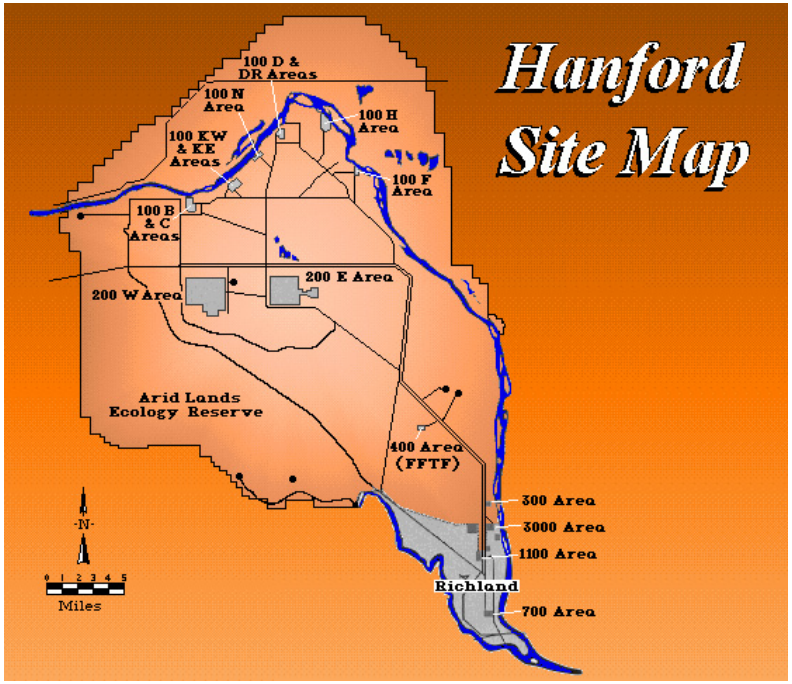
Brief History of the Hanford Site

Michele S. Gerber, Ph.D.



Founding

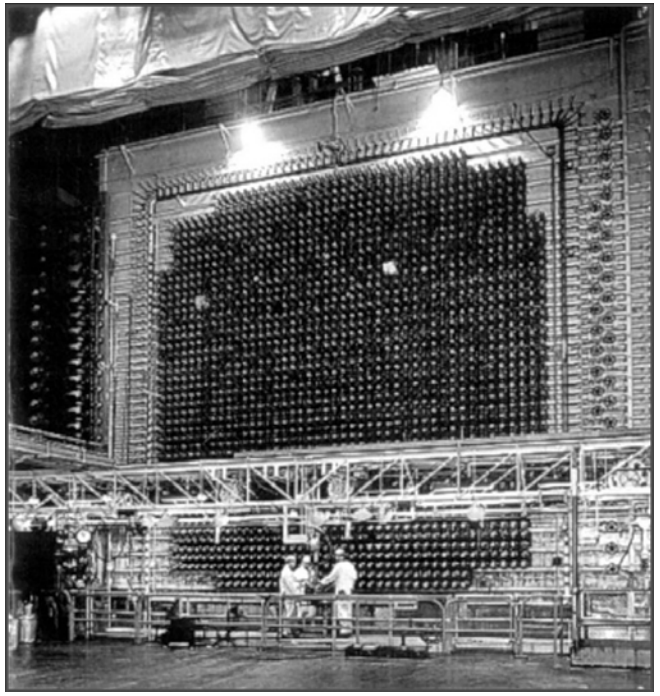
- Acquired February 1943
  - 640 square miles in southeast Washington
  - Conditions perfect for Manhattan Engineer District requirements
- Construction began March 1943
  - Army Corps of Engineers and DuPont

Original Mission

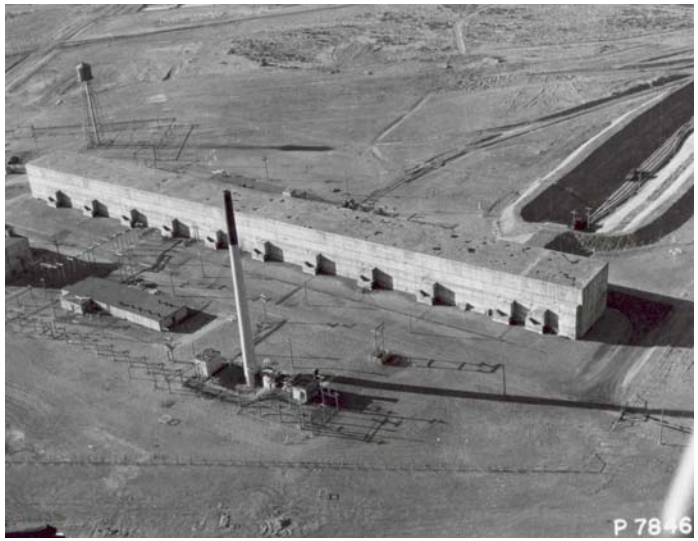
- Produce plutonium for world's first atomic weapons
- Mission succeeded
  - Trinity bomb test (July 1945)
  - Nagasaki weapon (August 1945)

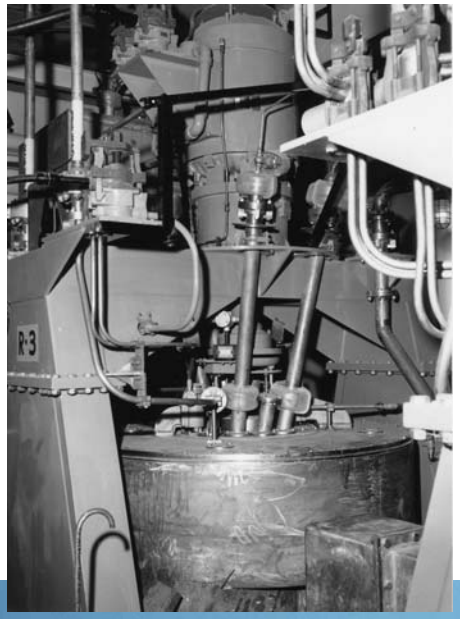
World War II Operations

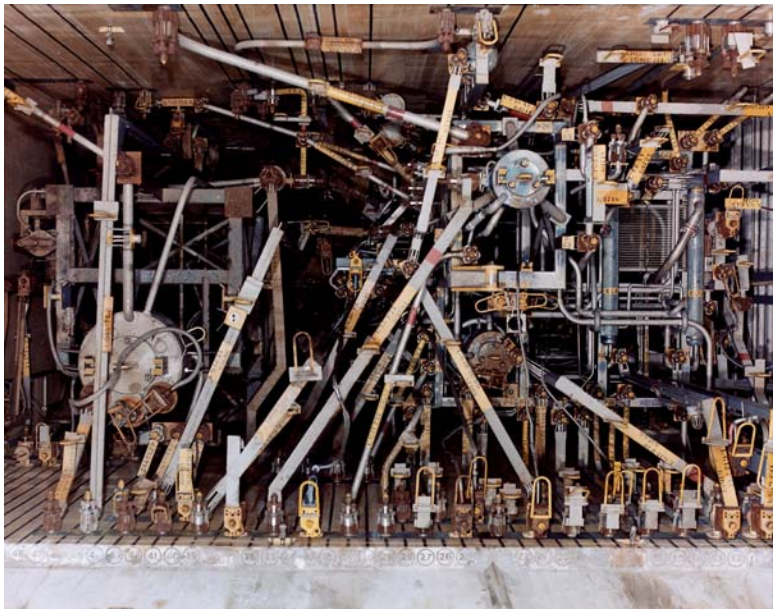
- 29 months from beginning of construction to WWII Victory (March 1943-August 1945)
- Huge construction and operations accomplishments
  - Complete fuel fabrication facilities
  - First three full-size reactors in world
  - First two full-size radiochemical separations plants
  - Plutonium isolation facility
  - 64 single-shell tanks for waste storage
  - Site infrastructure (i.e.roads, communications, electrical, water) for self-contained operations
  - Construction camp housing and feeding 51,000 workers
  - City of Richland built up from capacity for 300 to 17,000 people



The Hanford Process







The Hanford Process, con’t

WWII Tank Farm under construction, 1944


J.O.BANNER
D 7188

Early Postwar Developments

- 1946
  - Production lull and period of indecision
    - Hanford Site employment fell by half (10,000 to 5,000 operations workers)
  - Atomic Energy Act of 1946: AEC created
  - Winston Churchill's Iron Curtain Speech
- 1947: AEC ordered huge expansion


THE RICHLAND VILLAGER

Village Faces Boom with Plant Expansion

inal Plans Shaping for Richland Day

Enlargement to Draw 16,000 in Construction Plus 10,000 Residents


"Hanford Works Is Permanent"..Lilientha

BEST BETS

RICHLAND VILLAGER

20 PAGES

PUBLISHED BY AND FOR RESIDENTS OF THE ATOM-BUSTIN' VILLAGE OF THE WEST

Safety Is Big Factor in Slope Issue

Council Meeting Next Monday

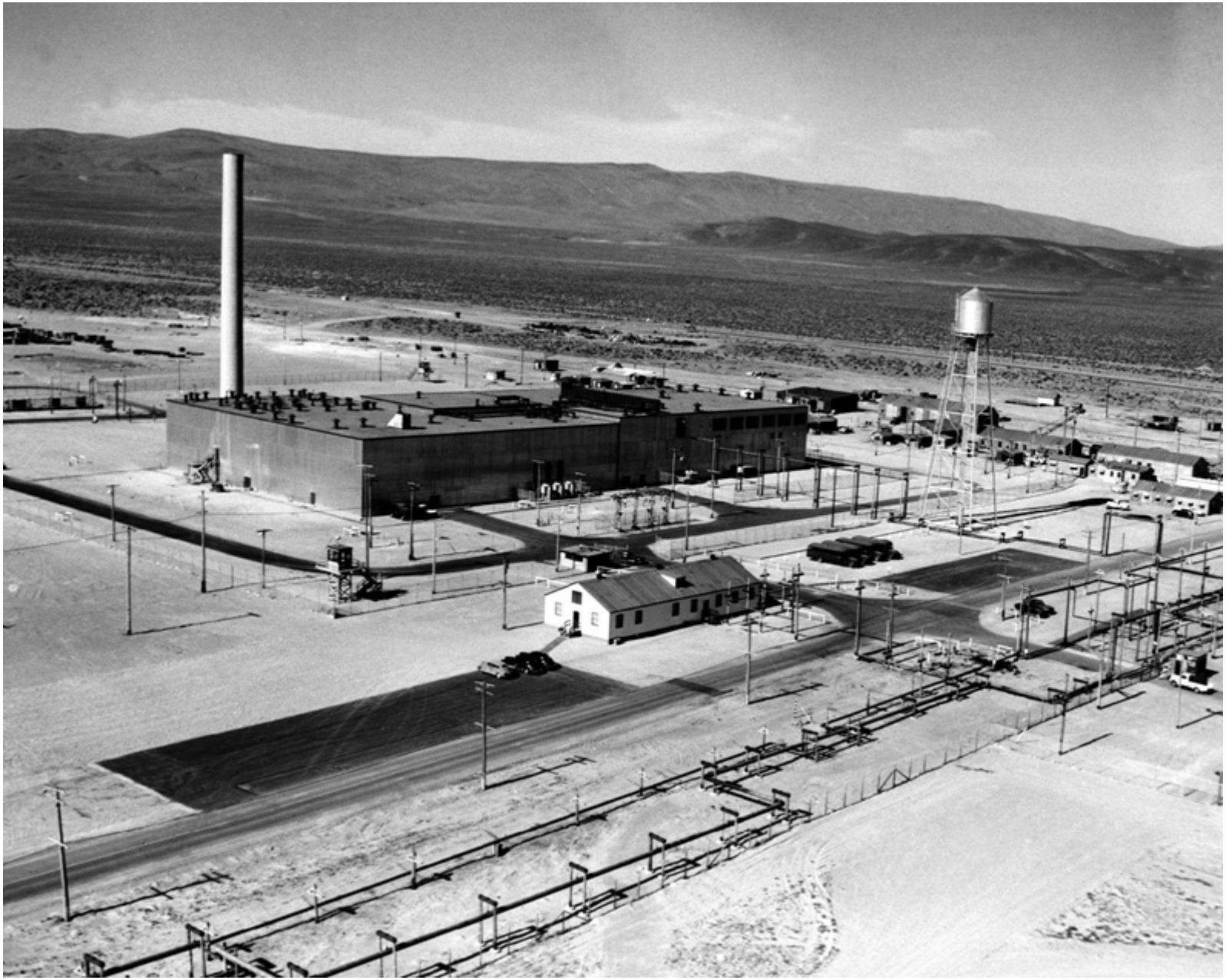
New Daylight Time Will Start Sunday

Ranking Officials Pay Visit to Hanford Works

Record Is Praised by Chairman

First Postwar Expansion

- Largest peacetime construction project in American history to that point
  - Cost more than original Hanford construction
  - Two more reactors built
  - Plutonium Finishing Plant
  - 42 additional waste storage tanks
  - Expansion of Richland to 23,000
  - Construction of trailer/barracks enclave for construction workers



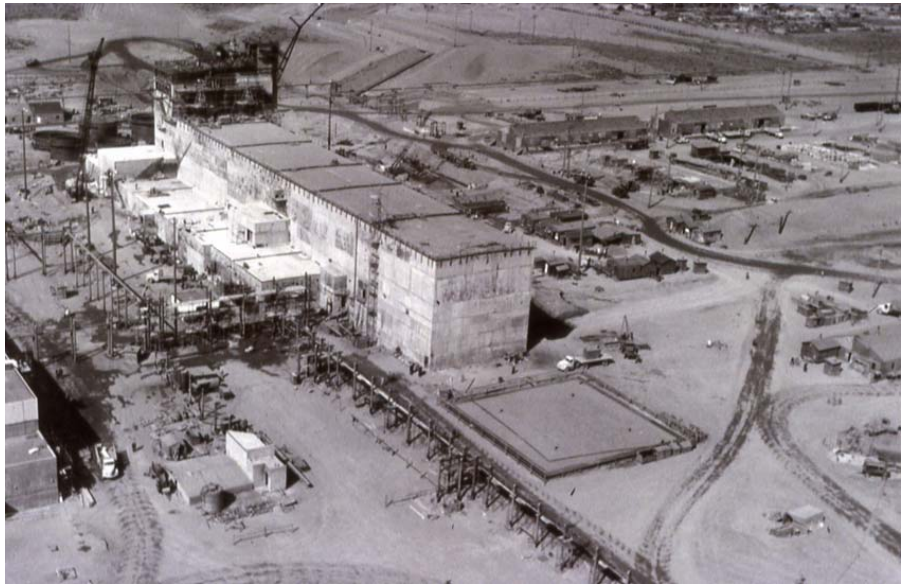
Plutonium Finishing Plant new in 1949

Plutonium “button” or “puck”

Cold War Escalates

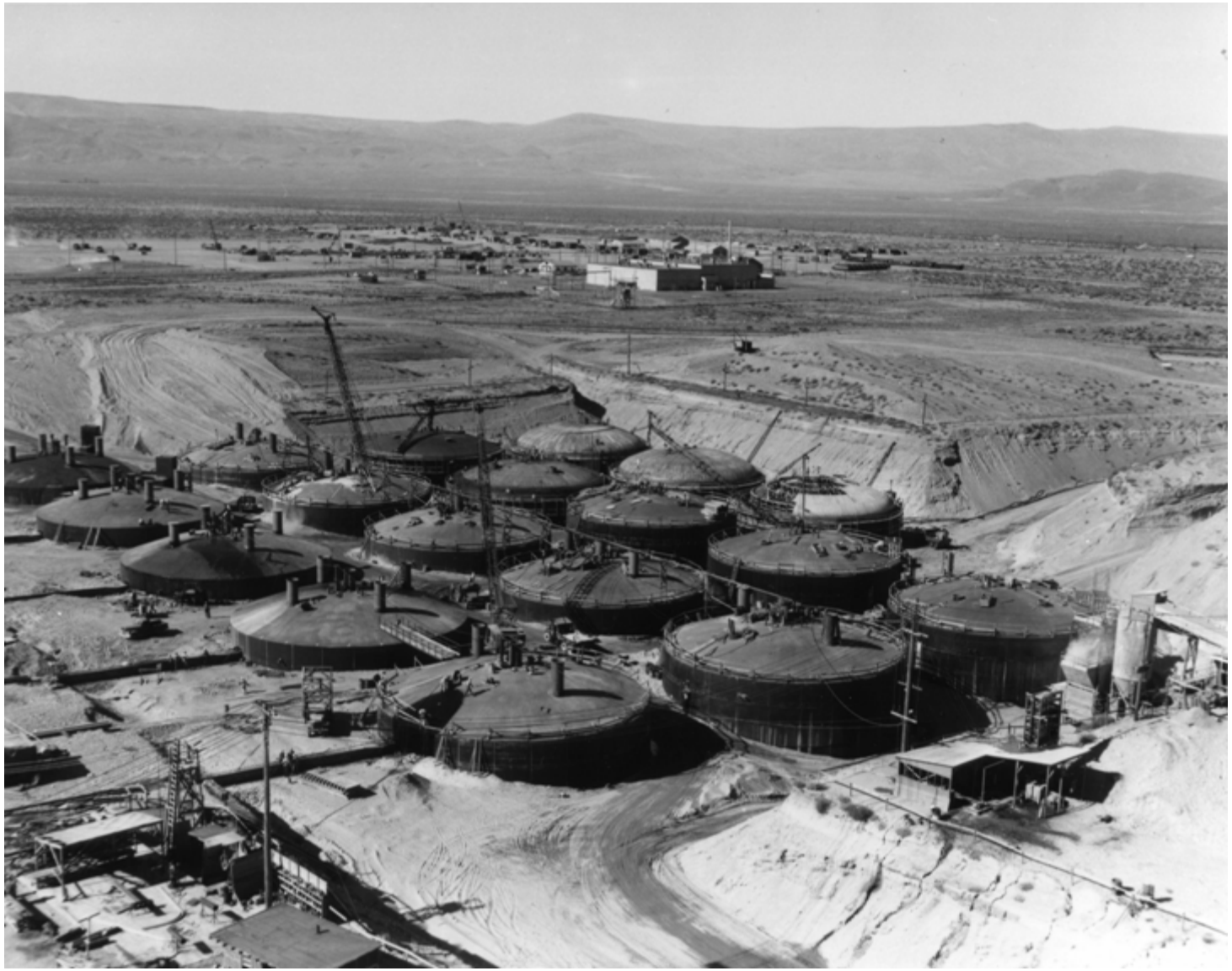
- 1949 - Soviets explode 1st atomic bomb
  - Mao Tse-tung's Communist Forces victorious over Nationalist forces in China
  - NATO (North Atlantic Treaty Organization) formed
- 1950 – President Truman decides to pursue development of H-bomb
  - Korean War begins (June)
  - Communist Chinese enter Korean conflict (December)
- 1952 (U.S.) and 1953 (U.S.S.R.) explode hydrogen bombs

Second Postwar Expansion
(Korean War Expansion)



- REDOX Plant
- C Reactor
- 2 evaporators for tank waste
- 18 additional waste tanks
- Major 300 Area laboratories expansion
- U Plant activated and UO3 Plant constructed

Hanford's 2nd Postwar Expansion: C Reactor under construction, 1951



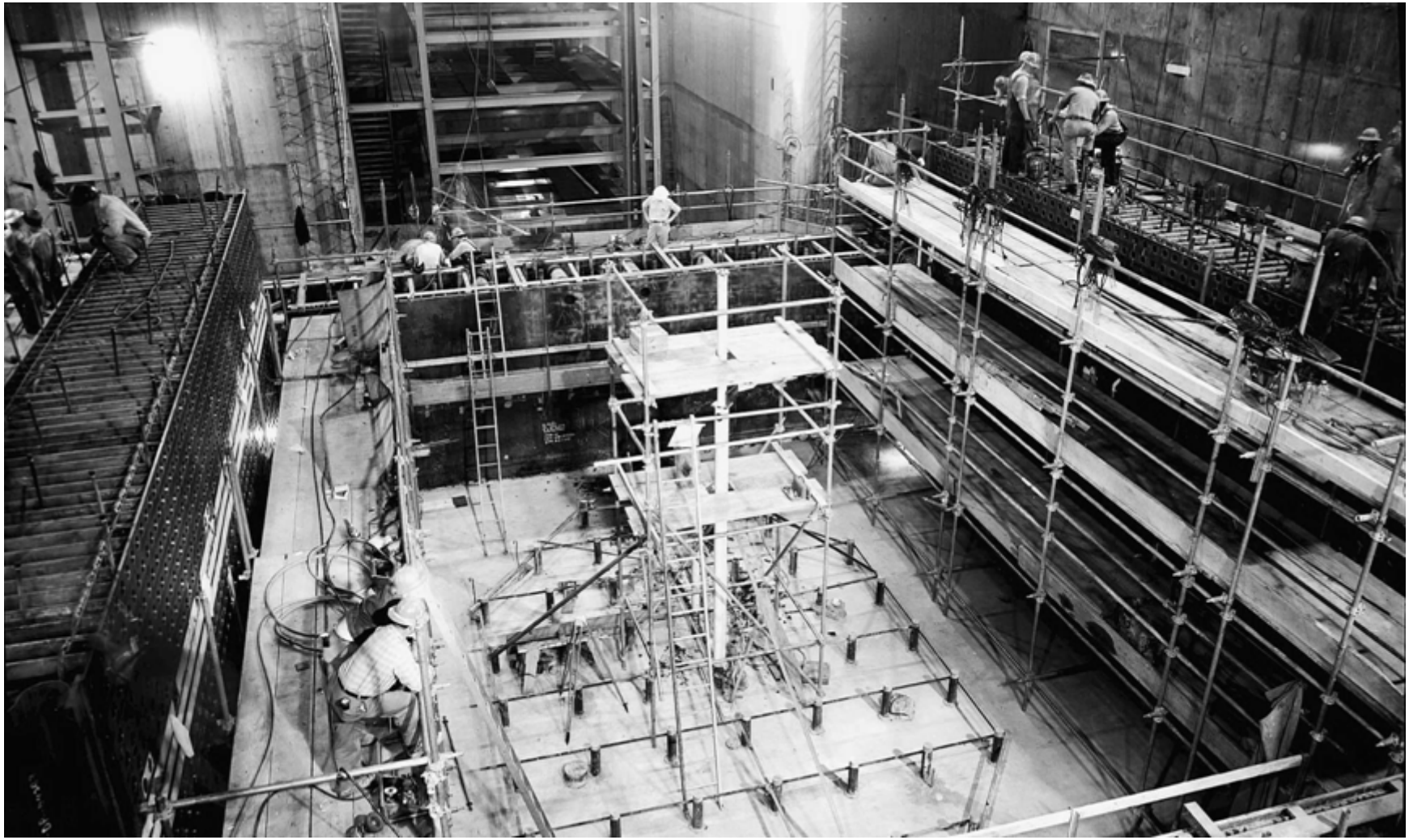
TX Tank Farm under construction, 1949

Cold War Escalates Further

- 1952 – Dwight D. Eisenhower elected president
  - Policy of massive retaliation
    - Deterrent value of large defense production facilities
    - Purposefully leaked information about new facilities
- 1955 – Nikita Khrushchev comes to power in Soviet Union

Third Postwar Expansion
(Second Korean War Expansion)

- President Eisenhower's Program X
  - KE and KW Reactors built
  - PUREX Plant
  - Plutonium recycle facilities
  - 21 additional waste tanks



K West Reactor under construction, 1954

Hanford's Peak Production Years

- 1955-1960 – All 8 single-pass reactors undergo "Modifications for Increased Production"
  - Reactor power levels soar
- 1956 – PUREX begins operations
  - WWII processing plants close
  - Production capacity quadruples in 4 years
  - REDOX relegated to "special operations"
  - PUREX becomes Hanford's workhorse
- 1957 – N Reactor construction authorized in response to Sputnik

President John F. Kennedy dedicates N Reactor 9/23/63

Hanford To Cut Back In 1965

Cutbacks at Hanford will not take place until 1965, The Herald learned today from Dr. Glenn Seaborg, chairman of the Atomic Energy Commission.

President Johnson today said production of nuclear weapons would be reduced and that four plutonium-producing reactors would be taken out of service.

No specific location was given, but Dr. Seaborg said three reactors at Hanford and one at Savannah River, Ga. are concerned.

1965 CLOSURE

There was no indication which Hanford reactors would be affected, but it is assumed they would be the three oldest, built during the war years. The first went into service in December, 1944, and the third was put into operation early in 1945.

Three of the nine reactors at Richland and one of the five at Savannah River are to be shut down over a 12-month period beginning July 1, 1964 Dr. Seaborg said.

The reactor shut down will result in cost reductions of about $13 million, by July 1965. When the shut downs are fully in effect the employment level at Richland and Savannah River will be reduced by about 2500 positions.

At Richland about 2,000 positions or about 20 per cent of the present employment level of some 8,300 will be eventually effected, Dr. Seaborg stated.

6-MONTH PERIOD

The three reactors at Richland will be shut down at intervals within the six-month period beginning Jan. 1, 1965. Employment reduction is not expected to be completed until fiscal year 1967, due to program shutdowns of auxiliary facilities, (principally plutonium separation plants) which will take place after the reactor shutdown.

EIGHT REACTORS

Eight plutonium-producing reactors are in operation at Hanford, the original wartime three and five which were added in post-war expansions.

A ninth reactor has been built but has not gone into service. It recently achieved "criticality", when enough fuel was loaded to sustain a chain reaction. However, it is not expected to reach full power for several months.

The cutbacks will not, however, affect the scheduled startup this year of the New Production Reactor. In addition to producing plutonium, the NPR will also produce steam that will be used by the Washington Public Power Supply System to generate 800,000 kilowatts of energy.

IMPACT

Dr. Seaborg said: "The Commission is keenly aware of the impact of these reductions upon the communities involved. It is Commission policy to cooperate with the local communities where AEC operations constitute the major economic force in their effort to assist in attracting new industries and activities. In 1962 the Commission intensified its efforts to encourage diversification of the economic base of certain of these communities. The Commission will continue these efforts.

For a number of months the Commission has been actively exploring alternate use of production facilities that might be idled in the event of a curtailment in production. These explorations and studies will continue. The problem is difficult but by and large these facilities were designed for a specific production purpose.

'INEVITABLE'

Robert F. Philip, president of the Tri-City Nuclear Industrial Council, said today:

"Everyone knew this adjustment at Hanford was inevitable. Now that the air is cleared of rumors we can step up our activity for diversification of the Hanford plant. But, at the same time, all interested parties, including labor and management, should work to create a climate that is conducive to attracting new industry.

COMPETITION

"We in the Tri-Cities are in competition with many other communities throughout the land.

"The full - time business of the Nuclear Council is to assist in diversification of the tremendous facilities at Hanford so that they might be used by other government agencies and private industry for the benefit of our nation.

"The much - discussed cutback was a constant threat. Now it is a reality and should spur us to greater efforts to bring about diversification which we believe, over the long haul, will prove of lasting good and benefit to the Tri-Cities.

"The Tri-Cities has always absorbed changes and adjustments when they have appeared and we have always gone forward even stronger as a result of them. We always will."

The text of President Johnson's message to Congress is on page 15. Governor's statement on page 1.

HOME OWNED HOME OPERATED INDEPENDENT

Tri-City Herald

VOL. 60, NO. 9 Wednesday, January 8, 1964 Pasco, Kennewick, Richland, Washington Copy 10c

$9-Million Plant Asked For Hanford

The Atomic Energy Commission is asking $9 million to build a fission-product plant at Hanford, Sen. Henry M. Jackson, D-Wash., said today.

* * *

Jackson said he understands the AEC will seek authority in its 1965 budget to proceed with the plant in a manner that will permit participation by private industry.

Industries will be invited to build the plant or to lease it and to help develop markets for fission products, Jackson explained.

PROPOSALS SOUGHT

He said it is expected the AEC soon will invite specific proposals from selected industrial firms.

"It is hoped this new venture can be initiated as an essentially private program from the outset, rather than strictly a government project," Jackson said.

Earlier, Jackson said several industries are interested in the waste-reprocessing business. He mentioned Monsanto and Dow chemical companies. Nuclear Materials and Equipment Co. already has made a proposal to the AEC.

Fission products are the radioactive ashes of the nuclear fires. They have great potential value because they emit energy spontaneously as radiation.

SPACE USES

Jackson said the many potential uses include generation of power for the operation of instruments on space satellites and other space vehicles.

* * * *

Pasco Seeks

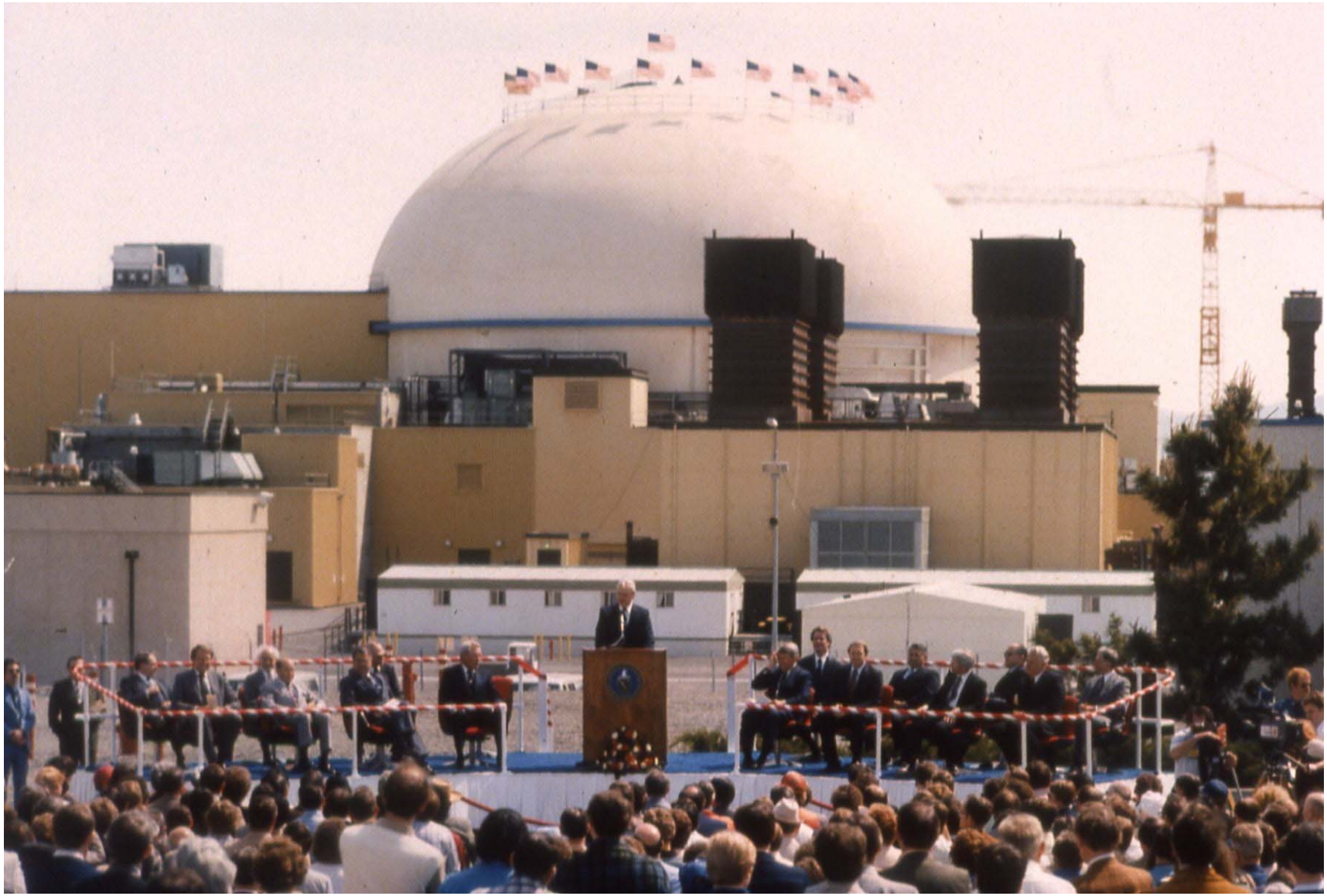
AEC

Hanford Cut-Backs 1960s, 1970s

- All 8 single-pass reactors close between 1964 and 1971
- N Reactor closes briefly in 1971
  - Re-opens for electric power production only
- Fabrication work ends at PFP, 1965
- Plutonium Reclamation Facility closes 1978-1984
- PUREX closes 1972-1983

Production Cutbacks: Experiments with Non-Defense Work

- PFP's defense production lines make special oxides for power reactor experiments
- Special radioisotopes extracted for NASA and other programs
- N Reactor operates for power production only
- Fast Flux Test Facility built as largest national experimental facility for power reactor technology
- 28 double-shelled waste tanks built

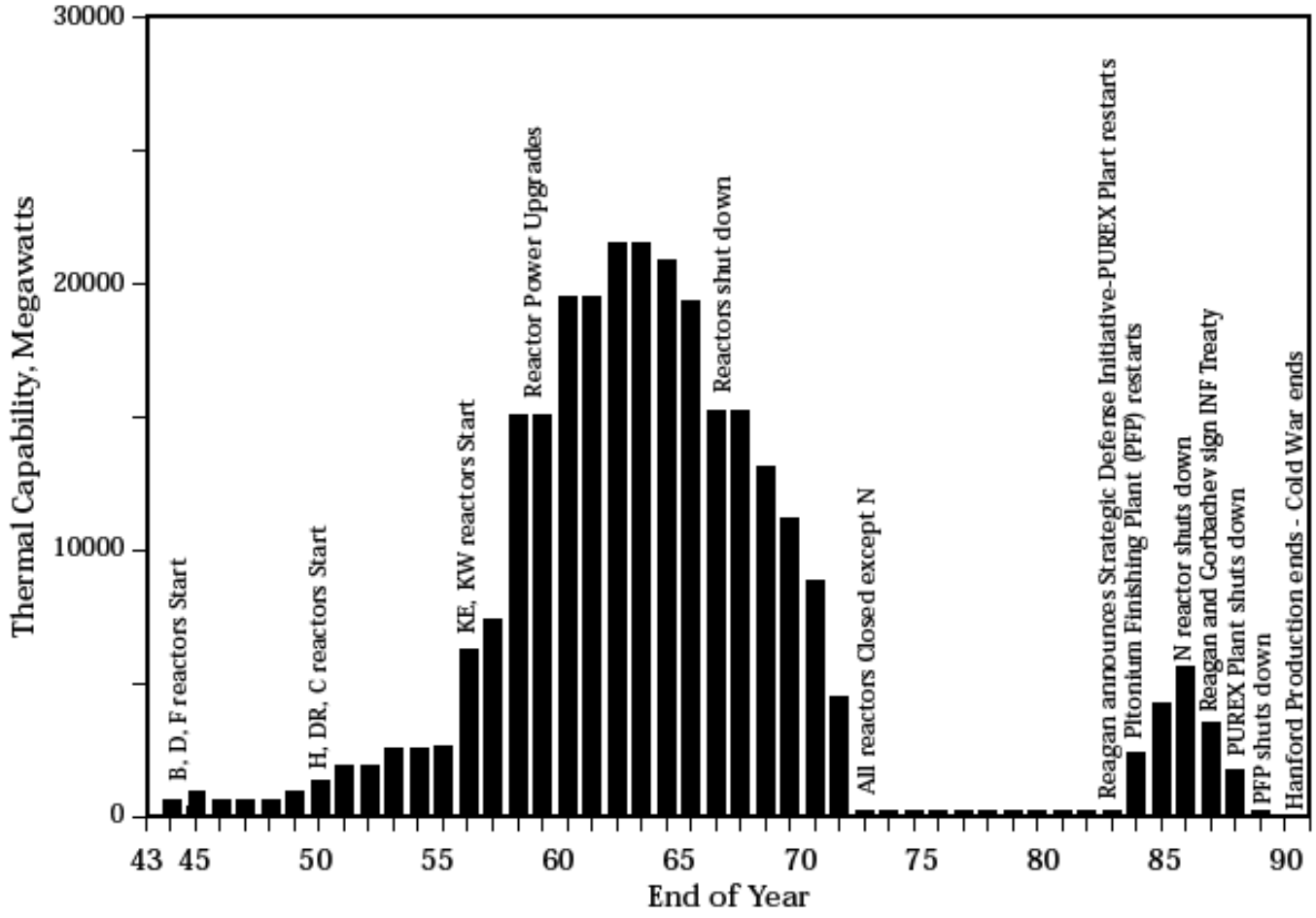


FFTF dedication, 1980

Hanford Production Facilities Reactivated

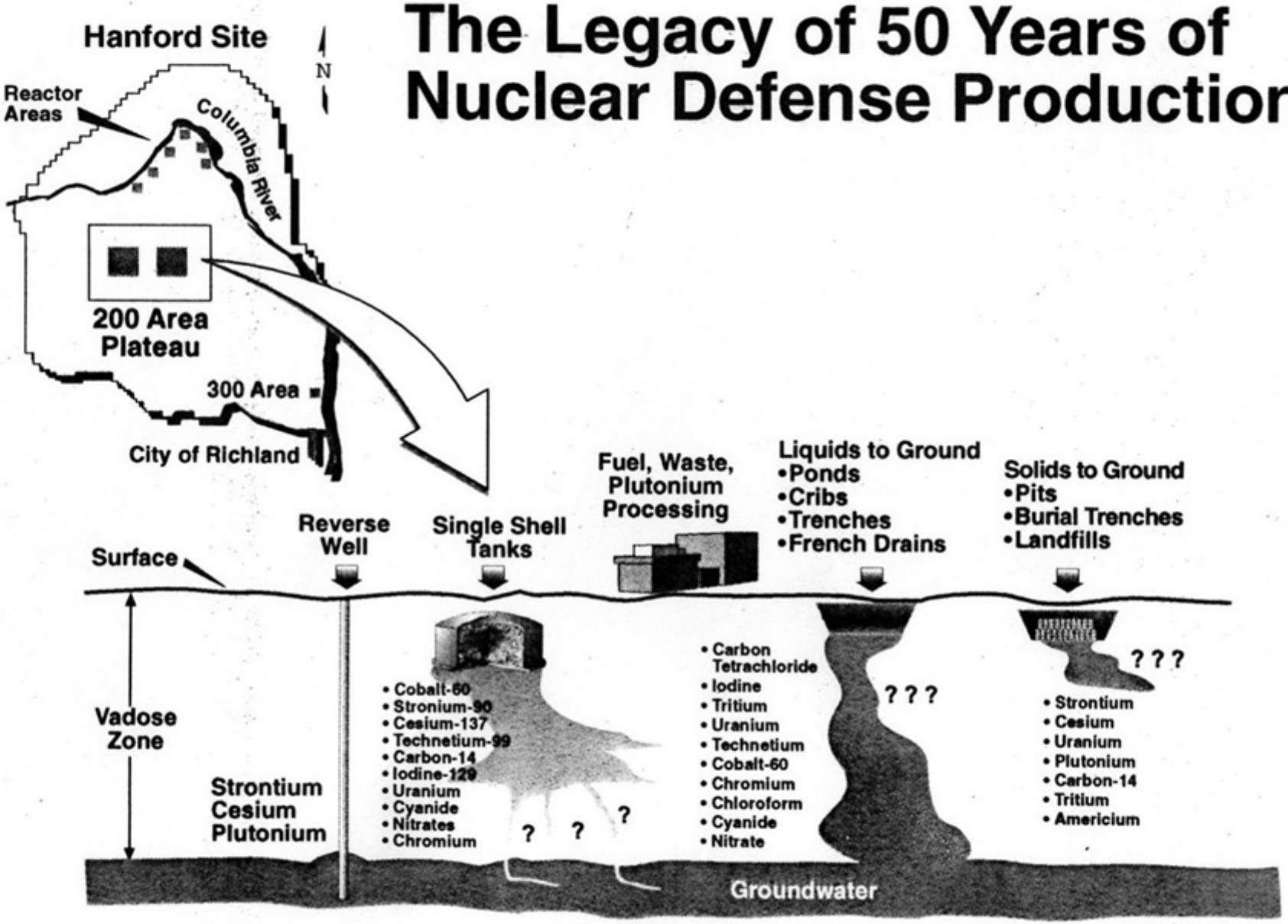
- PUREX retrofitted with multiple environmental upgrades, and oxide conversion facilities
- N Reactor re-tooled to produce weapons-grade material
- PFP and PRF upgraded; reopen for defense material production 1983 and 1984

Hanford Reactor Production over Time



Cold War Ends

The Legacy of 50 Years of Nuclear Defense Production



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Solid Waste Trench, Hanford, 1953

K East Reactor basins overflowing, leaking, 1962


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Waste Cleanup Project: Largest in the World

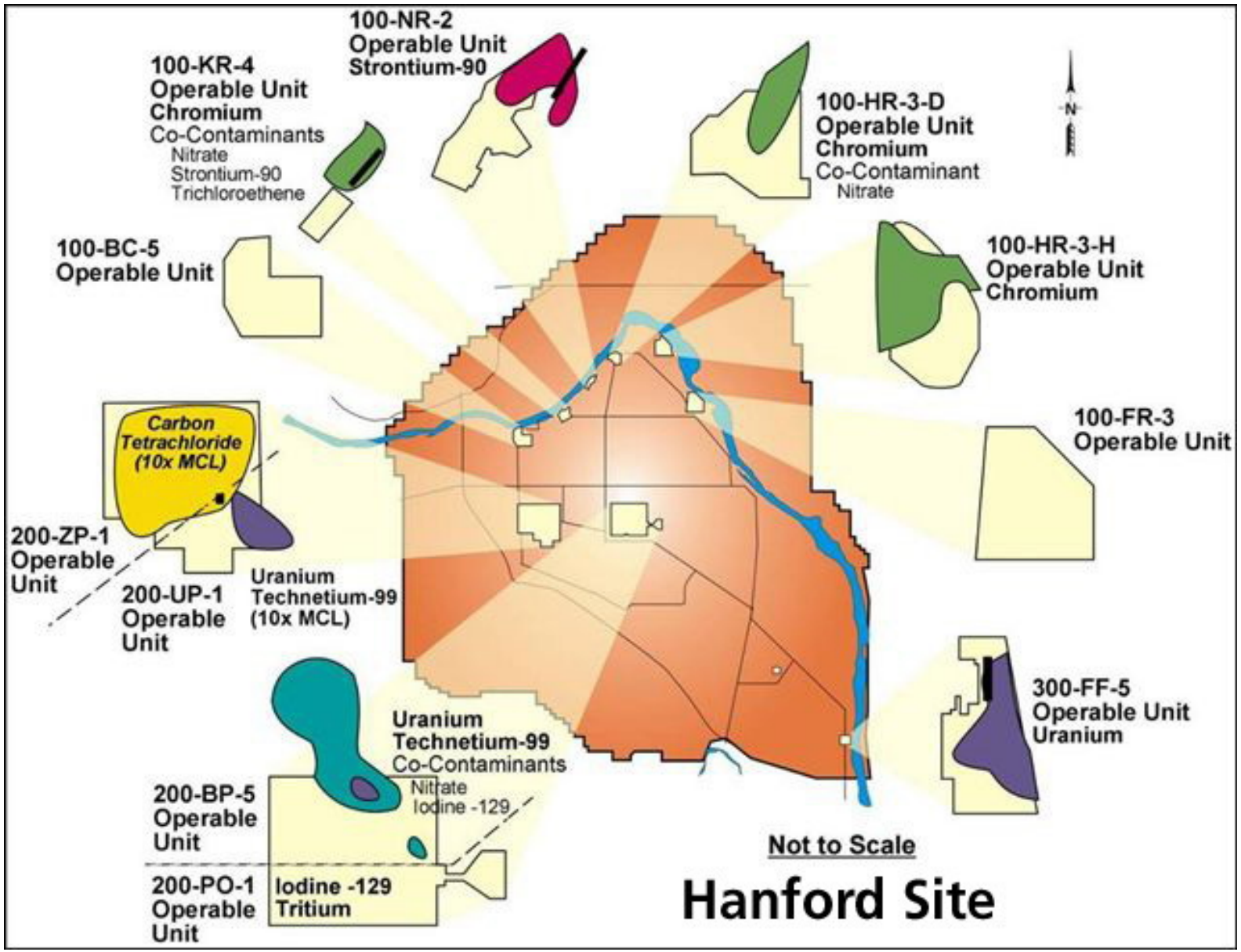
- Hanford's Tri-Party Agreement (TPA-Federal Facility Agreement and Consent Order)
  - U.S. DOE, U.S. EPA, Washington State Department of Ecology
  - May 1989
  - Revised many times; living document
- Hanford cleanup funded at nearly $2B per year

1/11/04 - 218-W-4C, Trench 4, West End


135
CAST
NTN 620

First MCO leaves KW Basin 12/07/2000


CAUTION
RADIOLOGICAL
BUFFER AREA
450C LC
DEER


100-NR-2
Operable Unit
Strontium-90
100-KR-4
Operable Unit
Chromium
Co-Contaminants
Nitrate
Strontium-90
Trichloroethene
100-HR-3-D
Operable Unit
Chromium
Co-Contaminant
Nitrate
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100-BC-5
Operable Unit
100-HR-3-H
Operable Unit
Chromium
Carbon
Tetrachloride
(10x MCL)
100-FR-3
Operable Unit
200-ZP-1
Operable
Unit
200-UP-1
Operable
Unit
Uranium
Technetium-99
(10x MCL)
300-FF-5
Operable Unit
Uranium
Uranium
Technetium-99
Co-Contaminants
Nitrate
Iodine -129
200-BP-5
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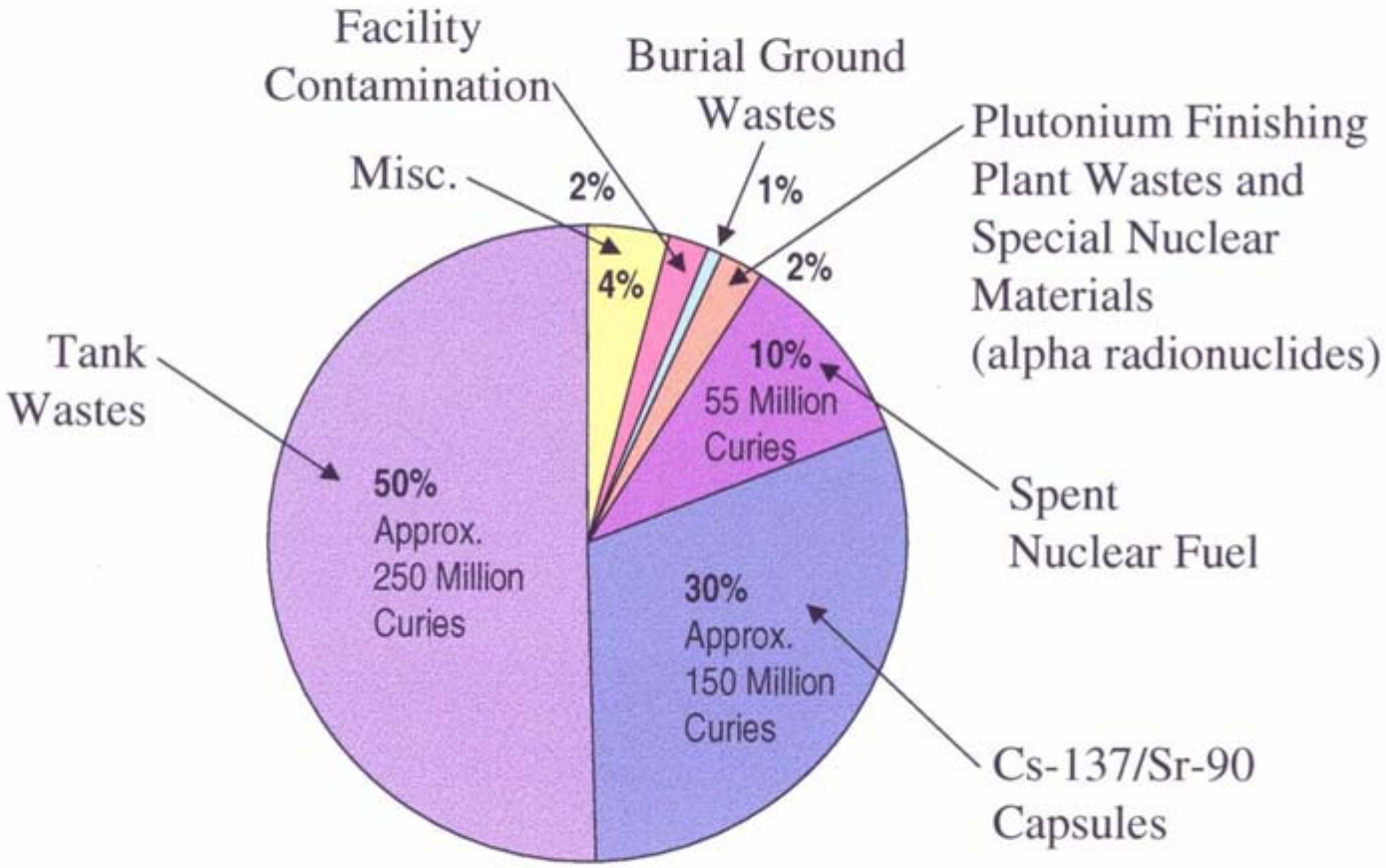
Not to Scale
Hanford Site

Hanford Site Wastes

(expressed in curies)



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Vitrification Plant, August 2007

Preserving our History