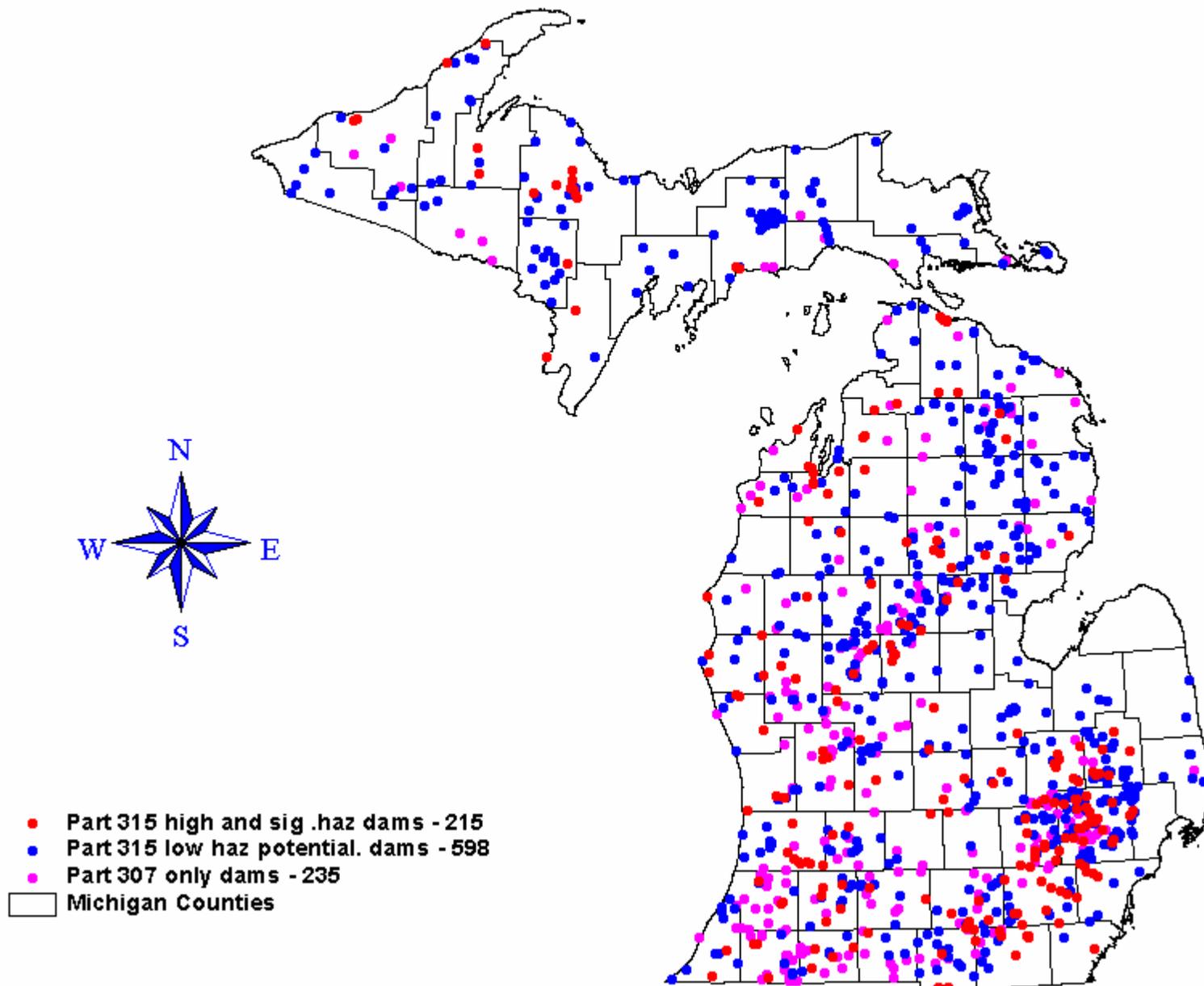


A photograph of a dam with water cascading over its spillway. The dam has a metal walkway with railings on top. In the background, there are green trees and a brick house with a red roof. The foreground shows a rocky stream bed.

Michigan's Dam Safety Program Successes and Challenges

Byron Lane, P.E.
Dam Safety Program

State Regulated Dams



The purpose of the Dam Safety Program is to protect the public from dam failures.



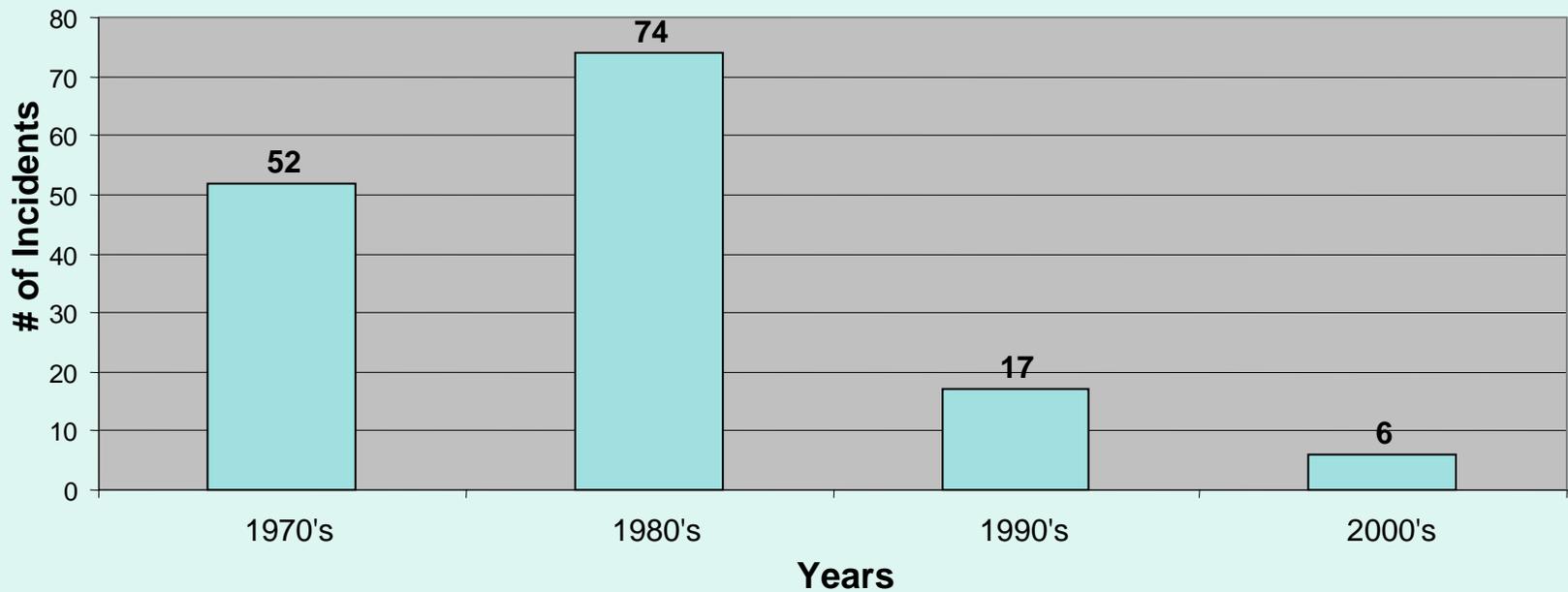
Tourist Park Dam, Marquette





Since the Dam Safety Statute was passed in 1990, dam failures have greatly decreased.

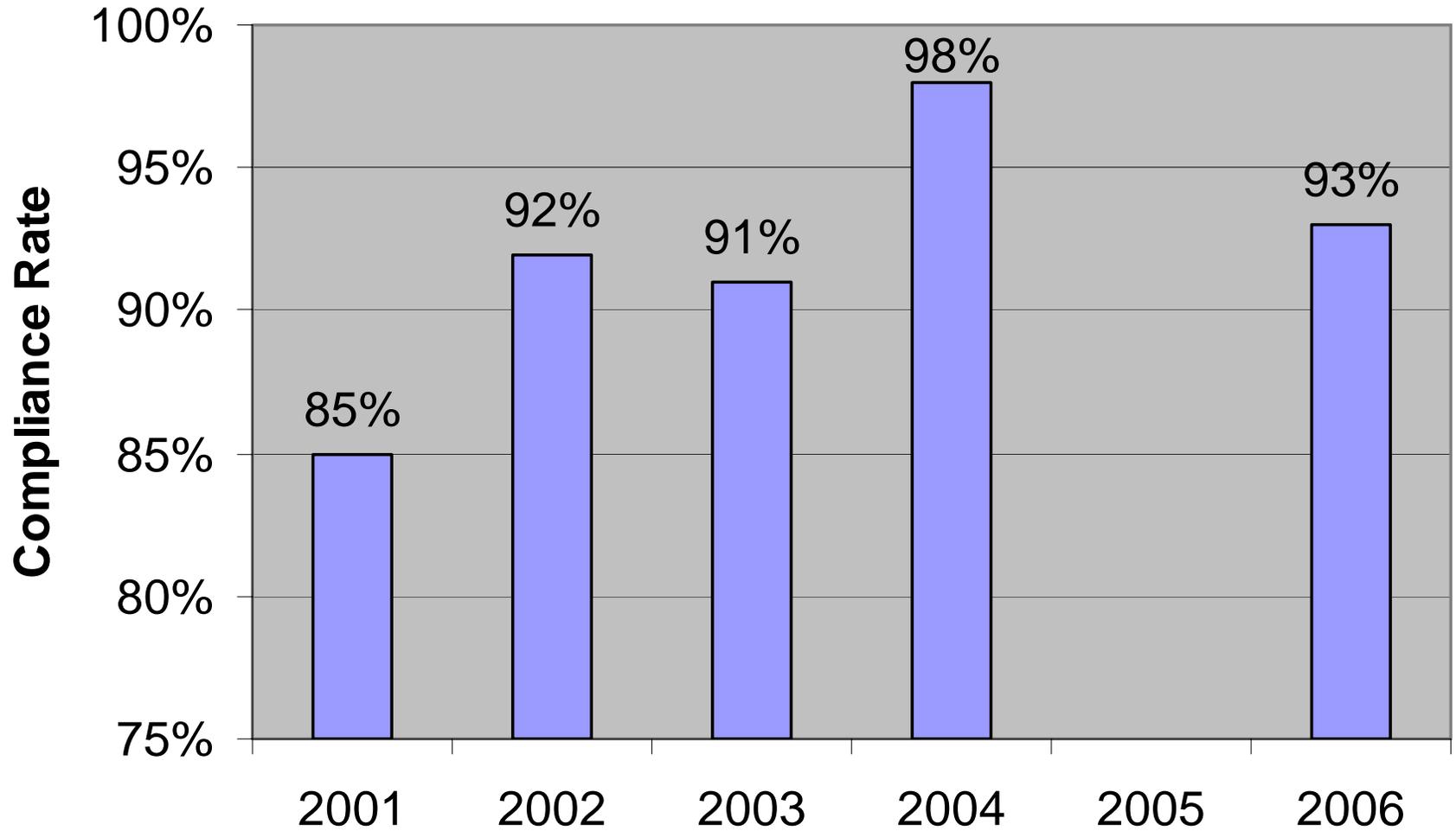
Michigan Dam Failures



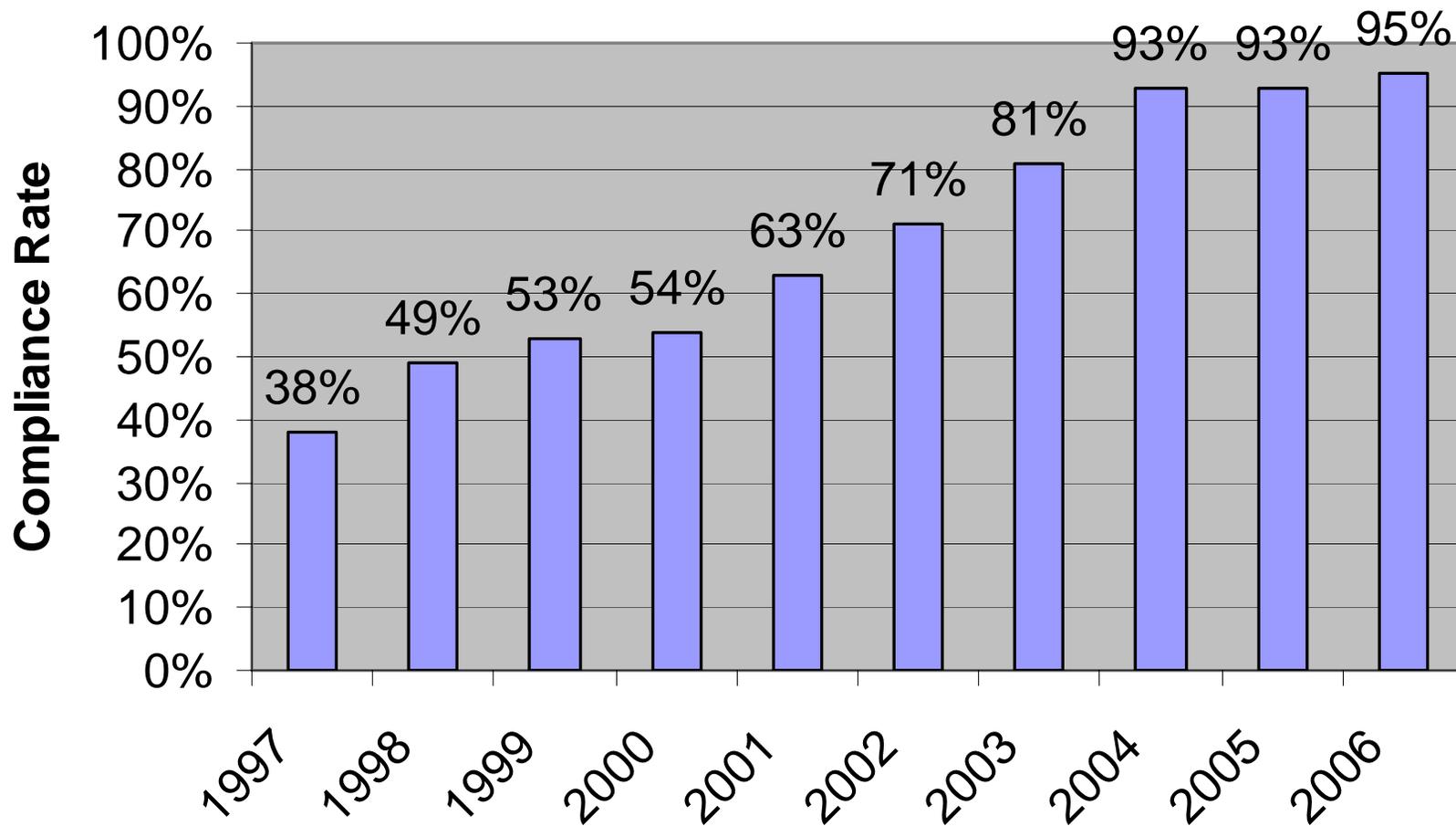
Part 315 Requirements

- Permits for Dam Construction Related Activities.
- Periodic Dam Inspections
- Correction of Dam Deficiencies
- Emergency Action Plans

Significant & High Hazard Dam Inspections



Emergency Action Plans Approved



Addressing Problem Dams

“A major issue remains unaddressed. The lack of funding for dam repair or removal has resulted in a number of seriously degraded dams. This is part of a nationwide problem.”

Policies And Measures That Can Be Taken
To Address Degrading Dams In Michigan,
MDEQ, 2004



DAMS

Since 1998, the number of unsafe dams has risen by 33% to more than 3,500. While federally owned dams are in good condition, and there have been modest gains in repair, the number of dams identified as unsafe is increasing at a faster rate than those being repaired. \$10.1 billion is needed over the next 12 years to address all critical non-federal dams—dams which pose a direct risk to human life should they fail.

D

Background

Dams provide tremendous benefits, including water supply for drinking, irrigation and industrial uses; flood control; hydroelectric power; recreation; and navigation. However, dams also represent one of the greatest risks to public safety, local and regional economies and the environment. Historically, some of the largest disasters in the United States have resulted from dam failures. In 1889, 2,209 lives were lost when the South Fork Dam failed above Johnstown, Pennsylvania. The 1928 St. Francis Dam failure killed 450. During the 1970s, the failures of the Buffalo Creek Dam in West Virginia, Teton Dam in Idaho and the Toccoa Falls Dam in Georgia collectively cost 175 lives and more than \$1 billion in losses. Such dam failures as Silver Lake Dam in Michigan in 2003 (\$100 million in damages and economic losses of \$1 million per day) and the Big Bay Lake Dam in Mississippi in March 2004 (100 homes destroyed) are current reminders of the potential consequences of unsafe dams.



“Concerns about bridge reliability pushed the state of the country's infrastructure into the political arena yesterday, as **Senate Majority Leader Harry M. Reid (D-Nev.)** called the **Minneapolis bridge collapse a "wake-up call."**

"We have all over the country crumbling infrastructure -- highways, bridges, dams -- and we really need to take a hard look at this," Reid said in a television interview.”

Washington Post, August 3, 2007







DEPARTMENT OF UTILITIES



Donald J. Williamson
Mayor

G. Robert Carlyon
Utilities Superintendent

Mary Ellen Cromwell, Acting Chief
Land and Water Management Division
Constitution Hall
525 West Allegan Street
P.O. Box 30458
Lansing, MI 48909-7958

September 21, 2004

Dear Mary Ellen,

The City of Flint has received the correspondence dated August 20, 2004, regarding the condition of Hamilton Dam and the determination that the dam poses a threat of failure. As we are all aware, there is a significant body of documentation supporting this condition of the structure. The City of Flint has been actively attempting to secure funding for the replacement of the structure for a number of years. The following narrative will detail our efforts to date and list the options.

“The City of Flint has been actively attempting to secure funding for the replacement of the structure for a number of years. The following narrative will detail our efforts to date and list the options.”

- U.S. Army Corps of Engineers
- FEMA Hazard Mitigation Grant Funding
- Drinking Water Revolving Fund Low Interest Loan
- Increase of Customer Water Rates

“The City of Flint is officially in a **state of Financial Emergency**. The most viable options listed above are the grant funding programs. We are diligently working with the stakeholder and our government officials to secure the grant funding options.”

“In terms of submitting a schedule for the replacement, **it is premature for the City to produce such a document.**”



Boardman Dam Draw-down

2007

**Boardman Pond Property Owners
565 Boardman View Drive
Traverse City, MI 49686
Phone: 231-946-5434 / Fax: 231-946-5444**

May 3, 2007

Mr. Steven Chester, Director
Michigan Department of Environmental Quality
P.O. Box 30473
Lansing, MI 48909-7973

Re: Emergency Draw Down of Boardman Pond and
File #06-28-68-P for Permanent Draw Down

Via Facsimile: 517-241-7401

Dear Director Chester:

I am writing you today on behalf of all property owners and citizens of standing and interest on and around the Boardman Pond (also referred to as the Keystone Pond), which is the backwater of the Boardman Dam, on the Boardman River, just south of Traverse City, in Garfield and Blair Townships of Grand Traverse County. I will attempt to be brief and concise in my comments, so that you can have a grasp of the situation and that actions can be initiated to prevent further damage.

A brief history: On or about March 14, 2007, a leak was discovered in the Boardman Dam and an emergency was declared, thus prompting Grand Traverse County and Traverse City Light and Power (TCLP) to initiate an immediate three (3) foot draw down of the Boardman Pond. As it turns out, this was nothing more than an old pipe, which

Jennifer M. Granholm
Governor of
The Great State of Michigan
&
Steven E. Chester
Director MDEQ

June 18, 2007

Dear Governor and Director Chester:

Subject: MDEQ file No. 06-28-0068-P Boardman Dam Draw Down by Grand Traverse County and Traverse City Light and Power.

Today 4000 cars and trucks will cross the Dam at Cass & Keystone. No County Road Commission Engineers have declared the Structure unsafe. No Engineering Company has declared the Dam to be unsafe and in danger of collapse or failure. The Dam may have merely fallen out of specification and rule in the event of a 200 year flood event. The record clearly shows that the Dam is safe enough.

Concerned property owners have filed an administrative appeal through the Office of Administrative Hearing. Other property owners are attempting to file a temporary Court injunction to stop the draw down until the administrative appeal can be heard.

Administrative Law Judge Richard A. Patterson has recommended that the aggrieved Keystone pond property owners attempt to work informally with the MDEQ to identify and possible find solutions or resolution before continuing with a costly APA Hearing.

The property owners are requesting under authority granted to the State of Michigan in

STATE OF MICHIGAN
STATE OFFICE OF ADMINISTRATIVE HEARINGS AND RULES

Dave Hamilton
Bygon Lake
File
Boardman 4/15/07
Grand Traverse Co.
10512

In the matter of

File No.: 06-28-0068-P

Edwin Martel et al on the permit issued
to Traverse City Light and Power

Part: 301, Inland Lakes and Streams

Agency: Department of Environmental
Quality

Case Type: Land and Water Management
Division

RECEIVED

JUN 15 2007

ENVIRONMENTAL QUALITY
LAND & WATER MANAGEMENT

Issued and entered
this 12th day of June, 2007
by Richard A. Patterson
Administrative Law Judge

RECEIVED

JUN 15 2007

ENVIRONMENTAL QUALITY
LAND & WATER MANAGEMENT DIV.

NOTICE OF OPENING NEW FILE

**STATE OF MICHIGAN
COUNTY OF GRAND TRAVERSE
IN THE THIRTEENTH CIRCUIT COURT**

**EDWIN MARTEL, BRUCE CARPENTER,
CRAIG PODDIG, CLAUDIA AGEMAK,
and WILLIAM LANE,
Plaintiffs**

Case No. 07-26015-CE
Hon.

v

**GRAND TRAVERSE COUNTY,
CITY OF TRAVERSE CITY,
and TRAVERSE CITY LIGHT &
POWER BOARD,
Defendants**

Robert Kaufman (P26719)

FUDEQ
FRENCH-UNIVERSITY
DISTRICT OF
ENVIRONMENTAL QUALITY

**NO
FISHING**







- Cost for repair or removal is estimated to be from \$300,000 to \$1 million.
- Stanton Township population is 1268 per the 2000 census.
- The Township's total annual budget is approximately \$120,000.

U.S. Rep. Bart Stupak, D-Menominee, said there's nothing the federal government can do to help the Township, because the problem was diagnosed by the Michigan DEQ.

"It's a state problem," he said.

State Sen. Mike Prusi, D-Ishpeming, observed the state of Michigan is in a budget crisis and, likewise, can do little.

"It's tough when the state is broke," he said.

Mining Gazette, 3/22/2004



The Growing Crisis of Aging Dams: Policy Considerations and Recommendations for Michigan Policy Makers

March 2007

Prepared for

The Michigan Municipal League Foundation
Ann Arbor, Michigan

Prepared by

Public Sector Consultants
Lansing, Michigan
www.pscinc.com

and

Prein&Newhof
Grand Rapids, Michigan
www.preinnewhof.com

On behalf of the



Key Recommendations

- Create a dedicated state funding program for dam rehabilitation and dam removal in Michigan. This fund should include consideration of direct grants in addition to the capitalization of a low interest loan program.

“Lawmakers shy away from a gas tax increase. It certainly wouldn’t be popular with a lot of motorists. **But the only positive to come from a disaster like the I-35W bridge collapse in Minneapolis may be creating a public will to invest in our bridges and roads.**”

Editorial
Crain’s Detroit Business, August 6, 2007

Key Recommendations

- Create a dedicated state funding program for dam rehabilitation and dam removal in Michigan. This fund should include consideration of direct grants in addition to the capitalization of a low interest loan program.
- Explore new and expanded public/private partnerships with nonprofit organizations to help maximize distribution of information and leverage resources for river restoration and dam removal.

Dam Removal

- Most dams in Michigan were built decades ago and many have deteriorated due to age, erosion, poor maintenance, flood damage, and poor designs.
- Many aging dams are no longer economically practical or cost-effective to operate.
- Dam removal restores the natural flowing character of a stream and restores essential ecological processes in the river.
- Dam removal is often less expensive than dam repair and continued operation.

Voluntary Dam Removal Pilot Project

May 12, 2004

Prepared by
Dam Safety Program
Water Management Section
Geological and Land Management Division
Byron Lane, P.E., Chief
James Pawloski, P.E.
James Hayes, P.E.
Paul Wessel, P.E.

- Michigan.gov Home**
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- al Coordination Unit
- life Action Plan
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Department of Natural Resources

Michigan.gov
The Official State
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Printer Friendly Text Version Email Page A- A+ Text Size

Overview

- [History of Michigan's Dams](#)
Dams have been built and rebuilt across Michigan to meet a variety of needs that reflect the evolution of the State's economy and society over the decades.
- [Dams in Michigan](#)
Maps of Michigan dams.
- [Environmental Impacts of Dams](#)
Protection and restoration of river environments is essential for sustainable, diverse, and productive stream fisheries. Over the last two decades, fisheries managers and ecologists have explored the changes dams cause in the ecological processes of river environments.
- [Regulation of Dams](#)

Great Lakes, Great Times, Great Outdoors

- [Dam Removal Guidelines for Owners](#)
The purpose of this guidance document is to suggest issues that may need to be considered when deciding the future of a dam, and to assist in implementing a dam removal project.
- [Dam Removal](#)
Most dams in Michigan were built decades ago and many have deteriorated due to age, erosion, poor maintenance, flood damage, and poor designs. Those dams that no longer make sense, that stand in disrepair, or are not removed are at significant risk of failure, particularly during high flow events.

Dams Removed in MI

- [Big Rapids Dam](#)
- [Stronach Dam](#)

Funding Sources

- [Grant Sources](#)
- [Paying for Dam Removal](#)

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DNR Stories and Photos





Announcements



E-mail - In an effort to reduce mailing and handling costs, and to improve our ability to quickly disseminate dam safety information to you, we ask that you provide us with the e-mail address for the primary contact person for the dam. This can be most easily done by sending an e-mail note to egej@michigan.gov providing the name of the primary contact and the ID number of the dam.



Dam Removal – The removal of unneeded dams is becoming increasingly popular around the country and around Michigan. Many of Michigan's 2500 dams have outlived their usefulness and have become costly maintenance headaches for their owners. If you are interested in looking into the possibility of removing your dam, visit our website at www.michigan.gov/deqdamsafety or the Department of Natural Resources' website at www.michigan.gov/dnrdams for helpful information on dam removal and a listing of possible funding sources.

Byron Lane, P.E., Chief
Dam Safety Program
Michigan Department of Environmental Quality
laneb@michigan.gov
517-241-9862

Succeeding with a Dam Removal Project

November 5-7, 2007
East Lansing, Michigan

Benefits for:

- ✓ Design engineers and planners
- ✓ Biologists
- ✓ Regulatory review professionals
- ✓ Dam owners
- ✓ Contractors/contracting service personnel
- ✓ Public sector professionals



THE UNIVERSITY
of
WISCONSIN
MADISON

Department of Engineering Professional Development
432 North Lake Street Madison, Wisconsin 53706

Printed on recycled paper.



Succeeding with a Dam Removal Project

November 5-7, 2007
East Lansing, Michigan

- Identify key decision points
- Implement practical, efficient dam removal approaches
- Know how to maximize environmental endpoints
- Understand engineering, sediment management and water quality issues

By invitation of and in cooperation with:

American Rivers

Michigan Water Environment Association

Michigan Chapter of the American Fisheries Society

Michigan Association of Conservation Districts

Michigan Department of Environmental Quality

Michigan Council of Trout Unlimited

Sediment Testing And Removal Incident to Dam Removals

Chris Antieau

LWMD Sediment Coordinator

Issue Summary

Contaminated sediments from sources such as point source discharges, aerial deposition and the transport of eroded sediment can accumulate behind dams. Dam removal projects often require the characterization and removal of contaminated sediment and may also result in the exposure of residual contamination after the dam removal.

LWMD's Role

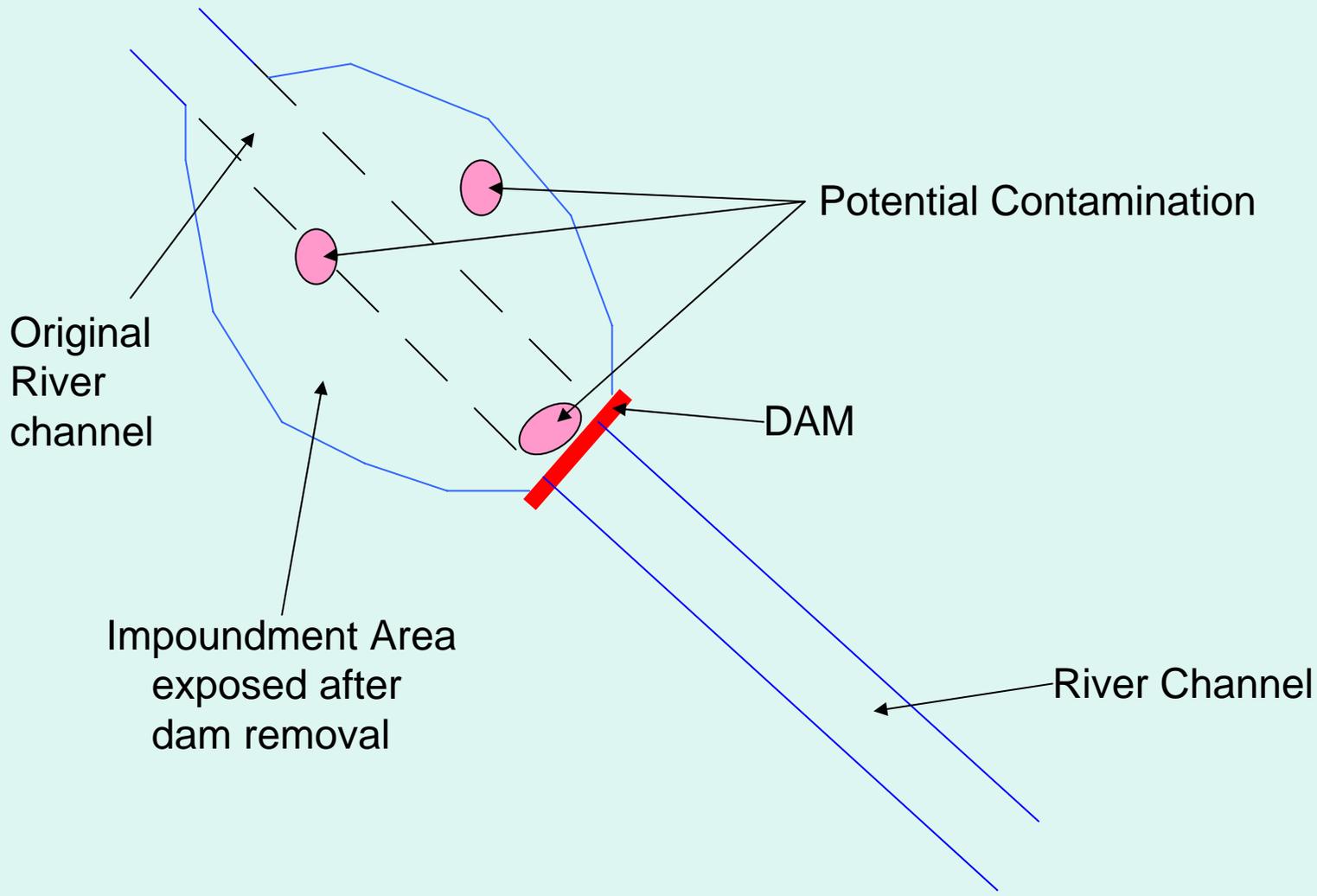
LWMD issues permits to perform construction projects on or in surface water bodies, however several key concerns with potential sediment contamination remain outside LWMD's expertise and authority and must be addressed before permits can be issued. Different aspects of the characterization and removal of contaminated sediment fall under the jurisdiction of the Remediation & Redevelopment Division (RRD), Water Bureau (WB) and Waste & Hazardous Materials Division (WHMD).

The Outcome

This multi-divisional review approach caused a significant increase in processing times for these projects; but also leads to a far more environmentally protective decision making process than LWMD could have completed independently; protecting the health and safety of Michigan's citizens and benefiting Michigan's public trust waters and other natural resources.

LWMD's typical dredging program follows WHMD protocols. This does not typically work well for dam removal projects because:

- The WHMD testing is designed to characterize dredged materials for disposal as either solid or hazardous waste, not to define the nature and extent of contamination.
- In many cases contaminated material is not proposed to be removed, but may be exposed by the river resuming its original channel following a dam removal.



Potential Contamination

Original River channel

DAM

Impoundment Area exposed after dam removal

River Channel

Dam removal projects fall under the following jurisdictions:

- Permitting dam removal and construction projects in or on inland lakes and streams—LWMD, pursuant to Parts 301, Inland Lakes and Streams and Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994, PA 451, as amended (NREPA). and the federal Clean Water Act.
- Characterization and disposal of dredged sediments--WHMD, pursuant to Parts 111, Hazardous Waste Management; or 115, Solid Waste Management, of the NREPA.
- Residual contamination not covered by a permit issued under another part of the NREPA--RRD, pursuant to Part 201, Environmental Remediation, of the NREPA.
- Surface water discharge permits for dredged sediment dewatering and protecting surface water quality during the dam removal and dredging—WB, pursuant to Part 31, Water Resources Protection, of the NREPA and the federal Clean Water Act.

Different DEQ Divisions and Bureaus are reviewing the potential project area using different criteria following the various statutes:

- WHMD--Type B criteria established by the former Michigan Environmental Response Act, 1982 PA 307, as amended.
- RRD--Soil criteria for the direct contact, ambient and particulate air inhalation, protection of the groundwater/surface water interface (GSI) and protection of groundwater drinking water exposure pathways, pursuant to Parts 201 of the NREPA.
- WB--Water Quality Standards, pursuant to Part 4 of the administrative rules promulgated under Part 31, of the NREPA; and the McDonald screening criteria to determine when toxicity testing is needed for designated uses for the protection of aquatic life.

The various programs require different amounts and types of sediment sampling to meet their objectives:

- WHMD, waste characterization--6 samples, composited over the entire depth of the dredging project;
- RRD, determining the nature and extent of contamination and verification of remediation--varied quantity samples collected from discrete depth intervals and locations, depending on the size of the area being evaluated;
- WB, surface water protection--site specific, but includes pre-project testing, water quality monitoring during dredging, and post-project verification sampling.

Disposal of contaminated sediment is no less complex.

The amount of contamination, site history and other factors will help determine which division will take the lead for contamination review.

There are differing locations available for disposal depending on which division is the lead

- WHMD allows for onsite disposal with a 'restrictive covenant' placed on the property deed.
- RRD does not typically allow this option without financial surety, annual inspections and restrictions in Part 201 prohibiting the relocation of contaminated soil at a facility regulated under Part 201. Contaminated material placed under a permit from another division is exempt from being a facility under Part 201.

Overall, this process poses significant challenges but appears to be moving in the right direction.

- DEQ is close to issuing its first dam removal permit that involves significant contamination in a manner that is consistent with department guidelines for environmental protection and for health and human safety.
- If successful, this process will likely function as the model for future dam removal projects where contaminated sediment is a concern.