



**A SPECIAL PERFORMANCE AUDIT  
OF THE  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION**

***DAM AND LEVEE SAFETY***

**MAY 2008**

**BUREAU OF DEPARTMENTAL AUDITS**

May 1, 2008

The Honorable Edward G. Rendell  
Governor  
Commonwealth of Pennsylvania  
225 Main Capitol Building  
Harrisburg, PA 17120

Dear Governor Rendell:

This report contains the results of the Department of the Auditor General's special performance audit of Dam and Levee Safety administered by the Department of Environmental Protection (DEP) for the period July 1, 2002 through September 18, 2006. This audit was conducted pursuant to Sections 402 and 403 of the Fiscal Code and in accordance with *Government Auditing Standards* which are applicable to performance audits and issued by the Comptroller General of the United States.

We commend your efforts in proposing additional funding to rehabilitate unsafe, high hazard dams through your Rebuilding Pennsylvania initiative. However, our audit found that DEP failed to adequately protect citizens and property through its efforts in assuring dam and levee safety in Pennsylvania. Specifically, we found the following: hundreds of high hazard dams that never had an approved emergency plan or the plan was outdated; inspections of dams by DEP and dam owners were not conducted annually as required; DEP's enforcement of dam safety law, regulations and policies was inadequate; no monitoring of federal dams in Pennsylvania; inadequate regulations regarding bonds or other acceptable financial assurance; and inadequate accountability and oversight of levees.

Without current emergency plans, local and county emergency management agencies may not effectively coordinate efforts in the event of a dam failure emergency. Furthermore, failing to perform annual dam inspections or ensure that dam owners timely perform inspections increases the risk that unsafe conditions will not be detected, thereby increasing the likelihood that loss of life and property may occur if a dam is breached. Finally, without adequate monitoring and oversight of levees, DEP cannot fully evaluate the Commonwealth's state of readiness for a flood or high water event, including the status of levee conditions, status of deficiencies needing repaired, and adequacy of emergency plans.

We offer 29 recommendations to improve DEP's administering of dam and levee safety, thereby reducing the risk of potential loss of life and property during a dam failure emergency.

We are pleased to report that DEP has taken a proactive role in implementing many of our recommendations. We will follow up at the appropriate time to determine whether and to what extent all recommendations have been implemented.

Sincerely,

JACK WAGNER  
Auditor General

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**EXECUTIVE SUMMARY**

The Department of Environmental Protection (DEP), through its Division of Dam Safety within the Bureau of Waterways Engineering, is responsible for regulating and overseeing most dams in Pennsylvania to protect the health, safety, and welfare of its citizens and their property. DEP primarily uses state funds to assure the proper planning, design, construction, maintenance, and monitoring of dams in accordance with the Dam Safety and Encroachments Act, Act 325 of 1978, as amended; dam safety regulations; and DEP policy.

Dams are classified in two ways: first, by size based on their height and the amount of water they impound, and second by hazard potential based on the population and properties downstream that would be affected by a dam failure. Dams considered to be of high hazard potential are required to be inspected annually and have Emergency Plans. Dams not considered to be high hazard are inspected less frequently and may not require Emergency Plans.

In addition to dam safety, DEP administers the Commonwealth's flood protection program, of which levees are a common feature. This program involves the evaluation of the need and feasibility of a flood protection project and the design and construction of structures determined to be the most appropriate for a flood-prone community.

<b>FINDINGS</b>	<b>SUMMARY</b>
<b><i>Finding No. 1 – DEP Failed to Adequately Protect Citizens and Property Downstream From High Hazard Dams</i></b>	Of the 793 high hazard dams identified in DEP's database as of September 18, 2006, we found that 406 never had Emergency Plans approved by DEP and 189 had outdated Emergency Plans. During the audit, we visited sites within the flood areas of 14 high hazard dams and found: Of the 34 Special Needs Facilities (e.g. schools, day care centers, and nursing homes) visited, 31 (91 percent) were unaware that they were located within a dam's flood area. Of the 41 county and local government sites visited that were required to have a high hazard dam notice posted, 27 (66 percent) did not. Of the 37 locations required to maintain an Emergency Plan on file, officials at 13 (35 percent) were unable to provide their copy for our review. Additionally, we requested the Emergency Plans for these 14 dams and found: DEP never approved Emergency Plans for four dams; of the ten reviewed, eight had one or more deficiencies. DEP indicated that lack of funding, staffing, and cooperation and understanding from dam owners attributed to these concerns. Failing to ensure that approved Emergency Plans exist and are maintained increases the risk that an effective emergency response will not occur in the event of a dam failure resulting in loss of life and property.

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<b>HIGHLIGHTS OF RECOMMENDATIONS</b>
<p>DEP should:</p> <ul style="list-style-type: none"> <li>• obtain Emergency Plans or updated Emergency Plans for all high hazard dams;</li> <li>• ensure that Emergency Plans are reviewed timely and that all plan information is accurate;</li> <li>• immediately revise its Emergency Plan guidelines requiring dam owners to update the list of and notify all Special Needs Facilities that would be impacted by a dam failure;</li> <li>• verify that required public notices are posted; and</li> <li>• confirm that Emergency Plans are maintained available at all required locations.</li> </ul>

<b>FINDINGS</b>	<b>SUMMARY</b>
<p><b><i>Finding No. 2 – DEP Failed to Ensure the Integrity, Safety, and Stability of Dams through Required Inspections</i></b></p>	<p>For calendar years 2003, 2004, and 2005, of the 793 high hazard dams, we found that, on average, owners of 127 high hazard dams (16 percent) failed to submit to DEP annual inspection reports certified by a professional engineer as required. Additionally, during that same period, DEP failed to perform its own annual inspections, on average, on 109 high hazard dams (14 percent). With respect to non high-hazard dams, which DEP inspects every two years, as of December 31, 2005, we found that DEP failed to inspect 28 of the 263 non-high hazard dams during our audit period. With respect to low hazard dams, which DEP inspects every five years, we found that DEP failed to inspect 485 of the 2,118 low hazard dams within the past five years. DEP management cited insufficient DEP resources and the irresponsibility of dam owners as the causes of these deficiencies. Failure to ensure that dam owners timely submit inspection reports and/or failure to perform its own inspections jeopardizes the health and safety of Commonwealth citizens and property.</p>

<b>HIGHLIGHTS OF RECOMMENDATIONS</b>
<p>DEP should:</p> <ul style="list-style-type: none"> <li>• follow the law and its own policy, obtain sufficient resources, and prioritize efforts in order to (1) annually inspect all high hazard dams, (2) biennially inspect all non-high hazard dams, and (3) inspect all low hazard dams every five years; and</li> <li>• ensure that high hazard dam owners inspect and submit annual inspection reports to DEP in accordance with dam safety regulations.</li> </ul>

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<b>FINDINGS</b>	<b>SUMMARY</b>
<b><i>Finding No. 3 – DEP Failed to Adequately Enforce Dam Safety Law, Regulations, and Policies by Not Penalizing Dam Owners for Violations</i></b>	Even though in 2004 DEP issued violation notices to the owners of 276 dams and in 2006 DEP issued second violation notices to the owners of 46 dams that failed to show any progress toward submitting an Emergency Plan, we found that, as of November 2007, DEP had not assessed any penalties against the owners of 167 of these dams that still did not have an approved Emergency Plan. In addition, for the 57 high hazard dams on DEP’s Unsafe Dams List on September 18, 2006, DEP management stated that it did not issue any formal enforcement actions and elected to not assess any penalties for non-compliance with dam safety regulations during the audit period. In fact, for our entire audit period, DEP only issued two penalties, resulting in the collection of \$3,250, far less than what was available by law. DEP admitted that it stops short of assessing penalties in most cases because penalty dollars reduce the dam owners’ available funds to make repairs and correct the non-compliance. DEP’s failure to take formal enforcement actions, including assessing penalties, has allowed unsafe dam conditions to exist for unreasonable long periods of time.
<b>HIGHLIGHTS OF RECOMMENDATIONS</b>	
DEP should utilize formal enforcement orders and pursue all necessary action to assess penalties when dam owners do not correct unsafe conditions within a reasonable time and/or violate provisions of laws and policies.	

<b>FINDINGS</b>	<b>SUMMARY</b>
<b><i>Finding No. 4 – DEP Failed to Monitor the Conditions of Federal Dams in Pennsylvania</i></b>	DEP acknowledged that it does not have procedures in place to obtain copies of federal dam inspections in order to review, monitor, or evaluate the conditions of the 77 federally-owned dams in Pennsylvania. Additionally, DEP is unaware whether federal dams have updated Emergency Plans to help protect citizens and property downstream from the dams in the event of a dam failure. DEP stated that according to its regulations, federal dams are not under its jurisdiction and, therefore, it has no responsibility for federal dam oversight and monitoring. However, DEP’s lack of federal dam oversight increases the risk of potential loss of life and damage to property.



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<b>HIGHLIGHTS OF RECOMMENDATIONS</b>
<p>DEP should obtain copies of dam inspection reports and determine:</p> <ul style="list-style-type: none"> <li>• the completeness of the inspection performed;</li> <li>• the adequacy of the report itself and any recommendations made in the report to address dam deficiencies noted; and</li> <li>• whether the inspections are performed at regular intervals by qualified individuals compared to DEP's standards for non-federal dams and whether any deficiencies noted are adequately followed up and addressed.</li> </ul> <p>In addition, DEP should review the emergency plans for high hazard federal dams and determine whether these plans are adequate to prepare Commonwealth citizens for the potential hazard of a dam failure.</p>

<b>FINDINGS</b>	<b>SUMMARY</b>
<p><b><i>Finding No. 5 – Current Regulations Requiring Secured Bonding for Certain High Hazard Dams Need Expanded to Include all High Hazard Dams</i></b></p>	<p>We found that DEP regulations only require dam owners to provide proof of financial responsibility (e.g. bonding) prior to the construction or modification of Category 1 (potential for substantial loss of life or excessive economic loss) high hazard dams that are privately owned rather than for all high hazard dams. As a result, as of September 18, 2006, only 30 of 793 high hazard dams have proof of financial responsibility. Without proof of financial responsibility, DEP would be forced to absorb the associated costs of repairing or removing a dam in the event the dam owner cannot or will not maintain its dam. DEP agrees that these regulations are inadequate.</p>

<b>HIGHLIGHTS OF RECOMMENDATIONS</b>
<p>DEP should actively pursue proposed changes to the regulations that would mandate proof of financial responsibility for all high hazard dams.</p>

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<b>FINDINGS</b>	<b>SUMMARY</b>
<b><i>Finding No. 6 – DEP Failed to Enforce Regulations Requiring Dam Owners to Obtain Permits</i></b>	We found that, of the 1,095 dams meeting the requirements to have a permit, 240 (22 percent) did not have a permit as of September 18, 2006. DEP must issue permits to anyone who constructs, operates, maintains, modifies, or abandons a dam, except for the smallest type of low hazard dam. DEP stated that it would not be cost-effective to make a special effort to try to obtain these permits due to the lack of adequate staffing. However, in addition to not collecting permitting fees totaling approximately \$400,000, failing to enforce the permitting increases the risk that dam owners will not be made aware of applicable dam regulations. Consequently, dam owners may not perform required functions.
<b>HIGHLIGHTS OF RECOMMENDATIONS</b>	
DEP should immediately request appropriate dam owners to submit permit applications and related fees. DEP should allocate necessary resources to timely review and issue these permits.	

<b>FINDINGS</b>	<b>SUMMARY</b>
<b><i>Finding No. 7 – DEP Lacked Adequate Accountability and Oversight of Levees in Pennsylvania</i></b>	Although DEP accounts for the 41 state-built levee systems, it was unable to account for the federally-built and private levees in Pennsylvania. Furthermore, DEP failed to ensure that all levees in Pennsylvania were annually inspected. We found that: for calendar years 2002 through 2006, DEP failed to inspect or inspection reports could not be located for between 12 and 39 percent of annual inspections for the 41 state-built levees; DEP does not inspect private levees nor does it ensure that the owners of private levees are conducting annual inspections as required; DEP does not receive or review inspections of federally-built levees to ensure situational awareness of any concerns. In addition, DEP failed to ensure that levee deficiencies noted during annual inspections of the 41 state-built levees were corrected timely. DEP stated that levee accountability and oversight have not been a priority. With respect to state-built levee inspections, DEP stated that the Corps, which orally agreed to inspect half of the 41 levees, failed to inspect them. Furthermore, DEP stated that it elects not to perform inspections of levees that previously were rated as unacceptable. Failure to adequately account for and monitor all levees would limit DEP's ability to evaluate the Commonwealth's state of readiness for a flood or high water event. Furthermore, without ensuring that annual inspections are completed, levee conditions could deteriorate without DEP's knowledge.

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**HIGHLIGHTS OF RECOMMENDATIONS**

DEP should:

- ensure all levees in Pennsylvania are accurately accounted for;
- ensure all state-built levees and private levees are annually inspected;
- obtain federally-built levee inspection reports performed by the Corps and review for Commonwealth impact; and
- review all inspection reports and, for inspections noting deficiencies, work with the sponsors to ensure the deficiencies are corrected timely.

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**BACKGROUND**

The Department of Environmental Protection (DEP) is responsible for regulating and overseeing most dams in Pennsylvania to protect the health, safety and welfare of the Commonwealth's citizens and their property. DEP, through its Division of Dam Safety within the Bureau of Waterways Engineering, and primarily using state funds, is to assure the proper planning, design, construction, maintenance, and monitoring of dams in accordance with the Dam Safety and Encroachments Act, Act 325 of 1978, as amended (act); dam safety regulations; and DEP policy.

In addition to dam safety, DEP administers the Commonwealth's flood protection program to prevent property damage and the loss of life due to flooding. This program involves the evaluation of need and feasibility of a flood protection project, and the design and construction of structures determined to be the most appropriate for a flood-prone community. Levees are a common feature of many flood protection projects and are designed to protect communities against flooding waters. Unlike dams that are constructed for the purpose of storing water, levees are built to hold back floodwaters within prescribed limits. DEP's responsibilities for dam and levee safety are presented separately below:

**Dams**

DEP defines a dam as an artificial barrier, such as an earthen embankment or concrete structure, built for the purpose of impounding or storing water. According to DEP's records, of 3,174 total dams in Pennsylvania as of September 18, 2006 there are 270 state-owned, 469 municipally-owned, 82 county-owned, 2,346 privately-owned and seven dams of unknown ownership. Additionally, DEP identified 77 federally-owned and 16 federally-regulated dams in Pennsylvania. A dam's height and amount of water impounded determine DEP's size classification assigned to all DEP-regulated dams. DEP regulates all non-federal dams located on a natural or artificial watercourse where the contributory drainage area exceeds 100 acres, or the greatest depth of water at maximum storage elevation exceeds 15 feet, or the impounding capacity at maximum storage elevation exceeds 50 acre-feet. DEP also regulates all non-federal dams used for the storage of water not located on a watercourse and which have no contributory drainage area where the greatest depth of water measured at upstream toe of the dam at maximum storage elevation exceeds 15 feet and the impounding capacity at maximum storage elevation exceeds 50 acre-feet. DEP also regulates all non-federal dams used for the storage of fluids or semifluids other than water, the escape of which may result in air, water or land pollution or endanger persons or property. DEP also assigns a hazard classification to each dam according to the loss of life and economic loss expected from the dam's failure. Hazard Classifications of dams include Category 1, Category 2 and Category 3. If a dam is so located as to endanger populated areas downstream in the

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event of its failure, it is classified as a high hazard dam (i.e., Category 1 High Hazard or Category 2 High Hazard). If potential damage downstream is limited to appreciable economic loss and no loss of life, the dam would be classified as Non-High Hazard (i.e., Category 2 Non-High Hazard)." If potential damage downstream is limited to minimal economic loss, the Hazard Potential Classification is Category 3. These dams are often referred to as Low Hazard dams.

Dams are classified according to both size and hazard potential. The size classifications are broken down into three different classes:

- "A." Largest size dam with dam height equal to or greater than 100 feet and/or dam impoundment is equal to or greater than 50,000 acre feet of water at the top of the dam.
- "B." Intermediate size dam that is greater than 40 but less than 100 feet high and/or impounds greater than 1,000 but less 50,000 acre feet of water at the top of the dam.
- "C." Small size dam which is 40 feet or less in height or impounds 1,000 acre feet of water or less at the top of the dam.

Dams are also classified according to their hazard potential. The hazard potential is broken down into three categories as follows:

- "1." Represents a dam where substantial loss of life or excessive economic loss (extensive residential, commercial, agricultural and substantial public inconvenience) in the event of a dam failure. If loss of life is expected, the dam is classified as a high hazard dam.
- "2." This category is further broken down per DEP's interpretation of the law (25 Pa. Code § 105.91) as follows:
  - high hazard – indicates a dam where no more than a few lives lost is expected in the event of a dam failure. Appreciable economic loss (damage to private or public property and short duration public inconvenience) may also be expected.
  - non-high hazard – indicates that potential loss of life is not expected but the potential for appreciable economic loss (damage to private or public property and short duration public inconvenience) does exist.
- "3." Represents a low hazard dam where no loss of life is expected and minimal economic loss (undeveloped or occasional structures with no significant effect on public inconvenience) is expected in the event of a dam's failure.

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For dams classified as Category 1 or Category 2, dam safety regulations require dam owners to develop an Emergency Action Plan (Emergency Plan), which describes procedures to be followed in the event of a dam failure to minimize the risk to citizens and their property within the inundation (flood) area. To assist with Emergency Plan development, DEP provides guidelines to dam owners for Emergency Plan preparation as well as a standardized format for presentation.

As part of the Emergency Plan, DEP requires professional engineers to prepare a dam break or dam breach inundation map (flood area map) that indicates geographic areas subject to inundation from a dam failure. The depth that waters would raise in this delineated area will vary greatly depending on the conditions when the dam actually fails. The limits of the delineated area, both laterally along the stream and longitudinally down the length of the stream demarcate those areas where the rise in floodwaters from a dam failure under the worst case scenario is at least one foot. DEP also requires each dam owner, through consultation with the Emergency Management Agencies (EMA) for all counties impacted by a dam failure, to include in its Emergency Plan the contact information for all local EMAs and emergency responders which would be involved in the emergency response efforts to protect citizens and property. Additionally, as part of the Emergency Plans, the county EMAs must identify the locations of all Special Needs Facilities (facilities) located in the flood area. These facilities have concentrated populations that would need special assistance to remain safe during a dam failure, such as schools, day care centers, nursing homes, and hospitals. This information is critical to ensure that EMAs effectively protect citizens at these facilities. Once completed, the dam owner submits the Emergency Plan for DEP's review and approval. Although DEP originally required Emergency Plans to be updated every two years, DEP revised this policy as of July 2005, increasing the time for updating Emergency Plans to every five years.

In addition to Emergency Plan requirements, dam safety regulations require owners of high hazard dams to submit to DEP annual inspection reports certified by a professional engineer. In addition, owners of all dams are required to inspect their dams every three months according to DEP regulations. However, these inspections are only submitted to DEP upon request. Although not required by law, DEP has established policies to conduct annual inspections of all high hazard dams (non-federal) within the Commonwealth. This decision was made due to the significant risk to citizens' lives and property. Non-high hazard dams and low hazard dams are to be inspected by DEP once every two years and every five years, respectively.

DEP maintains a list of high hazard dams with unsafe conditions, typically identified during a dam inspection, that, if not corrected, could result in the dam failing and ultimately cause loss of life and/or substantial property damage. As of September 18, 2006, DEP included 57 dams on its Unsafe Dams List (see Appendix A). DEP utilizes a database to track the correspondence, corrective actions, and resolution of the unsafe conditions. According to its policy, DEP may utilize enforcement actions to compel dam owners to comply with dam safety laws and policies.

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**BACKGROUND**

DEP's strategy to ensure compliance with dam safety laws and policies is based on its internal enforcement philosophy of voluntary compliance. DEP's techniques to ensure voluntary compliance initially include problem-solving assistance and technical guidance. However, if violators continue to not comply, DEP may initiate stronger enforcement actions, such as issuing notices of violations, or field or administrative orders. The act provides DEP the authority to pursue enforcement of its orders in Commonwealth Court or with the Environmental Hearing Board, both of which may assess penalties against violators.

While DEP monitors and oversees non-federal dams, DEP takes no responsibility for the 77 federally-owned dams located within the Commonwealth, of which 43 are high hazard dams. Inspections of these dams are performed by federal agencies, usually the Army Corps of Engineers (Corps) or the Federal Energy Regulatory Commission. Because DEP considers federal dams to be outside the realm of its jurisdiction, it does not review or monitor the emergency plans or inspection records for federally-owned dams.

Part of DEP's responsibilities also include issuing permits for constructing, operating, maintaining, modifying, enlarging, or abandoning any dam except certain low hazard dams. This requirement allows DEP to monitor compliance with, and make owners aware of, dam safety law and regulations, provide guidance/instruction for the safe design and operation of the dams, and track the dams on its database.

As a prerequisite for a permit to construct or modify a Category 1 high hazard dam, private dam owners must provide "proof of financial responsibility" as security for the dam's continued operations and maintenance during its lifetime. This security can include various instruments, including surety and collateral bonds. The purpose of the bond is to ensure that, if an owner declares bankruptcy or otherwise is unwilling or unable to maintain its dam, DEP has the ability to either make needed repairs or remove the dam.

**Levees**

DEP defines a levee as an earthen embankment or ridge constructed along a watercourse to confine water within prescribed limits. Within Pennsylvania, of the 65 flood protection projects that incorporate levees, 24 were designed and built by the federal government and 41 were designed and built by the Commonwealth. Both state and federal levees are built with local support and involvement. The local government entity, which accepts the role of sponsor, agrees to be responsible for monitoring, operation, and maintenance for the levee. In addition to these levees, there are an unknown number of private levees, which DEP considers to be of relatively low risk because most private levees encountered by DEP had been built by land owners to protect their land or property.

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According to DEP regulations, all levees are subject to an annual inspection to ensure that they continue to provide the designed level of flood protection. However, the Corps is solely responsible for inspecting the federal levees. In addition, DEP indicated that, based on an agreement with the Corps, the Corps is to inspect half the state levees, while DEP is to inspect the other half. DEP does not inspect or track conditions of private levees.

The annual inspection includes a visual assessment and evaluation of the project's condition, which results in a rating of Acceptable, Minimally Acceptable, or Unacceptable. An Acceptable rating indicates the levee will function as designed with a high degree of reliability. Minimally Acceptable indicates one or more deficient conditions exist that must be improved or corrected, such as overgrown vegetation. The levee will essentially function as designed, but with a lesser degree of reliability. An Unacceptable rating indicates one or more deficient conditions exist that may reasonably prevent the levee from functioning as designed, compromising the ability to provide reliable flood protection. Some serious deficiencies include erosion and tree growth.

A levee with an inspection rating of Acceptable or Minimally Acceptable is eligible for the Commonwealth's Flood Protection Grant program. The program's goals are to ensure that flood protection projects are effectively and efficiently operated and maintained, to initiate project improvements, and address non-routine maintenance. The grants are authorized by the Flood Protection Act of 1947, as amended (32 P.S. § 706) and the Administrative Code of 1929 as amended (71 P.S. § 510-5). The grant reimburses sponsors up to 65 percent for project improvements, such as reseeding the levee or eliminating sandbag closures, and non-routine maintenance like replacing safety fencing. The purchase of specialized equipment, such as slope mowers, is also eligible for reimbursement of 50 percent of the cost. Levees with a current inspection rating of Unacceptable are not eligible for grant money because the sponsor has not maintained the project at a functional level.





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**AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY**

**Objectives**

The objectives of this special performance audit were to determine if:

- DEP provides adequate oversight to ensure that dam and levee inspections are performed timely and in accordance with applicable laws and regulations (see Findings 2 and 7);
- DEP monitors dam and levee safety to ensure that deficiencies are timely and adequately addressed/resolved (see Findings 1 through 4, and 7);
- DEP performs an ongoing risk analysis to address dam and levee safety (see Findings 1, 2, 4, 6, and 7); and
- There is proper funding to address dam and levee safety problems (see Findings 1 through 3 and 5 through 7).

**Scope**

Our audit covered DEP's duties and responsibilities with regard to dam and levee safety for the period July 1, 2002 through September 18, 2006.

**Methodology**

The methodology in support of the audit objectives included:

- interviewing and/or corresponding with management from DEP's Division of Dam Safety, the Army Corps of Engineers, officials at county EMAs, management at local municipality buildings, school officials, and management at special needs facilities to gain an understanding of policies and procedures in regards to inspections and emergency preparedness;
- reviewing the Dam Safety and Encroachments Act, DEP's regulations, DEP's Guidelines for Developing Emergency Plans, and Standards and Guidelines for Identifying, Tracking, and Resolving Violations for the Dam Safety Program;
- verifying and analyzing the data from DEP's database for tracking dams and levees;

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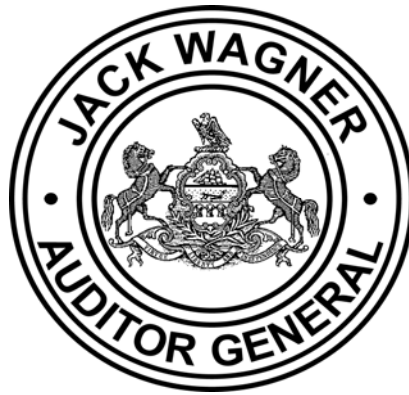
***AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY***

- obtaining and reviewing documentation for a sample of dams to determine compliance with inspection, Emergency Plan, bonding, and permitting requirements;
- obtaining and reviewing the inspection reports for Commonwealth-built levees;
- selecting a sample of Flood Protection Grants to verify compliance with the grant agreements;
- selecting a sample of local municipalities and special needs facilities based on several factors, including the proximity to the dam, location within the dams' flood areas, and if the facility was listed in the Emergency Plans;
- visiting selected local municipality offices and special needs facilities existing in the flood area of several dam sites to verify the completeness and accuracy of Emergency Plans;
- visiting 47 of the 57 dams DEP classified as unsafe as of September 18, 2006; and
- conducting research to identify special needs facilities within the dams' flood areas.

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***FINDINGS AND RECOMMENDATIONS***

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**DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DAM AND LEVEE SAFETY  
JULY 1, 2002 THROUGH SEPTEMBER 18, 2006**

**FINDINGS AND RECOMMENDATIONS**

***Finding No. 1 – DEP Failed to Adequately Protect Citizens and Property Downstream From High Hazard Dams***

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**Condition:** DEP's regulations (25 Pa. Code § 105.134) require owners of each high hazard dam to prepare an Emergency Action Plan (Emergency Plan) and submit it for DEP's review and approval. A high hazard dam is a dam so located as to endanger populated areas downstream by its failure. Potential for economic loss may also exist. An unsafe dam is defined as a dam with deficiencies of such a nature that if not corrected could result in the failure of the dam with subsequent loss of lives or substantial property damage. An Emergency Plan identifies potential emergency conditions at a dam and outlines the coordination of necessary actions by the dam owner and the responsible local, county, and state Emergency Management Agencies (EMA) to ensure timely notification of a dam failure emergency and timely evacuation of citizens.

To assist with evacuation, the Emergency Plan identifies the locations of all Special Needs Facilities (facilities) within the inundation (flood) area. These facilities have concentrated populations that would need special assistance from county and local EMAs to remain safe during a dam failure emergency, such as schools, day care centers, nursing homes, and hospitals.

Additionally, an Emergency Plan lists the locations where public notices must be posted to inform residents of the nearby high hazard dam and where the Emergency Plan is filed for public inspection, including county and local EMAs.

Our audit found the following concerns with DEP's management of Emergency Plans for Pennsylvania's high hazard dams:

**DEP's Five-Year-Update Requirement May Lead to Inaccurate/Incomplete Emergency Plans**

In July 2005, DEP revised its Emergency Plan guidelines. One change involved requiring dam owners to update their Emergency Plans once every five years rather than the previously required every two years. By changing to five years, DEP believed it could rely on the county EMA officials to keep the local EMAs informed and prepared for a dam failure emergency. As noted below, because of the numerous deficiencies we found relating to DEP's review and monitoring of the preparation and implementation of the Emergency Plans, requiring less frequent updates weakens DEP's control and increases the risk for citizens in flood areas.

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**75 Percent of the 793 High Hazard Dams and 70 Percent of the 57 Dams DEP Lists as Unsafe Have Never Had an Approved Emergency Plan or the Plan Was Outdated**

DEP utilizes a computer database to record Emergency Plan information for each high hazard dam. Once we verified the reasonableness and accuracy of these records, we analyzed the file to determine whether DEP had approved up-to-date Emergency Plans for all 793 high hazard dams that existed on the database as of September 18, 2006. Based on our review of these records, we found that DEP never approved Emergency Plans for 406 dams (51 percent) and DEP's last Emergency Plan approval for 189 dams (24 percent) was outdated in accordance with DEP's policy, which required that Emergency Plans be updated every two years. In total, 595 of 793 (75 percent) high hazard dams had deficient Emergency Plans. **Furthermore, of the 406 high hazard dams that never had a DEP-approved Emergency Plan and the 189 dams with outdated Emergency Plans, 40 are listed on DEP's September 18, 2006 Unsafe Dams List (see Appendix A).** For example, DEP records show that, as of September 18, 2006, an Emergency Plan was drafted by the dam owner in October 2004, but not approved by DEP for the Washington No. 3 Dam in Washington County, which was built in 1895. Unsafe conditions at this dam were identified in July 1978, and its failure would impact approximately 10,000 residents, 200 businesses, and 2 schools downstream.

**12 Percent or 74 of the High Hazard Dams That Lacked Current Emergency Plans Were Owned by Commonwealth Agencies**

Of the 406 dams mentioned above that never had DEP-approved Emergency Plans, 63 were owned by Commonwealth agencies. Likewise, of the 189 dams with outdated Emergency Plans, 11 were owned by Commonwealth agencies. In total, 74 of 595, or 12 percent of the dams with no Emergency Plans or out-dated Emergency Plans were state-owned dams. We consider this situation to be unacceptable. DEP should ensure that Commonwealth agencies are setting the example by complying with dam safety regulations.

**Deficiencies Noted as a Result of On-Site Visits to Flood Areas of 14 High Hazard Dams**

After determining the reasonableness and accuracy of DEP's records and the total population of high hazard dams, we selected a sample of 14 high hazard dams, including two identified on DEP's Unsafe Dams List, to determine the effectiveness of DEP's policy and procedures for ensuring the safety and welfare of citizens and property. DEP provided the most current Emergency Plan on file for each of the 14 dams, which were located in ten counties across the state. We reviewed each Emergency Plan to verify compliance with dam safety law and DEP regulations.

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***Finding No. 1***

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We conducted on-site visits within the flood area of these locations to evaluate whether residents and officials were adequately prepared for a dam failure emergency:

- 34 Special Needs Facilities;
- 41 sites required to post notices; and
- 37 sites required to maintain an Emergency Plan copy.

The results of our on-site visits are summarized by individual dam flood area in an attachment to this report (see Appendix B). The following describes in detail the deficiencies noted as a result of these on-site visits.

97 Percent of the Special Needs Facilities visited were unaware that they were located within a dam's flood area and/or were unaware of Emergency Plans, including 13 day care centers, 13 schools, 3 nursing homes, and 2 hospitals

We visited a total of 34 Special Needs Facilities (facilities) located within the flood areas of seven high hazard dams. For the three dams that had an Emergency Plan pending DEP approval, DEP had already approved the flood area map allowing us to identify facilities within the flood area. Based on our interviews at these 34 facilities, we found that 31 facilities (91 percent) were unaware that they were located within a flood area of the dam.

In addition to facilities not being aware of the dams' flood area, management at 33 of the 34 facilities (97 percent) visited stated that they were not aware that Emergency Plans were required to be developed by dam owners.

Furthermore, management at all 34 facilities indicated that neither DEP nor the dam owners contacted them regarding the potential danger of the respective dam. As a result, these facilities stated that their emergency evacuation plans were not specifically designed to protect the facilities' children or residents during a dam failure emergency. In fact, based on these discussions, **we found that some emergency plans direct staff to evacuate individuals to sites that were still within the dams' flood areas.** For example, the emergency plan at a day care center located within the Green Lane Dam's (Montgomery County) flood area directs staff to evacuate children to a nearby shopping center which would also be impacted by flood waters resulting from the dam's failure. Additionally, the principal at an elementary school stated that its evacuation plan is to move the students to three nearby churches. Again, we noted that all three sites were still within the flood area of the Frances Slocum Dam (Luzerne County).



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66 Percent of Sites Visited Did Not Have the Public Notice Posted

We visited a total of 41 county and local government sites required to have a notice posted from 10 of the high hazard dams, and found that 27 (66 percent) did not have the notice posted including: 15 borough, township or city municipal buildings, 5 state police stations, 5 tax offices, 1 county EMA, and 1 fire department. For example, none of the seven locations visited for the Laurel Run Dam (Elk County) had the notice posted. This dam was listed on DEP's Unsafe Dams List as of September 18, 2006 (see Appendix A).

35 Percent of Sites Visited Did Not Have an Emergency Plan on File

We visited a total of 37 locations required to maintain an Emergency Plan on file from 10 of the high hazard dams, and found that officials at 13 (35 percent) were unable to provide their copy for our review, including: three municipal buildings; eight local EMA offices; and two county EMAs. Because most of the dams' flood areas span multiple local municipalities, DEP management stated that county EMAs would most likely take the lead with emergency response efforts needed to protect the citizens downstream from the dam.

Additionally, even though the Emergency Plans we reviewed indicated the locations required to post notices and maintain Emergency Plans, we had to explain to the local officials at nine locations what Emergency Plans and/or Emergency Plan notices were and why they should be on file and/or posted.

10 of 14 Dam Flood Area Sites Visited Had Emergency Plans, but 80 Percent of Those Plans Were Either Inaccurate, Incomplete, or Outdated

During the audit, we also reviewed the 10 Emergency Plans approved by DEP to determine accuracy, completeness, and compliance with DEP regulations. We found that eight (80 percent) Emergency Plans had one or more of the following Emergency Plan deficiencies:

- Two Emergency Plans failed to list a total of five facilities that we identified within the flood areas. We visited these five facilities and noted that two state-licensed day care centers with a combined capacity of 190 children located within the dam's flood area that were not identified in its Emergency Plan. We also visited two day care centers with a combined capacity of 134 children and an assisted living facility housing 59 residents located within the Frances Slocum Dam's (Luzerne County) flood area that were not listed in its Emergency Plan. We verified that these facilities were in existence at the time the Emergency Plans were prepared.

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- Five Emergency Plans did not contain specific contact information for every facility listed as being within the flood areas. For example, the Emergency Plan for the Wilmore Dam (Cambria County) listed four schools within its flood area that would need to be notified in the event of a dam failure; however, the Emergency Plan only contained the names and phone numbers for two of the schools. We asked the county EMA coordinator to identify the names for the two other schools, but the coordinator could not provide them.
- Three Emergency Plan flood area maps did not identify every facility location by name. For example, the flood area map for the Still Creek Dam (Schuylkill County) fails to show the location of one school by name. Maps that specifically show where facilities are located allow emergency responders to quickly determine the most effective measures needed to protect the children or residents at these facilities.
- One Emergency Plan listed a closed facility. It was a parochial high school listed in the Emergency Plan of the Brownell Dam (Lackawanna County). We determined that it was closed in June 2005, approximately one year before the Emergency Plan's approval date.
- Four Emergency Plans were outdated. For example, DEP's latest approval of the Emergency Plan for the DeHart Dam (Dauphin County) was on January 21, 1998. Therefore, it became outdated on January 21, 2000. At the time of our flood area site visit, the Emergency Plan was outdated for more than seven years under DEP policy.

**4 of 14 Dam Flood Area Sites Visited Never Had an Approved Emergency Plan**

DEP records indicated that four of the 14 selected dams have never had a DEP approved Emergency Plan. For these four dams, DEP provided draft Emergency Plans that were pending approval.

We also noted that the process for approving Emergency Plans can take several years. For example, according to DEP records, in 2002, DEP approved the Emergency Plan for the Wilmore Dam (Cambria County) more than seven years after the owner submitted the first draft, which indicates in 2002, that DEP had difficulty getting the dam owner to understand what was needed to satisfy the Emergency Plan requirements. The dam owner submitted six drafts before DEP approved the Emergency Plan. Emergency Plans can take 18 months to two years to progress through the review process.

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**Criteria:** According to DEP’s regulations (25 Pa. Code § 105.91), DEP classifies dams based on size and hazard potential that might occur in the event of an operational or structural failure. Dams with the potential to cause loss of life resulting from their failure are classified as “high hazard” dams. An unsafe dam is defined by Pa Code § 105.136 as a dam with deficiencies of such nature that if not corrected could result in the failure of the dam with subsequent loss of lives or substantial property damage. According to 25 Pa. Code § 105.134, effective September 27, 1980, owners of high hazard dams have been required to develop Emergency Plans since September 1980. DEP reviews and approves all Emergency Plans. To help dam owners prepare Emergency Plans, DEP issues guidelines that require dam owners to consult with county EMAs to identify all facilities located within the dam’s flood area. An accurate and complete list of facilities in the Emergency Plans is necessary to ensure that emergency resources are provided to these locations during a dam failure emergency. As part of its Emergency Plan guidelines, DEP encourages dam owners to conduct exercises and communicate regularly with county EMAs because, as stated in these guidelines, “any plan is only effective when people know what to do.”

The Emergency Plans list contact information for key municipal offices and EMAs serving the areas affected by a dam failure and identify the locations required to maintain a copy of the Emergency Plan. DEP regulations (25 Pa. Code § 105.134) also require dam owners to post public notices at the city, borough, or township building, police and fire departments, and the tax collector’s office within each political subdivision located within the dam’s flood area. Notices must also be posted in areas that would be impacted by a dam failure to inform citizens of the dam’s existence and potential danger. The notices must state that an Emergency Plan is available for public inspection at the EMAs serving the flood area. According to DEP’s guidelines, dam owners must submit a statement to DEP certifying that the notices have been posted at the required sites identified in the Emergency Plan and the approved Emergency Plan has been distributed to the required local EMAs.

Additionally, DEP’s guidelines had required dam owners to update the Emergency Plans every two years. A July 2005 policy revision increased this cycle from every two years to every five years. The guidelines also provide a detailed template for dam owners to follow so the necessary information is accurate, complete, and presented in a specific format. An Emergency Plan’s effectiveness, however, also depends on DEP’s timely review and approval. Prudent business practices dictate that Emergency Plans be reviewed and approved timely to ensure they are distributed to county and local EMAs with the most current data available.

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**Cause:** DEP management stated that several reasons have contributed to the backlog of outdated Emergency Plans, inaccurate/incomplete Emergency Plans, and untimely Emergency Plan reviews. However, the main reason is a lack of funding.

**DEP management estimated that more than \$1 billion is needed for safety upgrades at more than 500 dams currently deficient, or projected to become deficient over the next five years.** DEP management stated that the Dam Safety Program is budgeted approximately \$2.2 million annually; however, these funds are only for program operations. None is spent to repair or upgrade dams. Additionally, DEP does not account for funds spent to repair or upgrade dams, because it does not track these costs incurred by dam owners, including other Commonwealth agencies that own dams. In fact, DEP officials represented that requests for capital project funding is the responsibility of the state agency that owns the dam and therefore DEP does not get involved or track capital project funding for other state agency owned dams. In a press release dated November 29, 2007, the Governor stated Pennsylvania invests approximately \$2.8 million each year in flood protection projects, while directing another \$10 million, on average, in bond money for public improvement projects dealing with flood protection.

Other reasons given for the deficiencies we noted are also mostly related to funding and include:

- inadequate DEP staffing;
- a lack of cooperation and understanding from dam owners; and
- a lack of funding available to dam owners to defray the costs of professional services needed to prepare Emergency Plans.

For example, according to DEP records, the owner of seven high hazard dams in Wayne County stated that a lack of time and money has prevented the preparation of the Emergency Plans. The owner explained that its engineer has been too busy with damage repair and recovery from the three floods that occurred over the past two years. Due to the area's apparent susceptibility to flooding combined with the absence of Emergency Plans, there is a greater risk to citizens and property near these dams. Furthermore, DEP's apparent reluctance to penalize dam owners who fail to complete and submit Emergency Plans is discussed in Finding No. 3.

Management at Special Needs Facilities located within the dams' flood areas are not properly prepared for a dam failure emergency because DEP does not require dam owners to notify or provide guidance to these facilities so they are aware of the dam's potential danger and can develop emergency plans specifically for a dam failure emergency.

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Additionally, DEP management stated it lacks the staff and resources necessary to conduct field reviews of sites throughout the dams' flood areas to ensure notices are posted and Emergency Plans are on file at required locations. According to DEP, as of August 2007, only five employees were assigned to the Dam Safety, Monitoring and Compliance Section and one of these positions was vacant. However, to accomplish the mission of the Dam Safety Program, eight full-time equivalent (FTE) positions are assigned to the program throughout DEP's six regions of the Commonwealth to help conduct inspections of high hazard dams, as well as assist with other Dam Safety Program issues. However, these positions are not under the control of Division of Dam Safety; thus, due to regional priorities, such as approving permits for bridges, culverts, stream crossings and the protection of wetlands, dam field reviews/inspections may not be conducted. As a result of the Division of Dam Safety not having control over these FTE positions, these eight positions are not being fully utilized on a yearly basis for the Dam Safety Program, further undermining the Division of Dam Safety's ability to carry out its responsibilities.

Dam Safety officials further stated that they focus available resources on other critical dam safety issues, such as monitoring unsafe dams, advising owners on needed repairs, reviewing permit applications for new dam construction and modification of existing dams, and responding to complaints concerning unauthorized dam construction or modification. DEP relies solely on the dam owner's statement submitted after an Emergency Plan is approved certifying to DEP that the notices were posted and Emergency Plan copies distributed as required.

DEP management stated that it would not be effective to conduct field reviews for posted notices because the law does not specify a period of time that the notice must be posted. DEP believes that posting a notice and removing it the same day would constitute compliance with the law. We disagree with this interpretation. We believe that notices must remain posted as long as a dam's failure threatens the safety and welfare of citizens and property downstream.

Finally, DEP management stated that discussions with state and county EMA officials led to the Emergency Plan update requirement change that became effective in July 2005. DEP believes that it can rely on these EMA officials to maintain an effective state of preparedness during the five-year period between Emergency Plan updates. We disagree with DEP's policy change because it increases the risk to citizens in the downstream flood areas of high hazard dams due to DEP placing greater reliance on third parties, such as the county EMAs, to monitor change within the flood areas.

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**Effect:** Failing to have an Emergency Plan for a high hazard dam increases the risk to Commonwealth citizens because county and local EMAs may be unprepared to provide the most effective emergency response necessary to protect lives and property during a dam failure. Emergency Plan procedures are intended to assure an effective, coordinated emergency response from the EMAs serving the flood areas.

Additionally, Emergency Plans that are outdated or inaccurate/incomplete may reduce the effectiveness of an emergency response by hindering the EMAs' efforts to protect residents. Without an approved, up-to-date, and accurate Emergency Plan to guide the county and local EMAs' response, Pennsylvanians within the flood areas are at greater risk for loss of life and property damage. An effective emergency response depends on coordinated efforts between the Special Needs Facilities' management and the EMAs serving the areas impacted. Furthermore, DEP's failure to ensure that facilities are informed of a dam's potential danger and that appropriate emergency plans are developed increases the risk of an ineffective and uncoordinated emergency response.

DEP's failure to conduct on-site inspections to ensure that notices are posted and Emergency Plans are on file increases the risk that residents, local EMAs, and county EMAs are unprepared for a dam failure emergency. People's lives may be in jeopardy, not only because they are not aware that they live and/or work within the flood area of a high hazard dam, but also because local and county EMAs are unprepared to provide an effective emergency response coordinated with other EMAs.

DEP's untimely Emergency Plan review process increases the risk that a dam emergency may occur before the Emergency Plan is approved and distributed to the appropriate EMAs. Consequently, this increases the risk that EMAs will be hindered in providing the most effective, coordinated emergency response.

Finally, DEP's July 2005 decision to require Emergency Plan updates only once every five years increases the risk to citizens because changes in the characteristics of the flood areas are more likely to occur over the longer period between updates. When considering the deficiencies we found with DEP's review and monitoring of the Emergency Plans, requiring less frequent updates weakens DEP's control over ensuring accurate and complete Emergency Plans.

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**Recommendations:** We recommend that DEP:

1. obtain Emergency Plans or updated Emergency Plans for all high hazard dams, as required, especially for dams owned by Commonwealth agencies;
2. require that Emergency Plans be updated every two years;
3. allocate necessary resources and staffing to ensure that Emergency Plans are reviewed timely and all Emergency Plan information is accurate, and that dams are adequately monitored to ensure compliance with statutes and regulations;
4. immediately revise its Emergency Plan guidelines requiring dam owners to update the list of and notify all Special Needs Facilities that would be impacted by a dam failure during the initial and all subsequent drafts, including any new facilities that open subsequent to the Emergency Plan's approval;
5. provide guidance to help Special Needs Facilities' management develop emergency plans specific to a dam failure;
6. verify required public notices are posted as required;
7. confirm Emergency Plans are maintained at all required locations, especially EMAs;
8. provide better guidance and communication to county and local officials so they may better understand the purpose of Emergency Plans and posting of public notices; and
9. improve its tracking of dam owners' costs to date and projected costs to repair and rehabilitate dams.

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**DEP Response:**

**DEP's Five-Year-Update Requirement May Lead to Inaccurate/Incomplete Emergency Plans**

DEP concurs with the concern underlying this finding, namely that certain information becomes outdated in 5 years, but chose an alternative way to solve this problem. Working in partnership with PEMA and the local emergency management responders who have the best understanding of local conditions, DEP concluded that local information such as contact information needs to be updated continuously which is not possible using the regulatory procedures for updating Emergency Action Plans. Changes to contact information and in the community landscape such as road closings or new development are continuously made at the local level by the County Emergency Management Agency (EMA) coordinators, and they rely upon that locally gathered and compiled information, not the EAP. This local emergency management function was incorporated in 2005 into the DEP/PEMA EAP guidelines, because it enabled immediate updating of local information. Moving the time sensitive material out of the EAP facilitated speedy updating, and simultaneously eliminated the need to undertake the resource intensive multiple agency review process every two years, saving resources. Therefore, the 5 year updating schedule is appropriate, with time sensitive information updating done continuously by the local agency.

**75 Percent of the 793 High Hazard Dams and 70 Percent of the 57 Dams DEP Lists as Unsafe Have Never Had an Approved Emergency Plan or the Plan Was Outdated**

DEP concurs with the information contained in the audit report as it relates to 2002 through 2004. Initiatives begun by the Rendell Administration substantially mitigated the finding by bringing attention to and completion of updated plans, providing a much more positive picture today.

On April 16, 2004, the Administration began an aggressive enforcement initiative to ensure that owners of high hazard dams had an EAP in place to protect the public downstream during an emergency situation. The initiative was focused on owners who had failed to continue a positive momentum toward the development of their EAP over the previous 18-month period. Currently, the owners of 253 of the 276 dams who received Notices of Violation now either have approved EAPs, are in the plan development and approval process, have removed or are in the process of removing their dam, or had their dam reclassified to a non-high classification through detailed engineering studies.



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**DEP Response Continued:**

Overall, the result of the initiative is the following:

- In April 2004, 27 percent of high hazard dams had approved EAPs
- Currently, 65 percent of the 781 high hazard dams in the Dams Inventory have approved EAPs
- 95 percent of high hazard dams are now either approved or actively in the review and approval process
- DEP is tracking progress on the owners of 23 dams who have not yet complied with the Notices of Violation and will pursue further enforcement where necessary
- The 2006 Federal Emergency Management Agency (FEMA) Progress Report on the National Dam Safety Program indicates the national average for all states is 49 percent

DEP concurs with audit data for the audit period of July 1, 2002 through September 18, 2006 as it relates to the EAPs for unsafe dams.

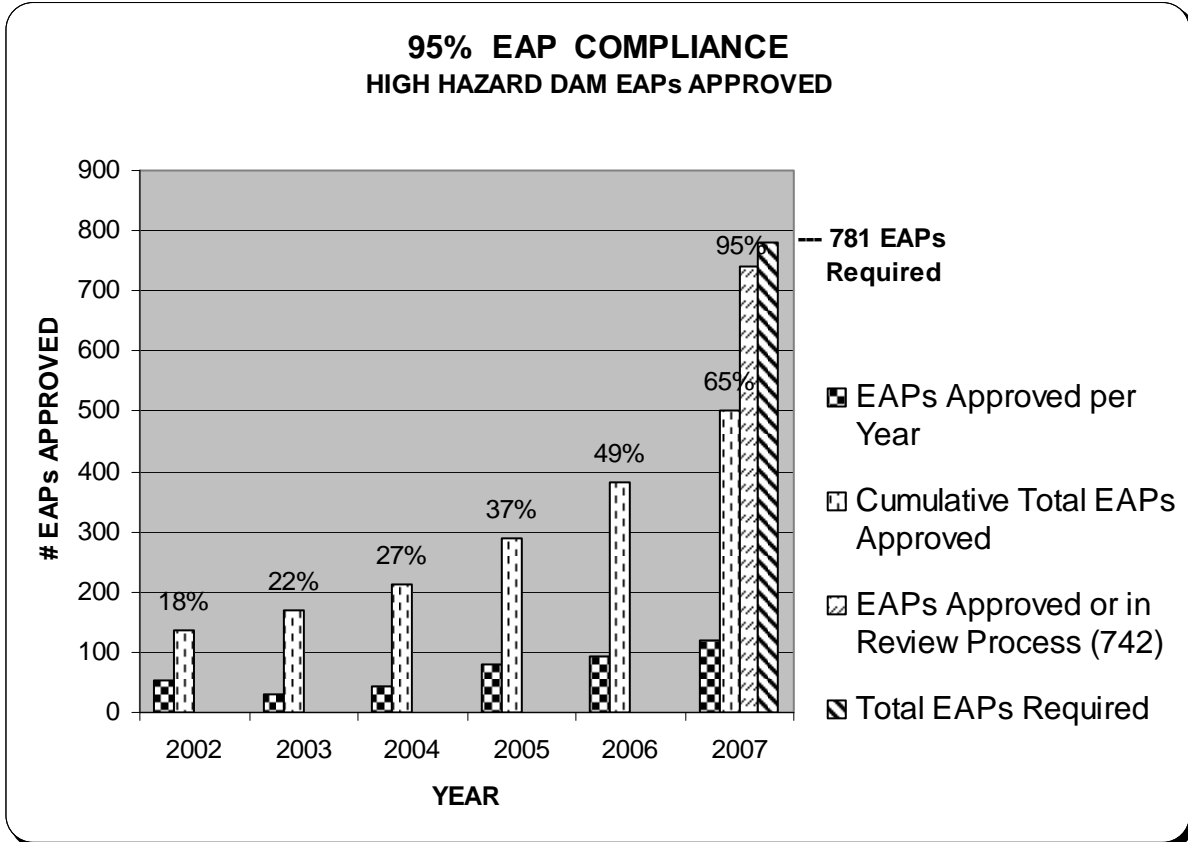
Currently, 49 of the 65 dams on the Unsafe Dam List have approved EAPs. Of the 16 remaining, 12 are in the review and approval process, three are scheduled to be breached, and one is awaiting an ownership decision in court.

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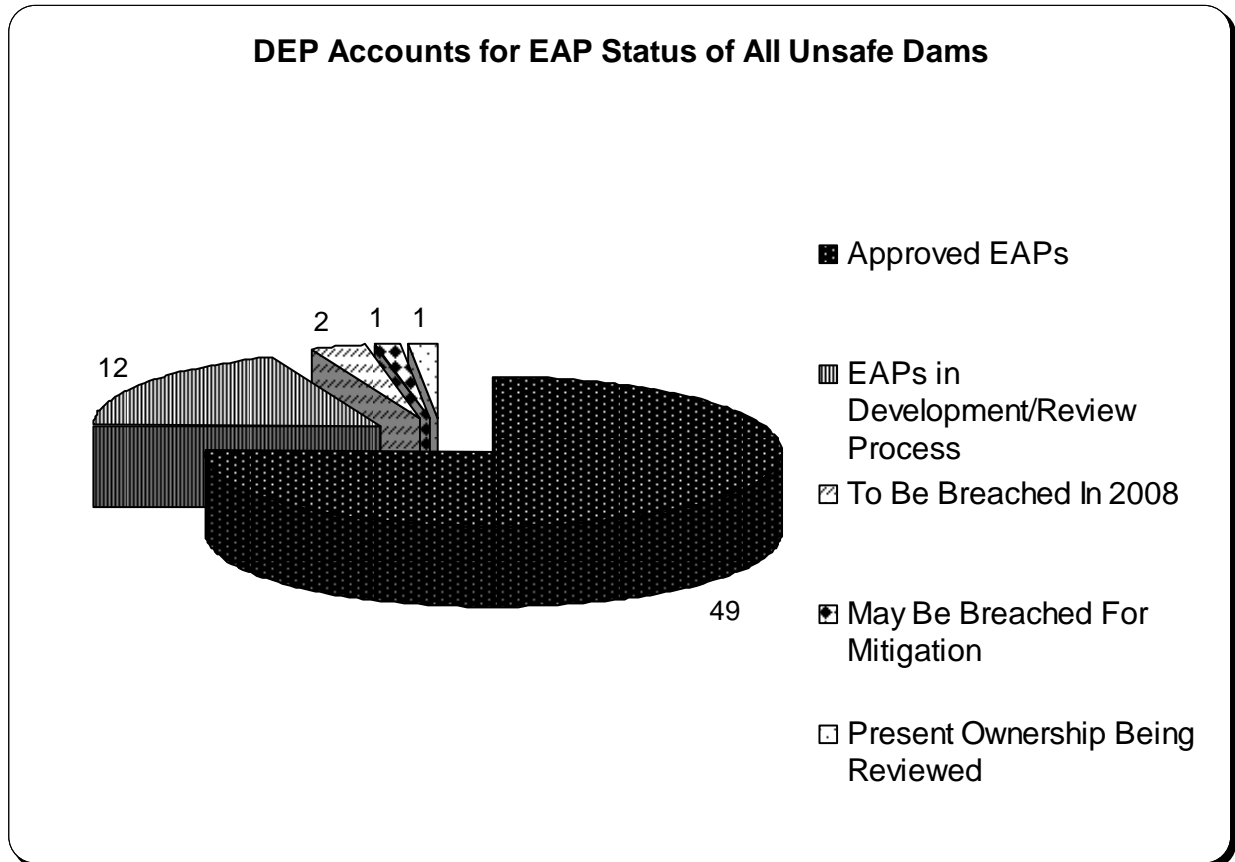
**DEP Response Continued:**



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**DEP Response Continued:**



**12 Percent or 74 of the High Hazard Dams That Lacked Current Emergency Plans Were Owned by Commonwealth Agencies**

DEP concurs with audit data for the audit period of July 1, 2002 through September 18, 2006.

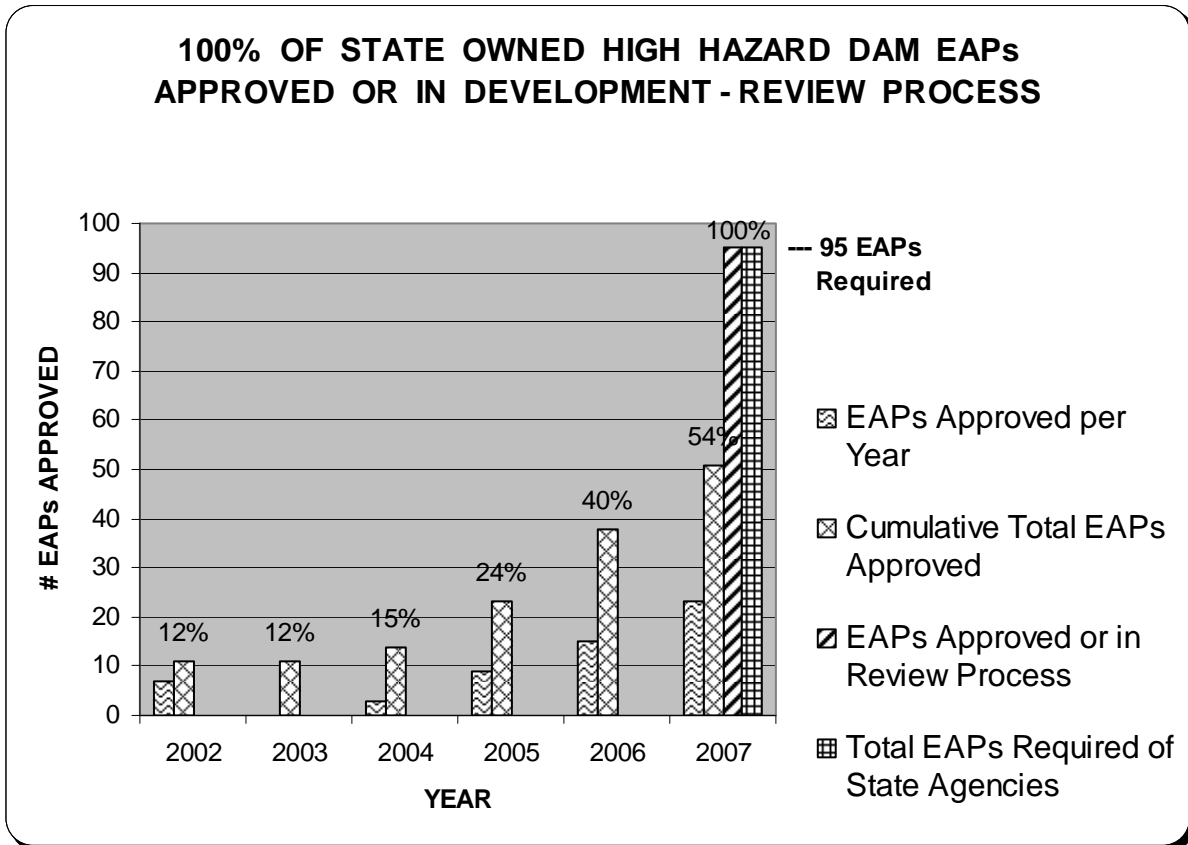
Currently, 100 percent of the 95 state-owned high hazard dams have current EAPs in the development, review and approval process; 63 (66 percent) currently have approved EAPs.

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**DEP Response Continued:**



**Deficiencies Noted as a Result of On-Site Visits to Flood Areas of 14 High Hazard Dams**

DEP appreciates the auditors' observations in this section of the audit as they highlight the need for an increase in state coordination among DEP, PEMA, the Department of Public Welfare, and the Department of Health. As discussed during the audit, DEP is responsible for reviewing the technical aspects of the EAP such as the breach analysis. The review of emergency response agencies and facilities in the inundation area are provided by the county EMA and PEMA.

The following recommendations have been shared with PEMA and the County EMA's who have primary responsibility for emergency response:

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**DEP Response Continued:**

- Provide additional guidance to help Special Needs Facilities' management develop emergency plans specific to a dam failure;
- Provide better guidance to county and local officials so they may better understand the purpose of Emergency Plans and posting of public notices; and
- Provide better guidelines to update the list of and notify all Special Needs Facilities that would be impacted by a dam failure.

PEMA surveyed its County Emergency Management Agency partners regarding these issues. The results of this survey do indicate a need for increased coordination and training of local EMAs, and are listed as responsive to each of the recommendations at the end of Finding No. 1.

DEP concurs that accurate lists of Special Needs Facilities are required to be on hand and outreach provided by local emergency management agencies. However, we do not agree the list should be published in the EAP, because of security concerns. In response to the national effort to improve homeland security, PEMA requested that the specific name of each Special Needs Facility be removed from the EAP. This list could certainly aid a potential domestic or international terrorist with valuable information for determining an attractive target. DEP therefore no longer requires the Special Needs Facilities to be included in the EAP itself. The EAP states that a list be maintained, updated and retained by the county EMA with each review of the EAP. We agree thoughtful work should continue to properly balance the need for local responders to have information related to special needs without advertising vulnerabilities.

**Unsafe conditions at this dam (Washington No. 3 Dam) were identified in July 1978.**

The dam was not unsafe in 1978, but rather in 2001 after new studies and the National Oceanic and Atmospheric Administration revised predictions of Probable Maximum Precipitation (PMP). The current owner only obtained ownership of this dam in 2006. Since that time, DEP has been actively and continuously engaged with the owner. The owner has made progress in the development and approval process of an Emergency Action Plan. However, no progress is apparent toward the rehabilitation of the dam and DEP has specified a deadline for the owner to submit a rehabilitation plan and is preparing the needed enforcement actions to secure compliance.

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**DEP Response to AG Recommendations:**

1. Obtain Emergency Plans or updated Emergency Plans for all high hazard dams, as required, especially for dams owned by Commonwealth agencies.

DEP concurs with the recommendation and this has been accomplished through the EAP enforcement initiative that began on April 16, 2004.

2. Require that Emergency Plans be updated every two years.

We share the auditors concern for accurate emergency information. Evaluating the content of the EAP, DEP and PEMA found that some information needed to be updated more frequently than 2 years, but most of the technical content does not change or require updating every 2 years. By charging County EMAs to separately update information used by local responders which is non-technical and changes rapidly, we can improve accuracy while limiting the updates of the EAP itself and technical review by DEP and PEMA to 5 year intervals. This addresses the underlying concern raised by the audit, but in a more efficient manner.

3. Allocate necessary resources and staffing to ensure that Emergency Plans are reviewed timely and all Emergency Plan information is accurate, and that dams are adequately monitored to ensure compliance with statutes and regulations.

Although DEP's Dam Safety Program has the staff and resources to meet its core mission to protect the health, safety, and welfare of its citizens and property downstream of dams and to execute the requirements of the Dam Safety and Encroachments Act and regulations, the Governor's FY2008-2009 budget includes a significant new investment in engineering and funding for the flood protection and dam safety programs. The Governor's 2008-2009 budget proposal adds nine new positions to further enhance dam safety and flood protection. The Governor's Rebuilding Pennsylvania initiative will also provide \$37 million to repair or remove 17 unsafe state-owned dams and \$6.6 million to create a grant program for unsafe publicly owned dams so they can leverage other dollars to repair or breach their dams.

4. Immediately revise its Emergency Plan guidelines requiring dam owners to update the list of and notify all Special Needs Facilities that would be impacted by a dam failure during the initial and all subsequent drafts, including any new facilities that open subsequent to the Emergency Plan's approval.

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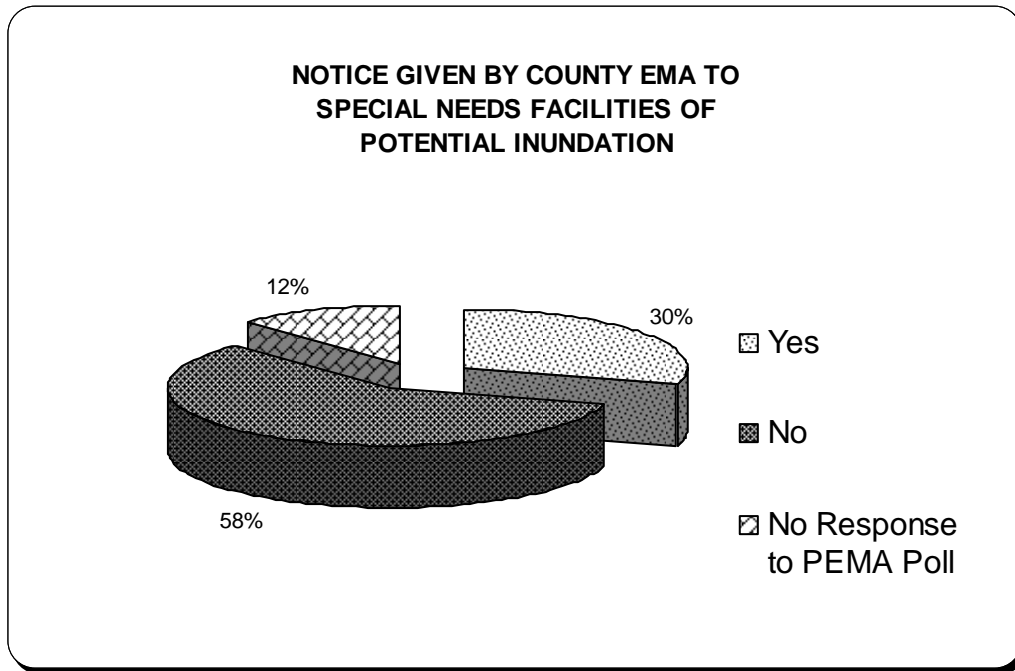
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**DEP Response to AG Recommendations Continued:**

DEP concurs that more coordination among state agencies and county and local EMAs is necessary. In response to our review of the draft audit, PEMA polled county EMAs as to whether any notice is given to Special Needs Facilities that they are within an inundation area of a potential dam failure. The chart below indicates the results of this poll. Clearly more needs to be done in this regard and DEP appreciates the work of the auditors in highlighting this area of needed improvement.



5. Provide guidance to help Special Needs Facilities' management develop emergency plans specific to a dam failure.

DEP concurs that this is a good recommendation that Special Needs Facilities receive guidance with respect to dam failure risks when developing emergency plans. DEP will coordinate with the Pennsylvania Department of Public Welfare (PDPW) and the Pennsylvania Department of Health (PDH). In response to the draft audit recommendations,

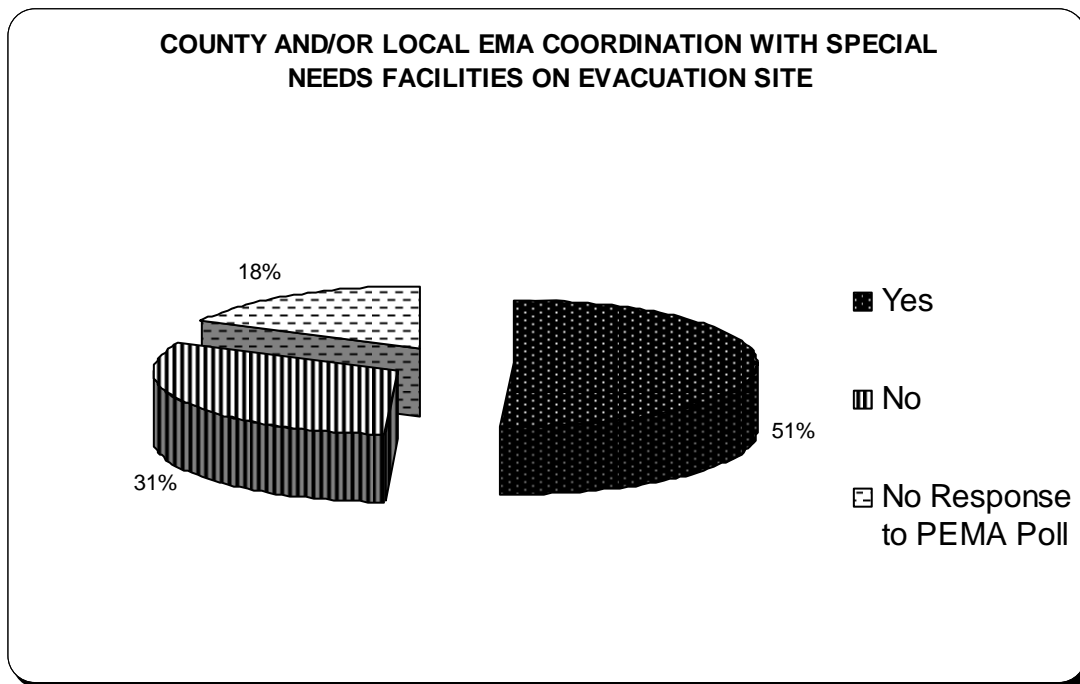
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PEMA polled county EMAs whose jurisdiction these facilities are located within to ascertain whether the county or local emergency responders work with the Special Needs Facilities to ensure their evacuation sites are not within the inundation area of a potential dam failure. The chart below indicates the results of this poll. DEP concurs that this is a good recommendation that Special Needs Facilities receive guidance when developing emergency plans. DEP will discuss with PEMA, PDH and the PDPW the need for coordination and enhanced outreach to Special Needs Facilities on this important issue.



6. Verify required public notices are posted as required.

When DEP approves the EAP, DEP requests a written certification from the dam owner that the notices have been posted and that they distributed the EAP. DEP will institute additional means to verify notices continue to be posted, such as requiring annual certification of the posting by the dam owner or his engineer in conjunction with the submission of the annual inspection report to DEP.



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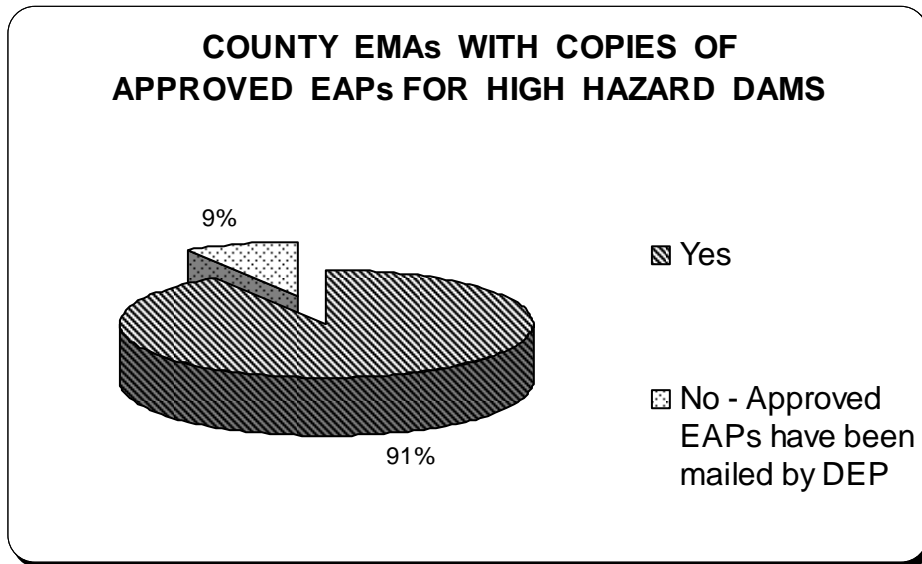
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**DEP Response to AG Recommendations Continued:**

7. Confirm Emergency Plans are maintained at all required locations, especially EMAs.

In response to the draft audit recommendations, DEP asked PEMA whether they could confirm that County EMA's have copies of all EAPs. PEMA has polled all county EMAs to determine whether they have copies of approved Emergency Action Plans for their high hazard dams. The chart below shows the result of that poll. The results indicate that 91% of EMAs did have copies of all EAP's. DEP has resent copies to four counties (6%) that indicated they were missing a few of their copies and to the one county (1.5%) that did not respond to the poll. DEP just learned from this poll that one county (1.5%) lost all of its EAPs in the June 2006 flood. DEP has resent EAPs to this county.



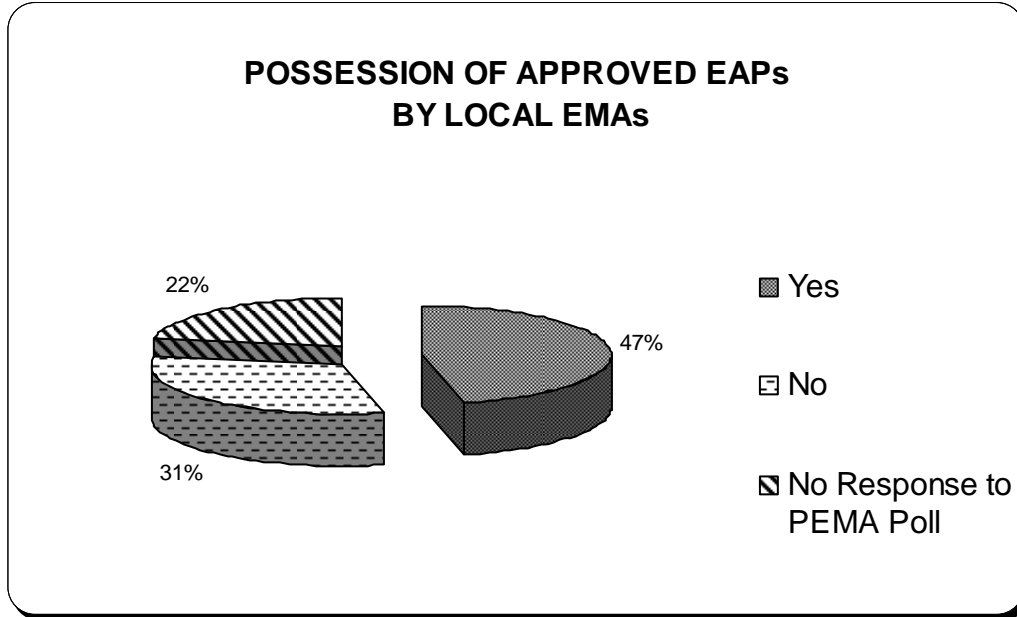
PEMA also posed the question as to whether local EMA's have copies of Emergency Action Plans for high hazard dams located in or impacting their municipality. The chart below shows the results of that poll. DEP will discuss with PEMA this critical need.

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8. Provide better guidance and communication to county and local officials so they may better understand the purpose of Emergency Plans and posting of public notices.

DEP concurs and will work with the dam owners and PEMA will work with the county emergency management officials to provide better awareness and understanding of the regulations.

9. Improve its tracking of dam owners' costs to date and projected costs to repair and rehabilitate dams.

DEP concurs that collecting and tracking these costs would be useful information in projecting statewide dam rehabilitation needs. DEP will modify appropriate construction project completion certification forms to begin collecting this information.

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**Auditors' Conclusion:** We acknowledge DEP's concurrence, in whole or in part, with each of the nine recommendations presented in the finding. Additionally, we acknowledge DEP's validation of the weaknesses identified in the finding through its coordination with emergency management agencies that are reportedly responsive to each recommendation presented. We commend DEP for recognizing the importance and magnitude of our concerns through the corrective actions noted in DEP's response. These corrective actions, which occurred subsequent to our audit period to strengthen some of the weaknesses found during the audit have not been audited by us, but may be evaluated during a follow-up audit.

DEP's response includes figures, percentages, and several charts and graphs that, on the surface, appear to contradict figures presented in the finding. However, we must emphasize that these figures are not comparable to the information that we reported in the finding. Although DEP agreed with our figures during the audit, it now disagrees with our figures that 75 percent of high hazard dams did not have approved, up-to-date Emergency Plans as of September 18, 2006. However, DEP fails to provide a comparable figure. Instead, it presents current figures to show the progress of the 2004 Governor's initiative. Because these figures include Plans that are still in the development and approval process, they may indicate progress, but do not indicate compliance with DEP's regulations and policy related to Emergency Plan submission and revision.

Although DEP concurs with our concerns related to outdated Emergency Plans, DEP's response related to 2006 focuses solely on approved Emergency Plans, disregarding the fact that 189 of them were outdated. As presented in DEP's chart titled, "95% EAP Compliance," DEP indicates that 49 percent of all high hazard dams had an approved Emergency Plan in 2006. However, this figure is incorrect and drops to approximately 25 percent after eliminating the 189 outdated Emergency Plans, which were not in compliance with DEP policy, as noted in the finding. Additionally, DEP's claim of 95 percent Emergency Plan compliance in 2007 is not comparable or relevant to the finding. Again, DEP indicates that this percentage includes not only approved Emergency Plans, but all Plans that are "actively in the review and approval process" leaving 35 percent of the Emergency Plans unapproved for use. Regardless of how DEP identified the Emergency Plans in process, we stress that compliance with DEP's regulations and policy is not achieved until the Emergency Plan is approved, which, as noted in the finding, can take years. Therefore, by considering dams with outdated Emergency Plans and dams with Plans in the approval process to be in compliance, DEP's claim of 95 percent of high hazard dams being in compliance with DEP regulations and policy is misleading.

Although DEP agrees that accurate lists of Special Needs Facilities are essential for the local emergency management agencies' response to a dam failure emergency, it disagrees with the finding's assertion that the lists be included within the Emergency Plans due to homeland security concerns. We question DEP's response. DEP's written guidelines mandate that Special Needs Facilities' information be contained in the Emergency Plan. Various publications of these guidelines (1997 and 2005, updated in 2007) provided to us during this audit require dam owners

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to include the Special Needs Facilities with contact information in their Emergency Plans. If DEP no longer requires such information to be included in the plans, it should revise its guidelines accordingly.

Finally, DEP states that the Washington No. 3 dam was not unsafe in 1978. **However, the finding states *only* that unsafe conditions were identified in 1978, a fact supported by a January 23, 2001, DEP letter to the dam's owner.**

The following are our specific comments regarding DEP's responses to our nine recommendations:

Although DEP's response to recommendation 1 indicates that progress has been accomplished after our audit period, based on figures in its response, we believe program improvements are still needed. DEP's response indicates: 35 percent of High Hazard dams currently do not have approved Emergency Plans, 20 percent of Unsafe High Hazard Dams currently do not have approved Emergency Plans, and 46 percent of State-Owned High Hazard dams currently do not have approved Emergency Plans.

DEP's response to recommendation 2 indicates that it shares our concern for accurate emergency information. However, DEP declines our recommendation to revert back to updating Emergency Plans every two years. DEP states that its current process of charging county EMAs to update non-technical information used by local emergency responders will improve accuracy and the Emergency Plan itself is now reviewed by DEP and PEMA every five years, which DEP states is more efficient. Our concern with this new process, however, is corroborated by DEP's response, which notes: only 47 percent of local (non-county) EMAs have possession of approved Emergency Plans, 58 percent of Special Needs Facilities have not been given notice by county EMAs of potential inundation, and only 51 percent of county and/or local EMAs have coordinated with the facilities on evacuation sites. As a result, we encourage DEP to reconsider its position.

DEP's response to recommendation 3 claims that it has sufficient staff and resources to meet its core mission of protecting the safety of citizens and property downstream of dams and executing the requirements of the laws and regulations. However, throughout the audit and as presented in several findings, DEP management stated that the cause of not performing various duties was because it lacked sufficient staff and funding. Based on our audit, we believe the cause for some of these deficiencies were a result of insufficient staff and funding. Given that the Governor's fiscal year 2008-2009 budget is proposing additional staff and funding, the Administration must agree that DEP needs these resources to help meet its mission. Additionally, the finding noted DEP's estimate that more than \$1 billion is needed for safety upgrades at more than 500 dams currently deficient or projected to become deficient over the next five years.

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DEP concurs with the remaining recommendations; therefore, the finding and recommendations remain as stated.

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**Finding No. 2 - DEP Failed to Ensure the Integrity, Safety, and Stability of Dams through Required Inspections**

**Condition:** As part of our audit, we utilized inspection information from DEP’s database to determine whether Commonwealth dams were inspected in accordance with statutes and regulations. In order to test the integrity of the database, we selected 68 high hazard dams files and requested the latest inspection reports for each. We reviewed the inspection reports for accuracy and to ensure the information agreed to the database. After verifying the accuracy of the database for these inspections, we utilized the data as of September 18, 2006, for data analysis purposes.

DEP’s database consisted of 3,174 dams: 793 high hazard, 263 non-high hazard, and 2,118 low hazard dams. The dams’ hazard classification dictates the frequency of required inspections. High hazard dams require annual inspections by both dam owners and DEP, whereas non-high hazard dams require biennial inspections and low hazard dams require inspections every five years by DEP only. Inspections are meant to safeguard the dam’s integrity, safety, and stability.

With respect to high hazard dams, the following table shows the number of dams **not** inspected during calendar years 2005, 2004, and 2003 by either the dam owner, DEP, or both:

**No Inspections for High Hazard Dams  
By Calendar Year**

<b>HIGH HAZARD DAM ANNUAL INSPECTION STATUS</b>	<b>Number of Dams without Inspections</b>			
	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>Three year average</b>
<b>No Inspection Submitted by Dam Owner</b>	143	111	128	127
<b>No DEP Inspection</b>	55	151	120	109
<b>No Dam Owner Inspection AND No DEP Inspection</b>	31	41	52	41

As illustrated in the table, dam owners failed to submit inspection reports for an average of 16 percent of the 793 high hazard dams that existed in the state over the three-year period. We also noted that, for nine high hazard dams, no inspections occurred over the entire three-year period by either DEP or the dam owner. In addition, over the three-year period, 10 dams noted in the table as not submitting owners annual inspections reports were owned by state agencies. Also, DEP failed to inspect 18 dams owned by state agencies. DEP’s inspections of high hazard dams are not as comprehensive nor meant to serve as a replacement for inspections conducted by dam owners.

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With respect to the other dam classifications, as of December 31, 2005, we found 28 non-high hazard dams and 485 low hazard dams not inspected by DEP. Inspections by dam owners for these dam classifications are not required to be submitted to DEP and, as such, are not included in DEP's database.

***Criteria:*** As explained in the Background, DEP classifies dams according to their size and hazard potential. A high hazard dam is defined as a dam where loss of life is expected in the event of a dam failure. A non-high hazard dam is a dam that has no potential loss of life expected but does have potential for economic loss in the event of failure. "Low hazard dam" is a term often used by the dam safety community and the regulated community to refer to a hazard potential Category 3 dam where no loss of life and minimal economic impacts are expected in the event of failure. According to DEP's regulations (25 Pa. Code § 105.53), annual reports regarding the condition of a high hazard dam shall be certified by a professional engineer and submitted to DEP by the dam owners on or before December 31 of each year. In addition, owners of all dams are required to inspect their dams every three months according to DEP regulations. However, these inspections are only submitted to DEP upon request. DEP policy requires its own engineers to also inspect all high hazard dams annually. DEP indicated that the additional dam inspections it performs are necessary and consistent with its responsibility to protect the health, safety, and welfare of Pennsylvanians and their property from environmental hazards associated with dams, especially high hazard dams.

Unlike inspections of high hazard dams, state regulations do not require owners of non-high hazard and low hazard dam to conduct inspections that are certified by a professional engineer. However, DEP policy requires their engineers to certify and inspect non-high hazard dams every two years and low hazard dams every five years.

***Cause:*** As noted in Finding No. 1, management indicated that a lack of sufficient resources resulted in its failure to perform dam inspections. Regarding delinquent dam owner inspection reports, DEP management would only cite irresponsibility of the dam owners as the possible cause for the significant number of owners' inspection reports that were not submitted during the audit period. Furthermore, DEP's apparent reluctance to penalize dam owners who fail to conduct annual inspections is discussed in Finding No. 3.

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***Effect:*** DEP's failure to obtain annual inspection reports from owners of high hazard dams and/or failure to perform its own inspections jeopardizes the health and safety of Commonwealth citizens and property. Without annual inspections, the integrity, safety, and stability of these dams are not evaluated in a timely and thorough manner, in accordance with the law and DEP policy, thus creating the potential for unsafe conditions to exist and worsen.

Additionally, DEP's failure to inspect non-high hazard dams and low hazard dams increases the risk to citizens and property. Furthermore, recent residential development of areas downstream of non-high hazard or low hazard dams may not be identified; as a result, dams may be incorrectly classified according to the risk they pose to populated areas. Therefore, without DEP's timely inspections of these dams, there is no assurance that these dams are properly classified and lives and property are not at risk.

***Recommendations:*** We recommend that DEP:

10. follow the law and its own policy, obtain sufficient resources, and prioritize efforts in order to (1) annually inspect all high hazard dams, (2) biennially inspect all non-high hazard dams, and (3) inspect all low hazard dams every five years; and
11. ensure high hazard dam owners inspect and submit annual inspections to DEP in accordance with dam safety regulations.

***DEP Response:*** DEP inspects all high hazard Category 1 and Category 2 dams annually, Category 2 non-high hazard dams biennially and Category 3 dams once every 5 years. While 100 percent inspection rates are not always achieved in each 12 month period, the record shows a high level of success in ensuring timely inspections. **All of the high hazard dams for which there was no annual inspection by DEP or the owner during the audit period have been inspected since the close of the audit period.**

Dams which present a risk to even one person living below the dam are considered "high hazard" and are required to be inspected and certified annually by a licensed professional engineer, and certified reports submitted to DEP. 25 Pa Code Section 105.53. On average, between 2003 and 2005, DEP received professional engineers' reports for 90 percent of high hazard dams. In addition to the required inspections, DEP prioritizes its own discretionary technical inspections of dams based upon public safety concerns such as age and condition of the dam, recent flooding which could affect dam integrity since a previous inspection, and past reliability of owner inspections. On average over the three-year period between 2003 and 2005, 98 percent of high hazard dams were inspected annually by DEP engineers or an engineer engaged by the dam owner.



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Owners are also required to inspect Category 2 non-high hazard and Category 3 dams at least once every 3 months and must retain records of these owner inspections so that they may be provided to the Department upon request.

The number of dams with no owner inspections and those with no owner and DEP inspections are significantly lower than listed in the audit report. See the below table for the corrected DEP numbers and the corresponding percentage of the total required inspections.

<b>HIGH HAZARD DAM ANNUAL INSPECTION STATUS</b>	<b>Number of Dams With Inspections</b>			
	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Three Year Average</b>
<b>Required Inspections Submitted by Dam Owner</b>	<b>89 percent (667)</b>	<b>95 percent (711)</b>	<b>87 percent (659)</b>	<b>90 percent (679)</b>
<b>DEP Inspections</b>	<b>87 percent (701)</b>	<b>82 percent (630)</b>	<b>94 percent (732)</b>	<b>88 percent (688)</b>
<b>Required Dam Owner Inspections DEP Inspections</b>	<b>97 percent (781)</b>	<b>99 percent (761)</b>	<b>98 percent (763)</b>	<b>98 percent (768)</b>

Paragraph 4 of the Condition Statement indicates that dam owners failed to submit inspection reports for on average 16 percent of the 793 high hazard dams that existed in the state over the three-year period. As seen in the table above, dam owners failed to submit inspection reports for an average of approximately 10 percent over that period. The auditor's number of 793 high hazard dams is inaccurate. The accurate number of high hazard dams is 802- 2003; 772- 2004; and 779- 2005 or an average of 784 for the three years. The Department does not require submission of an owner annual inspection report during a year when an owner has an engineer actively engaged in monitoring or design for a rehabilitation project and is already on-site performing that work. DEP still performs an annual inspection though. The number of required owner annual inspection reports was 750- 2003, 747-2004, and 761- 2005 or an average of 752 for the three years. The average number of dams that received no annual inspection over the three-year period is 16 or 2.0 percent of the total of high hazard dams required to have an owner annual inspection.

**A dam which is not inspected in a particular year becomes a priority the following year for DEP inspection, and all high hazard dams not inspected during the audit period have been inspected since the close of the audit period.**

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**Auditors' Conclusion:** We applaud DEP's efforts in ensuring that all high hazard dam inspections have been completed subsequent to the audit period. However, we could not verify this information.

With respect to DEP's disagreement with the number of high hazard dams that were in existence during the audit period, we used DEP's data as of the end of our audit period to determine the number of high hazard dams because DEP represented to us that its database contained only real-time data and that, therefore, it was not possible to go back to prior time periods to retrieve the information as it existed at that time. We must question DEP's ability to now provide such historical data.

Regarding DEP's disagreement with the number of inspections not performed by dam owners and/or DEP, we report the following:

- During the audit, we presented to DEP the number of dam owner and DEP inspections that were not conducted, based on our review of the data as well as our review of certain physical records. DEP's written response provided at that time by the Director of the Bureau of Waterways Engineering concerning its lack of inspections was that DEP is "not required to inspect high hazard dams by either statute or regulations." Additionally, DEP noted only minor differences regarding the number of inspections we presented. We followed up on DEP's stated differences and adjusted our numbers accordingly, which are the numbers presented in the finding.
- DEP's table showing the number of dams with inspections is somewhat misleading. The percentages DEP uses excludes dams that DEP claims were not required to be annually inspected by dam owners during a year. However, according to DEP's regulations, as cited in the finding's criteria section, there are no exceptions to the requirement for dam owners to annually submit inspection reports. As a result, the percentages are artificially inflated.
- Due to the risk of Commonwealth citizens' lives, DEP should have zero tolerance with respect to dam inspections not being conducted. However, based on DEP's table which shows a high percentage of inspections completed, DEP is portraying how well it is performing rather than showing the number of inspections not performed as shown in the finding. Even one high hazard dam not being inspected is one too many. DEP must focus on ensuring that all dams are timely inspected.

As a result, we consider the number of inspections not completed as reflected in the finding to be accurate and, therefore, the finding and recommendations will remain as stated.



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***Finding No. 3 - DEP Failed to Adequately Enforce Dam Safety Law, Regulations, and Policies by Not Penalizing Dam Owners for Violations***

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**Condition:** In order to protect the health, safety, and welfare of people living, working, and owning property near dams, DEP is required to monitor dam owners' compliance with various laws pertaining to proper planning, design and construction, maintenance, and other activities. Based on interviews, data analysis, and the review of DEP documents, we found that DEP failed to adequately enforce compliance with dam safety statutes, regulations, and policies as follows:

- According to DEP records, of the 793 high hazard dams that existed as of September 18, 2006, 406 (51 percent) never had a DEP-approved Emergency Action Plan (Emergency Plan) and 189 (24 percent) had an outdated Emergency Plan as noted in Finding No. 1. During 2004, as part of the governor's dam safety initiative, DEP issued violation notices to the owners of 276 dams who had not complied with past requests to submit their Emergency Plans. The notices advised these dam owners of their legal responsibilities and directed them to establish a schedule to create Emergency Plans. In September 2006, DEP announced that it issued second violation notices to the owners of 46 of the 276 dams because they had failed to demonstrate any substantive progress toward submitting an Emergency Plan. As of November 13, 2007, approximately three-and-a-half years after DEP first issued violation notices for the 276 dams, DEP management stated that 167 dams still do not have an approved Emergency Plan, including 26 dams lacking any notable progress toward submitting their Emergency Plans. Although these violations have continued for an unreasonably long period of time, DEP has not assessed any penalties against the dam owners. We also noted that the figure of 167 dams without an approved Emergency Plan does not take into account the 189 dams with outdated Emergency Plans, which would mean 45 percent were without Emergency Plans or outdated Emergency Plans at that time.
- For the 57 high hazard dams on DEP's Unsafe Dams List at September 18, 2006 (see Appendix A), DEP management stated that it did not issue any formal enforcement actions and elected to not assess any penalties during the audit period for non-compliance with dam safety regulations. Instead, DEP used informal enforcement procedures, such as correspondence requesting compliance, to address the circumstances that caused these dams to be declared unsafe. However, informal enforcement procedures have not worked to ensure deficiencies at unsafe dams are repaired timely. For example, according to DEP's database, one dam in Centre County had unsafe conditions noted as far back as 1967. Numerous memoranda from DEP to the dam owner described the severity of the violations. Although this documentation, dated April 17, 2001, indicates that the condition existed for more

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than 34 years and that the dam's failure could result in substantial loss of life and excessive economic loss, DEP failed to issue any formal enforcement orders and assess penalties to compel the dam owner to make needed repairs. As of September 18, 2006, this dam was still included on DEP's Unsafe Dam List.

Another example included a high hazard dam, located in Luzerne County, which was classified as unsafe in August 1980 because of its seriously inadequate spillway and marginally stable embankment. In 1980, DEP instructed the dam owner to repair and correct the unsafe conditions. In a second letter, dated July 5, 1983, DEP stated that there was no indication of any effort made to remedy the unsafe conditions. In November 2003, more than 23 years after the initial notification of the unsafe conditions, DEP and the owner's engineer finally agreed to an adequate spillway design, however, no formal enforcement order or penalty was issued. As of December 2007, these unsafe conditions still have not been corrected.

We also reviewed DEP records for the 57 unsafe dams to determine if their Emergency Plans were approved and up-to-date. We found that 31 (54 percent) did not have an approved Emergency Plan, and nine had an outdated Emergency Plan (see Appendix A).

- For the 382 annual inspection reports that high hazard dam owners failed to submit during the calendar years 2003, 2004, or 2005, as noted in Finding No. 2, DEP only assessed and collected one penalty from one dam owner.
- DEP only issued two penalties, totaling \$3,250, during the entire audit period. Both resulted from settlement agreements with the dam owners who violated dam safety law. These lenient penalty amounts were far less than what was available by law to enforce dam safety compliance. DEP could have assessed more than \$1 million for one penalty, but only assessed \$2,500. For the other penalty, DEP threatened to penalize a dam owner \$1,500 for failing to submit an annual inspection report, but offered to avoid litigation in the same letter for only \$750.

The weaknesses noted above illustrate DEP's apparent reluctance to pursue formal enforcement actions against dam owners, including penalty assessments, to ensure compliance with dam safety laws and policies. Additionally, the unreasonably long periods of non-compliance indicate the ineffectiveness of DEP's current compliance enforcement strategy.

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**Criteria:** According to the Dam Safety and Encroachments Act, as amended (act), DEP may issue enforcement orders to dam owners to aid in the enforcement of the dam safety program provisions. Any person violating or failing to comply with an enforcement order shall be deemed to be in contempt of that order. If this occurs, DEP has the authority to pursue the matter in Commonwealth Court, which may result in the court's order for the dam owner to immediately and fully comply with DEP's order and an assessment of civil penalties not less than \$100 or greater than \$10,000 per violation, plus \$500 for each continuing day of violation. Additionally, DEP may petition the Environmental Hearing Board to assess a civil penalty not to exceed \$10,000, plus \$500 for each day of continued violation, against a dam owner for violating a provision of the act, whether it was willful or not.

**Cause:** According to management, the goal of DEP's enforcement policies is compliance, not punishment. It views penalties as an "after-the-fact" financial punishment for harm caused by violating the law or willful disregard of the law after the matter has been resolved, not while the issue is ongoing. Management also stated that, because the correction of a significant violation is likely to take years to complete and cost the dam owner from thousands to millions of dollars, in some cases, assessing a penalty in addition to these costs is a marginally useful tactic, and more often counter-productive. According to DEP, it utilizes formal enforcement actions against dam owners, but admitted that it stops short of assessing penalties in most cases because penalty dollars reduce the dam owners' available funds to make repairs and correct the non-compliance issues.

**Effect:** DEP's failure to take formal enforcement actions, including assessing penalties, to ensure compliance and protect the health and safety of Commonwealth citizens has allowed unsafe dam conditions to exist for unreasonably long periods of time. Without stringent enforcement of dam safety laws and policies, including penalty assessments when warranted, DEP has not fulfilled its responsibility to protect the people and property downstream from high hazard dams. Additionally, DEP's failure to pursue penalties, because it does not want to impair the owner's ability to pay for needed repairs, results in the loss of revenue which could assist in funding its dam safety operations. In addition, the lack of stringent enforcement may contribute to consistent non-compliance with dam safety regulations by dam owners who know DEP is reluctant to take punitive actions against them.

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**Recommendations:** We recommend that DEP:

12. utilize formal enforcement orders to ensure dam owners comply with dam safety laws and policies; and
13. pursue all necessary action to assess penalties when dam owners do not correct unsafe conditions within a reasonable time and/or violate provisions of laws and policies, such as failing to submit annual inspection reports or failing to prepare and submit Emergency Plans. Penalties for repeated or continued violations should be progressive to deter future violations and compel dam owners to correct violations timely. This proactive approach will help ensure that DEP protects the health, safety, and welfare of the people and property downstream from high hazard dams.

**DEP Response:**

DEP concurs with the recommendation as it relates to enforcement orders. In 2005, DEP simplified the process of issuing Notices of Violation and Compliance Orders. All regional inspectors, engineers, and compliance and enforcement staff are now instructed to use these enforcement tools to deal with significant violations.

DEP does not fully concur with the recommendation as it relates to penalties. A lack of monetary penalties does not mean a lack of enforcement. The remedy sought on behalf of the public is performance. Correction of deficiencies is paramount for the vast majority of dam safety enforcement actions. This approach ensures cooperation of all but the most blatant violators, and reserves resources needed for expensive repairs. DEP's performance oriented enforcement strategy has resulted in many dams being brought into full compliance with statutes and regulations. **Targeted compliance efforts and not fines have provided for nearly 1,250 dam removals, dam repairs, major dam rehabilitation or new dam construction projects approved by the Dam Safety Program from 1994 through 2007. Since just 2000, 112 high hazard dam projects were completed.**

DEP's enforcement procedures have been successful in ensuring that deficiencies at unsafe dams are repaired in a timely manner. As of March 8, 2008, the Unsafe Dam List includes 65 dams. All 65 (100%) dams are currently moving toward compliance. Of these, 21 are in design or in the process of collecting engineering data necessary for design, 24 state-owned dams will be repaired or removed using the Governor's initiative or have other funding sources, 10 are breached or about to be breached, 9 dams are being rehabilitated or approved for construction, and one is awaiting a court decision on ownership.

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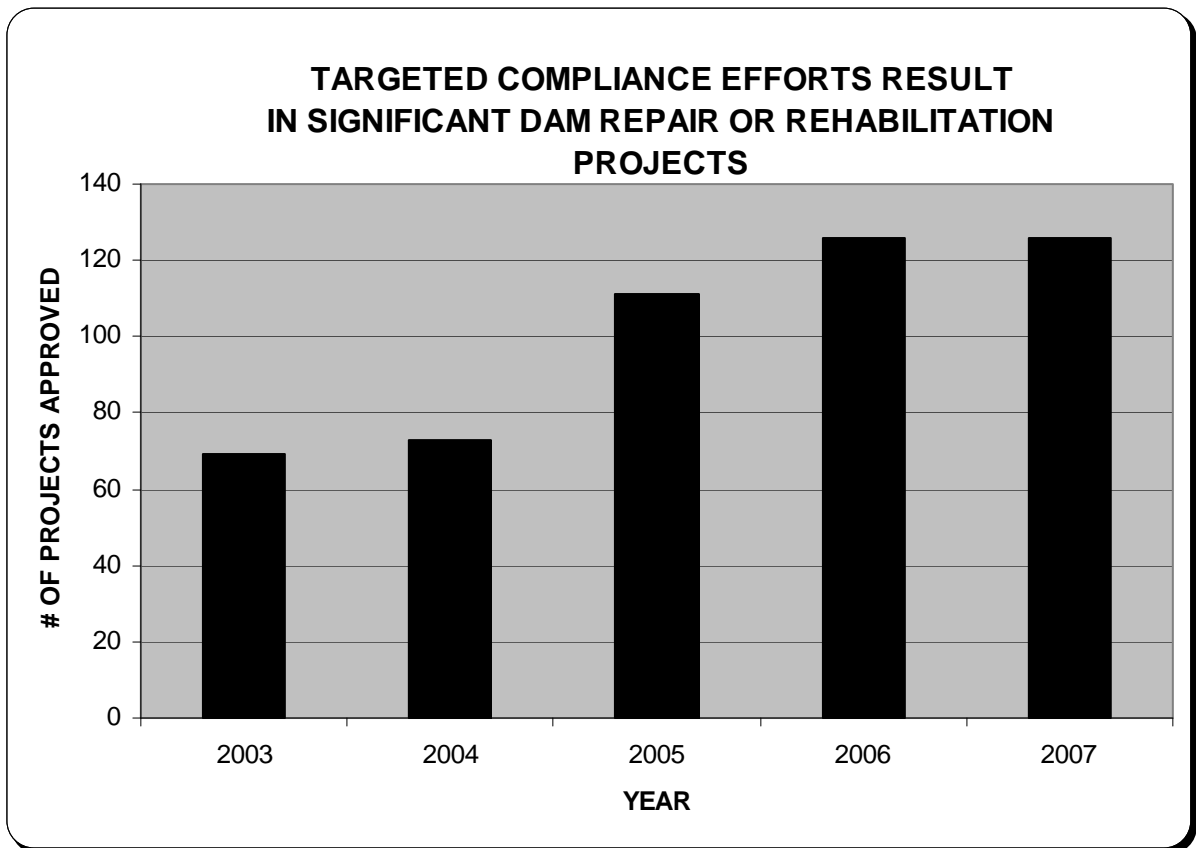
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**DEP Response Continued:**

The audit report references a dam in Center County that the auditors believe had unsafe conditions dating back to 1967. That is not correct- it was not unsafe at that time. After new studies were completed this dam was added to the Unsafe List on April 17, 2001. A Dam Permit for the rehabilitation of this dam was issued June 8, 2007 and construction is scheduled for 2008.

The audit report fails to mention a large penalty assessed in a Commonwealth Court judgment of July 19, 2006. That judgment awarded penalties to DEP up to \$256,000 for a dam owner's long-standing failure to abide by terms of a Consent Order and Agreement to fix or breach the dam. The Court reduced the award to the actual cost incurred by DEP for removal of the dam under a DEP contract (approximately \$67,000). The work was completed in July 2007. A DEP attorney is currently working to recover costs from the dam owner or file a lien on his property.





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**Auditors' Conclusion:** We acknowledge DEP's concurrence with our recommendation to issue formal enforcement orders to ensure dam owners comply with the law and DEP policies. DEP's response indicates that, in 2005, it simplified the process of issuing enforcement orders. Furthermore, DEP states, "All regional inspectors, engineers, and compliance and enforcement staff are now instructed to use these tools to deal with significant violations." DEP, however, does not define whether "now" means in 2005, at the time of the process change, or whether "now" means in 2008. If "now" means 2005, we saw no increase in the number of enforcement orders issued in 2006, even though, as of September 18, 2006, owners of 189 dams failed to submit updated Emergency Action Plans as noted in Finding No. 1 and 57 dams were on DEP's Unsafe Dams List. As a result, DEP's use of formal enforcement orders to correct significant violations appears inadequate during the audit period. Any enforcement policy changes implemented subsequent to the audit period may be evaluated during a follow-up audit.

We can appreciate DEP's philosophy of cooperation with dam owners to foster compliance. However, our analysis of DEP's records did not support its claim that lenient enforcement procedures have ensured that deficiencies at unsafe dams are repaired timely. As presented in the finding, unsafe conditions and significant dam safety violations have existed for unreasonably long periods of time. Additionally, some dam owners have repeatedly violated the law and DEP regulations. Most of these owners never received a formal enforcement order from DEP, and only two were assessed a penalty, as noted in the finding. While DEP asserts that a lack of monetary penalties does not mean a lack of enforcement, we assert that unsafe conditions and significant violations lasting for unreasonably long periods of time at numerous dams across the Commonwealth is the true indicator of DEP's lack of enforcement. Therefore, issuing penalties as allowed would "persuade" dam owners to comply with dam safety law and regulations.

DEP claims that we reported incorrect information regarding the high hazard dam in Centre County and states that it did not have unsafe conditions and was not unsafe in 1967. We emphasize that all information that we have included in the finding is supported by DEP documents, DEP data, and DEP management responses to auditors' questions. ***The finding states and the evidence supplied by DEP shows that unsafe conditions at this dam were noted in 1967.*** An April 17, 2001, letter written to the dam's owner by a former chief of DEP's Division of Dam Safety indicates a 34-year history of unsafe conditions at this dam. DEP's database indicated that only informal enforcement efforts were used during the audit period to compel the dam owner to comply. This is an example of unsafe conditions that have existed for an unreasonably long period of time as a result of DEP's lack of effective dam safety enforcement.

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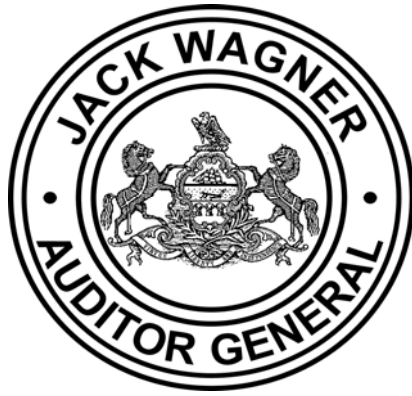
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Finally, DEP's response refers to a large penalty assessed in Commonwealth Court against a dam owner in July 2006. Although DEP management informed the auditors of this court ruling, due to DEP's uncertainty of when or if any funds would be collected, it would have been premature to include it in the audit report. Even so, additional enforcement efforts are needed to ensure that unsafe conditions are repaired in a timely manner.

Based on DEP's response, the finding and recommendations remain as stated.



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**Finding No. 4 – DEP Failed to Monitor the Conditions of Federal Dams in Pennsylvania**

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**Condition:** According to DEP, there are 77 federally-owned (federal) dams located in Pennsylvania as well as 3,174 non-federal dams noted in Finding No. 2. Of the 77 federal dams, 43 (56 percent) are classified as high hazard dams. Inspections of federal dams are performed by federal agencies, usually the Army Corps of Engineers (Corps) or the Federal Energy Regulatory Commission (FERC).

We learned through interviews that DEP has no procedures in place to obtain copies of federal dam inspections in order to review, monitor, or evaluate the conditions of federal dams. In addition, DEP is unaware if the federal dams have updated emergency plans to help protect citizens and property downstream from the dams in the event of a dam failure. It was represented to us by officials in the Corps' Baltimore office that a copy of the Flood Emergency Plan for federal dams is forwarded to PEMA and local municipality officials. However, Dam Safety officials represented to us that they have no communications with PEMA concerning federal dams and without DEP oversight of this process, there is no assurance that these documents are adequately prepared and timely updated to ensure the safety of citizens and property downstream.

DEP's lack of communication with federal agency officials was evidenced by DEP personnel not being able to provide us the names and telephone numbers of any contacts at these federal agencies. Consequently, we identified a general telephone number for the Corps' Baltimore Office in order to inquire about its procedures for inspecting federal high hazard dams within its jurisdiction located in Pennsylvania and whether current emergency plans are in place in case of a federal dam failure. According to officials of the Corps' Baltimore Office, if problems are not found for a particular dam during a period of five consecutive annual inspections and two subsequent biennial inspections, the dam would only be subject to an inspection by the Corps once every five years. This policy is inconsistent with DEP's regulations governing non-federal high hazard dams, which require the dam owner to hire a professional engineer to inspect the dam annually regardless of the results of previous inspections. As for emergency plans, Corps officials stated that, although emergency plans are required to be prepared, several high hazard dams in Pennsylvania were operating with what it considered to be outdated plans as of September 18, 2006.

**Criteria:** A prudent system of controls would dictate that, in order for DEP to ensure the safety and protection of Commonwealth citizens and property, DEP would monitor, review, and evaluate federal dams inspection results to assess the risk to citizens and property within the flood areas of federal dams. Furthermore, DEP should be aware of the emergency plans developed for federal dams, and ensure that appropriate county and local EMAs have copies to promote the most effective response to a federal dam failure.

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**Cause:** DEP management stated that federal dams are not under the jurisdiction of DEP according to its regulations. Therefore, DEP believes that it has no responsibility for federal dam oversight and monitoring. We disagree with DEP's perspective concerning oversight of federal dams. DEP should have procedures to ensure that all dams in Pennsylvania are subject to a thorough periodic inspection and that emergency plans are in place and citizens are aware of such plans. Furthermore, DEP officials should be aware of any deficiencies noted at federal dams so appropriate state and local officials can also be made aware of unacceptable dam deficiencies. This would be more consistent with the Division of Dam Safety's mission statement, which states that the Division of Dam Safety provides for the regulation and safety of dams and reservoirs throughout the Commonwealth in order to protect the health, safety, and welfare of its citizens and their property.

**Effect:** DEP's lack of oversight of federal dams increases the risk of potential loss of life and damage to property. Without DEP being aware of possible federal dam deficiencies through review of federal dam inspection reports, DEP's Division of Dam Safety would not be fulfilling its obligation to protect Commonwealth citizens and property and make them aware of any potentially dangerous dam deficiencies.

Additionally, as a result of DEP not reviewing emergency plans for federal dams, DEP cannot be assured that these plans are current and adequate. This includes ensuring that county and local EMAs are aware of the emergency plans in order to coordinate an effective emergency response in the event of a federal dam failure.

**Recommendations:**

14. At a minimum, DEP should obtain copies of the dam inspection reports prepared by the respective federal agencies and determine: the completeness of the inspection performed from an engineering/technical standpoint; the adequacy of the report itself and any recommendations made in the report to address dam deficiencies noted; whether the inspections are performed at regular intervals by qualified individuals; and whether the classification of the dam is consistent with what is currently in DEP's database.

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15. If dam deficiencies are noted by DEP within the inspection reports reviewed, follow-up procedures including reviewing specific corrective action plans and/or making site visits to observe the deficiencies and restorations process should be performed to ensure that appropriate corrective action is taken to address the deficiencies.
16. DEP should review the emergency plans for federal high hazard dams that meet the criteria for classification as a high hazard dam and determine whether these plans are adequate to prepare Commonwealth citizens for the potential hazard of a dam failure.

**DEP Response:** The Dam Safety and Encroachments Act of 1978 expressly excludes federal dam owners from the list of structures subject to DEP jurisdiction. The act defines person to include, “any natural person, partnership, association, corporation, municipality, municipal authority, receiver of trustee and any department, board, commission or authority of the Commonwealth.” Agencies, departments, commissions or authorities of the federal government are not included in the definition of person and the Department has no power to place any requirement on the federal government as a dam owner. 25 PA Code §105.3(a) further precludes jurisdiction over FERC regulated dams as this section defines the scope of the regulations to include “Dams on a natural or artificial watercourse, *other than those licensed under the Federal Power Act...*” (emphasis added). All federal agencies that own dams have internal dam safety programs.

Therefore, the auditors are correct that we do not review work performed by the federal agencies.

**Auditors’ Conclusion:** Although we acknowledge that DEP does not believe it has jurisdiction over federal dams, that fact in itself does not preclude the need for DEP to be aware of the status of federal dams within Pennsylvania. According to 32 P.S. § 693.17(d), DEP is to “cooperate and coordinate” with appropriate Federal and interstate agencies “for the purpose of assuring efficient regulation, permitting and inspection of dams....” In the event that a federal dam failure occurred in Pennsylvania, DEP would not be hands off because the federal dam was not in its jurisdiction; rather, it would assist in whatever capacity necessary to ensure the safety and security of Commonwealth’s citizens and property. As a result, in order for DEP to adequately fulfill its mission to protect Commonwealth citizens and property, DEP must obtain federal dam inspection reports and emergency plans. Furthermore, DEP should ensure that county and local EMAs have emergency plans of federal dams in order to coordinate an effective emergency response when needed.



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***Finding No. 5 - Current Regulations Requiring Secured Bonding for Certain High Hazard Dams Need Expanded to Include all High Hazard Dams***

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**Condition:** As part of our audit, we noted that the current regulations addressing bonds or other acceptable financial assurance (proof of financial responsibility) requirements for high hazard dams (25 Pa. Code § 105.20) need to be expanded. Title 25 Pa. Code § 105.20 requires dam owners to provide “proof of financial responsibility” prior to the construction or modification of a Category 1 (potential for substantial loss of life or excessive economic loss) dam that is privately owned. However, 25 Pa. Code § 105.20 does not require proof of financial responsibility of Category 2 (few lives lost or appreciable economic loss) high hazard dams. The “proof of financial responsibility” covers security for continued operations and maintenance during the lifetime of the dam, and can include one or more of the following:

1. A certificate of public convenience for the Pennsylvania Public Utility Commission if the owner of the proposed facility is subject to regulation by the Public Utility Code.
2. Ownership or management of the facility by an agency of the Federal, State, county or municipal government or of an interstate compact.
3. A bond or other legal device of a form acceptable to the Department, payable to the Commonwealth, which guarantees proper construction, repair, operation and maintenance, inspection and monitoring, and removal if necessary of the facility.

Of the 793 high hazard dams in DEP’s database, we found that 325 were classified as Category 1 privately owned dams. As of September 18, 2006, 30 of these dams applied for a permit for construction or modification and proof of financial responsibility was appropriately provided. According to DEP, the remaining 295 were not in need of this type of permit in accordance with current regulations. We selected and reviewed one of the 30 files to ensure the accuracy of the proof of financial responsibility information. We found the proof of financial responsibility documents to be accurate and in compliance with all applicable regulations. The purpose of the proof of financial responsibility is to ensure that, if an owner of a high hazard dam declares bankruptcy or otherwise is unwilling or unable to maintain their dam, DEP has the financial capability to either make needed repairs or remove the dam.

Furthermore, according to information obtained from DEP, hundreds of Pennsylvania’s high hazard dams have deficiencies. In addition, in 2004, the Council for Safe Dams published an article in which it indicated that numerous deficient dams in Pennsylvania are essentially time bombs which could be triggered by a major storm event. Accordingly, DEP should secure adequate proof of financial responsibility for all high hazard dams in order to protect people’s lives and to ensure taxpayer dollars are safeguarded.



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***Finding No. 5***

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**Criteria:** Current regulations require proof of financial responsibility for Category 1 high hazard dams that require a new permit or a permit for construction or modification of a dam. Regulations are silent as to the need for proof of financial responsibility of Category 2 high hazard dams. In order to ensure funding is available as a necessary resource in the event the dam owner cannot complete repairs, obtaining “proof of financial responsibility,” such as a bond, is a prudent business practice.

**Cause:** DEP current regulations governing the proof of financial responsibility are inadequate as this requirement does not apply to all high hazard dams. DEP agrees and stated that it is in the process of proposing revisions to these regulations that would assign all high hazard dams (i.e., dams with potential for loss of life upon failure) with a Category 1 Hazard Potential Classification, thereby extending the proof of financial responsibility requirement to all high hazard dams. DEP officials also stated that the change in the regulations is imperative because state and federal funding for the repair or removal of high hazard dams has not been readily available in the past.

**Effect:** Without proof of financial responsibility for all high hazard dams, DEP would be forced to absorb the associated costs since funding for the repair or removal of these dams has not been readily available. As such, the state may be exposed to a large potential liability for the costs to repair or remove these dams. Furthermore, lives may be in danger if proper proof of financial responsibility for the costs is not secured for the high hazard dams that are deteriorating to the point that DEP needs to have the dam repaired or removed and does not have the funds to take appropriate action.

**Recommendation:**

17. DEP should continue with its current ongoing effort to revise regulations that would mandate proof of financial responsibility for all high hazard dams.

**DEP Response:**

DEP concurs with this recommendation. Revisions to the Chapter 105 Dam Safety Regulations have been under development since April 2005 that include new financial responsibility requirements for all high hazard dams. The proposed regulatory revisions will classify any dam that is so located as to endanger populated areas downstream by its failure as a Category 1 dam, thereby requiring all owners of all high hazard dams to provide proof of financial responsibility. Bonds or other acceptable financial assurance will enable the Commonwealth to repair, operate, maintain, inspect, monitor or remove the dam in the event of failure of the owner to comply with orders of the Department or the terms and conditions of the permit.

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**Auditors' Conclusion:** We applaud DEP's efforts in revising its regulations to ensure that all high hazard dam owners provide bonds or other acceptable financial assurance. We hope that the proposed changes are approved and implemented in the near future.



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***Finding No. 6 – DEP Failed to Enforce Regulations Requiring Dam Owners to Obtain Permits***

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**Condition:** As part of our audit, we reviewed DEP’s database to determine whether DEP has issued permits for all applicable dams. After we verified the accuracy of the database regarding permit information we identified the number of dams that did not have a permit as required. We found that, of 1,095 dams meeting the requirement to have a permit, 240 (22 percent) did not have a permit as of September 18, 2006.

**Criteria:** DEP must issue a permit to anyone who constructs, operates, maintains, modifies, or abandons a dam (25 Pa. Code § 105.11). All dams are given an alpha-numeric classification (25 Pa. Code § 105.91). The alphabetical classification is according to size, A through C only, with A being the largest and C being the smallest. The numeric classification is according to hazard potential, Category 1, Category 2 or Category 3. Permitting requirements are waived for size and hazard potential classification C-3 dams if they were constructed prior to July 1, 1979. Permit application fees are \$3,000 for a Class A dam, \$2,500 for a Class B dam, and \$1,500 for a Class C dam not exempted.

**Cause:** DEP officials in the Division of Dam Safety stated that it would not be cost-effective to make a special effort to try to obtain these permits due to the lack of adequate staffing and the staff hours that would be necessary to correspond with these dam owners. However, DEP officials stated that, as time allows and staffing and workload improve, it will require the owners of applicable dams to obtain permits.

**Effect:** Based on the 240 dams not properly permitted, we estimate that DEP has not collected permitting fees totaling approximately \$400,000. Furthermore, DEP’s failure to enforce the permitting of these dams increases the risk that dam owners will not be made aware of applicable dam regulations, such as proper maintenance, inspections, and Emergency Plan preparation. Consequently, dam owners may not perform these functions when required.

**Recommendations:** We recommend that DEP:

18. immediately request appropriate dam owners to submit permit applications and related fees; and
19. allocate sufficient resources to timely review and issue these permits.

**DEP Response:** Currently the Dams Inventory includes 1,077 jurisdictional dams that require permits in accordance with the Dam Safety and Encroachments Act and DEP’s Chapter 105 Rules and Regulations. Of these 1,077 dams, 220 or 20 percent have not been permitted. (The figure of 240 in the audit is incorrect). Most of these unpermitted dams pre-existed the Act and the Rules and Regulations. Of the 220 unpermitted dams, 13 are on the Unsafe Dam List and DEP is working with those owners to correct the deficiencies.

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**DEP Response Continued:**

It is important to keep the purpose of the permit requirement in mind. Specifically, it is to ensure that design and construction of the dam conforms to the regulatory requirements. Therefore, the time to permit pre-existing dams is when they are undergoing some work or modification. Whenever new construction, reconstruction or rehabilitation is planned, DEP requires a complete permit at that time. The Department submits that issuance of an after-the-fact permit for already constructed facilities is more of an administrative exercise than an enhancement to public safety.

Further, unpermitted dams are closely monitored by DEP since they are included in DEP's dam inventory and must comply with the regulatory requirements for Emergency Action Plans, inspection, operation and maintenance and reporting. Today, all new dams or modifications to existing dams are permitted by DEP prior to construction.

**Auditors' Conclusion:** With respect to DEP's comment that the figure of 240 dams not permitted is incorrect, we compiled this information directly from data provided by DEP during our audit. Even though DEP disagrees with this figure, the variance of 20 is insignificant and does not change the substance of the finding.

Although we agree with DEP that most of the unpermitted dams pre-existed the Act and regulations, we disagree with DEP's statement that "the time to permit pre-existing dams is when they are undergoing some work or modification." According to 25 Pa. Code § 105.11(c), the owner of an existing dam who did not have a permit must "apply for and receive a permit to operate and maintain the facility under the act on or before January 1, 1981." In other words, owners of dams existing prior to the Act were required by the Act to obtain a permit. As a result, we believe that DEP is not in compliance with the Act by allowing owners of unpermitted dams to operate and maintain these facilities. Therefore, we reiterate the need for DEP to immediately request owners of unpermitted dams to apply for permits and submit related fees.

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**FINDINGS AND RECOMMENDATIONS**

***Finding No. 7 – DEP Lacked Adequate Accountability and Oversight of Levees in Pennsylvania***

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**Condition:** The Department of Environmental Protection (DEP) lacked adequate accountability and oversight of levees in Pennsylvania. In addition to DEP acknowledging that policies and procedures did not exist for administering the levee program, we noted the following deficiencies:

- DEP did not know how many levees exist in Pennsylvania.

Although DEP accounts for the 41 levee systems built by the Commonwealth (state), it was unable to account for the federally-built and private levees in Pennsylvania. To account for the 24 federally-built levees, DEP had to obtain a listing from the Army Corps of Engineers (Corps). To account for the private levees, DEP created a listing of 26 flood protection projects containing levees or flood walls by using a web-based computer system implemented in 2003. This system tracks permits issued related to construction or modification of flood protection projects. However, this listing was deemed incomplete because it excluded any private levee built or modified prior to 2003.

- DEP failed to ensure all levees in Pennsylvania were annually inspected as required by law.

Annual inspections are to be performed to verify no deficiencies exist to ensure levees are functioning as designed.

**State-built levees**

For the 41 state-built levees, for calendar years 2002 through 2006 we found that between 12 and 39 percent of inspections were not performed or the reports could not be found as noted below:

<b>Calendar Year</b>	<b>Inspections Completed</b>	<b>Inspections Not Completed</b>	<b>Inspection Reports Not Found</b>
2006	36	5	0
2005	30	10	1
2004	25	16	0
2003	36	4	1
2002	27	13	1
<b>Total</b>	<b>154</b>	<b>48</b>	<b>3</b>

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**Private levees**

DEP failed to ensure private levees were inspected. In addition to state-built levees not being annually inspected, DEP does not inspect private levees nor does it verify that the owners of private levees are conducting annual inspections as required.

**Federally-built levees**

With respect to federally-built levees in Pennsylvania, although DEP is not required to inspect federally-built levees, DEP does not receive or review these inspection reports conducted by the Corps to verify they are performed and to ensure situational awareness of any concerns/deficiencies.

- DEP failed to ensure levee deficiencies noted during annual inspections of the 41 state-built levees were corrected timely.

During an inspection, a levee can be rated acceptable, minimally acceptable, or unacceptable:

Acceptable rating - no immediate work required, other than routine maintenance; it will function as designed with a high degree of reliability.

Minimally Acceptable rating- one or more deficient conditions exist that needs to be improved or corrected; it will essentially function as designed but with a lesser degree of reliability.

Unacceptable rating - one or more deficient conditions exist that could prevent the levee from functioning as designed.

We reviewed the annual inspection reports for the 41 state-built levees for calendar year 2006 and found 11 had acceptable ratings, 25 had minimally acceptable ratings, and five had unacceptable ratings. The five rated unacceptable have been rated unacceptable for periods ranging from three to nine years. In regard to minimally acceptable-rated levees, although DEP continues to annually inspect these levees, DEP failed to ensure sponsors corrected noted deficiencies timely. Furthermore, if a levee is rated minimally acceptable for three consecutive years due to the same deficiencies, DEP would downgrade the rating to unacceptable. **However, once a levee is rated unacceptable, DEP not only discontinues annual inspections, but also fails to force sponsors to correct the deficiencies that could prevent the levee from functioning as designed.**

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This policy appears illogical and fails to protect the safety of Commonwealth citizens. When levees become unacceptable, the risk of failure is greater. Therefore, it becomes even more important for these deficiencies to be corrected as well as for DEP to continue to inspect these levees to assess the current deficiencies or to confirm the deficiencies were corrected.

- DEP failed to inspect the work performed or specialized equipment purchased prior to making the grant payments.

DEP issues Flood Protection Grants (grants) to local governments (sponsors) that maintain state-built or federal-built flood protection projects, which may include levees. The local government entity, which accepts the role of sponsor, agrees to be responsible for monitoring, operation, and maintenance for the levee. These grants will reimburse sponsors up to 65 percent for project improvements and non-routine maintenance costs or 50 percent for specialized equipment to monitor, operate, and maintain their flood protection projects. During fiscal year 2005-06, DEP awarded 30 grants for a total of \$662,239. As part of our audit, we reviewed files for five grants totaling \$206,259 and found that project improvements or purchases made for four out of five grants (80 percent) were not inspected prior to DEP disbursing the payments as required per the grant agreement.

- Emergency Plans are not required for levees.

According to DEP officials, there is no law or requirement for the implementation of an Emergency Plan for levee owners. DEP indicated that it developed an Emergency Plan template, dated February 2007 which is subsequent to our audit period, for sponsors to use, which was modeled after the dams Emergency Plan. DEP planned to present the Emergency Plan template at the annual workshop that DEP holds to educate and promote levee operation and maintenance.

**Criteria:** DEP's Bureau of Waterways Engineering plans, designs and inspects flood protection projects for the Commonwealth. It also coordinates efforts with various emergency management agencies, such as, PEMA, for flood-related issues. Strong internal controls dictate DEP should be aware of the entire population of levees in Pennsylvania along with the results of all annual inspections in order to determine the state of readiness to protect Pennsylvania communities and citizens during high water events.



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According to 25 Pa. Code §105.281(a) the owner or sponsor is required to annually inspect the levee or floodwall and submit reports regarding the condition of the flood protection facility to DEP on or before December 31 of each year. Furthermore, the regulations permit DEP to accept equivalent inspection reports prepared by governmental agencies in lieu of inspection reports submitted by owners or sponsors.

With respect to Flood Protection Grants, according to Attachment E to the grant agreement, “The Grantee [sponsor] shall notify the Department upon completion of work to arrange for an inspection of the work.” The local sponsor also receives a letter from DEP stating, “Upon completion of your project’s scope of work, contact this office and request an inspection, then submit an invoice on your letterhead requesting reimbursement.”

Levees provide vital flood protection and, like dams, they have the potential for failure resulting in tragic consequences. Therefore, Emergency Plans should be implemented and kept up to date for all levee systems. An Emergency Plan is a prepared and approved set of instructions that identifies potential emergency conditions at a flood protection project, and prescribes procedures to be followed to help prevent loss of life and minimize property damage. The Emergency Plan should be updated periodically to reflect any changes in site status.

**Cause:** DEP officials stated that levee accountability and oversight have not been a priority. Management indicated that the emphasis and awareness on levees did not occur until recently in the aftermath of Hurricane Katrina. As a result, DEP management acknowledged that accountability of levees in Pennsylvania, including the need for policies and procedures, is in its early stages of development. In addition, inadequate DEP staffing and a lack of funding were identified as contributing factors. DEP officials estimate that \$475 million is needed for flood protection projects across the Commonwealth, which represents the cost to complete every project currently in process. However, because some of these projects are in the preliminary stages and the feasibility studies need to be performed, DEP could not quantify the portion of this amount that specifically related to levees.

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**State-built levees**

With respect to annual inspections of state-built levees not being completed, DEP management provided two reasons:

1. DEP indicated that it has an agreement with the Corps, whereby each governmental entity (DEP/Corps) would annually inspect half of the 41 state-built levees in Pennsylvania. According to DEP, the Corps failed to perform 23 of 48 scheduled levee inspections during calendar years 2002 through 2006; and due to DEP's lack of resources and personnel, DEP was unable to assume the additional workload. We asked for a copy of the agreement, but DEP was not able to provide a copy and indicated they would need to contact the Corps to obtain a copy. However, when DEP inquired with the Corps, it learned that there was no written agreement. According to DEP, each year they meet with the Corps to determine which levees will be inspected by the Corps and which will be inspected by DEP. DEP indicated it has no recourse if the Corps does not complete the inspections it agreed to perform.
2. DEP elects not to perform annual inspections of levees that were previously rated as unacceptable. During calendar years 2002 through 2006, 25 of 48 inspections not performed had unacceptable ratings and, therefore, annual inspections were not conducted. According to DEP, an annual inspection would be performed only when the sponsor informs DEP that it has corrected the deficient conditions.

Although unacceptable rated levees have the greatest potential to fail, DEP does nothing to remedy the problem. DEP explained that, based on past experience, if DEP repaired or provided funding to correct deficiencies found during a levee inspection, it allowed the sponsor to continue to neglect their responsibility to perform routine maintenance; and therefore, this practice was stopped. As mentioned previously, this policy of not inspecting levees rated as unacceptable appears illogical and fails to protect the safety of Commonwealth citizens.

With respect to the missing inspection reports, DEP stated the inspections were performed, but did not know why the reports were missing.

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**Private levees**

With regard to the accounting for and inspections of private levees, DEP officials explained that private levee systems are considered low risk to the Commonwealth due to their nature. Most private levee systems DEP has encountered were built by landowners to protect their own land or property, and are not for the protection of communities as is the case with state and federal levee systems. Furthermore, DEP stated that private levees are not accounted for by DEP because private levees were built several years prior to passage of current laws governing flood protection. We disagree with this policy. DEP should maintain a good system of controls to account for all levees in the Commonwealth.

**Federally-built levees**

Additionally, according to DEP, because the Corps is solely responsible for federally-built levees in Pennsylvania, DEP believes that it has no oversight authority and, therefore, is not responsible for these levees. We disagree. DEP should, at a minimum, be aware of the inspection status and inspection results due to the safety and risk impact to Pennsylvanians.

**Flood Protection Grants**

Finally, regarding the inspection of project improvements or purchases made prior to grant payment, DEP admitted that these inspections are not performed because it believes that the invoice along with a copy of the sponsor's payment is sufficient proof that the equipment was purchased or the work was completed. Furthermore, DEP stated that the work completed or purchases made would be evident in the next annual inspection. However, because these grants can be awarded to sponsors of federally-built levees, which DEP does not inspect, as well as DEP's acknowledgement that it does not have procedures in place to inspect grant work during annual inspections, we question whether post-grant payment inspections are being performed.

**Emergency Plans**

Emergency Plans for levees were not required by law and, therefore, with limited resources and staff, were not a priority for DEP.

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**Effect:** Failure to adequately account for and monitor all levees in Pennsylvania would limit DEP's ability to evaluate the Commonwealth's state of readiness for a flood or high water event. Without ensuring annual inspections are completed, levee conditions could deteriorate without DEP knowledge. Furthermore, levee deficiencies not repaired timely can result in a levee failure, which could potentially lead to loss of life and/or property.

As a result of DEP not reviewing inspections for federal levees, DEP cannot be assured that these inspections are current and accurate. Without DEP being aware of possible federal levee deficiencies through review of levee inspection reports, DEP would not be fulfilling its obligation to protect Commonwealth citizens and property and make them aware of any potentially dangerous levee deficiencies.

Without adequate oversight by DEP, sponsors may be receiving grant monies for work not completed or adequately completed or for specialized equipment not received or used in accordance with the grant agreement.

Finally, lack of Emergency Plans for flood protection projects with levees fails to properly ensure that facilities and residents are informed of a levee's potential danger which increases the risk of an ineffective and uncoordinated emergency response in the event of a levee failure.

An Emergency Plan is needed for the following reasons:

- to preplan the coordination of necessary actions by the sponsors and responsible local, state, and federal emergency organizations;
- to provide timely notification of a flood protection project emergency evacuation in the event of a failure of the project; and
- to minimize the risk of loss of life and reduce the risk of property damage in protected areas resulting from a flood protection project failure.

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**Recommendations:** We recommend that DEP:

20. develop and implement written policies and procedures for the levee program;
21. ensure all levees in Pennsylvania are accurately accounted for;
22. ensure all state-built levees are annually inspected;
23. execute a written agreement with the Corps to establish which state-built levees the Corps will inspect. The agreement should stipulate recourse or, at a minimum, should require timely notice if the Corps will not complete its inspection to allow DEP ample time to complete them;
24. ensure all private levees are annually inspected;
25. obtain federally-built levee inspection reports performed by the Corps and review for Commonwealth impact/risk. If DEP becomes aware of uninspected federally-built levees, it should alert the affected local governments and formally let the federal government know this is unacceptable;
26. review all inspection reports, and for inspections noting deficiencies, work with the sponsors to ensure the deficiencies are corrected timely;
27. ensure grant work is inspected prior to grant payment or, at a minimum, during the next annual inspection;
28. ensure that Emergency Plans are implemented and effective for all levee systems that are protecting communities; and
29. should consider recommending revisions to the current laws to include requirements for levee owners to implement and maintain a current Emergency Plan which would assist DEP in enforcing compliance.

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**DEP Response:** Pennsylvania is one of only a few states that implement a levee inspection program and operates one of the few state-level flood protection programs in the country. Though not required by Law, DEP has been providing oversight and assistance for flood protection projects for decades by performing annual inspections of state-built projects, providing flood protection grants for state and federal projects, and providing technical assistance to project sponsors. Prior to its partnership with the U.S. Army Corps of Engineers (Corps), DEP inspected state-built levees independently. DEP now inspects levees in partnership with the Corps. In addition to designing and constructing major flood protection projects, DEP does many rehabilitation design and construction projects for levee repairs that are beyond the capability of local sponsors to keep the Commonwealth's flood protection facilities in good working order.

**DEP did not know how many levees exist in PA.**

DEP is unclear as to how the auditor reached this conclusion, as we provided the data that appears in this audit report. DEP knows how many levees exist, and maintains a database of state levees that is regularly updated.

DEP's Federal Flood Protection Program works closely with the local municipal sponsors of federal projects. DEP has information on all authorized Corps flood protection projects within Pennsylvania.

DEP's regulatory program tracks permits issued for various activities associated with levees, floodwalls, berms and retaining walls. Of all the waterway related activities authorized by DEP between 2002 and 2006, only 8 projects actually involved flood protection levees and floodwalls. And of those 8, only one permit was issued for construction of a private levee.

**DEP failed to insure that all levees in PA were annually inspected as required by law.**

DEP concurs with the auditor's information showing that 48 levee inspections were not performed during the audit period. However, all required levee inspections have now been performed. DEP and the Corps annually divide the work of levee inspections, and DEP inspects all of the levees assigned to it. The majority of the shortfall was with respect to levees assigned to the Corps. The audit recommendation identifies a need for a procedure for the Corps to notify the DEP sufficiently before the end of the year if the Corps expects to be unable to complete inspections it agreed to perform in order that DEP may schedule inspections.

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**DEP Response Continued:**

DEP failed to ensure private levees were inspected.

This recommendation identifies an improvement that DEP can make to ensure adequate inspection of private levees. Section 105.53 of DEP's Chapter 105 Regulations requires that owners of private levees conduct periodic inspection of their facilities, but does not require the inspection report to be submitted to DEP. DEP intends to add this to the proposed amendments to Chapter 105, and will likewise include permit conditions as appropriate to require submission of inspection reports to DEP.

DEP does not receive or review Corps' inspection reports for federal levees.

Since the Katrina disaster, the resources devoted to levee inspections by the Corps are substantial and DEP believes it is an unnecessary duplication of effort to review reports of federally regulated levees. (See also, response to Finding No. 4).

DEP failed to ensure that levee deficiencies noted during annual inspections of the 41 state built levees were corrected timely.

DEP concurs with the auditor's recommendations that deficiencies noted on levee inspection reports during the audit period needed to be corrected in a more timely manner. In addition to providing written notification of the deficiencies, since 2006, DEP has noted on the inspection report cover letter, the consequences of an Unacceptable rating carries exclusions from:

- Flood Protection Grant Program – Annually, Department of Environmental Protection (DEP) awards over \$500,000 to municipal sponsors to help purchase specialized equipment at 50 percent of the cost, and assist with project improvements and non-routine maintenance at 65 percent of the cost. If the stated deficiencies are not addressed, the project will not be eligible to participate in DEP's Flood Protection Grant Program.
- Flood Disaster Declaration Relief– If flooding occurs and a flood disaster is declared, the project will be denied emergency funding from FEMA.
- Project Repairs through PL 84-99 – The project will be ineligible for the federally funded PL 84-99 program for flood damage repairs. This program pays 80 percent of flood damage repairs and the municipal sponsor is responsible for 20 percent. DEP normally pays the municipality's share. Without this program the project sponsor must pay the entire bill for needed project repairs.

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**DEP Response Continued:**

In 2007, DEP began requesting the submission of written work schedules for addressing deficiencies that have been noted for two consecutive inspections. DEP will strive to improve efforts to correct noted deficiencies in levees.

Once a levee is rated unacceptable, DEP not only discontinues annual inspections, but also fails to force sponsors to correct the deficiencies that could prevent the levee from functioning as designed.

Toward the end of the audit period in 2006, DEP changed its practice to ensure annual inspections of levees with Unacceptable ratings.

In 2007, DEP inspected and met with managers of all Unacceptable rated projects. DEP will continue to closely inspect Unacceptable rated projects in future years. As an example of DEP's success in these efforts (and of hard work by municipal sponsors), the Vintondale Borough levee system was recently improved from an Unacceptable rating to an Acceptable rating, the highest rating granted in the Corps' inspection program.

DEP failed to inspect work performed or specialized equipment purchased prior to making grant payments.

For smaller grant-funded projects and equipment, DEP relies upon the submission of invoices and photographs of the work and materials to verify the purchase or work was completed. Municipal sponsors are required to provide detailed written documentation of expenditures. This information is closely scrutinized prior to authorizing payment. DEP typically inspects the work during the subsequent year's annual inspections.

Emergency (Action) Plans are not required for levees.

DEP's current regulations do not provide the authority to require Emergency Action Plans (EAPs) for levees. DEP concurs with the auditor's viewpoint that EAPs for levees should be a priority and has instituted a voluntary program to gain local flood protection sponsor's cooperation in developing and adopting the plans. In 2006 DEP drafted guidelines to help municipalities develop and implement EAPs. The guidelines were completed in early 2007. During the first year, DEP efforts have resulted in nearly 50 percent of municipal flood protection sponsors responding with satisfactory EAPs. As an incentive for completing the plans, beginning this year DEP will not allow municipal sponsors without plans to take advantage of the Flood Protection Grant Program, with the exception of applying for a grant to develop an EAP.



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**DEP Response to AG Recommendations:**

20. Develop and implement written policies and procedure for the levee program.

DEP's existing regulations provide adequate standards and procedures for the permitting, inspection, and maintenance of levees. DEP intends to develop written guidance to reflect the National Levee Safety Program currently under development.

21. Ensure all levees in Pennsylvania are accurately accounted for.

DEP currently accounts for all state and federal levee projects, as well as privately built levees.

22. Ensure all state built levees are annually inspected.

DEP concurs with this recommendation. All levees are being inspected annually.

23. Execute a written agreement with the Corps to establish which state owned levees the Corps will inspect. The agreement should stipulate recourse or at a minimum, should require timely notice if the corps will not complete its inspection to allow DEP ample time to complete them.

DEP concurs with this recommendation and plans to develop and execute a written agreement with the Corps which identifies inspection responsibilities and notice procedures to assure DEP can cover any levees not inspected by the Corps, in addition to the annual meeting. See [first page of response to Finding 7, paragraph 5.]

24. Ensure all private levees are annually inspected.

DEP intends to improve its ability to ensure inspections have occurred as required by adding to the existing regulatory inspection requirement the requirement that the inspection reports must be submitted to DEP.

25. Obtain federally built levee inspection reports performed by the U.S. Army Corps of Engineers (Corps) and review for Commonwealth impact/risk. If DEP becomes aware of uninspected federally built levees, it should alert the affected local governments and formally let the federal government know that this is unacceptable.

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**DEP Response to AG Recommendations:**

DEP does not agree with the auditor's recommendation to oversee the Corps inspection of federal levees as the Corps is qualified to perform these inspections. We expect to actively participate in the development and implementation of the National Levee Program.

26. Review all inspection reports, and for inspection reports noting deficiencies, work with the sponsors to ensure the deficiencies are corrected timely.

DEP concurs in the recommendation with respect to state-built projects only, and has confidence the current program provides for the review of all Corps inspection reports for state-built flood protection projects and ensures that listed deficiencies are addressed in a timely manner (see discussion number [22] above). With respect to other levees, as discussed in recommendation number [25] above, DEP review of Corps reports would provide little additional public benefit.

27. Ensure grant work is inspected prior to grant payment, or at a minimum, during the next inspection.

DEP agrees and is confident that its grant administration program assures the review of invoices and photographs of the grant-funded work and materials prior to payment, and the inspection of all funded work no later than the subsequent year's annual inspection.

28. Ensure that Emergency Plans are implemented and effective for all levee systems that are protecting communities.

DEP concurs with this recommendation, and initiated a successful voluntary EAP program in 2006, which is being expanded.

29. DEP officials should consider recommending revisions to the current laws to include requirements for levee owners to implement and maintain a current Emergency Plan which would assist DEP in compliance

DEP concurs with the auditor's recommendations for revisions to laws and regulations regarding Emergency Action Plans. Revisions to the Chapter 105 Regulations are now under development that include requiring an Emergency Action Plan for flood protection projects including levees.

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**Auditors' Conclusion:** We acknowledge DEP's concurrence with many of the recommendations presented in the finding. We commend DEP for recognizing the importance of these concerns and the proactive measures it has identified as in progress or planned for future implementation. However, we disagree with DEP's comments related to the following issues:

- DEP stated that its regulations do not require owners of private levees to submit their inspection reports to DEP. However, DEP failed to acknowledge that the same regulations require that the owner provide copies of the inspection reports and records of corrective actions taken to DEP "upon request" (25 Pa. Code § 105.53(5)). DEP should be more proactive on this issue until its revised regulations are approved and implemented.
- DEP stated that its existing regulations provide adequate standards and procedures for the permitting, inspection, and maintenance of levees. However, DEP's existing regulations do not provide adequate procedures to ensure strong internal controls within the levee safety program. As a result, we strongly encourage DEP to develop a policy and procedure manual to administer this program.
- DEP stated that it adequately accounts for all levees. However, during the audit, DEP officials were uncertain as to how many federal levees existed and expressed surprise to learn there were 24 when they provided us a list that we believe was obtained from the Army Corps of Engineers. During the audit, DEP also stated that it has no jurisdiction over federal levees and never indicated that it works with local sponsors of Federal Flood Protection projects as indicated in its response above. With respect to private levees, DEP could not provide a list of private levees when we initially inquired. DEP management stated that it was uncertain as to how many private levees existed. In order for DEP to develop at least a partial private levees list, DEP used information from its permitting system developed in 2003, but acknowledged that it was incomplete.
- DEP indicated that it does not need to obtain and review the federal levee inspection reports. As noted in the finding, the review of the 24 federal levee inspections would be a prudent business practice from an operational awareness standpoint in the event of flooding in Pennsylvania.
- DEP stated that it is appropriate to inspect grant work no later than the subsequent year's annual inspection. However, as stated in the finding, inspections of grant work are required to occur prior to the disbursement of grant payments. Also, because DEP lacked written procedures regarding the inspection of grant work, we encourage DEP to develop procedures to ensure grant work is inspected prior to disbursement of the grant payment to the sponsor.

## ***APPENDIX A***

## APPENDIX A

Unsafe Dams List September 18, 2006						
	Dam Name	County	Year Completed	Population at Risk	Declared Unsafe	Plan Approval Date
1	Lower Hereford Manor	Beaver	Prior to 1958	27	11/19/2002	None*
2	Upper Hereford Manor	Beaver	1958	27	11/19/2002	None*
3	Lake Antietam	Berks	1880	1,500	3/9/2001	None*
4	Furnace Creek	Berks	1960	200	2/27/2001	None*
5	Hollidaysburg Muleshoe Reservoir	Blair	1957	3,100	2/12/2002	10/29/99*
6	Millers Pond	Bradford	Prior to 1919	15	3/16/1998	None*
7	Galvin Pond	Bradford	1966	6	4/24/1996	None*
8	Boydstown	Butler	1896	9,000	2/28/2006	None*
9	Lake Oneida	Butler	1918	9,000	2/14/2006	None*
10	Glade Run	Butler	1955	150	11/19/2002	12/10/2004
11	Salt Run Reservoir	Cameron	1911	388	9/11/1998	5/26/2006
12	Poe	Centre	1938	153	4/17/2001	None*
13	Colyer Lake	Centre	1966	250	11/19/2002	11/20/2001*
14	Warren H Ohl	Clinton	1965	20	6/9/2006	5/10/2004
15	Opossum Lake	Cumberland	1961	50	11/19/2002	10/27/2005
16	Broomall Lake	Delaware	1883	10	5/22/1980	None*
17	H B Norton	Elk	1932	2	4/3/1979	3/25/2004
18	Laurel Run	Elk	1970	500	4/17/2006	None*
19	Colonial No 1	Fayette	1903	12	3/12/1996	None*
20	Crabapple	Fayette	1906	6	7/31/1997	None*
21	Virgin Run Lake	Fayette	1953	3	11/19/2002	2/8/2005
22	Gunter Valley	Franklin	1961	15	2/5/2001	2/14/2001*
23	Ryerson Station	Greene	1960	160	8/16/2005	None*
24	Barr Slope Reservoir	Indiana	1908	60	5/31/2002	None*
25	Kyle	Jefferson	1910	45	11/19/2002	None*
26	Glenburn Pond	Lackawanna	Prior to 1854	465	2/1/2005	2/4/2005
27	Speedwell Forge	Lancaster	1966	250	11/19/2002	7/21/2005
28	Marquette Lake	Lebanon	1943	85	11/15/2004	7/12/2006
29	Leaser Lake	Lehigh	1971	900	5/3/1999	None*
30	Meadow Run	Luzerne	1909	70	8/12/1980	3/29/2001*
31	Bradford City No 2	Mckean	1886	1,200	9/21/2000	1/9/2002*
32	Bradford City No 3	Mckean	1898	1,200	9/3/2004	12/14/2001*
33	Bradford City No 5	Mckean	1957	1,200	3/9/2001	1/9/2002*
34	Marshall Lake	Monroe	1904	3	8/27/1981	12/14/2001*
35	Skytop	Monroe	1930	175	4/10/2006	6/24/2004
36	Minsi Lake	Northampton	1970	150	11/19/2002	None*
37	Lower Owl Creek	Schuylkill	1883	500	9/12/1990	3/16/2006
38	Kehly Run No 3	Schuylkill	1872	1,600	4/12/1984	None*
39	Kehly Run No 5	Schuylkill	1882	1,600	4/12/1984	None*
40	Upper Owl Creek	Schuylkill	1921	500	3/12/2002	3/16/2006
41	Lake Somerset	Somerset	1956	500	11/19/2002	None*
42	Lake Nessmuk (PA-601)	Tioga	1968	1,350	11/19/2002	12/10/2004
43	Chapman	Warren	1949	1,445	3/24/2006	None*
44	Washington No. 3	Washington	1895	10,000	1/23/2001	None*
45	Claysville School Street No. 1	Washington	1926	975	3/28/2006	5/24/2006
46	Canonsburg	Washington	1943	90	11/19/2002	None*
47	Dutch Fork	Washington	1959	1,000	11/19/2002	None*
48	Cadjaw Pond Dam	Wayne	Prior to 1914	82	2/2/1979	None*
49	Lower Woods Pond	Wayne	1848	25	11/19/2002	6/1/2005
50	Belmont Lake	Wayne	1830	75	11/19/2002	11/5/2002*
51	House Pond	Wayne	1925	45	12/18/1996	8/3/2006
52	Gouldsboro Lake	Wayne	1895	100	12/13/2004	None*
53	Sugar Run	Westmoreland	1907	50	7/12/1999	None*
54	Jeannette (Mountain Valley Lake)	Westmoreland	1889	12	5/3/1979	None*
55	Howell	Westmoreland	1910	5	10/10/2001	None*
56	Donegal	Westmoreland	1967	540	11/19/2002	None*
57	Stevens Lake	Wyoming	1961	21	11/19/2002	2/4/2005

\*Plan outdated or never approved by DEP as of September 18, 2006 (total of 40 dams).

Plan - Emergency Plan

***APPENDIX B***

**APPENDIX B**

**Deficiency Summary of On-Site Visits Within the Flood Areas of 14 High Hazard Dams**

<b>HIGH HAZARD DAM INFORMATION</b>			<b>DEFICIENCY</b>					
<b>(as of September 18, 2006)</b>								
<b>Dam Name</b>	<b>County</b>	<b>Year Dam Completed</b>	<b>SPECIAL NEEDS FACILITIES (Deficient/Visited)</b>		<b>COUNTY/LOCAL SITES (Deficient/Visited)</b>		<b>Plan Inaccurate/Incomplete</b>	<b>Plan Pending Approval or Outdated</b>
			<b>Unaware of Flood Area</b>	<b>Unaware of Plan</b>	<b>Without Notice Posted</b>	<b>Without Plan on File</b>		
1. BROWNELL	Lackawanna	1908	5 / 6	6 / 6	1 / 6	2 / 6	1	---
2. C. E. SIEGRIST	Schuylkill	1994	n/f	n/f	3 / 5	0 / 6	---	---
3. DEHART	Dauphin	1940	n/f	n/f	4 / 5	2 / 4	---	Outdated on 1/21/00
4. FRANCES SLOCUM	Luzerne	1965	8 / 8	8 / 8	2 / 2	0 / 0	1	---
5. GREEN LANE	Montgomery	1957	3 / 3	3 / 3	n/a	n/a	n/a	Pending Approval**
6. LAKE MARBURG	York	1967	6 / 7	6 / 7	n/a	n/a	n/a	Pending Approval**
7. LAUREL RUN *	Elk	1970	n/s	n/s	7 / 7	4 / 5	1	---
8. LONG PINE RUN	Adams	1970	2 / 3	3 / 3	4 / 5	0 / 4	1	Outdated on 2/19/05
9. MIDDLE CREEK	Lancaster	1971	n/f	n/f	n/a	n/a	n/a	Pending Approval**
10. SAW MILL	Montgomery	1968	1 / 1	1 / 1	n/a	n/a	n/a	Pending Approval**
11. SPEEDWELL FORGE*	Lancaster	1966	n/f	n/f	3 / 5	3 / 4	---	---
12. STILL CREEK	Schuylkill	1935	n/s	n/s	2 / 2	0 / 2	1	---
13. WILLIAMS RUN	Cambria	1956	n/f	n/f	1 / 3	1 / 4	---	Outdated on 9/24/03
14. WILMORE	Cambria	1908	6 / 6	6 / 6	0 / 1	1 / 2	1	Outdated on 4/12/04
<b>TOTAL</b>			<b>31 / 34</b>	<b>33 / 34</b>	<b>27 / 41</b>	<b>13 / 37</b>	<b>6</b>	<b>8</b>

Note: Of the 793 high hazard dams in PA, we selected these 14 dams and visited the respective flood areas for each dam. We also visited four of the above noted dams.

\* - Dam is identified on DEP's Unsafe Dams List as of September 18, 2006. See Unsafe Dam List at Appendix A.

\*\* - Approval pending at the time of auditors' visit.

n/f – No facilities exist within the flood area.

n/s – No facilities were sampled for this dam because either the site visits were conducted prior to expansion of our testing strategy, or the sites visited were determined to be outside the flood area.

n/a – Deficiency not applicable because Emergency Plan was pending DEP approval and would not have been distributed to the County/ Local sites at the time of our visit.

Plan – Emergency Plan

## ***APPENDIX C***

What follows in Appendix C is the cover letter written by the Secretary of the Department of Environmental Protection (DEP) which accompanied DEP's detailed response to the findings and recommendations included in this report. Since the Secretary's letter related to the entire audit process and not to specific findings, it is included in Appendix C. Also included are additional general comments provided by DEP.



*APPENDIX C*

**Rachel Carson State Office Building  
P.O. Box 2063  
Harrisburg, PA 17105-2063  
March 19, 2008**

**Secretary**

**717-787-2814**

The Honorable Jack Wagner  
Auditor General  
Department of the Auditor General  
229 Finance Building  
Harrisburg, PA 17120-0018

RE: Dam and Levee Safety Programs Audit

Dear Auditor General Wagner:

Thank you for the opportunity to respond to the performance audit report issued by your office for the Dam and Levee Safety Programs.

The Department of Environmental Protection (DEP) takes its mission of protecting the health and safety of the public by administering these two programs very seriously. Pennsylvania has earned a longstanding national reputation for leadership in dam safety since the aftermath of the devastating Johnstown flood of 1977. Since the 1940s, DEP has operated one of the few state-level comprehensive Flood Protection Programs in the nation and levee safety is part of that program. Our dam safety and flood protection engineers are invited to serve in national professional organizations promoting dam safety, homeland security related to dams, and most recently on the newly formed national levee safety panel. Pennsylvania's 2004 compliance initiative to ensure that all high hazard dam owners complete an Emergency Action Plan is a model which will likely be copied by other states.

While we are not in agreement with all of the findings and recommendations, DEP appreciates the effort of your staff in preparing the report and presenting observations that will undoubtedly lead to further enhancement of our programs. Our response attempts to place the snapshot of your audit in the larger context of program development before and after the audit period. We have explained policy choices we make to direct resources to the situations which pose the greatest risk to the public. We are proud of our record of timely discovery and attention to unsafe high hazard dams, which has prevented any loss of life since the 1977 Johnstown flood. However, there is always room for improvement. One of the great challenges to the successful implementation of this program is coordination -- not only among state agencies such as PEMA, Homeland Security and DEP, but also at the County and Local Emergency Management Agency levels. Continuous training and guidance at all levels is essential for flawless emergency response and preparedness.

DEP looks forward to working with you in making further enhancements to the Dam and Levee Safety Programs.

Sincerely,



Kathleen A. McGinty  
Secretary

Enclosure

## *APPENDIX C*

### *ADDITIONAL GENERAL COMMENTS*

#### **DEPARTMENT OF ENVIRONMENTAL PROTECTION DAM AND LEVEE SAFETY PROGRAMS**

One of the unavoidable limitations to an audit is that it can only provide a snapshot of a program; it often records the midstream of program initiatives without knowledge of either the inception or the ultimate results. In our response we will try to bring the snapshot into focus as well as respond to the specific recommendations made by the auditors.

Launched in the aftermath of the tragic Johnstown Flood of 1977, the Department of Environmental Protection's (DEP) Dam Safety Program resolved to prevent loss of life and minimize damage from failure of unsafe dams. The Dam Safety Program oversees the regulation and safety of approximately 3,200 dams and reservoirs throughout the Commonwealth in order to protect the health, safety and welfare of its citizens and property downstream of dams. The goal is to ensure proper planning, design, construction, maintenance, operation, monitoring and supervision of dams and reservoirs. The Dam Safety Program also oversees removal of dams that are no longer needed by their owners.

In 2004, the Administration set in motion vast, far-reaching changes and improvements to the Dam Safety Program. As the result of an unprecedented enforcement initiative launched by this Administration, Pennsylvania's Dam Safety Program is leading the nation in securing compliance with Emergency Action Plan (EAP) requirements from owners of high hazard dams. Hundreds of violation notices were issued to the owners of high hazard dams that failed to have the required EAPs in place and maintain those plans with the most current information. While in 2004, only 27 percent of high hazard dams were in compliance, today the Commonwealth is on track to achieve 95 percent compliance. That compares with an EAP compliance rate of only 49 percent nationally. Through its partnership with the Pennsylvania Emergency Management Agency (PEMA) and county emergency management personnel, the EAP guidelines were revised in 2005 in a manner that ensured the most up-to-date information is available to emergency responders.

DEP operates one of the few state-level comprehensive Flood Protection Programs in the United States. For decades, DEP has responded to the needs of flood prone communities by designing and constructing effective flood protection facilities including channels, culverts, floodwalls and levees. The program evaluates flood prone areas, designs stream improvement and flood protection facilities, and manages the construction of these projects. It also coordinates the planning, design and construction of federal flood control and bank stabilization projects. The Flood Protection Program provides protection to communities during high water events by ensuring in advance that Pennsylvania's flood protection projects, including levees, are in a state of readiness and will function as designed. In a unique partnership with both municipalities and the U.S. Army Corps of Engineers (Corps), DEP provides technical assistance to sponsors for operating and maintaining the projects and also shares the responsibilities of inspecting the projects with the Corps.

## *APPENDIX C*

### *ADDITIONAL GENERAL COMMENTS*

Also in 2004, Pennsylvania's leadership was recognized as Governor Rendell received the Association of State Dam Safety Officials' (ASDSO) National Award of Merit—the organization's highest award given to individuals who have advanced the dam safety cause nationwide. Pennsylvania and ASDSO took a lead role along with federal agencies in formulating the National Dam Safety Program. Pennsylvania's leadership was also recommended by ASDSO to the U.S. Department of Homeland Security to serve as one of only eight states representing state dam safety programs on the US Department of Homeland Security's Dams Sector – Government Coordinating Council in its mission to improve and protect the nation's dam infrastructure as part of the National Infrastructure Protection Plan. Pennsylvania has also been nominated by ASDSO to serve as one of eight state representatives on the newly formed national levee safety panel.

Although the dam and levee safety programs in Pennsylvania are leading the way in many areas nationally, DEP appreciates those recommendations contained in the audit report that may further enhance the programs. Implementation of several of the recommendations was underway when the audit began and DEP will continue moving forward with those improvements. With the support of the legislature, the Governor's new funding initiative will further ensure the safety and well-being of Pennsylvanians against floods and dam failure. More always needs to be done. Although some recommendations in the audit report are focused on areas not under DEP's jurisdiction, the audit highlights the continuing need for interagency coordination and cooperation. The Governor's Interagency Flood Task Force, a centerpiece of his 2007 budget, will soon be enhanced with the appointment of a Director, whose key function will be to coordinate the activities of local, state and federal agencies with responsibilities and resources to address flooding and dam infrastructure in the Commonwealth. DEP values the audit recommendations as a means to further enhance the program's effectiveness and efficiency in ensuring public safety.

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**DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DAM AND LEVEE SAFETY  
JULY 1, 2002 THROUGH SEPTEMBER 18, 2006**

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