Burton Island Ash Disposal Area

DNREC SIRB Activities, July 2005 to April 2009

Compiled by Greg DeCowsky, DNREC SIRB, Project Manager/Natural Resource Trustee for Administration

Indian River Generating Station (IRGS)

- Operational from 1957 to present
- Now 4 coal-fired units
- Originally owned by Delmarva Power & Light (DP&L)
- Sold to NRG (Indian River Power LLC) in 2001
- NRG took liability for all environmental matters except an ongoing fuel oil release.

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WILDLIFE
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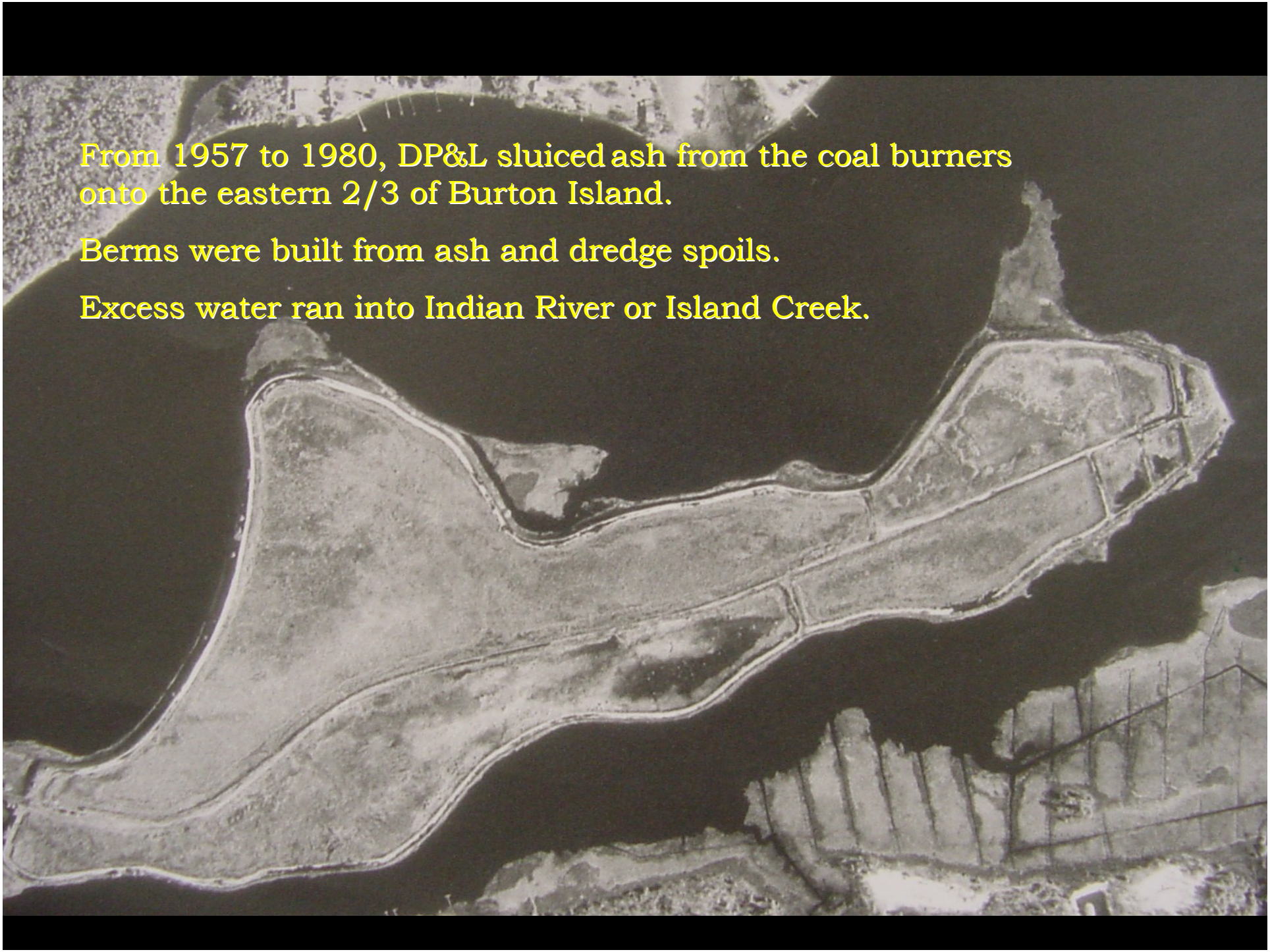
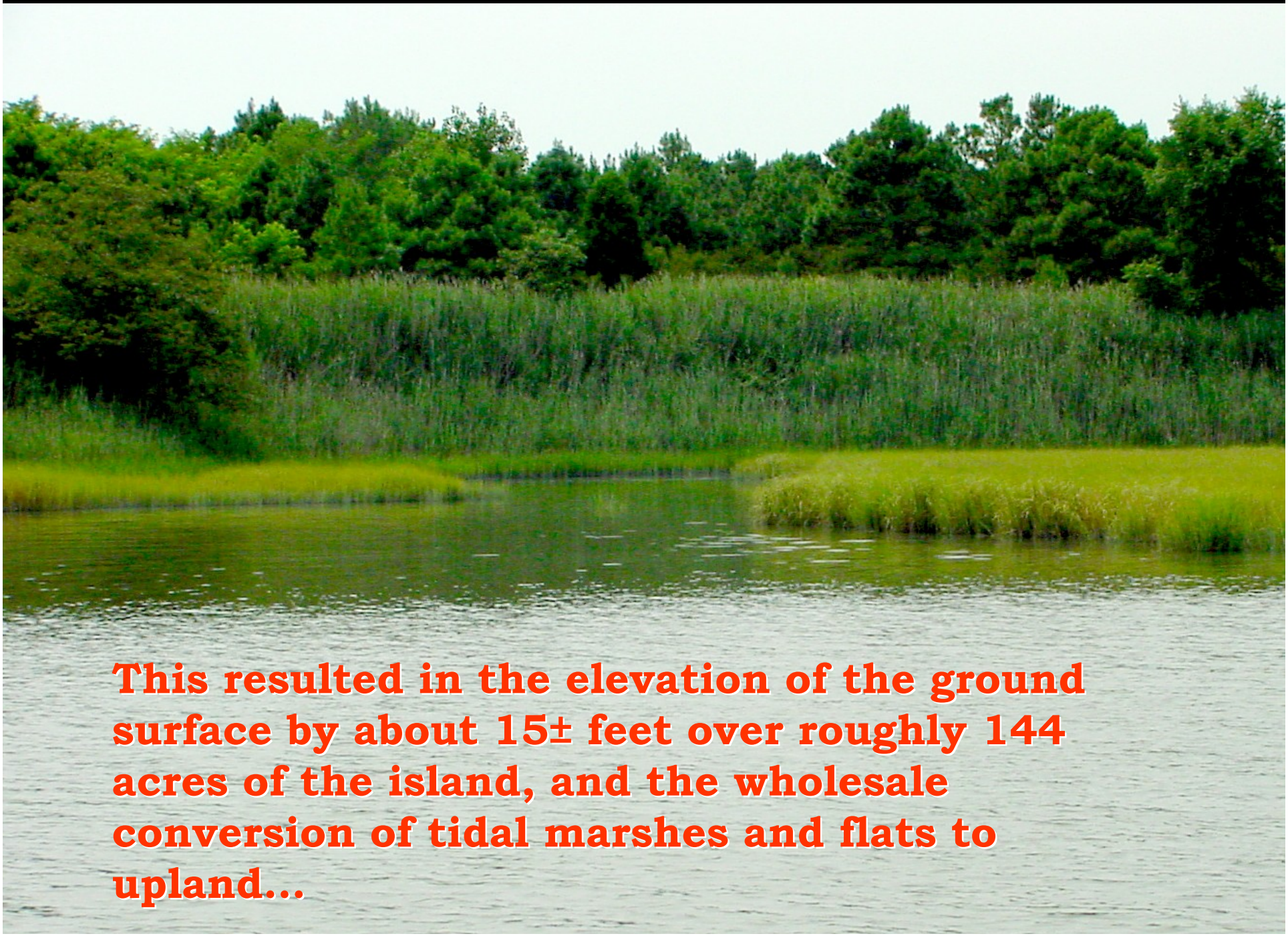
Burton Island, 1937

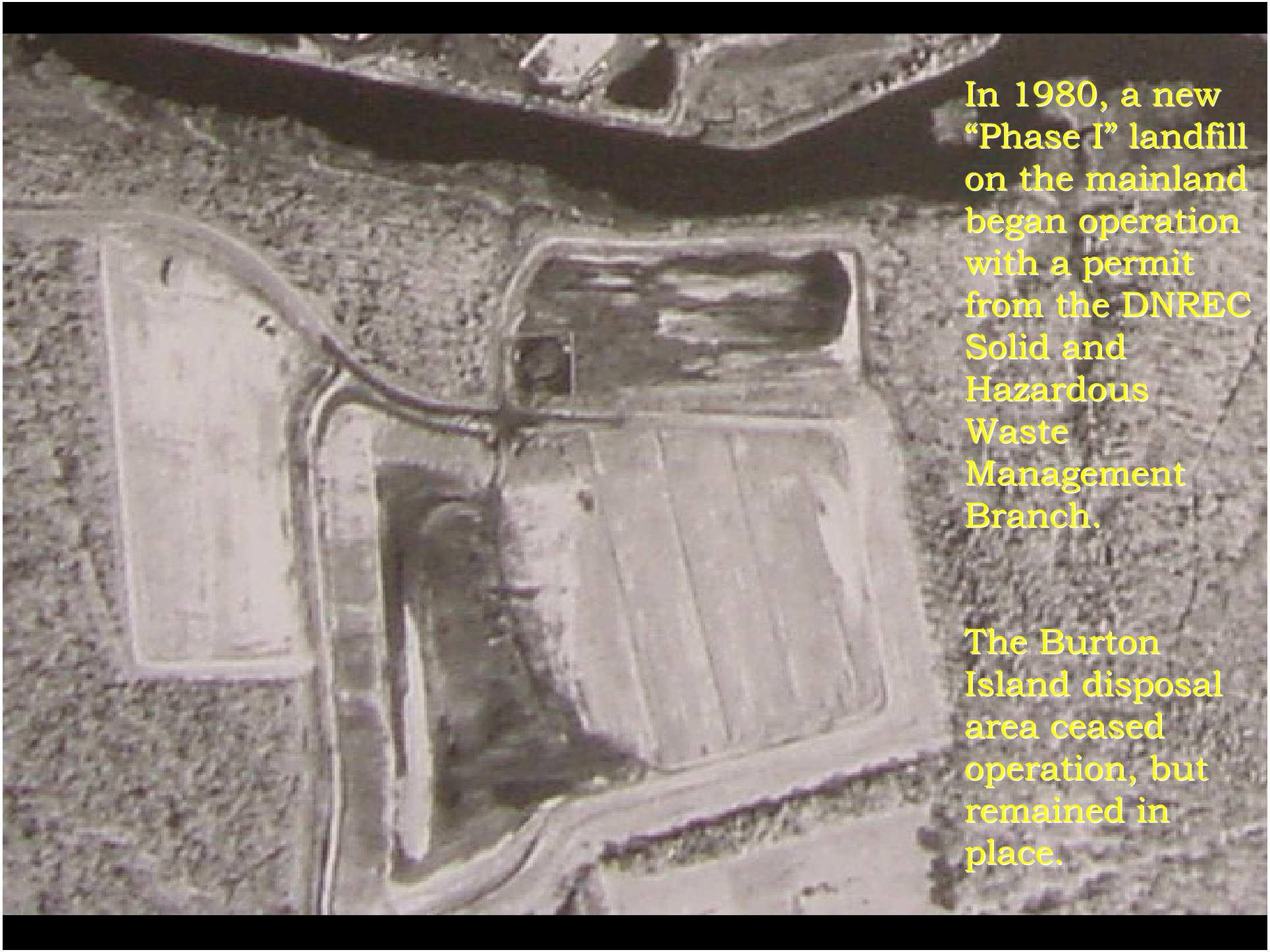

From 1957 to 1980, DP&L sluiced ash from the coal burners onto the eastern 2/3 of Burton Island.
Berms were built from ash and dredge spoils.
Excess water ran into Indian River or Island Creek.


This resulted in the elevation of the ground surface by about 15± feet over roughly 144 acres of the island, and the wholesale conversion of tidal marshes and flats to upland…

… where the “soil” is coal ash containing heavy metals…

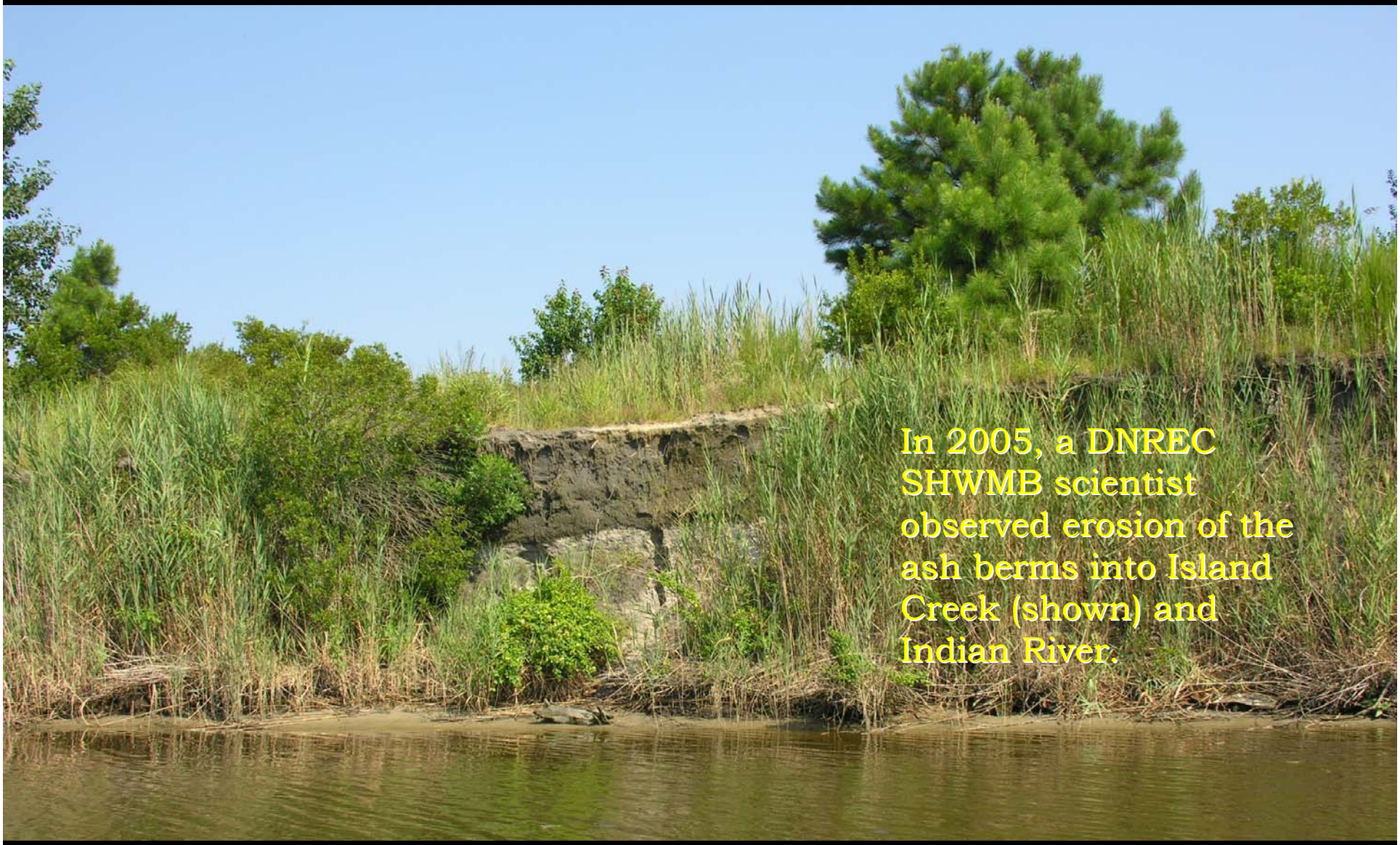
... and where native vegetation has largely been supplanted by invasive plants like *Phragmites*, mile-a-minute weed, and multiflora rose...

... though the native salt marsh cordgrass still survives
in fringing wetlands around much of the island and on
several spits on the river side.

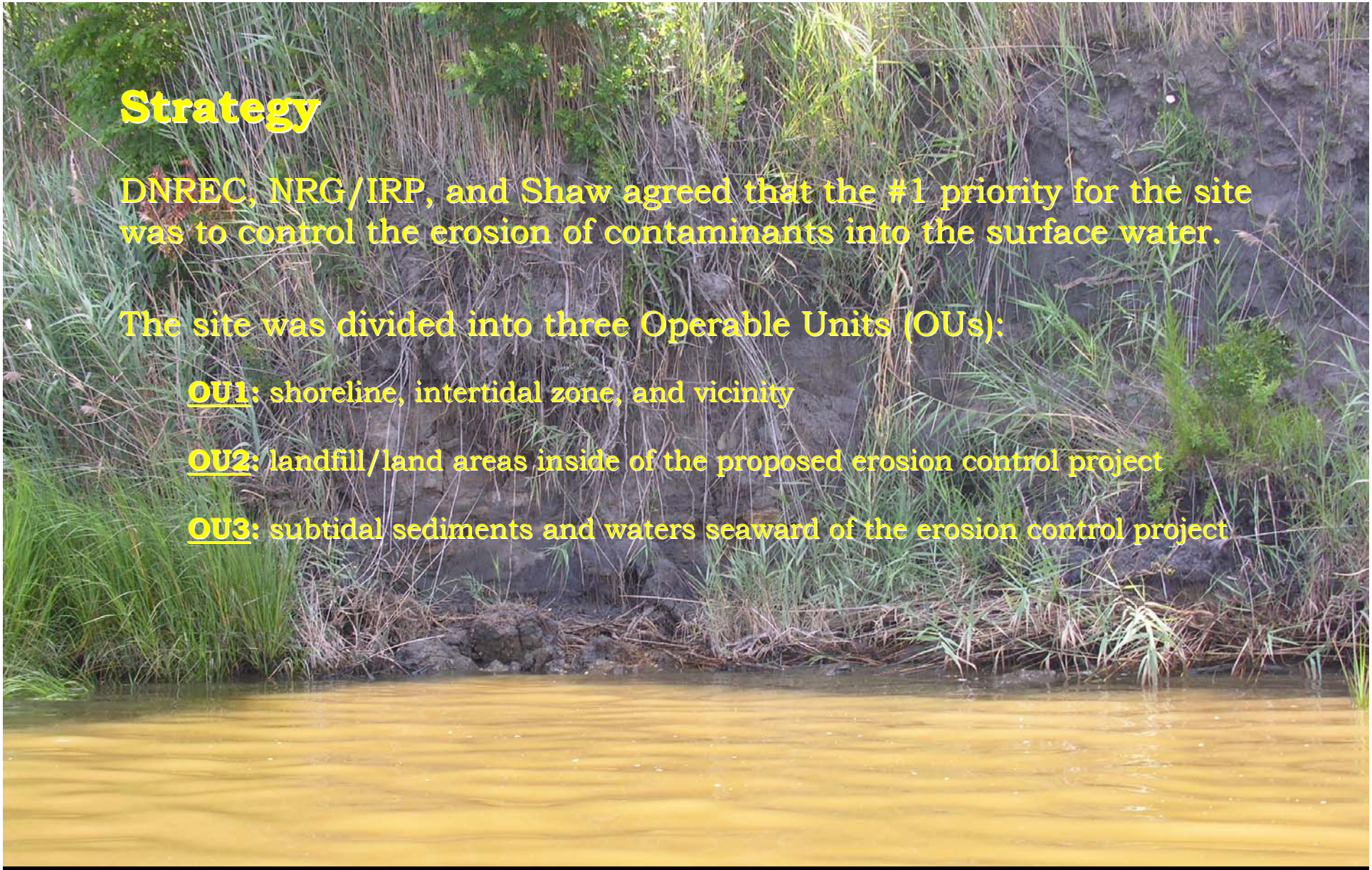


In 1980, a new "Phase I" landfill on the mainland began operation with a permit from the DNREC Solid and Hazardous Waste Management Branch.

The Burton Island disposal area ceased operation, but remained in place.


In 2005, a DNREC SHWMB scientist observed erosion of the ash berms into Island Creek (shown) and Indian River.

The site was referred to SIRB, which started an investigation.
Initial soil and shoreline sediment sampling revealed levels of metals exceeding DNREC standards.
NRG and DNREC negotiated a Voluntary Cleanup Program agreement for the investigation of the site.

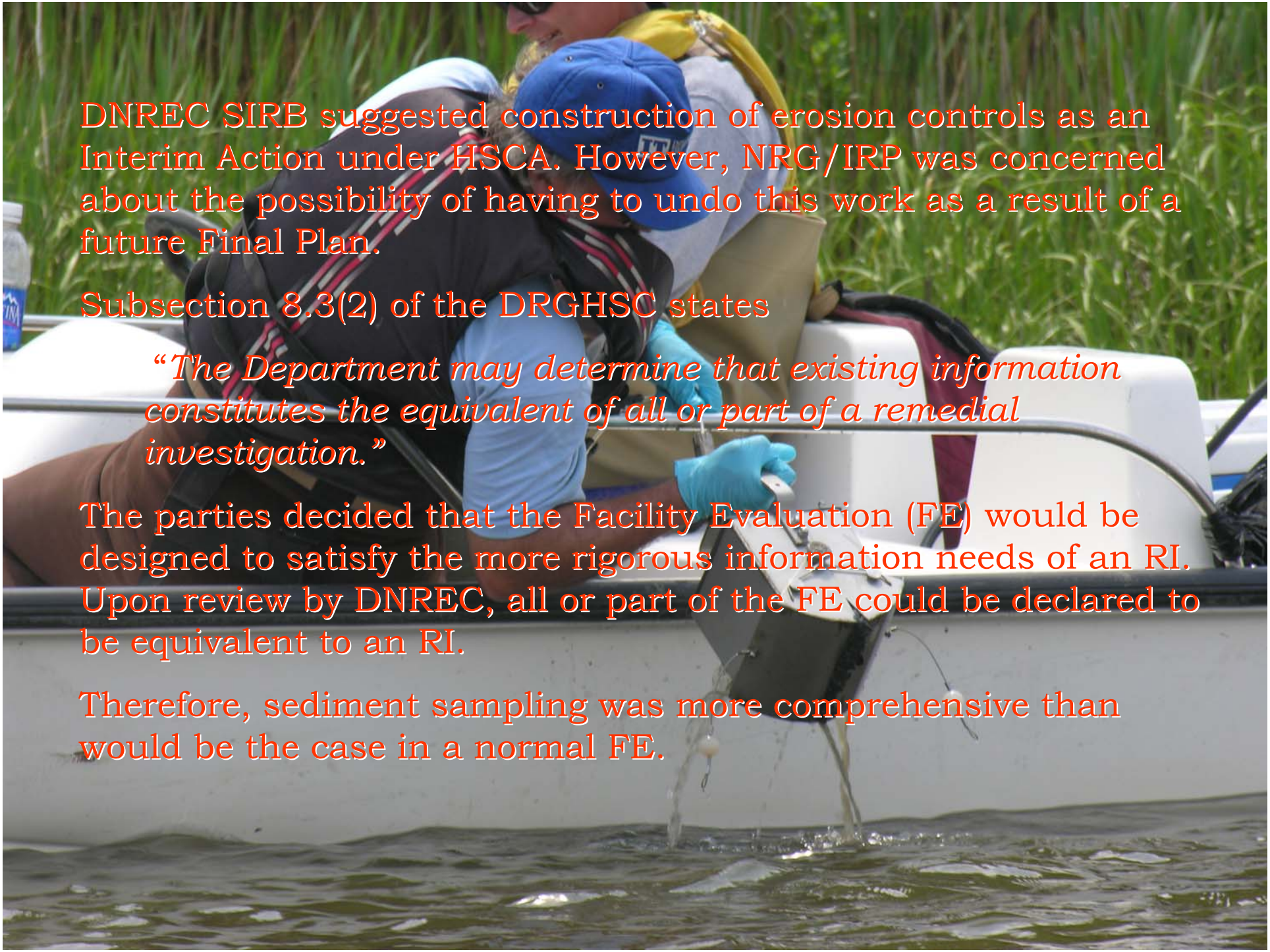


Strategy

DNREC, NRG/IRP, and Shaw agreed that the #1 priority for the site was to control the erosion of contaminants into the surface water.

The site was divided into three Operable Units (OUs):

- **OU1:** shoreline, intertidal zone, and vicinity
- **OU2:** landfill/land areas inside of the proposed erosion control project
- **OU3:** subtidal sediments and waters seaward of the erosion control project



DNREC SIRB suggested construction of erosion controls as an Interim Action under HSCA. However, NRG/IRP was concerned about the possibility of having to undo this work as a result of a future Final Plan.

Subsection 8.3(2) of the DRGHSC states

> *"The Department may determine that existing information constitutes the equivalent of all or part of a remedial investigation."*

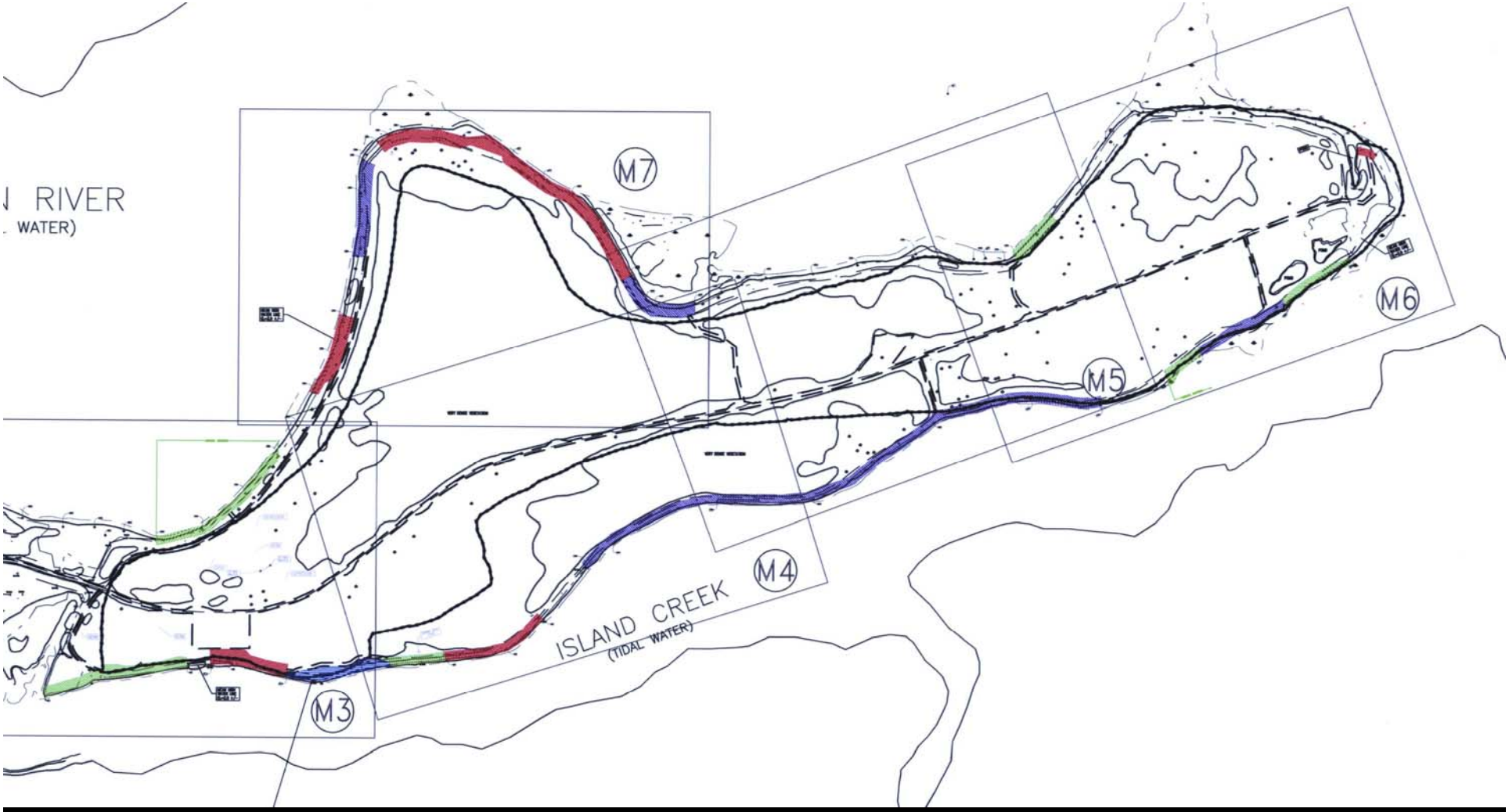
The parties decided that the Facility Evaluation (FE) would be designed to satisfy the more rigorous information needs of an RI. Upon review by DNREC, all or part of the FE could be declared to be equivalent to an RI.

Therefore, sediment sampling was more comprehensive than would be the case in a normal FE.

Upon review of the FE report, DNREC found that for OUs 1 and 3, the FE was sufficient to constitute an RI, allowing a saving of a major step in the HSCA process and of at least a year's worth of erosion. A Proposed Plan was issued calling for construction of the erosion controls as the remedy for OU1 and No Further Action (based on low human health risks) for OU3.

Following a public hearing, and in spite of substantial controversy, a Secretary's Order was issued approving the Proposed Plan as written. The Final Plan was signed on August 1, 2008, and the OU1 remediation was conducted during the winter and spring of 2008-2009. NRG expects the work to be done by the end of May, 2009.

OU2, because of its size and heterogeneity, will need to be investigated in greater detail before a Feasibility Study can be conducted and a remedy selected. Planning for the OU2 RI is in progress. Field work is expected to start later in 2009.

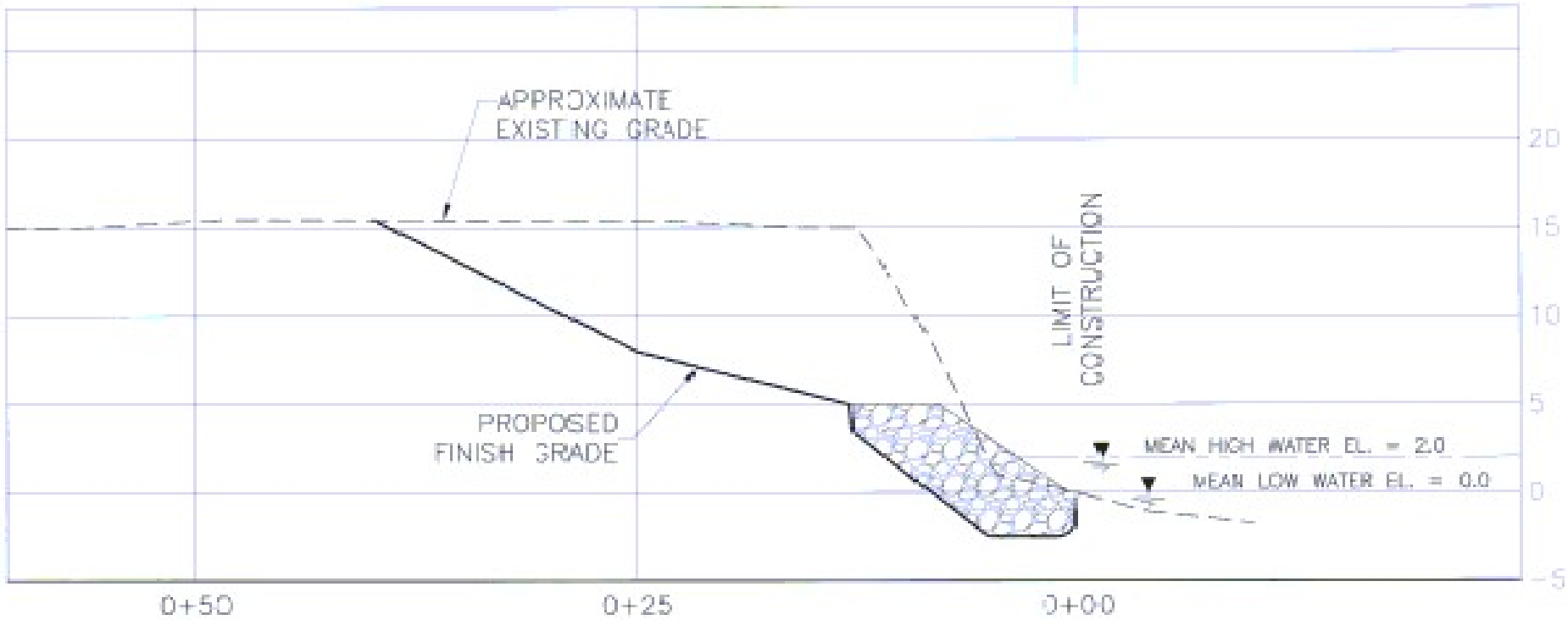


Because the operating plant area was also subject to erosion, NRG decided to address both the plant and the ash disposal area with the same project.

Areas of erosion were mapped as severe, moderate, or minimal.

Drawings by Shaw Environmental, Inc., from the Wetlands and Subaqueous Lands permit applicatio

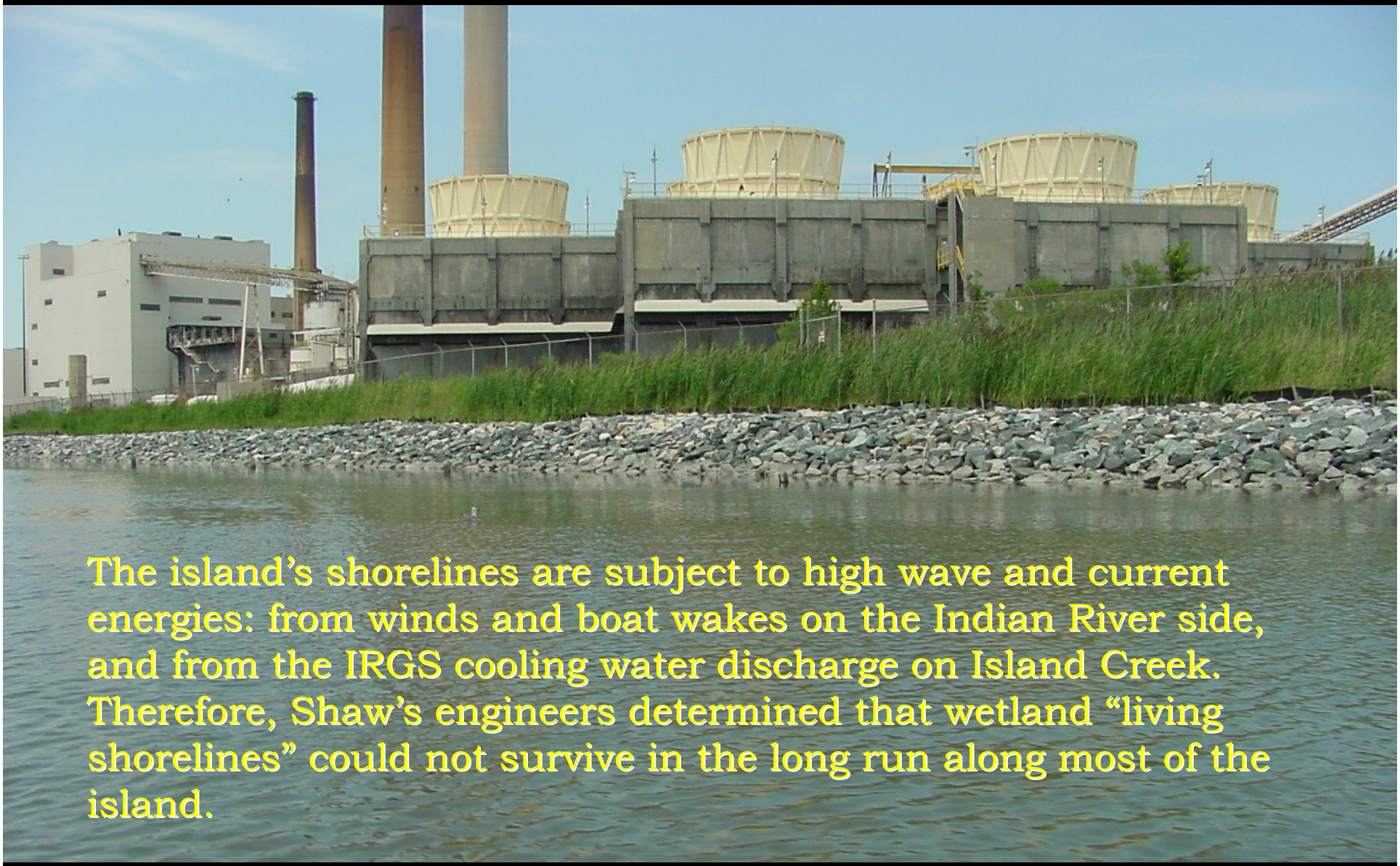
First, the banks were graded. Different grading profiles were specified depending on the degree of erosion.



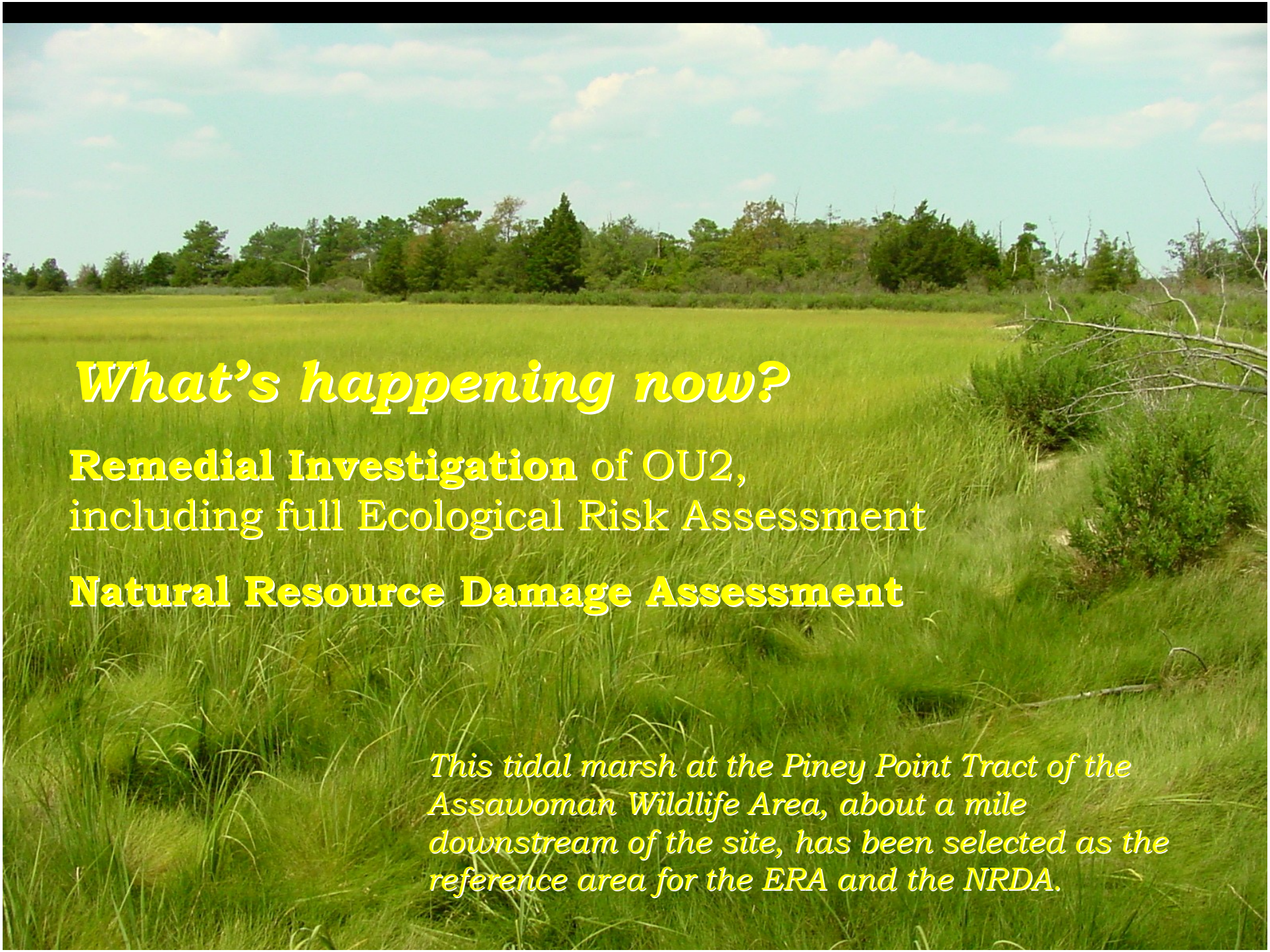
SEVERE EROSION TYPICAL SECTION A

Large “armor stones” were placed, a few at a time, to create a rip-rap bank.

Exposed berm areas above and behind the rip-rap were
covered with erosion control matting and seeded.



The island's shorelines are subject to high wave and current energies: from winds and boat wakes on the Indian River side, and from the IRGS cooling water discharge on Island Creek. Therefore, Shaw's engineers determined that wetland "living shorelines" could not survive in the long run along most of the island.



What's happening now?

Remedial Investigation of OU2, including full Ecological Risk Assessment

Natural Resource Damage Assessment

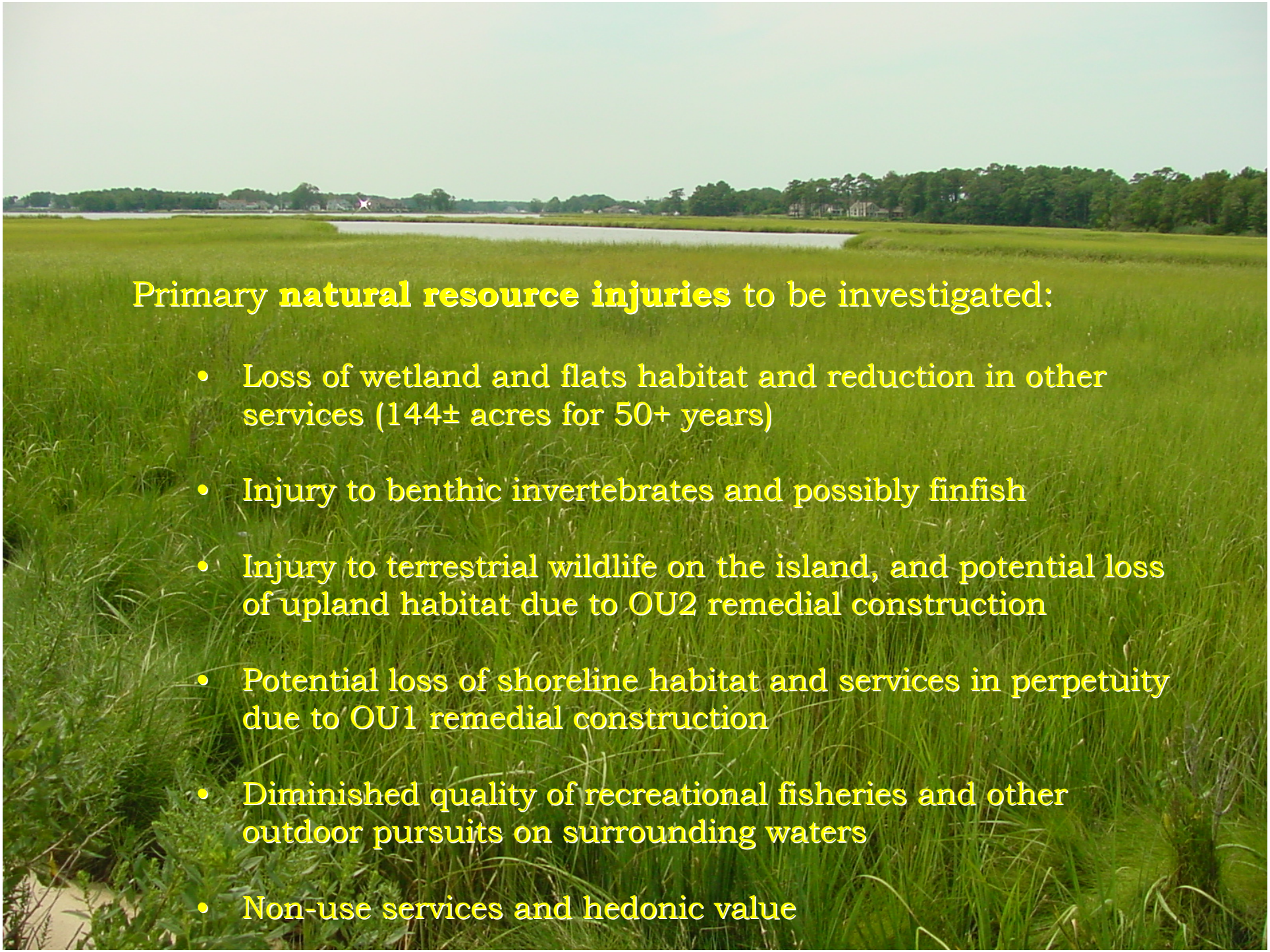
This tidal marsh at the Piney Point Tract of the Assawoman Wildlife Area, about a mile downstream of the site, has been selected as the reference area for the ERA and the NRDA.

During the summer and fall of 2008, Natural Resource Trustees and other representatives from the U.S Fish and Wildlife Service, NOAA, and DNREC, with NRG and consultants for both sides, toured the site, on land and by boat, to begin identifying critical species and habitats to be evaluated during the NRDA.

Crabs and other invertebrates along Burton Island's shoreline

Pools, wetlands, and inlets within OU2

Areas of bare ash that could present an exposure hazard to wildlife



Primary **natural resource injuries** to be investigated:

- Loss of wetland and flats habitat and reduction in other services (144± acres for 50+ years)
- Injury to benthic invertebrates and possibly finfish
- Injury to terrestrial wildlife on the island, and potential loss of upland habitat due to OU2 remedial construction
- Potential loss of shoreline habitat and services in perpetuity due to OU1 remedial construction
- Diminished quality of recreational fisheries and other outdoor pursuits on surrounding waters
- Non-use services and hedonic value

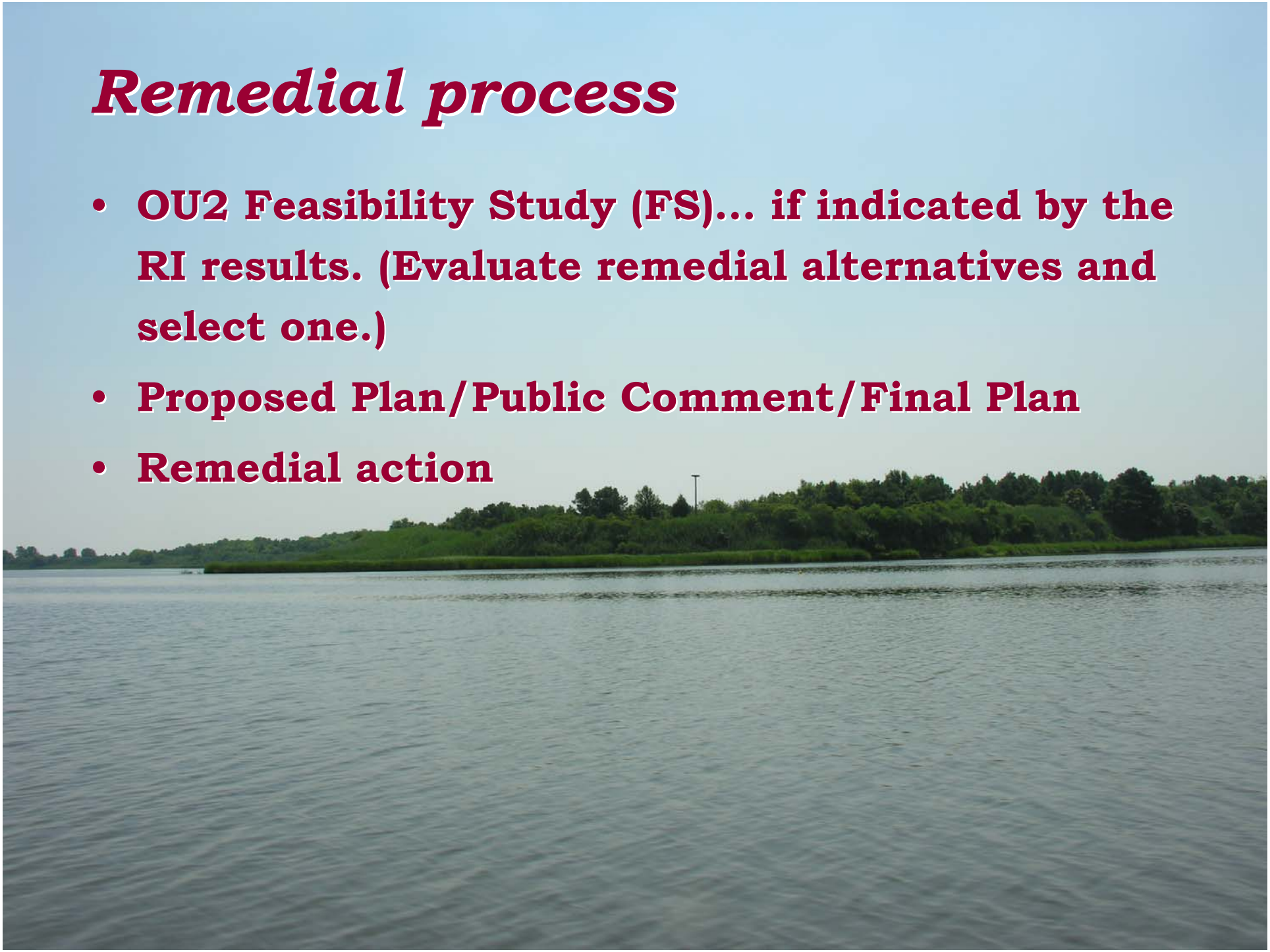
Coal ash: special ecological concerns:

- **Deer** may use coal ash as a **salt lick**. (Sample & Suter, 2002)
- Coal ash exposure causes **developmental impairments** and other damage in certain **frogs, toads, turtles, snakes, fish,** and **crayfish**. (Hopkins, *et al*)
- **Horseshoe crabs** at the reference site and near the study area, suggesting that migratory shorebirds feeding on crab eggs may be at risk.
- Possible **trace metals**, including **uranium** and **thorium** (dependent on coal source.) (Numerous references)

What's next?

Remedial process

- **OU2 Feasibility Study (FS)… if indicated by the RI results. (Evaluate remedial alternatives and select one.)**
- **Proposed Plan/Public Comment/Final Plan**
- **Remedial action**



Feasibility Study (FS)

Initial Screening of Remedial Alternatives

- Effectiveness in meeting site cleanup levels
- Appropriate engineering practices based on applicability, feasibility for the site and reliability
- Relative cost

Feasibility Study (FS)

Detailed Analysis of Remedial Alternatives

- Protection of public health and welfare and the environment
- Compliance with applicable laws and regulations
- **Community acceptance**
- Compliance monitoring requirements
- Permanence
- Technical practicability
- Restoration time frame
- Reduction of toxicity, mobility and volume of contamination
- Long-term effectiveness
- Short-term effectiveness

NRDA process

- Damage Assessment Plan.
- Studies to identify and quantify injuries and service losses.
- Possible integration of restoration with remediation – saves resources on both sides, gets to restoration faster.
- Finalize Damage Assessment and present claim.
- On-site and off-site restoration projects to "restore, rehabilitate, replace, or acquire the equivalent" of the resources and services injured or lost.

References

- Hopkins, William, Brandon Staub, Christopher L. Rowe, and Justin Congdon. Accessed Aug. 12, 2008. "Sublethal Impacts of Coal-Derived Trace Elements on Amphibians, Reptiles, and Invertebrates." *http://www.uga.edu/srelherp/projects/COAL.HTM*

- Sample, Bradley E., and Glenn W. Suter, October 2002. "Screening Evaluation of the Ecological Risks to Terrestrial Wildlife Associated with a Coal Ash Disposal Site." *Human and Ecological Risk Assessment*. 8:4, 637-656.

- Shaw Environmental, March 2008 on behalf of Indian River Power, LLC. *Final Facility Evaluation Report: Indian River Generating Station Burton Island Old Ash Landfill.*

Acknowledgements

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Robert Gano, DNREC Div. of Fish and Wildlife Regional Manager and Trustee

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