

General

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Tony Stanford, FWO-DO, MS K492
FROM: Steven Rae, ESH-18 *[Signature]*
SYMBOL: ESH-18/WQ&H:00-0188
SUBJECT: **FLOOD FLOWS**

DATE: June 5, 2000

MAIL STOP/TELEPHONE: K497/5-1859

Transmitted herewith is a summary of flood flows for twelve locations on or near the Laboratory. Tables for each station are included that have flood flows for different return periods.

These flows were generated with the HEC-1 model developed by the U. S. Army Corp of Engineers. This code with Laboratory inputs for drainage areas, elevations, channel lengths, and other parameters has been used to determine flood flows for the Laboratory's RCRA Permit, Site-Wide Environmental Impact Statement, and for location of utilities and other structures.

The difference between the Laboratory's flood flows and the Burned Area Emergency Rehabilitation Team (BAER) numbers are due to a longer storm duration used by the Laboratory (6-hr vs. 1-hr), a different distribution of rainfall over the storm (the Laboratory used storm centered peak rainfall intensity and the BAER used a distribution that has highest intensity at the start), and the Laboratory adjusted precipitation for elevation while the BAER used a constant value. The 6-hr storm duration is suggested for design and it has the 1-hr storm imbedded inside its distribution. The runoff generation parameter or curve number was consistent between the BAER and Laboratory simulations.

Both the Frijoles and Capulin Canyons watersheds have experienced fire and their peakflow rates have increased. On Frijoles Canyon the year after the La Mesa Fire, the observed peakflow was 3030 cfs with prior peakflow less than 20 cfs. For Capulin Canyon the year after the Dome Fire, a peakflow of 3630 cfs was observed and the prior peakflow was less than 25 cfs.

The 6-hr, 100-yr peakflow is suggested as a design basis for decisions related to facilities and infrastructure, although some facilities may require evaluation under longer return periods.

SR/rm

Attachments: a/s

Cy: R. Burick, DLDOPS, w/att., MS A100
L. McAtee, ESH-DO, w/att., MS K491
E. Springer, EES-15, w/att., MS J495
S. McLin, ESH-18, w/att., MS K497
WQ&H File, w/att., MS K497

Lars -

- ① flow numbers for dilution assumption - 100 yr flood - Julie says is our starting pt + to be used.
- ② check Neptune cables.
- ③ check conceptual model bullets.
- ④ Is Danny's plan ready for PAT review?
- ⑤ Copy this memo for Danny. *Charles A.*

Emergency design life = 5 yrs.



13386

All numbers are yr. 0 \Rightarrow unmitigated
 Yr. 1 can cut back 30%

DISCHARGES (cfs)

Location	LANL 100-yr Before Fire	LANL 100-yr After Fire	BAER 100-yr
Los Alamos at Omega Bridge	532	2182	509
Los Alamos at Pueblo Canyon	589	912	546
Pueblo at Diamond	206	3276	1711
Pueblo at LA Canyon		1072	701
Los Alamos below Pueblo		1299	
Pajarito at NM 501	146	1533	683
Pajarito at TA-18		1407	523
Pajarito at White Rock	498	1070	404
Canon de Valle at NM 501	147	714	220
Water Canyon at NM 501	264	1849	807
Mortandad at Eastern Boundary	35	264	
Canada del Buey at White Rock	72	90	90

Los Alamos Canyon at Omega Bridge Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	532	2182	1802	509	
50		1835	1594		
25		1550	1334	287	4
10		1188	969		
5		909	745		
2		484	340	18	

∴ Differences btwn. LANL & BAER is the way the storm is centered. BAER front end loads the peak + LANL uses storm centered or peak in the center.

Los Alamos Canyon at Pueblo Canyon Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	589	912	403	546	
50		771			
25		648		286	17
10		497			
5		376			
2		198		3	

Pueblo Canyon at Diamond Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	206	3276	3440	1711	
50		2896	3136		
25		2557	2785	1278	9
10		2100	2280		
5		1738	1928		
2		1150	1256	494	

Pueblo Canyon at Los Alamos Canyon Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100		1072	859	701	
50		935	756		
25		805	646	457	69
10		644	504		
5		522	409		
2		337	256	93	

Los Alamos Canyon below Pueblo Canyon Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100		1299	989		
50		1117	860		
25		946	723		
10		740	550		
5		584	438		
2		360	266		

Pajarito Canyon at NM 501 Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	146	1533	1476	683	
50		1310	1320		
25		1125	1133	460	1
10		879	879		
5		696	705		
2		423	381	100	

Pajarito Canyon at TA-18 Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100		1407	1101	523	
50		1174	928		
25		965	743	297	39
10		713	522		
5		533	378		
2		272	175	25	

Pajarito Canyon at White Rock Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	498	1070	793	404	
50		892	664		
25		731	528	228	64
10		536	368		
5		397	263		
2		199	119	15	

Canon de Valle at NM 501 Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	147	714	609	220	
50		597	528		
25		497	437	125	4
10		373	309		
5		279	228		
2		142	96	8	

Water Canyon at NM 501 Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	264	1849	1697	807	
50		1561	1480		
25		1309	1232	504	4
10		987	898		
5		760	680		
2		367	318	81	

Canada del Buey at NM 4 Peak Discharges (cfs)

Return Period (yrs)	LANL 6-hr Before Fire	LANL 6-hr After Fire	LANL 1-hr After Fire	BAER 1-hr After	BAER 1-hr Before
100	72	90	58	90	
50		70	41		
25		51	26	51	40
10		30	12		
5		17	4		
2		3	0	4	