

STATE OF MICHIGAN



JOHN ENGLER, Governor

**DEPARTMENT OF ENVIRONMENTAL QUALITY**

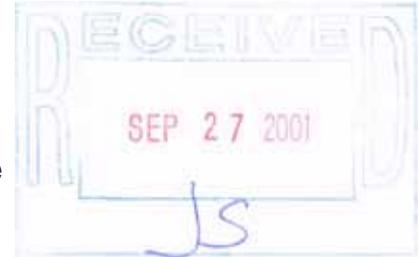
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HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: [www.deq.state.mi.us](http://www.deq.state.mi.us)

**RUSSELL J. HARDING**, Director

September 21, 2001



Mr. Joseph Sawyer, Manager City of Corunna 402 North Shiawassee Street Corunna, Michigan 48817

Dear Mr. Sawyer:

The enclosed Dam Safety Inspection Report for the Corunna Dam, Dam ID 379, Shiawassee County, was prepared by Mr. Paul T. Wessel, P.E., Dam Safety Program, Land and Water Management Division, Department of Environmental Quality (DEQ). The visual inspection and report were completed, at your request, under Section 31518(4) of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

This inspection report is based upon a site inspection conducted August 8, 2001. Since the time of the inspection, the City has been issued Permit 01-78-0003 to draw down the impoundment to facilitate a more detailed evaluation of the condition of the dam. This inspection was conducted on September 7, 2001. Observations from the follow-up inspection confirm the findings of the August 8, 2001 inspection.

The dam is in poor overall condition. The concrete continues to deteriorate, and there is a significant amount of flow passing through voids in the spillway. A detailed engineering evaluation of the structure should be conducted as soon as possible. A copy of this report should be provided to this office.

The dam should remain drawn down until recommended repairs are made. This may require an extension of your draw down permit, which expires December 31, 2001. Repairs or modification to the dam will also require a permit under Part 315.

If you have any questions, please feel free to contact Mr. Wessel at 517-335-6748, or you may contact me.

Sincerely,

A handwritten signature in cursive script that reads "Croskey".

Hope Croskey, P.E., Chief  
Water Management Section  
Land and Water Management Division  
517-335-3174

Enclosure

cc: Mr. Tim Crawford Corunna DPW  
Mr. Paul Wessel, P.E., DEQ

**DAM SAFETY INSPECTION REPORT**

**CORUNNA DAM  
DAM ID 379**

**SHIAWASSEE RIVER  
SHIAWASSEE COUNTY  
SE 1/4 Section 21, T7N, R3E**

**OWNER/OPERATOR:** City of Corunna  
402 North Shiawassee Street  
Corunna, Michigan 48817  
989-743-3650

**HAZARD POTENTIAL  
CLASSIFICATION:** Significant August 8,

**INSPECTION DATE:** 2001 September 19,

**REPORT DATE:**

**PREPARED AND INSPECTED BY:**



2001

Paul T. Wessel, P.E.  
Dam Safety Program  
Land and Water Management Division  
Department of Environmental Quality  
P.O. Box 30458  
Lansing, Michigan 48909  
517-335-6748



## **INTRODUCTION**

The purpose of this inspection is to evaluate the structural condition and hydraulic capacity of this dam as required by Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The report is limited to a discussion of observations based on a visual investigation and review of any previous inspection reports, plans, and data, which are available. This report should not be considered an in-depth engineering investigation.

All references to "right" and "left" in this report are based on the observer facing downstream.

## **CONCLUSIONS AND RECOMMENDATIONS**

The Corunna Dam is in poor condition. A significant amount of flow is flowing through and under the dam. The potential for internal erosion of the dam is present at the more concentrated areas of flow. A more detailed evaluation of the seepage flow passing through and under the dam should be conducted as soon as possible. The dam is submerged by the design flood. No measures to increase spillway capacity are required. The following recommended actions are listed by priority.

1. Conduct an in-depth engineering evaluation of the condition and stability of the dam by March 1, 2002.
2. Remove debris from the upstream side of the spillway by November 1, 2001.
3. Review and update the Emergency Action Plan (EAP) by December 31, 2001, providing a copy to the Dam Safety Program.
4. Prepare an Operation and Maintenance (O&M) Plan by March 31, 2002, providing a copy to the Dam Safety Program.

The significant hazard potential rating for this dam remains appropriate.

## **PROJECT INFORMATION**

The Corunna Dam was constructed in the mid 1800's to provide power for a mill. The impoundment is currently maintained to provide recreational opportunities for area residents. The City of Corunna has assumed responsibility for the operation and maintenance of the dam. The dam consists of a 200 foot wide overflow spillway with a 25 foot wide stoplog bay section located adjacent to the right abutment. The dam has a structural height of 10 feet, a normal head of 7 feet, and creates an impoundment with an estimated surface area of 17 acres.

The Corunna Dam was originally constructed as a timber crib. Concrete was later used to fill in the voids in the timber crib and to surface the dam.

## **SITE INVESTIGATION**

The following discussion of the physical condition of the dam and appurtenances is based on observations and photographs obtained on the date of this inspection.

The structural condition of the right abutment wall, seen in Photograph 1, is poor. The voids observed in the 1997 inspection and seen in Photographs 2 through 4, are still evident. It does not appear to have significantly increased since the 1997 inspection. Water is still flowing out of this void. The remainder of the mill concrete is also in generally poor condition, as seen in Photographs 3 through 6. If the dam is to be retained, repairs to the concrete in this area should be completed.

As seen in Photographs 2 and 5, leakage is evident at the stoplog bays. This leakage is primarily occurring at the interface between the stoplogs and the concrete walls, and for the most part, is not passing through the stoplogs. The stoplogs have been removed to accommodate a more detailed engineering evaluation being conducted by a consultant. The condition of the stoplogs should be reviewed, and if necessary, the stoplogs should be replaced.

The principal spillway, pictured in Photographs 7 and 8, consists of a concrete capped timber crib overflow spillway. Due to low water conditions on the date of the inspection, a more detailed inspection of the spillway was possible than on the previous inspection.

The upstream spillway approach is concrete, and extends from 5 to 20 feet back into the impoundment. As seen in Photograph 9, some debris had collected on the right portion of the spillway adjacent to the stoplog bays. This debris should be removed from the spillway face by November 1, 2001. Several small intermittent whirlpools were observed just upstream of the spillway approach. The whirlpools are evidence that water is passing through or under the spillway.

The spillway crest, seen in Photographs 9 and 10, is generally uniform, although the left portion of the crest is in poorer condition than the remainder of the crest. A rectangular opening, seen in Photograph 11, was reportedly built to provide fish passage. Several other unintentional holes and cracks were seen on the embankment crest, as seen in Photographs 11 through 13. Water was observed entering several of these holes. The largest of these voids is seen in Photograph 13. A look inside the void reveals the timber crib construction of the dam, as documented by Photograph 14. Significant deterioration is also evident on the left portion of the crest, as seen in Photographs 15 and 16.

The spillway face is also concrete capped. Several voids and areas of cracking were observed along the face and at the toe of the dam, as seen in Photographs 17 through 24. One large void, seen in Photographs 20 through 22, was observed just to the right

of the deflection point of the spillway. A significant amount of flow was observed passing through the dam at this location. The void was probed and extends approximately eight feet in from the face of the dam. A significant amount of flow was also passing under the left portion of the spillway. The water emerged at the void on the upstream portion of the downstream apron seen in Photograph 25.

### **STRUCTURAL STABILITY**

The concrete spillway is in poor condition, with numerous cracks and voids. Flow passing through and under the dam does raise concern over the potential for a piping failure to occur. However, there was no evidence of any active internal erosion. A further study into the extent of seepage paths through the dam and the structural condition of the dam is warranted. The City of Corunna has received a permit to drawdown the impoundment to facilitate the further investigation in the dam's overall condition.

### **HYDROLOGY AND HYDRAULICS**

The contributing drainage area to the Shiawassee River at the dam is approximately 507 square miles. The design discharge for this dam is the 0.5 percent chance (200-year) flood discharge of 6800 cubic feet per second. The entire dam will act as an overflow spillway under the design flood and will pass this flood with approximately five feet of flow over the dam. Therefore, the dam has adequate capacity to pass the design flood.

### **OPERATION AND MAINTENANCE**

A written O&M Plan, outlining procedures for upkeep and operation of the dam, should be prepared for this dam and periodically be reviewed and updated to reflect changes in operation and maintenance procedures.

### **EMERGENCY ACTION PLAN**

The Corunna Dam is a significant hazard potential dam. Therefore, an EAP is required. This office has received a copy of the EAP, dated January 26, 2001. A letter requesting minor modifications to the plan has been sent out separately, requesting a modified copy by December 31, 2001.

### **APPENDICES**

A location map and inspection photographs are attached.