage Class: Well drained
Wind Erodibility Index: 56
Land Capability Class: 3e

* Thornthwaite Precipitation-Effectiveness index: PE = 87*(annual average precipitation$_{in}$ * annual average temperature$^{9}_{F}$)$^{1.1111}$

** Climate Factor: C = 34.48 * V^3 / PE^2 – V = average annual wind velocity (6 mph used here)

View Series Distribution: CSS Site SEMTOOL OSD (NRCS)

Horizon Data: Key Physical and Chemical Properties (representative values)

Name	Depth	Clay	Silt	Sand	Frags 2mm-3"	Frags 3"-10"	Frags >10"	OM	$CaCO_3$	pH (H_2O)	D_b(Dry)	CEC-7
A	0 - 4 in	12%	66%	22%	65%	0%	0%	0.75%	0%	5	1.45g/cm^3	12
E	4 - 10 in	10%	78%	12%	65%	0%	0%	0.75%	0%	4.8	1.47g/cm^3	6
Bt1	10 - 28 in	28%	63%	9%	65%	5%	0%	0.25%	0%	4.8	1.63g/cm^3	12
2Bt2	28 - 80 in	60%	30%	10%	5%	0%	0%	0.25%	0%	4.3	1.81g/cm^3	32

Horizon Data: Moisture Characteristics (representative values)

Name	Depth	K_{sat}	AWC	H_2O sat	H_2O .33 bar	H_2O 15 bar	D_b .1 bar	D_b .33 bar	D_b 15 bar	LEP	Liquid Limit	Plast Index
A	0 - 4 in	2.83in/hr	0.12in/in	24%	12%	3.8%	N/A	1.33g/cm^3	1.44g/cm^3	1.5	25	5
E	4 - 10 in	2.83in/hr	0.12in/in	24%	11.3%	3.3%	N/A	1.35g/cm^3	1.47g/cm^3	1.5	25	5
Bt1	10 - 28 in	1.28in/hr	0.09in/in	20%	14.6%	8%	N/A	1.48g/cm^3	1.63g/cm^3	1.5	32.5	15
2Bt2	28 - 80 in	1.28in/hr	0.09in/in	37%	35.4%	32.6%	N/A	1.58g/cm^3	1.81g/cm^3	4.5	60.5	30

Horizon Data: Physical Properties

Name	Depth	Texture	AASHTO Class	UNIFIED Class	Kf	Kw
A	0 - 4 in	**GRV-SIL**	A-1-b , **A-2-4** , A-4	GC , **GC-GM** , GM	.49	.15
E	4 - 10 in	GRX-SIL , **GRV-SIL** , GR-SIL	A-1-a , **A-2-4** , A-4	GC , **GC-GM** , GP-GM	.64	.17
Bt1	10 - 28 in	GRX-SICL , GRV-SIL , GRX-SIL , **GRV-SICL**	A-2-4 , **A-2-6** , A-6	**GC** , GP-GC	.49	.15
2Bt2	28 - 80 in	**C**	**A-7-5** , A-7-6	CH , MH	.15	.15

* Bold type indicates the representative rating for the horizon.

Estimated Crop Yields (Acre)

Caucasian bluestem	7.1 Tons	**Warm season grasses**	6.75 Tons
Common bermudagrass (Cynodon dactylon)	4.9 Tons	**Corn** (Zea mays)	Bu
Orchardgrass-red clover	5.8 Tons	**Alfalfa hay**	4.34 Tons
Tall fescue (Lolium arundinaceum)	5.35 Tons		

Non-irrigated Land Capability Class: 3e
Forage Suitability Group: GrU

Forest Productivity - Site Index - Production (yr^3/acre-year)

Conservation Tree Shrub Group: **5**

shortleaf pine (Pinus echinata)	55 - 72ft^3/ac-yr	**white oak** (Quercus alba)	48 - 29ft^3/ac-yr
black oak (Quercus velutina)	53 - 72ft^3/ac-yr		

Soils in CTSG 5 are deep loamy moderately well to well drained with moderate AWC. Depth to the water table is at least 1.5 feet. Flooding frequency ranges from none to rare. The available water capacity is between 6 and 9 inches. Sodium adsorption rates are less than 1.

Trees to Manage

bitternut hickory (Carya cordiformis)	**flowering dogwood** (Cornus florida)
eastern redcedar (Juniperus virginiana)	**southern red oak** (Quercus falcata)
northern red oak (Quercus rubra)	**pignut hickory** (Carya glabra)
cockspur hawthorn (Crataegus crus-galli)	**blackgum** (Nyssa sylvatica)
shingle oak (Quercus imbricaria)	**post oak** (Quercus stellata)
common serviceberry (Amelanchier arborea)	**shagbark hickory** (Carya ovata)
persimmon (Diospyros virginiana)	**shortleaf pine** (Pinus echinata)
blackjack oak (Quercus marilandica)	**black oak** (Quercus velutina)
mockernut hickory (Carya alba)	**black hickory** (Carya texana)
white ash (Fraxinus americana)	**scarlet oak** (Quercus coccinea)
chinkapin oak (unknown scientific name)	**sassafras** (Sassafras albidum)

Windbreaks and Environmental Plantings (rep hts at 20 yrs)

arborvitae (Thuja occidentalis)	20ft	**honeylocust** (Gleditsia triacanthos)	31ft
black oak (Quercus velutina)	31ft	**persimmon** (Diospyros virginiana)	20ft
black hickory (Carya texana)	20ft	**flowering dogwood** (Cornus florida)	14ft
coralberry (Symphoricarpos orbiculatus)	7ft	**eastern redcedar** (Juniperus virginiana)	14ft
pin oak (Quercus palustris)	31ft	**southern red oak** (Quercus falcata)	20ft
post oak (Quercus stellata)	20ft	**pignut hickory** (Carya glabra)	20ft
eastern redbud (Cercis canadensis)	14ft	**flameleaf sumac** (Rhus copallinum)	7ft
mockernut hickory (Carya alba)	31ft	**hackberry** (Celtis occidentalis)	31ft
white oak (Quercus alba)	20ft	**bur oak** (Quercus macrocarpa)	20ft
Washington hawthorn (Crataegus phaenopyrum)	14ft	**Washington hawthorn** (Crataegus phaenopyrum)	14ft
common ninebark (Physocarpus opulifolius)	7ft	**shagbark hickory** (Carya ovata)	31ft
green ash (Fraxinus pennsylvanica)	31ft	**shortleaf pine** (Pinus echinata)	20ft
green hawthorn (Crataegus viridis)	20ft	**gray dogwood** (Cornus racemosa)	14ft
roughleaf dogwood (Cornus drummondii)	7ft	**fragrant sumac** (Rhus aromatica)	7ft

Common Plant Species

Forage Suitability Group: **GrU**

currant(Ribes)	**blackberry**(Rubus)
eastern poison ivy(Toxicodendron radicans)	**fragrant sumac**(Rhus aromatica)
summer grape(Vitis aestivalis)	

Group GrU (Gravelly Upland). The soils in this group generally are not suited to cultivated crops. Droughtiness and erosion are the main management concerns. Seedbeds should be prepared on the contour. Timely seedbed preparation helps to ensure rapid plant growth and a protective ground cover.

Interpretations — **Rating** (Score - Low - ***Rep*** - High)

(AWM) - Animal Waste Management

1 **Irrigation Disposal of Wastewater** — Rating: Very limited (0.00 - ***1.00*** - 1.00)
Reason 1: Too acid (0.00 - ***1.00*** - 1.00)
Reason 2: Too steep for surface application (0.00 - ***0.68*** - 1.00)

2 **Land Application of Municipal Sewage Sludge** — Rating: Very limited (***1.00***)
Reason 1: Strongly contrasting textural stratification (***1.00***)

Reason 1: Slope (0.00 - ***0.50*** - 0.50)
Reason 2: Landslides (***0.10***)

47 Soil Rutting Hazard Rating: Slight (***0.10***)
Reason 1: Strength (***0.10***)

(GRL) - Grazing and Range Management

Reason 2: =>50% by weight, 2mm to 3 inch fragments in 0-24 inches (0.39 - ***1.00*** - 1.00)

48 Fencing, Post Depth =<24 Inches Rating: Very limited (0.39 - ***1.00*** - 1.00)
Reason 1: 18 to 45% Clay (0.00 - ***0.27*** - 0.73)

49 Fencing, Post Depth =<36 Inches Rating: Very limited (***1.00***)
Reason 1: >45% Clay (***1.00***)
Reason 2: =>50% by weight, 2mm to 3 inch fragments in 0-36 inches (0.39 - ***1.00*** - 1.00)

(HYDS) - Hydric Rating

50 HYDRIC SOILS LIST Rating: No (***0.00***)

(MIL) - Military

51 Bivouac Areas (DOD) Rating: Very limited (0.39 - ***1.00*** - 1.00)
Reason 1: Too gravelly (0.39 - ***1.00*** - 1.00)
Reason 2: Too acid (0.00 - ***0.50*** - 1.00)

52 Excavations Crew-Served Weapon Fighting Position (DOD) Rating: Very limited (***1.00***)
Reason 1: Expect caving (***1.00***)
Reason 2: Too clayey (0.10 - ***0.60*** - 0.98)

53 Excavations for Individual Fighting Position (DOD) Rating: Not limited (***0.00***)

54 Excavations for Vehicle Fighting Position (DOD) Rating: Very limited (***1.00***)
Reason 1: Expect caving (***1.00***)
Reason 2: Too clayey (0.10 - ***0.60*** - 0.98)

55 Helicopter Landing Zones (DOD) Rating: Somewhat limited (0.10 - ***0.68*** - 1.00)
Reason 1: Slope (0.00 - ***0.68*** - 1.00)
Reason 2: Dusty (***0.10***)

56 Trafficability Veh. Type 1 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.99***)
Reason 4: Slope (0.99 - ***0.99*** - 1.00)

57 Trafficability Veh. Type 1 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.97***)
Reason 4: Slope (0.99 - ***0.99*** - 1.00)

58 Trafficability Veh. Type 1 dry season (DOD) Rating: Excellent (0.99 - ***0.99*** - 1.00)
Reason 1: Slope (0.99 - ***0.99*** - 1.00)

59 Trafficability Veh. Type 2 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.98***)
Reason 4: Slope (0.99 - ***0.99*** - 1.00)

60 Trafficability Veh. Type 2 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.95***)
Reason 4: Slope (0.99 - ***0.99*** - 1.00)

61 Trafficability Veh. Type 2 dry season (DOD) Rating: Excellent (0.99 - ***0.99*** - 1.00)
Reason 1: Slope (0.99 - ***0.99*** - 1.00)

62 Trafficability Veh. Type 3 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)

Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.97***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

63 Trafficability Veh. Type 3 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.92***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

64 Trafficability Veh. Type 3 dry season (DOD) Rating: Excellent (0.98 - ***0.99*** - 1.00)
Reason 1: Slope (0.98 - ***0.99*** - 1.00)

65 Trafficability Veh. Type 4 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.97***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

66 Trafficability Veh. Type 4 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.92***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

67 Trafficability Veh. Type 4 dry season (DOD) Rating: Excellent (0.98 - ***0.99*** - 1.00)
Reason 1: Slope (0.98 - ***0.99*** - 1.00)

68 Trafficability Veh. Type 5 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.98***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

69 Trafficability Veh. Type 5 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.97***)
Reason 4: Slope (0.98 - ***0.99*** - 1.00)

70 Trafficability Veh. Type 5 dry season (DOD) Rating: Excellent (0.98 - ***0.99*** - 1.00)
Reason 1: Slope (0.98 - ***0.99*** - 1.00)

71 Trafficability Veh. Type 6 1-pass wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Slope (0.90 - ***0.94*** - 1.00)
Reason 4: Low strength (***0.95***)

72 Trafficability Veh. Type 6 50-passes wet season (DOD) Rating: Good (***0.85***)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Low strength (***0.88***)
Reason 4: Slope (0.90 - ***0.94*** - 1.00)

73 Trafficability Veh. Type 6 dry season (DOD) Rating: Excellent (0.90 - ***0.94*** - 1.00)
Reason 1: Slope (0.90 - ***0.94*** - 1.00)

74 Trafficability Veh. Type 7 1-pass wet season (DOD) Rating: Good (0.80 - ***0.85*** - 0.85)
Reason 1: Sticky (***0.85***)
Reason 2: Slippery (***0.85***)
Reason 3: Slope (0.80 - ***0.88*** - 1.00)
Reason 4: Low strength (***0.94***)

75 Trafficability Veh. Type 7 50-passes wet season (DOD) Rating: Good (0.80 - ***0.81*** - 0.81)
Reason 1: Low strength (***0.81***)
Reason 2: Sticky (***0.85***)

MISSOURI
STATE PARKS

MDNR, Lake of the Ozarks State Park WWTF
#MO-0097551
Camden County

RECEIVED

SEP 26 2012

WATER PROTECTION PROGRAM

September 24, 2012

Mr. Curtis Gateley
Water Protection Program
P.O. Box 176
Jefferson City, MO 65102

Dear Mr. Gateley:

Enclosed is the permit renewal application and accompanying documents required for the renewal of Missouri State Operating Permit #MO-0097551 for MDNR, Lake of the Ozarks State Park Wastewater Treatment Facility (WWTF), in Camden County, Missouri. In addition to the submittal of these documents it is being requested that you review the following for consideration in drafting the said operating permit.

- Currently MSOP #MO-0097551 for MDNR, Lake of the Ozarks State Park WWTF requires quarterly reporting for emergency discharges and annual sampling of the irrigated wastewater. I would like to request that the emergency discharges be reported solely in the annual report, and any unauthorized discharges be reported in accordance with Standard Conditions, Part 1, Section B.2.b. I would also like to request the removal of sampling requirements for irrigated wastewater on the basis that the facility has demonstrated a history of proper land application practices.

  On March 16, 2012, MSOP #MO-0034819 for MDNR, Montauk State Park WWTF in Dent County was renewed by the MDNR, Southeast Regional Office. This permit renewal incorporated such modifications as requested above and was approved on the same basis. Therefore, your consideration in this matter would be greatly appreciated.

If you have any questions, please contact me at (573) 522-6380 in the Division of State Park's Director's Office, P.O. Box 176, Jefferson City, MO 65102

Sincerely,

DIVISION OF STATE PARKS

Martin Kator
Environmental Specialist IV

Enclosures: Form B, Form I, Operation & Maintenance Plan

c: Bill Arnold, Division of State Parks, Lake of the Ozarks State Park