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DEPARTMENT OF
ECOLOGY

2004 Report to the Legislature

Status of High and Significant Hazard Dams in Washington with Safety Deficiencies

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2004 Report to the Legislature

Status of High and Significant Hazard Dams in Washington with Safety Deficiencies

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Executive Summary

This report updates information regarding the condition of 333 dams in Washington that are situated above populated areas and regulated by the Department of Ecology's Dam Safety Office. The report also updates the progress to repair or improve dams found to be deficient during previous periodic safety inspections. The Executive Summary Figure on page 2 illustrates the numbers and status of dams in Washington.

The following three key messages summarize the status of dam safety in Washington in 2004:

- In 2003-04, more projects (7) were added to the list of dams with deficiencies as were removed by being repaired (6), continuing a trend noted in our 2002 report. The cause of this is twofold. First, fewer dams were repaired because for many of the privately owned dams remaining on the list, funding for repairs is not readily available. Second, more dams are still being added to the list following inspections by Ecology due to older dams not meeting higher safety standards because of population growth, increasing seismic standards, aging of manmade materials, and lack of maintenance.

- Total repair costs for the 31 dams currently listed as having safety deficiencies is estimated to be more than $1 million. Unless state or federal funding becomes available for repairing and maintaining existing infrastructure, many owners will not be able to afford repairs and the gap between dams with deficiencies and those that have been repaired will continue to widen. In those cases where an imminent threat of loss of life exists from an unsafe dam, Ecology is authorized to take emergency action and eliminate or mitigate the hazard, charging the costs back to the owner. In the remaining cases where the deficiencies are serious but do not represent an imminent threat, it is up to the owners to come up with funding to complete the repairs. While legislation has been introduced in Congress to create a federal loan fund for repairing the nation's unsafe publicly-owned dams, no funding programs are on the horizon for privately owned dams. Until funding can be secured, Ecology will continue to prioritize its efforts toward ensuring that unsafe dams which have the greatest number of downstream lives at risk are repaired. The department will work closely with owners providing technical assistance to find innovative ways to reduce the cost of making these necessary repairs.

- In 2003, Ecology was directed by the legislature to increase fees for plan reviews and construction inspections, and resume the collection of fees for Ecology's periodic inspection of existing dams. The revenue from the fees will partially offset the costs of operating the dam safety program. In return, Ecology was authorized to hire an additional dam safety engineer in the 2003-05 biennial budget to reduce the inspection cycle on high hazard dams to 5 years as recommended in federal dam safety standards, and retain a 10-year inspection cycle for significant hazard dams. As a result, Ecology was able to meet the inspection workload required to achieve these cycles in 2004.

In 2003-2004, Ecology completed or oversaw:

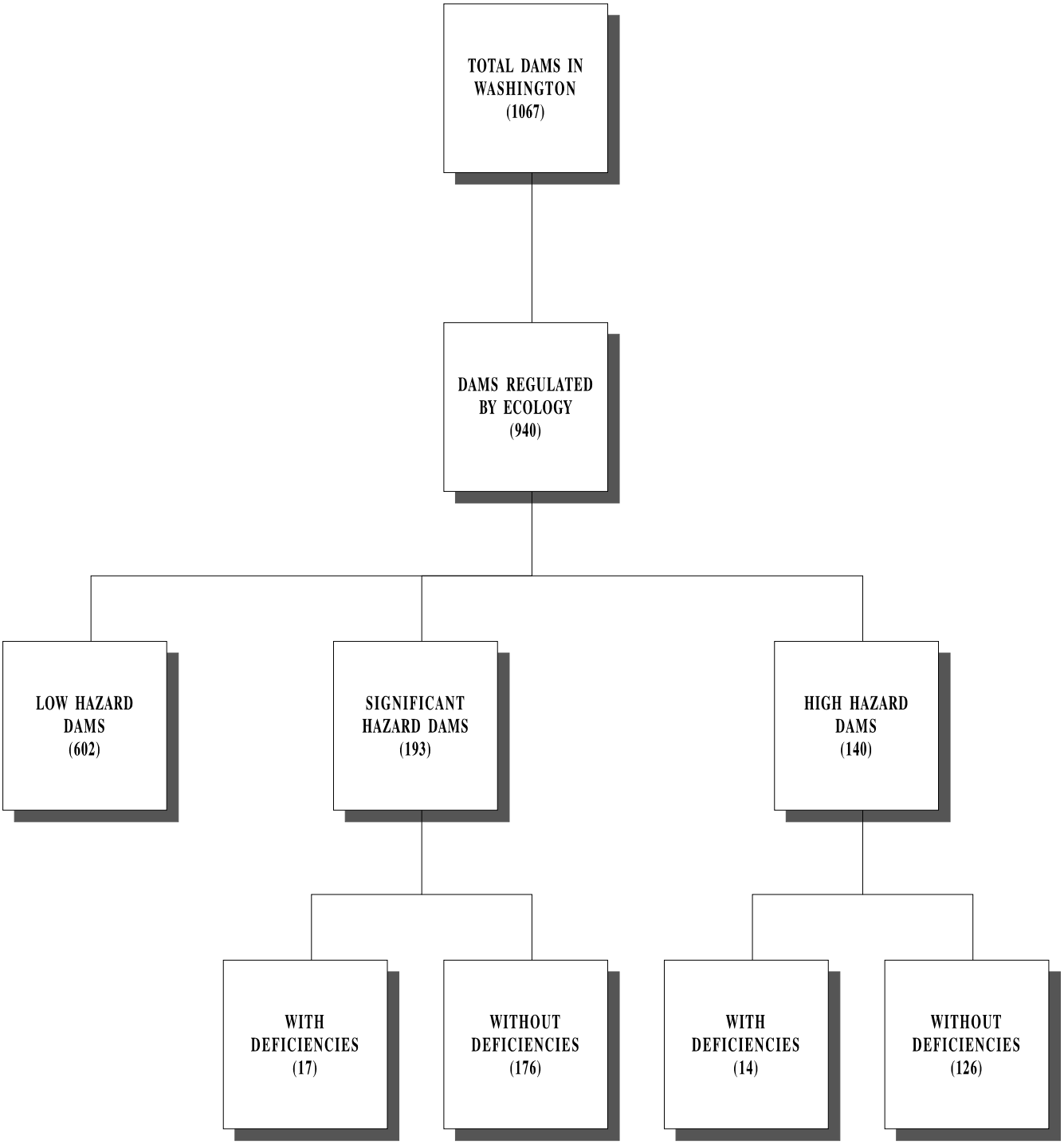
47 inspections of high hazard dams
21 inspections of significant hazard dams
6 safety deficiencies corrected by dam owners

Progress to correct deficiencies on dams slowed in 2001-2002 because the number of projects needing remedial work actually increased to 31. To date, safety deficiencies have been identified on 171 dams and actions to correct deficiencies include:

Deficiencies at 140 dams have been corrected
Partial repairs at 5 dams have been completed

Progress has stalled in closing the gap in repairing dams with safety deficiencies, because ongoing inspections are adding more new dams with deficiencies to the list than are being removed from the list by being repaired. This is largely due to the problem of aging dams not meeting higher safety standards due to population growth but is also due to increasing seismic standards, aging of man-made materials, and lack of maintenance.

EXECUTIVE SUMMARY TABLE



Introduction

In accordance with RCW 90.54.160, the Washington Department of Ecology is directed to report to the Legislature regarding dam facilities that exhibit safety deficiencies that pose a threat to the safety of life and property. Under state law, the report also identifies dam owners, details about their ability and attitude toward correcting any deficiencies, and provides an estimate of the cost of correcting the deficiencies if a study has been completed. This information is contained in the tables in **Appendix A.** This is the sixteenth such report providing information on the current status of dams with *High and Significant* downstream hazard classifications that have safety deficiencies.

A dam is defined as any artificial barrier or any controlling works that impounds or has the ability to impound at least 10 acre-feet water. The downstream hazard classification refers to the potential effects a dam failure could have on people and property downstream from a dam and does not relate to the structural or operational condition of a dam. **Table 1** lists the classification system used by the Department of Ecology's Dam Safety Office (DSO).

Table 1
Downstream Hazard Classification

Downstream Hazard Potential	Downstream Hazard Class	Population at Risk	Economic Loss Generic Descriptions	Environmental Damages
Low	3	0	Minimal. No inhabited structures. Limited agriculture development.	No deleterious materials in water
Significant	2	1 to 6	Appreciable. 1 or 2 inhabited structures. Notable agriculture or work sites. Secondary highway and/or rail lines.	Limited water quality degradation from reservoir contents and only short-term consequences.
High	1C	7 to 30	Major. 3 to 10 inhabited structures. Low density suburban area with some industry and work sites. Primary highways and rail lines.	Severe water quality degradation potential from reservoir contents and long-term effects on aquatic and human life.
High	1B	31-300	Extreme. 11 to 100 inhabited structures. Medium density suburban or urban area with associated industry, property and transportation features.	
High	1A	More than 300	Extreme. More than 100 inhabited structures. Highly developed, densely populated suburban or urban area with associated industry, property, transportation and community lifeline features.	

Items of Note in 2001 and 2002

Progress continued in 2003 and 2004 to correct safety deficiencies and upgrade the safety of dams in Washington. In addition, the 2003-05 biennial budget passed by the Legislature included funding for one additional FTE toward improving the inspection cycle on high risk dams. This allowed Ecology to hire an additional engineer to work on inspections, and reduce our inspection cycle from 6 to 5 years on high hazard dams and from 12 to 10 years on significant hazard dams. However, the number of dams repaired was still only able to keep pace with new projects found to be deficient through our periodic inspection program. Fewer dams are being repaired because funding is not readily available to the owners. At the same time, more dams are being added to the deficiency list due to population growth, increasing seismic standards, aging of man-made materials and lack of maintenance.

The following items are of particular note in 2003-2004:

- 6 dams with deficiencies were repaired or modified.

- 47 detailed inspections were conducted of high hazard dams and six projects were found to have safety deficiencies that could pose a threat to life or property.

- 21 reconnaissance inspections were performed on the smaller dams where there is a moderate to low potential for loss of life in the event of a dam failure.

- As noted previously, the Dam Safety Office was authorized to hire an additional engineer in the 2003-05 biennial budget to reduce the inspection cycle on high risk dams. In return, Ecology was directed to increase fees for plan reviews and construction inspections, and resume the collection of fees for Ecology's periodic inspection of existing dams. The revenue from the fees would be used to partially offset the costs of operating the dam safety program. In 2004, Ecology went through the rulemaking process and revised WAC 173-175, to include the increased fees. Fees for dam construction and modification permits were increased 180%. The yearly inspection fee for high-hazard dams was established at $688 a year for a 5-year inspection frequency, while the inspection fee for significant hazard dams was set at $250 a year for a 10-year inspection frequency.

- In 2003 and 2004, through FEMA, Ecology received state funding assistance of about $46,000 per year under the National Dam Safety Act. This funding was used to hire a technician to work on a special project to improve our emergency preparedness in dealing with both natural disasters and dam security issues. The technician is scanning all of our irreplaceable paper files to create electronic images of the information. The technician is also working on improving our Emergency Action Plans and helping maintain the dam safety database.

- Broetje Orchards Block 92 Dam located near Ice Harbor Dam in Walla Walla County failed on April 6, 2003. The immediate cause of the failure was caused by internal erosion exacerbated by the activity of burrowing animals. The geomembrane lined pond was constructed in the early 1990s by Orchard staff. It provided temporary storage to facilitate managing their appropriated water.

The pond was originally built without securing a Dam Safety permit. The pond at the time of failure was reportedly two-thirds full, releasing an estimated 20 acre-feet of water when it failed. Aside from property damage on the Orchard's property, there was no material threat to the public and environmental damages were minimal. The dam was subsequently repaired under the oversight of the Dam Safety Office.

- On January 15, 2004, Puget Sound Energy rejected its FERC License and shut down its generation plant for the White River Project, ending FERC's jurisdiction of the project. As a result, Ecology's Dam Safety Office assumed regulatory authority on January 16th over the 15 dams that impound Lake Tapps. Extensive studies have been done on the stability and safety of the Lake Tapps dikes, and just last year, PSE constructed improvements to Dikes 4A, 5, 6 and 11 as required by FERC. These improvements protect the dikes from failing in a major earthquake. Unfortunately, Dike 15, on the inlet canal to Lake Tapps also has seismic stability problems, but was not repaired before the transfer of authority. PSE asked if they could delay the repairs for one year, so they could reevaluate what is needed to prevent inundation of homes in the event of an earthquake. Ecology agreed to the delay, provided PSE agreed to a schedule with milestones for completing analyses, design, and construction of the repairs by the end of 2005.

Periodic Inspection

In general, periodic inspections and follow-up engineering analyses are performed on existing dams for various purposes including:

- Identifying obvious defects, especially due to aging.
- Evaluating project operation and maintenance.
- Assessing the structural integrity and stability of project elements.
- Determining the adequacy of the spillways to accommodate major floods.
- Assessing the stability of the structure under earthquake conditions.

Periodic inspections are the primary tool for detecting deficiencies at dams that could lead to failure. Experience has clearly shown that correction of these safety deficiencies in a timely manner can prevent dam failures and other serious incidents from occurring. The use of periodic inspections to detect deficiencies and avert disasters continues to be an important preventative tool in the dam safety program. Periodic inspections also help identify dams where significant development has occurred downstream, resulting in the need for more stringent design loadings due to greater population at risk.

Responsibility for Inspection of Dams in Washington

Responsibility for the inspection of the 1,067 dams in Washington rests with several agencies.

- Federally-owned and operated dams, such as facilities owned by the U.S. Army Corps of Engineers, Bureau of Reclamation, and various agencies of the Department of Interior are inspected by dam safety units within their respective agencies. (69 dams)

- Non-federal hydropower dams, licensed by the Federal Energy Regulatory Commission (FERC) are inspected by private engineering consultants every five years as required by the FERC as part of hydropower licensing. (58 dams)

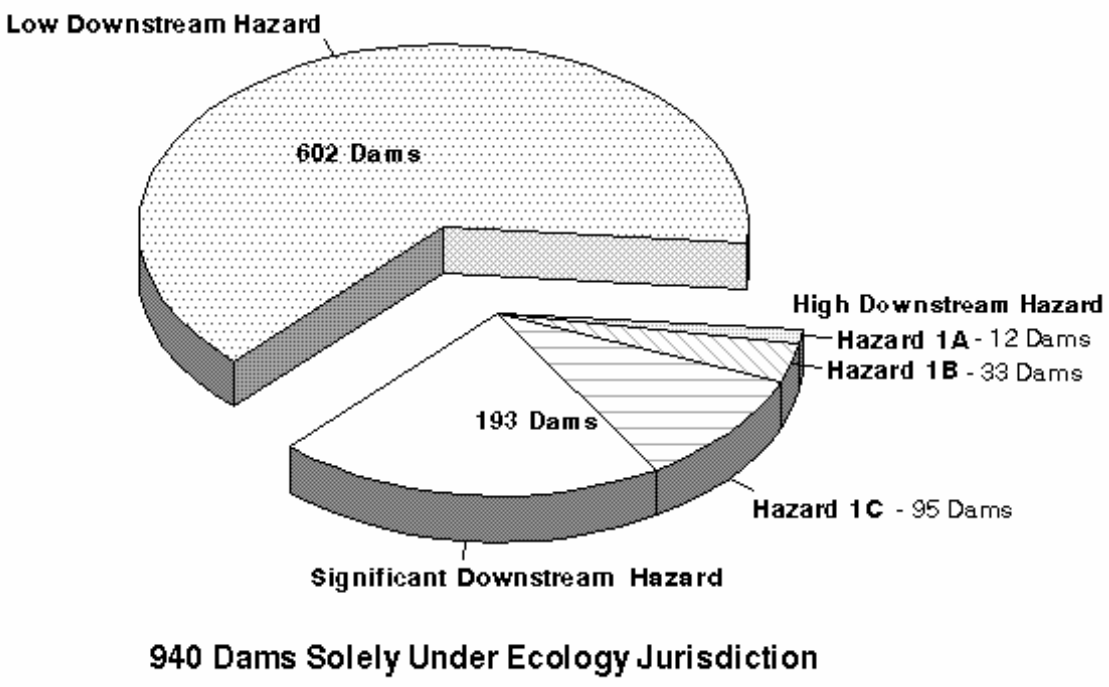
- The remaining 940 dams are the sole responsibility of the Department of Ecology under RCW 43.21A.064(2). These dams are inspected on a periodic basis by the Dam Safety Office.

Number of Dams Classified as High or Significant Downstream Hazard Potential

As stated above, there are currently 940 dams which are the sole regulatory responsibility of Ecology. A total of 333 of these dams are situated above populated areas and are classified as having *high* or *significant* downstream hazards if they were to fail. Priority is given to the periodic inspection of these dams.

The number of dams classified as high or significant hazard potential differs slightly from those reported in prior years. This variability in the number of dams occurs as new dams are built, or as existing dams are inspected and downstream hazard classifications are upgraded to reflect current development in the downstream valley. Of these 333 dams, about two-thirds are privately owned, and one-third publicly owned. The breakdown of dams by hazard classification is shown in Figure A.

Figure A
Number of Dams by Hazard Classification



Current Dam Safety Inspection Program

The Dam Safety Office conducts periodic inspections of particular projects to reasonably secure safety to life and property, as authorized under RCW 43.21A.064. In 2004, the Dam Safety Office formalized its periodic inspection program with the adoption of WAC 173-175-705. Under this program, inspections are performed on dams where there is the potential for loss of life and significant property damage in the event of a dam failure. Dam with *high* hazard classifications will be inspected on a 5-year cycle, while dams with *significant* hazard classifications will be inspected on a 10-year cycle. Dams classified as *low* hazard are not included in the periodic inspection program.

The inspections are performed by professional engineers from the Dam Safety Office and involve:

- Review and analysis of available data on the design, construction, operation, and maintenance of the dam and its appurtenances.
- Visual inspection of the dam and its appurtenances.
- Evaluation of the safety of the dam and its appurtenances, which may include assessment of the hydrologic and hydraulic capabilities, structural stabilities, seismic stabilities, and any other condition which could constitute a hazard to the integrity of the structure.
- Evaluation of the downstream hazard classification.
- Evaluation of the operation, maintenance, and inspection procedures employed by the owner and/or operator.
- Review of the emergency action plan for the dam including review and/or update of dam breach inundation maps.

The Dam Safety Office prepares a comprehensive report of the findings for the owner, which includes findings from the inspection, and any required remedial work to be performed.

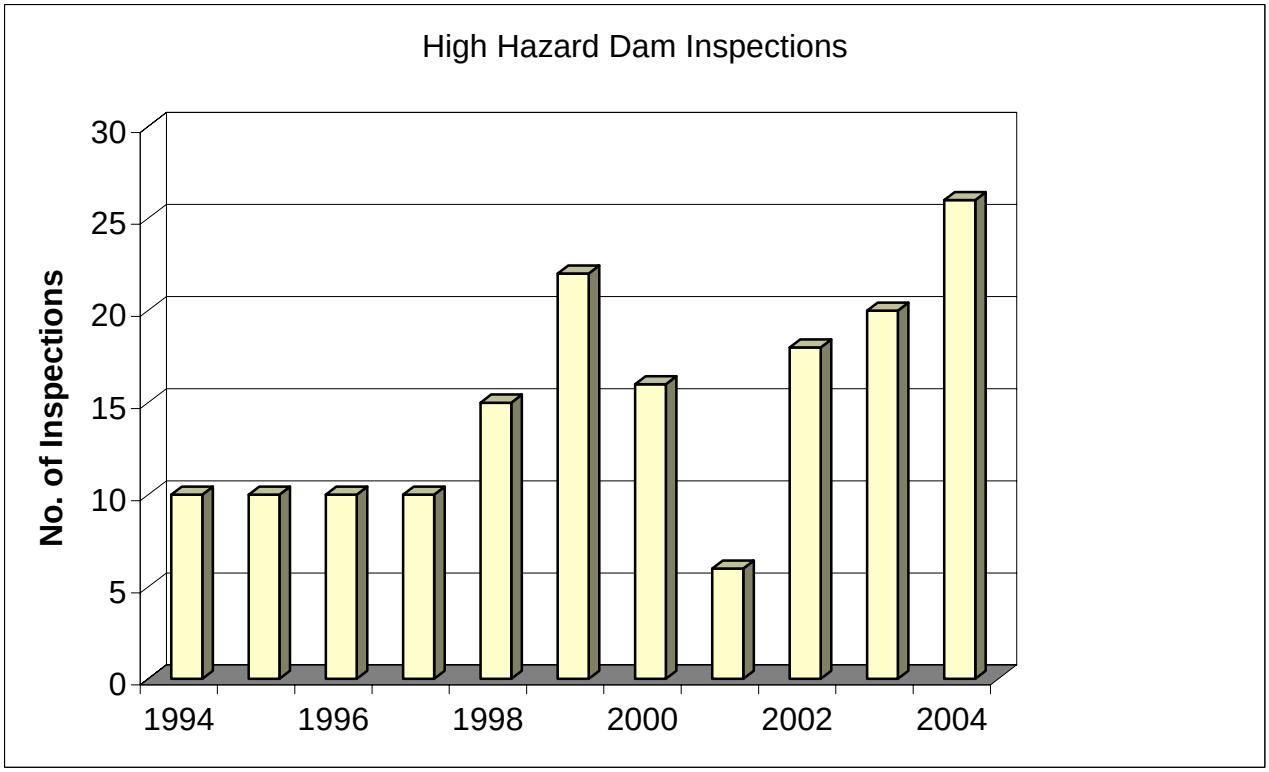
In 2003 and 2004, a total of 47 high hazard dams were inspected, and seven dams were added to the list of dams with deficiencies.

Reconnaissance inspections are conducted on those smaller dams where there is a moderate to low potential for loss of life in the event of a dam failure. For these dams, the primary intent is to identify any situations that pose an imminent hazard, or where population growth has occurred in the downstream floodplain. A total of 21 reconnaissance inspections were performed, primarily on Hazard 2 Dams.

A summary of the high hazard dam inspection activity over the last 10 years is provided in Figure B. As can be seen in the figure, the level of high hazard dam inspection activity has picked up over the past two years, largely due to the hiring of a new dam safety engineer.

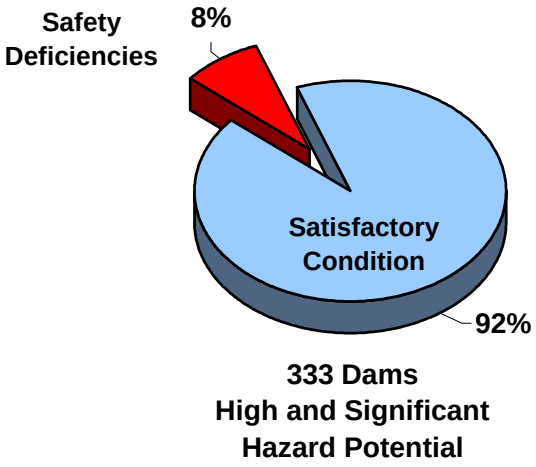
Figure B

Summary of Periodic Inspection Activity Since 1994



Up to this point, the report has focused on the identification of dams with deficiencies and progress in correcting those deficiencies. Figure C has been prepared to give a broader perspective of the periodic inspection program for dams situated above populated areas. It summarizes the number of dams that are in satisfactory condition relative to the number of dams with deficiencies. This chart shows that most of the dams above populated areas are in satisfactory condition, but there are still a significant number of dams that are in need of repairs.

Figure C
Condition of Dams Above Populated Areas in Washington - 2004



Remedial Activity

Progress in Repairs to Dams during 2003-2004

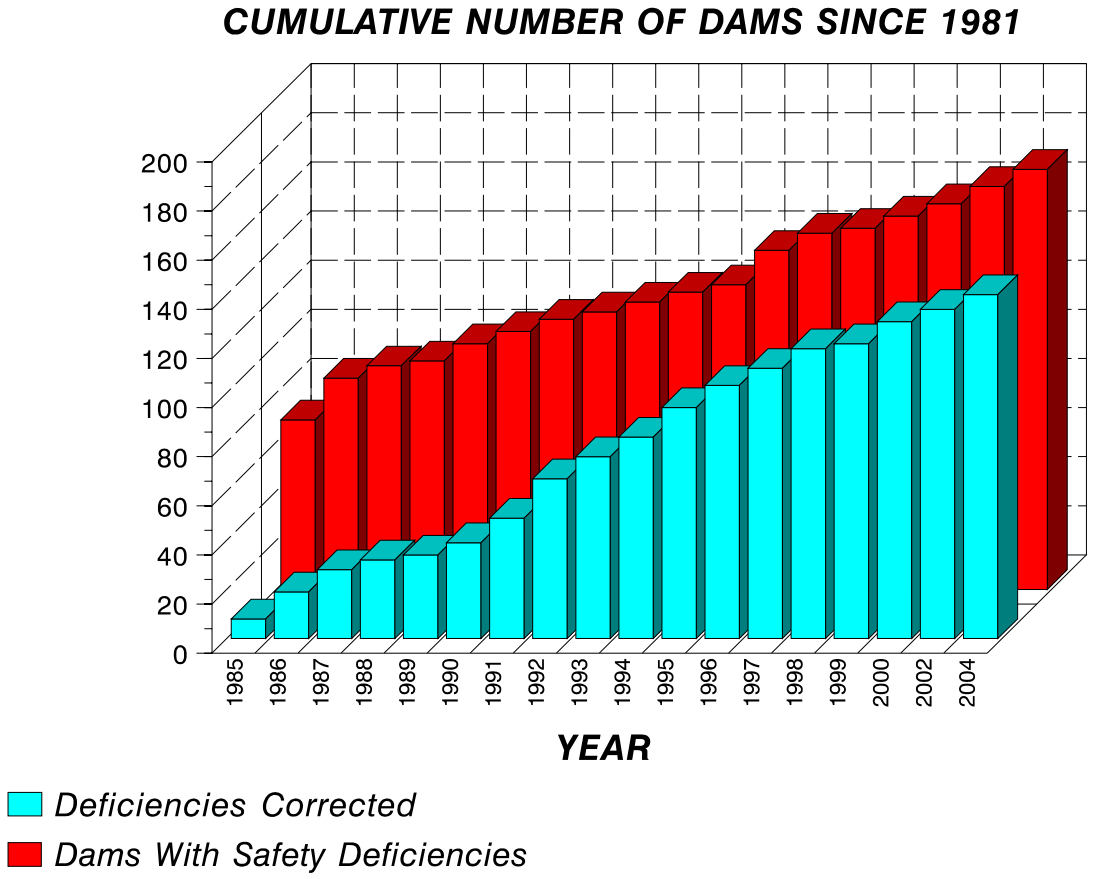
Based on inspections performed in 2003 and 2004, seven dams were added to the list of dams with safety deficiencies. Due to this increase, no progress was made in reducing the backlog of projects in need of remedial work, as only six dams were removed from the list after remedial work was completed. Table 3 summarizes the dams where repairs were completed during 2001-2002.

Table 3
Dams Repaired or Modified in 2001-02

COUNTY	PROJECT AND DAM NAME	OWNER
CHELAN	Mathison Dam	Kyle Mathison
KING	ICON Materials Sedimentation Dam	ICON Materials, Inc.
MASON	Timberlakes Dam	Timberlakes Homeowners Association
PEND OREILLE	Cedar Creek Reservoir Dam	Town of Ione
SKAMANIA	Trout Creek (Hemlock) Dam	U.S. Forest Service
WHATCOM	Lummi Island Estates Dam	Lummi Island Estates Homeowners Assoc.

Remedial work has now been completed on 140 of the cumulative 171 dams that have been identified since 1981 as having safety deficiencies (Figure D). In addition, partial repairs have been completed on five dams. As shown in Figure D, progress has stalled in closing the gap in repairing dams with safety deficiencies, because ongoing inspections are adding as many new dams with deficiencies to the list as are being removed from the list by being repaired. This is largely because aging dams are not meeting higher safety standards due to population growth but also increasing seismic standards, aging of man-made materials, and lack of maintenance.

Figure D
Cumulative Summary of Corrective Action



Conclusions

There are now 333 dams in Washington sited above populated areas for which Ecology's Dam Safety Office is the sole regulatory agency. All of the 140 dams located upstream of three or more residences (high downstream hazard potential) have been inspected at least once and are now on a 5-year inspection cycle. The first round of inspections for the 193 dams classified as having a significant downstream hazard has also been completed, and these projects are on a 10-year inspection cycle. Thanks to the addition of a new dam safety engineer, the Dam Safety Office was able, in 2004, to meet the inspection workload required to achieve these cycles. This resulted in 26 inspections of high hazard dams, and 17 inspections of significant hazard dams.

In 2003-04, more projects were added to the list of dams with deficiencies in 2001-02 than were removed by being repaired, continuing a trend noted in our 2002 report. The cause of this is twofold. First, fewer dams were repaired because funding for repairs is not readily available for many of the dams remaining on the list. Second, more dams are being added to the list following inspections because aging dams are not meeting higher safety standards due to population growth, increasing seismic standards, aging of manmade materials, and lack of maintenance. It is anticipated that unless state or federal funding becomes available for repairing and maintaining existing infrastructure, the gap between dams with deficiencies and those that have been repaired will continue to widen. In those cases where an imminent threat of loss of life exists from an unsafe dam, Ecology is authorized to take emergency action and eliminate or mitigate the hazard, charging the costs back to the owner. However, in the remaining cases where the deficiencies are serious but do not represent an imminent threat, it is up to the owners to come up with funding to complete the repairs. It should be noted that legislation has been introduced in Congress to create a federal loan fund for repairing the nation's unsafe publicly-owned dams. However, no funding programs are on the horizon as yet for privately owned dams.

To date, safety deficiencies have now been identified on a cumulative 171 dams, and actions to correct deficiencies are summarized below.

- Deficiencies have been corrected ..... 140 dams.
- Partial repairs have been completed..... 5 dams.
- Engineering studies and/or design work is underway..... 14 dams.

The number of dams where owners have been unresponsive increased in 2004 from 10 to 13 projects, continuing a trend noted in the 2002 report. Owners are unresponsive due to lack of funding for repairs. These projects are still on a prioritized schedule for compliance. Should the owners continue to be unresponsive, the Ecology's Dam Safety Office will begin issuing regulatory orders and/or penalties. If an emergency situation exists, Ecology may physically reduce the hazard and charge the owner for costs incurred.

Appendix A - Project Status

The status of the remaining projects with uncorrected deficiencies as identified during the Ecology inspections prior to 1999 is provided in Table I. The dams identified as having deficiencies in 1999 and 2000 are shown in Table II.

Within these tables, individual projects are listed by county location and project name in alphabetical order. The dam identification numbers are also provided as listed in the state inventory of dams. Project owners are listed next, followed by a brief description of the identified major safety deficiencies. The status of activity, reflecting, in part, the owners' attitude to make the needed repairs or modifications, is indicated by the following letter codes.

C - Deficiencies corrected

I - Some deficiencies corrected-necessary modification incomplete

S - Action started but currently not progressing

P - Action started and studies and/or work progressing satisfactorily

A - Informal enforcement action initiated (i.e., advisory/warning letter)

R - Formal enforcement action initiated (i.e., regulatory order issued)

N - No response or progress

L - Regulatory order appealed to Pollution Control Hearings Board or in litigation

The final columns in the tables provide information on rehabilitation or modification costs. Where no detailed engineering assessment was available, an estimated cost range was provided based on an assumed range of probable options that may come under consideration. These figures are shown to indicate the relative order of magnitude of the problem and, necessarily, cannot be assumed to be highly reliable.

Projects where remedial work was completed in years prior to 2000 have been removed from this report. For a listing of these projects, please refer to the 1998 Report to the Legislature.

TABLE I

PROJECT REHABILITATION STATUS SUMMARY OVER LAST 3 YEARS
(DAMS INSPECTED PRIOR TO 2003)

County I.D. No.	Project Name	Owner	Safety Deficiencies	Status/Attitude			Estimated Repair Cost $ Thousands	Repairs Completed	Population at Risk
				2002	2003	**2004**			
CHELAN									
77	Mathison Dam	Kyle Mathison	Embankment stability,seepage	S	P	C	5	Completed	2-5
72	Meadow Lake Dam	Galler Ditch Company	Inadequate Spillway Capacity	A,P	S	S	10-20	None	7-15
235, 412	Wenatchee Heights Dam 1 & Saddle Dam	Wenatchee Heights Reclamation District	Embankment Stability, Seepage	S,A	S,A	P,A	10-70	None	1-5
FERRY									
622	Grouden Dam	U.S. Forest Service	Inadequate Spillway Capacity	A,P	P	P	100-200	None	6-12
GRAYS HARBOR									
663	College Hill Reservoir	City of Hoquiam	Seismic Stability Issues	S	S	S	50-100	None	50-100
KING									
683	ICON Materials Sedimentation Dam	ICON Materials, Inc.	Illegal Construction Seismic Stability	A,P	R,P	C	100	Complete	10-30
194	Welcome Lake Dam	Lake of the Woods Homeowners Assoc.	Inadequate Spillway Capacity	A,P	P	P	50	None	50-100
KLICKITAT									
446	Johnson Creek Res.	Jim Meduna	Spillway Erosion	S	A,S	P	20-30	None	1-3
MASON									
89	Timberlakes Dam	Timberlakes Homeowners	Outlet Conduit Deterioration	P	C	C	60	Complete	1-6
OKANOGAN									
662	Aspen Lake Dam	Washington State Dept. of Fish and Wildlife	Inadequate Spillway Embankment Stability	A,P	P	P	50-100	None	3-6
40	Fanchers Dam	Cascade Ranches, Inc. Olma Brothers Corp.	Inadequate Spillway Capacity Embankment Stability,Seepage	P,I	P,I	P,I	100	Partial	15-20
329	Beth Lake Dam	USDA National Forest	Inadequate Spillway Capacity	P	A,P	P	20-40	None	6-10
PACIFIC									
522	Indian Creek Dam	City of Ilwaco	Inadequate Spillway Capacity	P,I	A,P,I	P,I	20	Partial	1-3

C = Deficiencies Corrected; I = Some deficiencies corrected, but incomplete; S = Action started but currently not progressing; P = Progressing satisfactorily

A = Informal enforcement action; R = Regulatory Order issued; N = No response or progress; L = Litigation; F = Inadequate funding for repairs by owner

TABLE I (continued)

County I.D. No.	Project Name	Owner	Safety Deficiencies	Status/Attitude 2002	Status/Attitude 2003	Status/Attitude **2004**	Estimated Repair Cost $ Thousands	Repairs Completed	Population at Risk
PEND OREILLE									
1123	Cedar Creek Reservoir Dam	Town of Ione	Cracking and Deterioration of Concrete, Structural Stability, Spillway Adequacy	R,P	P	C	5	Complete	10
SAN JUAN									
444	Roache Harbor Dam	Roache Harbor Water Co.	Inadequate Spillway Capacity	P	P	P	100	None	3-10
SKAGIT									
382, 383, 384	Cultus Mountain Dams A, B and C	Evergreen Council, Boy Scouts of America	Spillway Rehabilitation, Seismic Stability	S	S	S	10-70	None	3-10
141	Nookachamps Hills Dam	MV Associates	Inadequate spillway capacity embankment stability	S,I	S,I	S,I	30-50	Partial	3-6
SKAMANIA									
89	Trout Creek(Hemlock) Dam	U.S. Forest Service	Structural Stability During Floods	P	C	C	100	Complete	10
SNOHOMISH									
1521,1522	Neilson Dams B & C	Green Acres Mobile Home Park	Inadequate Spillway Capacity	A,P	P	P	10	None	7-10
SPOKANE									
50	Reflection Lake South Dam	Reflection Lake Homeowners Assoc.	Inadequate Spillway Support Maintenance Deficiencies	S	S	P	250	None	8-12
STEVENS									
1308	Blue Gulch Reservoir	Richard Hurst	Barrier Stability,	S,I	S,I	S,I	20	Partial	1-3
64	Beitey Lake Dam	Gerald Beitey	Inadequate Spillway Capacity	A,P	P	S	30	None	10-20
60	Serenity Lake Dam	Long Wood LLC	Inadequate Spillway Capacity	A,P	P	S	20-50	None	10-20
WHATCOM									
522,1204	Holiday & Swim Lake Dams	Lummi Island Estates Homeowners Assoc.	Seepage & Piping Concerns Inadequate Spillway	P	C	C	30-80	None	1-3
YAKIMA									
1809	Berghoff Dam	Dwight Berghoff	Inadequate Spillway Capacity	P,I	S,I	S,I	20-30	Partial	1-3
1010	Stevenson Dam	Robert White	Inadequate Spillway Capacity	S	S	A,S	20-50	None	3-6

C = Deficiencies Corrected; I = Some deficiencies corrected, but incomplete; S = Action started but currently not progressing; P = Progressing satisfactorily

A = Informal enforcement action; R = Regulatory Order issued; N = No response or progress; L = Litigation; F = Inadequate funding for repairs by owner

TABLE II
PROJECT REHABILITATION STATUS SUMMARY
(DAMS INSPECTED BY DAM SAFETY SECTION IN 2003 & 2004 AND FOUND TO HAVE DEFICIENCIES)

County I.D. No.	Project Name	Owner	Safety Deficiencies	Status/Attitude 2004	Estimated Repair Cost $ Thousands	Repairs Completed	Population at Risk
BENTON							
59	Blair Reservoir Dam	Kennewick Irrigation District	Inadequate Spillway	A,P	50-100	None	30-50
CHELAN							
194	Great Depression Reservoir Dam	Lappin Forest LLC	Inadequate Spillway Capacity	A,P	5-10	None	10-15
CLARK							
	Esteb Reservoir Dam	Orville Esteb	Inadequate Spillway Capacity	A,S	10-30	None	1-3
ISLAND							
691	Minckler Dam B	Sherwood Minckler	Embankment Stability	A,P	25-50	None	10-15
SAN JUAN							
	Buck Mountain Reservoir Dam No. 2	Eastsound Water Users	Deteriorated Outlet Conduit	A,P	50-100	None	1-3
THURSTON							
220	Berger Dam	Robert Strawn and Jeffery Wong	Inadequate Spillway Capacity	P	15-25	None	10-30
WHATCOM							
1719	Bagley Dam	U.S. Forest Service Mt. Baker District	Concrete Deterioration	A,P	30-100	None	1-3

C = Deficiencies corrected; I = Some deficiencies corrected, but incomplete; S = Action started but currently not progressing; P = Progressing satisfactorily A = Informal enforcement action; R = Regulatory Order issued; N = No response or progress; L = Litigation; F = Inadequate Funding for repairs by owner