UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

March 29, 1983

NOTE TO: O. Parr

FROM: R. Capra

SUBJECT: TAC 49636-Trojan

The subject TAC deals with the possible hazards posed by a failure of Spirit Lake Dam. No specific ASB input has been requested at this time. It is a valid TAC number to charge time towards; however, it is not considered a licensing action. As a result I have not included it in the list of DSI Plant-Specific Licensing Actions for FY-83. If at a later time it turns out that ASB needs to provide some type of SER input, let me know and I will add this back into the list.

If you have any questions, please let me know.

R. Capra

Enclosure:
Copy of DL Work Request

cc: [redacted]
R. Lobel
J. Wermiel
L. Rubenstein

C/18

Enclosure 2

Routing Slip

TRANSMITTAL OF DIVISION OF LICENSING WORK REQUEST

SPECIAL HANDLING - PROCESS WITHOUT DELAY

TAC#-Plant Name-Title 49636 - TROJAN - MT. ST. HELENS - SPIRIT LAKE DAM

Description of review requested:
1. Review draft USGS/FEMA report on possible hazards posed by failure of Spirit Lake dam. (to be provided by PM about 2-22-83).
2. Review may involve site visit and further review depending on safety assessment of 1. above.

Requested target date "Quick Look" at USGS report by ~ March 1, 1983.

Basis for request date:

SEQUENCE	NAME	DATE
1. Originator	~~C. Trammell~~ CHT	2-17
2. OR Branch Chief	R.A. Clark /for	2/17/83
3. OR A/D	G. Lainas /for	2/17/83

☐ This action is requested to be added to the review branch's current commitments

☐ This action is requested to be completed in lieu of TAC# _____ for _____ (Plant Name)

4. Review Branch Chief	~~(ASB)~~ O. Parr OP	3/2/83
5. A/D	L. Rubenstein for	3/2/83
6. Division Director	R. Mattson Ray for	3/24/83

☐ This action is accepted for completion with a target date of None Required

☐ This action is accepted for completion with a target date of _____ in lieu of completing TAC# _____ in this fiscal year

7. Return to Review Branch Chief for assignment of reviewer and retention of work package

Jerry Wermiel (Reviewer's Name) JBW (RAMS Initials)

8. Return routing slip to originator

FROM C Trammell	MAIL STOP 422	PHONE 27329

4-28-83

K. Campe	-	AR 5200	SAB
J. Levine	-	P 730	METB
R. Pichumani	-	P214	SGEB
B. Jagannath	-	P214	SGEB
H. LeFevre	-	P-514	GSB
M. Fliegel	-	P214	EHEB *
J. Wermiel		P1022	ASB
R. Gonzales		P214	EHEB *
R. McMullen		P514	GSB
S. Brocoum		P514	GSB
R. Ballard		AR5200	EHEB *

TAC 49636 - TROJAN - SPIRIT LAKE DAM BLOCKAGE

Attached are:

1. PGE letter of 4-12-83.
2. "Mt. St. Helens Eruption - The Challenge to restore and protect" Oct. 81. (This is the one I hoped would [illegible] us to "calibrate" the problem.)

Please fold into your review of this matter.

[illegible]
X27389

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* Already have attach. 2.

c/19

SYSTEM OPERATING PRACTICE PGE LOAD DISP

Title:	SOP 10-060
NOTIFICATION OF MOUNT ST. HELENS AND SPIRIT LAKE CONDITIONS	Page 1 of 3
	Effective Date: 05/02/83

THOSE AFFECTED

1. This System Operating Practice applies to System Power Dispatchers and System Generation Dispatchers.

GENERAL

2. The Company is notified by the U. S. Forest Service of changing conditions on Mount St. Helens and at Spirit Lake because of their close proximity to the PGE electrical system.

POLICY

3. The notification to PGE is made by telephone to the System Power Dispatcher. The System Power Dispatcher is responsible for notifying the appropriate organizations within the Company.

NOTIFICATION PROCEDURE

4. In the event of an eruption or any volcanic activity that may indicate an eruption is expected, the System Power Dispatcher should immediately notify the following people:

Name: Trojan Shift Supervisor
Work: 1914-256

Name: Beaver Shift Supervisor
Work: 1917-256

Name: Jack Lentsch
Work: 226-8120
Home: [redacted]

Name: T. E. Bushnell
Work: 226-8061
Home: [redacted]

5. In the event of a breach in the debris dams that form Spirit Lake or any activity that may indicate such a breach is expected, the System Power Dispatcher should immediately notify the following people:

Name Trojan Shift Supervisor
Work: 1914-256

Name: Beaver Shift Supervisor
Work: 1917-256

Name: Jack Lentsch
Work: 226-8120
Home. [redacted]

Name: T. E. Bushnell
Work: 226-8061
Home: [redacted]

C/20

6. If an eruption has occurred and a heavy ash fallout (1/16" or greater) over any Company facility is expected, the System Power Dispatcher should immediate notify the district duty manager or the operator in charge of the affected facility. He should also notify:

Name Bill Sirpless
Work: 226-5723
Home: [redacted]
Page Boy: 453

And one of the following:

Name: Dean Campbell (Principal)
Work: 226-8798
Home: [redacted]
Page Boy: 463

Name: George Normine (1st Alternate)
Work: 226-5619
Home: [redacted]
Page Boy: 519

Name: Walt Higgins (2nd Alterna
Work: 226-5622
Home: [redacted]

7. If an eruption has occurred and any ash is expected to fall in the Portland area, the System Power Dispatcher should immediately notify one of the following:

Name: Bob Robinet (Principal)
Work: 226-5759
Home: [redacted]

Name: Bill Nickleberry (First Alternate)
Work: 226-7439
Home: [redacted]

8. From time to time, the Forest Service will provide an update of conditions at Mount St. Helens and Spirit Lake. This information should be transmitted via memo from the Power System Dispatcher to the following people:

W. J. Lindblad
G. E. Bredemeier
T. E. Bushnell
C. Goodwin
L. E. Hodel
E. F. Wildfong
B. D. Withers
E. J. Whelan
R. E. Gillmor
W. J. Sirpless
S. Loy
H. W. Miller
R. M. Lee
J. Lentsch
N. K. Lilly
W. S. Orser
C. P. Yundt
S. R. Christensen
R. E. Dyer
W. Higgins
J. T. Wiitala

9. During a volcanic eruption, PGE personnel may be manning a desk at the Forest Service Headquarters. The PGE phone number at the headquarters is 220-3133. (NOTE: This phone is on the PGE Centrex system.) When PGE personnel are manning the desk, they will be the PGE interface with the Forest Service and will be responsible for communicating with Trojan and the System Power Dispatc The System Power Dispatcher will still be responsible for communicating with all other affected PGE organizations.

Prepared by: _____
Power Operations Engineer

Issued by: _____
Manager, System Control

MRR/sa
5-01.4B12

Attachment 3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
301-492-7000

FACSIMILE SERVICE REQUEST

DATE: 5/6/83

MESSAGE TO: Gary Zimmerman, Portland General Electric

TELECOPY NUMBER: 503-226-5690

AUTOMATIC: (Yes) No → (NEFAX SYSTEM 3)

VERIFICATION NUMBER 503-226-8102

NO. OF PAGES 3 PLUS INSTRUCTION SHEET

STATE & CITY PORTLAND, OREGON

MESSAGE FROM: Charles Trammell

TELECOPY NUMBER 492-8110 RAPIFAX AUTOMATIC

492-7617 3M VRC AUTOMATIC

VERIFICATION NUMBER 492-7371

BUILDING PHILLIPS 5-STORY OFFICE PHONE 27389 MAIL STOP 428

CLASS OF SERVICE: ____ Overnight ✓ 4 hour ____ 2 hour

____ 1 hour ____ Immediate

SPECIAL INSTRUCTIONS:
1. Please return (mail stop 428).

Received/Time-Date | Transmitted/Time-Date

C/21

DRAFT

Hydrologic Engineering Questions
Concerning a Postulated Breakout of
Spirit Lake and the Effects on the
Trojan Nuclear Plant

In referring to USGS Report 82-4125, you state that the Trojan Plant is protected against conditions that might be expected from a failure of the Spirit Lake debris blockage. You apparently base this statement on the fact that the design basis flood for Trojan, 4,400,000 cfs, is substantially more than the 1,090,000 cfs postulated by the USGS in their report. We would agree with this reasoning if the Spirit Lake breakout flood was a clear-water flood. However, since it would be a mudflow, the forces considered in analyzing fluid flow, particularly pressure, inertia and viscosity would be significantly different. We would expect that the more viscous mudflow would result in reduced channel efficiency and higher flood levels for a given flow. In addition, the mudflow would be capable of depositing a tremendous amount of sediment in the Columbia River thus resulting in even higher flood levels.

The staff position is that you have not provided sufficient information to show that a breakout of Spirit Lake and the ensuing mudflow would not affect the safety of the Trojan Plant. You should therefore provide the following information for staff review.

1. Taking the scenario in the USGS report as a "given", discuss the potential for sediment deposition in the Columbia River, i.e., how much of the 2.4×10^9 cubic yards of sediment that would be entrained in the Spirit Lake breakout flood would be deposited in the Columbia River?

2. The Corps of Engineers estimates in their report, "Mount St. Helens, The Challenge to Restore and Protect," that about 45,000,000 cubic yards of mudflow infill were deposited in the Columbia River following the May 1980 eruption of Mount St. Helens; the major portion being deposited from about 5 miles downstream of the mouth of the Cowlitz River (River Mile 63) to about the vicinity of the Trojan Plant (River Mile 72). Of this amount, about 14,000,000 cubic yards were removed by the Corps of Engineers and about 31,000,000 cubic yards were left in the river outside the 600 foot wide navigation channel. Discuss the impact of this new condition on the flood carrying capacity of the Columbia River and the effect on the design basis water level of 45 ft at Trojan.

3. Assume that the sediment amount determined in your response to question 1 would be deposited between River Miles 63 and 72, as was the case following the 1980 mudflow, and analyse the impact on flood levels in the Columbia River at the Trojan Plant.

Given the USGS assumptions.

4. The USGS study necessarily required many assumptions concerning items such as the amount of sediment that would be entrained, dam failure mode, downstream routing methods, flood peak attenuation, etc. The USGS assumptions were reasonable and not necessarily upper bound conditions such as are usually assumed in siting of nuclear power plants. You should therefore assume other debris blockage failures and mudflow hydrographs ~~more severe~~ than the USGS's, and discuss the likelihood of water levels exceeding plant grade elevation of 45 feet msl at Trojan.

5. Discuss the effect of water levels higher than elevation 45 feet msl on the safety of the Trojan Plant assuming various durations and levels of flooding.

5/16/83

Mike Fliegel – results of May 11 mtg
w/USGS, Corps, FEMA X.

– no model now avail to study beyond Longview [illegible]

– final rec. due NOV 15 to the President on how to fix

– Quick & dirty study? Yes (by USGS)
by ______.

– interative process using first study as source term.

first cut – a few weeks

– [illegible]
– [illegible] 22
–

5/23/83

Jack Lentsch –

quick look, too conservative, could lead to a problem when none exists?

– 2 Billion cu yds. no credit for deposition May 18 [illegible] as thru load.

– 30' MSL based on 2×10' cu yds
600,000 CFS Col R. flow
40' MSL

450 – 40×10⁶ y cu. 3' rise

C/22

MEMORANDUM

TO: J. W. Lentsch

May 16, 1983

LWE-28-83M

FROM: L. W. Erickson

SUBJECT: Contingency Plan for Flooding Beyond the Design Basis Flood

As you requested, Systems and Analysis Branch has considered possible actions which could be taken in the event of a flood exceeding the FSAR design basis of 45-ft MSL. Attachment 1 outlines a plan to establish and maintain cooling of the reactor over an extended time period. We made the following assumptions in developing our plan:

- Plant operating at 100% power at t = 0
- Flooding above Elevation 45 ft at t = 20 hrs
- Flooding level reaching Elevation 50 ft with resultant unavailability of:
  - offsite power
  - emergency diesel generators
  - all ESF pumps and equipment at or below Elevation 50 ft

In summary, our plan would involve:

- A reactor shutdown and Reactor Coolant System (RCS) cooldown commencing at t = 0
- Establishing a natural circulation cooling mode using two steam generators fed from the condensate storage tank and/or cooling tower basin using pumper trucks
- Providing RCS makeup from the refueling water storage tank via safety injection system using a portable engine-driven pump

In the event that natural circulation heat removal to the steam generators cannot be maintained, core cooling can be maintained in a "Feed-and-Bleed" mode. Steam generated by reactor heat can be vented via the reactor head vent and/or the pressurizer relief valves. In either cooling mode, RCS pressure should be maintained low (less than 150 psi) to minimize RCS leakage and assure makeup capability.

C/23

Please advise if further work is needed in this regard.

LWE/GET/klg
5905G.583

c: B. D. Withers
D. J. Broehl
C. P. Yundt
R. L. Steele
TNP:GEN ENGR 7 FSAR:Sec. 3.4

TROJAN CORE COOLING PLAN FOR FLOOD ELEVATION 50 FT

Assumptions:

. Plant initially at 100% power
. 20 hr. duration before flood peaking
. No offsite or onsite power (except 120 VAC) after t=20 hr.

RCS Cooldown (0<t<20 hr)

. Cool Plant rapidly to ~250°F, ~100 psia
. Decay heat load 75 x 10^6 $\frac{BTU}{HR}$
. Auxiliary feed to S/G or primary makeup requirement to remove decay heat ~ 160 gpm (feed temperature ~100°F)
. Fill S/Gs to 75 - 80% level

S/G Feed Preparation

. Station pumper truck and fuel truck at Cooling Tower Basin
. Take suction from Cooling Tower Basin*
. Run 2 1/2" fire hose from pumper to Main Steam Support Structure
. Branch to two 1 1/2" fire hoses
. Connect 1 1/2" hoses to 1" drains on S/G feedline (S/G 'A' and 'C') via machined nipples
. Rig N^2 supply to S/G 'A' and 'C' PORs
. Secure main feed system
. Secure auxiliary feed system
. Throttle pumper feed at pump or by drain valves FW-086, FW-082, FW-080, FW-084

Primary Makeup Preparation

. Place mobile diesel-driven pump and fuel supply on dechlorination building roof
. Take suction from RWST drain
. Run discharge fire hose through Auxiliary Building to 61 ft elevation of Facade
. Connect discharge hose to test vent connection upstream of MO-8835
. Isolate 8821 A and B
. Throttle flow manually via MO-8835

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* Until limited by water levels, first source of water should be from CST using second pumper truck

Instrumentation Needed

. POR Controllers HIC - 2210 'A'
. HIC - 2250 'C'
. S/G 'A' and 'C' narrow range level
. Communication with pump and throttle stations
. RCS wide range temperature
. RCS wide range pressure
. In-core T/Cs
. RVLIS
. Pressurizer level

GENERAL INSTRUCTIONS

. Establish natural circulation cooling while auxiliary feed is available
. Secure RHR, letdown, and charging
. Isolate auxfeed to SG 'A' and 'C'
. Feed S/G 'A' and 'C' via pumper truck
. Maintain natural circulation with S/G 'A' and 'C'
. Secure auxiliary feed to S/G 'B' and 'D' just prior to loss
. Maintain RCS as-is
. Use primary makeup connection to balance RCS leakage
. Should RCS core temperatures increase, or core water level decrease to dangerous levels (loss of natural circulation) begin primary feed and bleed by opening head vent while charging from RWST.
. Provisions to fill and borate RWST must be made.

LWE/GET/41g
5905G:583

PORTLAND GENERAL ELECTRIC COMPANY

UPDATED
MAINTAINED BY COPY HOLDER

TROJAN NUCLEAR PLANT

May 16, 1983

Revision 1

SAFETY-RELATED

OFF-NORMAL INSTRUCTION - ONI-53

Columbia River Flooding

APPROVED BY C R Yundt DATE 5/17/83

PURPOSE

This instruction describes the necessary actions in the event the Columbia River is expected to reach flood stage.

I. SYMPTOMS

A. High and increasing water level indicated on the intake structure level recorder.

B. Dispatcher notification of impending high flood waters.

C. Notification of a major failure of the Spirit Lake debris dam. ✓

II. AUTOMATIC ACTIONS

None.

III. IMMEDIATE OPERATOR ACTIONS

None.

IV. SUBSEQUENT OPERATOR ACTIONS

A. Perform the following 30 hours prior to an expected flood water crest of 21-foot elevation or greater:

1. Shut down the plant to cold conditions per GOI-3 and GOI-4.

2. Check the intake structure (service water pump room) for water tightness by closing all doors and hatches.

c/24

3. Notify the load dispatcher that a heavy line gang and truck will be required to supply off-site power with a flooded switchyard as follows:

   a. Remove the pipe bus risers from the main transformers 230-kV line dead end tower.

   b. Remove the pipe risers from either the St. Mary's or the Allston BPA #1 dead end tower.

   c. Place a jumper from the main transformers line to the selected 230-kV transmission line.

   d. Remove the bus disconnects between the main generator and main transformers.

      NOTE: These changes will ensure a source of preferred power without regard to high flood waters.

4. Adjust the protective relays as follows:

   a. At BPA Allston Substation,
      Set zone 1 distance relay at 3.70 (18.5) ohms
      Set zone 2 distance relay at 8.50 (42.5) ohms
      Set IRD-9 ground relay at 0.5 (200) amp TD-1
      IT-10 (4,000) amp

   b. At PGE St. Mary's Substation,
      Set zone 1 distance relay at 7.25 (45.31) ohms
      Set zone 2 distance relay at 12.95 (80.93) ohms
      Set IRD-9 ground relay at 0.5 (160) amp TD-1
      IT-4 (1,280) amp

   NOTE: With the above emergency settings, the zone 1 relays will reach 50 percent through the unit auxiliary transformer FRR-3, and the zone 2 relays will reach 150 percent through transformer FRR-3. The ground relays will trip for faults in the 230-kV windings of main transformers VF-1 and VF-2.

B. When the water level reaches 21 feet or when the line crew is ready to make the line changes, start the emergency diesel generators, pick up essential bus loads and de-energize the switchyard.

C. Make the 230-kV line changes as outlined in step A.3 and A.4.

D. Energize the in-plant buses and loads as required via the unit auxiliary transformers.

E. Return the emergency diesel generators to a standby condition.

F. If the water reaches the 21-foot level of the intake structure, check the SW pump room for water tightness.

G. For symptom I.C.:

1. Request pumper truck(s) from Rainer Rural Fire District immediately upon receiving an alert of a major failure of the Spirit Lake debris dam.

NOTE 1: A minimum of 525 gpm makeup is required for hot standby if off-site power is restored.

NOTE 2: A minimum of 4,000 gpm makeup is required for hot standby if off-site power is not restored.

H. Consult the Trojan Emergency Plan for further actions.

5/19/83

RAC

Could you attend a mtg in Vollmer's office Fri at 3:00 p

Subject: Spirit Lake blockage & Trojan

CT

5/19

Yes, I can —

Thanks

Bob

c/z5

5/23/83

D. Eisenhut
RA. Purple
G. Lainas
RA Clark
R. Vollmer
W. Johnston
R. Ballard
O. Parr
R. Mattson
L. Rubenstein

The attached press clipping concerns Mount St. Helens' Spirit Lake blockage and Trojan which has been under active review by NRC. For your info.

C Tramell

c/26

FRONT PAGE - WASH. POST 5/23/83

St. Helens' Dam a Time Bomb

By Bill Prochnau
Washington Post Staff Writer

Three years ago, Mount St. Helens blew her snow-capped top with the force of a hydrogen bomb, splintering giant forests, killing at least 59 persons, wreaking more than $1 billion in damage and capturing the imagination of a nation.

In the election year of 1980, the volcanic explosion also captivated politicians.

President Carter swept in by helicopter. Washington Gov. Dixy Lee Ray (D), pounded a table and demanded federal money. Sen. Warren G. Magnuson (D-Wash.), then chairman of the Senate Appropriations Committee, produced almost $1 billion in special disaster aid.

Now, with the mountain bubbling only occasionally and all three of these politicians removed by the Democrats' natural disaster of 1980, the 45,000 people in the valleys below the mountain are living with a time bomb potentially more catastrophic than the volcano.

But, in an era of budget cuts and short memories, they cannot get anyone to listen.

"What no one seems to understand is that we still could lose everything," said Van A. Youngquist, a Republican county commissioner from Cowlitz County who made his fifth fund-seeking trip here last week. "No one in the Reagan administration seems to understand the magnitude of the problem."

To anyone living in the volcanic-gray valley west of Mount St. Helens, the problem is ominous. Above them looms a giant reservoir of water and mud precariously held back by an eroding wall of silt and debris dumped by St.

See MOUNT ST. HELENS, A8, Col. 1

'Southcom' Hub of U.S. Latin Role

By Christopher Dickey
Washington Post Foreign Service

FORT GULICK, Panama—In the headquarters of the 3d Battalion, 7th Special Forces Group, there is a wall covered with framed photographs. One shows a tall American Santa Claus mobbed by smiling Panamanian children: "Civic Actions. David Orphanage. Dec. '79." In the picture next to it, Che Guevara's corpse lies open-eyed and bare-chested on a slab: "MTT [Mobile Training Team], Bolivia. Oct. '67," reads the caption without further explanation.

Col. Fred Scruggs, the lanky, slow-talking Kentuckian who commands the unit, explained in a recent interview how his people are now training "about 20 men to be cadres in patrolling in Costa Rica." Another of his teams is trying to shape up notoriously ineffectual battalions of government troops in the heavily contested Salvadoran provinces of San Vicente and Usulutan.

As they were the leading edge of U.S. efforts in Southeast Asia 20 years ago, the Special Forces are the vanguard of Washington's counterinsurgency initiative in Central America today. But Scruggs' 305 Green Berets are only part of the total American force at the U.S. Southern Command, or "Southcom," as it is called.

Historically a backwater for the U.S. military, the command now finds itself the nerve center of what its outgoing chief considers a continent-wide war against Soviet-Cuban expansion. The command's almost 9,000 Army, Navy and Air Force personnel are the hub of the U.S. military presence from Tierra del Fuego to Tijuana.

Protecting the Panama Canal remains

See COMMAND, A15, Col. 1

'Nonsex Warfare'

Small, Vocal Band of Citizens Challenges Sex Education in Montgomery County Schools

If as predicted volcanic dam breaks, Spirit Lake could flood the battered valley below with 2.4 billion cubic yards of sediment and 300,000 acre-feet of water, according to the U.S. Geological Survey

Mount St. Helens' Eruption Created Time Bomb

MOUNT ST. HELENS, From A1

Helens into the only outlet of once-pristine Spirit Lake.

The U.S. Geological Survey estimates that a break in the Spirit Lake volanic dam could send 300,000 acre-feet of water and 2.4 billion cubic yards of sediment into the valley.

The USGS says that mud flows, common after ancient Pacific Northwest volcanic eruptions, could inundate already battered hamlets such as Castle Rock and Lexington with 60 feet of mud. The Columbia River and towns of Longview and Kelso could be flood 30 to 40 feet deep.

"We would cease to exist," Youngquist said, noting that is just the beginning of the problem.

Such a catastrophic mud flow, he said, would probably cut off Columbia River shipping lanes, isolating the busy port at Portland, Ore., from the sea. Backed-up flood waters could also threaten the Trojan nuclear-power plant on the bank of the Columbia and cut off the north-south interstate highway connecting Seattle and Portland.

Youngquist's constituents, living beneath 21 new warning sirens strung along the Toutle River up toward Spirit Lake, are not simply frightened. They are angry about federal promises that seem to have disappeared into a maw of bureaucracy and politics.

Of the $951 million appropriated in 1980 for volcano relief, $435 million has been spent on volcano damage. The rest of the money is long gone—spent by federal agencies on other disasters after a House-Senate conference committee failed to include the words "Mount St. Helens" in the relief bill.

Of the largest portion of the funds—$430 million for low-interest Small Business Administration loans—about $70 million has found its way to volcano victims.

Property owners in the region have bought almost $900 million in federally backed flood insurance since the eruption. Erosion along riverbanks is still dragging homes into the water. And frustrated homeowners have found that erosion losses are not covered by the federal program.

In the first year after the eruption, the Army Corps of Engineers spent $215 million dredging mud-filled riverbeds and building levees to protect the valley against floods from Spirit Lake. But the corps, hampered by budget cuts, ran out of money in September, 1981.

Silt is again filling the rivers. In some places, river bottoms are almost as full—and as threatening—as on the day after the eruption.

"You can't imagine the emotional suffering the people have endured out there for the past three years," says William Paris, an aide to Gov. John D. Spellman (R-Wash.).

Three years ago, riverfront farmer Sam Hornstra watched the first mud flow race down the Toutle, with salmon and steelhead trout leaping out of the volcano-heated waters and landing on their backs, dead.

That flood left his 18-acre filbert orchard under 10 feet of mud. A year later, all but five of his 800 filbert trees were dead. Today, most of his farm is covered with levees excavated from the Toutle, and he has received no federal aid.

Meanwhile, Youngquist, Paris and other local officials are continuing hat-in-hand trips here, pleading with congressional committees and trying to get the White House to support a $48.1 million special appropriation to allow the Corps of Engineers to start dredging again so that, if the worst happens, riverbeds can carry most of the mud past threatened towns.

"I guess I'll never understand Washington," Youngquist said as he headed home last week. "We've got people scared to death. But the federal government also has $900 million in flood insurance at stake. If Spirit Lake goes, they'll have to pay off. Isn't $48 million a better investment?"

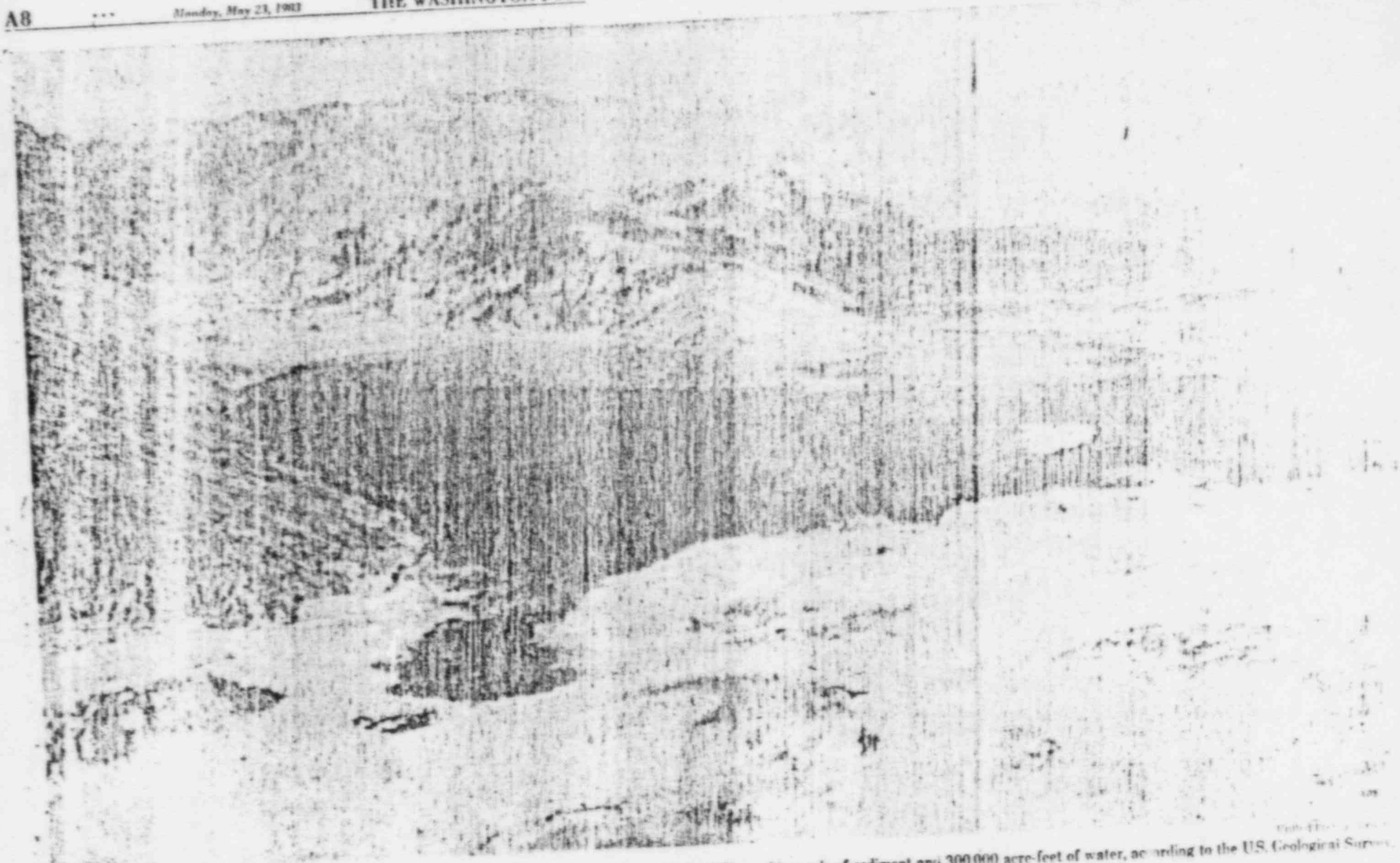
At Spirit Lake, high above Youngquist's county commission office, the average annual precipitation is 105 inches. The area around the lake is a moonscape, stripped of timber and ground cover by the 1980 eruption. Rainwater has no place to flow, except into Spirit Lake.

The Corps of Engineers used the last of its money installing 20 pumps to take some of the water around the shaky dam, stabilizing the size of the lake at 275,000 to 300,000 acre-feet. But USGS is not sure that the dam will hold a lake of that volume, more than twice what it was after the eruption.

Youngquist said the government is taking a "tremendous risk" if it does not provide money in time for dredging this summer.

"The region is noted for dry summers and mild, wet winters when heavy mountain snowfalls are often followed by mild Pacific rainstorms that cause flooding even under normal circumstances.

"Since the eruption, we've been blessed by dry winters," Youngquist said. "We can't stay that lucky. We had three winters in the 1970s that could have breached that dam. One more like that, and we're done for. There would be nothing of value left."



If a precarious volcanic dam breaks, Spirit Lake could flood the battered valley below with 2.4 billion cubic yards of sediment and 300,000 acre-feet of water, according to the U.S. Geological Survey.

Mount St. Helens' Eruption Created Time Bomb

6/17/83

SPIRIT LAKE

Status

Completed several runs -

① Clear water: ~10° cfs

low flow	20'	MSL
(100 yr. flood) high flow	38'	MSL

Ph I tentative

② Sediment, adjusted for mud:

65% silt 7%

Columbia low flow	31'	MSL.
once/10yr. high flow	44'	MSL.
100 yr. flood	48'	MSL.

After event (assumed to have occurred at low flow)
then, 50 yr flood = 52'.

C/27