KLINGNER & ASSOCIATES, P.C.
Engineers • Architects • Surveyors

LITTLE SWAN LAKE - DAM INSPECTION REPORT

40.67178º, -90.52478º

June, 2018

Prepared for:

THE LITTLE SWAN LAKE SILTATION COMMITTEE

229 140th Street
Roseville, IL 61415

Prepared by:

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Project No. 18-3036

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1.0 INTRODUCTION

The Little Swan Lake Dam is located in Warren County, IL approximately five (5) miles west of Avon, in Section 20, Township 8N, Range 1W. The lake has a surface area between 225 and 230 acres and drains approximately 5600 acres of primarily pasture and row crops (National Land Cover Database, 2011). This creates a drainage area to lake surface area ratio of 25:1 (See Appendix B, Figure 1). The lake is used primarily for residential development and recreation. The Lake/Dam was built in 1968 and has been owned and maintained by the Little Swan Lake Club from its inception. The National Inventory of Dams states that the dam height, measured from top of dam to the downstream invert of the outlet structure, is 49 feet and storage volume is 5423 acre-ft. Given the lakes size, the dam is regulated by the Illinois Department of Natural Resources (IDNR), it has a National Inventory of Dams ID number (NIDID) of IL00469. As such the dam should be inspected by a licensed professional engineer on a five (5) year cycle. This inspection and inspection report is intended to fulfill that State of Illinois recommendation.

The Little Swan Lake Dam was inspected by Klingner & Associates P.C. on Monday May 14th, 2018 using the Illinois Department of Natural Resources procedures and checklists. The condition of the dam and its spillways were the focus of that inspection. This report summarizes the findings, provides a suggested course of remediation for problem areas, and prioritizes these potential issues in the urgency we recommended they be considered. Dam safety and maintenance recommendations were adopted from MoDNR's, "*Maintenance, Inspection, and Operations of Dams in Missouri, 1991*" and IDNR's *"Guidelines and Forms for Inspection of Illinois Dams"*. Select pictures highlighting a particular condition or observation can be seen in Appendix A. The pictures in their entirety will be provided to Little Swan Lake on a separate flash drive.

The dam was inspected in segments based on the unique conditions and potential issues that can arise at the different dam components. This report will discuss the conditions of each component independently. Figure 2 in Appendix B illustrates the dam components and may be a useful tool for interpreting this report.

2.0 REVIEW OF PAST INSPECTIONS & DAM HISTORY

A 2001 inspection completed by Hutchinson Engineering was reviewed and used as a basis for comparison of this report. Deficiencies noted in that report include animal damage, locations of sparse vegetative cover on upstream slope, woody growth among riprap, earthen voids around concrete, clogged toe drains, concrete deterioration, construction joint deterioration, sluice gate malfunction, and excessive vegetative growth at the dams toe. A number of these deficiencies have been remedied, such as seeding on the upstream slope, concrete repair on the principle

spillway headwall, and cutting of the excessive woody vegetation at the dams toe. These items are not listed in the body of the report and are now noted to be in good condition. The remaining items are still noted as deficient in some capacity, additional detail on these items can be found in the Sections below. It should be noted that this Little Swan Lake Inspection Report is 17 years old so it is possible that deficiencies have been fixed but have reappeared. It is recommended that the dam be inspected by a Licensed Professional Engineer on a 5 year cycle and that the dam be inspected by a Little Swan Lake Representative annually.

3.0 PERTINENT DETAILS

As inspected, the pertinent dam details are as follows:

Drainage Area	5600 Acres
Top of Dam Elevation	665.5 Feet
Normal Pool Elevation	655.5 Feet
Principal Spillway Material	Concrete
Principal Spillway Size	~15'x15' Drop Box & 30" Conduit
Emergency Spillway	Earthen Channel
Emergency Spillway Width	~80 Feet
Emergency Spillway Activation Elevation	660.0 Feet
Estimated Storage at Top of Dam	5423 Ac-ft
Surface Area at Normal Pool	225 Acres
Surface Area at Top of Dam	300 Acres
Dam Height	49 Feet
Dam Material	Earth Embankment
Dam Length	958 Feet
Dam Top Width	10 Feet
Upstream Side Slopes	6H:1V
Downstream Side Slopes	5H:1V

4.0 INSPECTION RESULTS

4.1 Crest

4.1.1 Description of Problem Areas/ Deficiencies

The dam top is approximately 10 feet wide. The dam crest is well maintained and covered with thick, well vegetated, grass. The crest shows no signs of settlement, misalignment, rutting, or cracking. The Crest can be seen in Figure A.1

4.1.2 Corrective Actions

No corrective actions on the dam crest are currently recommended. The crest can, and should be kept up using Little Swan Lakes current maintenance/mowing methods and schedule (minimum mowing of twice per year). The crest should be monitored no less than annually for any signs of deteriorating conditions including cracks, sloughs, or depressions.

4.2 Upstream Slope

4.2.1 Description of Problem Areas/ Deficiencies

The upstream slope has riprap intermittently lining the upstream face of the dam along its entire length. Rip rap extends approximately 20 feet up the slope (Fig. A.2). The erosion protection and the fact that the dam is oriented in the north-south direction, out of the prevailing wind, has saved the upstream face from erosion, wave wash, and beaching. In general, the upstream slopes are consistent (6H:1V). The upstream rip rap protection is in good general condition and is protecting the upstream slope as designed.

The upstream slope is well vegetated with tall grasses and some woody vegetation up to 4 inches in diameter (Fig A.3). Woody vegetation create large root systems that can create preferential seepage paths through the dam. The root wads can also cause holes in the dam upon their removal and/or upheaval during a storm event.

Evidence of burrowing animals were found on the upstream slope. Animal burrows can create flow paths for seep water, and if an extensive network of burrows exists, over a long period of time they can lead to dam failure (Fig. A.4).

For the most part, trash and debris were not located on upstream slope. The only debris found was a spare tire (Fig A.5). A large accumulation of trash and debris could affect dam performance by damaging spillways or clogging the trash rack. However, the small amount that was observed is not of significant concern.

4.2.2 Corrective Actions

Trees and woody vegetation should be removed. Stumps can be removed either by pulling or grinding. All woody material should be removed to about 6 inches below the ground surface. The cavity should be filled with well-compacted soil and grass vegetation should be established. If the stumps cannot be removed, they should be cut flush and chemically treated to prevent further growth. Chemical treatment should be done with care in order to avoid an environmental impact to the lake. Some cutting and treating of stumps has occurred (Fig A.6) as part of the dams regular maintenance, corrective action may include increasing the frequency of this tree/ woody vegetation removal.

Animal burrows should be eliminated by mud packing or equivalent method. Mud packing is accomplished by placing a vertical pipe over the burrow entrance and pouring a mud pack mixture (such as bentonite). Once full, remove the pipe and tamp the entrance. Vegetation should be established over the burrow hole once it is filled. The rodent population should be controlled near the dam to limit the possibility of future burrowing. Review the current Illinois hunting and trapping laws before taking animal control action.

Trash and debris should be removed from the upstream slope as part of the Lakes regular maintenance program. It is likely that this process is already being completed by the Lake, in which case no action is required.

4.3 Downstream Slope

4.3.1 Description of Problem Areas/ Deficiencies

The downstream slope has a strong stand of grassy vegetation and is well mowed and maintained (Fig A.7). No woody or undesirable vegetation was found. The downstream slope is consistent, measured at approximately, 5H:1V. There is a drainage swale south of the emergency spillway at the toe of the dam on the west side. This area was found to have a significant area of soft, wet, spongy soil. In which case the swale is either not draining properly, or there is a seepage issue (Fig A.8). Some animal burrows were also found on the downstream slope, although not as prevalent as on the upstream side (Fig A.9).

No significant cracks, settlements, or bulges were found upon inspection of the downstream slope.

4.3.2 Corrective Actions

Although no plans or design information on the dam or lake were available, it seems that the dam has a pervious blanket and toe drain. The drain is intended to collect seep water from the dam and allow it to drain to the openings on the wing walls in a controlled manner (Fig A.10). These drains should be inspected and if necessary cleaned, repaired, or replaced. It should be noted that the drains were flowing very little water at the time of the inspection, which may be an indicator of plugged drains. If after maintenance to the toe drain, the area remains soft and

spongy, the area worsens, boils appear, or noticeably “dirty” water is seen flowing into this area (i.e. piping) contact IDNR and a licensed professional engineer immediately.

As with the upstream slope, animal burrows should be eliminated by mud packing or equivalent method.

4.4 Principal Spillway

The principal spillway inlet is made up of an approximate 15’x15’ foot wide concrete drop structure that flows into a single concrete culvert (Fig. A.11). The spillway entrance has a concrete headwall (Fig. A.12) and a concrete platform on top. The platform houses the electric gate valve mechanism, with which the Lake is able to control the water levels. The gate valve can be automatically operated from the Little Swan Lake Club House. The gate and its appurtenances were recently replaced (2015) and the knowledge of the operators they have had no negative experiences with its controls since its installation (see Section 4.7). To the knowledge of the Lake Club no design documents or reports are available for the dam thus the design capacity of the principal spillway is unknown. However, the operator believes that the principal spillway handles most of the water. This is somewhat confirmed by the Dams Spillway Operation Guide which states the lake can be lowered 8” to 10” in 24 hours when the gate is in the fully open position. The emergency spillway is only activated on rare occasions (every 20 to 30 years). The principal spillway has a trashrack made up of fifteen (15) welded steel poles. It appears the rack is an after construction addition. At the time of the inspection the rack was clear and free of debris, the poles have begun to corrode, however they still appear to be structurally sound (Fig A.13). The principal spillway discharge consists of a concrete spillway, concrete chute, and concrete wingwalls (Fig A.14). The chute discharges into a riprapped stilling basin (Fig A.15) before entering the discharge channel.

4.4.1 Description of Problem Areas/ Deficiencies

4.4.1.1 Entrance

The entrance to the principal spillway drop structure was significantly weathered and deteriorating, scaling, pitting and surface cracks were observed, as well as, major erosion of the inlets upstream face (Fig A.16). At the time of this inspection there was very little water flowing from the lake over the drop box, however the gate valve was partially open therefore allowing some water through the spillway. Only a surface level inspection was performed. Access and lake discharge conditions did not allow safe entrance into the drop structure.

4.4.1.2 Concrete Headwall

The concrete headwall showed some surface cracks and pitting. However, the top of the wall seems to have been repaired relatively recently and is holding up well (Fig. A.17). There were no signs of exposed rebar or any signs of significant structural deficiencies such as wide structure cracks (greater than 1 in) or misalignment of the wall.

4.4.1.3 Concrete Pipe

The principal spillway conduit is a concrete pipe. The size was unable to be verified in the field or with As-Built drawings. Due to access, safety, and lake discharge the pipe could not be inspected.

4.4.1.4 Principal Spillway Discharge

The principal spillway has a formed concrete chute discharge that flows into a rip rapped stilling basin. The chute has vertical concrete walls which then flare into concrete wingwalls (Fig. A.18). The chute and walls show signs of minor deterioration such as surface cracks and pitting (Fig. A.19). No structural concerns were observed such as large structural cracks (greater than 1 in), exposed rebar, misaligned walls, etc. The stilling basin seems to be operating as intended (Fig A. 20). There were no signs of excess scour in the basin or in the downstream channel. Rip rap showed little displacement. There was a significant amount of woody debris that has grown up around the concrete walls and chain link fence (Fig. A. 21) and some depressions were noted behind the concrete walls (Fig. A. 22).

4.4.2 Corrective Actions

The entrance/drop box should be monitored to track the rate of the deteriorating concrete. The Lake may wish to consider setting aside funds for a future rehab project of the drop inlet. The drop shaft should be inspected with equipment/personnel capable of safely accessing the structure.

Monitor the concrete headwall for structural deficiencies and to ensure surface cracks do not widen.

The concrete principal spillway pipe could not be accessed due to its size and discharge conditions. It is recommended that the pipe be inspected via remote operated vehicle (ROV) or CCTV. Depending on the condition of the pipes in that inspection, the Lake should consider inspecting the pipe on a regular basis.

The spillway discharge should be monitored for structural deficiencies and to ensure cracks do not widen. Woody debris around the concrete walls should be removed to about six (6) inches below the ground surface and the cavity filled in with well-compacted soil and grass vegetation established. If the stumps cannot be removed, they should be cut flush and chemically treated. Care should be taken in the chemical treatment in order to not have an environmental impact on the downstream channel. Voids behind the concrete walls should be filled, compacted, and vegetation established. Voids may be due to improper function of the seepage collection and toe drain. Further inspection and maintenance of the toe drain is recommended. If voids reoccur IDNR or a licenses professional engineer should be consulted.

4.5 Discharge Channel

4.5.1 Description of Problem Areas/ Deficiencies

The channel downstream of the principal spillway is approximately 60 feet wide at its top, it is well vegetated and shows little to no signs of erosion (Fig A.23). Based on the condition of the channel it seems that the principal spillway discharge structure does a sufficient job of dissipating energy prior to entering the channel. A slide was noted approximately 30 feet south of the 30th Avenue Bridge and 250 feet north of the dam (Fig A.24). Flowing water could be seen at the bottom of the slide. There is a drainage swale along the road immediately upstream of the slide and it is not clear whether the discharge is due to the saturated conditions of the swale or from the seepage of the dam. If it is seepage from the dam this may be of significant concern and is a sign that the seepage collection system is not operating correctly. Given the other observed seepage indicators, it is likely this is due to dam seepage.

The discharge channel flows beneath the 30th Street Bridge approximately 280 feet from the toe of the dam. No scour of the bridge abutments were observed.

The channel was primarily clear and free of debris.

4.5.2 Corrective Actions

The seepage collection system and toe drains at the downstream base of the dam should be inspected and flushed then, if necessary, repaired or replaced. The inspection report should be provided to a licensed professional engineering for review. The slide should be filled, well-compacted, and vegetation re-established. If the slide reoccurs or additional slides are observed there may be a significant seepage issue beyond that of the toe drains. If this occurs contact IDNR and a licensed professional engineer immediately.

4.6 Emergency Spillway

4.6.1 Description of Problem Areas/ Deficiencies

The Little Swan Lake Emergency Spillway consists of an 80 foot wide earthen channel, located on the dams west side (Fig A.25). The spillway is lined with rip rap at its inlet (Fig A.26). The rip rap is well maintained and there are no signs of wave wash or erosion on the inlet to the emergency spillway. Docks have been erected at the entrance to the spillway, which are each tied to boats (Fig A.27). These docks and boats could be a major obstruction during activation of the emergency spillway. The spillway itself has a well-established stand of grassy vegetation, it is well mowed and well-maintained. There were no signed of debris or unwanted structures within the spillway. However, a trench was observed near the top the emergency spillway which may cause irregular flow patterns during activation, this could lead to future erosion of the spillway (Fig A. 28).

4.6.2 Corrective Actions

Docks and boats should be removed from the spillway entrance. During a large storm event owners may be unable to remove boats and docks which would lead to them flowing through and blocking or damaging the spillway.

Unless there is a structural or hydraulic reason for the trench, it should be filled, compacted, and vegetation re-established.

4.7 Mechanical Equipment

4.7.1 Description of Problem Areas/ Deficiencies

There is a gate valve on the principal spillway used regularly to maintain the lakes desired level and discharge (Fig A.29). The gate and sill could not be inspected due to access and safety issues however, in conversations with Little Swan Lake Representatives and review of the past 2001 inspection report, some issues were uncovered.

The valve is well exercised, the operator stated that it is opened and closed every 2 to 3 months. The mechanism which operates the valve has been recently replaced and can be operated automatically from the Little Swan Lake Club House. According to Little Swan Lake the mechanism works well, and there have been no issues since its installation. The Sluice Gate itself does require some additional inspection and repair/replacement. The gate does not close entirely and has been noted to have issues since at least 2001. To date the Lake has been able to operate relatively efficiently with the broken gate, however if complete failure were to occur it could be detrimental to the dam and those living around the Lake.

4.7.2 Corrective Actions

Along with the principal spillway conduit inspection noted in 4.4.1.3, the sluice gate and sill should be inspected and the inspection report provided to a licensed professional engineering for review. Based on the results of that inspection, the sluice gate/sill should be repaired and/or replaced.

5.0 PRIORTIZATION LIST

In general the dam is in adequate condition, with the possible exception of a seepage issue. The dam has some additional minor maintenance issues that should be addressed before they become a more serious concern. The corrective actions below are separated into three categories, with priority one being the items that may cause the greatest risk of dam failure, and priority three being the items that may cause the least risk of dam failure. This list is meant to give Little Swan Lake an idea of the severity of these issues. It may not be practical, or

economically feasible to correct the dam issues in the order listed below. Consult a professional engineer and competent contractor before beginning any major remediation or modification project.

1) Priority One

a) Toe Drains should be further inspected and flushed, then repaired and replaced, if necessary. The inspection report should be provided to a licensed professional engineer for review prior to any rehab project. Multiple red flags related to seepage/drainage were observed during the inspection including: soft, spongy soils at the dam toe, voids behind the concrete discharge structure, little discharge through the toe drain discharge, and the slide and flowing water discovered near the bridge. No “dirty” water (piping) was observed flowing from these seep areas which means there was no observed movement of dam foundation materials. However, should uncontrolled seepage continue it could easily lead to piping, an extremely dangerous condition which can lead to dam failure. If maintenance to the toe drains do not eliminate seepage concerns, further action will be necessary.

b) Repair voids and slides possibly caused by the seepage issue by filling, compacting, and vegetating. If voids and slides re-occur contact IDNR and a licensed professional engineer.

c) Inspect principal spillway conduit, drop box, and gate/sill using an ROV, CCTV and/or other safety conscious method. Provide the inspection report to a licensed professional engineer and repair/replace gate/sill based on the results of that inspection.

2) Priority Two

a) Animal burrows should be eliminated by mud packing or like process. Attempt to control the rodent population along the dam.

b) Remove woody vegetation from upstream slope and around the principle spillway discharge structure. Stumps should be dug out at least 6-inches and voids filled and compacted. Or stumps should be cut flush and chemically treated.

c) Remove docks and boats from the entrance of the emergency spillway.

d) Investigate the reason behind the trench in the emergency spillway. If the trench is not a hydraulic or structural part of the spillway it should be filled, compacted, and vegetated.

3) Priority Three

a) Monitor deteriorating concrete on the principle spillway and appurtenances and budget for a future rehabilitation project.

b) We advise an Operations and Maintenance Plan and Emergency Action Plan be developed.
c) Remove trash and debris from the upstream slope.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The Little Swan Lake Dam was inspected by Klingner and Associates on May 14th, 2018. The purpose of this inspection was to document potential issues with the dam and develop a recommended course of remediation. Currently the dam is in adequate condition with no signs of issues that could cause immediate failure, although the potential seepage issue and broken sluice gate should be investigated as soon as possible. To ensure that dam is able to operate safely in the future, the remediation steps listed in this report should be undertaken. Since dam repairs can be an expensive, this report has prioritized the action items. These items should be completed as funding becomes available or be added to the regular maintenance activities. A competent professional engineer with experience in dam construction and maintenance should be consulted before beginning any major rehabilitation project. For further information regarding dam safety please refer to the:

Illinois Department of Natural Resources
https://www.dnr.illinois.gov/WaterResources/Pages/DamSafetyProgram.aspx

Missouri Department of Natural Resources
(http://www.dnr.mo.gov/env/wrc/damsft/damsfthp.htm)

U.S Army Corps of Engineers
(http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx)

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APPENDIX A
SAMPLE PHOTOGRAPHS

Description	Dam Crest – Well maintained, no signs of settlement, misalignment, rutting, or cracking.	**A.1**
Location	40°40’18.76”, 90°31’27.29”	

Description	Typical rip rap coverage on upstream slope. Rip rap is heavily vegetated and currently holding the slope well.	**A.2**
Location	40°40’17.67”, 90°31’22.29”	

Description	Woody vegetation on upstream slope. Some trees reached approximately 4” in diameter.	**A.3**
Location	40°40’18.54”, 90°31’30.34”	

Description	Typical animal burrow on the upstream slope of the dam.	**A.4**
Location	40°40’18.28”, 90°31’27.89”	

Description	Debris on upstream slope of dam.	**A.5**
Location	40°40’18.54”, 90°31’33.27”	

Description	Past maintenance of trees on upstream slope	**A.6**
Location	40°40’18.65”, 90°31’30.53”	

Description	Typical view of the downstream slope. Slope is well vegetated and maintained.	**A.7**
Location	40°40’18.48”, 90°31’21.00”	

Description	Soft, wet, spongy soils at the toe of the dam on the west side. Likely a sign of seepage.	**A.8**
Location	40°40’20.58”, 90°31’29.73”	

Description	Typical animal burrow on downstream slope.	**A.9**
Location	40°40’20.55”, 90°31’30.06”	

Description	Toe drain outlets, currently flowing very little water. This could be a sign of blocked outlets.	**A.10**
Location	40°40’21.22”, 90°31’28.22”	

Description	View of concrete drop box. Taken from the top of the gate valve platform.	**A.11**
Location	40°40’18.21”, 90°31’29.40”	

Description	Concrete headwall behind the concrete drop box. Top of wall has recently been repaired.	**A.12**
Location	40°40’18.27”, 90°31’29.29”	

Description	Trash Rack, made up of welded steel poles. Some minor corrosion but poles appear structurally sound.	**A.13**
Location	40°40’18.20”, 90°31’29.35”	

Description	Principle Spillway Discharge Structure.	**A.14**
Location	40°40’21.14”, 90°31’28.17”	

Description	Discharge channel stilling basin.	**A.15**
Location	40°40’21.17”, 90°31’27.45”	

Description	Weathering of the principle spillway entrance.	**A.16**
Location	40°40’18.21”, 90°31’29.40”	

Description	Surface cracks on the concrete headwall.	**A.17**
Location	40°40’18.27”, 90°31’29.29”	

Description	Vertical concrete walls at spillway discharge.	**A.18**
Location	40°40’20.62”, 90°31’28.52”	

Description	Surface cracks on concrete walls of the discharge structure.	**A.19**
Location	40°40’21.29”, 90°31’28.22”	

Description	Discharge of the stilling basin and stilling basin rip rap.	**A.20**
Location	40°40’21.14”, 90°31’28.22”	

Description	Woody debris surrounding concrete walls around discharge structure.	**A.21**
Location	40°40’21.17”, 90°31’27.45”	

Description	Depression on the east side of the concrete walls surrounding the discharge structure.	**A.22**
Location	40°40’20.81”, 90°31’28.28”	

Description	Typical view of the dam discharge channel.	**A.23**
Location	40°40’23.27”, 90°31’27.31”	

Description	Slide south of the 30th street bridge. Water flowing from the bottom of the slide was noted.	**A.24**
Location	40°40’22.98”, 90°31’27.09”	

Description	Typical view of the emergency spillway.	**A.25**
Location	40°40’19.45”, 90°31’34.15”	

Description	Rip rap lining the entrance to the emergency spillway.	**A.26**
Location	40°40’17.21”, 90°31’33.16”	

Description	Docks and boats parked within the entrance of the emergency spillway.	**A.27**
Location	40°40’17.75”, 90°31’33.66”	

Description	Trench spanning the length of the emergency spillway.	**A.28**
Location	40°40’18.46”, 90°31’34.40”	

Description	Gate valve mechanism.	**A.29**
Location	40°40’18.28”, 90°31’29.35”	

Description		
Location		

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APPENDIX B
MAPS

Figure 1. Little Swan Lake Watershed

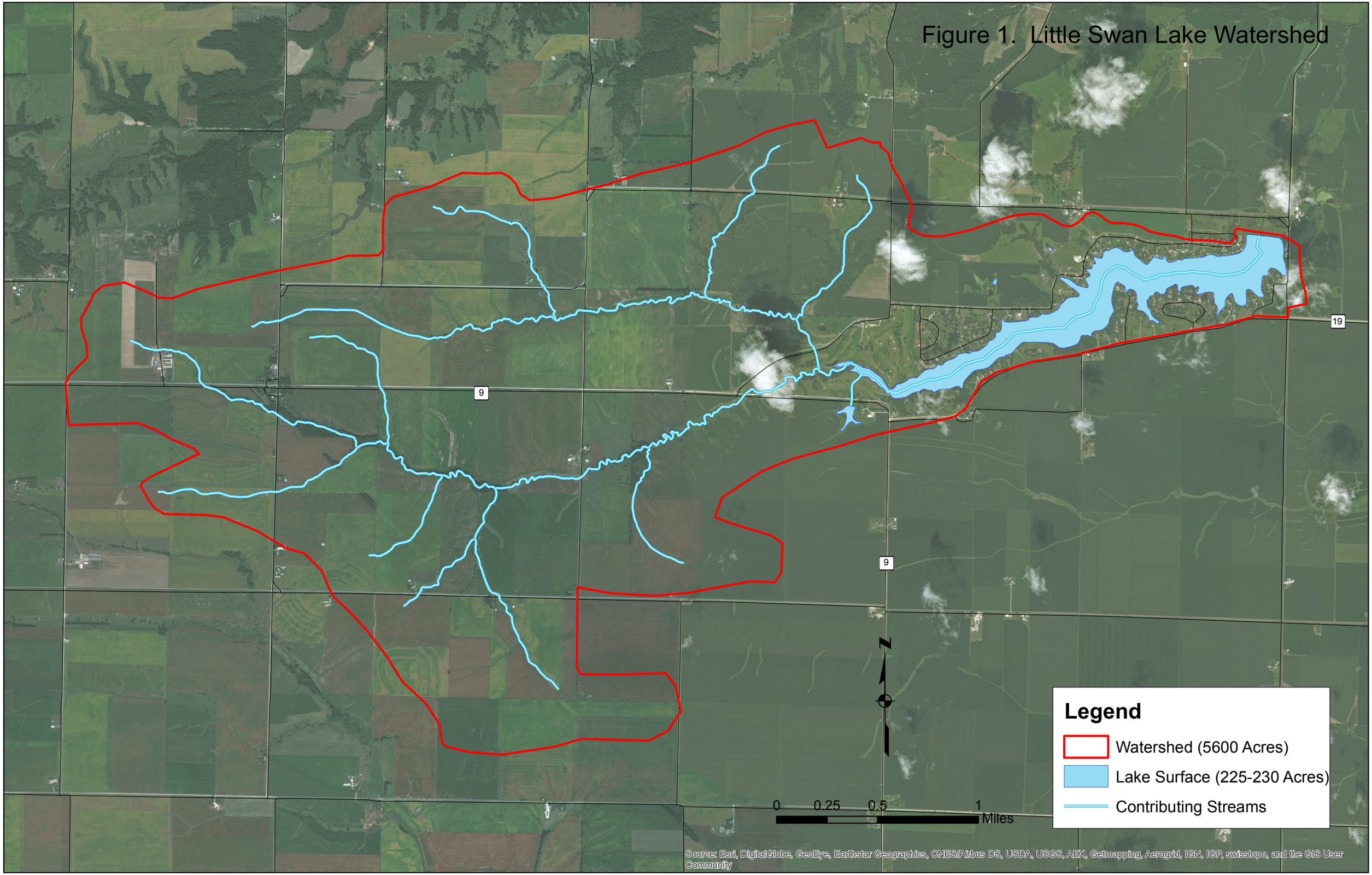


Figure 2. Little Swan Lake Dam and Appurtenances

0 50 100 200 Feet

N

30th Avenue

DISCHARGE CHANNEL

EMERGENCY SPILLWAY

OUTLET STRUCTURE

DAM CENTERLINE

PRINCIPLE SPILLWAY

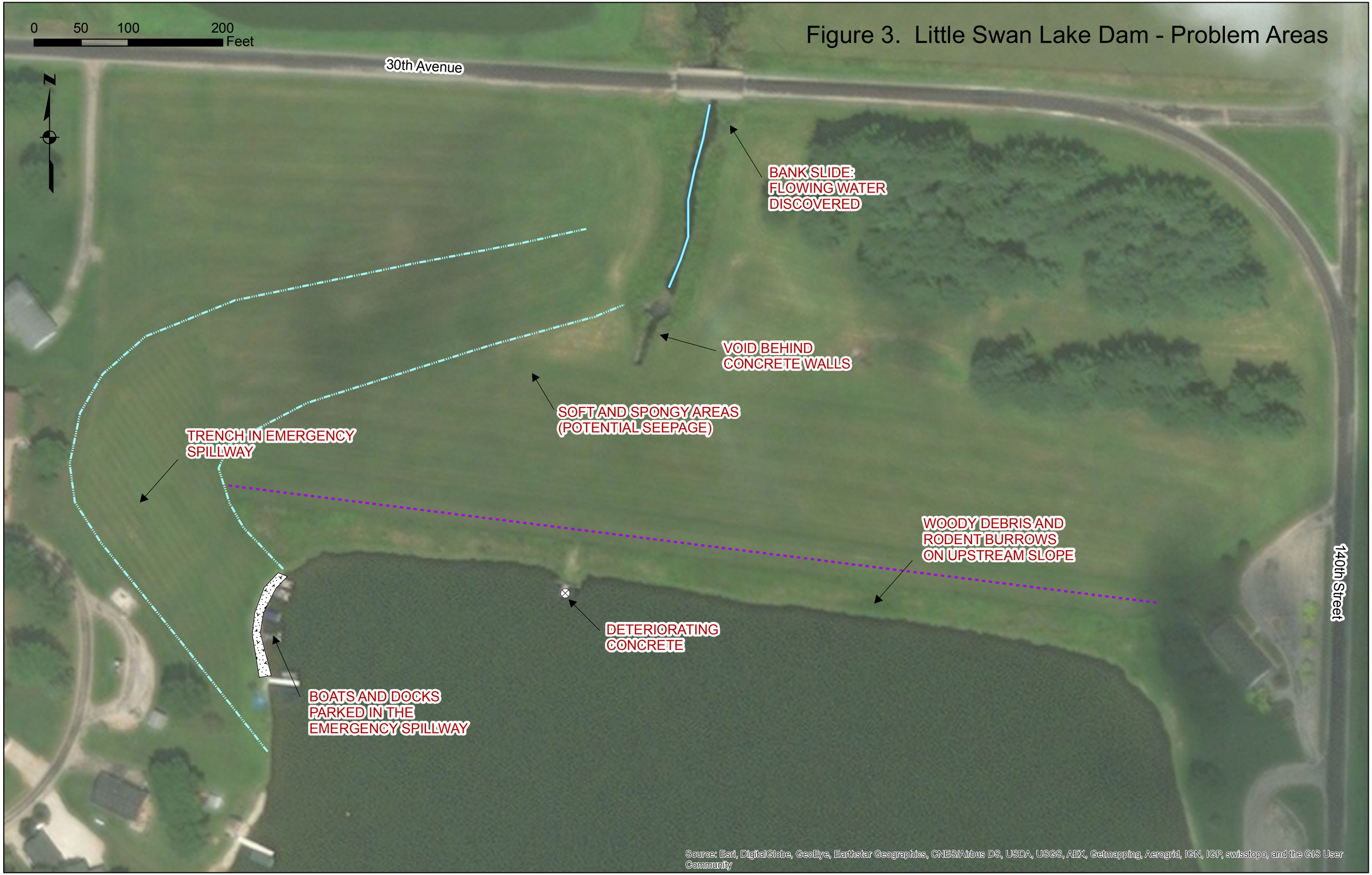
GATE VALVE

EMERGENCY SPILLWAY ENTRANCE (RIPRAP)

140th Street

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 3. Little Swan Lake Dam - Problem Areas



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APPENDIX C
INSPECTION CHECKLIST

Dam Inspection Report

Name of Dam: Little Swan Lake Dam Dam ID No.: IL 00469

Permit Number: NA Class of Dam: NA

Location: 40.6718, -90.5247 Section: 20 Township: 8N Range: 1w

Owner: Little Swan Lake Club (Name) 309-678-7216 (Telephone Number (Day))

229 140th Street (Street) (Telephone Number (Night))

Roseville, IL (City) 61415 (Zip Code) County: Warren

Type of Dam: Earth

Type of Spillway: Concrete Drop Inlet

Date(s) Inspected: NA

Weather When Inspected: Warm, Mix of Clouds and Sun

Temperature When Inspected: 77-86°F

Pool Elevation When Inspected:

Tailwater Elevation When Inspected:

Inspection Personnel:

Name	Title
William E. Klingner	P.E., CFM

Professional Engineer's Seal

The Department of Nautural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected - list the reason for non-inspection under deficiencies

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE		
Vertical and Horizontal Alignment of Crest	NE		
Unusual Movement or Cracking At or Beyond Toe	NE		
Sloughing or Erosion of Embankment and Abutment Slopes	NE		
Upstream Face Slope Protection	GC	Rip Rap on upstream face is in place. Some woody vegetation is growing between rocks. But no wave wash or beaching was noted.	
Seepage	MM, OB	Some sofy, spongy areas were noted at the toe of the dam west of the principal spillway outlet. The weather has been dry, so soft areas may be due to dam seepage and underperforming filter.	
Filter and Filter Drains	MM, OB	As noted above, soft spongy areas at the toe of the dam may be due to an underperforming filter blanket and corresponding drains. No plans of the dam are available so this should be investigated further.	Monitor seepy areas and clean/replace non-operating filter drains if this area remains soft and spongy over a period of time.

EARTH EMBANKMENT

(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	MM	Small animal burrows were noted.	As part of a regular maintenance plan, burrows should be filled and packed with benotonite Animal burrows can cause preferential seepage paths.
Embankment Drainage Ditches	NA		
Vegetative Cover	MM	The dam had a strong stand of grassy vegetation. The dam is well maintained and mowed regularly. However, woody vegetation should be removed	Woody vegetation should be removed as part of the regular maintance plan and their stumps treated to prevent re-growth. Some cutting of this vegetation has occurred, but the owner should consider completing this task on a more regular basis.
Other (Name)			
Other			
Other			
Other			

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage			
Structure to Abutment/ Embankment Junctions			
Water Passages			
Foundation			
Surface Cracks in Concrete Surfaces			
Structural Cracking			
Vertical and Horizontal Alignment			

CONCRETE OR MASONRY DAMS

(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints			
Contruction Joints			
Spalling of Concrete			
Filters, Drains, etc.			
Riprap			
Other (Name)			

IF THE DAM IS GATED - Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)			
Other			
Other			
Other			

PRINCIPAL SPILLWAY

X Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	MM, OB	Significant spalling and erosion of the concrete along the upstream face of the concrete drop inlet were noted.	It is reccomended that the District begin to budget for repair of the principal spillway inlet. The concrete is likely the age of the dam (50 years) and is showing signs of significant deterioration. As the primary means releasing water, it is important that the drop inlet remain in good repair.
Structure to Embankment Junction	IN		
Drains	IN		
Seepage Around or Into Structure	IN		
Surface Cracks	MM, OB	A large number of surface cracks were noted on the drop inlet and headwall. None were observed to be greater than 0.25"	Observe and measure surface cracks on a regular basis. If cracks begin to widen, or rebar becomes exposed concrete should be repaired as soon as possible.
Structural Cracks	NE	No large structure cracks were noted. However access to the structure was limited.	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

X Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	MM	Minor cracks and spalling were noted. The top of the headwall has been repaired in recent years and seems to be holding up.	
Construction Joints	GC	The observed joints seemed to be in good condition given the age. However, due to access restrictions not all joints could be viewed.	
Filter and Filter Drains	MM	While no plans were available, it is likely the dam contains a filter blanket and drains. It seems these drains may be plugged.	Inspect and flush drains. If during inspection it is found that the drains are broken contact a professional engineer and/or IDNR and repair.
Trash Racks	GC, OB	The trash rack seems to be an addition made post original dam construction. No debris was noted within the rack. However some minor corrision seems to have occurred. Corrsion has not yet led to any structural defects of note.	Monitor trash rack. Repair/Replace bars as deteriotation occurs.
Bridge and Piers	NA		
Differential Settlement	NE		
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

X Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	IN	Due to access and confined space issues, the conduit could not be inspected. However, due to its age and construction being the same of the drop inlet, we would expect the conduit to be in similar condition.	Conduit should be inspected using a CCTV and/or ROV equipment. This applies to the remaining items on this page.
Joint Separation	IN		
Seepage Around of Into Conduit	IN		
Surface Cracks	IN		
Structural Cracks	IN		
Trash Racks	NA		
Differential Settlement	IN		
Alignment	IN		
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

(Continued)

X Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	MM, OB	Minor pitting and erosion of the concrete was noted	Observe concrete to make sure its condition does not worsen
Structure to Embankment Junction	MM, OB	Minor concrete deterioration, voids were observed behind the wingwalls	Observe concrete to make sure the condition does not worsen. Fill and compact voids behind the walls. If voids reappear, the owner should consider futher investigation.
Construction Joints	MM, OB	Minor deterioration	Observe joints to make sure their condition does not worsen
Expansion and Contraction Joints	NA		
Differential Settlement	NE	No observable movement of the discharge structure was noted	
Surface Cracks	MM	Minor cracks less than 0.25" were noted.	Observe cracks. If they widen or rebar becomes visible, repair immediately.
Structural Cracks	NE	No large cracks or exposed repair was noted.	
Wall Alignment	GC	Walls seem to be in good position with no obervable shifting.	
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

☐ Principal Spillway ☐ Dewatering ☐ Other: Gate Valve

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	IN	Access to the Gate was not available.	This should be inspected along with the principal spillway conduit
Gate Seals	IN	Access to the Gate was not available.	This should be inspected along with the principal spillway conduit
Gate and Frame	IN	Access to the Gate was not available.	This should be inspected along with the principal spillway conduit
Operating Machinery	MM	The gate does not shut completely but stem seemed to be in good working condition. Operator states they have had no issues of note.	This should be inspected along with the principal spillway conduit
Emergency Operating Machinery	NA		
Other (Name)			
Other			

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Joint Separation			
Seepage Around or Into Conduit			
Intake Structure			
Outlet Structure			
Outlet Channel			
Riprap			
Other (Name)			
Other			

ENERGY DISSIPATOR

X Principal Spillway ☐ Outlet Works

Type: _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Structure to Embankment Junction			
Construction Joints			
Surface Cracks			
Structural Cracks			
Differential Alignment			
Expansion and Contraction Joints			

ENERGY DISSIPATOR

(Continued)

X Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	GC	Riprap was in place with little displacement or deterioration noted.	
Outlet Channel	OB	Outlet channel was well maintained with little erosion of the banks noted. One slough away from the dam, near the bridge was observed. Water was running out the bottom.	The slough should be repaired and observed. This could be an indication of seepage.
Debris	NE	No significant debris was observed.	
Other (Name)			
Other			
Other			
Other			

EMERGENCY SPILLWAY

X Earth

Other: Name _____

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NE		
Weeds, Logs, Other Obstructions	NE		
Side Slope Sloughing	NE		
Vegetation	GC	A thick stand of well maintained grass was located in the spillway.	
Sedimentation	NE		
Riprap	GC	Riprap on the upstream face of the spillway showed little signs of deterioration or displacement	
Settlement of Crest	NE		
Downstream Channel	GC	Downstream channel was well maintained.	
Other (Name)			

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION 5/14/2018

DATE OF LAST INSPECTION Unknown

THIS SHOULD BE FILLED OUT FOR SUBSEQUENT INSPECTIONS.

1. EARTH EMBANKMENT DAMS

2. CONCRETE MASONRY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

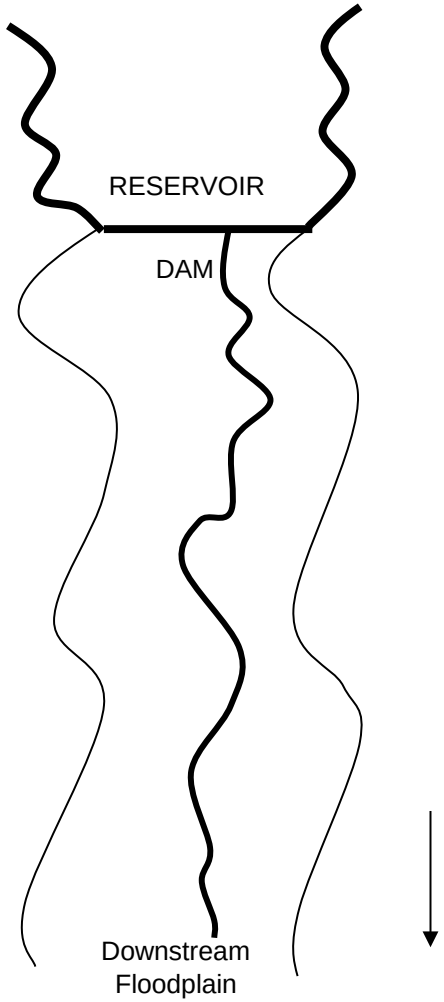
5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT

APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.1 MILES

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss of Life Potential			Economic Loss Potential		
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name	OTHER DEVELOPMENT (Name	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED
0 to 1/4								X					X			X		
1/4 to 1/2																		
1/2 to 3/4																		
3/4 to 1																		
1 to 1-1/4																		
1-1/4 to 1-1/2																		
1-1/2 to 1-3/4																		
1-3/4 to 2																		
OVER 2																		

SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.