



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF THE DIRECTOR
235 Promenade Street, Room 425
Providence, Rhode Island 02908

June 14, 2017

The Honorable Gina Raimondo
Governor, State of Rhode Island
Executive Chambers
State House
Providence, RI 02903

Dear Governor Raimondo,

I am pleased to submit the Department of Environmental Management's (DEM) 2016 Dam Safety Annual Report, as required by Chapter 46-19 of the Rhode Island General Laws. Under this Chapter, "*DEM is responsible for causing dams to be inspected to determine their condition, reviewing and approving plans for construction or substantial alteration of a dam and ordering repairs or other action to address unsafe conditions.*"

I would like to take this opportunity to highlight several important ongoing projects.

DEM's primary focus continues to be addressing unsafe high hazard and unsafe significant hazard dams. Last year, DEM removed seven out of fifty-three unsafe dams from the list, and issued formal and informal actions to the owners to address unsafe conditions.

DEM identified, notified, and formally registered owners of high hazard and significant hazard dams. DEM has also completed dam inspections and awarded an engineering contract using funds from a Federal Emergency Management Agency grant.

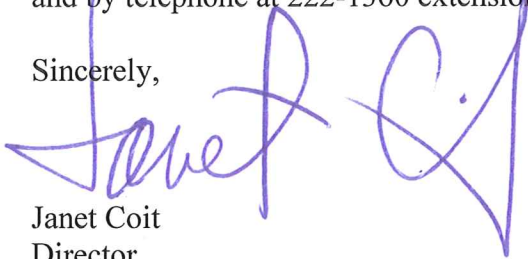
In 2006, legislation was enacted requiring the preparation of emergency action plans (EAPs) for all high hazard and significant hazard dams. An EAP is a formal document that identifies potential emergency conditions at a dam and specified pre-planned actions, including notification and evacuation information, to be followed to minimize loss of life. The law mandated that the EAP be prepared by the city or town in which the dam lies, or in the case of a state owned dam, by the agency that owns it. To date, DEM has identified 96 high hazard and 81 significant hazard dams. A deadline of July 1, 2008 was established for submission of the EAPs to the Rhode Island Emergency Management Agency (RIEMA).

Progress on finalizing EAPs has been slower than expected. RIEMA developed an EAP template which was presented to cities and towns at a workshop in January 2008. DEM participated in the workshop and provided the cities and towns with the dam failure inundation maps that are necessary to complete an EAP. Through 2016, RIEMA has approved a total of about 46 EAPs. The approved EAPs include those for the 14 DEM-owned dams. Work in this area continues.

I also want to bring to your attention the section of the report entitled "Program Limitations." This section discusses the need to identify dam owners, address orphan dams, bring dams up to current engineering standards and improve emergency coordination/response between State and local officials to address the more severe storms we are expected to receive as a result of our changing climate.

I hope you find this report informative and welcome the opportunity to answer any questions you may have regarding dam safety. DEM's lead staff on this issue, David Chopy is available to provide information and address questions. David can be reached at david.chopy@dem.ri.gov and by telephone at 222-1360 extension 7400.

Sincerely,



Janet Coit
Director

Cc: The Honorable Nicholas A. Mattiello, Speaker of the House
The Honorable K. Joseph Shekarchi, House Majority Leader
The Honorable Patricia L. Morgan, House Minority Leader
The Honorable Dominick J. Ruggiero, Senate President
The Honorable Michael J. McCaffrey, Senate Majority Leader
The Honorable Dennis L. Algieri, Senate Minority Leader

STATE OF RHODE ISLAND

2016

Annual Report to the Governor
on the Activities of the

DAM SAFETY PROGRAM



Restored Spillway Channel at Tiogue Lake Dam (No. 177) in Coventry

Department of Environmental Management

Prepared by the Office of Compliance and Inspection

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STATUTORY AND REGULATORY AUTHORITY OF RHODE ISLAND'S DAM SAFETY PROGRAM

The Rhode Island dam inspection and inventory program had its inception in 1883, and was under the authority and responsibility of the Commissioner of Dams and Reservoirs. At that time, there were 86 dams included in the records; today, there are 667 inventoried dams.

A complete list of the inventoried dams, sorted by town and river, is attached.

STATUTES

As set forth in Rhode Island General Laws, Chapters 46-18 and 46-19, a dam owner has the responsibility for the safe operation of his/her dam, and is liable for the consequences of accidents or failures of the dam. In general, a dam owner is required to use "*reasonable care*" in the operation and maintenance of a dam. This responsibility includes the proper operation, maintenance, repair and rehabilitation of a dam, which are essential elements in preventing a dam failure.

The criteria governing the administration and enforcement of Rhode Island's Dam Safety Program are contained in the General Laws of Rhode Island, Chapter 46-19. The Department of Environmental Management (DEM) has the responsibility to cause to be inspected dams to determine their condition, to review and approve plans for construction or substantial alteration of a dam, to order the owner to make repairs or to take other necessary action to make a dam safe.

In 2001, Section 46-12.2-2 was amended, authorizing the Clean Water Finance Agency to issue loans for projects associated with dam safety.

In 2005, Chapter 45-62 (Dam Management Districts) was added, authorizing municipalities to create dam management districts for dam repairs, maintenance, management and/or removal.

In 2006 two amendments to Chapter 46-19 were enacted. Section 4 was amended to authorize DEM, in an emergency, to take necessary actions to mitigate an unsafe condition at a dam and to assess the costs of those actions against the dam owner. Section 9 was amended to require a city or town where a high or significant hazard dam is located, and to require a state agency that owns a high or significant hazard dam, to complete by July 1, 2008, an Emergency Action Plan (EAP) for the dam. Rhode Island's Emergency Management Agency is responsible for coordinating development of the EAPs and must give final approval for the EAP to be considered complete.

In 2012, Section 46-19-4 was amended by adding subsection (c). This change authorizes DEM to record an enforcement action for an unsafe dam in the land evidence records of the city or town in which the dam is located. Upon satisfactory completion of the requirements of the enforcement action, DEM is also authorized to record such written notice in the land evidence records.

Federal Energy Regulatory Commission Authority

In 2011, DEM became aware that for any dam in the state that has a Federal Energy Regulatory Commission (FERC) Permit or Exemption, DEM does not have any dam safety regulatory authority. In 2016, the following 9 dams were under FERC Authority:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Central Falls / Cumberland	063	Valley Falls Pond	Low
Central Falls / Pawtucket	064	Central Falls	Low
North Smithfield	043	Slatersville Reservoir Upper	High
North Smithfield	045	Slatersville Upper Intermediate	Low
North Smithfield	393	Blackstone	Low
Pawtucket	066	Pawtucket Lower	Low
West Warwick	147	Riverpoint Pond Upper	High
West Warwick	148	Arctic	High
Woonsocket	056	Woonsocket Falls	Significant

DEM REGULATIONS

On December 20, 2007 DEM's *Rules and Regulations for Dam Safety* (Dam Safety Regulations) went into effect. The regulations, which are available on DEM's website at

<http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>, include the following:

- Definitions of important terms including dam, hazard classifications, maintenance, repair and unsafe dam;
- Assignment of a hazard classification to each dam in the state inventory;
- Requirement that owners register their dams and notify DEM when ownership is transferred (no associated fee);
- A schedule for visual inspections of high and significant hazard dams;
- Procedure to streamline repair of high and significant hazard dams (no associated permit fee); and
- A procedure for dam owners to take emergency actions at high and significant hazard dams.

In June 2007, DEM's *Rules and Regulations for Governing the Administration and Enforcement of the Freshwater Wetlands Act* were amended to allow high hazard and significant hazard dam repair requests to be approved under the Dam Safety Regulations. The Dam Safety Program coordinates such requests with the Freshwater Wetlands Program.

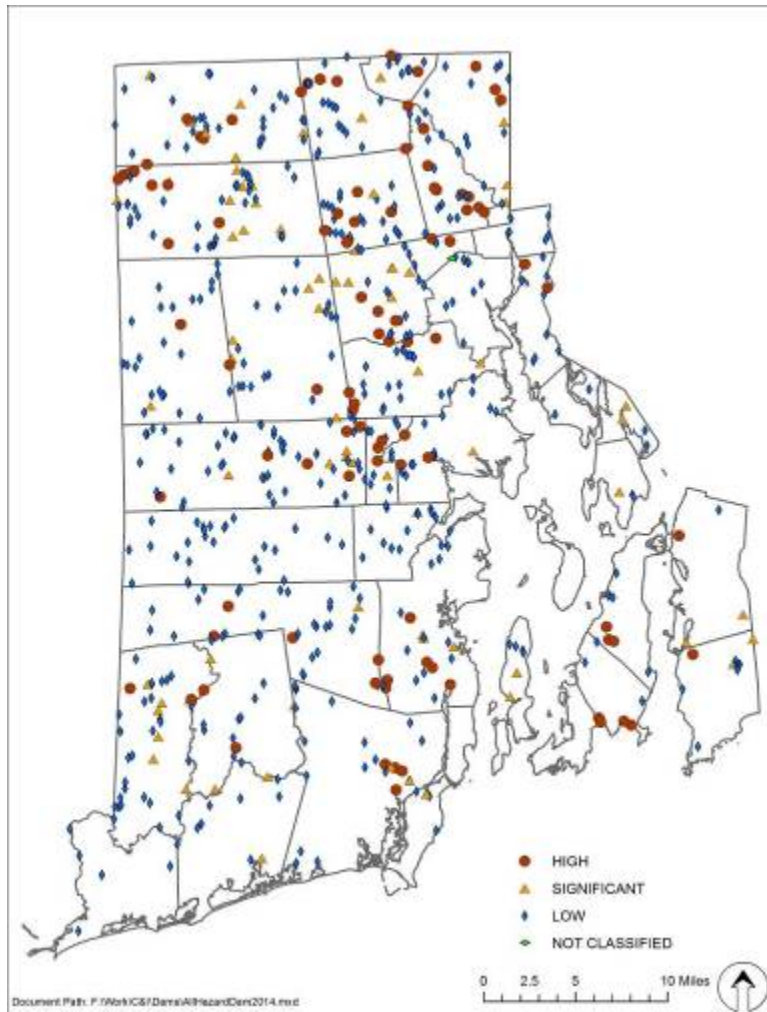
HAZARD CLASSIFICATIONS

Inventoried dams are classified by the hazard, which relates to the probable consequences of failure or misoperation of the dam; it does not relate to the current condition or the likelihood of failure of the dam. The hazard classifications are defined in the Dam Safety Regulations as follows:

High Hazard – means a dam where failure or misoperation will result in a probable loss of human life.

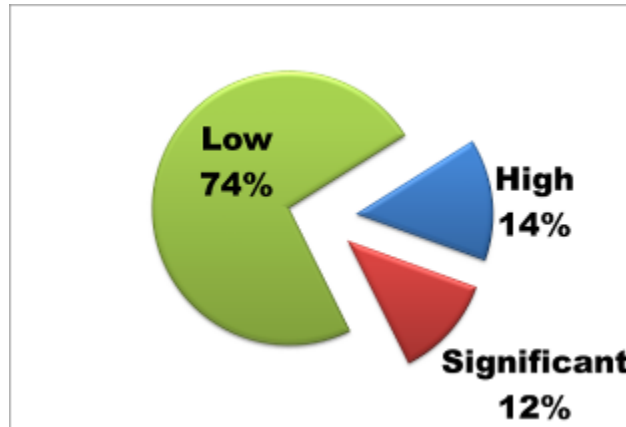
Significant Hazard – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public’s health, safety or welfare. Examples of major economic loss include washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.

Low Hazard – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.



Dams / Hazard Classifications

In 2016, there were 96 high hazard dams, 81 significant hazard dams and 490 low hazard dams, for a total inventory of 667 dams. The following chart illustrates the percentage of dams in each hazard classification:



INSPECTION PROGRAM

In accordance with the Dam Safety Regulations, a dam's hazard classification determines the inspection frequency. Visual inspections of high hazard dams are required every 2 years (48 each year if distributed evenly) and visual inspections of significant hazard dams are required every 5 years (16 each year if distributed evenly). Low hazard dams are required to be inspected every five years to determine whether downstream conditions have changed over time that warrant raising the hazard classification to significant or high. Also, DEM will visually inspect a high or significant hazard dam whenever DEM has reason to believe that the dam may be unsafe.

The visual inspections performed are conducted under a general inspection format based on guidelines established in 1976 by the United States Army Corps of Engineers for the National Program for the Inspection of (Non-Federal) Dams. A visual inspection may be performed by DEM, by an engineer hired by DEM or by an engineer hired by the dam owner.

As part of each visual inspection, the condition of the major components of the dam are subjectively rated as *good*, *fair*, *poor* or *unsafe*. The major components of a dam are the embankment, the spillway and the low level outlet. *Good* is defined as meeting minimum guidelines, where no irregularities are observed and the component appears to be maintained properly. *Fair* is defined as a component that requires maintenance. *Poor* is defined as a component that has deteriorated beyond a maintenance issue and requires repair; the component no longer functions as it was originally intended. *Unsafe* means the condition of a regulated dam, as determined by the DEM, is such that an unreasonable risk of failure exists that will result in a probable loss of human life or major economic loss. Among the conditions that would result in this determination are: excessive vegetation that does not allow the DEM to perform a complete visual inspection of a dam, excessive seepage or piping, significant erosion problems, inadequate spillway capacity, inadequate capacity and/or condition of control

structure(s) or serious structural deficiencies, including movement of the structure or major cracking.

A detailed investigation may be required if a visual inspection leads to a determination that a dam is or may be unsafe. A detailed investigation may include studies, investigations and analyses appropriate to evaluate the structural safety and hydraulic capacity of a dam or reservoir and appurtenant works, such as soil analysis, concrete or earth stability analysis, materials testing, foundation explorations, hydraulic and hydrologic analysis, including basin studies, flood potential, and an analysis of the dam's ability to pass flood waters.

Following a visual inspection performed by DEM, a dam inspection report is prepared, identifying specific deficiencies and, when warranted, recommending corrective measures. A copy of the report is forwarded to the owner, with the expectation that the deficiencies will be corrected. If it is determined that a dam may be unsafe or is unsafe, then DEM will order additional investigation or corrective action.

ACTIVITIES IN 2016

UNSAFE/POTENTIALLY UNSAFE DAMS WITH KNOWN OWNERS

One of DEM's primary responsibilities in the Dam Safety Program is to identify unsafe or potentially unsafe dams and take appropriate action to properly address the unsafe condition. An unsafe dam is a high or significant hazard dam whose condition is such that an unreasonable risk of failure exists.

Following a visual or detailed inspection of a dam, the owner is notified of any condition that DEM considers to be unsafe or that may be unsafe. Notification is in the form of a Notice of Violation and Order (NOV) for an unsafe condition or a Notice of Intent to Enforce (NOI) for a potentially unsafe condition. An NOV sets forth the unsafe condition and requires the owner to take corrective action, while an NOI requires the owner to provide further investigation of the potentially unsafe condition and take corrective action, if needed.

During 2016, DEM addressed 60 dams with unsafe or potentially unsafe conditions as indicated in the table below. By the end of 2016, the safety issues at 7 of these dams were properly addressed and the dam was considered to be in compliance (shaded in grey below).

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	UNSAFE CONDITION(S)	OWNER
Bristol	409	State Street	Significant	Vegetation prohibited inspection, unknown presence of low level outlet	Town of Bristol
Burrillville	003	Wilson	High	Vegetation prohibited inspection, embankment movement	Wilson Reservoir Association
Burrillville	016	Pascoag West Dike	High	Vegetation prohibited inspection, embankment movement	Leo Plouffe

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	UNSAFE CONDITION(S)	OWNER
Burrillville	027	Sucker	Significant	Vegetation prohibited inspection, plywood blocked spillway, low level outlet inoperable, auxiliary spillway modified	Bliss Golf Investors LLC
Burrillville	565	Ross	Significant	Vegetation prohibited inspection, low level outlet inoperable	George E. Binns Living Trust & Nancy F. Binns, Trustee
Burrillville	572	Wilbur	High	Vegetation prohibited inspection, spillway headwall & seepage, low level outlet operability	Tillinghast Holding Co., LLC
Coventry	175	Quidnick	Significant	Vegetation prohibited inspection, low section of embankment, debris blocked low level outlet channel	YMCA Of Pawtucket Inc.
Coventry	186	Upper	Significant	Seepage & sediment transport, embankment section low, spillway discharge flowed along base of dam	Town of Coventry
Coventry	498	Hopkins Farm	Significant	Raised spillway crest, auxiliary spillway partially filled	Jeremy Votolato, D/B/A Island Green Golf, LLC
Coventry	645	Centre of New England #1	Significant	Vegetation prohibited inspection, spillway movement & debris impacting flow	Commerce Park Properties, LLC
Cranston	198	Curran Lower	High	Vegetation prohibited inspection, vegetation in spillway inhibited flow, low level outlet inoperable	DEM
Cranston	320	Stone	High	Vegetation prohibited inspection, vegetation inhibited spillway flow, embankment movement & seepage	Richard A. & Kathleen M. Fenner; Pauline E. Grieco
Exeter	219	Boone	High	Vegetation prohibited inspection, debris in spillway affected flow, leakage with sediment transport through spillway	Boone Lake Dam Management District
Exeter	221	Browning	High	Vegetation prohibited inspection, vegetation may be impacting flow	DEM
Exeter	238	Edward's	Significant	Vegetation prohibited inspection	Peter C. Hendrick Revocable Trust
Exeter	239	Slocum	High	Low level outlet inoperable	American Baptist Churches Of R.I.
Foster	163	Westconnaug	High	Vegetation prohibited inspection	Providence Water Supply Board; City of Providence
Glocester	018	Burlingame	High	Vegetation prohibited inspection, inadequate erosion protection	DEM

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	UNSAFE CONDITION(S)	OWNER
Glocester	354	Coomer	Significant	Vegetation prohibited inspection, inoperable low level outlet, severe embankment erosion	Providence Water Supply Board; City of Providence
Glocester	727	Bowdish Lower	High	Vegetation prohibited inspection, debris obstructing spillway, low level outlet operability unknown	Lynda Jean Marshall, a/k/a Lynda J. Schmidt
Glocester / Smithfield	111	Waterman	High	Vegetation/debris prohibited inspection, drainage trench clogged	Citizens For The Preservation Of Waterman Lake, Inc.
Hopkinton	440	Hoxie Farm	Significant	Vegetation prohibited inspection	RI Department of Transportation
Hopkinton / Richmond	216	Wyoming Upper	High	Vegetation prohibited inspection, inoperable low level outlet, Embankment depressions, sinkholes, failing & rotating areas, spillway leakage	DEM
Jamestown	575	Jamestown Lower	Significant	Vegetation prohibited inspection, low level outlet could not be located	Town of Jamestown
Johnston	169	Almy	High	Vegetation prohibited inspection, spillway not functioning properly, low level outlet inoperable	Town of Johnston
Johnston	170	Simmons Upper	High	Vegetation prohibited inspection, low level outlet inoperable	Town of Johnston
Johnston	171	Simmons Lower	High	Vegetation prohibited inspection, severe embankment erosion, spillway not functioning properly, low level outlet inoperable	Town of Johnston
Johnston	313	Hughesdale Upper	High	Low section of embankment, low level outlet inoperable	Jeannette Y. Fontaine Of The Fontaine Living Trust
Johnston	346	Kimball	Significant	Vegetation prohibited inspection	Providence Water Supply Board; City of Providence
Lincoln	097	Butterfly	High	Low level outlet inoperable	Town Of Lincoln
Lincoln	104	Bleachery	High	Low level outlet inoperable	Providence Casket Co.
Little Compton	485	Watson	High	Vegetation prohibited inspection, unknown operation of low level outlet	City of Newport
Middletown	582	Nelson	High	Vegetation prohibited inspection, deteriorated auxiliary spillway	City of Newport
Middletown	583	Gardiner	High	Vegetation prohibited inspection, embankment erosion	City of Newport
Middletown	584	Easton North	High	Vegetation prohibited inspection, deteriorated spillway, unknown operability of low level outlet	City of Newport

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	UNSAFE CONDITION(S)	OWNER
New Shoreham	424	Rod & Gun Club	Significant	Vegetation prohibited inspection, auxiliary spillway not present	Estate Of George Russell James
Newport/Middletown	585	Easton South	High	Vegetation prohibited inspection	City of Newport
North Kingstown	444	Silver Spring	High	Vegetation prohibited inspection, vegetation affected spillway flow	DEM
North Kingstown	553	Belleville	Significant	Vegetation prohibited inspection, low section & large area of erosion on embankment, sediment transport thru spillway	Town Of North Kingstown
North Kingstown	710	Slocum Road Upper	High	Vegetation prohibited inspection, spillway stop log operability unknown	Maurice N. Klein & Kimberly Perry
North Providence	084	Wenscott	High	Low level outlet inoperable	Town Of North Providence
North Smithfield	067	Todd's	Significant	Vegetation prohibited inspection, low level outlet inoperable	Paul R & Karen A Hazard
Portsmouth	395	Lawton Valley	High	Vegetation prohibited inspection, vegetation may inhibit spillway flow	City of Newport
Portsmouth	580	Sisson	High	Vegetation prohibited inspection, vegetation may inhibit spillway flow	City of Newport
Portsmouth	581	St Mary's	High	Vegetation prohibited inspection, vegetation may inhibit spillway flow	City of Newport
Providence	093	Canada Upper	Significant	Low level outlet inoperable	City Of Providence
Scituate	161	Gainer	High	Vegetation prohibited inspection	Providence Water Supply Board; City of Providence
Scituate	345	Jordan	Significant	Inoperable low level outlet, embankment deterioration, leakage at the primary & auxiliary spillways	Providence Water Supply Board; City of Providence
Scituate	351	Peeptoad	Significant	Embankment deterioration	Providence Water Supply Board; City of Providence
Scituate	361	Pine Swamp No. 1	Significant	Vegetation prohibited inspection, spillway deterioration	Providence Water Supply Board; City of Providence
Scituate	648	Shoestring Mill	Significant	Depressed areas of embankment, spillway deterioration	Providence Water Supply Board; City of Providence
Smithfield	108	Stillwater	High	Vegetation prohibited inspection, unknown operability of low level outlet	DEM

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	UNSAFE CONDITION(S)	OWNER
Smithfield	109	Stillwater	Significant	Vegetation prohibited inspection, vegetation inhibited spillway flow, low level outlet inoperable	Breakwater Preservation Conservancy
South Kingstown	425	Wakefield	High	Vegetation prohibited inspection, low level outlet inoperable	Town Of South Kingstown
Tiverton	396	Nonquit	Significant	Vegetation prohibited inspection, inoperable low level outlet	City of Newport
Tiverton	742	Creamer	High	Vegetation prohibited inspection	Manuel Laureanno, Laureanno Development Corporation, Daniel T. Church Estate Homeowners' Association
Warren	480	Warren Upper	Significant	Vegetation prohibited inspection, spillway location unknown, low level outlet operability unknown	Bristol County Water Authority
West Warwick	455	Bouchar Farm	Significant	Vegetation prohibited inspection	Gary M. Appolonia/P&D Realty
Woonsocket	073	Harris	High	Vegetation prohibited inspection, low level outlet operability unknown	Woonsocket Water Division
Woonsocket	621	Holley Lane	High	Vegetation prohibited inspection, spillway flow diverted	H.S. Realty Corp.

A summary of each dam follows:

Dam number 409 (State Street) in Bristol

The dam was inspected in 2013 and DEM issued an NOV to the Town of Bristol in July 2016 for the unsafe conditions. The Town did not request a hearing on the NOV. However, the Town was working towards compliance in late 2016.

Dam number 003 (Wilson) in Burrillville

The dam was inspected in 2013 and DEM issued an NOV to the owner in April 2016 for the unsafe conditions. The owner did not request a hearing on the NOV. However, the owner was working towards compliance in late 2016.

Dam number 016 (Pascoag West Dike) in Burrillville

The dam was inspected in 2015 and DEM issued an NOV to the owner in April 2016 for the unsafe conditions. The owner did not request a hearing on the NOV. However, the owner was working towards compliance in late 2016.

Dam number 027 (Sucker) in Burrillville

The dam was inspected in 2010 and DEM issued an NOV to the owner in 2011 for the unsafe conditions. In 2012 the owner cleared the vegetation, removed the plywood and hired an engineer to inspect the dam and complete a report, which was submitted to DEM. The low level outlet and auxiliary spillway issues have not been addressed. The owner did not request a hearing on the NOV.

Dam number 565 (Ross) in Coventry

The dam was inspected in 2011 and DEM issued an NOV to the owner in 2013 for the unsafe conditions. The owner requested a hearing on the NOV and met with DEM in 2013 to discuss settlement. In 2015 and 2016, DEM sought additional information from the Department of Transportation to determine if the significant hazard classification is appropriate.

Dam number 572 (Wilbur) in Burrillville

The dam was inspected in 2013 and 2015 and DEM issued an NOV to the owner in May 2016 for the unsafe conditions. The owner did not request a hearing on the NOV.



Seepage at base of Wilbur Dam (No. 572) in Burrillville

Dam number 175 (Quidnick) in Coventry

The dam was inspected in 2012 and DEM issued an NOV to the owner in 2013 for the unsafe conditions. The owner requested a hearing on the NOV. In 2014, the owner resolved the vegetation and debris issues. In 2015, DEM approved plans to repair the low section of embankment. The work was completed in 2016 and all the unsafe conditions were satisfactorily addressed.

Dam number 186 (Upper) in Coventry

The dam was inspected in 2011 and DEM issued an NOV to the Town of Coventry in 2013 for the unsafe conditions. The Town requested a hearing on the NOV and also negotiated with DEM, entering a Consent Agreement in 2013 to resolve the NOV. The Consent Agreement includes a plan and schedule to return the dam to a safe condition. In 2014, the compliance date in the Consent Agreement was extended to June 2014 at the Town's request, which included the addition of an analysis to determine the capacity of the spillway and to appropriately resize it if needed. The compliance date was not met and stipulated penalties were accruing. In 2015, DEM agreed to extend the compliance date and waived the penalties, and subsequently received an application to repair the dam. In December 2016, DEM approved the repair plan.

Dam number 498 (Hopkins Farm) in Coventry

The dam was inspected in 2012 and DEM issued an NOV to the owner in 2013 for the unsafe conditions. The owner has not contacted DEM and a hearing was not requested on the NOV.

Dam number 645 (Centre of New England #1) in Coventry

The dam was inspected in 2012 and DEM issued an NOV to the owner in 2015 for the unsafe conditions. The owner did not request a hearing on the NOV. An informal meeting was held with the owner in May 2016.

Dam number 198 (Curran Lower) in Cranston

The dam was inspected in 2010. DEM owns the dam and in 2012, DEM (Planning & Development) was notified of the unsafe conditions. In 2015 the process of addressing the unsafe condition began, which continued through 2016.

Dam number 320 (Stone) in Cranston

The dam was inspected in 2013 and 2015 and DEM issued NOVs to the owners in August 2016 for the unsafe conditions. Both owners requested hearings on their NOVs.



Overgrown Stone Dam (No. 320) in Cranston

Dam number 219 (Boone) in Exeter

The dam was inspected in 2013 and DEM issued an NOV to the owner in 2014 for the unsafe conditions. The owner requested a hearing on the NOV and also worked toward compliance. In 2014, the owner's engineer submitted a report to address the unsafe conditions and also noted additional leakage through the embankment. DEM required that the engineer develop a monitoring plan for the leakage. In 2015, DEM approved the monitoring plan and entered a Consent Agreement with the owner, which resolved the NOV. The Consent Agreement requires the leakage to be monitored for two years, at which time the results must be submitted to DEM in a report prepared by a the engineer, along with recommendations for any further action that may be needed.

Dam number 221 (Browning) in Exeter

The dam was inspected in 2014. DEM owns the dam and in August 2016, DEM (Planning & Development) was notified of the unsafe conditions.

Dam number 238 (Edward's) in Exeter

The dam was inspected in 2012 and DEM issued an NOV to the owner in 2015 for the unsafe conditions. The owner did not request a hearing on the NOV.

Dam number 239 (Slocum) in Exeter

The dam was inspected in 2010 and DEM issued an NOV to the owner in 2011 for the unsafe conditions. The owner did not request a hearing on the NOV. A Consent Agreement was entered between DEM and the owner in 2011, which resolved the NOV and provided a schedule by which the dam would be returned to a safe condition. In 2012, DEM approved the owner's proposed engineering plan to place the low level outlet into proper operation. Through 2015, the owner continued to have problems lowering the pond to complete the work, but was finally successful later in the year. The work was fully complete in March 2016, at which time the unsafe conditions were satisfactorily addressed.

Dam number 163 (Westconnaug) in Foster

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the Providence Water Supply Board (PWSB) in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.

Dam number 018 (Burlingame) in Gloucester

The dam was inspected in 2014. DEM owns the dam and in August 2016, DEM (Planning & Development) was notified of the unsafe conditions.

Dam number 354 (Coomer) in Gloucester

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the Providence Water Supply Board (PWSB) in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.

Dam number 727 (Bowdish Lower) in Gloucester

The dam was inspected in 2009 and DEM issued an NOV to the owner in 2012 for the unsafe conditions. The owner requested a hearing on the NOV, which was held in 2014. The DEM hearing officer issued a decision in 2015 upholding the NOV. The owner made no progress in resolving the unsafe conditions at the dam and in 2016 DEM initiated action in Superior Court, which led to a Court Order upholding the NOV as a final compliance order.

Dam number 111 (Waterman) in Gloucester/Smithfield

The dam was inspected in 2012 and DEM issued an NOV to the owner in 2014 for the unsafe conditions. The owner did not request a hearing on the NOV, but has made progress in resolving the unsafe conditions.



Improper vegetation at Waterman Dam (No. 111) in Gloucester

Dam number 440 (Hoxie Farm) in Hopkinton

The dam was inspected in 2010 and DEM issued an NOV to the Department of Transportation (DOT) in 2013 for the unsafe condition. The DOT did not request a hearing on the NOV and removed some of the vegetation in 2014. DEM discussed the outstanding vegetation with the DOT in late 2015. The DOT made progress in resolving the unsafe conditions during 2016.

Dam number 216 (Wyoming Upper) in Hopkinton/Richmond

The dam was inspected in 2011. DEM owns the dam and the DEM (Planning & Development) was notified of the unsafe conditions in 2013. In late 2015, the process of addressing the unsafe conditions at the dam began.

Dam number 575 (Jamestown Lower) in Jamestown

The dam was inspected 2012 and DEM issued an NOV to the Town of Jamestown in 2013 for the unsafe conditions. The Town did not request a hearing on the NOV and has hired an engineer to develop plans to rehabilitate the dam. In 2016, the Town pursued funding for a comprehensive repair of the dam.

Dam number 169 (Almy) in Johnston

The dam was inspected and DEM issued an NOV to the Town of Johnston in 2010 for the unsafe conditions. The Town requested a hearing on the NOV. In 2013, DEM and the Town entered a Consent Agreement to resolve the NOV. The Consent Agreement provides a schedule to return the dam to a safe condition and the Town is working towards achieving compliance.

Dam number 170 (Simmons Upper) in Johnston

The dam was inspected and DEM issued an NOV to the Town of Johnston in 2010 for the unsafe conditions. The Town requested a hearing on the NOV. In 2013, DEM and the Town entered a Consent Agreement to resolve the NOV. The Consent Agreement provides a schedule to return the dam to a safe condition and the Town is working towards achieving compliance.

Dam number 171 (Simmons Lower) in Johnston

The dam was inspected and DEM issued an NOV to the Town of Johnston in 2010 for the unsafe conditions. The Town requested a hearing on the NOV. In 2013, DEM and the Town entered a Consent Agreement to resolve the NOV. The Consent Agreement provides a schedule to return the dam to a safe condition and the Town is working towards achieving compliance.

Dam number 313 (Hughesdale Upper) in Johnston

The dam was inspected in 2011 and DEM issued an NOV to the owner in 2013 for the unsafe conditions. The owner requested a hearing on the NOV. In 2015, the owner raised the low section of the embankment. No additional progress was made in 2016.

Dam number 346 (Kimball) in Johnston

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the Providence Water Supply Board (PWSB) in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.

Dam number 097 (Butterfly) in Lincoln

The dam was inspected in 2010 and DEM issued an NOV to the Town of Lincoln in 2011 for the unsafe condition. The Town requested a hearing on the NOV. In 2012, DEM and the Town entered a Consent Agreement to resolve the NOV. In 2014, DEM approved an application to repair the low level outlet. In 2016 the work was completed and the Consent Agreement was closed.

Dam number 104 (Bleachery) in Lincoln

The dam was inspected in 2010 and DEM issued an NOV to the owner in 2011 for the unsafe condition. The owner requested a hearing on the NOV and later entered a Consent Agreement with DEM in 2013, which resolved the NOV. Subsequently, the dam was transferred to a new owner. DEM approved an application to repair the dam in late 2015, at which time work began. The work was completed and the Consent Agreement was closed in June 2016.

Dam number 485 (Watson) in Little Compton

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.



Overgrown downstream slope of Watson Dam (No. 485) in Little Compton

Dam number 582 (Nelson) in Middletown

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 583 (Gardiner) in Middletown

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 584 (Easton North) in Middletown

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 424 (Rod & Gun Club) in New Shoreham

In 2012 the dam was inspected and DEM issued an NOV to the owner in 2014 for the unsafe conditions. The owner requested a hearing on the NOV and also hired an engineer and satisfactorily addressed the vegetation issue. No further progress was made in 2016.

Dam number 585 (Easton South) in Newport/Middletown

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 444 (Silver Spring) in North Kingstown

The dam was inspected in 2013. DEM owns the dam and the DEM (Planning & Development) was notified of the unsafe conditions in March 2016.

Dam number 553 (Belleville) in North Kingstown

The dam was inspected in 2012 and DEM issued an NOV to the Town of North Kingstown in 2013 for the unsafe conditions. The Town did not request a hearing on the NOV. In late 2015, the Town's engineer submitted a report to address the unsafe conditions at the dam. DEM reviewed the report, which did not adequately address the unsafe conditions, and issued a letter to the Town indicating such in January 2016.

Dam number 710 (Slocum Upper) in North Kingstown

The dam was inspected in 2010 and DEM issued an NOV to the owners in 2012 for the unsafe conditions. The owners did not request a hearing on the NOV and cut some of the vegetation in 2013. In late 2015, additional vegetation was cut. DEM, which previously agreed to reinspect the dam, did so and did not observe any unsafe conditions; the NOV was closed in April 2016.

Dam number 084 (Wenscott) in North Providence

The dam was inspected in 2009 and DEM issued an NOV to the Town of North Providence in 2010 for the unsafe condition. The Town requested a hearing on the NOV and in 2012, DEM and the Town entered a Consent Agreement to resolve the NOV. The Consent Agreement provides a schedule to return the dam to a safe condition. In 2015, DEM approved an application to repair the low level outlet. Due to a conflict with the method of construction, the repairs were not completed in 2016.

Dam number 067 (Todd's) in North Smithfield

The dam was inspected in 2010 and DEM issued an NOV to the owner in 2012 for the unsafe conditions. The owner requested a hearing on the NOV and also submitted documents attempting to show that the dam is incorrectly classified as a significant hazard and should be downgraded to a low hazard. Through 2014, DEM, the dam owner and the owner of the downstream property that would be affected by failure of the dam were reviewing the documents. In 2015, the downstream property owner indicated that changes would be made to the topography of the property to make it more flood resistant. Following these changes, which were expected in 2016 but did not take place, DEM will reassess the dam's hazard classification.

Dam number 395 (Lawton Valley) in Portsmouth

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 580 (Sisson) in Portsmouth

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 581 (St. Mary's) in Portsmouth

The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter.

Dam number 093 (Canada Upper) in Providence

The dam was inspected in 2011 and DEM issued an NOV to the City of Providence in 2012 for the unsafe condition. The City requested a hearing on the NOV and entered a Consent Agreement with DEM in 2014. The Consent Agreement provides a schedule by which the dam will be returned to a safe condition. DEM approved an application to repair the low level outlet in 2015. Subsequent to obtaining bid costs to complete the work, the City decided to investigate removal of the dam, and the Consent Agreement was amended to reflect this.

Dam number 161 (Gainer) in Scituate

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the Providence Water Supply Board (PWSB) in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.



Overgrown downstream side of dike at Gainer Dam (No. 161) in Scituate

Dam number 345 (Jordan) in Scituate

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the Providence Water Supply Board (PWSB) in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.

Dam number 351 (PeepToad) in Scituate

The dam was inspected in 2014 and DEM issued a Notice of Intent to Enforce to the City of Providence and the Providence Water Supply Board in December 2016 for the potentially unsafe conditions.

Dam number 361 (Pine Swamp No. 1) in Scituate

The dam was inspected in 2014 and DEM issued an NOV to the City of Providence and the PWSB in November 2016 for the unsafe conditions. The City and PWSB requested a hearing on the NOV and also met with DEM in December 2016 to discuss resolution of the matter.

Dam number 648 (Shoestring) in Scituate

The dam was inspected in 2014 and DEM issued a Notice of Intent to Enforce to the City of Providence and the Providence Water Supply Board in December 2016 for the potentially unsafe conditions.

Dam number 108 (Stillwater) in Smithfield

The dam was inspected in 2014. DEM owns the dam and the DEM (Planning & Development) was notified of the unsafe conditions in August 2016.

Dam number 109 (Stillwater) in Smithfield

The dam was inspected in 2010 and DEM issued an NOV to the owner in 2011 for the unsafe conditions. The owner did not request a hearing on the NOV.

Dam number 425 (Wakefield) in South Kingstown

The dam was inspected in 2010 and DEM issued an NOV to the Town of South Kingstown in 2011 for the unsafe conditions. The Town requested a hearing on the NOV. The vegetation issue was resolved when the Town submitted an inspection report to DEM in 2012. The Town worked with federal and state agencies, which were designing a replacement fish ladder for the dam, to incorporate a low level outlet into the design. Installation of the low level outlet was completed and the NOV was closed in January 2016.

Dam number 396 (Nonquit) in Tiverton

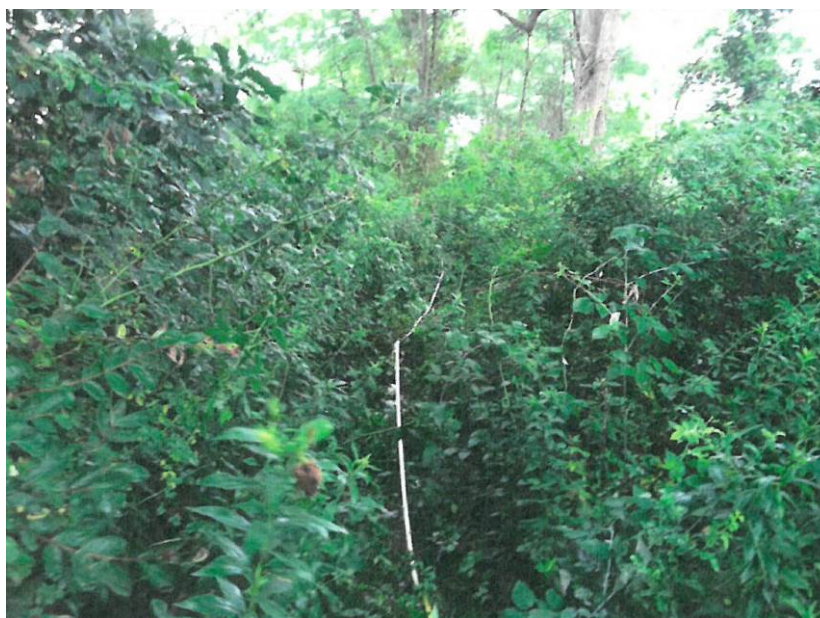
The dam was inspected in 2013 and DEM issued an NOV to the City of Newport in April 2016 for the unsafe conditions. The City requested a hearing on the NOV and also met with DEM in May 2016 to discuss resolution of the matter. The City submitted an application to repair the low level outlet, which DEM approved in December 2016. The work is expected to be completed in 2017.

Dam number 742 (Creamer) in Tiverton

The dam was inspected in 2010 and DEM issued an NOV to the owners in 2011 for the unsafe condition. The owners did not request a hearing on the NOV. In 2013, DEM filed a lawsuit against the owners. Concurrently, DEM's Office of Legal Services completed additional research that identified 27 property owners whose recorded deeds include language that required them to form the Daniel T. Church Estate Homeowners' Association and maintain the dam. These property owners were formally informed of their responsibilities by DEM in 2013. In 2014, the Association was formed and much of the vegetation was removed. In 2015, DEM identified additional dam owners and began the registration process (*Registration*, page 25). During 2016, the matter was in Superior Court to determine legal responsibility for the dam.

Dam number 480 (Warren Upper) in Warren

The dam was inspected in 2012 and DEM issued an NOV to the Bristol County Water Authority (BCWA) in 2014 to address the unsafe conditions. The BCWA requested a hearing on the NOV and in 2016 was investigating removal of the dam.



Overgrown crest (typical of entire dam) of Warren Upper Dam (No. 480) in Warren

Dam number 455 (Bouchar Farm) in West Warwick

The dam was inspected in 2011 and DEM issued an NOV to the owners in 2014. Both owners requested a hearing on the NOV. In 2016, one of the owners removed vegetation from his portion of the dam.

Dam number 073 (Harris) in Woonsocket

The dam was inspected in 2012 and DEM issued an NOV to the City of Woonsocket in 2014 to address the unsafe conditions. The City requested a hearing on the NOV. The City also submitted an engineering report that provided inspection findings of some of the vegetated areas of the dam, which were previously cleared, and verified proper operation of the low level outlet. The report also indicated that an area of excessive

vegetation still remained that prohibited proper inspection. The remaining issues were properly addressed and the NOV was released in March 2016.

Dam number 621 (Holley Lane) in Woonsocket

The dam was inspected in 2013 and DEM issued an NOV to the owner in April 2016 for the unsafe conditions. The owner did not request a hearing on the NOV and has been working toward compliance.

UNSAFE/POTENTIALLY UNSAFE DAMS WITH UNKNOWN OWNERS

Through 2016, DEM identified the following 27 dams as unsafe or potentially unsafe, but have not been able to issue enforcement actions because the owners have not been determined (Program Limitations, page 31).

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Burrillville	015	Union Mill	Significant
Burrillville	016	Pascoag Upper	High
Burrillville	039	Spring	Significant
Burrillville	051	Nichols	Significant
Charlestown	758	Cross Mills	Significant
Coventry	176	Coventry	High
Coventry	177	Tiogue	High
Coventry	185	Black Rock	High
Foster	349	Spear	High
Foster	526	Gorham, N. Farm	Significant
Glocester	032	Snakeskin	Significant
Glocester	401	Lake Washington	High
Hopkinton / Richmond	247	Alton	Significant
Johnston	169	Almy	High
Johnston	323	Caesarville	Significant
Johnston	504	Dexter Farm	Significant
Little Compton	746	Adamsville	Significant
North Kingstown	704	Secret	Significant
North Providence	760	Louisquisset Flood Control	High
North Smithfield	048	Forestdale	High
Richmond	273	Wood River Junction	Significant
Smithfield	121	Sprague Lower	High
Smithfield	123	Hawkins	Significant
South Kingstown	525	Hefler Farm	High
West Warwick	145	Natick	High
West Warwick	149	Centerville	High
Woonsocket	621	Holley Lane	High

COMPLIANCE INSPECTIONS

The Dam Safety Regulations (page 4) require visual inspection of high hazard dams every 2 years and significant hazard dams every 5 years. Inspections are completed by DEM, or by engineering consultants hired by DEM using a FEMA grant (page 26) or hired by the dam owner.

High Hazard Dam Inspections

20 high hazard dams were inspected in 2016, as indicated in the table below.

TOWN	DAM NO.	DAM NAME
Burrillville	008	Harrisville Pond
Burrillville	766	Ocean State Power
Coventry	167	Flat River Reservoir
Coventry	185	Black Rock Reservoir
Coventry	371	Pearce Pond
Cranston	373	Clarke's Pond Upper
Foster	349	Spear Pond
Glocester	022	Keech Pond
Glocester	401	Lake Washington
Glocester	555	Hawkins Pond
Lincoln	099	Moffett Pond
Lincoln	295	Limerock Reservoir
Lincoln	408	Bridlewood Pond
Lincoln	649	Bridlewood Upper End
North Kingstown	710	Slocum Road Upper
North Smithfield	046	Slatersville Reservoir Middle
Warwick	462	Camp Warwick Pond
Warwick	764	Grist Mill Apartments
West Warwick	149	Centerville Pond
Woonsocket	073	Harris Pond

Significant Hazard Dam Inspections

13 significant hazard dam were inspected in 2016, as indicated in the table below.

TOWN	DAM NO.	DAM NAME
Burrillville	015	Union Mill Pond
Burrillville	039	Spring Lake
Coventry	152	Mill Pond
Glocester	021	Cherry Valley Pond
Glocester	032	Snakeskin Pond
Glocester	594	David King Farm Pond
Hopkinton	227	Ashville Pond
Hopkinton	285	Langworthy Pond
Hopkinton	440	Hoxie Farm Pond
Johnston	310	Pocasset Pond
Johnston	323	Caesarville Pond
North Smithfield	047	Slatersville Reservoir Lower
Scituate	160	Hope

As indicated in *Inspection Program* (page 6), the Dam Safety Regulations require visual inspection of 48 high hazard dams and 16 significant hazard dams each year, if the inspection are distributed evenly across the years. As indicated above, 20 high hazard dams and 13 significant hazard dam were inspected in 2016.

If a dam owner is actively working on a dam, either in response to an enforcement action or as an owner-initiated dam repair, then DEM will typically suspend the visual inspection requirement until the work is complete. The shortfall in 2016 inspections was due to this reason, among others.

Requested Inspections

DEM investigates complaints for any high or significant hazard dam upon request by any person who has cause to believe the dam is unsafe. In 2016, DEM did not receive any such requests.

REPAIR APPROVALS

Repairs of the following high and significant hazard dams were approved by DEM in 2016:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	REPAIR
Coventry	186	Upper Pond	Significant	Embankment, Spillway
Coventry	561	Arnold	High	Spillway, Aux. Spillway
North Kingstown	693	Slocum Woods	High	Aux. Spillway, Embankment
Tiverton	396	Nonquit Pond	Significant	Low Level Outlet

OWNER / CONTACT INFORMATION

DEM's records for the owners of dams that were previously classified as high hazard or significant hazard are fairly accurate; however, many dams that were previously classified as low hazard and were reclassified to significant or high hazard have questionable owner information. DEM's Office of Legal Services has been researching ownership of these dams as time allows.

Orphan Dams

In previous annual reports, the term "orphan dam" has been defined in several different ways. In this report, DEM uses the following definition: An orphan dam is one in which no owner can be identified. Through 2016, DEM has identified the following 1 orphan dam:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
South Kingstown	525	Hefler Farm Pond	High

In 2013, DEM contacted the Town of South Kingstown and the owners that have property on the pond that is created by the dam to determine if the Town or property owners were interested in acquiring ownership of the dam or assuming responsibility for its maintenance. The DEM advised the Town and the owners that if there was no interest, the DEM would seek funds to have the dam removed. The Town expressed a willingness to assist the owners, however, none of the owners expressed an interest and the dam remains unmaintained.

Registration

In 2008 DEM began registering dams. The process involves mailing a registration form to each owner of a high hazard or significant hazard dam to formally notify the owner of the dam's hazard classification. The owner then has a specific time period to return a completed registration form or to appeal the hazard classification. There is no fee to register a dam and the main purpose of the registration form is to obtain up-to-date contact information on the dam owner.

Through 2016, DEM has received 105 completed, current registration forms.

At the end of 2016, about 40 dams have at least one owner that either has not been identified by DEM or has been identified but has not been registered. Most dams require DEM research to identify the owners. The priority is placed on unsafe dams as they are discovered.

REMOVALS

There were no dam removals in 2016.

GRANTS TO DEM

From 2000 through 2016, DEM received grants totaling \$808,433 from the Federal Emergency Management Agency (FEMA), National Dam Safety Program.

The 2016 grant was awarded in August 2016 for \$61,769 to fund the following:

\$32,560	high hazard dam spillway adequacy analyses
\$24,480	high and significant hazard dam visual inspections
\$2,458	training/travel
\$1,740	cell phone/wireless modem service
\$500	ASDSO dues
\$31	state audit fee

Previous grants were used for engineering services to complete hazard classification of about 200 dams and to visually inspect high and significant hazard dams, and to purchase vehicles, computers, tablets, cell phones, file cabinets and aerial photos, all of which assisted with the operation of the dam safety program.

INTERAGENCY COORDINATION

Since 2010, DEM and the Rhode Island Emergency Management Agency (RIEMA) have met on an as-needed basis to improve communication and response to dam safety emergencies. Coordination also includes a DEM review of specific sections of emergency action plans for which RIEMA requested assistance, such as a dam-specific condition that describes when the plan should go into effect (*Emergency Action Plans*, page 28).

MEETING/SEMINAR ATTENDANCE

There was no such activity in 2016.

STATE OWNED DAMS

The following high and significant hazard dams are owned by the state and maintained by either DEM or the Department of Transportation (DOT):

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	OWNER	STATUS	REPAIR PRIORITY
Cranston	166	Curran Upper	High	DEM	Not Unsafe	Completed 2015
Cranston	198	Curran Lower	High	DEM	Unsafe	1
Cranston	340	Meshanticut Park	Significant	DEM	Not Unsafe	
Exeter	221	Browning Mill	High	DEM	Unsafe	3
Glocester	018	Burlingame Upper	High	DEM	Unsafe	
Glocester	566	Bowdish	High	DEM	Not Unsafe	Completed 2002
Glocester	499	Durfee Hill Wildlife Marsh #2	Significant	DEM	Not Unsafe	
Hopkinton	440	Hoxie Farm	Significant	DOT	Unsafe	Ongoing
Hopkinton/ Richmond	216	Wyoming Upper	High	DEM	Unsafe	2
Hopkinton/ Richmond	215	Barberville	Significant	DEM	Not Unsafe	
Lincoln	102	Olney	High	DEM	Not Unsafe	Completed 1999
Little Compton	474	Simmons	Significant	DEM	Not Unsafe	
North Kingstown	444	Silver Spring	High	DEM	Unsafe	4
Richmond	261	White's	High	DEM	Not Unsafe	
Smithfield	108	Stillwater	High	DEM	Unsafe	

A summary of each DEM owned dam being addressed in 2016 follows:

Dam number 198 (Curran Lower) in Cranston

Due to lack of public access infrastructure associated with this dam, DEM is working towards partial removal of the dam. A sufficient amount of the dam will be removed to provide a reduction in the hazard classification from its current high hazard to low hazard. The design is about 60% complete.

Dam number 221 (Browning Mill) in Exeter

Bidding documents are being prepared to begin the process of selecting an engineering consultant to design repairs to the dam.

Dam number 216 (Wyoming Upper) in Hopkinton/Richmond
An engineering consultant has completed about 60% of the repair design.



Spillway & leaking low level outlet at Wyoming Upper Dam (No. 216) in Hopkinton/Richmond

Dam number 444 (Silver Spring) in North Kingstown
Bidding documents are being prepared to begin the process of selecting an engineering consultant to design repairs to the dam..

EMERGENCY ACTION PLANS

Rhode Island General Laws Section 46-19-9 requires a city or town in which a high hazard or significant hazard dam is located, and a state agency that owns a high hazard or significant hazard dam, to complete by July 1, 2008, an Emergency Action Plan (EAP) for the dam (*Statutes*, page 3). An EAP is a formal document that identifies potential emergency conditions at a dam and specifies pre-planned actions to be followed to minimize loss of life and property damage. The law mandates that the Rhode Island Emergency Management Agency (RIEMA) coordinate development of the EAPs and give final approval for an EAP to be considered complete. The law also requires that DEM and the Rhode Island League of Cities and Towns cooperate with RIEMA.

Through 2016, RIEMA has approved EAPs for the following 46 dams:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Burrillville	001	Wallum Lake	Significant
Burrillville	003	Wilson Reservoir	High
Burrillville	008	Harrisville Pond	High
Burrillville	015	Union Mill Pond	Significant
Burrillville	027	Sucker Pond	Significant
Burrillville	039	Spring Lake	Significant
Burrillville	051	Nichols Pond	Significant
Burrillville	565	Ross Pond	Significant
Burrillville	572	Wilbur Pond	High
Cranston	166	Curran Upper Reservoir	High
Cranston	198	Curran Lower Reservoir	High
Cranston	340	Meshanticut Park Pond	Significant
Exeter	221	Browning Mill Pond	High
Glocester	018	Burlingame Reservoir Upper	High
Glocester	499	Durfee Hill Wildlife Marsh #2	Significant
Glocester	566	Bowdish Reservoir	High
Hopkinton / Richmond	215	Barberville Pond	Significant
Hopkinton / Richmond	216	Wyoming Upper	High
Lincoln	102	Olney Pond	High
Little Compton	474	Simmons Pond	Significant
Narragansett	733	Sprague Pond	Significant
North Kingstown	444	Silver Spring Lake	High
North Kingstown	513	Carr Pond	High
North Kingstown	550	Hamilton Reservoir	Significant
North Kingstown	553	Belleville Pond	Significant
North Kingstown	615	Rodman Mill	High
North Kingstown	693	Slocum Woods	High
North Kingstown	704	Secret Lake	Significant
North Kingstown	708	Shady Lea Mill	High
North Kingstown	710	Slocum Road Upper	High
Providence	093	Canada Upper Pond	Significant
Providence	300	Cunliff Pond	Significant
Richmond	261	White's Pond	High
Scituate	161	Gainer Memorial	High
Scituate	162	Moswansicut Pond	Significant
Scituate	164	Barden Reservoir	Significant
Scituate	345	Jordan Pond	Significant
Scituate	360	Horseshoe	Significant
Scituate	361	Pine Swamp Reservoir #1	Significant
Scituate	648	Shoestring Mill	Significant
Smithfield	108	Stillwater Reservoir	High
South Kingstown	426	Peace Dale Pond	High
South Kingstown	525	Hefler Farm Pond	High
South Kingstown	549	Asa Pond	High
South Kingstown	573	Indian Run	Significant
South Kingstown	579	Rocky Brook Reservoir	Significant

DAM MANAGEMENT DISTRICTS

Rhode Island General Laws Chapter 45-62 authorizes cities and towns to create dam management districts for the maintenance and repair of dams within their boundaries. The following two districts are currently in operation:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Burrillville	016	Pascoag Upper	High
Exeter	219	Boone	High

In 2008 the Town of Exeter created a district for the *Boone Lake Dam (No. 219)*, which is a privately owned, high hazard dam.

In 2009 the Towns of Burrillville and Gloucester created a district for the *Pascoag Reservoir Upper Dam (No. 16)*. The dam is a privately owned, high hazard dam. The dam is located in Burrillville and the impoundment continues into Gloucester.

PROFESSIONAL ASSOCIATIONS

Rhode Island has been a member of Association of State Dam Safety Officials (ASDSO) since its inception in Denver, Colorado in 1984. ASDSO membership consists of state representatives along with corporate and individual members representing dam owners and professional engineering firms. ASDSO was formed to serve these initial functions:

- Improve efficiency and effectiveness of state dam safety programs;
- Foster public awareness;
- Facilitate inter-organizational, intergovernmental and interstate cooperation;
- Assist the dam safety community and provide a forum for the exchange of information;
- Provide representation of dam safety interests before state legislatures and before Congress; and
- Manage the association effectively through internal policies and procedures.

ASDSO has helped to improve dam safety in Rhode Island mainly through its sponsorship of regional dam safety workshops and its national annual conferences.

PROGRAM LIMITATIONS

UNCLEAR OWNERSHIP

While a final number is not yet known, there is a substantial number of high hazard dams and significant hazard dams with unclear ownership. Currently, there are about 40 dams that require research to determine ownership, which DEM estimates will cost \$200,000. DEM does not have the staff or the financial resources to conduct timely title searches to determine ownership of these dams, to routinely monitor these dams and to maintain them in a safe condition. Without identifying ownership, DEM has no way of issuing orders to correct unsafe conditions at these dams. If the cities and towns and/or the property owners who benefit from the ponds/lakes that are created by these dams are unable or unwilling to assume responsibility for the upkeep of these dams, these dams will continue to pose an increased risk of failure.

CONSTRUCTION OF BUILDINGS WITHIN INUNDATION AREAS BELOW DAMS

New structures that are built within inundation areas below dams increase the number of high hazard dams and significant hazard dams and increase the risk to life and property. At present there is no statute that allows an evaluation of the risk posed by new structures within these inundation areas.

LACK OF FUNDING TO REPAIR OR REMOVE PRIVATELY OWNED DAMS

About 35% of the high hazard and significant hazard dams in Rhode Island are privately owned. The cost to repair these dams can range from the tens of thousands of dollars to the hundreds of thousands of dollars, which far exceeds the financial ability of most private owners. For high hazard dams and significant hazard dams that are determined to be unsafe, this poses a risk to all residents in the State. DEM currently has the authority to issue orders to owners for unsafe dams and if the owner fails to comply with the order, DEM has the authority to repair the dam and assess the cost of the repairs to the dam owner, including the use of deed restrictions. However, DEM does not have a funding source to implement the authority.

INADEQUATE SPILLWAY CAPACITIES AND ENGINEERING ANALYSES

By law, DEM is required to cause to be inspected all the dams in the state. However, the visual inspections performed by DEM do not involve full engineering analyses of the structural integrity of dams. DEM does not have the staff or the financial resources to ensure that such detailed inspections are completed. Although a visual inspection can provide indicators of underlying problems, an engineering analysis is sometimes needed to more fully assess the condition of the dam.

Climate scientists predict that we will experience more severe storms and heavy rainfall. A report entitled *Climate Change in Rhode Island: What's Happening Now & What You Can Do* states that bridges and roads will be more susceptible to damage because of more severe storms and heavy rainfall. A link to the report can be found at http://oceanservice.noaa.gov/education/pd/climate/teachingclimate/climate_change_in_rhode_island.pdf.

The same is true of dams. In the March 2010 floods 5 dams failed in Rhode Island (2 significant hazard dams and 3 low hazard dams). DEM believes that many of the high hazard dams and the significant hazard dams are unable to safely pass the amount of water that will be generated from these storms, causing the dams to overtop. Overtopping is the primary cause of dam failures. Engineering analyses of the spillway capacities of each of the 177 high hazard dams and significant hazard dams is required to determine the amount of water these dams can safely pass without overtopping. DEM does not have the staff or the financial resources to perform these analyses.

LACK OF EMERGENCY ACTION PLANS

EAPs identify what actions will be taken in case of an emergency at a dam, including notification and evacuation. DEM and RIEMA have been working to get Emergency Action Plans (EAPs) in place for all high hazard dams and significant hazard dams. Under current law, cities and towns were required to submit EAPs to RIEMA by July 1, 2008. As indicated in *Emergency Action Plans* on page 28, it has been more than 8 years since the EAPs were required and only 46 dams have approved EAPs. Responding to an emergency at a dam without an EAP increases the risk to life and property.

INADEQUATE STAFFING

Currently, the Dam Safety Program has 2.15 full time equivalents (FTEs), consisting of 2.0 FTEs (engineers/inspectors), 0.1 FTE (management) and 0.05 FTE (administrative/clerical). To successfully meet the requirements of the current statute and the Dam Safety Regulations, DEM needs an additional 1 FTE (engineer/inspector) and an additional 0.5 FTE (administrative/clerical).

INTENSE RAINSTORMS

On August 14, 2014 a storm hit Islip, Long Island with 13.5 inches of rain in 24 hours. Islip is 86 miles from Rhode Island. The National Oceanic and Atmospheric Administration (NOAA) modeled the impact to RI dams if that storm had struck us and their conclusion was that the storm would have caused record floods on pretty much all of the major rivers in the state. Because this storm developed so quickly, our current response capabilities would be ineffective for this type of storm.

Establishment of a notification system for dams is needed. The system could be along the lines of that used by the National Weather Service for severe weather, including a dam advisory, a dam watch and a dam warning. The intent of the system would be to coordinate the actions of officials at the Federal, State and local levels.

This completes the annual report on dam safety and the activities performed by DEM in 2016. For further information on the Dam Safety Program please contact David Chopy at (401) 222-1360, extension 7400.