



June 25, 2014

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Agenda for the June Subcommittee Meeting

5:30

Call to order, introductions
Review of agenda

Presentations

- Paducah Waste Disposal Alternatives Project Informational Session Part 2

Administrative Issues

Next Steps



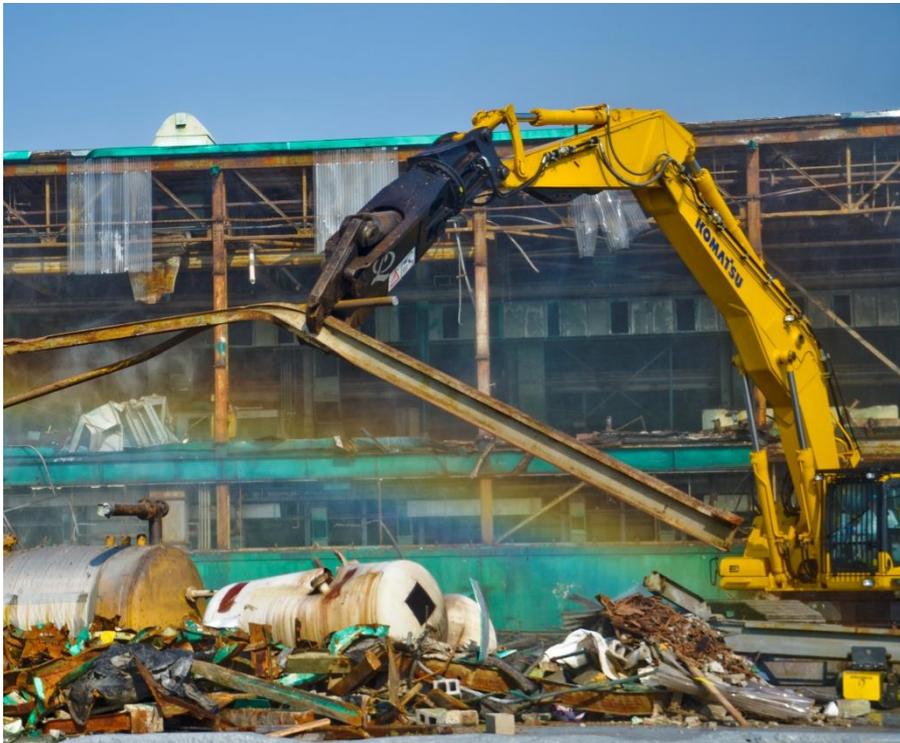
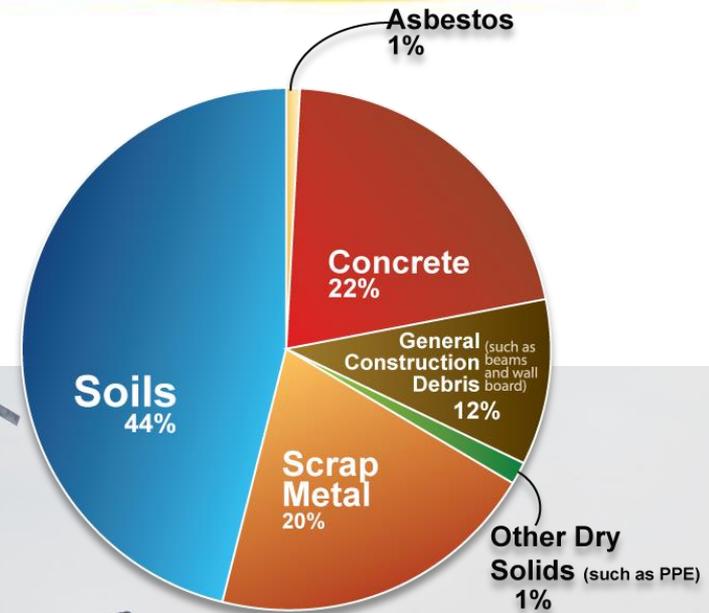
**Paducah Waste Disposal
Alternatives Project
Part 2**

**CITIZENS
ADVISORY BOARD**

June 25, 2014

Waste Created at PGDP

Approximately 3.6 million cubic yards of waste is expected to be generated from the demolition of over 500 buildings and facilities and continued environmental remediation of the Paducah site



C-410 Building Demolition

Alternative 1—No Action

- Project-by-Project decisions
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U waste acceptance criteria

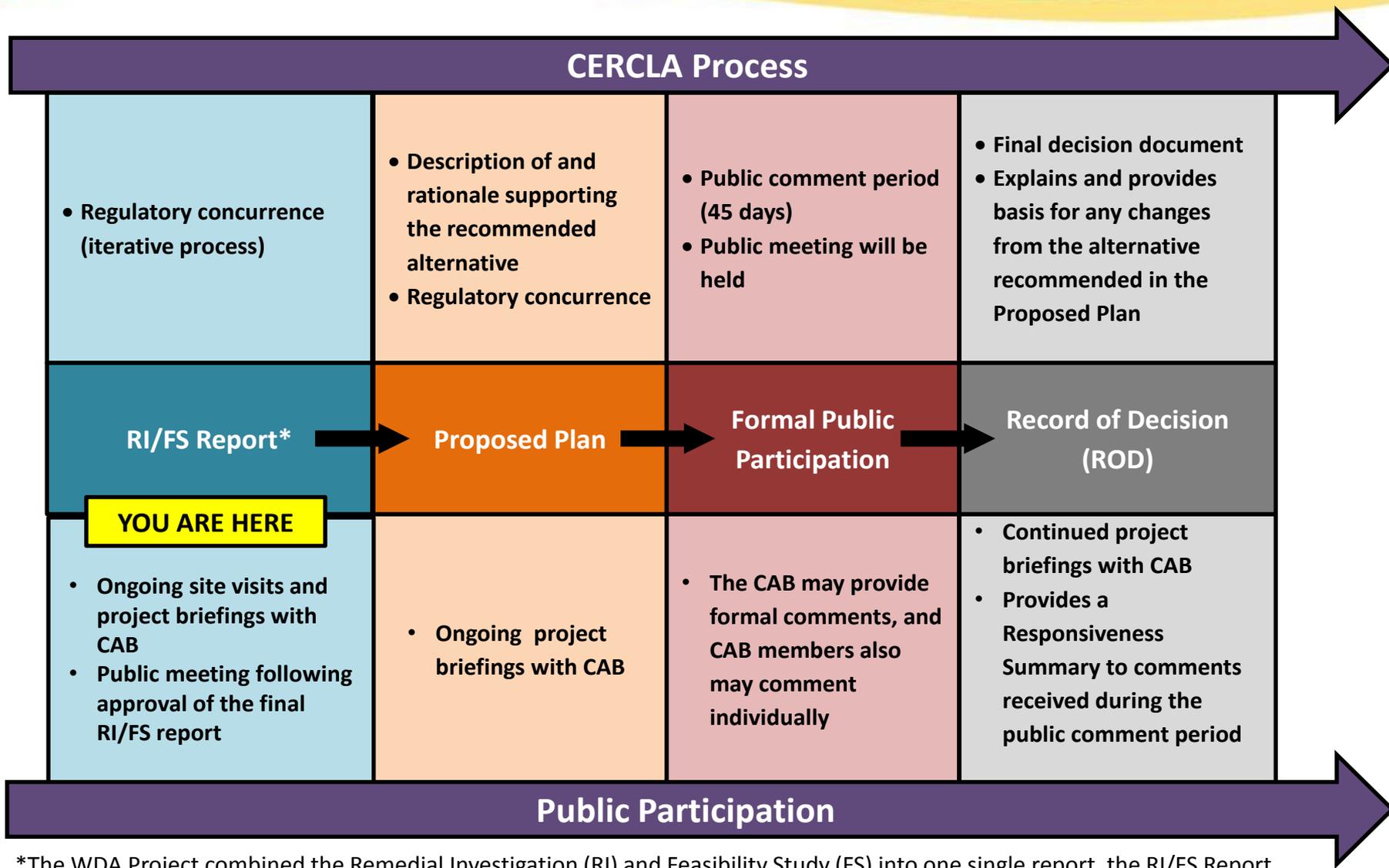
Alternative 2—Off-site

- Single Programmatic decision
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U waste acceptance criteria

Alternative 3—On-site

- Single Programmatic decision
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Construct a new on-site waste disposal facility (OSWDF) with expanded waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U or OSWDF waste acceptance criteria

CERCLA Process and Public Participation for the WDA Project



*The WDA Project combined the Remedial Investigation (RI) and Feasibility Study (FS) into one single report, the RI/FS Report.

No Change

- Project-by-Project decisions
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U waste acceptance criteria

\$1.3 Billion

(Net Present Value)

On-Site

- Single Programmatic decision
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Construct a new on-site waste disposal facility (OSWDF) with expanded waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U or OSWDF waste acceptance criteria

\$800 Million

(Net Present Value)

Off-Site

- Single Programmatic decision
- On-site disposal of waste that meets the existing C-746-U waste acceptance criteria
- Off-site disposal of waste that does not meet the C-746-U waste acceptance criteria

\$1.3 Billion

(Net Present Value)

On-Site Alternative Cost Estimate

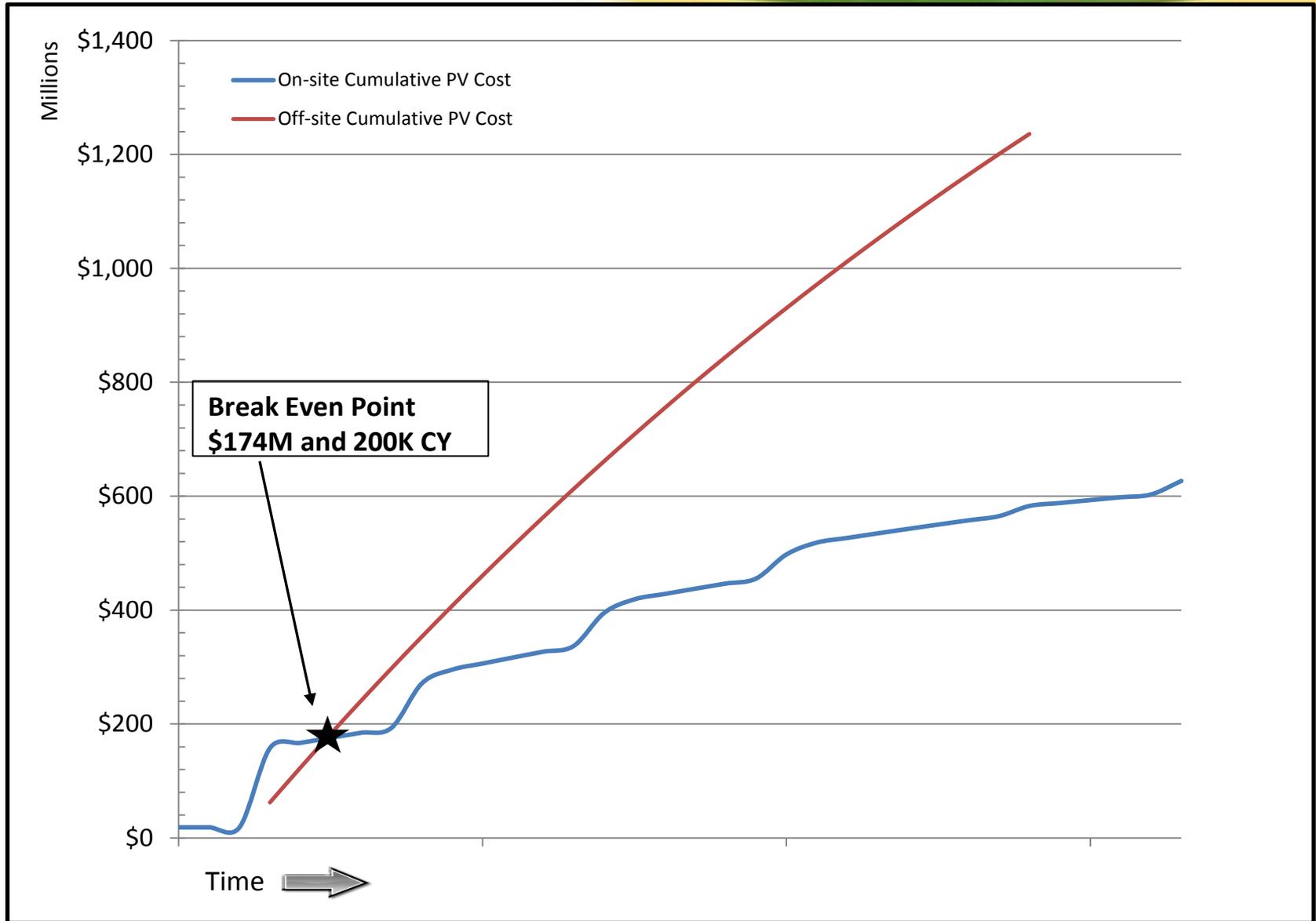
	On-site (Base Case Waste Volume)*	Cost (Net Present Value \$M)
	Site Development	\$20
	Construction	\$300
	Operations and Monitoring	\$250
	5% Waste Off-site Disposal	\$65
	Closure	\$55
	Postclosure	\$20
C-746-U Landfill Costs	Operations	\$25
	Construction Phases 12–23	\$25
	Closure	\$30
	Post-closure Care	\$10
TOTAL PRESENT VALUE COST		\$800M

*Site 11 cost were used

Off-Site Alternative Cost Estimate

Off-site (Base Case Waste Volume)	
LLW	Cost (Net Present Value \$M)
Containers & Transportation	\$400
Disposal	\$500
MLLW	Cost
Containers & Transportation	\$30
Disposal	\$90
TSCA Waste	Cost
Containers & Transportation	\$1
Disposal	\$9
Classified Waste	Cost
Containers & Transportation	\$100
Disposal	\$80
C-746-U Landfill Costs	Cost
Operations	\$25
Construct Phases 12–23	\$25
Closure	\$30
Postclosure Care (30 years)	\$10
<u>TOTAL PRESENT VALUE COST</u>	<u>\$1.3B</u>

On-site vs. Off-site Break Even Analysis



Off-site Alternative Considerations

- Transportation risk
- Waste packaging
- State equity
- Cost
- Uncertainty in future disposal capacity
- Uncertainty in future disposal waste acceptance

On-site Alternative Considerations

- Seismic performance
- Depth to groundwater
- Distance to residential property, floodplains, streams, and DOE property boundary
- Expandability (aesthetics)
- Terrain stability
- Impacts to NEPA considerations (e.g., wetlands, threatened or endangered species, etc.)

Transportation Risks

- Off-site Alternative has greater risk associated with transporting waste off-site through other communities due to the significantly greater volume of waste that would be transported across multiple states
- Other transportation issues include incidents with waste packaging and profiling
- Some states (e.g., Missouri) charge a radioactive fee each time a truck or railcar containing radioactive waste enters their state
- Special permits are required to transport hazardous/mixed waste within certain states



Transportation Risks

- Statistics from a DOE transportation handbook* were used to calculate how many fatalities and injuries could occur based on number of miles traveled
- Based on these calculations, the off-site transportation could result in 20 injuries and 4 fatalities

	On-site Alternative	Off-site/No Action Alternative
Truck	-	10,000 shipments
Rail	1,600 rail cars	30,000 rail cars



*A Resource Handbook on DOE Transportation Risk Assessment, DOE/EM/NTP/HB-01

Recent mega earthquakes in locations where modern landfills exist:

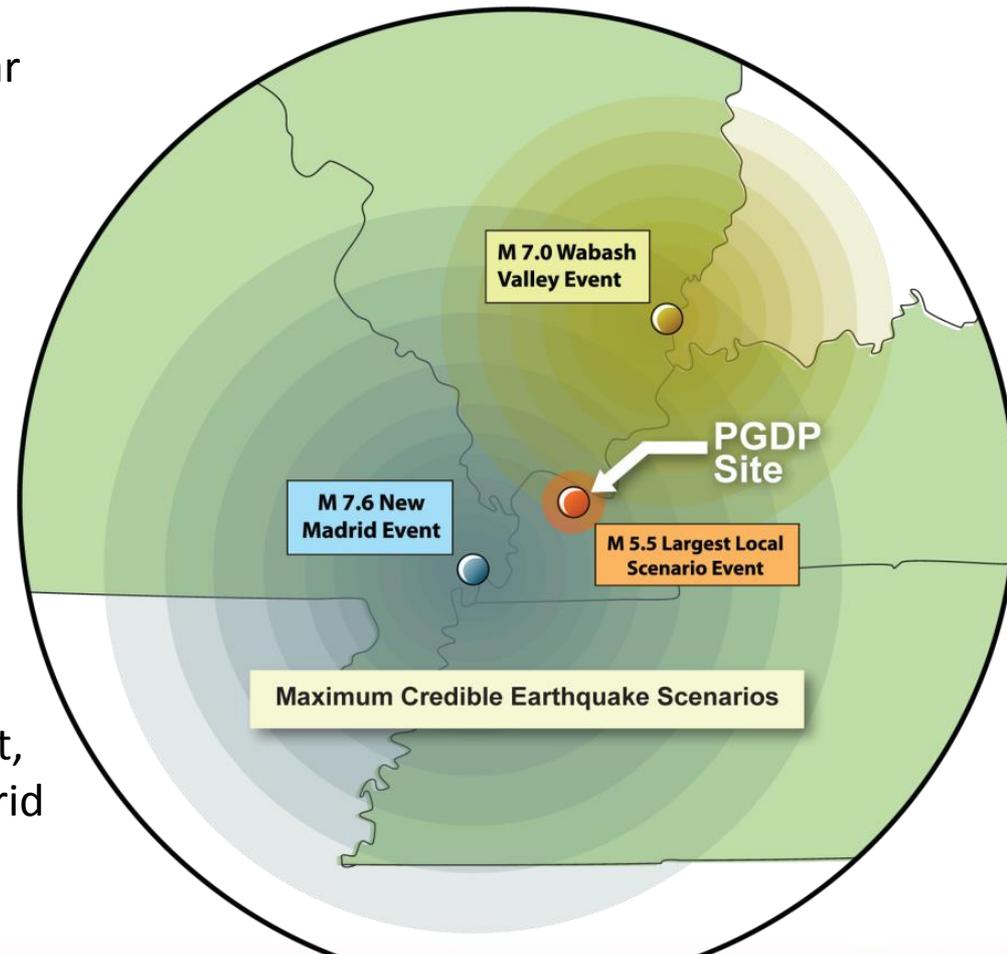
- 2003 Magnitude 7.8 in Turkey
- 2010 Magnitude 8.8 in Chile
- 2011 Magnitude 9.0 in Japan (Fukushima)

Observing the actual performance of modern landfills during earthquakes of high magnitude and the results of the seismic analyses completed in 2012 for the C-746-U Landfill at the PGDP provide confidence that an on-site waste disposal facility can be designed to resist the maximum credible earthquake (MCE) in this area.

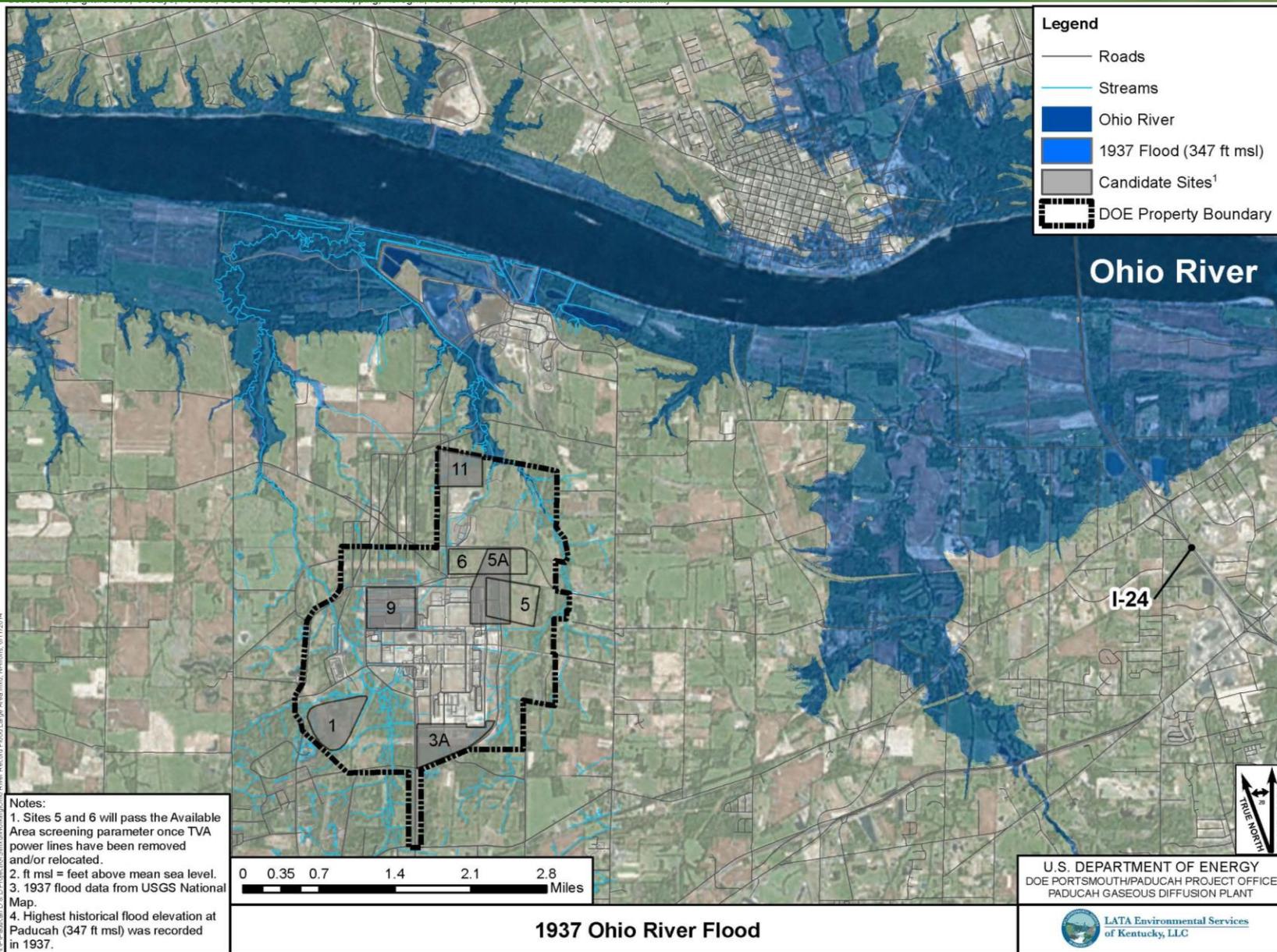
Post-earthquake landfill performance can be assessed rapidly by inspection of environmental control systems such as:

- Groundwater monitoring wells
- Leachate collection and removal systems
- Landfill cover system

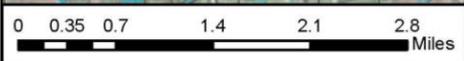
- The site seismicity and geologic conditions are well understood, as documented in eight site-specific studies
- Geologic conditions in Paducah would not permit a Magnitude 9.0 earthquake (similar to Fukushima earthquake that occurred at the interface of continental plates)
- A maximum credible earthquake (MCE) represents the worst case scenario for a given fault
- The MCE for Paducah is predicted to be no greater than Magnitude 5.5
- The potential waste disposal facility would be designed to resist the critical MCE event, Magnitude 7.6, predicted at the New Madrid Fault



1937 Ohio River Flood



Notes:
 1. Sites 5 and 6 will pass the Available Area screening parameter once TVA power lines have been removed and/or relocated.
 2. ft msl = feet above mean sea level.
 3. 1937 flood data from USGS National Map.
 4. Highest historical flood elevation at Paducah (347 ft msl) was recorded in 1937.

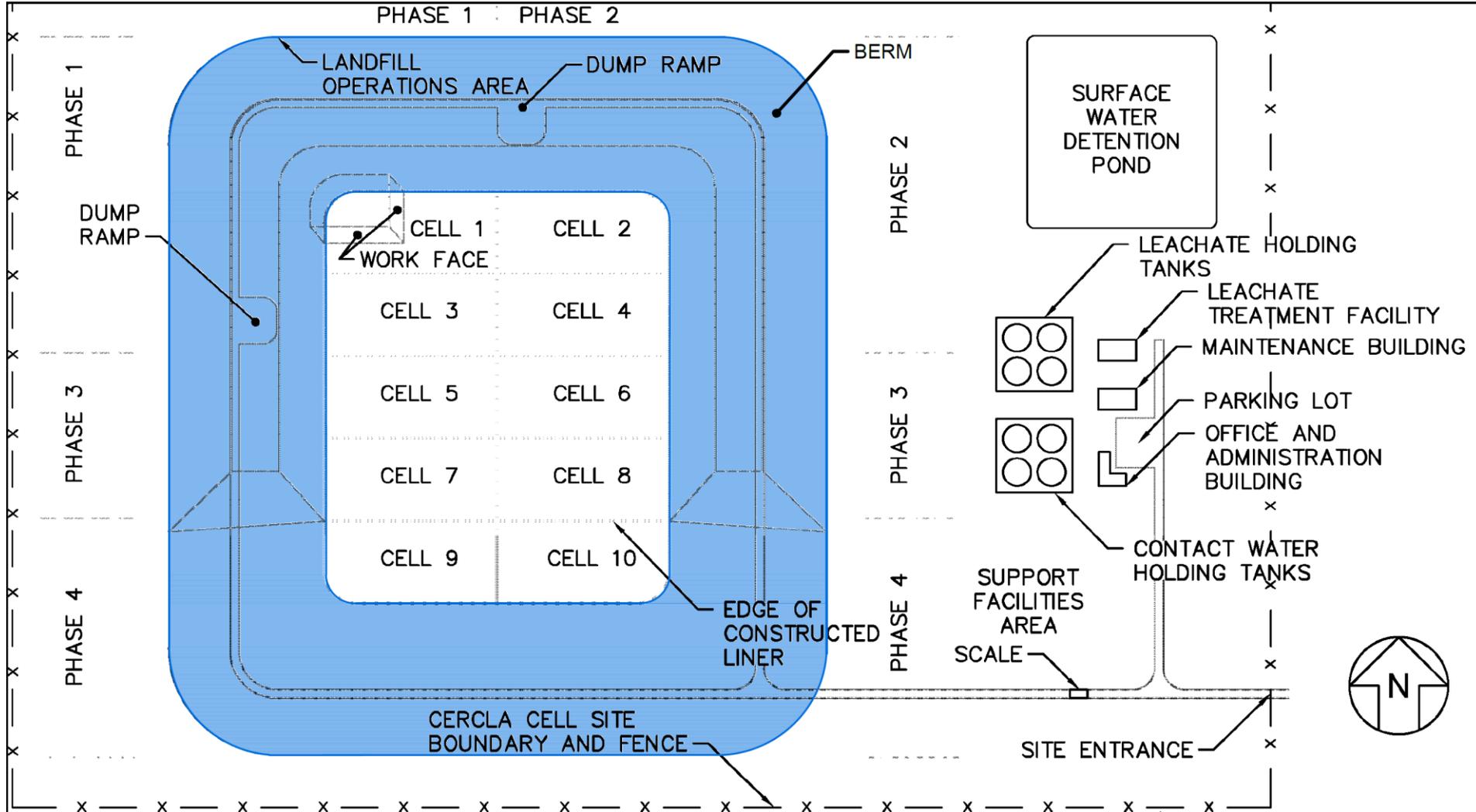


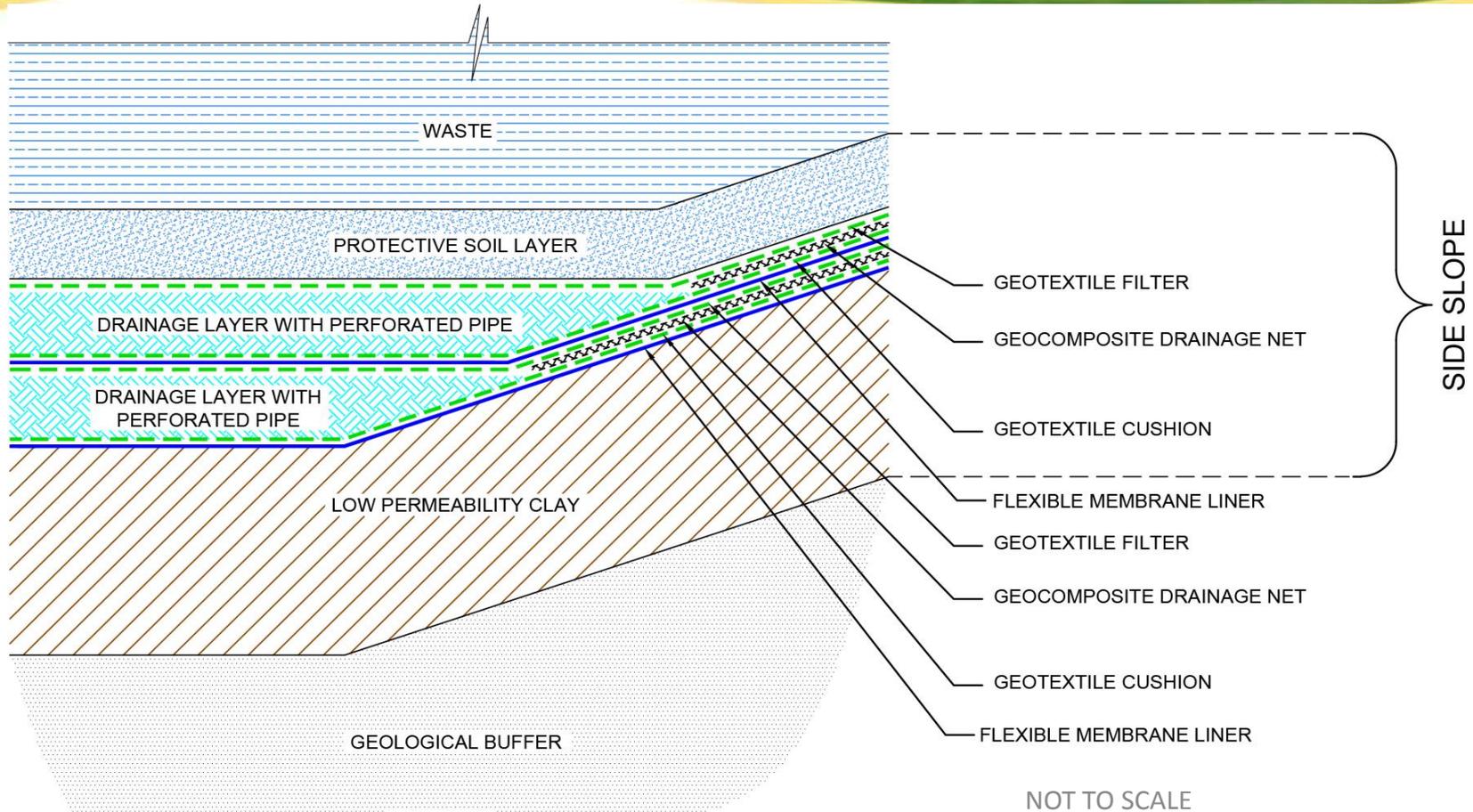
1937 Ohio River Flood

U.S. DEPARTMENT OF ENERGY
 DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
 PADUCAH GASEOUS DIFFUSION PLANT

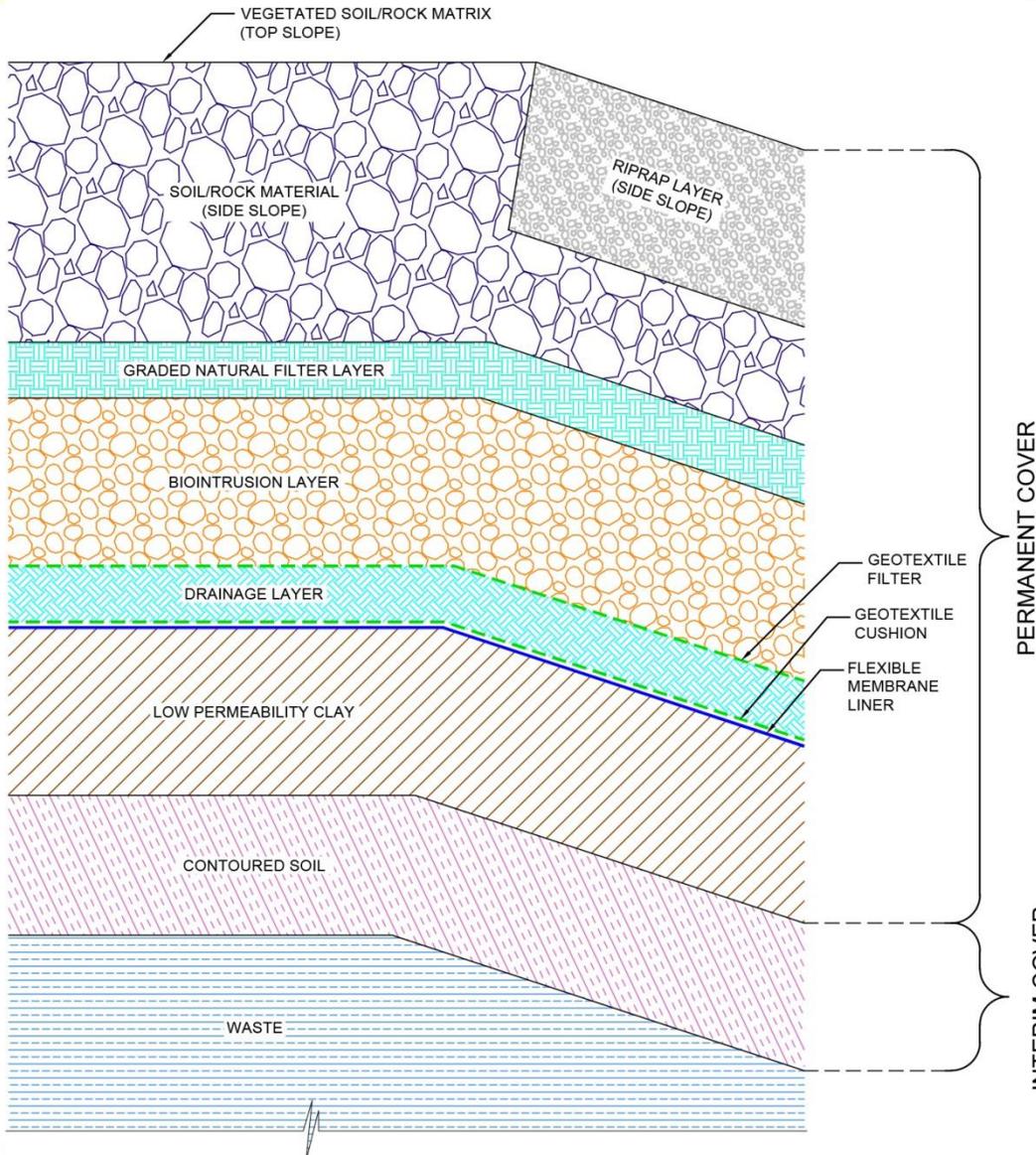


Conceptual Design-Layout





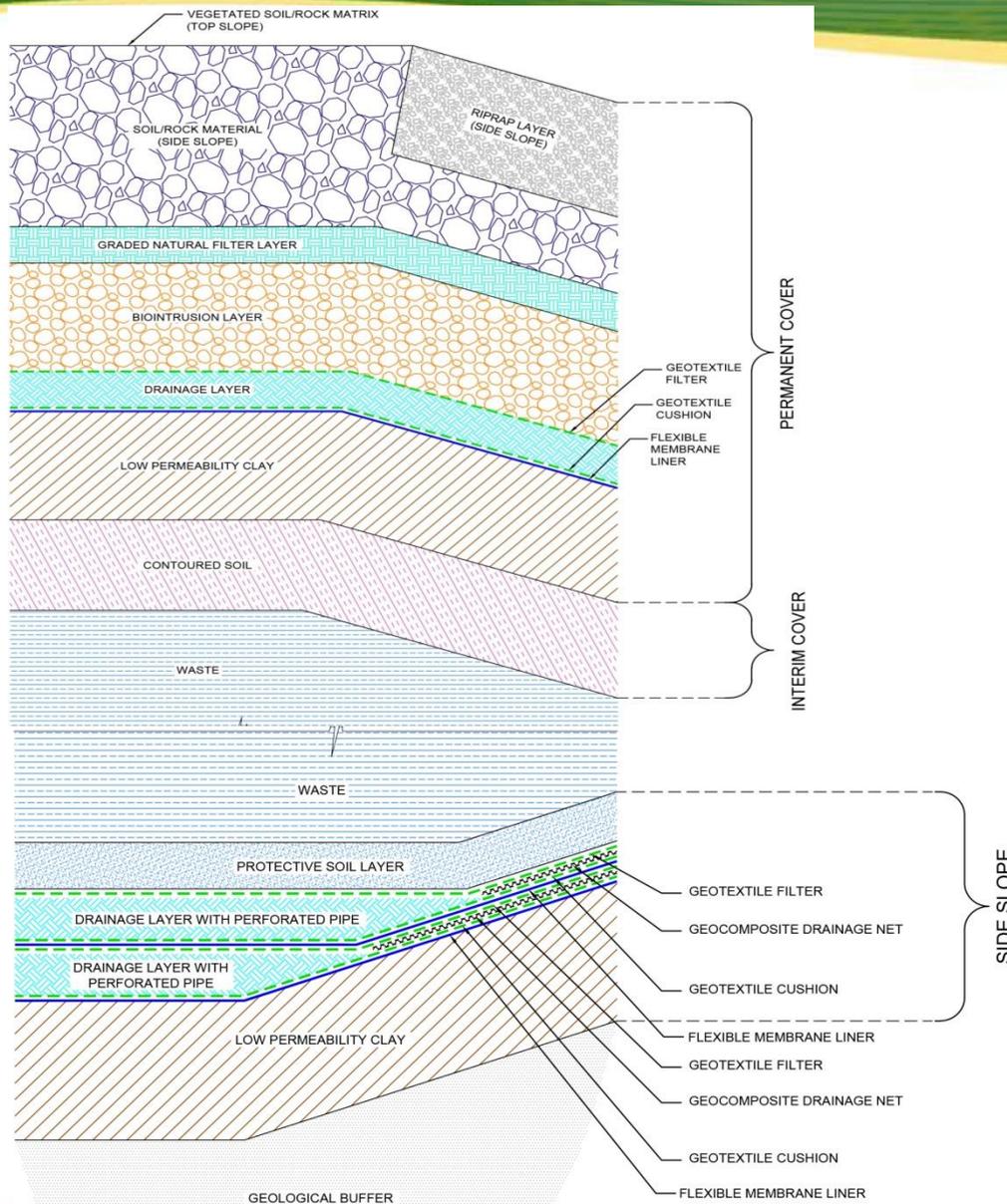
- Double liner system—two geosynthetic membrane layers
- Leachate collection and detection systems
- Clay underlying the bottom membrane
- Geologic buffer



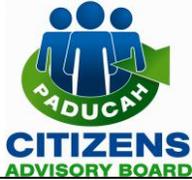
- Soil layers
- Biointrusion layer
- Drainage layers
- Membrane
- Clay

NOT TO SCALE

Conceptual Design-Detailed Cross Section



Once the waste facility is closed, the waste will be secured between the liner and permanent cover; prior to closure, an interim cover will be used.



PADUCAH GASEOUS DIFFUSION PLANT CITIZENS ADVISORY BOARD

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Paducah Gaseous Diffusion Plant Citizens Advisory Board Waste Disposal Alternatives Subcommittee Meeting Summary June 25, 2014

The Citizens Advisory Board (CAB) met at the Environmental Information Center (EIC) in Paducah, Kentucky on Wednesday, June 25th at 5:30 p.m.

Board members, DOE, and DOE subcontractors present: Ben Peterson, Ken Wheeler, Ralph Young, Renie Barger, Buz Smith, Jennifer Woodard, Tom Grassham, Mike Kemp, Kevin Murphy, Dianne O’Brien, Richard Rushing, Judy Clayton, Carol Young, David Franklin, Robert Coleman, Jonathan Hines, Bill Murphie, Robert Edwards, Gaye Brewer, Joe Walker, Steve Christmas, Mitch Stewart, Elizabeth Wyatt, Mark Duff, Lauren Shaw, Dave Strater, Tom Ramsey, Eric Roberts, and Jim Ethridge.

Peterson opened the meeting. He turned the meeting over to **Duff** for the second part of an educational presentation on the CERCLA cell.

<p>Clayton: With regard to the components out there that are hollow, how do you intend to stabilize those?</p>	<p>Duff: Typically, you have a void space limitation, so you would have to either crush it or cut it up. You can also use grout. Woodard: Both Energy Solutions and NNFS have foam that they can use.</p>
<p>Clayton: Does that also destroy their classification?</p>	<p>Woodard: Just filling it with the foam, no it doesn’t. Our pricing does take into consideration the fencing, and monitoring required to put classified material into the cell.</p>
<p>O’Brien: What is considered classified?</p>	<p>Woodard: There is process components within the facility that would be classified.</p>
<p>Hines: What kind of monitoring did you say they would do out there?</p>	<p>Woodard: I think security requirements now are to have a fence with barbed wire at the top, and security cameras installed.</p>
<p>Hines: Will the monitoring be done by people that are here?</p>	<p>Wyatt: Yes. I believe the requirements right now are to have someone drive by the facility twice every twenty-four hours, but I don’t believe it requires for someone to be there all the time. Woodard: We are so early in the design that some things have just not yet been developed. As things progress, more details will be decided when we see what will have to go in there. I don’t mean to be vague, but we just aren’t far enough along in the process to answer some questions. Brewer: The classification issue is like a “trade</p>

	secret” for other industries.
Wheeler: It was my recollection from a preliminary report that there was a delta between the onsite and offsite cost of a billion dollars. The report that we are looking at now shows a delta of five hundred million dollars. I was wondering if you could help us understand during the refinement of the process what it was that shrank that delta.	Wyatt: We were looking at ranges of numbers for a low end, middle, and a high end, and I think that the difference for the high end was close to a billion dollars.
Wheeler: So you are saying that there was nothing that caused the change between the different versions of this report?	Wyatt: Yes, nothing changed that would have caused that big a difference.

Kemp: How do you evaluate the risk associated with moving this material around on site for the next thirty years?	Wyatt: We look at the short term risk to the workers handling the waste and also the long term of transporting the waste to the landfill. As a result, this option would have almost negligible injuries and fatalities associated with it. I think the fatalities was less than one and there were two injuries, as opposed to 4 fatalities and 20 injuries for shipping offsite. Woodard: Those figures are based on mileage.
O’Brien: Down the road I’m not sure how we allow for changes. We used to measure things in parts per million and now we measure things in parts per billion.	Wyatt: We would not be bringing anything new in to be put in the cell. We would take what is already out there and put it in one central, engineered, stable location. We would have everything that is spread out over the entire plant and put it in one facility where it is monitored so it can’t hurt any of the public or environment.
Clayton: I would like to suggest that at some point in the future you explain what low level waste is. And how dangerous it is. And how we encounter it on a daily basis voluntarily. I think that would lay part of this to rest.	Duff: We can certainly provide that in an upcoming briefing.
Wheeler: Also, if you could include a basic briefing on the waste acceptance criteria.	Duff: Yes, we have to use preliminary waste acceptance criteria to help design the cell. That can change during the process of designing the cell.
Wheeler: Mark, is the 5.5 seismic number for this area the one used by USGS?	Wyatt: That number is the more conservative number used by USGS.

Duff reviewed the list of previously asked questions about the CERCLA cell, listed on the next page.

Peterson reminded everyone that the next WDA presentation would be held on July 10th, and that EPA’s Franklin Hill and Sec. Len Peters from KY, would be in attendance.

The meeting adjourned at 7:33 pm.

Questions and/or Actions from May 15, 2014 WDA Meeting

Please provide the sequence of events that shows the integration of public involvement with the regulatory process; graphical representation is preferred.

Include break-even cost analysis for on-site vs. off-site alternatives in the next WDA presentation.

How much waste had to be transported off-site at the Fernald site?

Have any DOE sites that have a CERCLA cell been reindustrialized?

What is the total cost estimate to cleanup the entire Paducah site?

Please provide a seismic model for a potential on-site waste disposal facility.

What percent of the off-site cost is for disposal (tipping) fees?