



US Army Corps
of Engineers
Buffalo District

Formerly Utilized Sites
Remedial Action Program (FUSRAP)

SEAWAY SITE
BRIEFING

JUNE 18, 2008

Tim Byrnes
Project Manager
U.S. Army Corps of Engineers

First, thank you for having us and I hope this will serve to be informative, as it has been our intention to keep you informed and work with you as we follow the CERCLA process.

Again, I am Tim Byrnes the project manager for the Seaway Site and would like to show you what we envision will be similar to our presentation to the public upon release of the Proposed Plan. We have moved the date of release back to address the change of Command and staffing.



US Army Corps
of Engineers
Buffalo District

MEETING PURPOSE

- Present the Seaway Site intended Proposed Plan
- Obtain input

The purpose of this meeting is to present to you the intended proposed plan and most importantly to get your input. We recognize that at this point we will not get your official position. We would appreciate anything you can provide and ask you to recognize that we will be trying to refine this presentation to use it as a conveyance to the public upon actual release of the Proposed Plan.



US Army Corps
of Engineers
Buffalo District

AGENDA

- Welcome and Introduction
- Preferred Alternative
- Technical Presentation in support
of the Proposed Plan
- Comments and Questions

9

Here is the possible Agenda for the public meeting and will serve us here. I welcome your interaction and my introduction now will bring you right up front to the preferred alternative where for the public meeting we will address the formality of commenting. The brief technical presentation is geared to the general public and I expect that there may be more technical questions from you which will lead to comments and questions.



US Army Corps
of Engineers
Buffalo District

Introduction Preferred Alternative

Alternative 6: Containment

MED/AEC-related material on the Seaway property will be contained within Seaway Areas A, B and C

MED/AEC-related material outside the Seaway containment system excavated to achieve cleanup criteria

Cover the areas with a minimum of 4.5 - 5 feet of cover

Maintain land use controls

Conduct 5-year reviews

4

This is the Preferred Alternative from the Proposed Plan which is containment of Manhattan Engineer District\Atomic Energy Commission materials within the landfill. For material outside the landfill containment system (leachate collection system), excavation and disposal out of state.

Cover, land use controls and 5 year reviews will also be a part of the preferred alternative.



US Army Corps
of Engineers
Buffalo District

Outline of Technical Presentation

- General
- History
- Nature and Extent of Contamination
- Process and Criteria
- Remedial Action Alternatives
- Preferred Alternative

5

I will take you through these items. Some of you may know the history better than I. Then we will cover the nature and extent, the process, the alternatives considered and the preferred alternative.

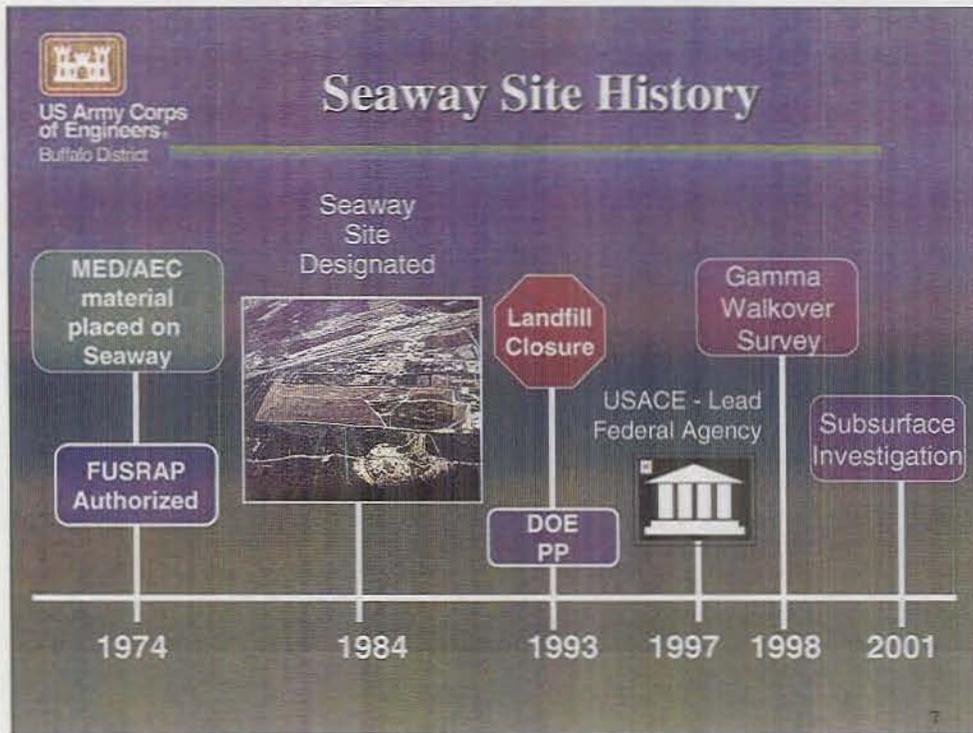


US Army Corps
of Engineers
Buffalo District

Site Photograph



- Here is the Seaway Site property comprising about 100 acres off River Road in the Town of Tonawanda, NY, referred to as the Seaway Industrial Park.
- For orientation here is the 190 going north; the south Grand Island Bridge and River Road.
- The Seaway Site is a landfill that was used for the disposal of various types of wastes starting in 1930 and ending in 1993.
- Place a north arrow on this



•During the 1970's, some residues resulting from the processing of uranium ores for the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) were relocated to the Seaway site. The residues that had been deposited at the adjacent Ashland 1 property were relocated from the Ashland 1 property as a part of installation of new oil tank.

•The Seaway site was designated as a Formerly Utilized Remedial Action Program (FUSRAP) Site in 1984. FUSRAP was the responsibility of the U.S. Department of Energy (DOE) until 1997 and a number of studies were conducted by DOE.

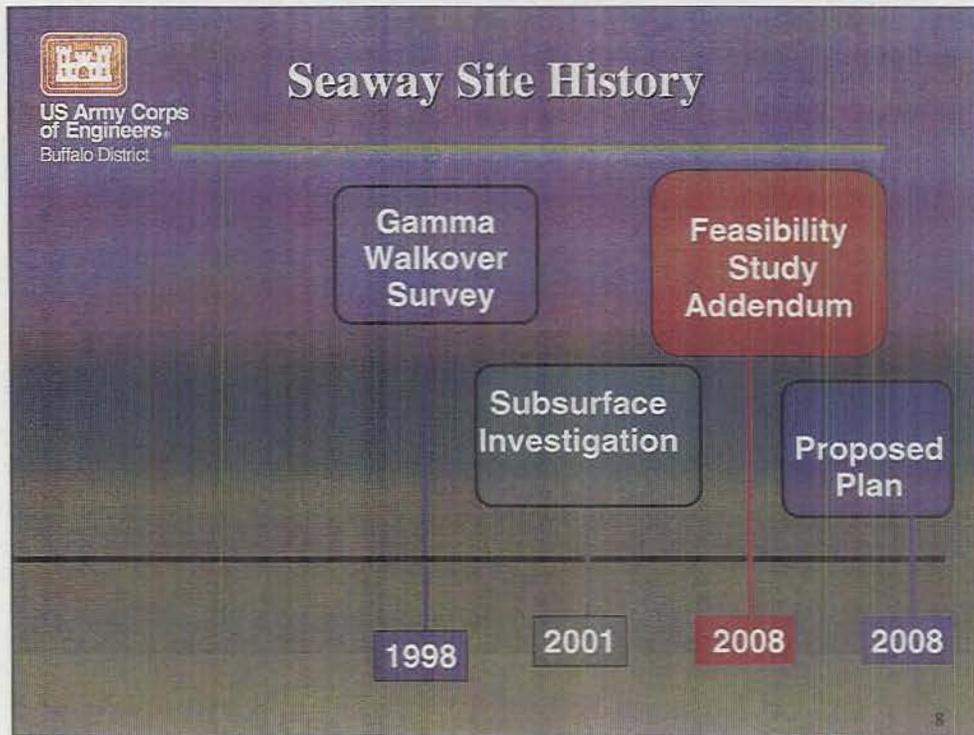
•DOE conducted a remedial investigation, baseline risk assessment and feasibility study for the Tonawanda FUSRAP Sites (Linde, Ashland 1, Ashland 2 and Seaway) and issued a proposed plan in 1993 right around the time the landfill closed.

•The responsibility for conducting remedial investigations and actions at the Seaway Site was transferred to the US Army Corps of Engineers or USACE in 1997. Congress subsequently directed USACE to conduct its FUSRAP work in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

•USACE conducted supplemental investigations since 1997 assessed groundwater, institutional controls and radon emissions, incorporated additional sampling results from 1998 and 2001, improved volume estimates and updated the radiological risk posed by the FUSRAP contaminants

BACKUP

DOE reported in the 1993 RI that at least 6,000 cubic yards of MED/AEC-related materials placed in Areas A, B and C in 1974.



The more recent history is shown here.

The additions are the Feasibility Study Addendum incorporating the 1998.

The subsurface work done in 2001 was the most extensive Corps investigation and done in coordination with NYSDEC and USEPA.

The Proposed Plan is what we are talking now. It is to be released in the near future and this meeting is to present the highlights to you.



US Army Corps
of Engineers
Buffalo District

Nature and Extent of Contamination

- Soils: Unacceptable future risk for Radium, Thorium, Total Uranium including daughters Actinium and Protactinium
- Groundwater: Not impacted
- Surface Water: Not impacted
- Air: Not impacted

The soils, groundwater, surface water and air were examined as a part of our investigations regarding the nature and extent of contamination from MED/AEC related constituents. Only in the soils did the impacts exceed guidelines and the proposed plan addresses these with each alternative. The contaminants of concern are radium, thorium, and total uranium including actinium and protactinium.

• Question is not impacted or no unacceptable risk.



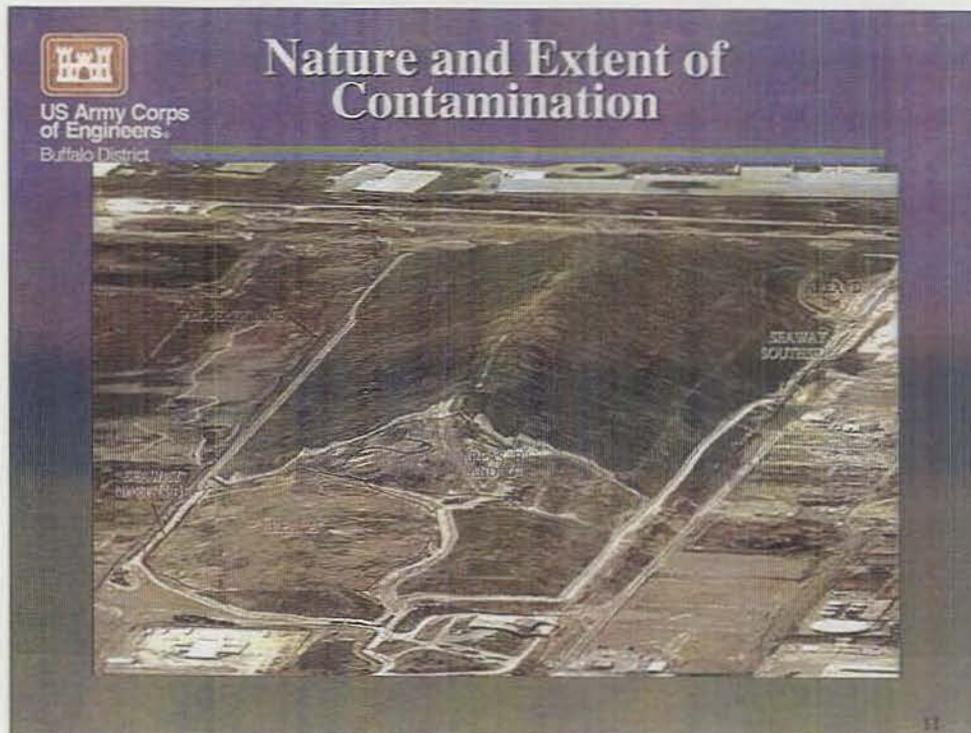
US Army Corps
of Engineers
Buffalo District

Nature and Extent of Contamination

- Remediation of Ashland 2 Site
 - Elevated levels of radionuclides found at the Seaway Site boundary called Seaway Northside.
 - Some contamination located outside of the Seaway Site containment system.
- Remediation of Ashland 1 Site
 - Elevated levels of radionuclides found at two areas at the Seaway Site boundary called Seaway Southside.
 - Some contamination located outside of the Seaway Site containment system.

10

Remediation activities at adjacent sites yielded two new areas of soil contamination namely the Seaway Northside and the Seaway Southside. Both areas have contamination that is outside of the containment system or leachate field for the landfill.



Here are the four areas of soils contamination investigated. For orientation at the bottom of the screen is River Road and I-190 is to the right not shown

There is area A uncapped,

Area B & C uncapped and once thought to be separate areas but found to be one

Seaway Northside at the property boundary found during remediation of Ashland 2

and Seaway Southside at the property boundary found during remediation of Ashland 1.



US Army Corps
of Engineers
Pittsford District

Nature and Extent

Radionuclide	Area A			Area B&C			Northside			Southside		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Ra-226	ND	140	8	ND	93	4	-	14	-	ND	14	2
Th-230	ND	2,800	130	ND	547	8	-	400	-	ND	1,900	2400
Uranium2												
U-234	ND	54	8	ND	32	7	-	-	-	-	-	-
U-235	ND	11	.5	ND	6	.6	-	-	-	-	-	-
U-238	ND	74	10	ND	100	7	-	22	-	ND	220	25
Uranium Daughters												
Ac-227	ND	25	7	ND	25	5	-	12	-	-	-	-
Pa-231	ND	39	4	ND	28	4	-	12	-	-	-	-

ND – Not Detected

All Values in pCi/g

12

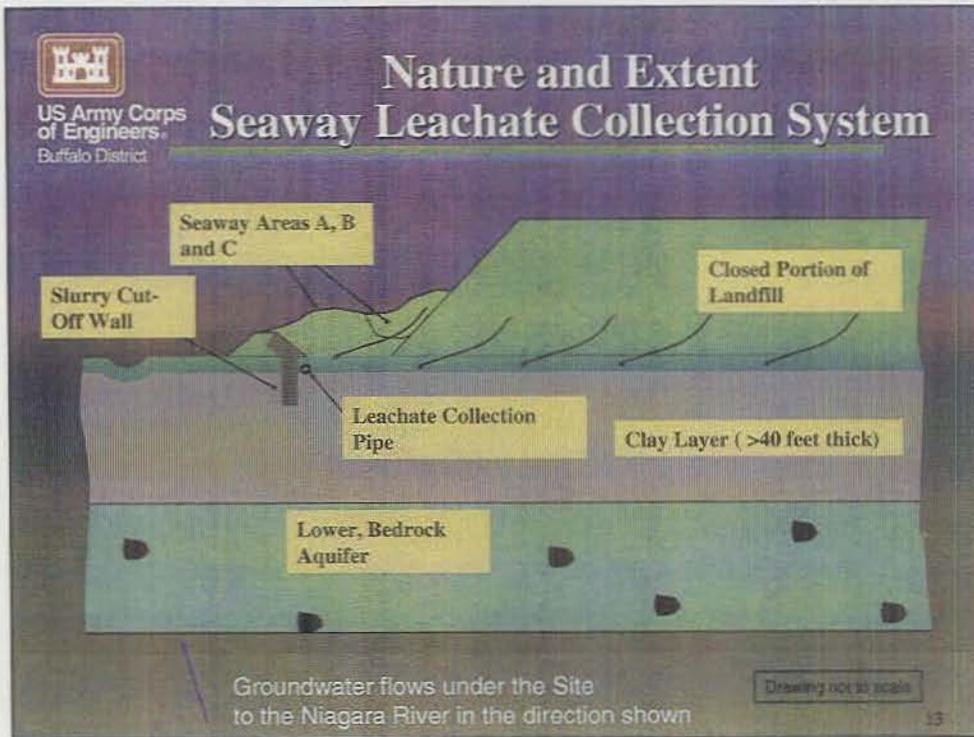
For the four areas of soil contamination here are the levels of activity detected for the contaminants of concern.

ND – Not Detected

1-There is only one result for Seaway Northside, which is indicated as the maximum.

2-Total Uranium is calculated by adding the values for U-234, U-235 and U-238

Source table 3 of PP



Here is a not to scale graphic of the north west end of the land fill or essentially looking north, showing uncapped areas a, b and c. They sit above a 40 feet clay layer and within the cutoff wall for the leachate collection system.



Here is a not to scale graphic of the north end of the land fill showing areas a, b and c. They sit above a 40 feet clay layer and within the cutoff wall for the leachate collection system.



- The process is to examine cleanup regulations regarding the constituents of concern in soils namely, radionuclides. We examined Applicable, Relevant and Appropriate Requirements (ARARs) and we found none applicable but we didn't stop there. We found these as Relevant and Appropriate Requirements.

- The Code of Federal Regulations (CFR) cited here establishes cleanup requirement for receptors regarding radionuclides

- Backup** – There are three potential sources of media specific cleanup goals, concentrations based on site specific background data; Applicable, Relevant and Appropriate Requirements (ARARs) and Risk Based Concentrations (RBCs). ARARs in this case, which are relevant and appropriate were used and by definition then considered protective.

- Section 121(d)(2)(A) of CERCLA, 42 U.S.C. Sec. 9621(d)(2)(A), requires with respect to any contaminant that will remain on site after the remedy is complete, that the degree of cleanup must meet all ARARs.

- plus as low as reasonably achievable (ALARA)



US Army Corps
of Engineers
Buffalo District

Process Applicable, Relevant & Appropriate Regulations

General

40 CFR Part 192,
Subpart A and 10 CFR Part 40,
Appendix A, Criterion 6(1)

Remedy is effective for 1000 years

Removal of Impacted Soils

40 CFR Part 192, Subpart B

RA-226 Concentration on surface soils
<5 pCi/g, <15 pCi/g in subsurface soils
averaged over 100m²

10 CFR Part 40,
Appendix A, Criterion 6(6)

All other COCs will have an equivalent
dose to Ra-226

Containment of Impacted Soils

40 CFR Part 192, Subpart A

Radon flux <20 pCi/m²/s concentration in
air at or outside border <.5 pCi/L increase

16

These relevant and appropriate regulations specify that if residues remain on site we are looking at the effectiveness of a remedy for 1,000 years, the levels of residues that may remain in the soils and what is needed to be protective from radon emissions if there is containment of the residual soils.

Source Table 4 of PP



US Army Corps
of Engineers
Buffalo District

Cleanup Goals

Contaminant Of Concern	Background	Removal Standards for Soil (incremental to background)	
		Surface	Subsurface
Ra-226	1.1	5	15
Th-230	1.4	15	44
U-Total	6.3	110	1000

All values are in pCi/g

17

Considering the regulations in this case those that are relevant and appropriate, the resultant cleanup goals for contaminants of concern were derived for the industrial worker and are shown here in units per unit weight of soil. These are the levels that if exceeded removal will be necessary.

Source table 6 of PP



US Army Corps
of Engineers
Buffalo District

Screening Alternatives

Soils Media		
Alternative	Protective	Meets Regulations
1 No Action	No	No
2 Complete Excavation, Off-Site Disposal	Yes	Yes
3 Complete Excavation, On-Site Disposal (N/A)		
4 Partial Excavation, Off-Site Disposal	Yes	Yes
5 Partial Excavation, On-Site Disposal (N/A)		
6 Containment	Yes	Yes

This table identifies the six alternatives that were considered in the Feasibility Study. Having examined the cleanup goals, looked at technologies and developments leading to the feasibility study addendum only four alternatives were examined for the Proposed Plan.

Alternatives 2 and 5 involving the consolidation of all MED/AEC related waste from the four Tonawanda sites and disposal of the waste in a on-site engineered disposal facility have been dropped from consideration since the other Tonawanda sites have been or are in the process of being remediated under separate CERCLA actions and all excavated wastes are being shipped offsite for disposal. Therefore alternatives 2 and 5 were not evaluated in this proposed Plan.

•Now for a brief description.....



US Army Corps
of Engineers
Buffalo District

Alternative 2: Complete Excavation with Off-Site Disposal



Actions:

- Remove all soils necessary to meet cleanup criteria
- Ship off-site for disposal 150,000 cu. yds.
- Cover excavated area with 1 foot of soil
- No land use controls
- No 5-year reviews

Cost

\$113M

19

Then we have...Alternative 2: Excavation of soils (yellow areas) and disposal. Here we address soils by removal of all impacted soils with offsite disposal and backfill.

152,000 yards of soil will to be shipped offsite at a total cost of 113 million dollars



US Army Corps
of Engineers
Buffalo District

Alternative 4: Partial Excavation with Off-Site Disposal



Actions:

- Remove all accessible soils (soils not under 10 feet or more of landfill material) and soils outside the landfill containment system necessary to meet cleanup criteria
- Ship off-site for disposal 116,000 cu. yds.
- Cover Area A with 1 foot of soil, cover Areas B and C with 4.5-5 foot of cover
- Land use controls necessary
- 5-year reviews necessary

Cost

\$80M

20

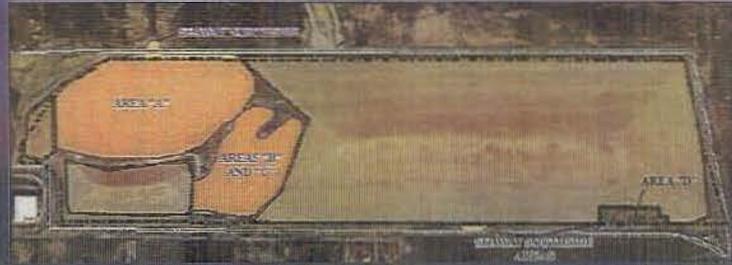
Alternative 4: Partial Excavation of soils (yellow area diminished) and disposal. Partial removal leaves some impacted soils within Area B and C. Leaving residues necessitates land use controls and reviews to assure proper functioning of the remedy.

116,000 yards of soil will to be shipped offsite at a total cost of 80 million dollars.



US Army Corps
of Engineers
Buffalo District

Alternative 6: Containment



Actions:

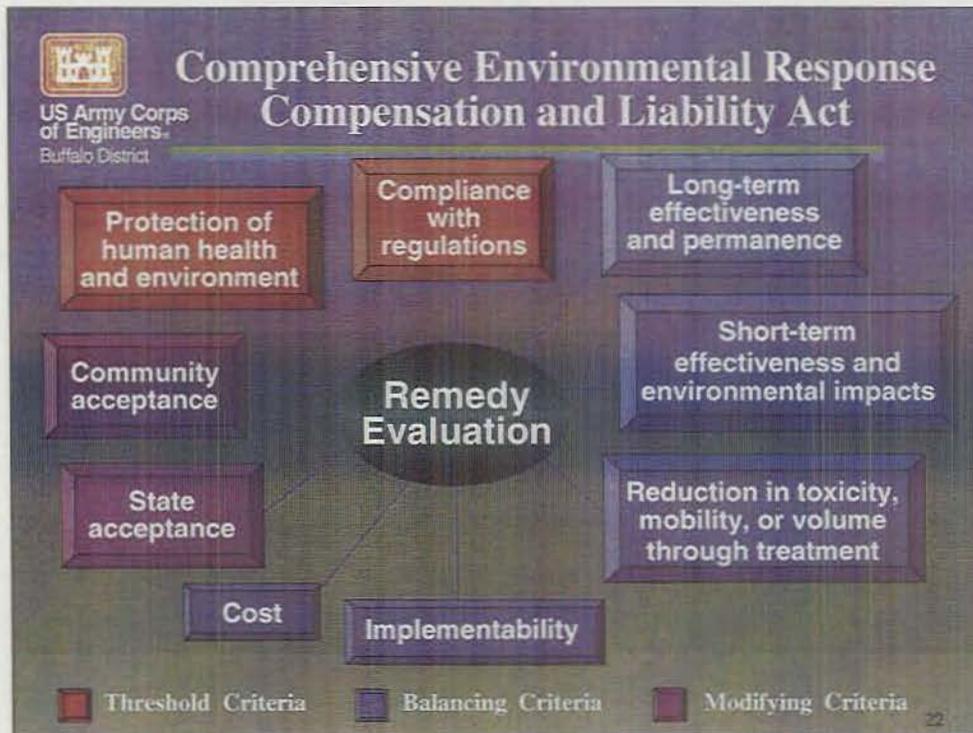
- Remove all soils outside the landfill containment system necessary to meet cleanup criteria
- Ship off-site for disposal 8,000 cu. yds.
- Cover Areas A, B and C with 4.5-5 foot of cover
- Land use controls necessary
- 5-year reviews necessary

Cost
\$30M

21

Alternative 6: Containment covers areas a, b, c with the removal of materials outside the leachate collection system. Excavation and disposal is limited to 8000 cubic yards from the Northside and Southside outside of the leachate collection system. Again, leaving residues necessitates land use controls and reviews to assure proper functioning of the remedy.

a total cost of 30 million dollars



The Comprehensive Environmental Response Compensation and Liability Act sets (9) criteria to evaluate alternatives. The Threshold Criteria – that must meet are

1. Protection of human health and the environment;
2. Compliance with federal and state environmental regulations;

As stated and shown previously the only alternative carried in the Proposed Plan that does not meet this condition is the Noo action. Then there are the five Balancing Criteria

1. Long-term effectiveness and permanence,
2. Short-term effectiveness and environmental impacts;
3. Reduction in toxicity, mobility or volume through treatment;
4. Implementability;
5. Cost;

And I will shortly go through those with you

The remaining two Modifying Criteria - are evaluated after release of the proposed plan and that is part of the reason you are here tonight

1. State acceptance, and,
2. Community acceptance.

Community acceptance is important to USACE



US Army Corps
of Engineers
Buffalo District

Alternatives Compared

#2



ALTERNATIVE #2: COMPLETE EXCAVATION WITH OFFSITE DISPOSAL

#4



ALTERNATIVE #4: PARTIAL EXCAVATION WITH OFFSITE DISPOSAL

#6



ALTERNATIVE #6: CONTAINMENT

Here we see the alternatives and you can see by comparison the areas where soils will be excavated and disposed offsite – the yellow areas from alternative 2 complete, to alternative 4 partial to alternative 6 containment.



US Army Corps
of Engineers
Buffalo District

Comparative Analysis of Alternatives

Soils

Criteria	2- Complete Excavation & Off-Site Disposal	4- Partial Excavation & Off-Site Disposal	6- Containment
Long-Term Effectiveness and Permanence	5	5	5
Reduction of Toxicity, Mobility or Volume through Treatment	1	1	1
Short-Term Effectiveness	2	3	4
Implementability	2	3	4
Cost	\$113,000,000	\$80,000,000	\$30,000,000

Criteria rated from 0 to 5, where 5 is most favorable

24

Long-Term Effectiveness and Permanence: they all provide for provide long-term effectiveness or permanence as residues are in a waste disposal facilit.

Reduction of Toxicity, Mobility and/or Volume Through Treatment: They all provide No treatment but reduced mobility through isolation. Minimal consolidation in volume.

Short-Term Effectiveness: Opening of closed portions of the landfill creates risks to workers and the public as does excavation and transportation. Shortest duration of construction is best which is containment.

Implementability: complete excavation has a High degree of complexity, due to impacts to the closed portions of the landfill and removal of large amounts of soil covering MED/AEC-related material. Partial has a Medium degree of complexity, due to excavation in close proximity to the closed portions of the landfill and non MED/AEC-related contamination. While containment is relatively easy to implement. Excavation limited to the Seaway Northside and Southside areas.

Cost - Present Value (Millions of \$) \$113M \$80M \$30M

The no action plan is not shown as it did not meet the threshold criteria protective of human health and the environment

Source table 10 of pp



US Army Corps
of Engineers
Buffalo District

Preferred Alternative

Alternative 6: Containment

MED/AEC-related material on the Seaway property will be contained within Seaway Areas A, B and C

MED/AEC-related material outside the Seaway containment system excavated to achieve cleanup criteria: 8,000 cu. yds.

Cover the Areas with a minimum of 4.5 - 5 feet of cover

Maintain Land Use Controls

Conduct 5-year reviews

Total Cost: \$30,000,000

25

After comparison, this is the Preferred Alternative which address the MED/AEC- related contaminants in soils includes a combination of containment and the excavation and disposal offsite of 8,000 cubic yards of soils with long-term monitoring. Total cost is 30 million dollars.

The PP does not include specific details about long-term maintenance and surveillance activities, which would need to be performed under the preferred alternative. The site is currently restricted by a number of land use controls: a deed covenant and administrative land use controls required by NYS regulation of Solid Waste management facilities and enforceable by NYSDEC; local zoning; and, the listing of this site on environmental listings of contaminated sites. If the preferred alternative is selected the Corps will prepare a Land Use Control Plan that will identify the necessary data needs for assisting in reviews of the continued adequacy of land use controls necessary to: maintain the landfill cover; maintain the operational integrity of the leachate collection system and preclude its overloading; and, preclude future contact with remaining FUSRAP materials which are now primarily being maintained based upon NYS regulations.



US Army Corps
of Engineers
Buffalo District

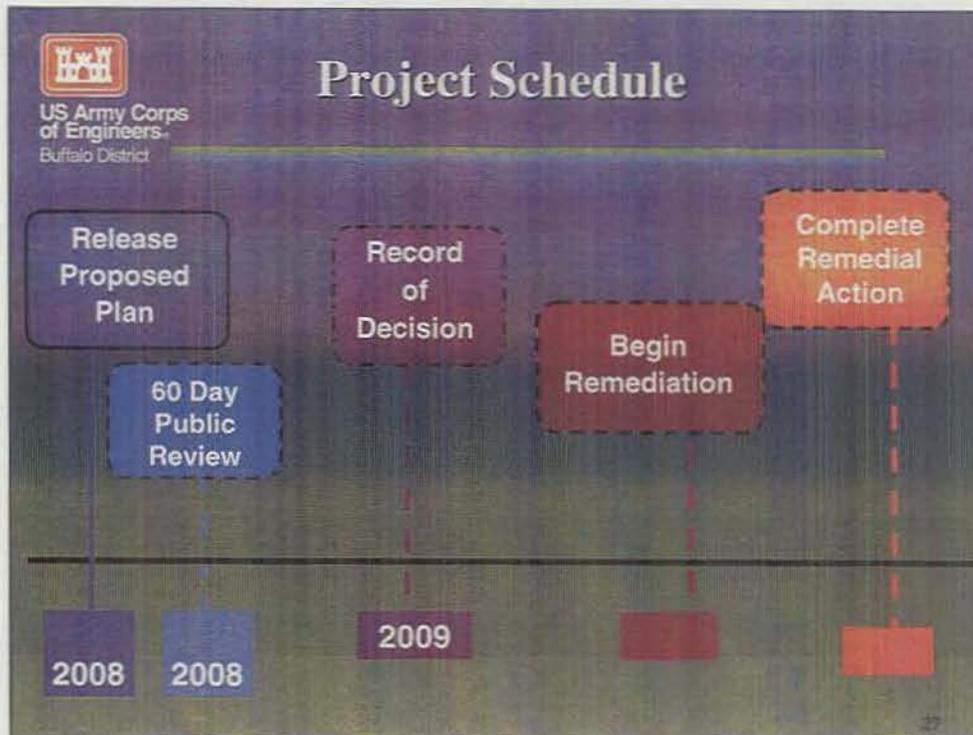
Preferred Alternative

Benefits

- Fully protective of Human Health and the Environment both short and long term
- Meets requirements of all relevant and appropriate regulations and guidelines
- Consistent with Town of Tonawanda Waterfront Development Plan
- Presents the lowest risk to workers and the community during the remediation
- Cost effective

26

The proposed plan to address to address MED/AEC- related contaminants in the soils will be...



We are planning release of the proposed plan late summer and a ROD in the first half of 2009.

6/18/08

Seaway Site Briefing

John Mitchell NYSDEC

John Abunew NYSDEC

Robert Snyder NYS DOH

Tim Byrnes Corps of Engineers

JANNA HUMMEL COE

David O'Toole NYSDEC - DSHW ALBANY

Daniel Evans NYSDEC (Sitting in for Bob Pleneut)

Tom Papura NYSDEC Acting Section Chief - Radiological Sites Sec.

Via phone

Jim Karsten - USACE FUSRAP prog. Mgr

Fred Boglione - " ENV. Branch Chief

George Butterworth - SAIC - USACE Contractor

Mark Hens - NYSDEC



US Army Corps
of Engineers
Buffalo District

Questions and Comments



US Army Corps
of Engineers®
Buffalo District

Formerly Utilized Sites Remedial Action Program (FUSRAP)

SEAWAY SITE BRIEFING

JUNE 18, 2008

Tim Byrnes
Project Manager
U.S. Army Corps of Engineers



US Army Corps
of Engineers®
Buffalo District

MEETING PURPOSE

- Present the Seaway Site intended Proposed Plan
- Obtain input



US Army Corps
of Engineers®
Buffalo District

AGENDA

- Welcome and Introduction
- Preferred Alternative
- Technical Presentation in support
of the Proposed Plan
- Comments and Questions



US Army Corps
of Engineers®

Buffalo District

Introduction

Preferred Alternative

Alternative 6: Containment

MED/AEC-related material on the Seaway property will be contained within Seaway Areas A, B and C

MED/AEC-related material outside the Seaway containment system excavated to achieve cleanup criteria

Cover the areas with a minimum of 4.5 - 5 feet of cover

Maintain land use controls

Conduct 5-year reviews



US Army Corps
of Engineers®
Buffalo District

Outline of Technical Presentation

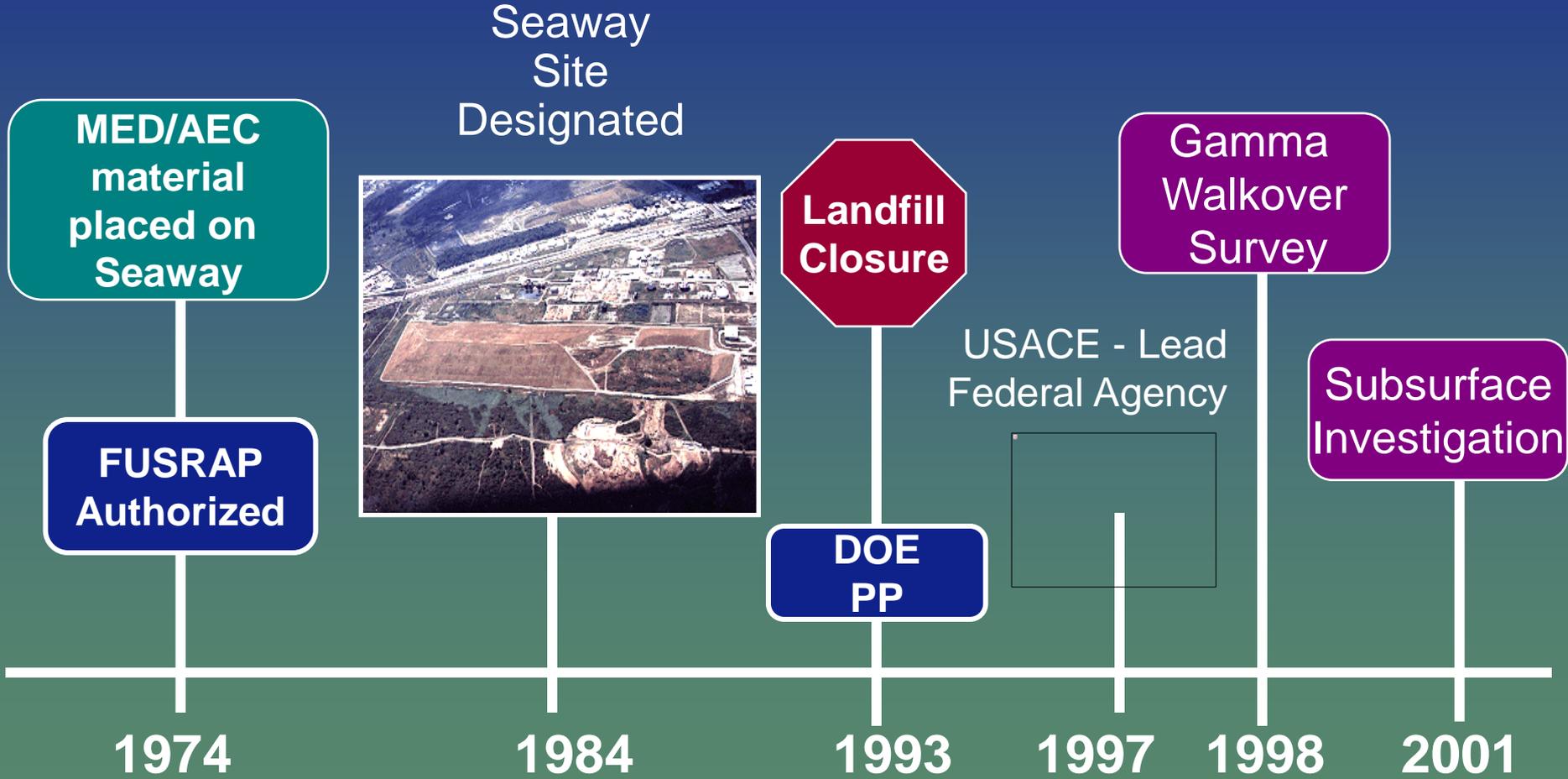
- General
- History
- Nature and Extent of Contamination
- Process and Criteria
- Remedial Action Alternatives
- Preferred Alternative

Site Photograph



US Army Corps
of Engineers®
Buffalo District

Seaway Site History





US Army Corps
of Engineers®
Buffalo District

Seaway Site History

**Gamma
Walkover
Survey**

1998

**Subsurface
Investigation**

2001

**Feasibility
Study
Addendum**

2008

**Proposed
Plan**

2008



US Army Corps
of Engineers®

Buffalo District

Nature and Extent of Contamination

- Soils: Unacceptable future risk for Radium, Thorium, Total Uranium including daughters Actinium and Protactinium
- Groundwater: Not impacted
- Surface Water: Not impacted
- Air: Not impacted



US Army Corps
of Engineers®

Buffalo District

Nature and Extent of Contamination

- Remediation of Ashland 2 Site
 - Elevated levels of radionuclides found at the Seaway Site boundary called Seaway Northside.
 - Some contamination located outside of the Seaway Site containment system.

- Remediation of Ashland 1 Site
 - Elevated levels of radionuclides found at two areas at the Seaway Site boundary called Seaway Southside.
 - Some contamination located outside of the Seaway Site containment system.

Nature and Extent of Contamination



Nature and Extent

US Army Corps
of Engineers®

Buffalo District

Radionuclide	Area A			Area B&C			Northside			Southside		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Ra-226	ND	140	8	ND	93	4	-	14	-	ND	14	2
Th-230	ND	2,800	130	ND	547	8	-	400	-	ND	1,900	2400

Uranium2

U-234	ND	54	8	ND	32	7	-	-	-	-	-	-
U-235	ND	11	.5	ND	6	.6	-	-	-	-	-	-
U-238	ND	74	10	ND	100	7	-	22	-	ND	220	25

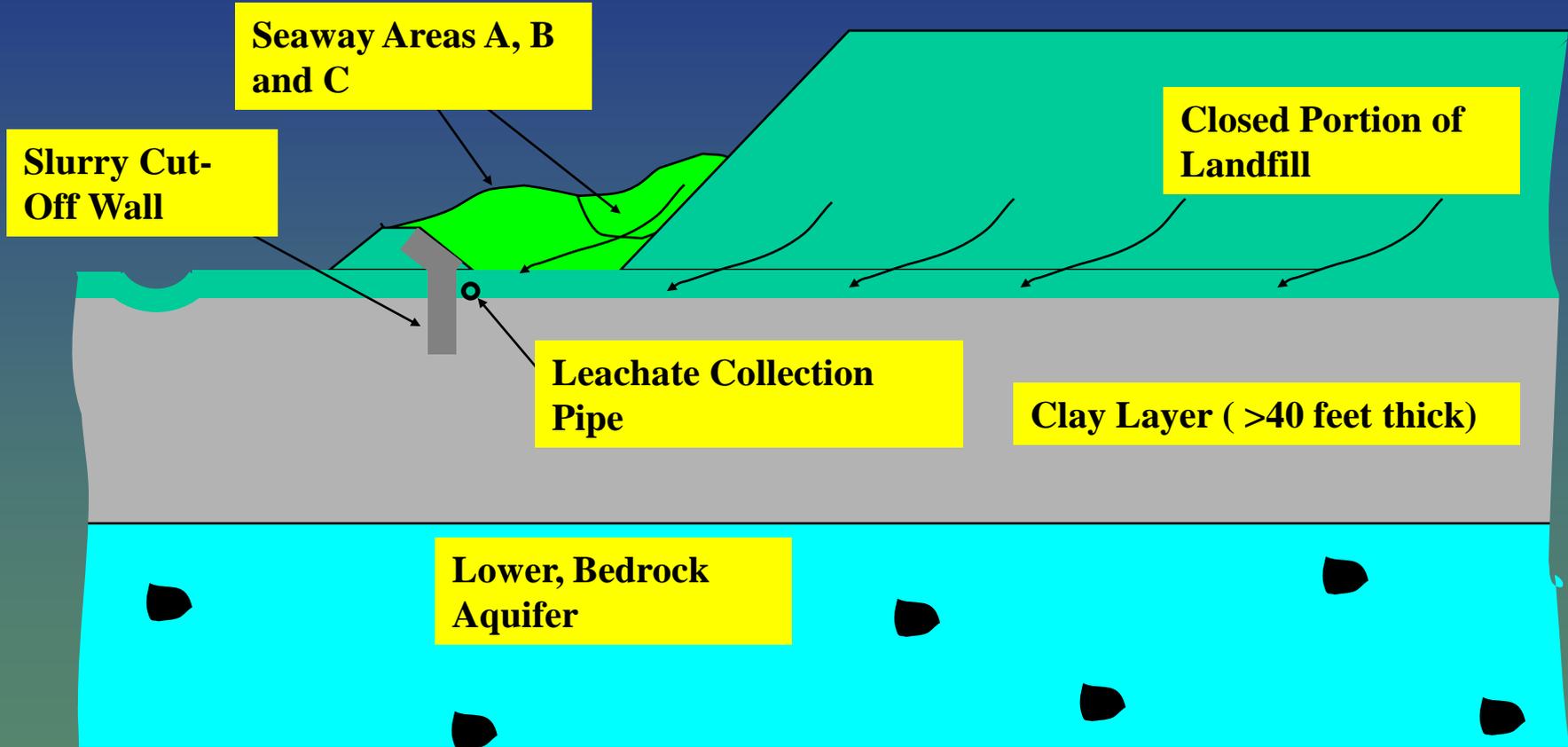
Uranium Daughters

Ac-227	ND	25	7	ND	25	5	-	12	-	-	-	-
Pa-231	ND	39	4	ND	28	4	-	12	-	-	-	-



US Army Corps
of Engineers®
Buffalo District

Nature and Extent Seaway Leachate Collection System



Seaway Areas A, B
and C

Slurry Cut-
Off Wall

Closed Portion of
Landfill

Leachate Collection
Pipe

Clay Layer (>40 feet thick)

Lower, Bedrock
Aquifer



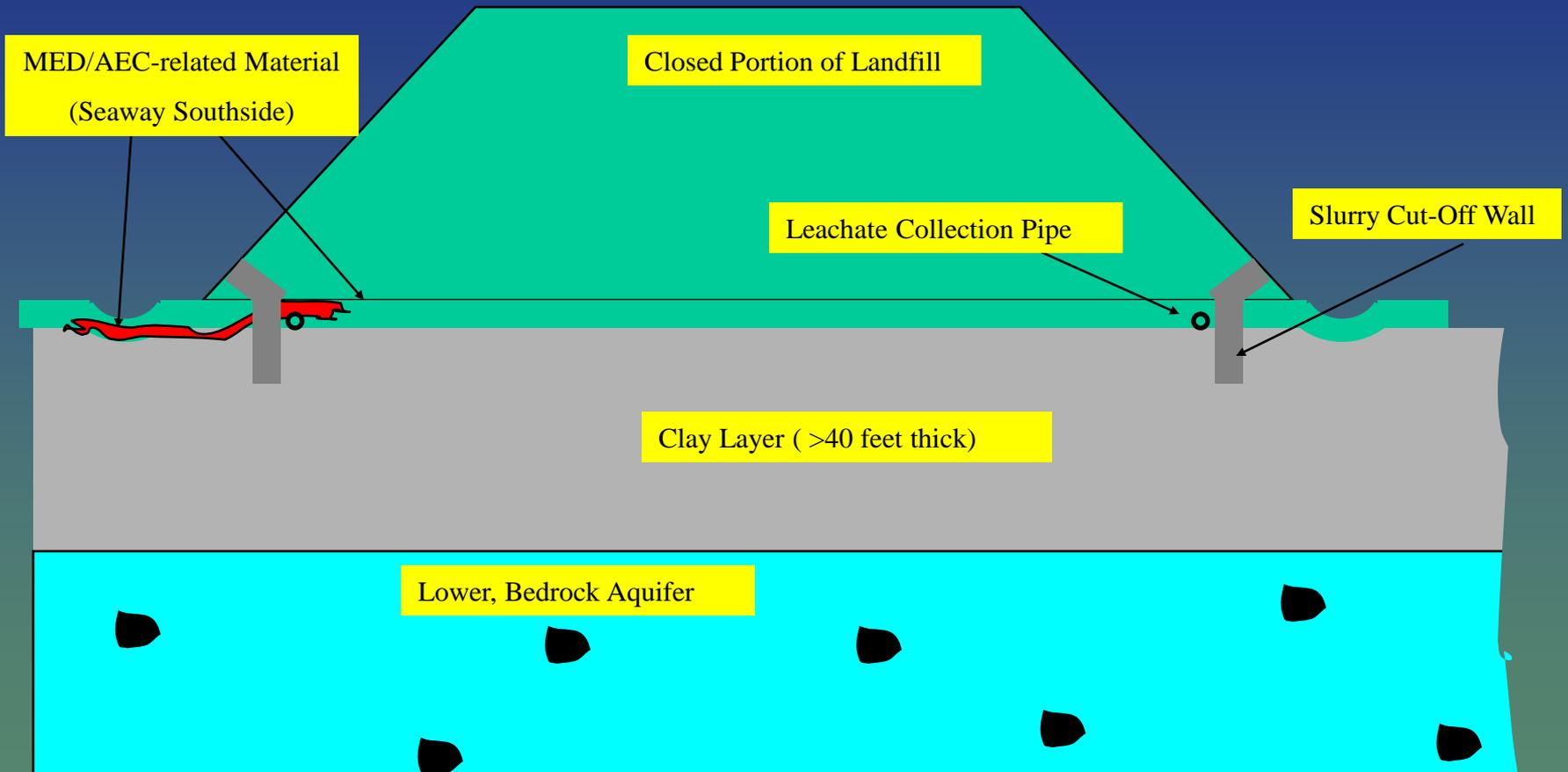
Groundwater flows under the Site
to the Niagara River in the direction shown

Drawing not to scale



US Army Corps
of Engineers®
Buffalo District

Nature and Extent Seaway Leachate Collection System



Groundwater flows under the Site
to the Niagara River in the direction shown

Drawing not to scale



US Army Corps
of Engineers®
Buffalo District

Process

Cleanup Criteria in Soils

Radionuclides

- 40 CFR 192, Subpart A
- 40 CFR 192, Subpart B
- 10 CFR 40, Appendix A, Criterion 6(6)



US Army Corps
of Engineers®
Buffalo District

Process Applicable, Relevant & Appropriate Regulations

General

40 CFR Part 192,
Subpart A and 10 CFR Part 40,
Appendix A, Criterion 6(1)

Remedy is effective for 1000 years

Removal of Impacted Soils

40 CFR Part 192, Subpart B

RA-226 Concentration on surface soils
<5 pCi/g, <15 pCi/g in subsurface soils
averaged over 100m²

10 CFR Part 40,
Appendix A, Criterion 6(6)

All other COCs will have an equivalent
dose to Ra-226

Containment of Impacted Soils

40 CFR Part 192, Subpart A

Radon flux <20 pCi/m²/s concentration in
air at or outside border <.5 pCi/L increase



US Army Corps
of Engineers®
Buffalo District

Cleanup Goals

Contaminant Of Concern	Background	Removal Standards for Soil (incremental to background)	
		Surface	Subsurface
Ra-226	1.1	5	15
Th-230	1.4	15	44
U-Total	6.3	110	1000

All values are in pCi/g



Screening Alternatives

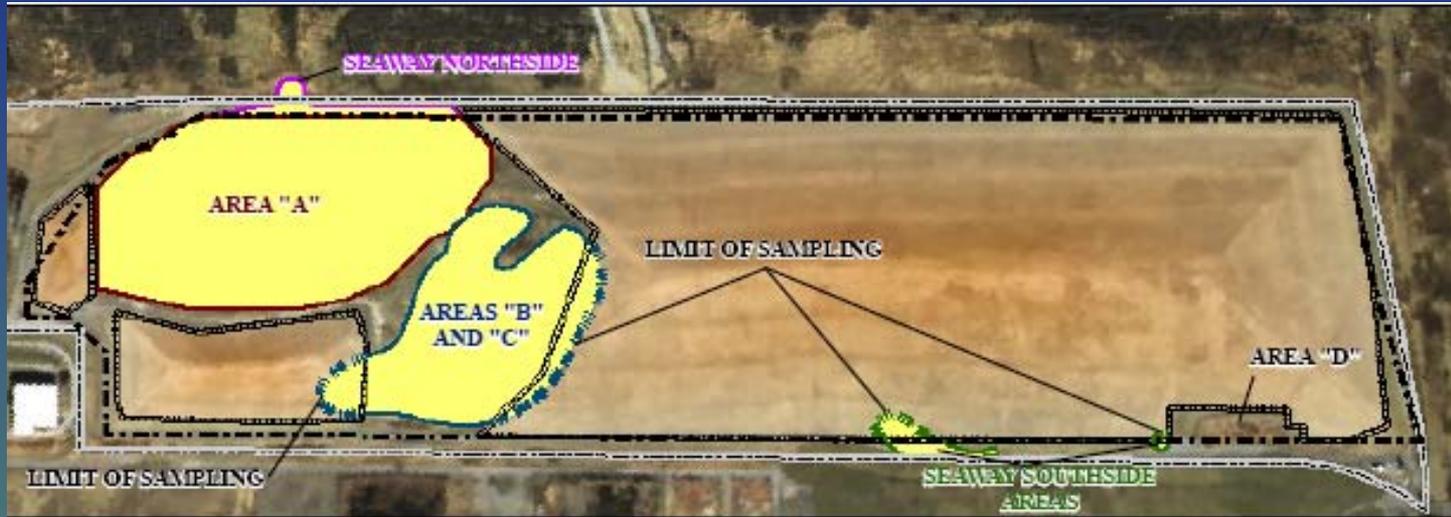
US Army Corps
of Engineers®
Buffalo District

Soils Media		
Alternative	Protective	Meets Regulations
1 No Action	No	No
2 Complete Excavation, Off-Site Disposal	Yes	Yes
3 Complete Excavation, On-Site Disposal (N/A)		
4 Partial Excavation, Off-Site Disposal	Yes	Yes
5 Partial Excavation, On-Site Disposal (N/A)		
6 Containment	Yes	Yes



US Army Corps
of Engineers®
Buffalo District

Alternative 2: Complete Excavation with Off-Site Disposal



Actions:

- Remove all soils necessary to meet cleanup criteria
- Ship off-site for disposal 150,000 cu. yds.
- Cover excavated area with 1 foot of soil
- No land use controls
- No 5-year reviews

Cost

\$113M



US Army Corps
of Engineers®
Buffalo District

Alternative 4: Partial Excavation with Off-Site Disposal



Actions:

- Remove all accessible soils (soils not under 10 feet or more of landfill material) and soils outside the landfill containment system necessary to meet cleanup criteria
- Ship off-site for disposal 116,000 cu. yds.
- Cover Area A with 1 foot of soil, cover Areas B and C with 4.5-5 foot of cover
- Land use controls necessary
- 5-year reviews necessary

Cost

\$80M



US Army Corps
of Engineers®
Buffalo District

Alternative 6: Containment



Actions:

- Remove all soils outside the landfill containment system necessary to meet cleanup criteria
- Ship off-site for disposal 8,000 cu. yds.
- Cover Areas A, B and C with 4.5-5 foot of cover
- Land use controls necessary
- 5-year reviews necessary

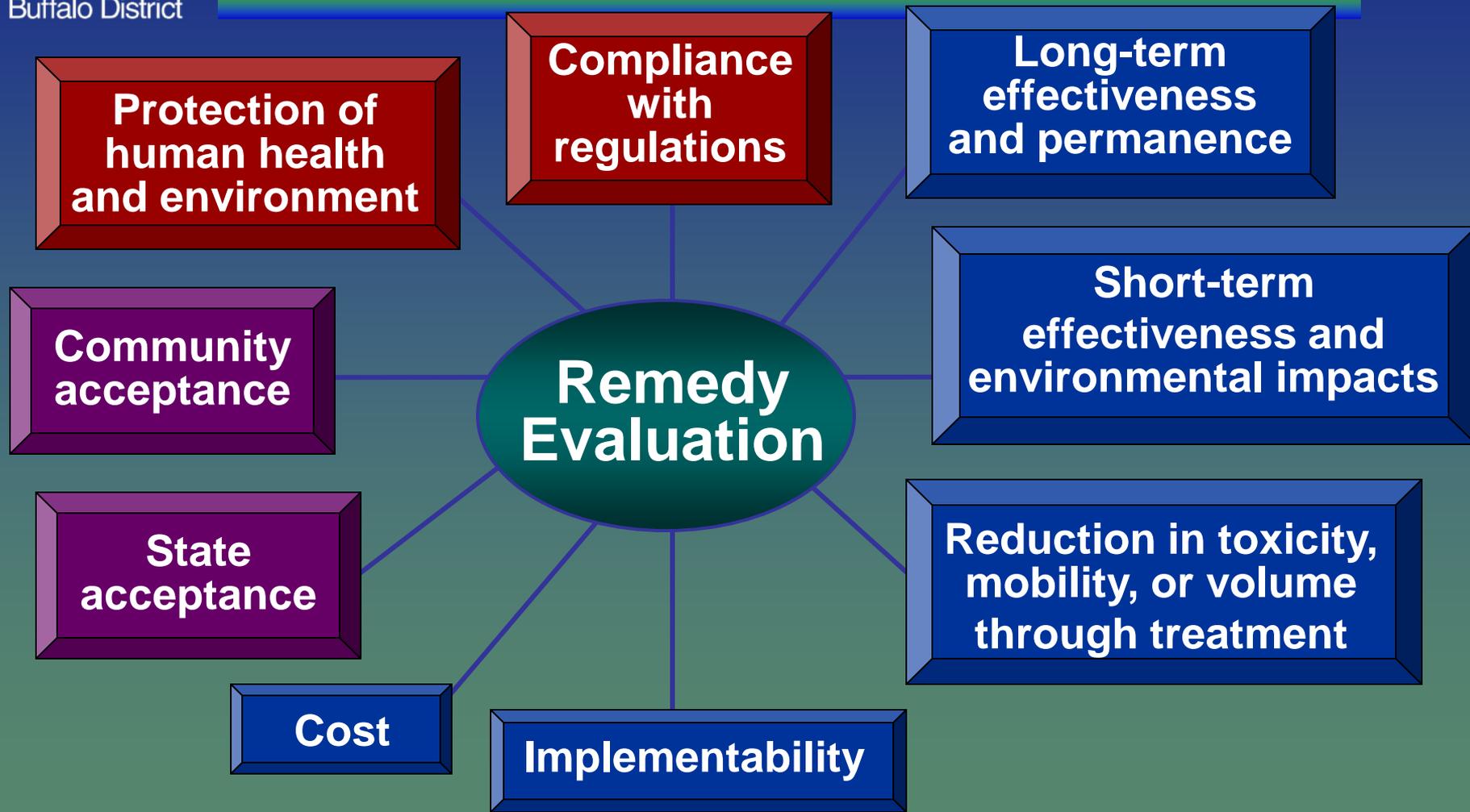
Cost

\$30M



US Army Corps
of Engineers®
Buffalo District

Comprehensive Environmental Response Compensation and Liability Act



 Threshold Criteria

 Balancing Criteria

 Modifying Criteria

Alternatives Compared

#2

#4

#6



US Army Corps
of Engineers®
Buffalo District

Comparative Analysis of Alternatives

Soils

Criteria	2- Complete Excavation & Off-Site Disposal	4- Partial Excavation & Off-Site Disposal	6- Containment
Long-Term Effectiveness and Permanence	5	5	5
Reduction of Toxicity, Mobility or Volume through Treatment	1	1	1
Short-Term Effectiveness	2	3	4
Implementability	2	3	4
Cost	\$113,000,000	\$80,000,000	\$30,000,000

Criteria rated from 0 to 5, where 5 is most favorable



US Army Corps
of Engineers®
Buffalo District

Preferred Alternative

Alternative 6: Containment

MED/AEC-related material on the Seaway property will be contained within Seaway Areas A, B and C

MED/AEC-related material outside the Seaway containment system excavated to achieve cleanup criteria: 8,000 cu. yds.

Cover the Areas with a minimum of 4.5 - 5 feet of cover

Maintain Land Use Controls

Conduct 5-year reviews

Total Cost: \$30,000,000



US Army Corps
of Engineers®
Buffalo District

Preferred Alternative

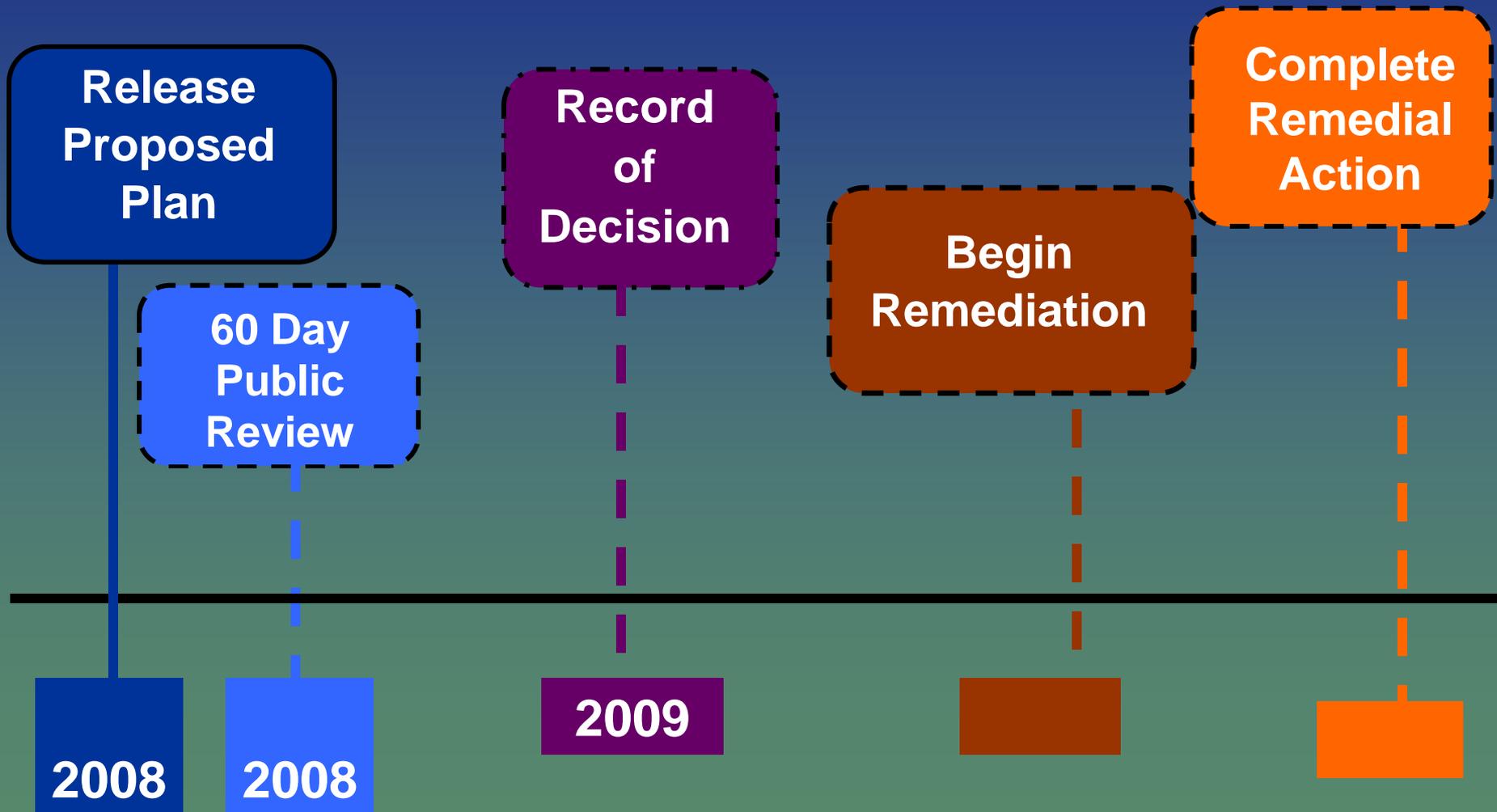
Benefits

- Fully protective of Human Health and the Environment both short and long term
- Meets requirements of all relevant and appropriate regulations and guidelines
- Consistent with Town of Tonawanda Waterfront Development Plan
- Presents the lowest risk to workers and the community during the remediation
- Cost effective



US Army Corps
of Engineers®
Buffalo District

Project Schedule





US Army Corps
of Engineers®

Buffalo District

Questions and Comments