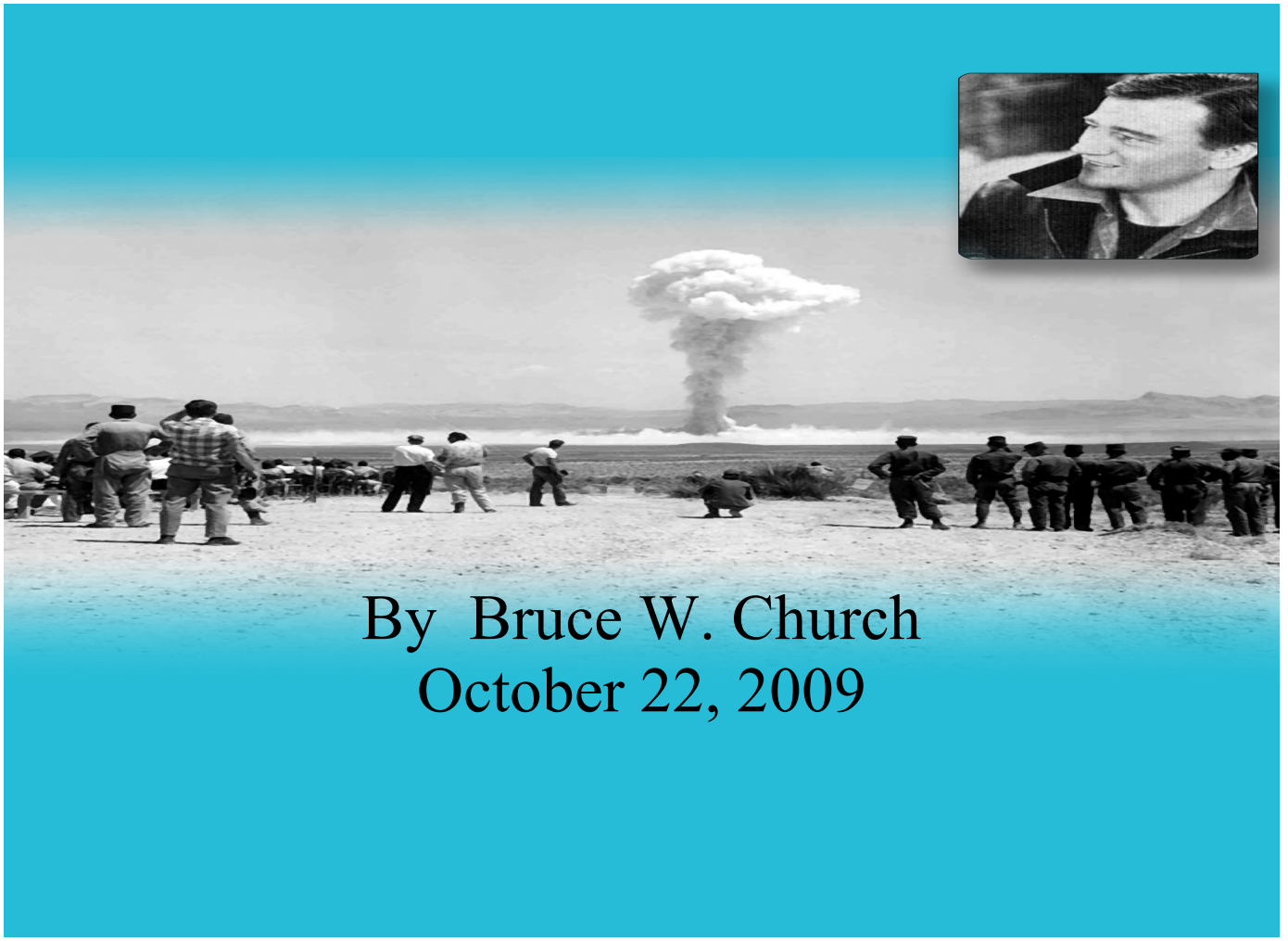
U.S. ATMOSPHERIC NUCLEAR WEAPONS TESTING: The Connection Between John Wayne and Radioactive Fallout, and Other Tales.



By Bruce W. Church

October 22, 2009

WHAT IS RADIOACTIVE FALLOUT ?

- Fallout is the residual radiation hazard from a nuclear explosion, so named because it "falls out" of the atmosphere into which it is spread during the explosion. It commonly refers to the radioactive dust created when a nuclear weapon explodes. Visible dust is referred to as “local” or close-in fallout. Very small particles (not visible) is referred to as delayed or “world wide” fallout.

Radioactive Fallout Continued

- Early, Local or Close-in Fallout – Made up of visible particles, e.g., fine sand, ~ ≤100 microns at the most distant portions of the fallout area to larger particles closer in to point of burst.
- Delayed or Worldwide Fallout – This the deposition of very small particles which descend very slowly over large areas of the earth's surface.

BEHAVIOR OF FALLOUT

- Energy or Yield
- Design of the weapon/device
- Height of the Explosion
- Nature of surface beneath point of burst.
- Meteorological conditions: Height of Tropopause, Temperature, Precipitation, Wind speed, Wind Direction, Wind shear.
  - The tropopause is the atmospheric boundary between the troposphere (~6.8 mi., or ~12 km) and the stratosphere.

Fallout Atmospheric Transport Model

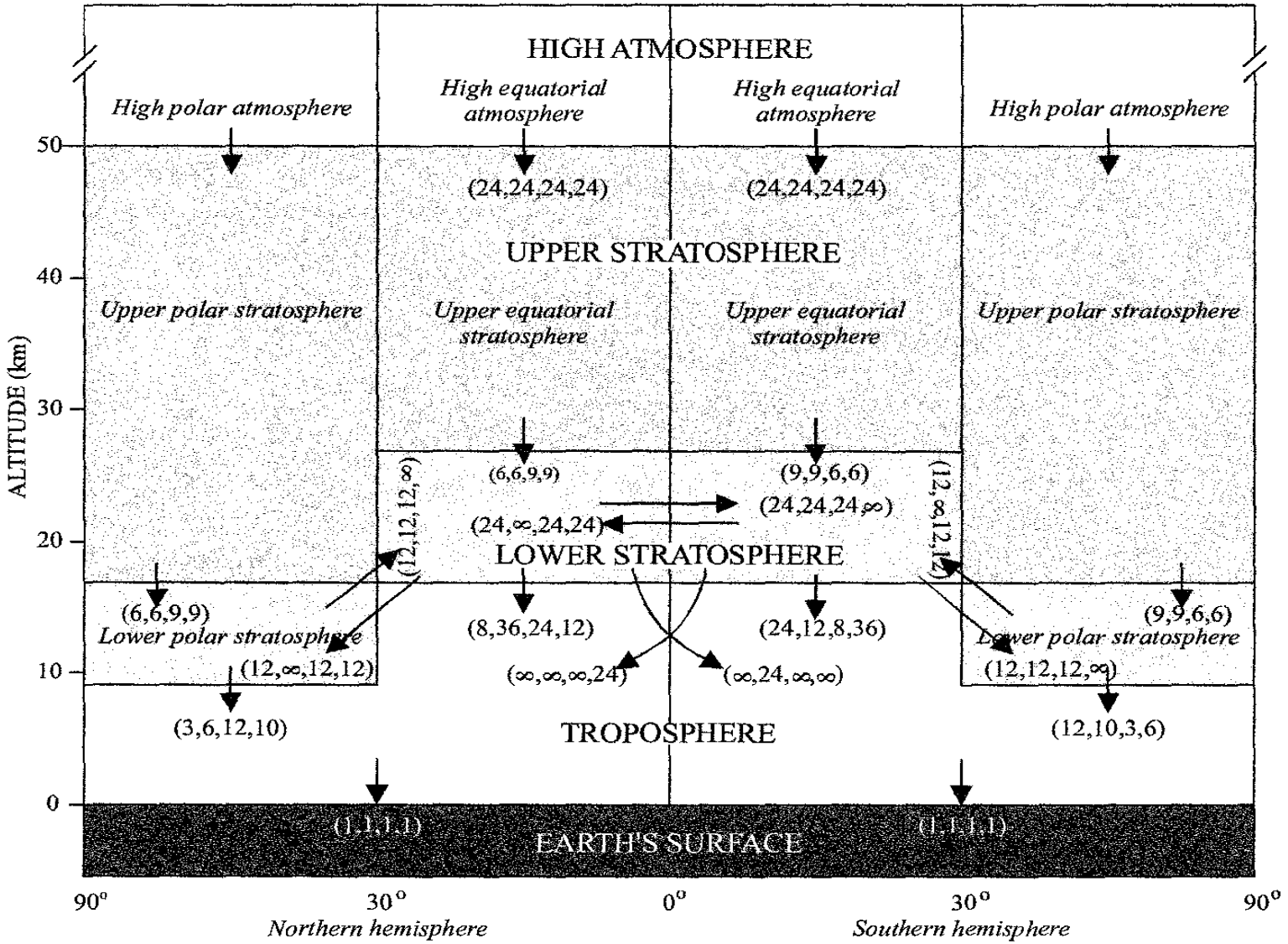


Figure III. Schematic diagram of transfers between atmospheric regions and the earth's surface considered in the empirical atmospheric model [B1].

The numbers in parentheses are the removal half-times (in months) for the yearly quarters in the following order: March-April-May, June-July-August, September-October-November, December-January-February.

Test Parameters for Selected Atmospheric Tests

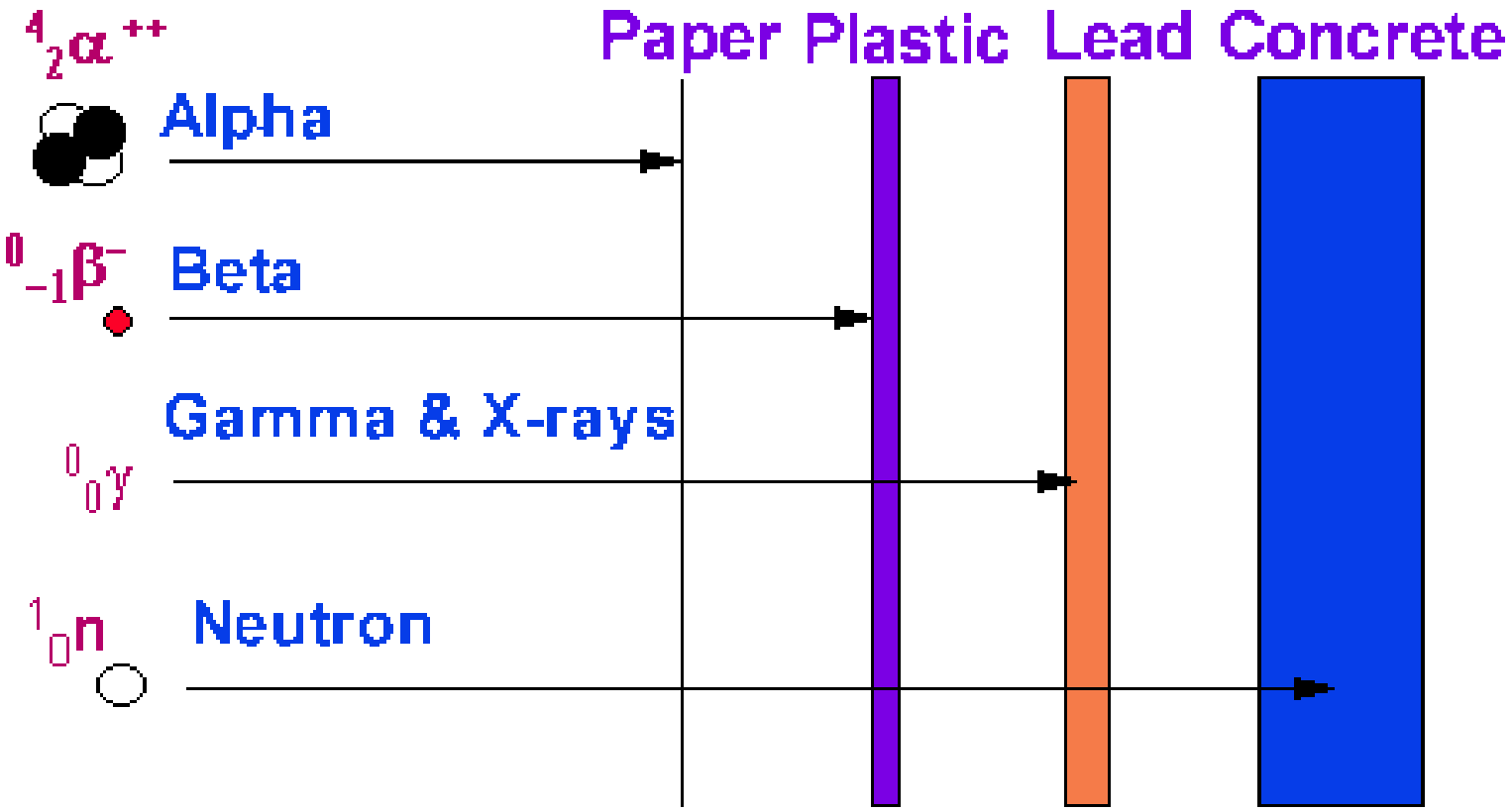
Name	Location	Type of Test	Date	Yield	Height of Burst (ft)	Cloud Top (kft)	Height of Tropopause (kft)
X-Ray	Eniwetak	Tower	14-Apr-48	37 kt	200	56	56
Baker	Nevada	Air drop	28-Jan-51	8 kt	1080	35	32
Easy	Nevada	Air drop	2-Jan-51	1 kt	1080	12	35
Annie	Nevada	Tower	17-Mar-53	16 kt	300	41	36
Dixie	Nevada	Air drop	6-Apr-53	11 kt	6020	43	36
Simon	Nevada	Tower	25-Apr-53	43 kt	300	45	38
Harry	Nevada	Tower	19-May-53	32 kt	300	43	42
Bravo	Bikini	Surface	28-Feb-54	15 Mt	Surface	114	55
Hornet	Nevada	Tower	12-Mar-55	4 kt	300	35	38
Apple-2	Nevada	Tower	5-May-55	29 kt	500	43	41
Lassen	Nevada	Balloon	6 May 57	0.5 ton	500	7	43
Hood	Nevada	Balloon	5-Jul-57	74 kt	1500	48	53
John	Nevada	Rocket	19-Jul-57	~2 kt	20,000	44	48
Smoky	Nevada	Tower	31-Aug-57	44 kt	700	38	35
Yucca	Near Eniwetak	Balloon	28-Apr-58	1.7 kt	86,000		53
Teak	Johnston Island	Rocket	1-Aug-58	Megaton Range	252,000		
Orange	Johnston Island	Rocket	12-Aug-58	Megaton Range	141,000		
Argus I	South Atlantic	Rocket	27-Aug-58	1-2 kt	~300 miles		
Name	Location	Type of Test	Date	Yield	Height of Burst (ft)	Cloud Top (kft)	Height of Tropopause (kft)

Factors Considered to Minimize Dose From Fallout!

"The physical parameters & meteorological conditions DISCUSSED are controlled to the extent possible to maximize the radiological safety principles below":

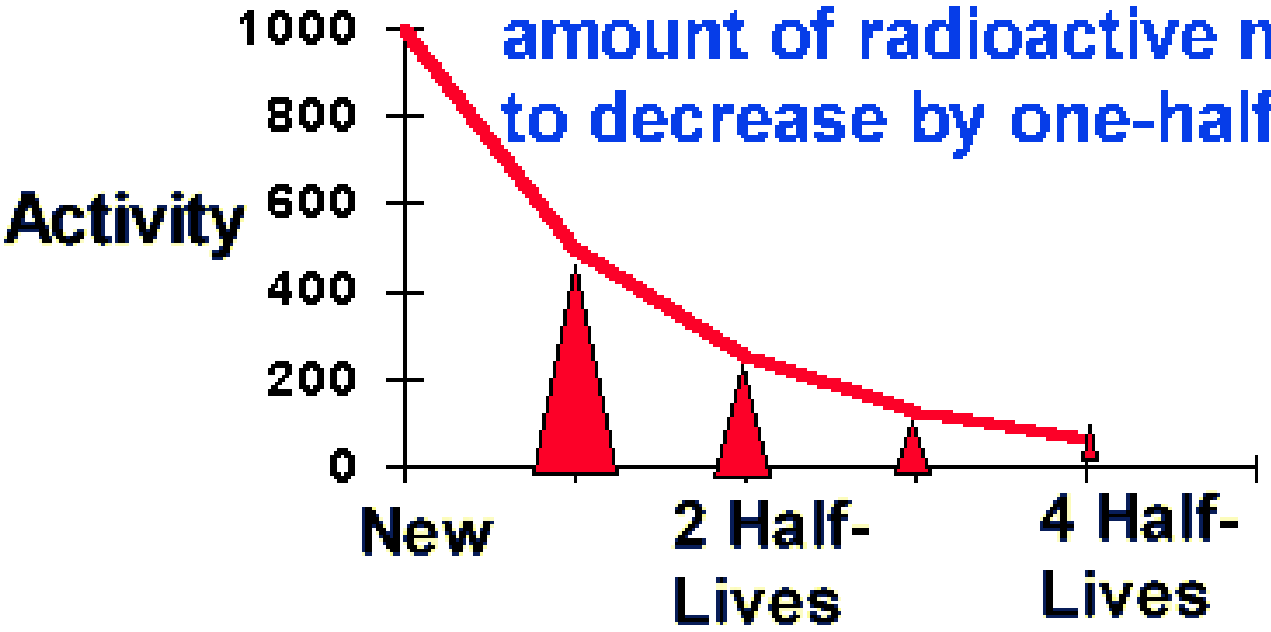
- TIME
- DISTANCE
- SHIELDING

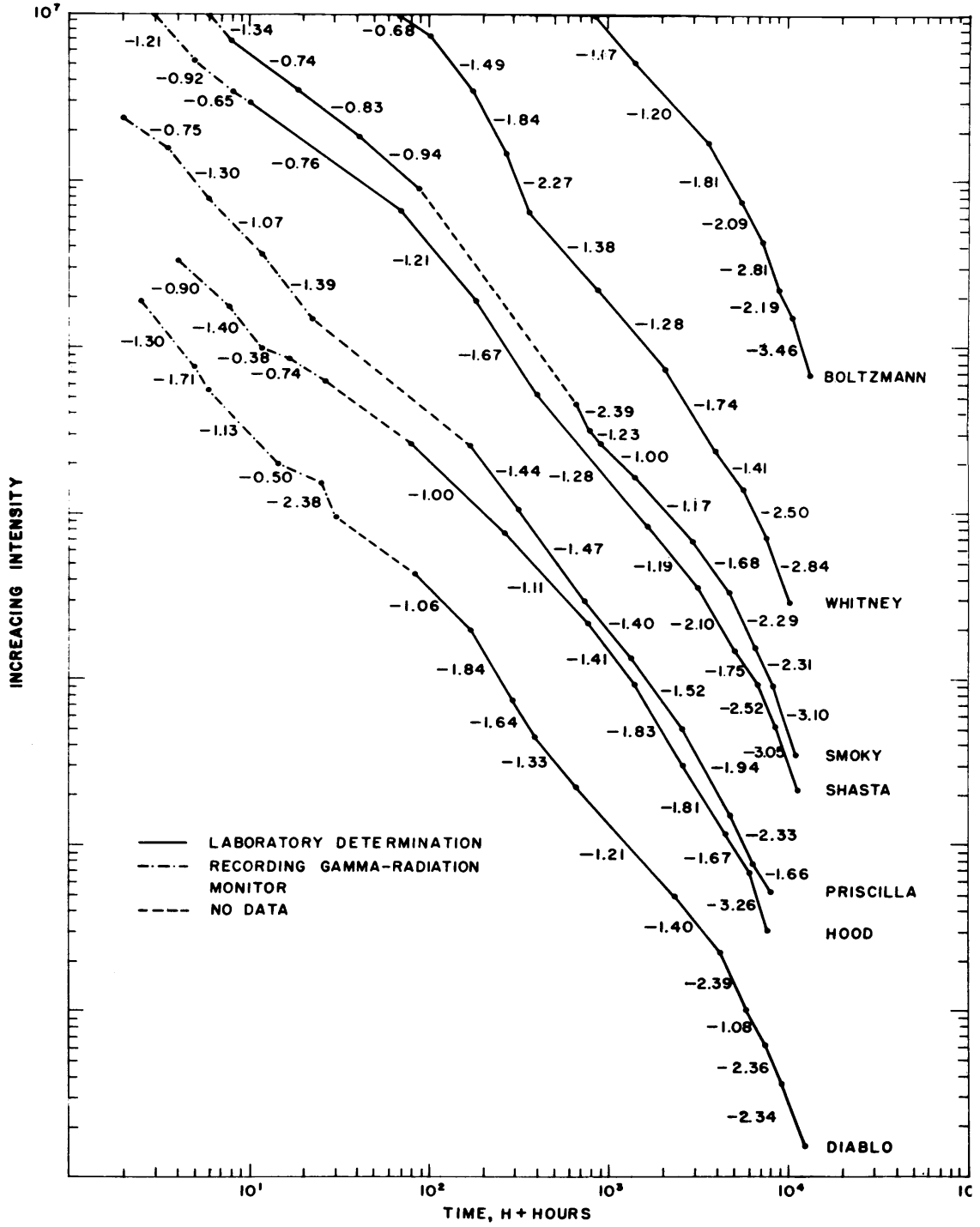
Penetrating Distances



Half-Life

The time required for the amount of radioactive material to decrease by one-half





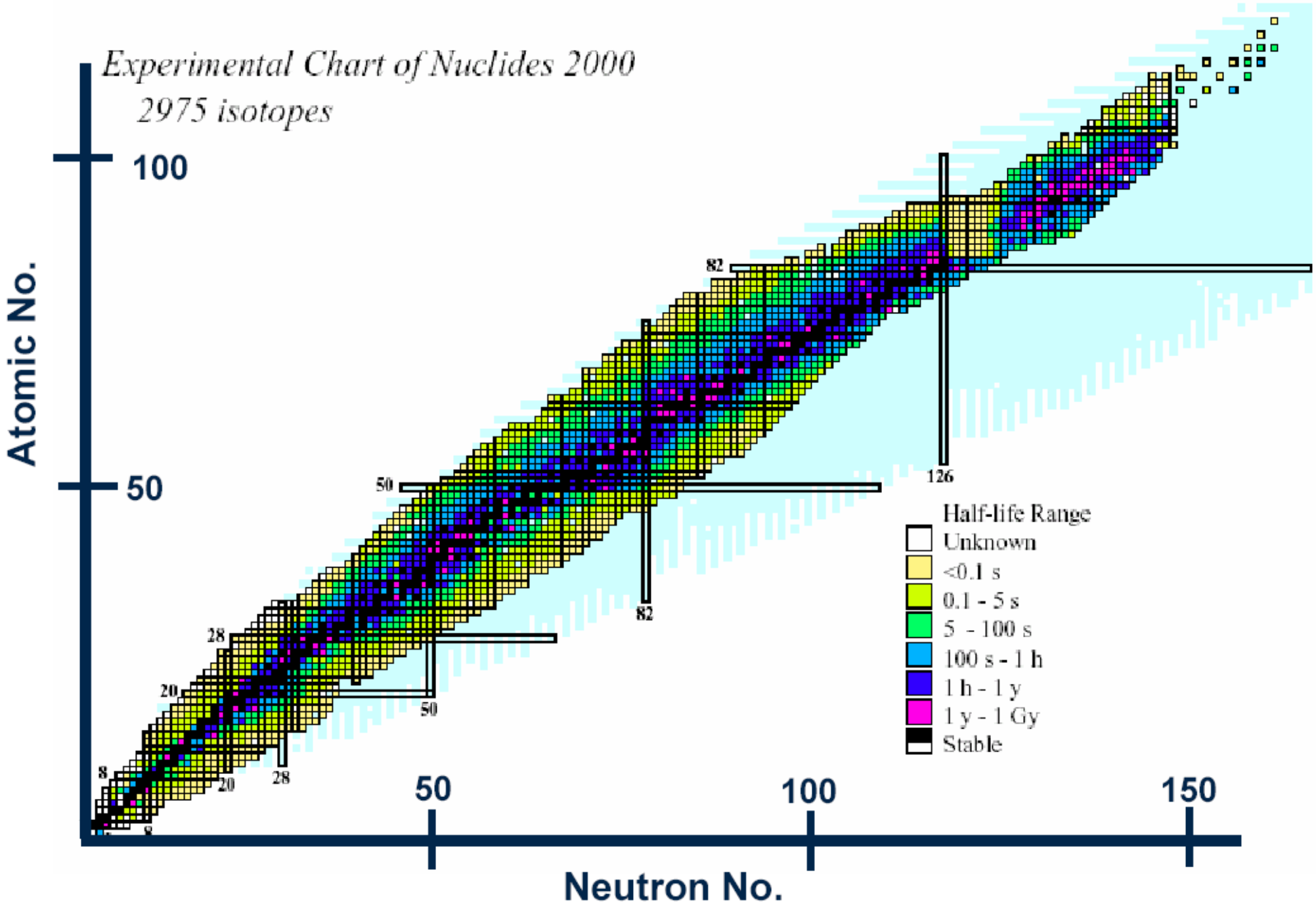
Gamma Decay Curves Fallout from Seven Shots.

Fallout Decay Curves

Gamma decay curves from seven tests from Operation Plumbbob. This slide shows that nuclear decay generally follows the basic decay curve $t^{-1.2}$.

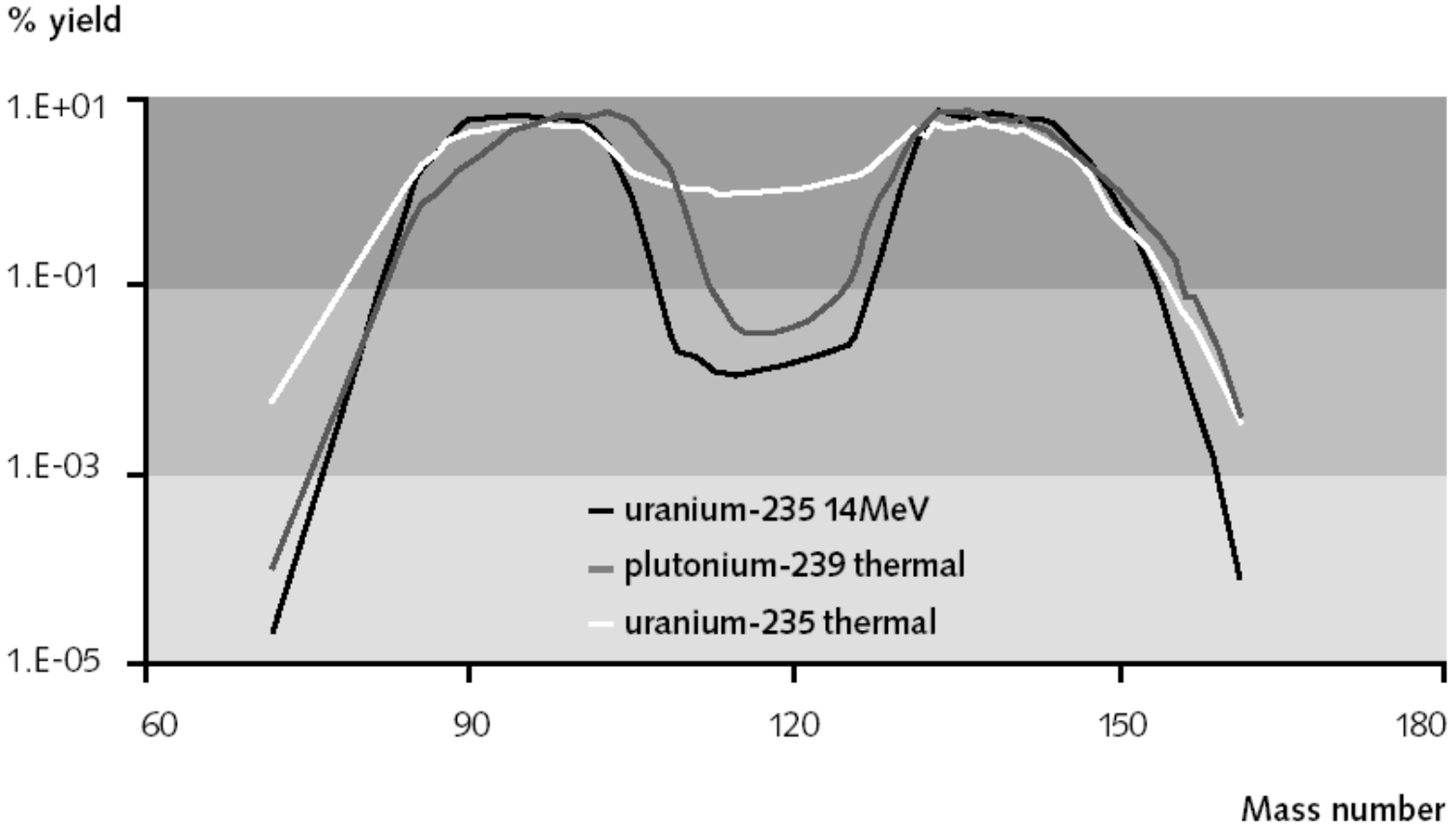
Radioactive DECAY Rule of Thumb for Fallout

- 7 hour rule: At 7 hours after detonation the fission product activity will have decreased to about 1/10 (10%) of its amount at 1 hour.
- At about 2 days (49 hours-7X7) the activity will have decreased to 1% of the 1-hour value!
- At about 1 year (8760 hours) the radioactivity will have decreased to about 0.01% of the 1-hour value!

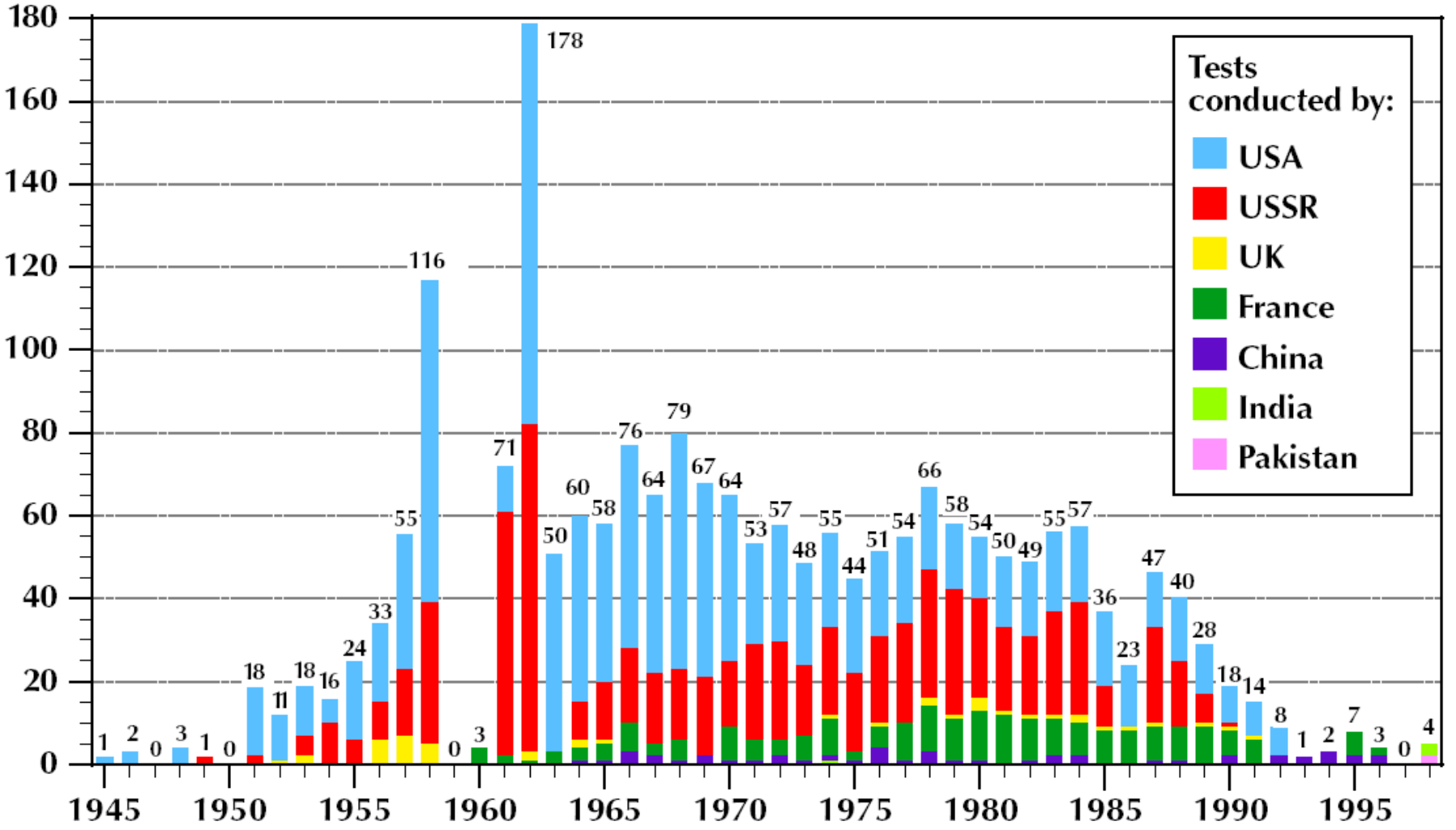

Experimental Chart of Nuclides 2000
2975 isotopes
Atomic No.
100
50
Neutron No.
50
100
150
8
20
28
50
82
126
Half-life Range
Unknown
<0.1 s
0.1 - 5 s
5 - 100 s
100 s - 1 h
1 h - 1 y
1 y - 1 Gy
Stable

Fission Yield Curve

Figure 2 **Fission yield curves**



Total Worldwide Nuclear Tests by Year (1945–98)



SOURCES:
U.S. Department of Energy; Natural Resources Defense Council; Arms Control Association

Coalition to Reduce Nuclear Dangers
June 1999

TOTAL MEGATONNAGES EXPENDED IN NUCLEAR TESTS, 1945-1996

	Atmosphere	Underground	Total
USA	141	38	179
Soviet Union	247	38	285
UK	8	0.9	8.9
France	10	4	14
China	21.9	1.5	23.4
Pakistan		(2 tests)	
India		(3 tests)	
	Atmosphere	Underground	Total

MYTHS & OTHER TALES ABOUT FALLOUT

- John Wayne & Cast dying from radiation induced cancer as a result of filming the Conqueror in Snow Canyon, Utah?
- Fallout appearing & eaten as snow?
- Exposure to Fallout causing acute hair loss?
- Exposure to Fallout causing cancer epidemic in Southern Utah?

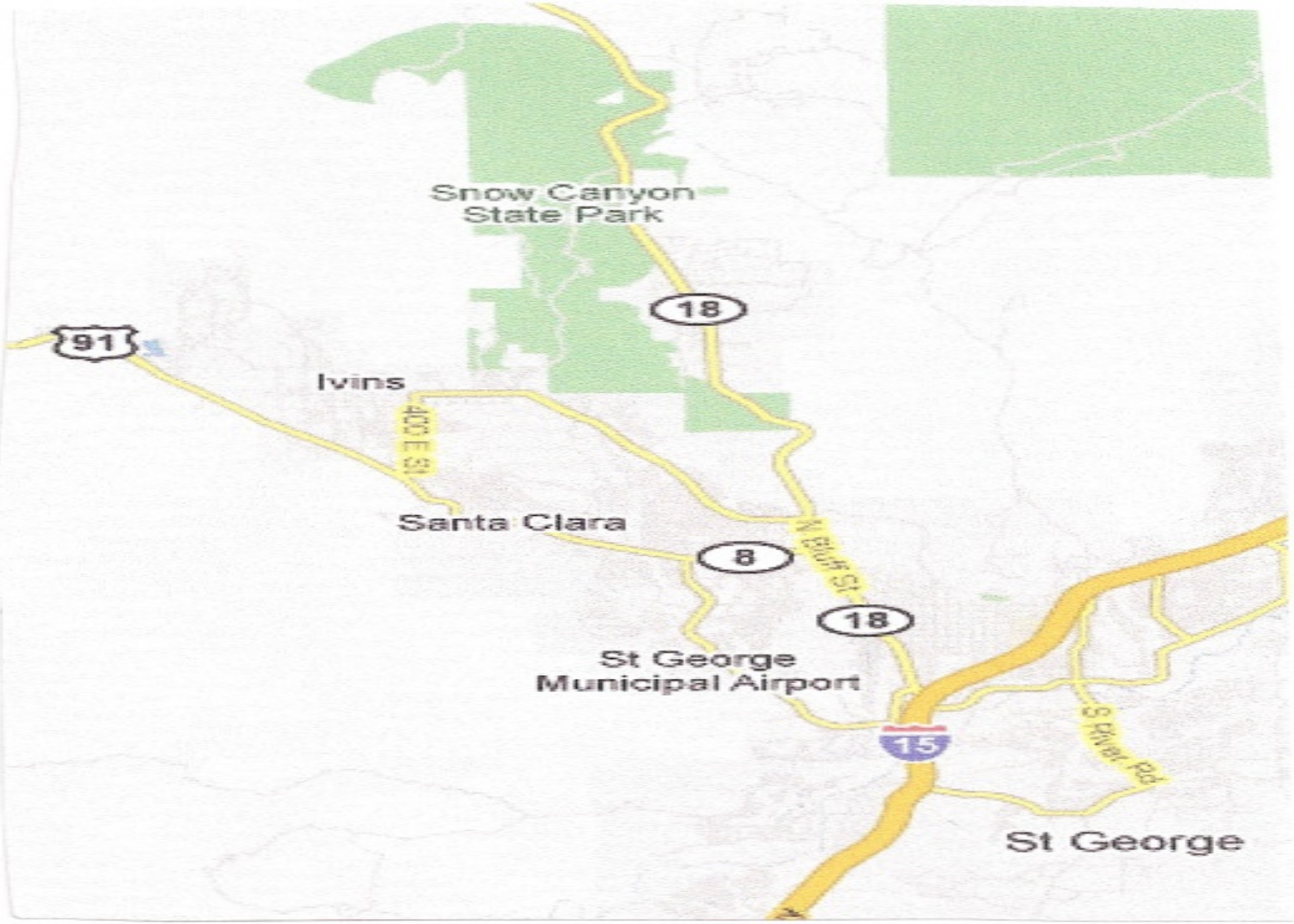
The John Wayne myth – a few facts!

- Conqueror filmed in Snow Canyon May-Aug. 1954!
- There was NO nuclear weapons testing in Nevada in 1954!
- Dick Powell, Pedro Armendariz, Agnes Moorehead, Susan Hayward all dead by 1975. JOHN WAYNE diagnosed w/ lung cancer Sept., 1964, died from stomach cancer 1979!
- All heavy smokers, John Wayne smoked 5 packs a day!
- *People Magazine* stated in an article on Nov. 10, 1980 that "Of The Conqueror's 220 cast & crew members from Hollywood, an astonishing 91 have contracted cancer." There was NO mention of smoking!
- The National Cancer Institute states that "the overall incidence of being diagnosed with cancer in a person's lifetime is about 40%." Thus in a cohort of 220 people, 88 would be diagnosed with cancer at some point! At 91 this would be within the expected range.

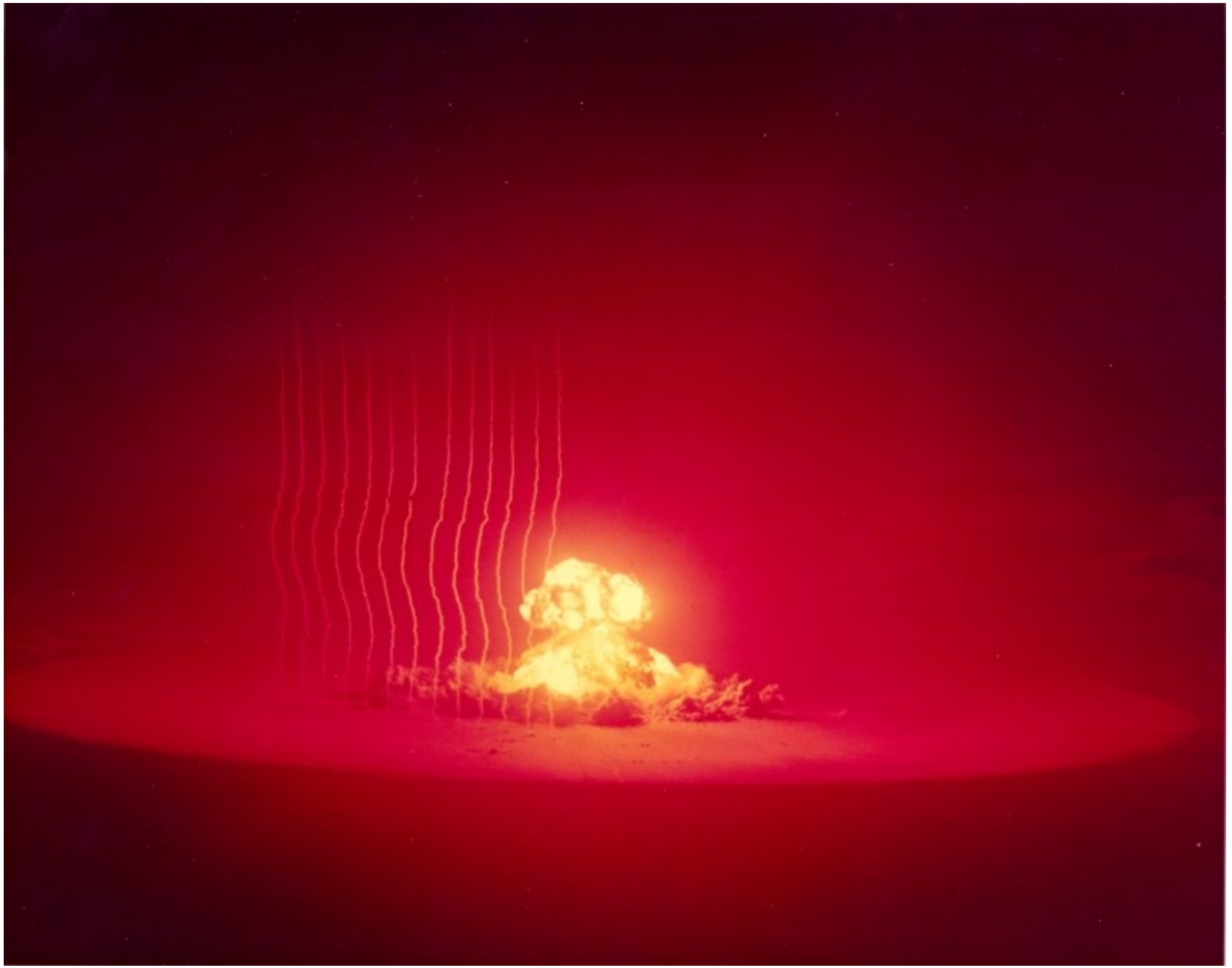
The Radiological Facts

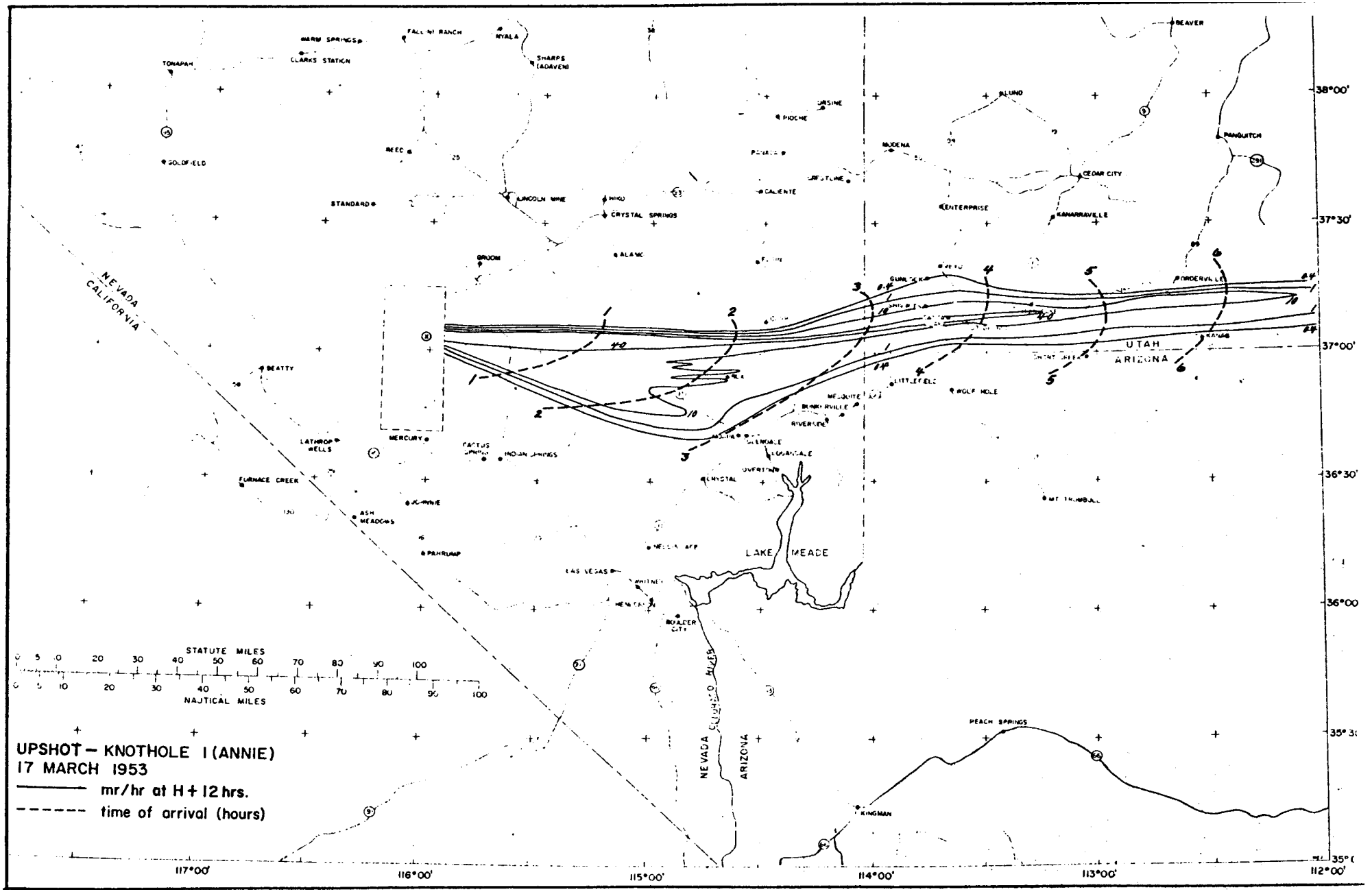
- Fallout occurred in the Snow Canyon area from the Annie event (16 kt) March 17, 1953 & the Harry event (32 kt) May 19, 1953!
- Data collected in the vicinity of Snow Canyon in May of 1954 indicates the radiation levels were essentially background!

Conqueror filming & monitoring Locations



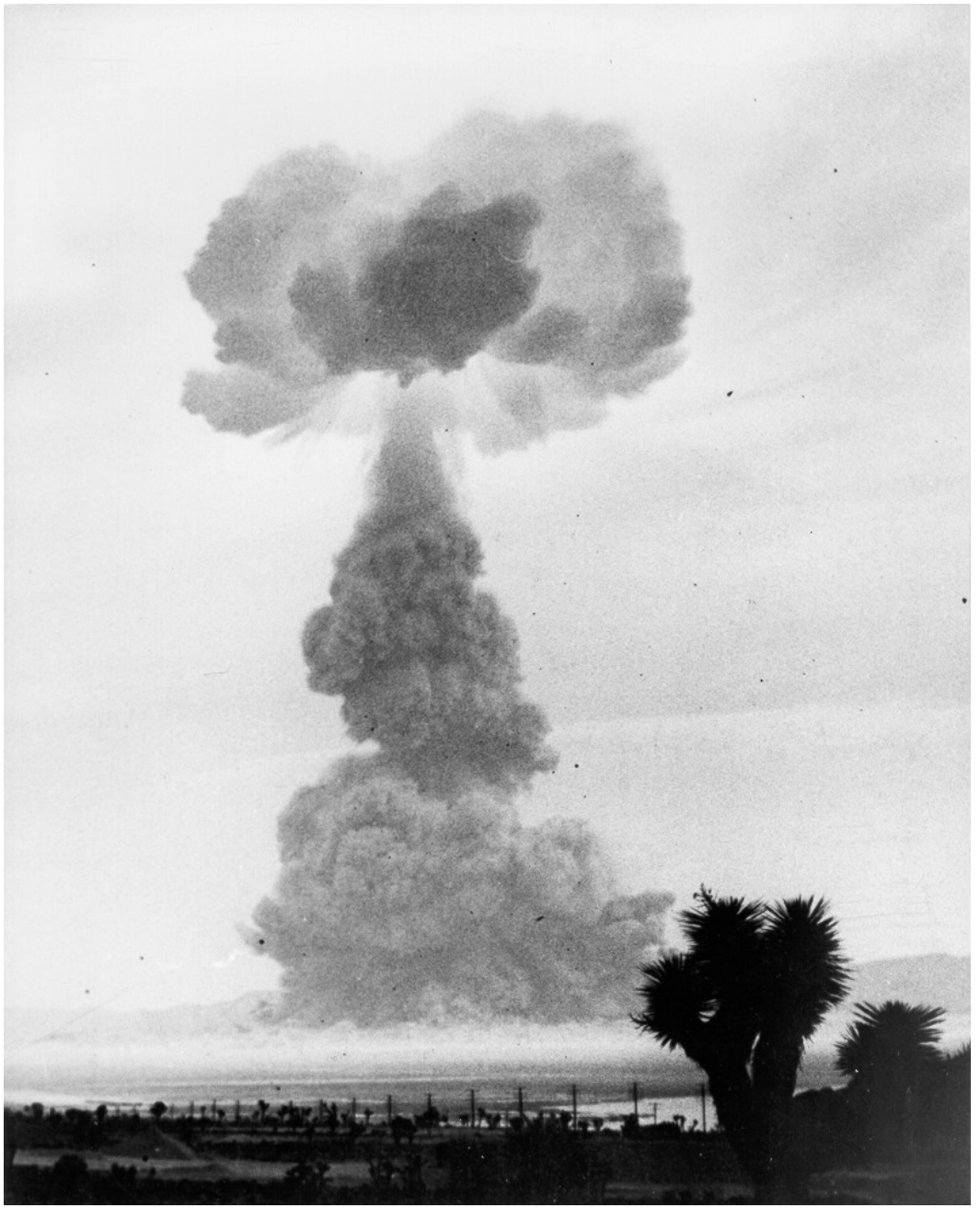
ANNIE (Operation Upshot-Knothole) – March 17, 1953





OPERATION UPSHOT-KNOTHOLE, ANNIE Event, March 17, 1953.
Fallout pattern 1956.

HARRY (Operation Upshot-Knothole) – May 19, 1953



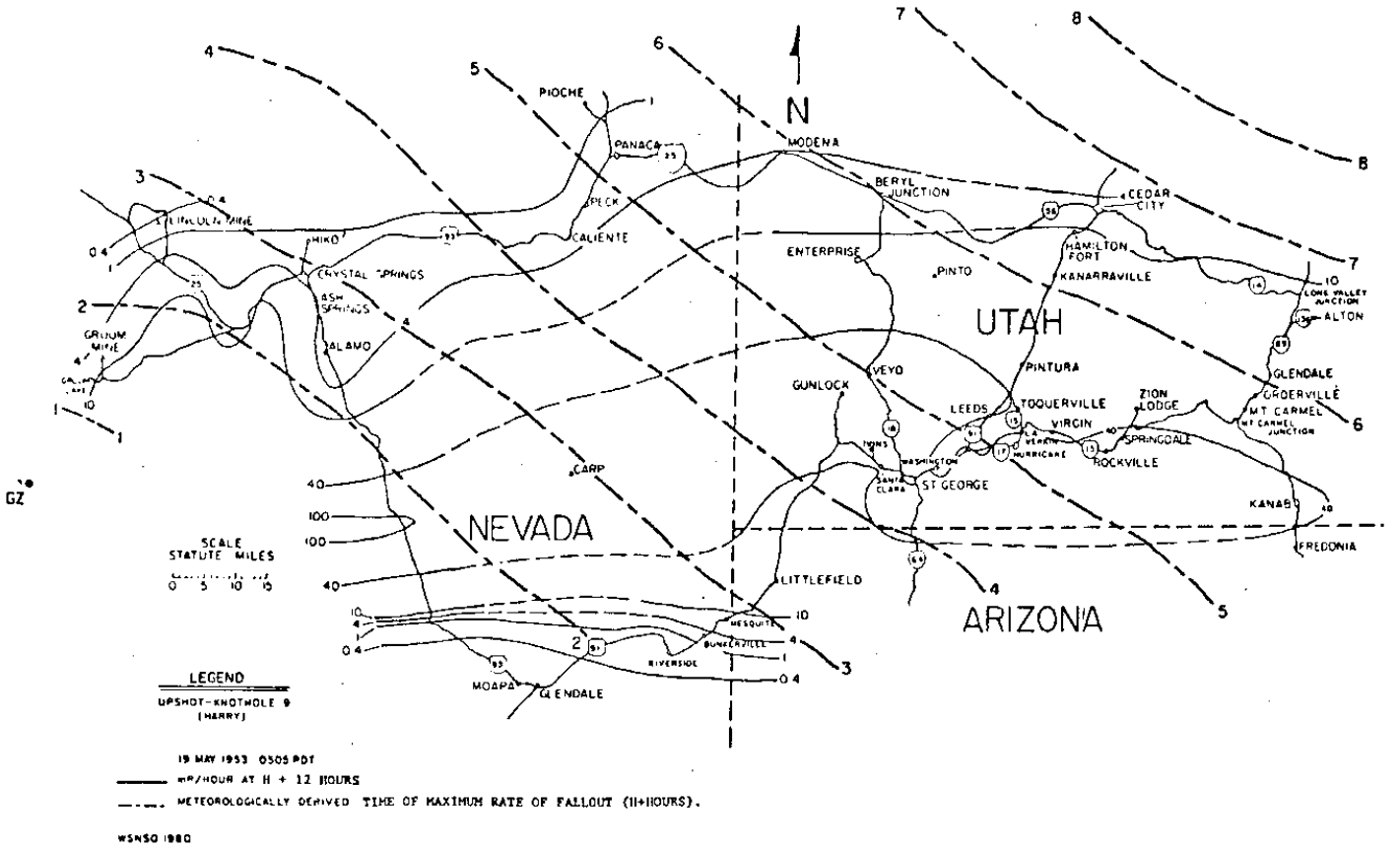


Figure 9. Extended range fallout pattern contours (mR/hr at H + 12 hours) and meteorologically derived time of maximum rate of fallout (H + HOURS).

OPERATION UPSHOT-KNOTHOLE, HARRY Event, May 19, 1953. Fallout pattern reanalyzed by Weather Service Nuclear Support Office in 1980.

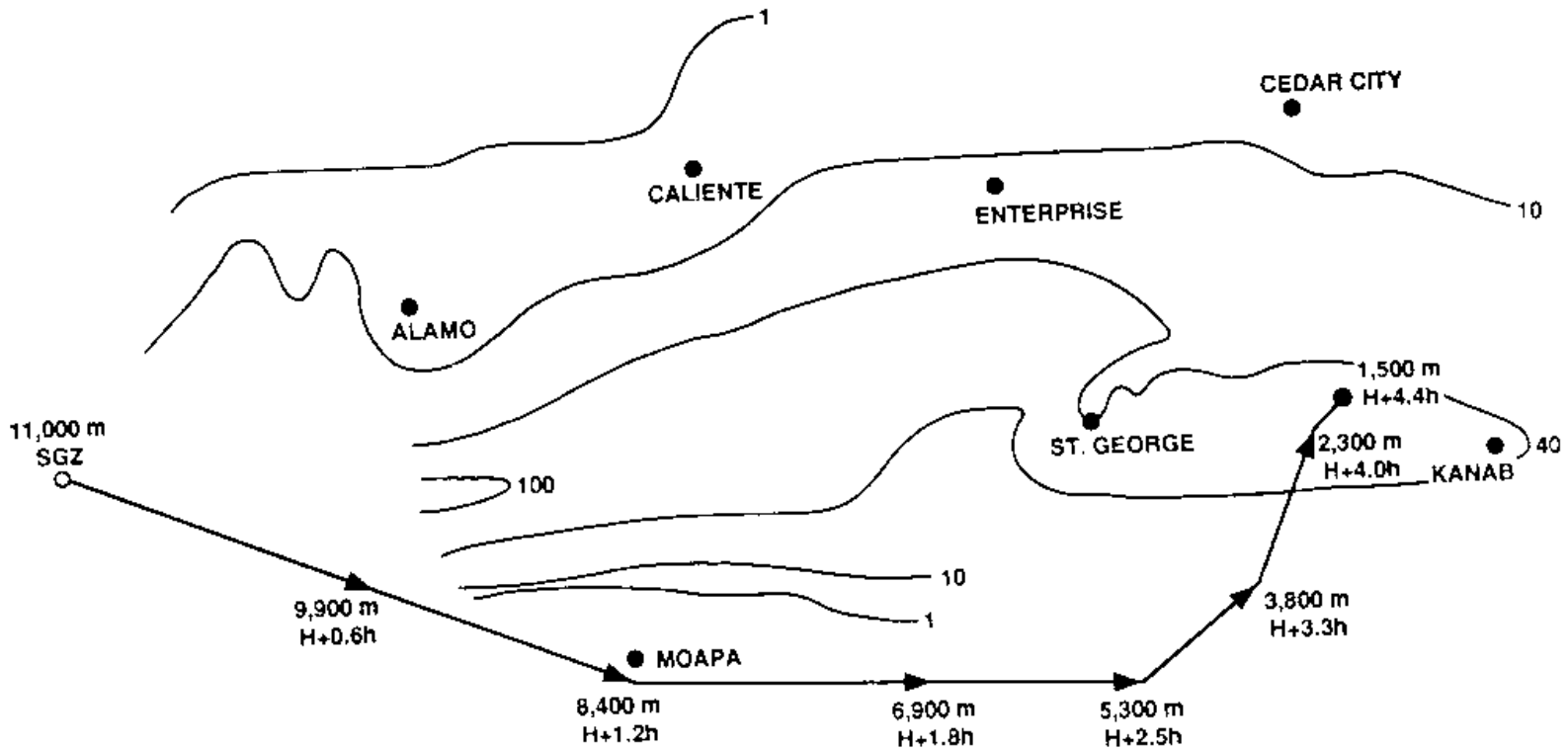
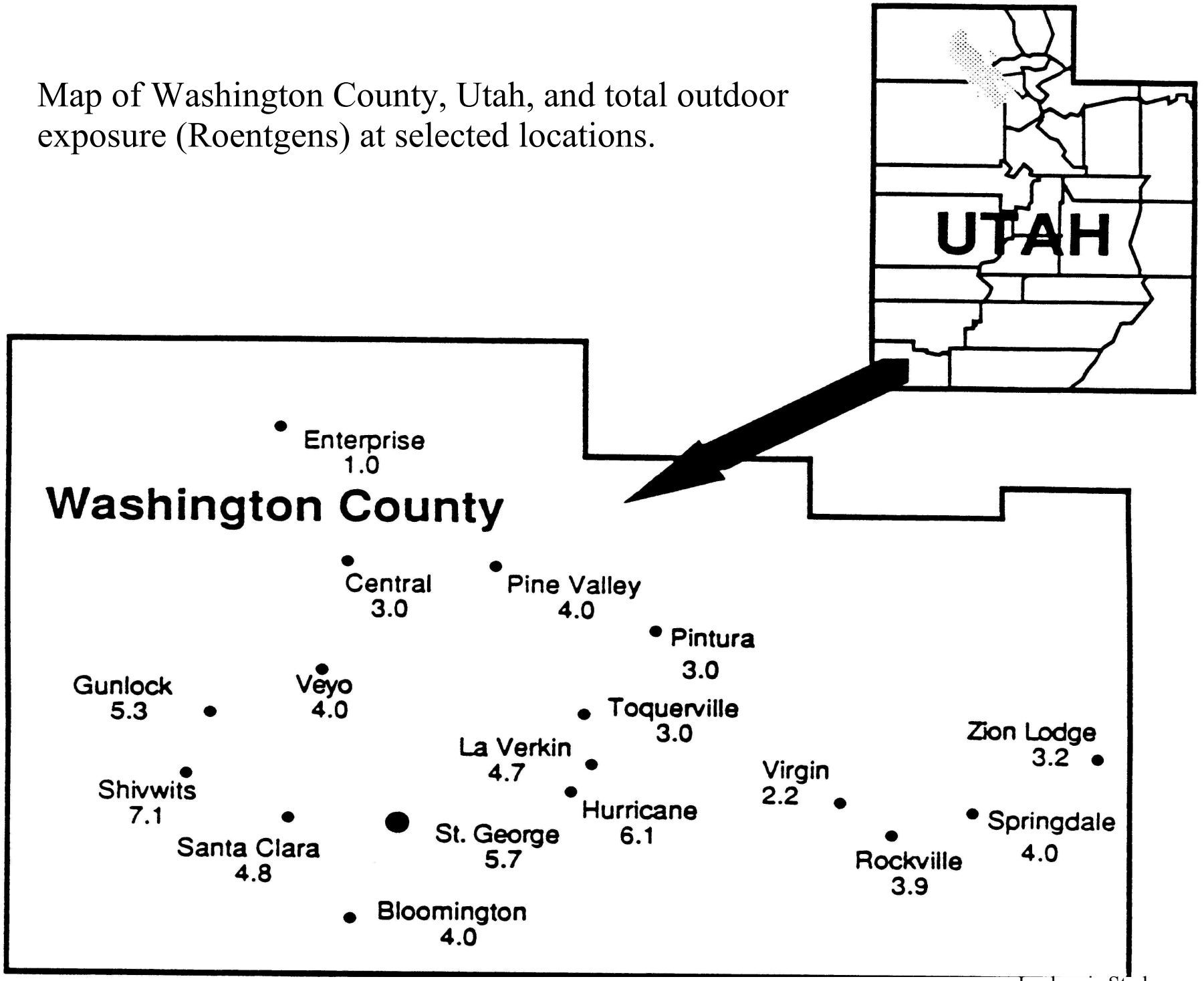


Fig. 3. Fallout particle trajectory (path), shown by the heavy line with arrowheads, as it falls from 11,000 m ASL to 1,500 m ASL in 4.4 h. The numbers by the arrowheads are the altitude of the particle and the time (H + h) it reached that altitude. Thin lines are fallout contours (mR h^{-1} at H + 12 h) from the WSNSO HARRY analysis.

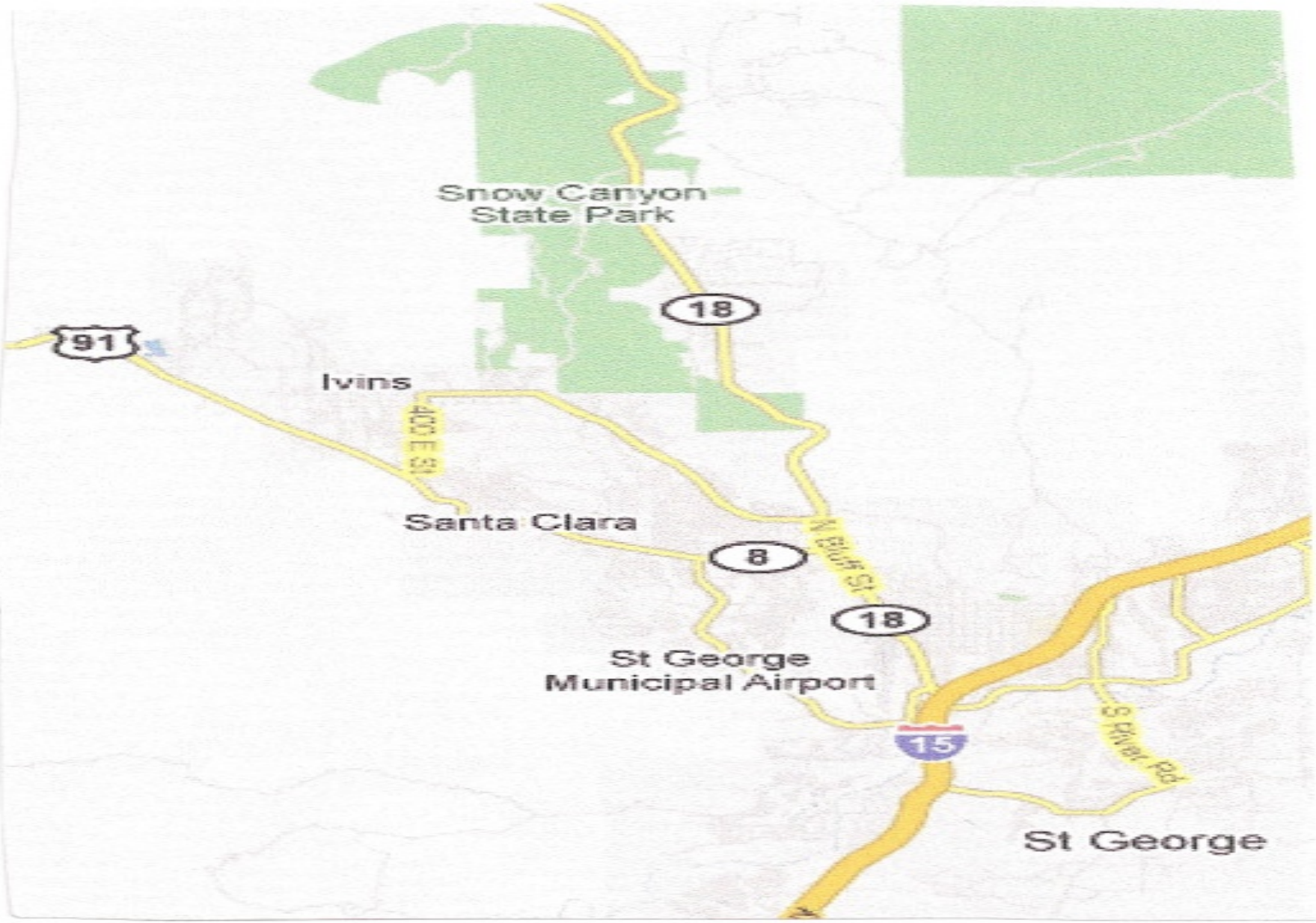
OPERATION UPSHOT-KNOTHOLE, HARRY Event, May 19, 1953. Fallout particle path shown by heavy line with arrowheads.

PRIMARY CONTRIBUTORS TO FALLOUT IN SOUTHERN UTAH				
City	**Event Name**	**Historical Dose Estimate**	**Percent of Total**	
St. George, UT				
(Washington County)	Annie (UK)	0.35	0.09	
	Simon (UK)	0.01	0.00	
	Harry (UK)	2.50	0.68	
	Tesla (Teapot)	0.10	0.03	
	Zucchini (Teapot)	0.04	0.01	
	Priscilla (Plumbbob)	0.03	0.01	
	Smoky (Plumbbob)	0.66	0.18	
	Morgan (Plumbbob)	0.01	0.00	
total		3.70		
Cedar City, UT				
(Iron County)	Fox (TS)	0.02	0.03	
	Harry (UK)	0.25	0.39	
	Apple I (Teapot)	0.03	0.05	
	Zucchini (Teapot)	0.10	0.16	
	Priscilla (Plumbbob)	0.03	0.05	
	Smoky (Plumbbob)	0.21	0.33	
total		0.64		
Kanab, UT				
(Kane County)	Simon (UK)	0.05	0.03	
	Harry (UK)	1.55	0.97	
total		1.60		
Orderville, UT				
(Kane County)	Harry (UK)	1.40	0.88	
	Tesla (Teapot)	0.08	0.05	
	Apple I (Teapot)	0.02	0.01	
	Priscilla (Plumbbob)	0.04	0.03	
	Smoky (Plumbbob)	0.04	0.03	
	Morgan (Plumbbob)	0.02	0.01	
total		1.60		
Beaver, UT				
(Beaver County)	Fox (TS)	0.05	0.20	
	Met (Teapot)	0.20	0.80	
total		0.25		

Map of Washington County, Utah, and total outdoor exposure (Roentgens) at selected locations.

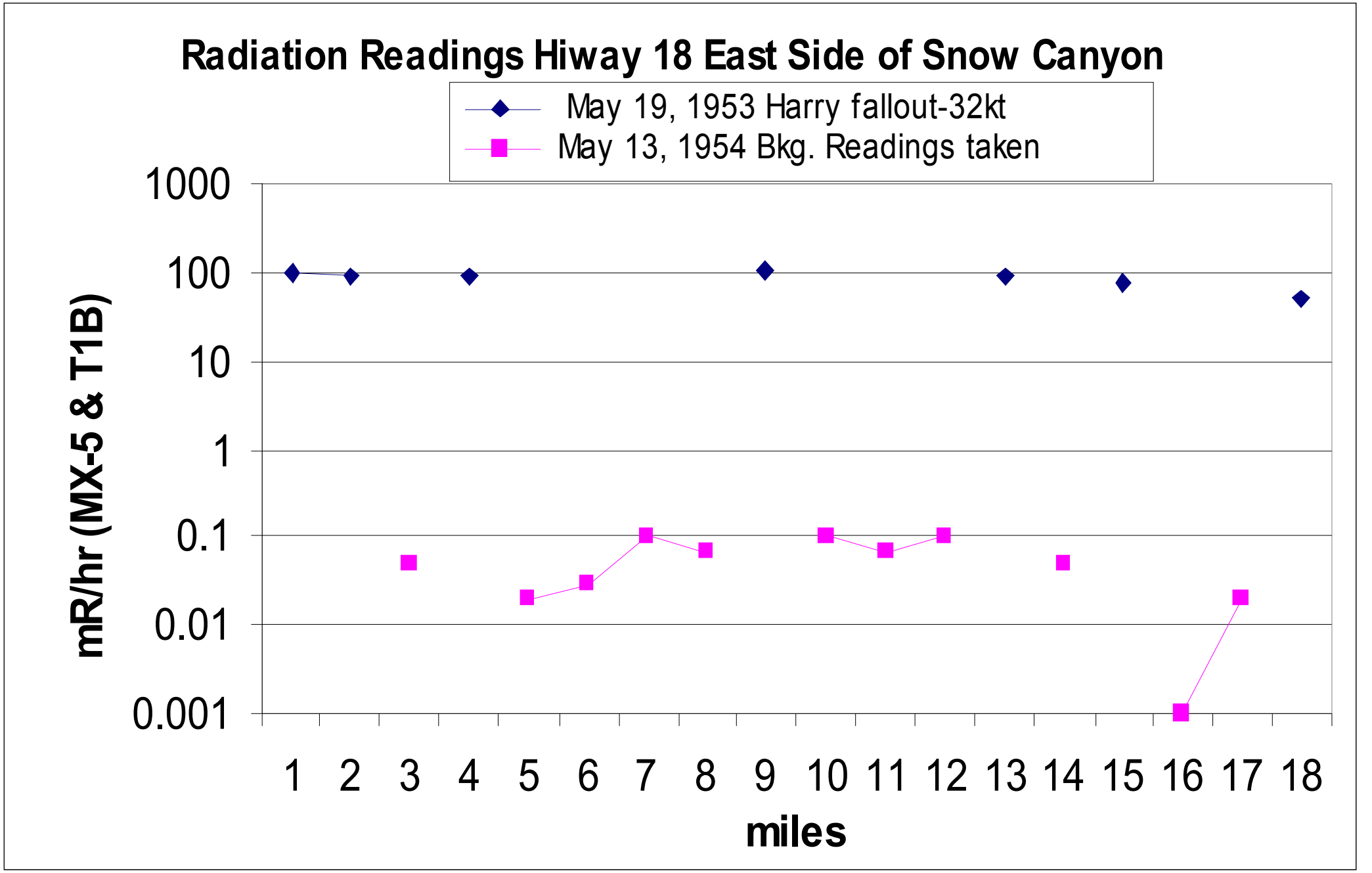


Conqueror filming & monitoring Locations



The Conqueror - Portable Instrument Readings along Hiway 18 running along the East side of Snow Canyon

Date	Miles from the Center of St. George	Miles from Juntion of US 91 & UT 18	Hours since H-Hour	Net mR/hr MX-5/T1B
19-May-53	Center of St. George	-1.1	10.83	100
19-May-53	Junction of US-91 & UT-18	0	10.97	90
19-May-53	3 mi. N. of Junt.	3	11.03	90
19-May-53	8 mi. N. of Junt.	8	11.12	110
19-May-53	13 mi. N. of Junt.	13	11.25	90
19-May-53	16 mi. N. of Junt. (Veyo)	16	11.38	75
19-May-53	18 mi. N. of Junt.	18	11.33	50
13-May-54	1.1 mi. N. of Junt.	1.1	8616	0.05
"	3.2	3.2	8616	0.02
"	5.1	5.1	8616	0.03
"	7.1	7.1	8616	0.1
"	7.6	7.6	8616	0.07
"	9.1	9.1	8616	0.1
"	10.8	10.8	8616	0.07
"	12.7	12.7	8616	0.1
"	15.2	15.2	8616	0.05
"	16.7 (Veyo)	16.7	8616	0
Date	Miles from the Center of St. George	Miles from Juntion of US 91 & UT 18	Hours since H-Hour	Net mR/hr MX-5/T1B

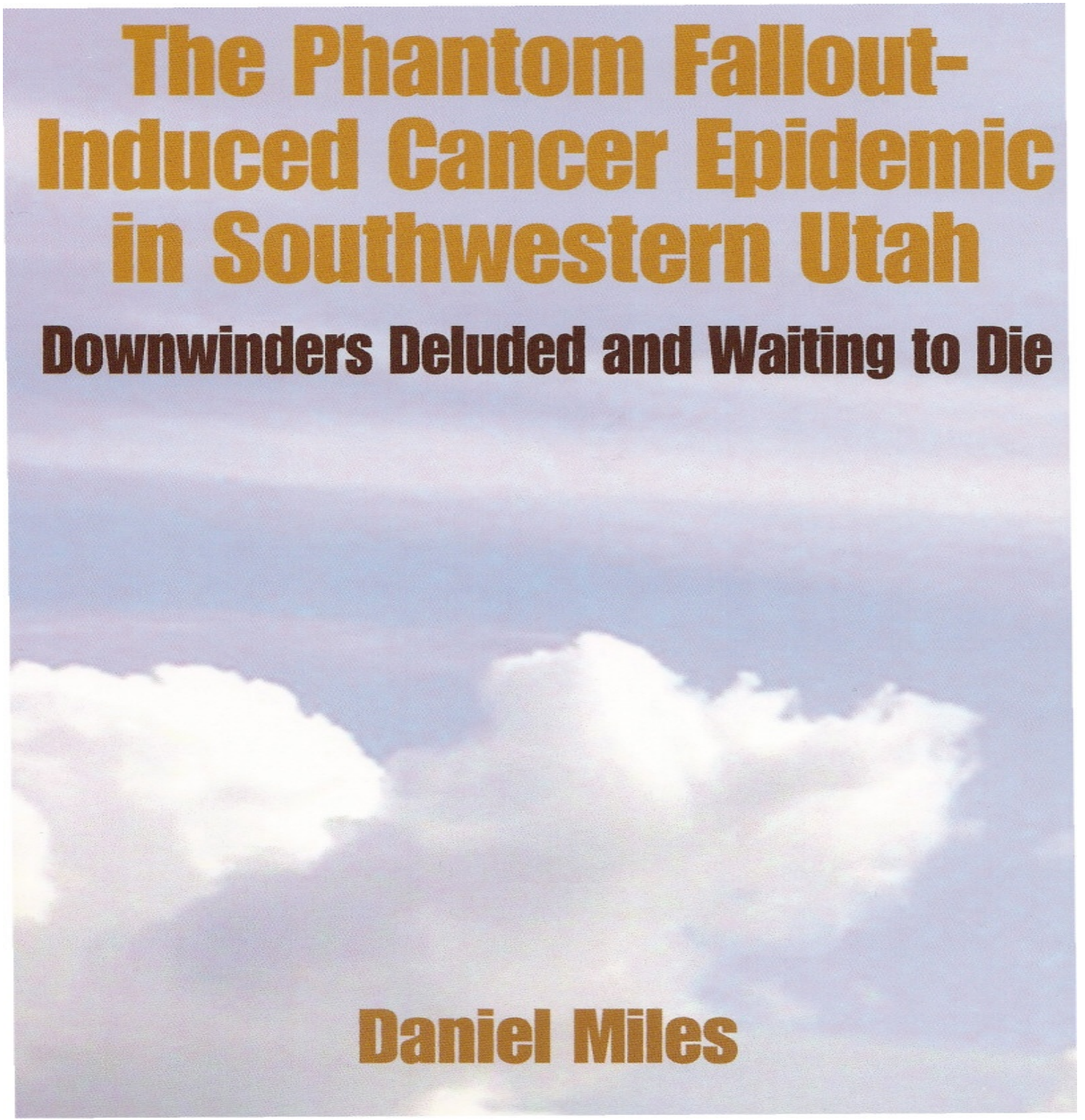

Radiation Readings Hiway 18 East Side of Snow Canyon
May 19, 1953 Harry fallout-32kt
May 13, 1954 Bkg. Readings taken
mR/hr (MX-5 & T1B)
1000
100
10
1
0.1
0.01
0.001
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
miles

THE ANSWER TO THE QUESTION OF A CONNECTION BETWEEN JOHN WAYNE AND RADIOACTIVE FALLOUT IS:

THERE IS NO CONNECTION!

The Phantom Fallout-Induced Cancer Epidemic in Southwestern Utah

Downwinders Deluded and Waiting to Die



Daniel Miles

Fallout appearing as SNOW!

- “American Ground Zero”-by Carole Gallagher quotes a woman who says: “After a Bomb, there (it) would be the fallout, fine like flour, kind of grayish white. We would play like that was our snow.”
- St. George Town Meeting-1979. Stories were told about children eating fallout debris thinking it was snow.
- Daniel Miles interviewed >30 people who experienced all the fallout episodes in St. George 1951-1958. No one including him recalls episodes of visible fallout.
- No photograph of fallout snow has ever surfaced.
- No column in the Washington county News ever mentioned visible fallout.

Exposure to Fallout causes loss of hair!

- Acute exposure of 2-300 rad will cause temporary loss of hair & takes about 2 weeks to occur!
- The St. George area received about 4 rad exposure.
- The most celebrated person (Joann Workman) claims that this occurred within a few hours of observing the detonation of the Harry event.
- Joann was a neighbor of Dan Miles who observed that she had all her hair during the summer of 1953 & that 5 year book pictures attested to the fact she had it all during 1954. She did lose her hair 20 years later due to Chemotherapy.
- I met up with Joann Workman on the set of a live TV talk show in San Francisco in about 1984 while debating H.G. Fuller (The Day We Bombed Utah)!

(Biggest myth of all is....) Fallout causes cancer EPIDEMIC!

- Jan. 24,1978-U.S. House Subcommittee on Health and the Environment began hearings as a result of media attention to claims (1976) by Paul Cooper that his Leukemia was caused by exposure received during Military maneuvers at the NTS.
- Acting on a press story by the CDC in trying to find veterans who were exposed to radiation Vonda McKinny a J.P. Navajo Co., AZ, whose husband died of Leukemia while working in Fredonia, AZ was able to get 2 AZ lawyers interested in the "fallout victims."
- Fall of 1978-Stewart Udall, with a team of lawyers comes to St. George to drum up clients for a lawsuit. Much press attention given and town meetings held.
- Spring of 1979 Utah Senator Orrin Hatch held a special town meeting in St. George. Collecting testimonies & anecdotes about children playing in the snow, hair loss, skin burns, hemorrhages and cancer.
- Magazines, newspapers & TV news shows picked up the downwinder's story. The Utah press has given the issue extensive coverage. The SLC "Deseret News" have featured the downwinders 265 times in the last 10 yrs.

(Biggest myth of all is....) Fallout causes cancer EPIDEMIC! Continued

- August 30, 1979 the AZ attorneys filed a suit in U.S. District Court in SLC.
- During 1979, John Wayne died, Three Mile Island accident occurred & the movie “China Syndrome was released.
- These events fueled the public interest and many congressional hearings were held.
- The downwinder trial (Allen et al. v the U.S.- 1200 plaintiffs) began Sep. 20, 1982.

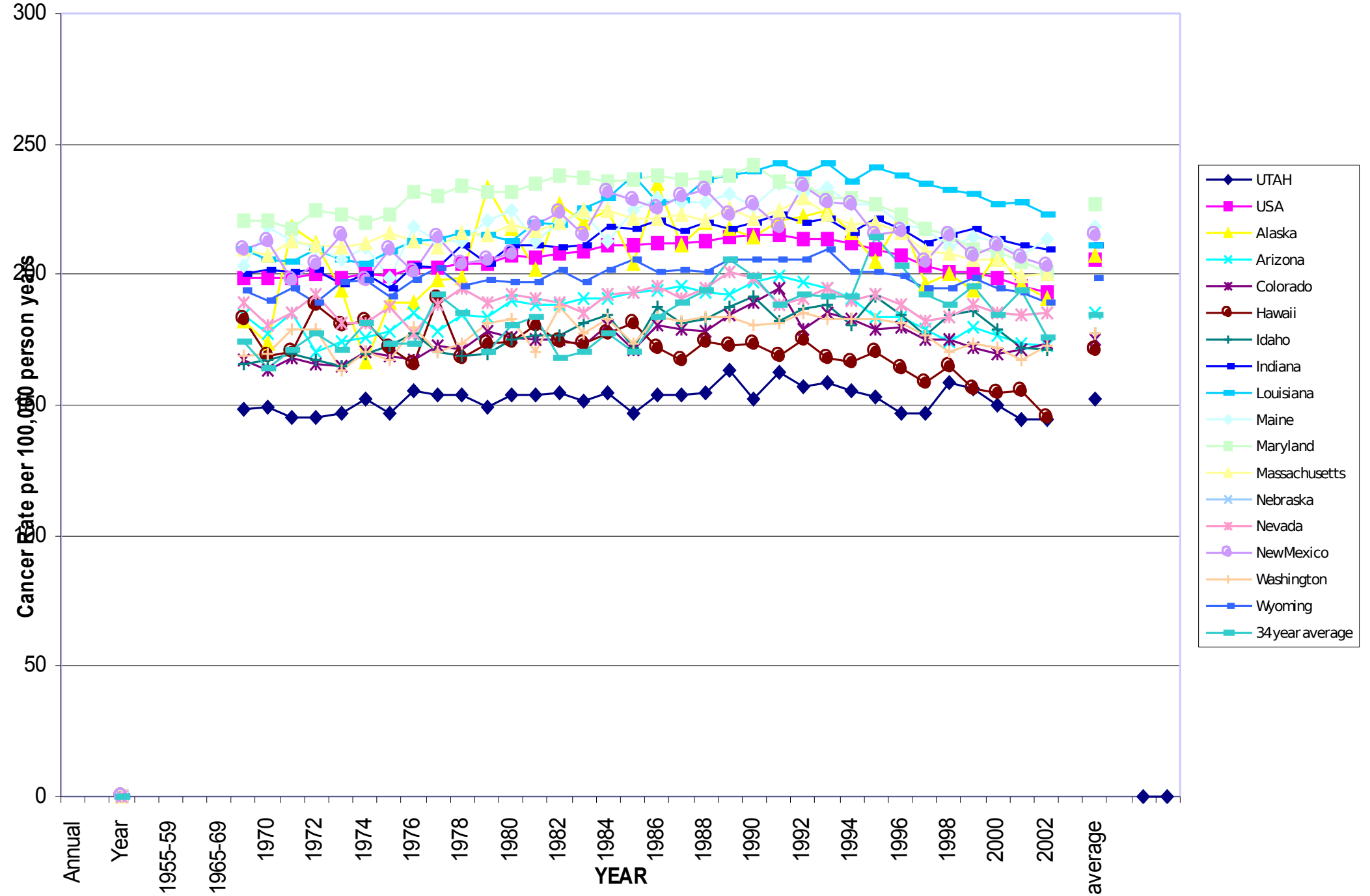
(Biggest myth of all is....) Fallout causes cancer EPIDEMIC! Continued

- Press coverage was expanded to include a number of books being published:
  - *"Killing Our Own"* by Wasserman, & Solomon, 1982.
  - *"The Day We Bombed Utah"* by Fuller, 1984.
  - *"Under The Cloud: The Decades of Nuclear Testing."*, Miller 1986.
  - *"Justice Downwind: America's Atomic Testing Program in the 1950s."* Ball 1986.
  - *"Fallout: An American Nuclear Tragedy."* Fradkin 1989.
  - *"American Ground Zero."* Gallagher 1993.
- Spring of 1990 – Hatch passes RECA (Radiation Exposure Compensation Act)

UTAH CANCER DEATH RATES vs US & OTHER SELECTED STATES – 1969-2002

Year	Utah	US	Alab	Alas	Ariz	Ark	Calif	Colo	Conn	Dela	Wash DC	Flor	Geo	Haw	Ida
1969	148.2	198.6	179.8	181.9	184.8	178.2	194.3	167.3	210.1	207.8	238.9	191.7	176.6	183.2	165.4
1970	148.9	198.8	178.0	173.9	177.8	177.3	196.9	163.6	206.1	217.7	246.1	192.6	179.8	168.8	167.3
1971	144.9	198.9	184.4	218.7	185.0	180.3	195.8	167.7	204.6	217.0	253.4	191.6	180.2	170.2	169.3
1972	145.1	200.4	188.0	212.2	170.1	180.4	196.3	165.6	209.5	211.2	243.1	197.6	180.9	188.3	167.3
1973	147.0	198.7	185.6	194.1	174.2	184.9	193.3	164.6	209.8	219.5	251.5	192.7	180.5	180.8	165.3
1974	152.5	199.9	188.0	166.7	175.6	196.7	198.4	170.2	214.6	246.2	252.5	194.9	182.0	182.0	169.9
1975	146.7	199.1	188.0	189.0	178.1	184.2	198.4	168.9	217.1	210.1	259.6	193.0	179.9	171.9	172.6
1976	155.4	202.3	189.5	189.3	185.5	187.6	200.3	167.1	213.4	213.6	256.2	197.7	184.4	165.9	177.5
1977	154.1	203.0	193.5	197.9	178.4	184.1	201.4	172.6	216.9	222.7	265.6	197.3	187.3	190.8	170.8
1978	154.3	204.4	196.5	198.9	184.9	188.6	203.9	170.9	211.3	238.0	261.2	201.0	193.0	168.2	168.5
1979	149.2	204.5	198.8	232.9	183.8	192.1	201.8	178.5	215.3	223.1	273.0	199.8	189.4	173.3	169.8
1980	153.6	207.0	205.5	217.4	190.0	195.3	204.1	175.8	222.7	224.4	275.2	201.9	196.0	174.7	174.8
1981	153.6	206.4	208.8	202.0	188.2	200.2	204.2	174.9	209.6	246.5	280.1	199.5	199.4	180.6	176.7
1982	154.8	208.3	207.6	227.1	188.4	199.7	209.0	175.5	210.9	236.1	266.8	202.2	201.1	174.7	176.4
1983	151.6	209.2	208.7	219.7	190.6	207.5	205.8	173.1	215.9	233.5	260.4	203.2	202.8	173.2	181.5
1984	154.6	210.9	216.8	224.4	191.2	203.9	209.6	180.8	212.7	232.6	265.3	204.2	210.0	177.3	184.3
1985	146.6	211.3	216.2	204.3	193.2	208.1	208.7	170.9	215.8	236.8	271.8	205.6	212.9	181.2	172.1
1986	153.7	211.8	218.6	235.2	193.7	207.7	208.1	180.6	214.3	238.9	285.0	203.5	214.0	171.9	188.0
1987	153.8	211.9	219.8	211.5	195.9	215.2	207.9	179.1	213.0	239.0	279.5	204.2	214.7	167.2	181.5
1988	154.6	212.6	220.2	219.6	193.3	217.9	205.4	178.2	209.1	244.6	277.9	205.1	217.3	174.4	183.3
1989	163.5	214.3	221.0	217.5	192.4	219.4	203.3	184.5	215.8	238.6	292.8	207.6	218.2	172.6	187.8
1990	152.0	214.9	219.4	214.3	197.0	224.2	202.9	189.5	204.0	245.0	268.1	209.8	212.3	173.6	191.6
1991	162.4	215.1	219.5	220.5	199.2	217.8	203.9	194.5	208.3	239.4	272.5	207.7	217.1	169.1	182.5
1992	157.4	213.5	221.7	222.5	197.1	223.3	199.9	178.8	208.5	238.5	268.9	206.5	214.9	174.8	187.0
1993	158.5	213.4	219.6	225.0	194.7	224.5	200.0	185.5	203.3	240.9	257.6	205.8	218.2	168.2	188.4
1994	155.6	211.7	222.8	216.3	191.2	219.5	198.9	182.8	203.6	237.9	278.5	204.5	214.0	166.2	180.7
1995	153.4	209.9	219.7	204.7	183.9	221.6	195.3	179.2	199.7	232.1	267.2	203.1	215.4	170.2	191.4
1996	147.1	207.0	219.0	221.9	183.9	215.8	190.5	180.1	200.1	234.3	250.6	199.1	204.4	164.4	184.8
1997	146.8	203.6	217.8	196.3	179.4	216.0	189.7	175.0	197.4	225.5	245.9	196.5	209.1	158.9	176.7
1998	158.7	200.8	217.0	200.3	174.0	210.4	183.5	175.0	194.3	217.5	246.4	192.2	205.2	164.7	184.5
1999	155.9	200.7	210.8	193.8	179.8	213.9	185.1	171.8	190.6	223.5	241.5	189.9	202.9	156.6	186.5
2000	150.3	198.6	214.6	208.2	176.4	209.7	181.2	169.3	188.4	201.9	238.3	190.0	206.1	154.7	179.3
2001	144.3	195.7	212.0	196.2	173.4	208.3	179.4	170.9	186.7	219.8	236.5	186.6	203.2	155.8	171.8
Year	Utah	US	Alab	Alas	Ariz	Ark	Calif	Colo	Conn	Dela	Wash DC	Flor	Geo	Haw	Ida

Annual Age-Adjusted Cancer Dath Rates by State, 1969-2002



Death Rate Report for Utah by County, death years through 2001

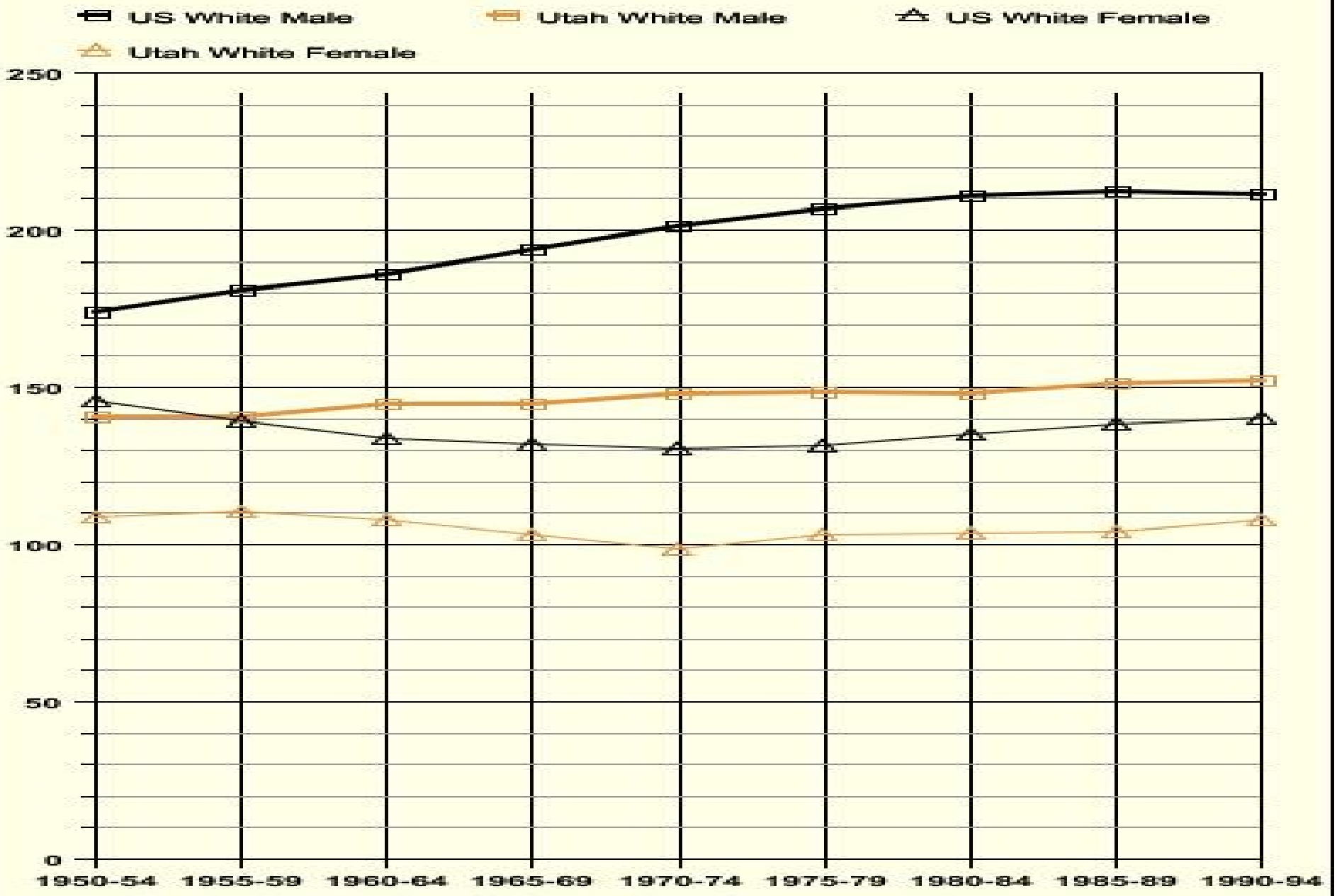
All Cancer Sites
Healthy People 2010 Objective Number: 03-01

Reduce the overall cancer death rate.
White, Both Sexes, All Ages
Sorted by Rate

County	Met Objective of 159.9?	Death Rate (1)	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Count	Trend	Trend (2)	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Trend (2)
United States	No	196.9	196.7	197.2	475121	1997 - 2001	falling	-1	-1.1	-0.9	1993 - 2001
Utah (State)	Yes	150.6	147.8	153.4	2244	1997 - 2001	falling	-0.7	-1.3	-0.1	1991 - 2001
Kane County	No	212.4	166.8	270.1	15	1997 - 2001	falling	**	**	**	**
Grand County	No	207.6	165.3	258.1	17	1997 - 2001	stable	0.2	-1.4	1.8	1977 - 2001
Carbon County	No	194.9	168.8	224.3	40	1997 - 2001	stable	0.6	-0.5	1.7	1977 - 2001
Uintah County	No	186.5	159.3	217.3	34	1997 - 2001	rising	1.5	0.3	2.7	1977 - 2001
Duchesne County	No	184.7	147.6	229.7	18	1997 - 2001	stable	0.9	-0.2	2	1977 - 2001
Tooele County	No	180.1	156.3	206.8	43	1997 - 2001	stable	0.6	-0.4	1.6	1977 - 2001
Garfield County	No	175.9	126.1	241.4	8	1997 - 2001	stable	1.2	-1.1	3.5	1977 - 2001
Beaver County	No	175.7	131.4	231.5	11	1997 - 2001	stable	1.9	-0.5	4.4	1977 - 2001
Sevier County	No	173.2	147.1	203.2	32	1997 - 2001	stable	0.7	-0.3	1.7	1977 - 2001
Juab County	No	171.9	129.7	223.8	11	1997 - 2001	stable	0.8	-1.8	3.4	1977 - 2001
Emery County	No	165.4	129.2	208.8	14	1997 - 2001	stable	-0.4	-2.2	1.5	1977 - 2001
Salt Lake County	Yes	156.5	151.9	161.1	918	1997 - 2001	stable	-0.2	-0.5	0.1	1977 - 2001
Box Elder County	Yes	156.4	137.9	176.9	51	1997 - 2001	stable	0	-0.9	0.8	1977 - 2001
Weber County	Yes	155.5	146.8	164.6	239	1997 - 2001	stable	0.1	-0.3	0.5	1977 - 2001
Sanpete County	Yes	154.1	129.8	181.9	29	1997 - 2001	stable	-0.4	-1.6	0.8	1977 - 2001
Wasatch County	Yes	151.7	119.4	190.6	15	1997 - 2001	stable	-0.3	-1.7	1.2	1977 - 2001
Davis County	Yes	142.1	133.2	151.4	199	1997 - 2001	stable	-0.3	-0.9	0.3	1977 - 2001
Wayne County	Yes	139.9	83.8	226.3	4	1997 - 2001	falling	**	**	**	**
Iron County	Yes	138.3	117.1	162.4	30	1997 - 2001	stable	-22.3	-40.2	0.9	1998 - 2001
Utah County	Yes	137.4	130	145.1	261	1997 - 2001	stable	0	-0.4	0.4	1977 - 2001
Cache County	Yes	130.9	117.5	145.4	71	1997 - 2001	stable	-0.3	-1.1	0.4	1977 - 2001
Washington County	Yes	129.7	119.7	140.4	133	1997 - 2001	stable	-0.6	-1.3	0.2	1977 - 2001
Summit County	Yes	129.1	100.5	164.6	18	1997 - 2001	stable	-0.9	-2.2	0.5	1977 - 2001
San Juan County	Yes	123.7	84.8	175.1	7	1997 - 2001	stable	-0.9	-3.5	1.7	1977 - 2001
Morgan County	Yes	119.4	79.1	174.2	6	1997 - 2001	stable	-1.3	-3.7	1.2	1977 - 2001
Millard County	Yes	117.8	91.6	150.2	14	1997 - 2001	stable	0.3	-1.4	2	1977 - 2001
Daggett County	*	*	*	*	*	*	*	*	*	*	*
Piute County	*	*	*	*	*	*	*	*	*	*	*
Rich County	*	*	*	*	*	*	*	*	*	*	*

Notes:
Created by statecancerprofiles.cancer.gov on 04/24/2005 3:09 pm.
State Cancer Registries may provide more current or more local data.

5-year Cancer Mortality Rates per 100,000 person-years,
Age-adjusted 1970 US Population
All Cancers, 1950 to 1994, All Ages



Source: Cancer Mortality Maps & Graphs Web Site,
a service of the National Cancer Institute
http://cancer.gov/atlasplus/

© Corda.com

Statement on Cancer and Radiation Dose by the Council of Scientific Society Presidents – Wingspread Conference 1997, Racine, WI

- "A substantial body of scientific evidence demonstrates statistically significant increases in cancer incidence for acute whole-body exposures of adults to ionizing radiation at doses of about 10 rem and greater."

Health Physics Society Position on Risk of Cancer resulting from Exposure to Ionizing Radiation - Apr.,1999

1. Health effects have primarily only been observed in populations exposed to high doses at high dose rates.
2. The Life Span Studies of the Japanese survivors, exposed at high doses and high dose rates, form the most significant basis for estimates of risk from radiation.
3. The risk (i.e., chance) that any given cancer is related to a given radiation exposure depends on the amount of that exposure (i.e., dose) as well as other factors such as type of cancer, age at exposure, gender, and time since exposure.
4. The lowest doses at which an increase in any type of cancer is attributed to radiation exposure in the Japanese studies is greater than the 5 rem (0.05 Sv) used by the VA as a screening level for compensation evaluations.
5. The risks on a "per dose basis" of exposure to low dose, low dose-rates are less than those due to high dose, high dose-rates.

From these scientific facts the Society makes the opinion that there is no justification for assuming a presumptive causation of a cancer without consideration of all factors listed in #3 above, including dose.

BEIR VII (2005) Lifetime Risk Model Prediction (using the LNT model)

- Committee predicts that ~ 1 person/100 would develop cancer from an exposure to 10 rem above background.
- While approximately 42 of the 100 persons would be expected to develop cancer from other causes.

A Summary of the Facts

- Radiation Doses in So. Utah are too low to support a increase in cancer that is measurable.
- Dr. Charles R. Smart, chief of surgery at LDS Hospital, has tracked the incidence of cancer since 1966 when he founded the Utah Cancer Registry. He testified at the Allen trial (1982) that he had not found excessive cases among Utahans that diseases were induced by exposure to fallout.
- A review of NCI data shows that Utah has had the lowest cancer fatality rate of all the states in the U.S. for the last 60 years.
- Washington County is among the lowest counties in the State of Utah for Cancer Fatality rate. Ranked in 2001 22/26 w/26 being the lowest rate in the State.
- NO Utah politician has ever questioned the alleged horror from radioactive fallout!

The drumbeat goes on!

9/7/09

Exposed

New play tells the downwinder story

BY BRIAN PASSEY
bpassey@thespectrum.com

Mary Dickson says her play was an accident.

The Salt Lake City-based journalist was working on a manuscript for a nonfiction book about the nuclear testing at the Nevada Test Site and the downwinders who attribute various health problems to those tests.

During the research she told an actress about her own personal battle against thyroid cancer. It is one of the diseases eligible for compensation under the Radiation Exposure Compensation Act of 1990 for people who lived in certain geographic areas during the Cold War-era above ground testing.

Dickson's sister, Ann, also passed away from complications of lupus. Some downwinders and doctors believe there may be a connection between the testing and autoimmune diseases like lupus but there is no proof.

The actress told Dickson to write a play about her own experiences instead of a book. At first, Dickson wasn't sure. She was a journalist, not a playwright. She felt it would be too painful to write her own story.

Then the actress told her: "The best writing comes from pain."

Soon Dickson had a series of monologues that eventually became the play "Exposed," which details Dickson's personal connection — both as a cancer survivor and journalist — to the nuclear testing and the aftermath. The Space Between Theatre Company will produce "Exposed" locally beginning Thursday at Green Valley Spa in St. George.

Because Dickson did not live in one of the areas covered by RECA, she didn't think her own thyroid problems had any connection to the testing. But while interviewing a downwinder, the interviewee made the connection for her, showing a map that traced radioactive fallout across most of

If You Go

- **What:** "Exposed" by The Space Between Theatre Company.
- **When:** 7:30 p.m. on Thursdays, Fridays and Saturdays through Sept. 26.
- **Where:** Green Valley Spa Conference Center, 1871 W. Canyon View Drive, St. George.
- **Tickets:** $15. They can be purchased online at *www.tsbtc.org* or by calling 216-5523.

Brian Passey / The Spectrum & Daily News

Aly Hansen, as playwright Mary Dickson, and Martha Smythe rehearse a scene from "Exposed" Thursday evening at the Green Valley Spa Convention Center in St. George.

really an American story because it affected so many people across the country."

However, there are plenty who argue that the testing is not

> **"It's really an American story because it affected**

filmstrips provided additional information.

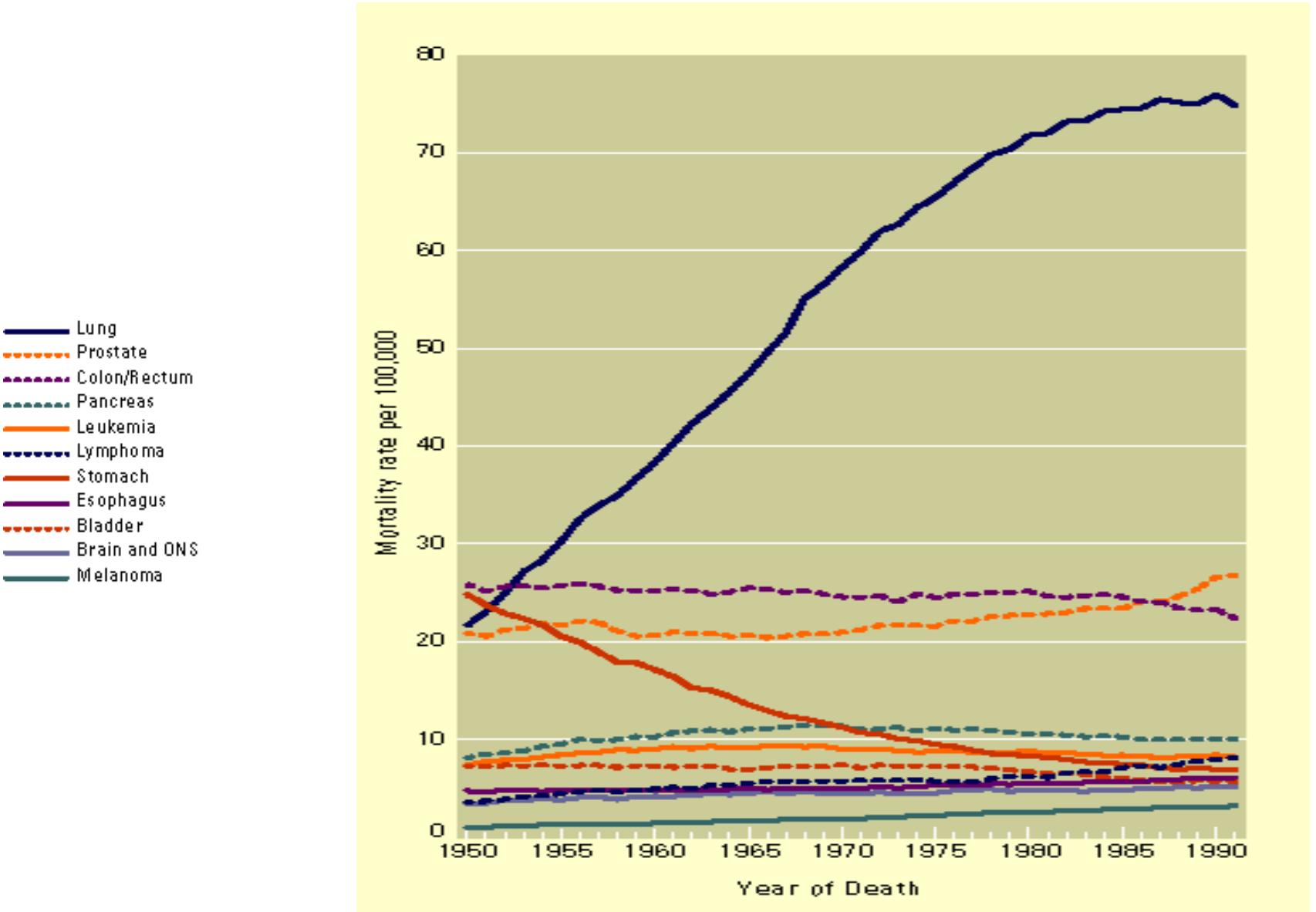
"I did not make this stuff up," Dickson says.

By telling the story through

THE END

Time to stop the presentation and take questions!

Cancer Mortality in the United States
Changing patterns for 11 Major Cancers in U.S. Males, 1950-91
Death Rates for Males, per 100,000, for 11 Sites, 1950-91, Age-adjusted to 1970 U.S. Standard



	Source of Estimate			
Factor	Doll & Peto [2]	EPA [3]	Willett [3]	Ames et al. [3]
Diet	35 (10–70)[1]	–	32 (20–42)	20–40
Tobacco	30 (25–40)	–	–	35
Infection	10 (1–<10)[2]	–	–	–
Reproductive and sexual behavior	7 (1–13)	–	–	–
Occupation • Ionizing radiation – 0.3 %	4 (2–8)	1–4	–	5
Alcohol	3 (2–4)	–	–	–
Geophysical Factors • UV (sunlight on white skin) 1–2 % • Ionizing radiation[3] 1.4 % (cosmic, radon, + other radionuclides in air, our bodies & all natural materials, i.e., Natural Background)	3	3–6	–	–
Pollution	2 (<1–5)	1–3	–	–
Food Additives	1 (–5–2)	–	–	–
Medicines & medical procedures	1 (0.5–3)	–	–	–
Industrial (consumer) products	<1 (<1–2)	<1	–	–
Unknown	?	–	–	–

[1] The best estimate is presented followed by the 'range of acceptable estimates.'

[2] Doll & Peto considered these numbers very uncertain.

[3] Doll & Peto do not consider these cancers derived from 'natural background' avoidable.

Dose Ranges

(mSievert)