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## EARTH DAM VISUAL INSPECTION REPORT

State Form 50777 (R / 4-05)

Indiana Department of Natural Resources  
 Division of Water, Dam Safety Section  
 402 West Washington Street, Room W264  
 Indianapolis, Indiana 46204  
 Telephone: (317)232-4160 or toll free (within Indiana) 1-877-928-3755

Dam Name Lake Deturk dam			Quad. Martinsville		Date of Inspection 06 / 22 / 2011		
State Dam ID 55-76	Permit D-6132	County Morgan		Sec. T. R. 34 12 N 1 E	Last Inspection 04 / 20 / 2006		
Owners Name Ozark Fisheries, Incorporated					Owner's Phone (573 ) 765-3227		
Address/Zip Code 1100 Ozark Fisheries Road Stoutland, MO 65567					Owners E-mail Address larry@ozarkfisheries.com		
Contact's Name Lawrence B Cleveland				Contact's Phone (573 ) 774-0444		Spillway Width Top Bot. 40	Ft. FBD. 5.0
Hazard Low	Drainage Area 0.6 Mi <sup>2</sup>	Surface Area 29.0 AC	Height 30 FT	Crest Length 590 FT	Crest Width 25 FT	Inlet Below Crest 9 FT	Slope: Up 3:1 Down 4:1

<b>FIELD CONDITIONS OBSERVED</b>						<b>DRAWDOWN STRUCTURE</b>	
Water Level - Below Dam Crest _____ Ft.						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> None	
Ground Moisture Condition: Dry <input type="checkbox"/> Wet <input checked="" type="checkbox"/> Snowcover _____ Other _____						Comment: *two drawdowns, See pg. 2	
<b>MONITORING</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> None							
<input type="checkbox"/> Gage Rod <input type="checkbox"/> Piezometers <input type="checkbox"/> Seepage Weirs <input type="checkbox"/> Survey Monuments <input type="checkbox"/> Other            Comments: _____							

**NOTICE TO OWNERS:** PLEASE READ BOTH SIDES OF THESE TWO PAGES AND FOLLOW RECOMMENDATIONS MADE HEREIN.

This visual inspection notes the obvious surficial problems of your dam and appurtenant works. This is not a detailed engineering evaluation. There may be serious defects and/or design deficiencies with your dam that may render your dam unsafe during unusual conditions such as high pool levels and/or earthquake loading. Since you are liable for any property damage, injury or loss of life resulting from failure of your dam, you should consult with an engineer experienced in dam design about the current safety of your dam.

**OWNER INSPECTION:** The owner (or owner's representative) should inspect this dam routinely under normal conditions and more frequently under unusual loading conditions.

<b>A UPSTREAM SLOPE</b>	<b>PROBLEMS NOTED:</b> <input type="checkbox"/> (A-1) None <input type="checkbox"/> (A-2) Riprap - Missing, Sparse, Displaced, Weathered <input type="checkbox"/> (A-3) Wave Erosion-with Scarps <input type="checkbox"/> (A-4) Cracks-with Displacement <input type="checkbox"/> (A-5) Sinkhole <input type="checkbox"/> (A-6) Appears Too Steep <input type="checkbox"/> (A-7) Depressions or Bulges <input type="checkbox"/> (A-8) Slides <input type="checkbox"/> (A-9) Animal Burrows <input checked="" type="checkbox"/> (A-10) Trees, Brush, Briars <input type="checkbox"/> (A-11) Other _____
GOOD	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	
Comments: (A-10) Trees located along right (South) contact area.	

<b>B CREST</b>	<b>PROBLEMS NOTED:</b> <input checked="" type="checkbox"/> (B-1) None <input type="checkbox"/> (B-2) Ruts or Puddles <input type="checkbox"/> (B-3) Erosion <input type="checkbox"/> (B-4) Cracks with Displacement <input type="checkbox"/> (B-5) Sinkholes <input type="checkbox"/> (B-6) Not Wide Enough <input type="checkbox"/> (B-7) Low Area <input type="checkbox"/> (B-8) Misalignment <input type="checkbox"/> (B-9) Inadequate Surface Drainage <input type="checkbox"/> (B-10) Trees, Brush, Briars <input type="checkbox"/> (B-11) Other _____
GOOD	<input checked="" type="checkbox"/>
ACCEPTABLE	
DEFICIENT	
POOR	
Comments: *Blacktop road with guard rails along each side.	

<b>C DOWNSTREAM SLOPE</b>	<b>PROBLEMS NOTED:</b> <input type="checkbox"/> (C-1) None <input type="checkbox"/> (C-2) Livestock Damage <input checked="" type="checkbox"/> (C-3) Erosion or Gullies <input type="checkbox"/> (C-4) Cracks with Displacement <input type="checkbox"/> (C-5) Sinkholes <input type="checkbox"/> (C-6) Appears too Steep <input type="checkbox"/> (C-7) Depression or Bulges <input type="checkbox"/> (C-8) Slide <input checked="" type="checkbox"/> (C-9) Soft Areas <input checked="" type="checkbox"/> (C-10) Trees, Brush, Briars <input type="checkbox"/> (C-11) Animal Burrows <input type="checkbox"/> (C-12) Other _____
GOOD	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	
Comments: (C-3) Along left side (North) of principal outlet. Minor erosion along left (North) contact area.	
(C-9) Along the entire length of the toe area extending upslope about 10 ft.	
(C-10) Trees and brush around outlet basin, Right (South) contact area, and Left (North) contact area.	

<b>D SEEPAGE</b>	<b>PROBLEMS NOTED:</b> <input type="checkbox"/> (D-1) None <input checked="" type="checkbox"/> (D-2) Saturated Embankment Area <input type="checkbox"/> (D-3) Seepage Exits on Embankment <input type="checkbox"/> (D-4) Seepage Exits at Point Source <input type="checkbox"/> (D-5) Seepage Area at Toe <input type="checkbox"/> (D-6) Flow Adjacent to Outlet <input checked="" type="checkbox"/> (D-7) Seepage Clear/Muddy [DRAIN OUTFALLS SEEN] <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> (D-8) Flow Clear/Muddy <input type="checkbox"/> (D-9) Dry/Obstructed <input checked="" type="checkbox"/> (D-10) Other _____
GOOD (NONE)	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	
Describe location of drains and indicate amount and quality of discharge.	
Comments: (D-2) Along toe area extending upslope about 10 ft. (D-7) Seepage, Clear, around manhole extending downslope along drawdown #1 to outlet basin. (D-10) See page #2 Additional Comments	

If following box is checked, see additional comments added to Page 2 of 4

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#### ADDITIONAL COMMENTS

\*Drawdown #1 is located on the right, downstream slope below the manhole access. Drawdown #2 is located in the center of the downstream slope.

(D-10) Recommend owner's professional engineer experienced in dam design & construction evaluate all saturated areas on downstream slope and develop a plan to properly abandon the old drawdown #1 structure that is located below the manhole access.

(G-4) Recommend removing all silt/debris from emergency spillway pipes.

(G-6) Recommend all trees/cattails within 25 feet of dam be killed with a herbicide, safe for use around fish, then cut & remove from dam. Recommend all trees 6" diameter & greater be removed under the direct supervision of owner's professional engineer experienced in dam design & construction. Once all trees are removed establish a sod forming grass and begin an annual mowing program to keep woody growth in check.

(G-8) Recommend owner's professional engineer experienced in dam design & construction evaluate the erosion & prepare plans for repair/control of the erosion for the area left (North) of the principal spillway outlet box, after the removal of the trees/brush in the outlet basin area.

(G-10) Recommend placing riprap over a filter stone bedding or geo-textile fabric in erosion area on the downstream slope along the left (North) contact area to reduce the chance of increased erosion damage.

#### AUTHORITY OF THE STATE OF INDIANA

##### I.C. 14-28 Chapter 1 "Flood Control" - Section 1 "Legislative Intent"-

Sec. 1 The following are declared.

(1) The loss of lives and property caused by floods and the damage resulting from floods is a matter of deep concern to Indiana affecting the life, health, and convenience of the people and the protection of property. To prevent and limit floods, all flood control works and structures and the alteration of natural or present watercourses of all rivers and streams in Indiana should be regulated, supervised, and coordinated in design, construction, and operation according to sound and accepted engineering practices so as to best control and minimize the extent of floods and reduce the height and violence of floods.

(2) The channels and that part of the flood plains of rivers and streams that are the floodways should not be inhabited and should be kept free and clear of interference or obstructions that will cause any undue restriction of the capacity of the floodways.

(3) The water resources of Indiana that have been diminishing should be accumulated, preserved, and protected to prevent any loss or waste beyond reasonable and necessary use.

(4) A master plan or comprehensive plan for the entire state to control floods and to accumulate, preserve, and protect the water resources should be investigated, studied, and prepared, policy and practices should be established, and the necessary works should be constructed and placed in operation.

##### I.C. 14-28 Chapter 1 "Flood Control" - Section 8 "Right of entry upon premises"-

Sec. 8 The commission and the commission's agents, engineers, surveyors, and other employees may enter upon any land or water in Indiana for the purpose of making an investigation, an examination, or a survey provided by this chapter.

#### UNAPPROVED STATUS OF DAM

A dam that has been given an unapproved status (see entry for permit) is one in which plans, construction specifications, hydraulic analyses, and geotechnical investigations have not been received and approved by the Department of Natural Resources. The Flood Control Act (IC 14-28), as amended, requires the Commission to adopt rules for the purpose of administration of the Commission's powers and duties. The Commission has adopted rule 312 IAC 10 entitled "Flood Plain Management" that requires in Rule 4 (312 IAC 10-4-1) "License requirement for construction in a floodway"

Section 1 (a) Except as otherwise provided in IC 14-28-1 or this article, a license from the department is required to erect, make, use, maintain, suffer, or permit a structure, obstruction, deposit, or excavation in or on a floodway.

If this form indicates an unapproved status, our records do not show that progress has been made to secure the required license. The fact that the dam is inspected under the Indiana Code (IC 14-27- 7.5) "Regulation of Dams" in no way alters the alleged illegal status of the structure(s). If your dam is indicated to be unapproved, it is requested that you contact the Indiana Department of Natural Resources, Division of Water, to discuss the resolution of the unapproved status of this dam.

DAMNAME Lake Deturk dam

STATE DAM I.D. 55-76

DATE 06/22/2011

<b>E</b>	<b>PRINCIPAL SPILLWAY</b>
GOOD	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	

DESCRIPTION: 30" smooth pipe with a concrete headwall. \*Concrete headwall has been repaired, and inlet area has been covered with riprap

PROBLEMS NOTED:  (E-1) None  (E-2) Deterioration  (E-3) Separation  (E-4) Cracking  (E-5) Inlet, Outlet Deficiency  (E-6) Stilling Basin Inadequacies  (E-7) Trash Rack  (E-8) Other

Comments: (E-2)&(E-4) Concrete outlet box culvert is showing deterioration, cracking, and spalling. (E-6) Trees in outlet basin, and on top of outlet box culvert. Erosion along left side of outlet box culvert

<b>F</b>	<b>AUXILIARY SPILLWAY</b>
GOOD	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	

DESCRIPTION: Cut channel left (North) of contact area with five (5) 16" CMP under access road. \* Two of the damaged inlet colars have been replaced.

PROBLEMS NOTED:  (F-1) None  (F-2) No Auxiliary Spillway Found  (F-3) Erosion with Backcutting  (F-4) Crack with Displacement  (F-5) Appears to be Structurally Inadequate  (F-6) Appears too Small  (F-7) Inadequate Freeboard  (F-8) Flow Obstructed  (F-9) Concrete Deteriorated/Undermined  (F-10) Other

Comments: (F-8) Left two pipes are partially silted in, may restrict flow.

<b>G</b>	<b>MAINTENANCE AND REPAIRS</b>
GOOD	
ACCEPTABLE	<input checked="" type="checkbox"/>
DEFICIENT	
POOR	

PROBLEMS NOTED:  (G-1) None  (G-2) Access Road Needs Maintenance  (G-3) Cattle Damage  (G-4) Spillway Obstruction  (G-5) Brush, Weeds, Tall Grass, on Upstream Slope, Crest, Downstream Slope, Toe  (G-6) Trees on Upstream Slope, Crest, Downstream Slope  (G-7) Rodent Activity on Upstream Slope, Crest, Downstream Slope, Toe  (G-8) Deteriorated Concrete-Facing, Outlet, Spillway  (G-9) Gate and/or Drawdown Need Repair  (G-10) Other

Comments: See page #2 Additional Comments

**H OVERALL CONDITIONS**

Based on this inspection and recent file review, the overall suricial condition is determined to be  (H-3) Conditionally Poor  (H-4) Poor  (H-5) Unsatisfactory  (H-1) Satisfactory  (H-2) fair

Remarks: \*Slopes of dam are well mowed. Overall condition of dam may change with the completion of the maintenance and repair items listed and talked about with the owner.

**ITEMS REQUIRING ACTION BY OWNER TO IMPROVE THE SAFETY OF THE DAM**

**MAINTENANCE-MINOR REPAIR-MONITORING**

- (\*) Provide Additional Erosion Protection; In areas where trees/brush are removed
- (2) Mow: Continue with the mowing program
- (3) Clear Trees and/or Brush From: Within 25 ft. of dam in the contact areas, and around principal spillway outlet
- (4) Initiate Rodent Control Program and Properly Backfill Existing Holes;
- (5) Repair: Left wingwall of concrete box culvert outlet.
- (6) Provide Surface Drainage For:
- (7) Monitor: Seepage along toe area and around manhole access for increased flow or change in color from clean to ruddy. Report any changes.
- (8) Other:
- (9) Other: Remove silt/debris from emergency spillway pipes

**ENGINEERING-EMPLOY AN ENGINEER EXPERIENCED IN DESIGN AND CONSTRUCTION OF DAMS TO:**

(Plans & Specifications must be approved by State prior to construction.)

- (10) Prepare Plans and Specifications for the Rehabilitation of the Dam
- (11) Prepare As-Built Drawings of:
- (12) Perform a Geotechnical Investigation to Evaluate the Stability of the Dam
- (13) Perform a Hydrologic Study to Determine Required Spillway Size:
- (14) Prepare Plans and Specifications for an Adequate Spillway:
- (15) Set up a Monitoring Program
- (16) Refer to Unapproved Status of Dam:
- (17) Develop an Emergency Action Plan:
- (18) Other: (G-8) Recommend owner's professional engineer experienced in dam design & construction evaluate the erosion & prepare plans for
- (19) Other: repair/control of the erosion for the area left (North) of the principal spillway outlet box, after the removal of the trees/brush in the outlet basin area. (D-10) See page #2 Additional Comments

Inspectors Signature

Brandon Mescall

Technician  Engineer  Geologist

Reviewed By

Owner/Owner's Representative

Date

The State of Indiana, by providing this dam inspection report, does not assume responsibility for any unsafe condition of the subject dam. The sole responsibility for the safety of this dam rests with the owner, who should perform or have performed frequent inspections of this dam.

## GUIDELINES FOR DETERMINING CONDITIONS

### CONDITIONS OBSERVED - APPLIES TO UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, CONDUIT SPILLWAY, SPILLWAY

GOOD	ACCEPTABLE	DEFICIENT	POOR
In general, this part of the structure has a good appearance, and conditions observed in this area do not appear to threaten the safety of the dam.	Although general cross-section is maintained, surfaces may be irregular, eroded, rutted, spalled, or otherwise not in new condition. Conditions in this area do not currently appear to threaten the safety of the dam.	Continued deterioration and/or unusual loading may threaten the safety of the dam.	Conditions observed in this area appear to threaten the safety of the dam. Conditions observed in this area are unacceptable.

### CONDITIONS OBSERVED - APPLIES TO SEEPAGE

GOOD (NONE)	ACCEPTABLE	DEFICIENT	POOR
No evidence of uncontrolled seepage. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions do not appear to threaten the safety of the dam.	Some seepage exists at areas other than the drain outfalls, or other designed drains. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions observed do not currently appear to threaten the safety of the dam.	Excessive seepage exists at areas other than drain outfalls and other designed drains. Seepage needs to be evaluated. Increased flow and/or continued deterioration in seepage conditions may threaten the safety of the dam.	Excessive seepage conditions observed appear to threaten the safety of the dam and is unacceptable. Examples: 1) Designed drain or seepage flows have increased without increase in reservoir level. 2) Drain or seepage flows contain sediment, i.e., muddy water or particles in jar samples. 3) Widespread seepage, concentrated seepage or ponding appears to threaten the safety of the dam.

### CONDITIONS OBSERVED - APPLIES TO MAINTENANCE AND REPAIR

GOOD	ACCEPTABLE	DEFICIENT	POOR
Dam appears to receive effective on-going maintenance and repair, and only a few minor items may need to be addressed.	Dam appears to receive maintenance, but some maintenance items need to be addressed. No major repairs are required.	Level of maintenance of the dam needs significant improvement. Major repairs may be required. Continued neglect of maintenance may threaten the safety of the dam.	Dam does not receive adequate maintenance. One or more items needing maintenance or repair has begun to threaten the safety of the dam. Level of maintenance is unacceptable.

### OVERALL CONDITIONS

<p><b>SATISFACTORY</b> - No existing or potential dam safety deficiencies recognized. Safe performance is expected under all anticipated loading conditions, including such events as infrequent hydrologic and/or seismic events.</p> <p><b>FAIR</b> - No existing dam safety deficiencies are recognized for normal loading conditions. Infrequent hydrologic and/or seismic events would probably result in a dam safety deficiency.</p>	<p><b>CONDITIONALLY POOR</b> - A potential safety deficiency is recognized for unusual loading conditions which may realistically occur during the expected life of the structure. <b>CONDITIONALLY POOR</b> may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency; further investigations and studies are necessary.</p>	<p><b>POOR</b> - A potential dam safety deficiency is clearly recognized for normal loading conditions. Immediate actions to resolve the deficiency are recommended, reservoir restrictions may be necessary until problem resolution.</p> <p><b>UNSATISFACTORY</b> - A dam safety deficiency exists for normal conditions. Immediate remedial action is required for problem resolution.</p>
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### HAZARD CLASSIFICATIONS OF DAMS

<p><b>LOW</b> - Dams located in rural or agricultural areas where failure may damage farm buildings, agricultural land, or township and country roads.</p>	<p><b>SIGNIFICANT</b> - Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways or minor railroads or cause interruption of use or service of relatively important public utilities.</p>	<p><b>HIGH</b> - Dams located where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, main highways, or railroads.</p>
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Hazard classification is defined in 312 IAC Article 10.5 "Regulation of Dams"