5/7/12 from C Ehlers

Dam failures predicted

Thursday, July 29, 2004

Old study warned of chain-reaction breakdowns

By LAWRENCE HAJNA
Courier-Post Staff

Engineering studies conducted 25 years ago as part of a national dam safety assessment program almost uncannily predicted the chain-reaction dam failures that occurred in the July 12 storm.

The studies also found that dams in Burlington County did not have enough spillway capacity to handle a storm a fraction the size of the "1,000-year storm" that caused dams to topple like dominoes.

Yet records show the Department of Environmental Protection did little during the intervening years to force dam owners to correct the situation.

The DEP's dam safety bureau frequently kept on top of owners about basic maintenance, updating emergency response plans and conducting spillway capacity studies but rarely made any real progress toward upgrading the aging dams.

An exception was the Vincentown Mill Pond Dam, which was being reconstructed when the storm hit, dumping up to 13 inches of rain in Burlington County. It did not fail but was severely damaged. The list of dams that failed in the worst series of dam failures in New Jersey in more than 60 years now stands at 16. The number of dams damaged during the storm has grown to 26, with at least 10 owners under orders to lower lake levels to avoid future flooding.

High-hazard dams

John H. Moyle, who heads the dam safety bureau, defended the state's record. His office, he said, has focused its dam-replacement efforts on those the Army Corps of Engineers, as part of its national dam assessment 25 years ago, determined were high hazards, meaning people could die if they failed.

"If you look at the last four (major) storms that occurred (statewide), we didn't lose a high-hazard dam, and we had no loss of life for some very unusual precipitation events," Moyle said.

Of 200 high-hazard dams initially identified statewide, only 47 remain to be reconstructed to modern standards, Moyle said.

The Vincentown dam is classified high-hazard, but the others that failed in the July 12 storm were ranked as significant hazards, meaning property loss is expected but loss of life is not expected to result from a breach, or as low-hazard.

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The state's response does little to ease the anger of John Jardine, a resident of Lumberton, which was hammered by converging floodwaters from two branches of Rancocas Creek where upstream dams failed. Flooding reached the first floor of his house.

"They didn't do their job. They should have opened them up or taken them down or fixed them - one of the three things," said the 49-year-old high school teacher. "The amount of loss people have had to go through, and it was unnecessary."

He was also critical of evacuation plans, saying general warnings to evacuate did not come until hours after a wave of water rolled through his neighborhood.

Jeff Tittel of the New Jersey Sierra Club maintains the state, over many administrations, has lacked the backbone to take action to force owners to upgrade dams because of the overwhelming potential cost involved and the difficulty of litigation.

`This time we got lucky'

"People should be angry and force change," Tittel said. "This time we got lucky and nobody got hurt."

In 1979, the U.S. Army Corps of Engineers, in conjunction with the DEP, surveyed some of Burlington County's dams as part of a National Dam Inspection program authorized by Congress.

The studies, carried out by consultants, coincidentally focused on the string of dams that would fail through the Medford and Medford Lakes area, including Lake Stockwell Dam, Lower and Upper Aetna Lakes dams, and Birchwood Lake Dam.

Nearly a dozen dams failed or were damaged in this area during the July 12 storm.

One study suggested a failure at the Stockwell dam, which impounded a recreational lake for YMCA's Camp Ockanickon, could cause cascading dam failures.

"Any abrupt failure of this dam could cause like damage to one or more downstream dams, and could threaten many homes and possibly some lives," the report by Louis Berger & Associates states.

Gary Graham, Camp Ockanickon's director, declined comment, saying he had never seen the report.

A report filed last year with the state by KSA Inc. of Medford, the YMCA's consulting engineer, notes that a failure of the Stockwell dam alone would not cause "excessive" damage but adds that "more significant" damage could occur as the result of "hydraulically simultaneous failures of upstream lakes."

On June 22, just three weeks before the storm, DEP inspectors noted several problems at the Lake Stockwell Dam, including erosion behind the spillway "drop box," a wooden board blocking part of the spillway, and an animal burrow on the downstream slope.

It's not clear if any actions were taken to correct these problems before the storm hit.

The dam was built in 1926, was reconstructed in 1934 and 1947 and has not had any significant upgrades since. The DEP has not specifically named the dam as the prime suspect, but Moyle said that "anytime you have lakes and dams in a series, certainly the

farthest one upstream could be the trigger."

A review of DEP files suggests the DEP was consistently trying to buy time with dam owners, occasionally threatening legal action but only to compel updates to studies, not to force any major dam reconstruction.

Despite the spillway problems, the national dam studies, released in early 1980, recommended downgrading the hazard classification for many of the studied dams from high to significant hazards.

The consultants did not believe their failures would result in loss of lives. Engineers also found the dam structures themselves to be in generally fair condition.

Spillways faulted

The consultants, however, repeatedly concluded the spillways for study dams were inadequate to handle floodwaters from a 100-year storm. In some cases, spillways were not considered adequate to handle even 10 percent of the floodwaters from a 100-year-storm.

The DEP, Moyle said, responded by requiring spillway capacities for new dams much greater than those used in the engineering models, a fact that would make reconstruction even more expensive for cash-strapped dam owners.

The DEP is currently reviewing rainfall data, high water marks and other flood data to determine whether it now needs to set new spillway standards.

Had the dams been upgraded to current state standards, Moyle said, "most likely they would have been able to discharge those flows without a problem."

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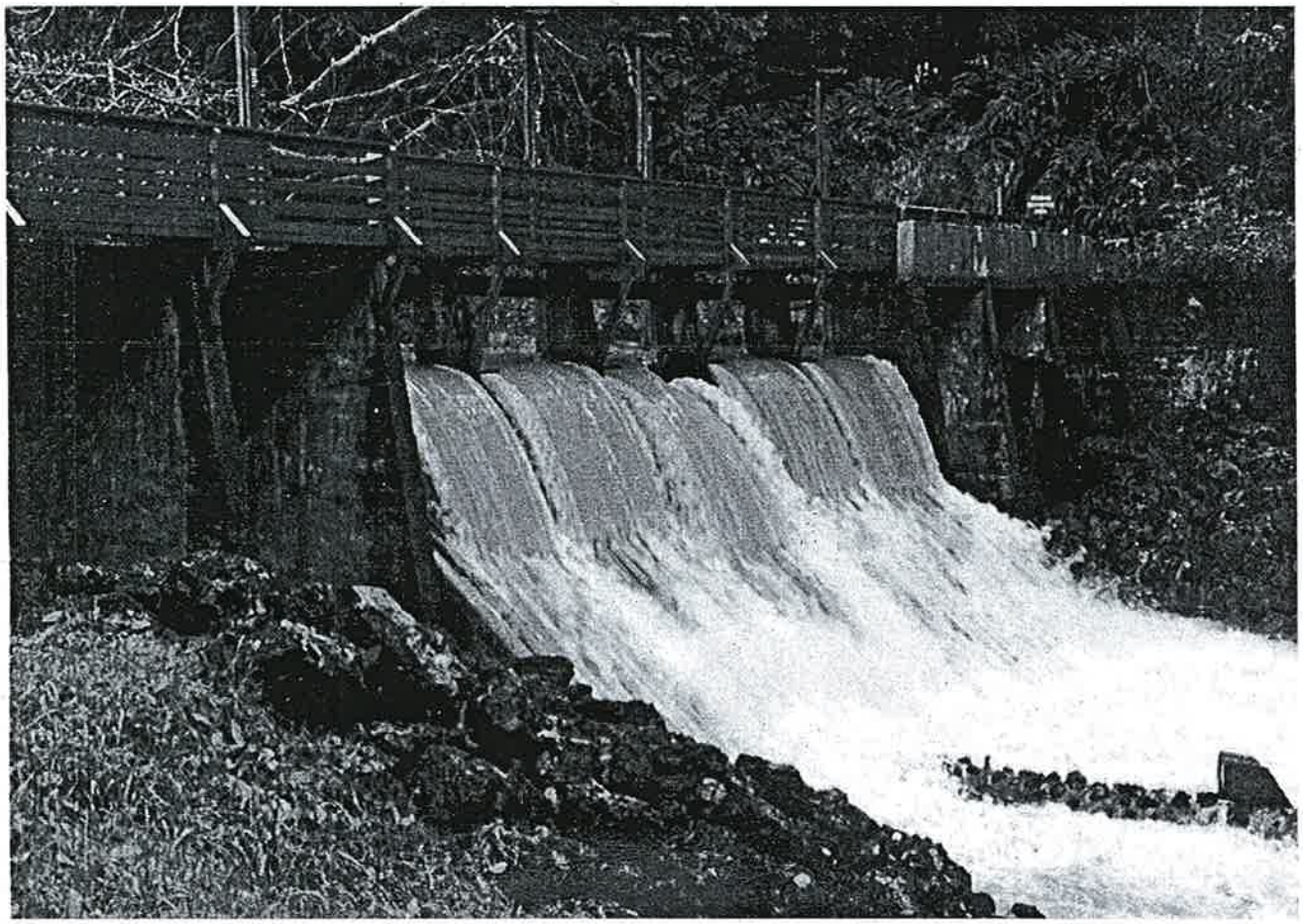
from C Ehlers 5/7/12

Inventory of Dams

in the State of Washington



WASHINGTON STATE DEPARTMENT OF ECOLOGY

Washington State Department of Ecology
Water Resources Program
Dam Safety Section

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NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

SKAGIT COUNTY

Baker Dam — SK04-0172 — WA00172 — Lake Shannon

1925	VACN	HR	570	278	2218.0	132300	162590	46920

Puget Sound Power and Light

48 32 54	121 44 24	S 2 T35N R 8E	Baker River			4	297.00	1A

Barnaby Slough No. 2 Dam — SK04-0156 — WA00156 — Barnaby Slough No 2

1968	RE	O	230	9	43.0	124	157	0

Washington Dept. of Wildlife

48 28 42	121 33 0	S31H T35N R10E	Tr-Skagit River			4	4.33	3

Bear Creek Dam — SK04-1203 — WA01203

1910	VA	H	235	23	4.3	24	40	0

Lone Star Cement Corporation

48 37 12	121 44 12	S11N T36N R08E	Bear Creek			4	0.00	3

Cranberry Lake Dam — SK03-0282 — WA00282 — Cranberry Lake

1910	RE	R	385	9	24.0	178	234	29

City of Anacortes

48 30 18	122 38 36	S23K T35N R 1E	Cranberry Creek			3	0.48	1C

Cultus Mountain Reservoir Dam A — SK03-0382 — WA00382 — Cultus Mountain Reservoir

1971	RE	RO	530	20	32.5	320	366	40

Boy Scouts of America

48 23 42	122 11 18	S32G T34N R05E	Tr-E Fork Nookachamps Creek			3	0.82	2

Cultus Mountain Reservoir Dam B — SK03-0383 — WA00383 — Cultus Mountain Reservoir

1971	RE	RO	310	9	32.5	320	403	50

Boy Scouts of America

48 23 36	122 11 12	S32H T34N R05E	Tr-E Fork Mookachamps Creek			3	0.82	2

Cultus Mountain Reservoir Dam C — SK03-0384 — WA00384 — Cultus Mountain Reservoir

1971	RE	RO	400	17	32.5	320	366	0

Boy Scouts of America

48 23 12	122 11 6	S32R T34N R05E	Tr-E Fork Nookachamps Creek			3	0.82	2

Judy Reservoir Dam A — SK03-0183 — WA00183 — Judy Reservoir

1965	RE	S	680	44	140.0	3375	4031	278

Skagit County, PUD No. 1

48 28 18	122 11 18	S32Q T35N R 5E	Tr-Skagit River			3	1.60	1C

Judy Reservoir Dam B — SK03-0181 — WA00181 — Judy Reservoir

1965	RE	S	2340	67	140.0	3375	4031	278

Skagit County, PUD No. 1

48 28 42	122 10 36	S33E T35N R 5E	Tr-Skagit River			3	1.60	1C

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

SKAGIT COUNTY

Lang Dam No. 1			SK03-1160	WA01160				
1972	RE	RP	150	15	1.2	30	30	0
Harry M. Lang								
48 23 42	122 16 54	S34C T34N R04E	Tr-Carpenter Creek			3	0.25	2
Lang Dam No. 2			SK03-1161	WA01161				
1972	RE	RP	125	3	8.3	10	10	0
Harry M. Lang								
48 23 48	122 16 54	S34C T34N R04E	Tr-Carpenter Creek			3	0.00	3
Lang Dam No. 3			SK03-1162	WA01162				
1972	OT	RP	100	5	10.0	20	20	0
Harry M. Lang								
48 23 54	122 16 48	S34C T34N R04E	Tr-Carpenter Creek			3	0.00	3
Mayer Dam			SK03-1506	WA01506	Mayer Pond			
1971	REOT	IR	15	8	8.0	24	36	0
Jack I. Mayer								
48 26 48	122 38 48	S11L T34N R01E	Tr-Lake Erie			3	0.13	2
Nichols Dam			SK03-1447	WA01447				
1982	RE	RD	1100	20	3.4	25	27	0
Thomas Nichols								
48 32 30	122 9 48	S09A T35N R05E	Offstream			3	0.10	2
Nookachamps Hills Dam			SK03-0141	WA00141				
1969	RE	O	1350	45	6.3	109	126	127
MV Associates								
48 24 6	122 13 36	S25R T34N R 4E	Tr-Nookachamps Creek			3	0.30	2
Skagit Lake Dam			SK04-0182	WA00182	Skagit Lake			
1971	RE	R	330	17	42.0	258	343	166
Lands-West Inc.								
48 34 42	121 46 12	S28K T36N R 8E	Grandy Creek			4	1.15	3
Texas Pond			SK05-0330	WA00330	Texas Pond			
1970	RE	RO	210	14	6.0	0	86	424
Dept. of Agriculture, Forest Service								
48 22 18	121 35 0	S12 T33N R 9E	Tr-North Fork Stillaguamish			5	0.30	3
Twin Sisters Pit No. 2			SK01-1311	WA01311	Twin Sisters Pit #2			
1974	RE	O	175	15	1.7	4	10	0
Northwest International								
48 37 12	121 55 36	S08Q T36N R07E	Tr-South Fork Nooksack River			1	0.00	3

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

SKAGIT COUNTY

Victoria Heights Reservoir Dam			SK03-1159	WA01159	Victoria Heights Reservoir			
1970	RE	P	400	17	1.5	10	10	0
Pacific Denkmann Company								
48 17 54	122 15 6	S35R T33N R04E	Tr-Skagit River			3	0.00	3
Wade Dann Waterski Pond Dam			SK03-1702	WA01702	Wade Dann Waterski Pond			
1990	RE	R	400	8	12.7	50	90	
Wade Dann								
48 35 10	122 20 45	S30B T36N R04E	Tr-Friday Creek-Offstream			3	0.03	3

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

WHATCOM COUNTY

Bagley Dam — WH01-1719 — WA01719 — Bagley Lake
1927 — VA — HR — 64 — 16 — 26.0 — 140 — 197
Dept. of Agriculture, Forest Service
48 52 0 — 121 42 0 — S19 T39N R09E — Bagley Creek — 1 — 0.15 — 2

Baker Pond Dam — WH01-1576 — WA01576
1965 — RE — I — 350 — 11 — 5.5 — 17 — 24 — 30
C. O. Baker
48 41 42 — 122 40 30 — S15M T37N R01E — Tr-Hale Passage — 1 — 0.00 — 3

Bellingham Frozen Foods Waste Ponds Dam — WH01-0612 — WA00612 — Bellingham Frozen Foods Waste Ponds
1991 — RE — Q — 2200 — 15 — 4.6 — 46 — 60
Bellingham Frozen Foods, Inc
48 48 35 — 122 34 25 — S05L T38N R02E — Tennant Creek-Offstream — 1 — 0.01 — 2

Blaine Reservoir Dam — WH01-1245 — WA01245 — Blaine Reservoir
1920 — RE — O — 180 — 15 — 2.7 — 15 — 16 — 0
City of Blaine
48 59 6 — 122 41 24 — S04K T40N R01E — Tr-Dakota Creek — 1 — 0.00 — 3

Bullard Dam — WH01-1087 — WA01087 — Bullard Lake
1969 — PG — R — 81 — 8 — 6.6 — 19 — 26 — 390
Cedar Grove Park Association
48 42 24 — 122 26 24 — S09M T37N R03E — Tr-Padden Creek — 1 — 1.10 — 2

Diablo Dam — WH04-0170 — WA00170 — Diablo Lake
1929 — CNVAPG — HR — 1180 — 332 — 990.0 — 88500 — 89200 — 117500
Seattle City Light
48 42 48 — 121 7 48 — S 5 T37N R13E — Skagit River — 4 — 1103.00 — 1A

Ferndale Aerated Sewage Lagoon No. 3 — WH01-0514 — WA00514 — Ferndale Aerated Sewage Lagoon No. 3
1986 — RE — Q — 1872 — 14 — 4.0 — 38 — 55 — 12
City of Ferndale
48 50 18 — 122 35 48 — S30R T39N R02E — Tr-Nooksack River-Offstream — 1 — 0.01 — 2

Glenhaven Lakes Dam — WH03-0206 — WA00206 — Reed Lake
1963 — RE — R — 360 — 9 — 16.0 — 125 — 155 — 134
Glenhaven Lakes Community Club
48 39 24 — 122 19 48 — S32D T37N R04E — Silver Creek — 3 — 1.85 — 3

Gorge Dam — WH04-0168 — WA00168 — Gorge Lake
1961 — CNVAPG — HR — 670 — 285 — 241.0 — 8485 — 8500 — 145000
Seattle City Light
48 41 54 — 121 12 24 — S14 T37N R12E — Skagit River — 4 — 1141.00 — 1B

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

WHATCOM COUNTY

Happy Valley Stormwater Detention Basin — WH01-1347 — WA01347 — Happy Valley Stormwater Detention Basin
1981 — RE — C — 540 — 13 — 0.1 — 0 — 26 — 1500
City of Bellingham
48 43 18 — 122 28 42 — S06L T37N R03E — Tr-Padden Creek — 1 — 1.20 — 1C

Holiday Lake Dam — WH01-1204 — WA01204 — Holiday Lake
1967 — RE — R — 140 — 23 — 2.4 — 9 — 22 — 30
Lummi Island Scenic Estates
48 40 42 — 122 38 18 — S23J T37N R01E — Tr-Hale Passage — 1 — 0.00 — 3

Louise Lake Dam — WH01-0175 — WA00175 — Lake Louise
1972 — RE — RI — 460 — 14 — 29.0 — 1070 — 1175 — 50
Sudden Valley Community Association
48 42 42 — 122 19 30 — S08F T37N R04E — Tr-Lake Whatcom — 1 — 0.32 — 2

Lummi Island Estates Dam — WH01-0184 — WA00184
1963 — RE — RS — 310 — 26 — 4.3 — 49 — 60 — 35
Lummi Island Scenic Estates
48 40 48 — 122 38 24 — S23J T37N R01E — Tr-Hale Passage — 1 — 0.20 — 3

Marona Mill Pond — WH01-1244 — WA01244 — Marona Mill Pond
1941 — RE — O — 350 — 7 — 5.4 — 15 — 15 — 0
E. E. Boyd
48 43 6 — 122 12 48 — S07B T37N R05E — Jones Creek-Offstream — 1 — 0.01 — 3

Nooksack Diversion Dam — WH01-1232 — WA01232
1906 — OT — H — 72 — 10 — 2.0 — 8 — 10 — 0
Puget Sound Power and Light
48 54 24 — 121 48 24 — S31R T40N R08E — North Fork Nooksack River — 1 — 0.00 — 3

Nubgaard Dam No. 2 — WH01-1105 — WA01105
1959 — RE — I — 450 — 12 — 3.1 — 13 — 15 — 0
J. Ellenz
48 51 18 — 122 37 12 — S24J T39N R01E — Tr-Lummi River — 1 — 0.00 — 3

Olason Reservoir Dam — WH01-1240 — WA01240 — Olason Reservoir
1954 — RE — I — 140 — 15 — 2.0 — 12 — 12 — 0
S. Olason
48 59 0 — 122 42 18 — S05K T40N R01E — Tr-Dakota Creek — 1 — 0.00 — 3

Padden Lake Dam — WH01-0364 — WA00364 — Lake Padden
1933 — RE — R — 72 — 9 — 160.0 — 770 — 1440 — 465
City of Bellingham
48 42 18 — 122 27 42 — S08N T37N R03E — Padden Creek — 1 — 2.63 — 1C

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

WHATCOM COUNTY

Ross Dam — WH04-0169 — WA00169 — Ross Lake
1949 — CNVA — HR — 1300 — 540 — 11678.0 — 1434800 — 1452750 — 127000
Seattle City Light
48 43 54 — 121 4 0 — S35 T38N R13E — Skagit River — 4 — 978.00 — 1A

Selder Road Reservoir — WH01-1580 — WA01580
1985 — RE — CI — 340 — 9 — 3.1 — 6 — 11 — 30
The Semiahmoo Company
48 57 6 — 122 46 48 — S14Q T40N R01W — Tr-Birch Bay — 1 — 0.00 — 3

Simonson Pond — WH01-1243 — WA01243 — Simonson Pond
1955 — RE — R — 350 — 4 — 13.0 — 21 — 21 — 0
H. Simonson
48 52 42 — 122 40 48 — S10N T39N R01E — Tr-Terrell Creek — 1 — 0.00 — 3

Smrekar Reservoir Dam — WH01-1108 — WA01108 — Smrekar Reservoir
1954 — RE — IR — 140 — 20 — 3.0 — 23 — 40 — 260
Vincent F. Smrekar
48 53 42 — 122 41 12 — S04R T39N R01E — Fingalson Creek — 1 — 1.35 — 2

Squires Lake Dam — WH01-0550 — WA00550 — Squires Lake
1960 — RECB — IR — 50 — 15 — 7.7 — 44 — 52 — 45
Mrs. Robert E. Fankhauser
48 38 48 — 122 21 18 — S31N T36N R04E — Tr-Friday Creek — 1 — 0.41 — 3

St. Clair Stormwater Detention Dam — WH01-1566 — WA01566 — St. Clair Detention Basin
1986 — RE — C — 520 — 20 — 2.3 — 20 — 25 — 1335
City of Bellingham
48 46 42 — 122 26 0 — S21D T38N R03E — Fever Creek — 1 — 6.18 — 1C

Telegraph Road Stormwater Detention Dam — WH01-1655 — WA01655 — Telegraph Road Detention Pond
1988 — RE — C — 340 — 13 — 6.0 — 0 — 35 — 800
City of Bellingham
48 47 12 — 122 28 42 — S18G T38N R03E — Spring Creek — 1 — 1.02 — 2

Terrell Lake Dam — WH01-0160 — WA00160 — Lake Terrell
1950 — CB — O — 18 — 7 — 440.0 — 5600 — 5600 — 0
Washington Dept. of Wildlife
48 52 24 — 122 41 18 — S16G T39N R01E — Terrell Creek — 1 — 2.85 — 3

Unruh Reservoir Dam — WH01-0159 — WA00159 — Unruh Reservoir
1959 — RE — I — 200 — 15 — 8.3 — 18 — 50 — 325
P. J. Unruh
48 53 48 — 122 45 6 — S01R T39N R01E — Tr-Terrell Creek — 1 — 0.30 — 3

NAME OF DAM			STATE ID	NATIONAL ID	IMPOUNDMENT NAME			
YEAR COMPLETED	TYPE OF DAM	RESERVOIR PURPOSES	CREST LENGTH (Feet)	DAM HEIGHT (Feet)	NORMAL SURFACE AREA (Acres)	NORMAL STORAGE (Acre-Feet)	MAXIMUM STORAGE (Acre-Feet)	SPILLWAY MAX DISCHARGE (Cfs)
NAME OF OWNER								
LATITUDE (Deg Min Sec)	LONGITUDE (Deg Min Sec)	SEC TWN RGE	RIVER OR STREAM			WRIA	DRAINAGE AREA (Square Miles)	DOWNSTREAM HAZARD CLASS

WHATCOM COUNTY

Upper Baker Dam			WH04-0173	WA00173	Baker Lake			
1961	PGCN	HCR	1235	295	4985.0	298000	310984	60000
Puget Sound Power and Light								
48 38 54	121 41 24	S31M T37N R09E	Baker River			4	215.00	1A
West Pass Dike			WH04-0174	WA00174	Baker Lake			
1961	REER	HR	1200	54	4985.0	159104	310984	0
Puget Sound Power and Light								
48 39 30	121 41 12	S30P T37N R09E	Baker River			4	215.00	1A
Whatcom Falls Dam			WH01-1574	WA01574				
1937	PG	R	70	11	2.3	6	10	1500
City of Bellingham								
48 45 12	122 25 30	S28K T38N R03E	Whatcom Creek			1	0.00	3
Whatcom Lake Dam			WH01-0158	WA00158	Lake Whatcom			
1937	PGRE	SR	111	14	5000.0	25000	77000	7000
City of Bellingham								
48 45 30	122 25 18	S28A T38N R03E	Whatcom Creek			1	55.90	1B

from C Ehlers 5/7/12

WAOENG-81-18
WDOE-81-18

Inventory of Dams

in the State of Washington

DECEMBER 1981

STATE OF WASHINGTON
John Spellman, Governor

WASHINGTON STATE DEPARTMENT OF ECOLOGY
Donald W. Moos, Director

In cooperation with

WASHINGTON STATE ENERGY OFFICE
Richard H. Watson, Acting Director

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Grant No. DE-FG51-80R00 1001

NAME OF DAM			ID NO.	IMPOUNDMENT NAME		RIVER OR STREAM	WRIA
YEAR COMPLETED	TYPE OF DAM	CREST LENGTH (FT)	HYDR. HEIGHT (FT)	STORAGE CAPACITY (ACRE FEET) MAXIMUM	NORMAL	NEAREST DOWNSTREAM CITY DIST. FROM DAM (MILES)	NAME
RESERVOIR PURPOSE(S)	INSTALLED POWER CAP. (MW)	SPILLWAY TYPE	WIDTH (FT)	MAX. DISCH. (CFS)	ENGINEERING BY	DAM LOCATION LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	SEC-TWP-RGE
NAME OF OWNER							STATUS	

SKAGIT COUNTY

BAKER DAM — 00172 — LAKE SHANNON — BAKER RIVER — 04
1925 VA 570 278 136,860 132,300 1 CONCRETE
HR 64.0 C 219 41,400 UNK. 48 32.9 121 44.4 S 2 T35N R 8E
PUGET SND POWER & LIGHT

BARNABY SLOUGH NO.2 DAM — 00156 — BARNABY SLOUGH NO 2 — TR-SKAGIT RIVER — 04
1968 RE 230 9 157 124 3 ROCKPORT
O C 21 WA ST GAME DEPT 48 28.7 121 33.0 S31H T35N R10E
WA ST GAME DEPT

BEAR CREEK DAM *WANONAME 340 — 01203 — BEAR CREEK — 04
1910 VA 235 23 40 24 7 CONCRETE
H 1.8 U 78 PORTLAND CEMENT CO 48 37.2 121 44.2 S11N T36N R08E
LONE STAR CEMENT CORP NOT OPERATING

CRANBERRY LAKE DAM — 00282 — CRANBERRY LAKE — CRANBERRY CREEK — 03
1910 RE 385 9 234 178 ANACORTES
R U 3 29 UNK. 48 30.3 122 38.6 S23K T35N R 1E
CITY OF ANACORTES

CULTUS MOUNTAIN RESERVOIR DAM A — 00382 — CULTUS MOUNTAIN RESERVOIR — TR-E FORK NOOKACHAMPS CREEK — 03
1971 RE 530 20 366 320 5 CLEAR LAKE
RO C 8 40 RUSKIN FISHER & ASSOC. 48 23.7 122 11.3 S32G T34N R05E
BOY SCOUTS OF AMERICA

CULTUS MOUNTAIN RESERVOIR DAM B — 00383 — CULTUS MOUNTAIN RESERVOIR — TR-E FORK NOOKACHAMPS CREEK — 03
1971 RE 310 9 403 320 5 CLEAR LAKE
RO C 2 50 RUSKIN FISHER & ASSOC. 48 23.6 122 11.2 S32H T34N R05E
BOY SCOUTS OF AMERICA

CULTUS MOUNTAIN RESERVOIR DAM C — 00384 — CULTUS MOUNTAIN RESERVOIR — TR-E FORK NOOKACHAMPS CREEK — 03
1971 RE 400 17 366 320 5 CLEAR LAKE
RO N RUSKIN FISHER & ASSOC. 48 23.2 122 11.1 S32R T34N R05E
BOY SCOUTS OF AMERICA

JUDY RESERVOIR DAM A — 00183 — JUDY RESERVOIR — TR-SKAGIT RIVER — 03
1965 RE 680 44 4,031 3,375 8 BURLINGTON
S N R W BECK & ASSOC 48 28.3 122 11.3 S32Q T35N R 5E
SKAGIT CO PUD NO.1

NAME OF DAM			ID NO.	IMPOUNDMENT NAME		RIVER OR STREAM	WRIA
YEAR COMPLETED	TYPE OF DAM	CREST LENGTH (FT)	HYDR. HEIGHT (FT)	STORAGE CAPACITY (ACRE FEET) MAXIMUM	NORMAL	NEAREST DOWNSTREAM CITY DIST. FROM DAM (MILES)	NAME
RESERVOIR PURPOSE(S)	INSTALLED POWER CAP. (MW)	SPILLWAY TYPE	WIDTH (FT)	MAX. DISCH. (CFS)	ENGINEERING BY	DAM LOCATION LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	SEC-TWP-RGE
NAME OF OWNER							STATUS	

SKAGIT COUNTY

JUDY RESERVOIR DAM B — 00181 — JUDY RESERVOIR — TR-SKAGIT RIVER — 03
1965 RE — 2,340 — 67 — 4,031 — 3,375 — 3 SEDRO WOOLEY
S — U 10 — 115 — R W BECK & ASSOC — 48 28.7 — 122 10.6 — S33E T35N R 5E
SKAGIT CO PUD NO.1

LANG DAM NO 1 — 01160 — TR-CARPENTER CREEK — 03
1972 RE — 150 — 15 — 30 — 30 — 7 CONWAY
RP — U 4 — UNK. — 48 23.7 — 122 16.9 — S34C T34N R04E
H M LANG

LANG DAM NO 2 — 01161 — TR-CARPENTER CREEK — 03
1972 RE — 125 — 3 — 10 — 10 — 7 CONWAY
RP — U 1 — 48 23.8 — 122 16.9 — S34C T34N R04E
H M LANG

LANG DAM NO 3 — 01162 — TR-CARPENTER CREEK — 03
1972 OT — 100 — 5 — 20 — 20 — 7 CONWAY
RP — U 7 — UNK. — 48 23.9 — 122 16.8 — S34C T34N R04E
H M LANG

SKAGIT LAKE DAM — 00182 — SKAGIT LAKE — GRANDY CREEK — 04
1971 RE — 330 — 17 — 343 — 258 — 7 BIRDSVIEW
R — U 52 — 166 — SIBOLD MINISH WEBB — 48 34.7 — 121 46.2 — S28K T36N R 8E
LANDS-WEST INC

TEXAS POND — 00330 — TEXAS POND — TR-NORTH FORK STILLAGUAMISH — 05
1970 RE — 210 — 14 — 86 — 24 ARLINGTON
RO — U — 424 — USDA FS — 48 22.3 — 121 35.0 — S12 T33N R 9E
USDA FS

TWIN SISTERS PIT #2 *WANONAME 556 — 01311 — TWIN SISTERS PIT #2 — TRIB TO SF NOOKSACK RIVER — 01
1974 RE — 175 — 15 — 10 — 4 — 15 SAXON
O — N — UNK. — 48 37.2 — 121 55.6 — S08Q T36N R07E
NORTHWEST INTERNATIONAL

VICTORIA HEIGHTS RESERVOIR DAM — 01159 — VICTORIA HEIGHTS RESERVOIR — TR-SKAGIT RIVER — 03
1970 RE — 400 — 17 — 10 — 10 — 7 CONWAY
P — C 1 — UNK. — 48 17.9 — 122 15.1 — S35R T33N R04E
PACIFIC DENKMANN CO

NAME OF DAM			ID NO.	IMPOUNDMENT NAME		RIVER OR STREAM		WRIA
YEAR COMPLETED	TYPE OF DAM	CREST LENGTH (FT)	HYDR. HEIGHT (FT)	STORAGE CAPACITY (ACRE FEET)		NEAREST DOWNSTREAM CITY		
				MAXIMUM	NORMAL	DIST. FROM DAM (MILES)	NAME	
RESERVOIR PURPOSE(S)	INSTALLED POWER CAP. (MW)	SPILLWAY TYPE	SPILLWAY WIDTH (FT)	SPILLWAY MAX. DISCH. (CFS)	ENGINEERING BY	DAM LOCATION LATITUDE (DEG MIN)	DAM LOCATION LONGITUDE (DEG MIN)	SEC-TWP-RGE
NAME OF OWNER							STATUS	

SKAGIT COUNTY

WALKING M DAM			00141			TR-NOOKACHAMPS CREEK		03
1969	RE	1,350	60	126	109	13	MOUNT VERNON	
O		U 10	127	LEGRO & JUDY		48 24.1	122 13.6	S25R T34N R 4E
SKAGIT CORPORATION								
WOOD DAM			01154			TR-ROSARIO STRAIT		03
1967	RE	15	4	2	2	NONE		
IP		N		UNK.		48 26.9	122 38.9	S11L T34N R01E
R WOOD								

NAME OF DAM			ID NO.	IMPOUNDMENT NAME		RIVER OR STREAM		WRIA
YEAR COMPLETED	TYPE OF DAM	CREST LENGTH (FT)	HYDR. HEIGHT (FT)	STORAGE CAPACITY (ACRE FEET)		NEAREST DOWNSTREAM CITY		
				MAXIMUM	NORMAL	DIST. FROM DAM (MILES)	NAME	
RESERVOIR PURPOSE(S)	INSTALLED POWER CAP. (MW)	SPILLWAY TYPE	SPILLWAY WIDTH (FT)	SPILLWAY MAX. DISCH. (CFS)	ENGINEERING BY	DAM LOCATION LATITUDE (DEG MIN)	DAM LOCATION LONGITUDE (DEG MIN)	SEC-TWP-RGE
NAME OF OWNER							STATUS	

WHATCOM COUNTY

NUBGAARD DAM NO 1 — 01104 — TR-LUMMI RIVER — 01
1960 RE — 105 — 14 — 3 — 2 — NONE
I — U 8 — USDA SCS — 48 51.3 — 122 37.3 — S24K T39N R01E
N NUBGAARD

NUBGAARD DAM NO 2 — 01105 — TR-LUMMI RIVER — 01
1959 RE — 450 — 12 — 15 — 13 — NONE
I — N 94 — USDA SCS — 48 51.3 — 122 37.2 — S24J T39N R01E
J ELLENZ

OLASON RESERVOIR DAM — 01240 — OLASON RESERVOIR — TR-DAKOTA CREEK — 01
1954 RE — 140 — 15 — 12 — 12 — NONE
I — U 3 — UNK. — 48 59.0 — 122 42.3 — S05K T40N R01E
S OLASON

ROCKY CREEK DAM *WANONAME 341 — 01202 — ROCKY CREEK — 04
1910 VA — 125 — 50 — 8 — 8 — 12 CONCRETE
H — U 74 — PORTLAND CEMENT CORP — 48 40.6 — 121 44.8 — S22Q T37N R08E
LONE STAR CEMENT CORP — NOT OPERATING

ROSS DAM — 00169 — ROSS LAKE — SKAGIT RIVER — 04
1949 VA — 1,300 — 413 — 1,633,400 — 1,434,800 — 12 NEWHALEM
HR 360.0 — C 240 — 127,000 — JOHN L.SAVAGE AND ASSOC. — 48 43.9 — 121 04.0 — S35 T38N R13E
CITY OF SEATTLE

SIMONSON POND — 01243 — SIMONSON POND — TR-TERRELL CREEK — 01
1955 RE — 350 — 4 — 21 — 21 — NONE
R — N 2 — UNK. — 48 52.7 — 122 40.8 — S10N T39N R01E
H SIMONSON

SMREKAR RESERVOIR DAM — 01108 — SMREKAR RESERVOIR — FINGALSON CREEK — 01
1954 RE — 140 — 18 — 31 — 23 — NONE
IR — U 12 — 260 — USDA SCS — 48 53.7 — 122 41.2 — S04R T39N R01E
V F SMREKAR

TAYLOR POND DAM — 01242 — TAYLOR POND — TR-SILVER CREEK — 01
1953 RE — 80 — 6 — 3 — 3 — 6 MARIETTA
P — U 1 — UNK. — 48 48.1 — 122 31.0 — S11B T38N R02E
L HALLOK

NAME OF DAM			ID NO.	IMPOUNDMENT NAME		RIVER OR STREAM	WRIA
YEAR COMPLETED	TYPE OF DAM	CREST LENGTH (FT)	HYDR. HEIGHT (FT)	STORAGE CAPACITY (ACRE FEET) MAXIMUM	NORMAL	NEAREST DOWNSTREAM CITY DIST. FROM DAM (MILES)	NAME
RESERVOIR PURPOSE(S)	INSTALLED POWER CAP. (MW)	SPILLWAY TYPE	WIDTH (FT)	MAX. DISCH. (CFS)	ENGINEERING BY	DAM LOCATION LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	SEC-TWP-RGE
NAME OF OWNER							STATUS	

WHATCOM COUNTY

TERRELL LAKE DAM — 00160 — LAKE TERRELL — 5,600 — 5,600 — TERRELL CREEK — 01
1950 CB — 18 — 7 — NOTOWN
O — C — 18 — WA ST GAME DEPT — 48 52.4 — 122 41.3 — S16G T39N R01E
WA ST GAME DEPT

UNRUH RESERVOIR DAM — 00159 — UNRUH RESERVOIR — 50 — 18 — TR-TERRELL CREEK — 01
1959 RE — 200 — 15 — NONE
I — U — 14 — 325 — USDA SCS — 48 53.8 — 122 45.1 — S01R T39N R01W
P J UNRUH

UPPER BAKER DAM — 00173 — BAKER LAKE — 316,100 — 298,000 — BAKER RIVER — 04
1961 PG — 1,220 — 295 — 8 CONCRETE
HR — 94:4 — C — 75 — 61,000 — STONE & WEBSTER — 48 38.9 — 121 41.4 — S31M T37N R09E
PUGET SND POWER & LIGHT

WEST PASS DIKE — 00174 — BAKER LAKE — 177,184 — 159,104 — BAKER RIVER — 04
1961 ER — 1,200 — 44 — 9 CONCRETE
HR — N — STONE & WEBSTER — 48 39.5 — 121 41.2 — S30P T37N R09E
PUGET SND POWER & LIGHT

WHATCOM LAKE DAM — 00158 — LAKE WHATCOM — 77,000 — 25,000 — WHATCOM CREEK — 01
1937 PGRE — 111 — 14 — 2 BELLINGHAM
SR — C — 54 — 7,000 — BAAR & CUNNINGHAM — 48 45.5 — 122 25.3 — S28A T38N R 3E
CITY OF BELLINGHAM