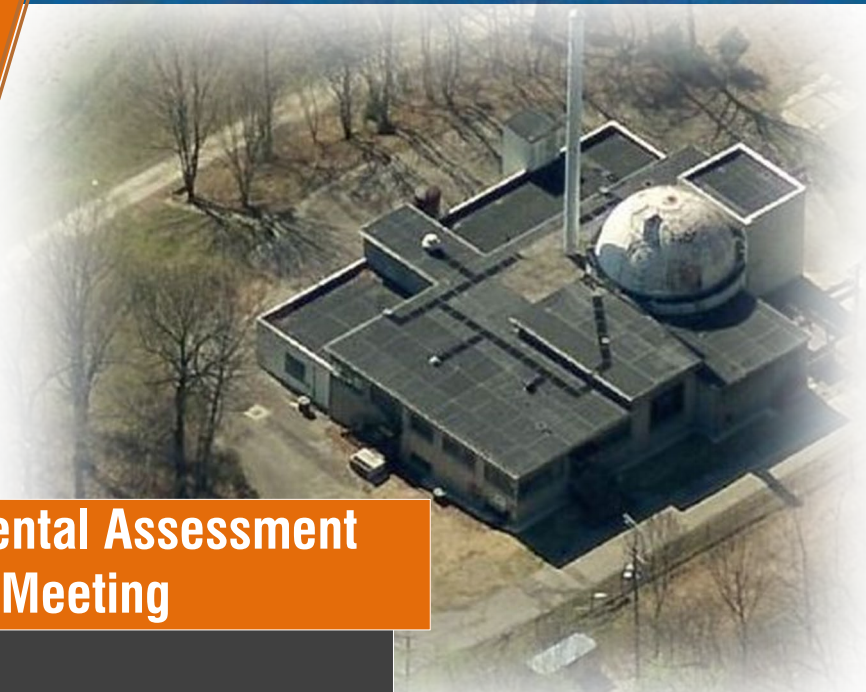


WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

1:00 p.m. – 2:00 p.m.

- Open House
- Meet and interact with U.S. Army Corps of Engineers and Fort Belvoir personnel

2:00 p.m. – 3:00 p.m.

- Formal Presentation
- Question & Answer Session
- Poster Availability

January 7, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020

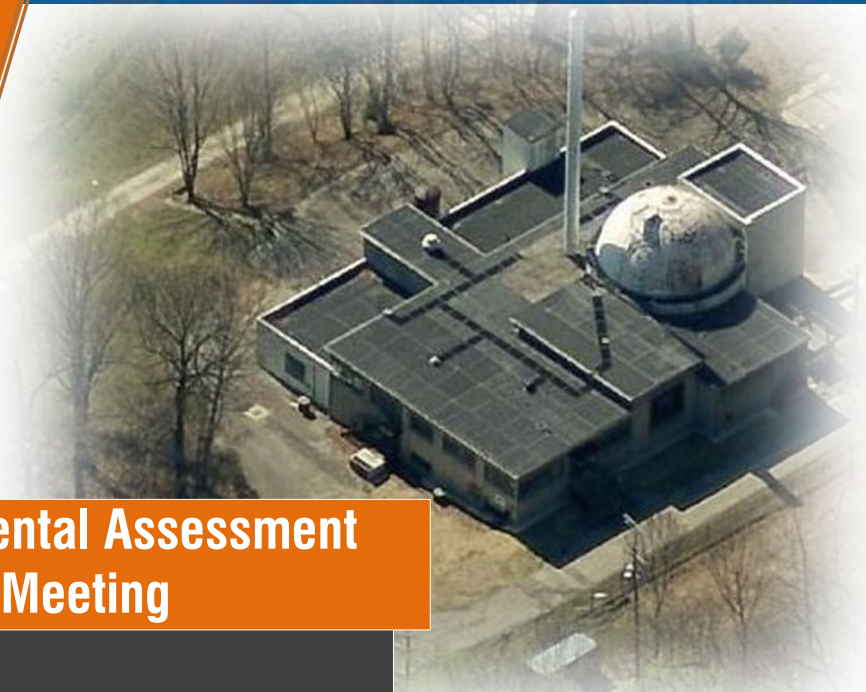


US Army Corps
of Engineers®



WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

6:30 p.m. – 7:30 p.m.

- Open House
- Meet and interact with U.S. Army Corps of Engineers and Fort Belvoir personnel

7:30 p.m. – 8:30 p.m.

- Formal Presentation
- Question & Answer Session
- Poster Availability

January 7, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020

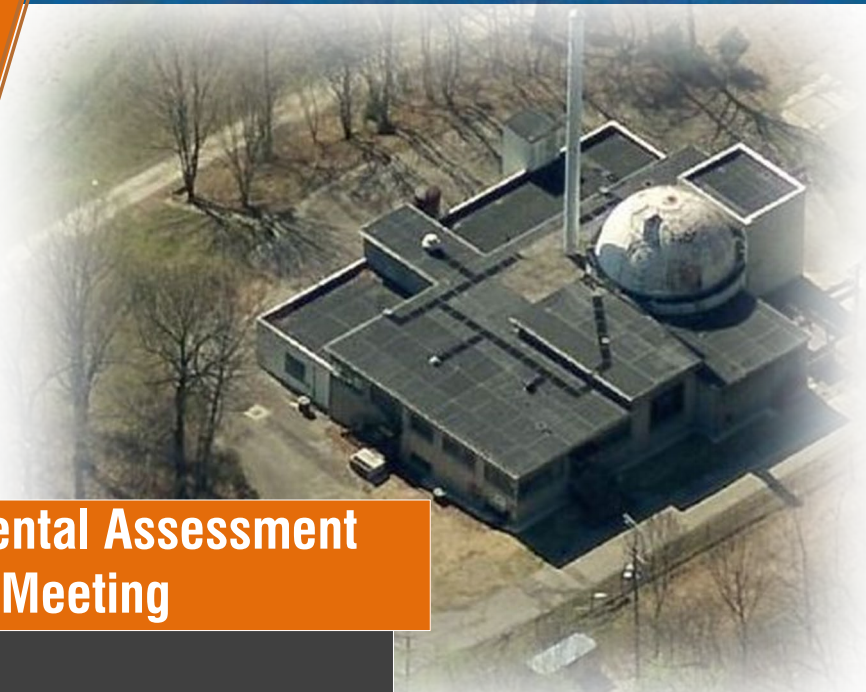


US Army Corps
of Engineers®



WELCOME

SM-1 DECOMMISSIONING PROJECT



Schedule

Draft Environmental Assessment Public Meeting

6:30 p.m. – 7:30 p.m.

- Open House
- Meet and interact with U.S. Army Corps of Engineers and Fort Belvoir personnel

7:30 p.m. – 8:30 p.m.

- Formal Presentation
- Question & Answer Session
- Poster Availability

January 8, 2020

Public review period began on
December 20, 2019 and ends
on January 31, 2020



US Army Corps
of Engineers®

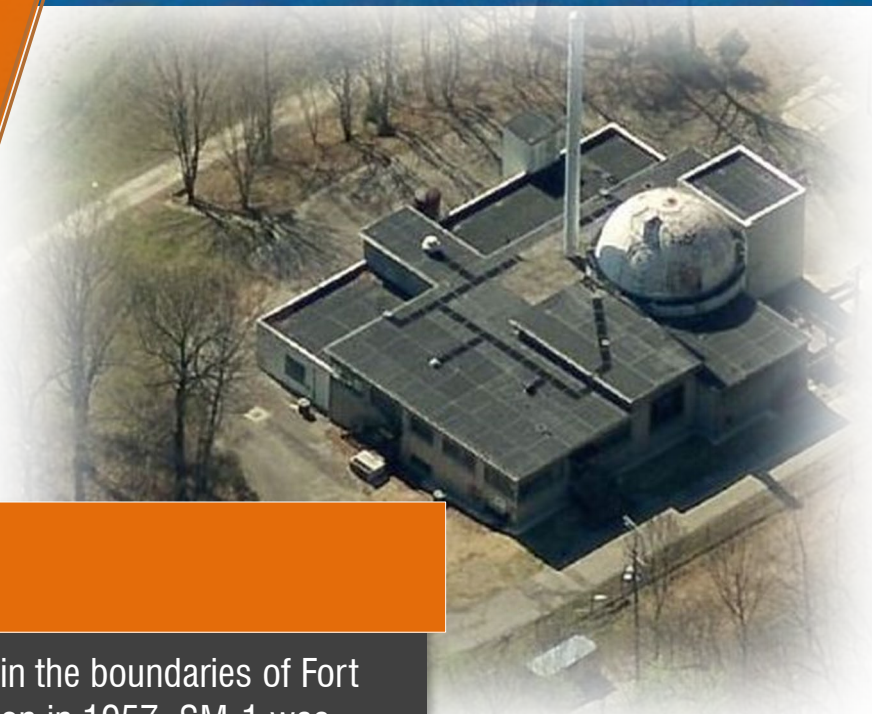


WELCOME

SM-1 DECOMMISSIONING PROJECT

Brief History

The Deactivated SM-1 Nuclear Reactor Facility is situated within the boundaries of Fort Belvoir in Fairfax County, Virginia. After construction completion in 1957, SM-1 was used to train Department of Defense (DOD) power plant operators and was capable of delivering a net 1,750 kilowatts of electrical power. It was the first nuclear power reactor to provide electricity to a commercial power grid in the United States. In 1973, SM-1 was deactivated (shut down). Deactivation included removal of the nuclear fuel and sealing of the reactor pressure vessel, decontamination of building areas to the extent possible, and off-site disposal of radioactive wastes. The site is now referred to as the Deactivated SM-1 Nuclear Reactor Facility. For more than 45 years, the site has been monitored and maintained while the accessible portions of the facility have been used as a museum and storage space.



**US Army Corps
of Engineers®**

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

- The Army has prepared a Draft Environmental Assessment (EA) to analyze this action in compliance with NEPA
- NEPA is the national charter for protection of the environment (42 U.S.C. Part 4321 et seq.)
- NEPA requires federal agencies to analyze the impacts of their proposed actions
- NEPA requires opportunities for public involvement (e.g., Draft EA public comment period, this meeting)

Resources analyzed in the Draft EA:



Water resources



Air quality



Biological resources



Radiological safety and health



Occupational safety and health



Cultural resources



Transportation and traffic



Non-radiological hazardous materials and non-hazardous solid waste



Geological resources



US Army Corps
of Engineers®



DRAFT ENVIRONMENTAL ASSESSMENT ALTERNATIVES

1. PROPOSED ACTION ALTERNATIVE

Complete decommissioning and dismantlement of the Deactivated SM-1 Nuclear Reactor Facility.

This alternative includes:

- Removal of the Deactivated SM-1 Nuclear Reactor Facility and associated buildings and structures
- Removal of residual radioactive contamination exceeding regulatory levels
- Restoration of the SM-1 site to a vegetated condition and return of the site to Fort Belvoir for future use
- Termination of U.S. Army Corps of Engineers Decommissioning Permit

2. NO ACTION ALTERNATIVE

Decommissioning would not be completed and the Deactivated SM-1 Nuclear Reactor Facility would be maintained as it currently is for the foreseeable future.



US Army Corps
of Engineers®



SUMMARY OF DRAFT ENVIRONMENTAL ASSESSMENT FINDINGS

- The Proposed Action would have **no significant impacts** on resources analyzed in the Draft Environmental Assessment
- Most **adverse impacts** would be **short-term and temporary**, occurring during decommissioning / dismantling activities
- The Army and/or its contractors would implement management practices and measures to minimize adverse impacts to the extent possible
- Removal of the Deactivated SM-1 Nuclear Reactor Facility would have **long-term beneficial impacts** on some resources

The National Environmental Policy Act (NEPA) process will conclude when the Army issues a Finding of No Significant Impact (FNSI).

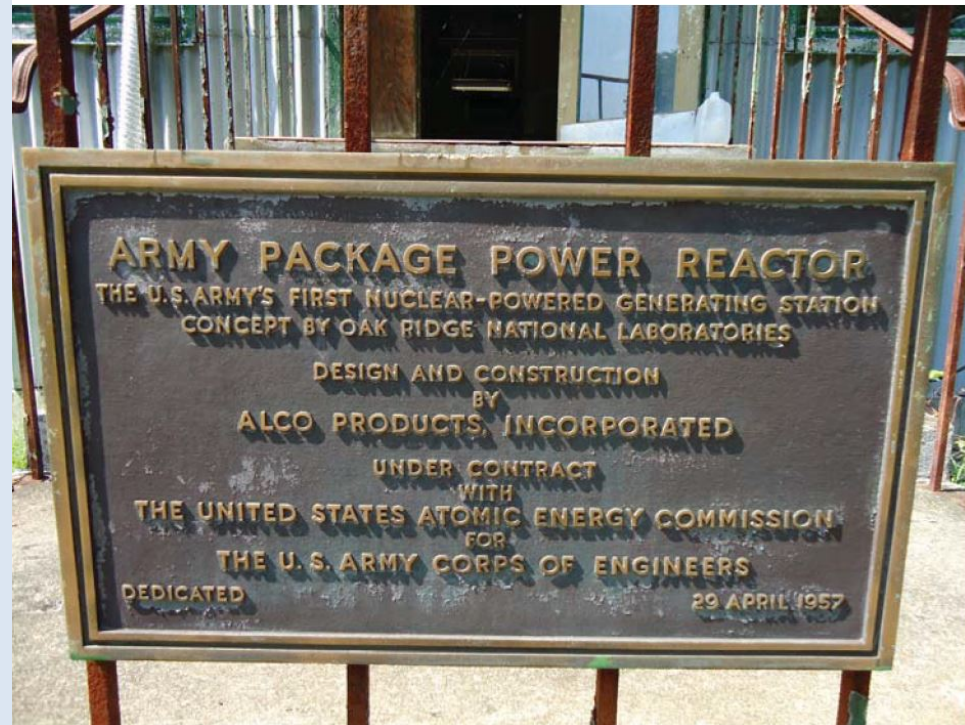


US Army Corps
of Engineers®



NATIONAL HISTORIC PRESERVATION ACT – SECTION 106

- Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on properties listed, or eligible for listing, in the National Register of Historic Places
- The SM-1 Reactor Facility is eligible for listing in the National Register due to its historic significance
- Under Section 106, the Proposed Action would have an adverse effect on the SM-1 Reactor Facility
- The Army is mitigating the Section 106 adverse effect by preparing a modified Historic American Engineering Record document to record SM-1's historic significance, and will implement other measures in consultation with the Virginia Department of Historic Resources



US Army Corps
of Engineers®



FLOODPLAIN MANAGEMENT

- Executive Order 11988 requires federal agencies to consider the effects of their actions on floodplains
- The former water intake pier and discharge pipe must be removed as part of the Proposed Action
- Removal of these structures will allow the shoreline to return to a natural condition, resulting in a beneficial long-term impact
- No practicable alternative exists to remove the pier and discharge pipe that would avoid disturbance of floodplains
- The Army has prepared a Draft Finding of No Practicable Alternative (FONPA) to address floodplain disturbance



US Army Corps
of Engineers®



FEDERAL OVERSIGHT

- The U.S. Army Corps of Engineers will provide quality assurance over the contractor and their quality control program
- Corps of Engineers National Environmental Center of Expertise
- Army Reactor Office and Reactor Council
- Oak Ridge Associated Universities – Independent Review



US Army Corps
of Engineers®



ORAU

DECOMMISSIONING RISKS AND HOW WE REDUCE THEM

- **Safety is the Army's number one priority** – the safety and health of the community and our workers are paramount to the success of our project
- Trained professionals will use proven techniques and precautions to ensure the safety of the workers and the public
- To the greatest extent possible, work will be completed using appropriate engineering controls
- All wastes will be properly packaged in compliance with U.S. Department of Transportation and Nuclear Regulatory Commission requirements
- Wastes will be disposed of at licensed / permitted off-post facilities



US Army Corps
of Engineers®



QUESTIONS AND HOW TO LEARN MORE

Learn more about the SM-1 Project online at:
www.nab.usace.army.mil/SM-1/

Sign up for the SM-1 stakeholder update
e-mail list by e-mailing:
CENAB-CC@usace.army.mil

Stay engaged with us online:



<https://www.facebook.com/USACEBaltimore>



[@USACEBaltimore](https://twitter.com/USACEBaltimore)



www.nab.usace.army.mil



US Army Corps
of Engineers®



HOW TO COMMENT

Tonight: Fill out a comment form or dictate your comment to the stenographer

Send written comments to:

U.S. Mail: Brenda Barber, P.E.
USACE Project Manager
c/o AECOM
4840 Cox Road
Glen Allen, Virginia 23060

E-mail: cenab-cc@usace.army.mil

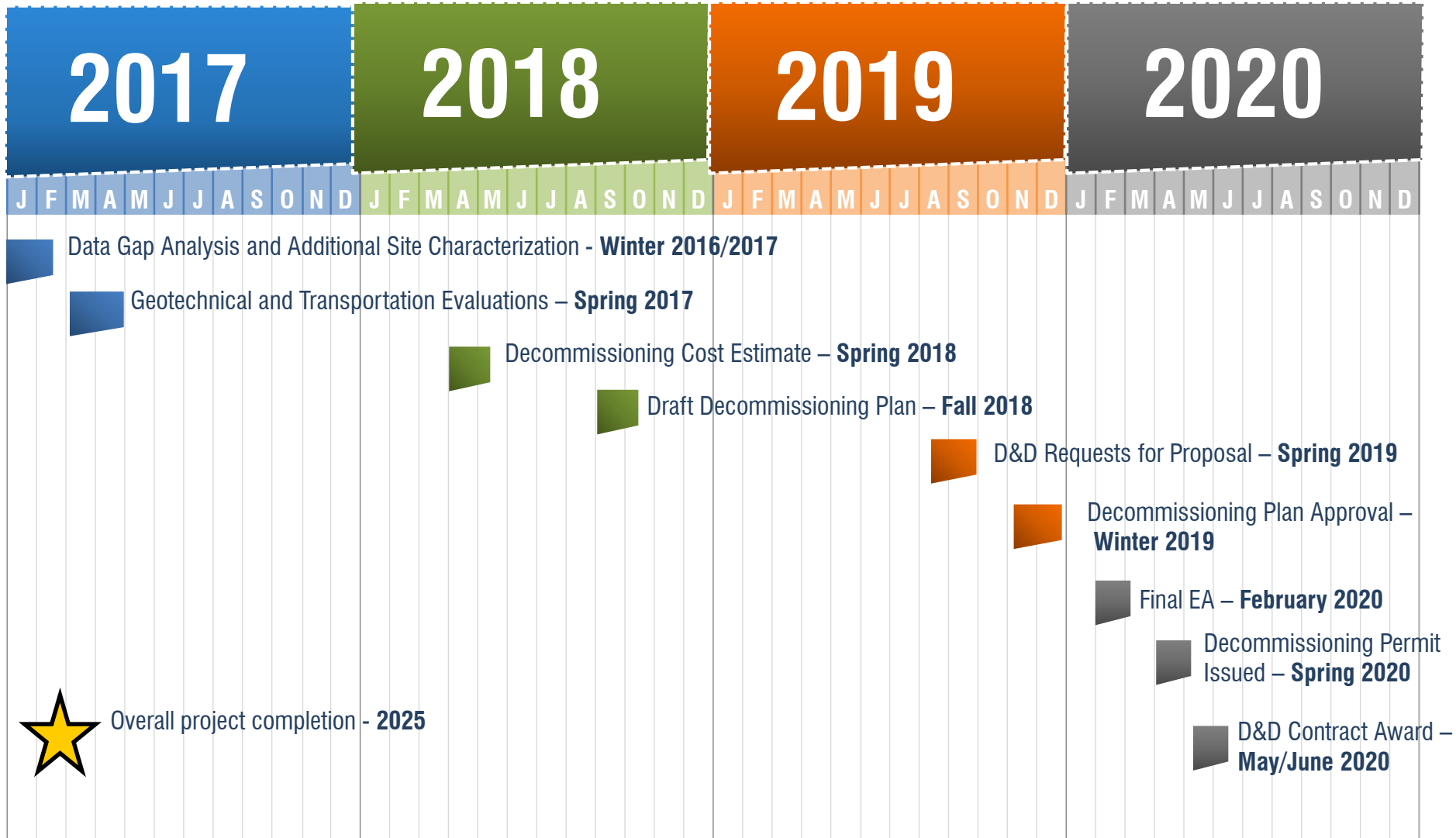
**Written comments must be postmarked
by January 31, 2020**



US Army Corps
of Engineers®



SM-1 TIMELINE/SCHEDULE



TIMELINE FOR THE SM-1 REACTOR FACILITY

1954

U.S. Army Engineer Reactors Group Established



1957-1973

SM-1 served as the Army's primary training facility to train reactor operations personnel



1996

U.S. Army Center for Health Promotion and Preventive Medicine performed extensive surveys of the SM-1 Reactor Facility and surrounding environment to provide an independent review of the environmental monitoring program

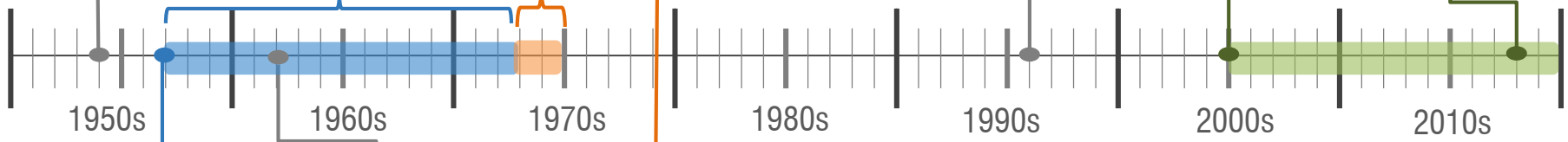
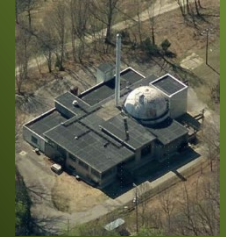
2005

Historical Site Assessment completed



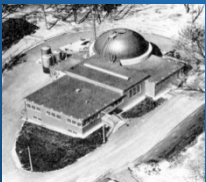
2013

Site Characterization and Survey Report Finalized



1957

Construction and start-up of SM-1



1962

SM-1A Reactor startup in Alaska using SM-1 prototype designs



1973-1974

Deactivation and initial decommissioning of SM-1 Reactor



LEGEND

- SM-1 Reactor in use
- Reactor deactivation and initial decommissioning
- Decommissioning planning
- Other



**US Army Corps
of Engineers®**

WASTE SEGREGATION PROCESS

WHERE DOES IT ALL GO?



CLEAN MATERIAL & EQUIPMENT AND DEMOLITION DEBRIS FOR DISPOSAL OR RECYCLING

- ELECTRICAL DISTRIBUTION EQUIPMENT
- CONTROL ROOM CONSOLES
- BUILDING DEBRIS
 - STEEL
 - CONCRETE

>50%



TRUCKS and TRAINS TRANSPORT WASTE

<25%



<25%



LOW-LEVEL RADIOACTIVE WASTE TO A LICENSED DISPOSAL FACILITY

- **RADIOLOGICALLY ACTIVATED**
 - REACTOR PRESSURE VESSEL (RPV)
 - OTHER REACTOR COMPONENTS
- **RADIOLOGICALLY CONTAMINATED**
 - PRIMARY and SECONDARY REACTOR SYSTEMS
 - LIQUID WASTE MANAGEMENT SYSTEM
 - CONTAMINATED SOIL AND DEBRIS



HAZARDOUS WASTE TYPES TO PERMITTED LANDFILLS

- SOIL AND DEBRIS CONTAMINATED WITH VERY LOW LEVELS OF RADIOACTIVITY
- ASBESTOS INSULATION, FLOOR TILES, ADHESIVES, ETC.
- LEAD-CONTAMINATED SOILS
- UNIVERSAL WASTE (fluorescent bulbs, mercury-containing equipment, etc.)



**US Army Corps
of Engineers®**

RADIATION, RADIOACTIVITY, AND RISK

WHAT IS RADIATION?

RADIATION

- Invisible energy moving through space

NON-IONIZING RADIATION

- Light, sound, heat or infrared waves, microwaves, radio waves, low frequency power line radiation

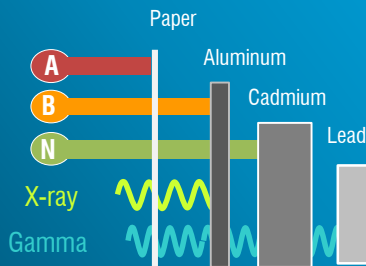
IONIZING RADIATION

- A** Alpha particles (fast moving helium nucleus)
- B** Beta particles (fast moving electron)
- N** Neutrons
- Gamma, X-ray

QUANTIFYING RADIATION EXPOSURE

- REM (millirem – 1/1000 REM)
Unit of absorbed dose in the body that measures the impact of deposited energy.

DIFFERENT TYPES OF RADIATION HAVE DIFFERENT PENETRATING POWERS



WHAT IS RADIOACTIVITY?

RADIOACTIVITY

- Spontaneous emission of radiation
- Is reduced as radioactive atoms decay

RADIOACTIVE ATOMS

- Are unstable
- Change or decay until they become stable
- Give off surplus energy by emitting radiation

HALF LIFE

- The time it takes for decay to half the previous radioactivity

QUANTIFYING RADIOACTIVITY

- Disintegration per second (d/s)
- The number of atomic nuclei that decay each second

SOME HALF LIVES

5.27 years	Cobalt-60
100.1 years	Nickel-63
4.5 billion years	Uranium-238

WHAT IS RISK ASSESSMENT?

RISK ASSESSMENT

- Evaluating benefits versus risk
- Is a smoke detector worth its radiation risk?

NO ANSWER TO THE QUESTION:

- What is a safe level of radiation exposure?
- (What is a safe driving speed?)

APPROPRIATE QUESTION TO ASK IS:

- What is the risk associated with a given exposure? (What is the risk of injury for this situation and speed?)

HEALTH RISKS FROM RADIATION COMPARED WITH OTHER SITUATIONS

	Days Life Lost
Unmarried Male.....	3500
Smoke 20 cigarettes per day.....	2370
Unmarried Female.....	1600
Overweight by 20%.....	985
All accidents combined.....	435
Auto Accidents.....	200
Alcohol Consumption (U.S. averages).....	130
1000 millirem per year for 30 years, calculated.....	30
Natural background radiation calculated.....	8
Medical Diagnostic X-rays.....	6
Coffee drinker.....	6

ANNUAL RADIATION DOSES IN MILLIREM - VARIOUS EXPOSURES

5,000 mrem	US OCCUPATIONAL DOSE LIMIT
2,000 mrem	TOBACCO SMOKING
1,500 mrem	UNDERGROUND URANIUM MINES
620 mrem	AVERAGE ANNUAL RADIATION PUBLIC DOSE
200 mrem	RADON IN THE AIR
100 mrem	NUCLEAR REGULATORY COMMISSION PUBLIC DOSE LIMIT
40 mrem	FOOD AND WATER
26 mrem	TERRESTRIAL RADIATION - US AVERAGE
25 mrem	SM-1 SITE RELEASE CRITERIA
10 mrem	CHEST X-RAY
1 mrem	SM-1 MATERIAL RELEASE CRITERIA

mrem =

MILLIREM = 1/1000 REM.
UNIT OF ABSORBED DOSE IN THE BODY THAT MEASURES THE IMPACT OF DEPOSITED ENERGY

USACE COMMITMENT – SM-1

RISKS?

Safety is our number one priority. There will be minimal risk to the public as we implement this project. The U.S. Army Corps of Engineers will have a highly skilled team of engineers, scientists, and contractors dedicated to the project. SM-1's nuclear fuel was removed more than 40 years ago.

#1
PRIORITY

**PUBLIC AND
WORKER
SAFETY**

100
percent

**DEDICATION TO
PROJECT**

100
percent

**REGULATORY
COMPLIANCE**

↓
MINIMAL

**RISK TO
PUBLIC**

0
NUCLEAR
FUEL

**SM-1
REACTOR**



**US Army Corps
of Engineers®**