ATLANTIC COMPACT COMMISSION

OCTOBER 25, 2007

COMPACT UTILITY GENERATORS PRESENTATION

Atlantic Compact Utility Generators

6 Utilities

13 Reactors

Progress Energy

Robinson

PSEG

Salem (2 units)

Hope Creek

Duke Energy

Oconee (3 units)

Catawba (2 units)

Dominion

Millstone (2 units)

SCE&G

VC Summer

Exelon

Oyster Creek

Commitment to working in partnership to achieve a long-term solution

THREE FUNDAMENTAL CHANGES IN THE INDUSTRY

1. Deregulation of electric power in NJ and CT
   Increased costs will tend to make nuclear units less competitive.

2. License extensions of existing units will delay the shipment of decommissioning waste.

3. More efficient operations and waste minimization programs have driven waste volumes down thus resulting in decreased revenues to Barnwell.

Compact Utility Generators Meeting in 2006

Conclusions:

1. Projected waste volumes too low to sustain Barnwell, at its current mode of operation .
2. Operating costs remain high.

PRIORITIES FOR THE OPERATION OF BARNWELL

1. Least Cost Operating Plan
2. Intermittent operating mode
3. Break-even operation
4. Reasonable Fees
5. Extended Care Fund used for maintenance costs associated with the retired portion of the site.
6. Reserve funded by excess revenue in FY 2008

By working collaboratively, a solution will be found that will be fair to the site operator while meeting the operational and economic needs of the generators.

Atlantic Compact Commission Meeting
Columbia, South Carolina; October 25, 2007

BARNWELL LOW-VOLUME OPERATIONS: PRE-PLACED VAULTS WITH PART-TIME OPERATIONS

Robert D. Baird; P.E.
URS Corporation
robert_d_baird@urscorp.com; 801-904-4122
756 East Winchester St, Suite 400
Salt Lake City, Utah 84107

Pre-Placed Vaults with Part-Time Operations

DISCLAIMERS

- Conceptual Design: Key Issues Are Addressed
- Conceptual Design: Not All Questions Can Be Answered ***TODAY*** – Significant Additional Design, Analyses, and Development Are Yet Required
- Generic Proposal – No Schedule Implied

Pre-Placed Vaults with Part-Time Operations

LIMITED SCOPE OF WORK

- Project Maximum Number of Vaults Required Annually
- Provide Conceptual Facility Design
- Consider Radiation Exposure Implications
- Consult with DHEC Representatives
- Estimate Operating Costs

Pre-Placed Vaults with Part-Time Operations

CONSTRAINTS

- No Consideration of Large Components or Slit Trench Operations
- No Account Made for Utilizing Remaining Disposal Capacity in Existing Trenches

Pre-Placed Vaults with Part-Time Operations

CONCEPT OBJECTIVES

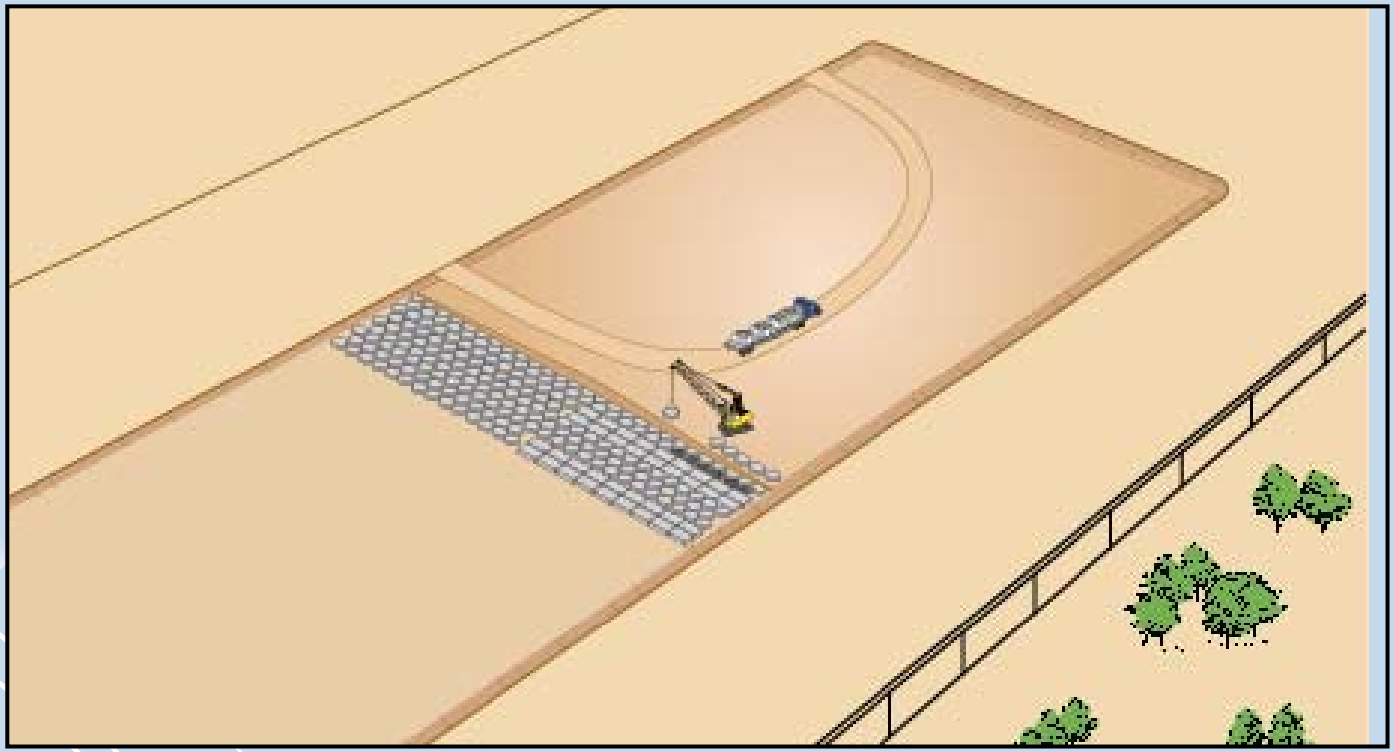
- Comply with Applicable Regulatory Requirements
- Reduce Operating Costs
- Minimize Infiltration into Disposal Unit
- Stimulate Productive Discussion about Operating Changes that Will Meet All Objectives

Pre-Placed Vaults with Part-Time Operations

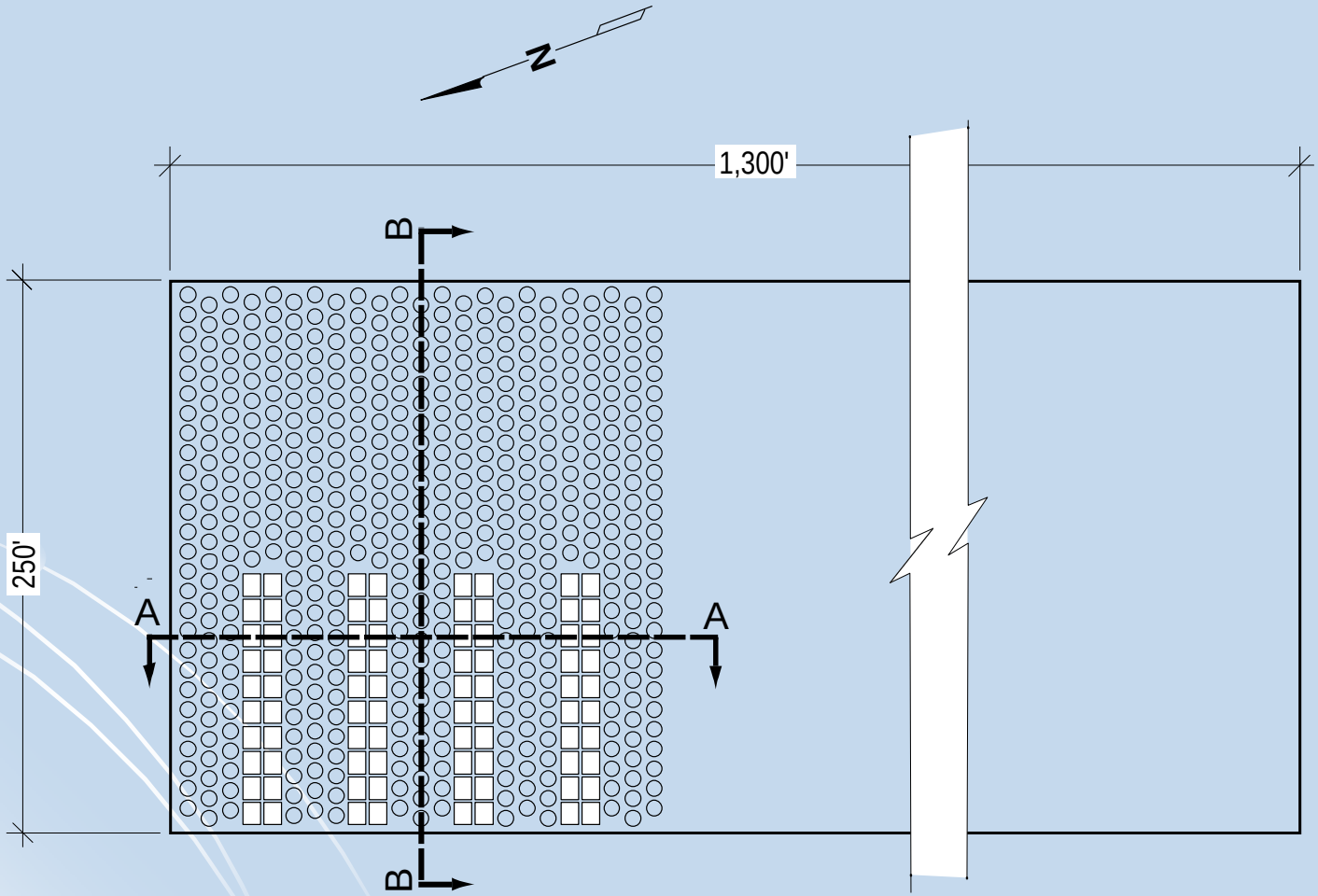
PROMINENT CHARACTERISTICS

- Shallow Excavation with Leachate Collection and Removal system
- One Layer of Vaults Placed during Construction with Tops at Local Grade
- Vaults Provided with Weather Shields
- Voids Backfilled Immediately and Provided with Low-Permeability Cover Layer

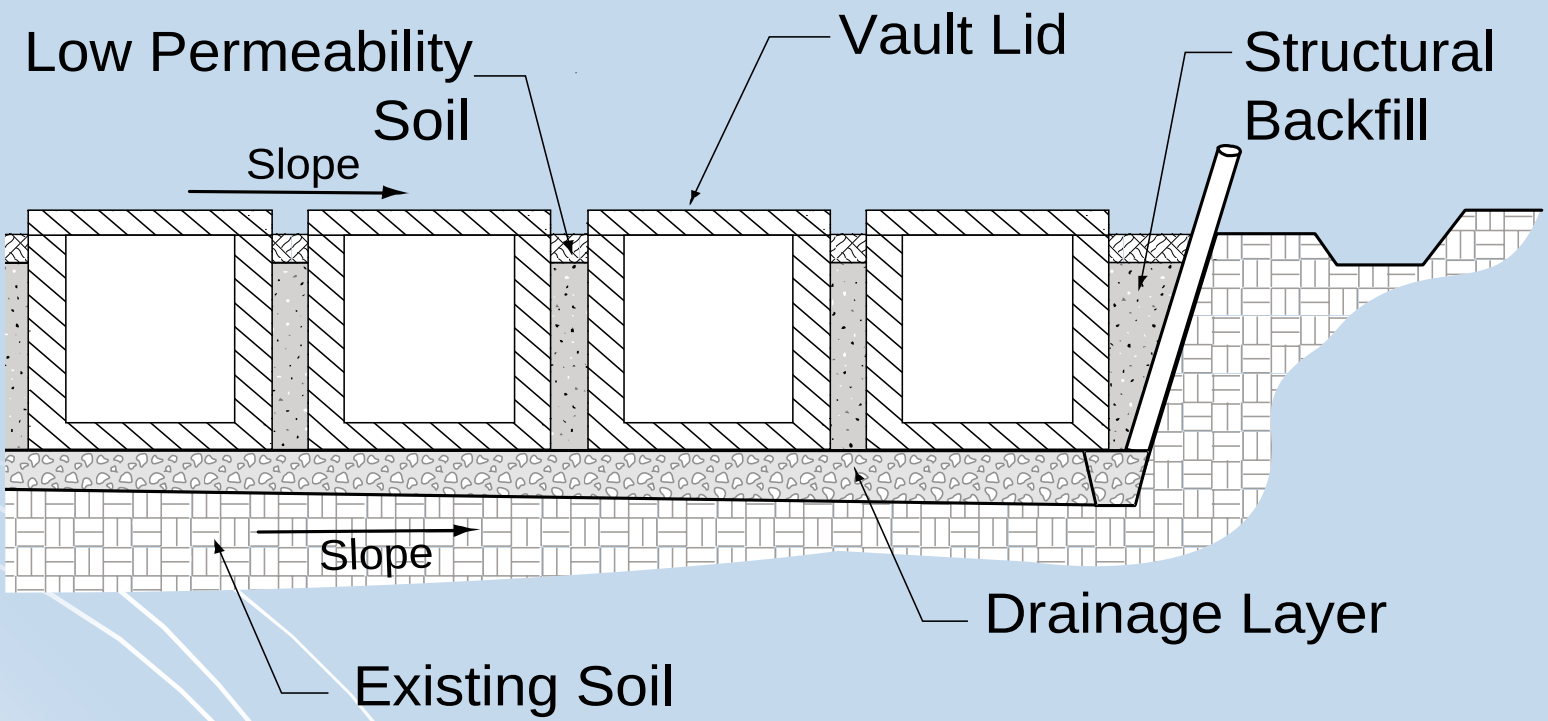
Pre-Placed Vaults with Part-Time Operations



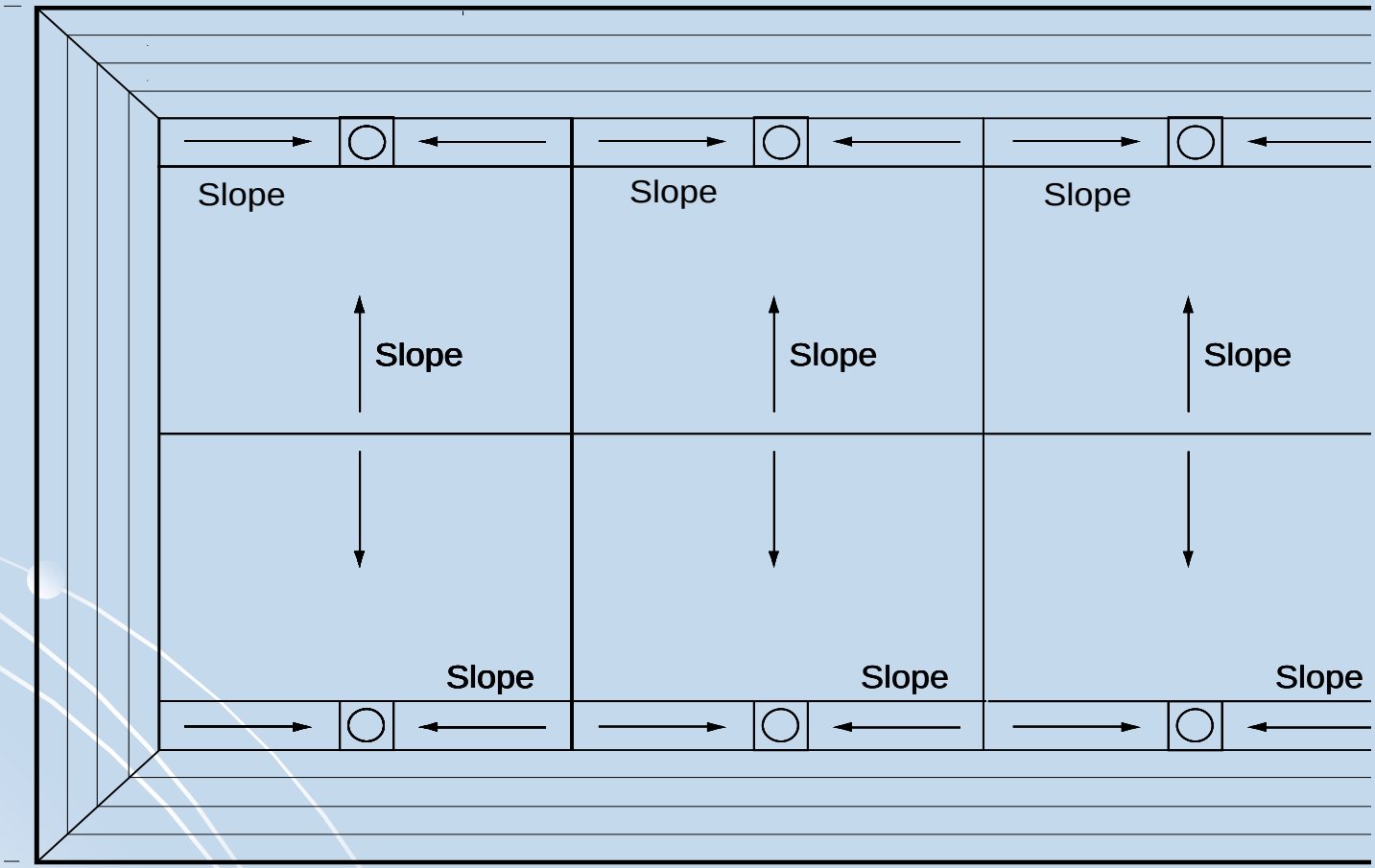
Pre-Placed Vaults



Pre-Placed Vaults



Pre-Placed Vaults

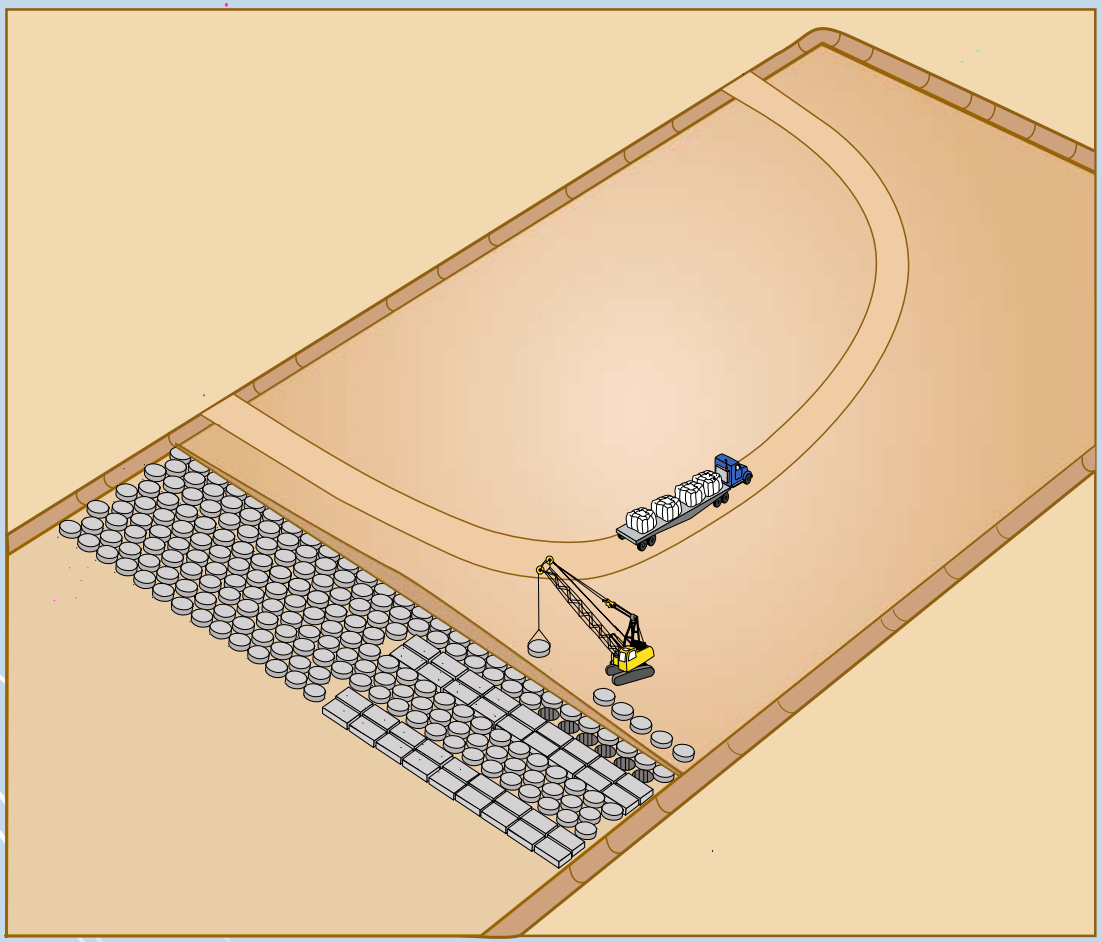


Pre-Placed Vault

PART-TIME OPERATIONS

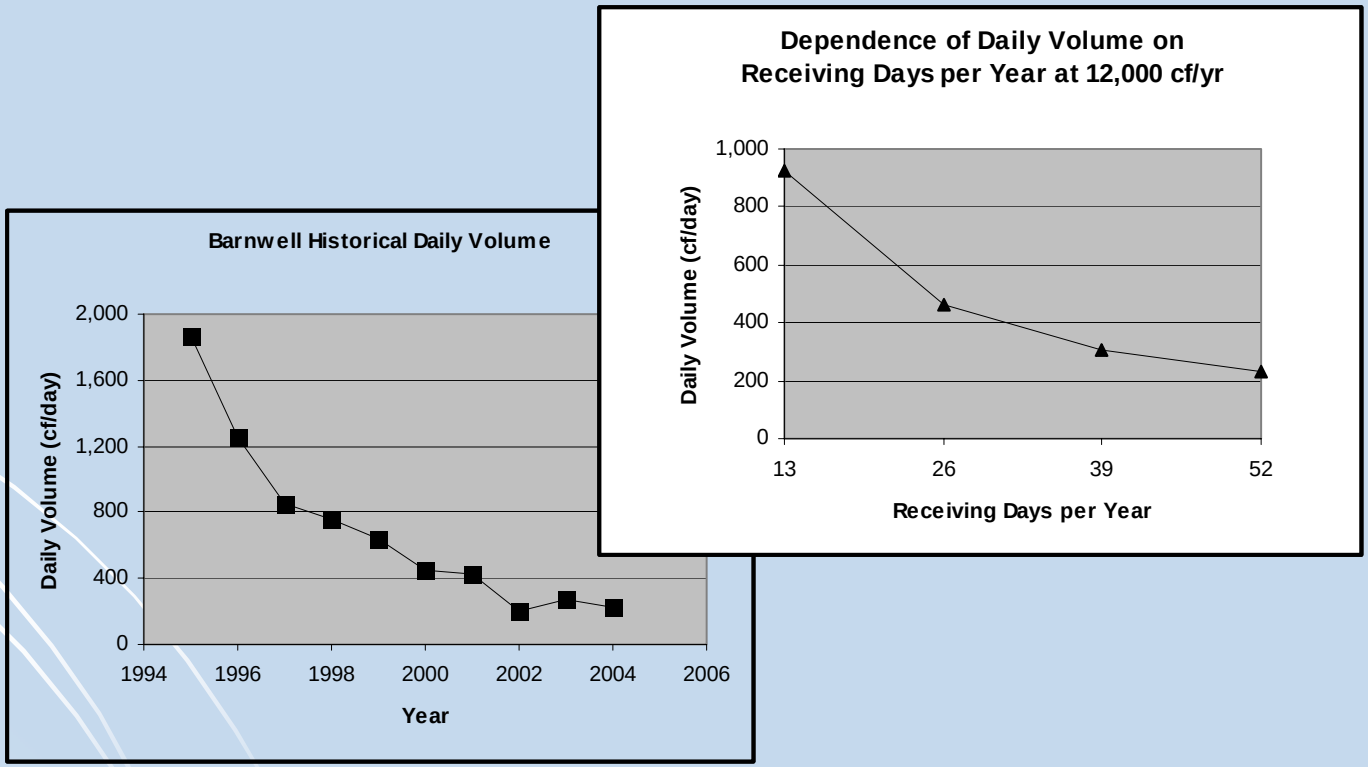
- One Day Every Other Week
- Shipping Vehicles Drive to Active Disposal Area
- Crane Transfers Containers from Shipping Vehicles into Pre-Placed Vaults
- Structural and Interim Cover Layers Extended as Needed

Pre-Placed Vaults with Part-Time Operations



Part-Time Operations

Can that Much Waste Be Received in a Day?

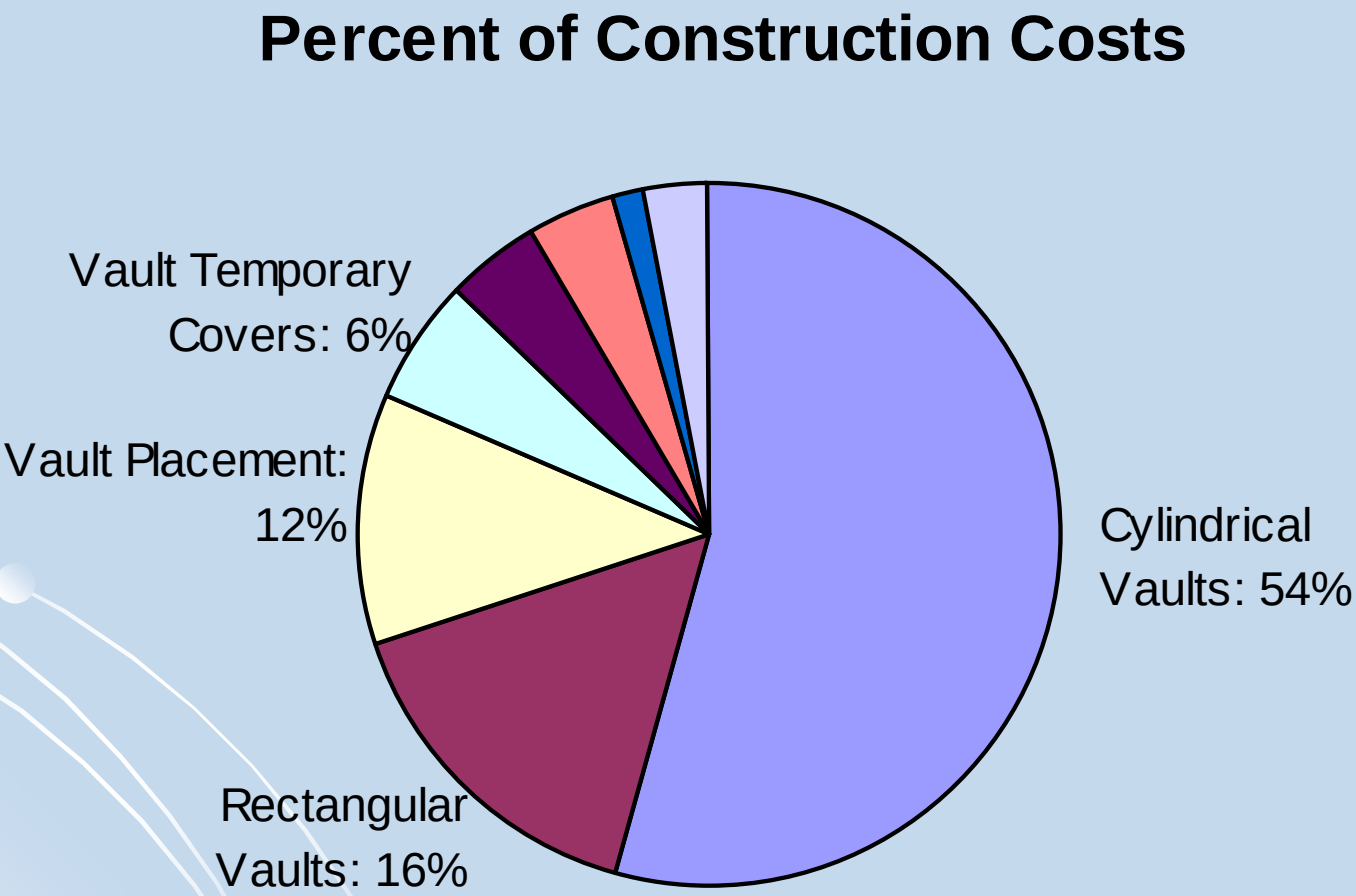


Pre-Placed Vaults

MAJOR CONSTRUCTION COSTS

Item	Quantity	Units	Unit Cost	Cost	Percent of Total
Cylindrical Vaults	335	ea	$5,280	$1,768,800	54%
Rectangular Vaults	45	ea	$11,440	$514,800	16%
Vault Placement	380	ea	$997	$378,708	12%
Vault Temporary Cover	380	ea	$500	$190,000	6%
Structural Backfill	9,977	cy	$15	$144,861	4%
Disposal Unit Excavation	22,222	cy	$6	$124,667	4%
Drainage Layer	1,852	cy	$28	$50,926	2%

Pre-Placed Vaults



Pre-Placed Vaults

CONSTRUCTION COSTS

Estimated Total	$4.3 million
Capacity Provided	60,000 cubic feet
	5 to 12 years
Effective Cost	<$75 per cubic foot

Part-Time Operations

OPERATING COSTS

Table 5. Support Staffing Requirements

Position/Function	Basis for Time Sharing
Security Guard	10 percent, lump sum
Program Coordinator	Bi-weekly: 1 day in 10; 28 of 100 employees Annually: 7 of 52 weeks; 28 of 100 employees
Administrative	Bi-weekly: 1 day in 10; 28 of 100 employees Annually: 7 of 52 weeks; 28 of 100 employees
Radiation Safety Officer	50 percent during disposal operations 10 percent during balance of the year.

Part-Time Operations

OPERATING COSTS

Table 4. Operational Staffing Requirements

Position/Function	Crew Size	Position/Function	Crew Size
Project Manager	1	Accounting Manager	2
Secretary/Clerk	2	Health and Safety Manager	1
Engineer	2	Operations Manager	1
Technician (Health Physicist, Radiation Worker, Laboratory)	2	Field Technician (Environmental monitoring, Quality Assurance)	2
Equipment Operator	6	General Laborer	2
Mechanic	1		
		Estimated Total Crew Size	22

Part-Time Operations

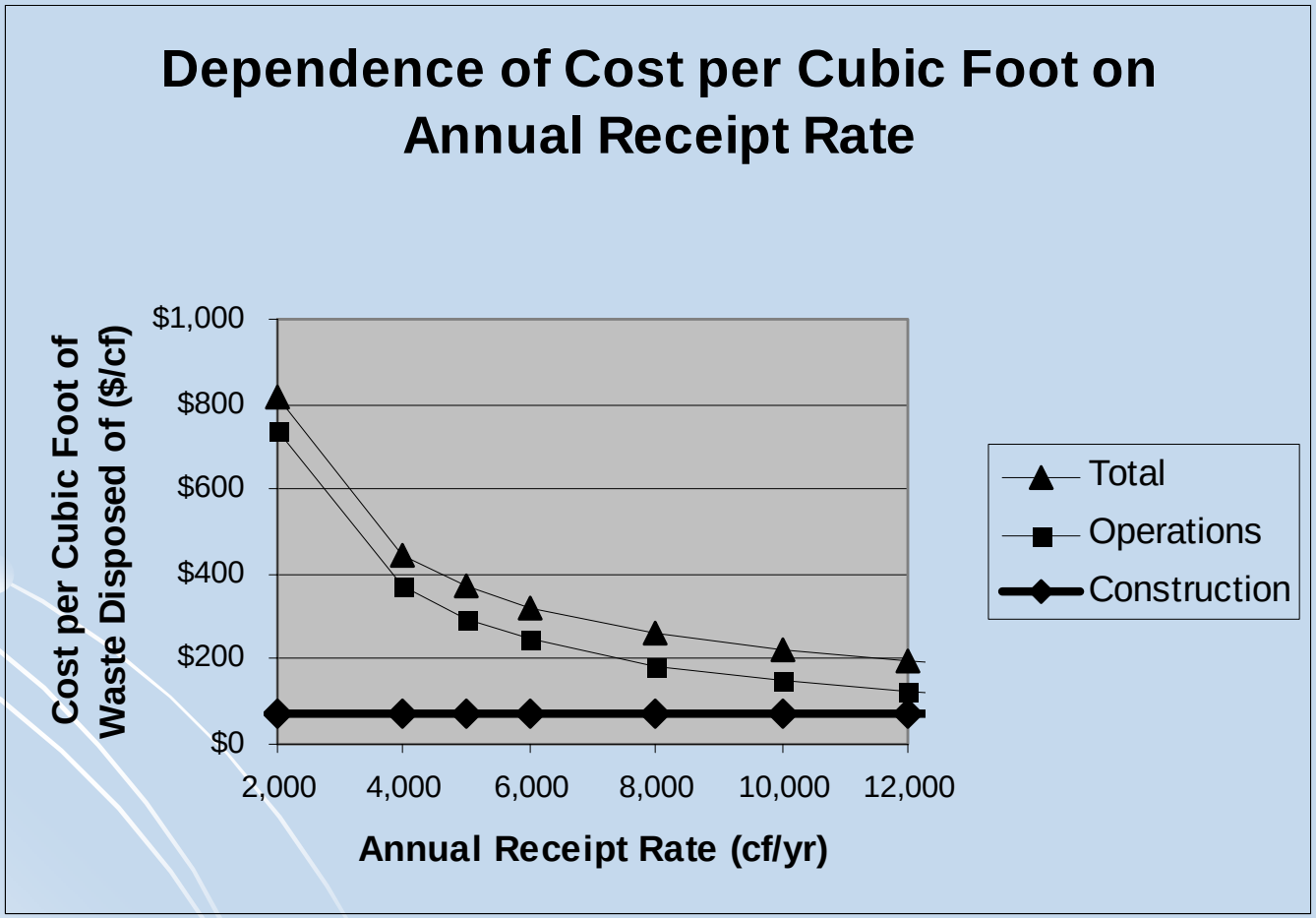
- No allowance was made for extending the final cover system
- Workman's comp and fixed overhead costs are estimated to be 32.5 percent of labor, travel, equipment, and materials costs.
- Overhead costs are estimated to be 10 percent of labor, travel, equipment, materials and workman's comp/fixed overhead costs.
- Margin payable to the facility operator was estimated to be 29 percent of all direct and indirect operating costs.
- Contingency allowance of 15 percent of all direct and indirect operating costs plus margin was provided.

Part-Time Operations

OPERATING COSTS

	Part-Time Year-Round Operations	Part-Time Annual Campaign Operations
Labor Cost	$262,000	$289,000
Travel	$10,000	$210,000
Equipment and Materials	$267,000	$210,000
Markups	$626,000	$724,000
Total Annual Operating Cost	$1,165,000	$1,483,000

Pre-Placed Vaults with Part-Time Operations

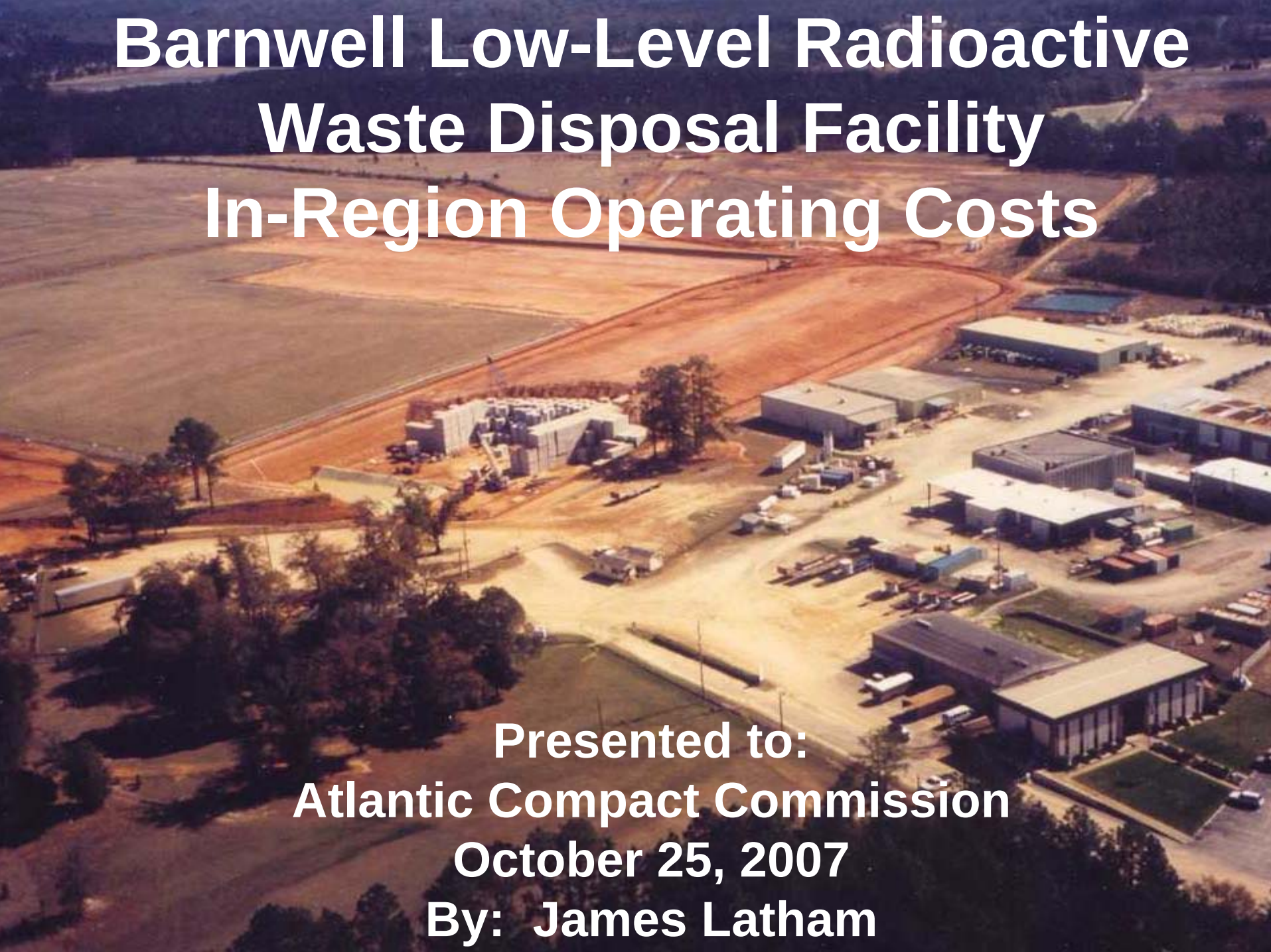


Pre-Placed Vaults with Part-Time Operations

SUMMARY

- Concept Can Be Designed to Address All Technical and Regulatory Considerations
- Construction Costs for Capacity of 60,000 Cubic Feet Total Less Than $5 Million
- Operating Costs Total Between $1.2 and $1.5 Million per Year, Depending on Part-Time Operating Mode
- Effective Cost Ranges from $200 to $800 per Cubic Foot, Depending on Annual Receipt Rate.

Barnwell Low-Level Radioactive Waste Disposal Facility In-Region Operating Costs



Presented to:
Atlantic Compact Commission
October 25, 2007
By: James Latham

Barnwell LLRW Disposal Site Presentation Summary

- Barnwell LLRW Disposal Site Status
- In-Region Operations / Phase I Closure Transition Planning
- Small Volume Trench Options
- Operational Scenarios Considered
- Post 2008 Operating Costs

Barnwell LLRW Disposal Site Status

- **License Status**
  - Timely Renewal status since 2000
  - In Appeal Process since 2004
- **Current Operating Scenario**
  - Three trench designs
  - Full time receipt of Class A, B, & C wastes
  - Acceptance of routine waste forms plus irradiated hardware and large components
- **Closure Activities Completed**
  - 96 acres of Enhanced Cap installed
  - West Pond storm water management system completed

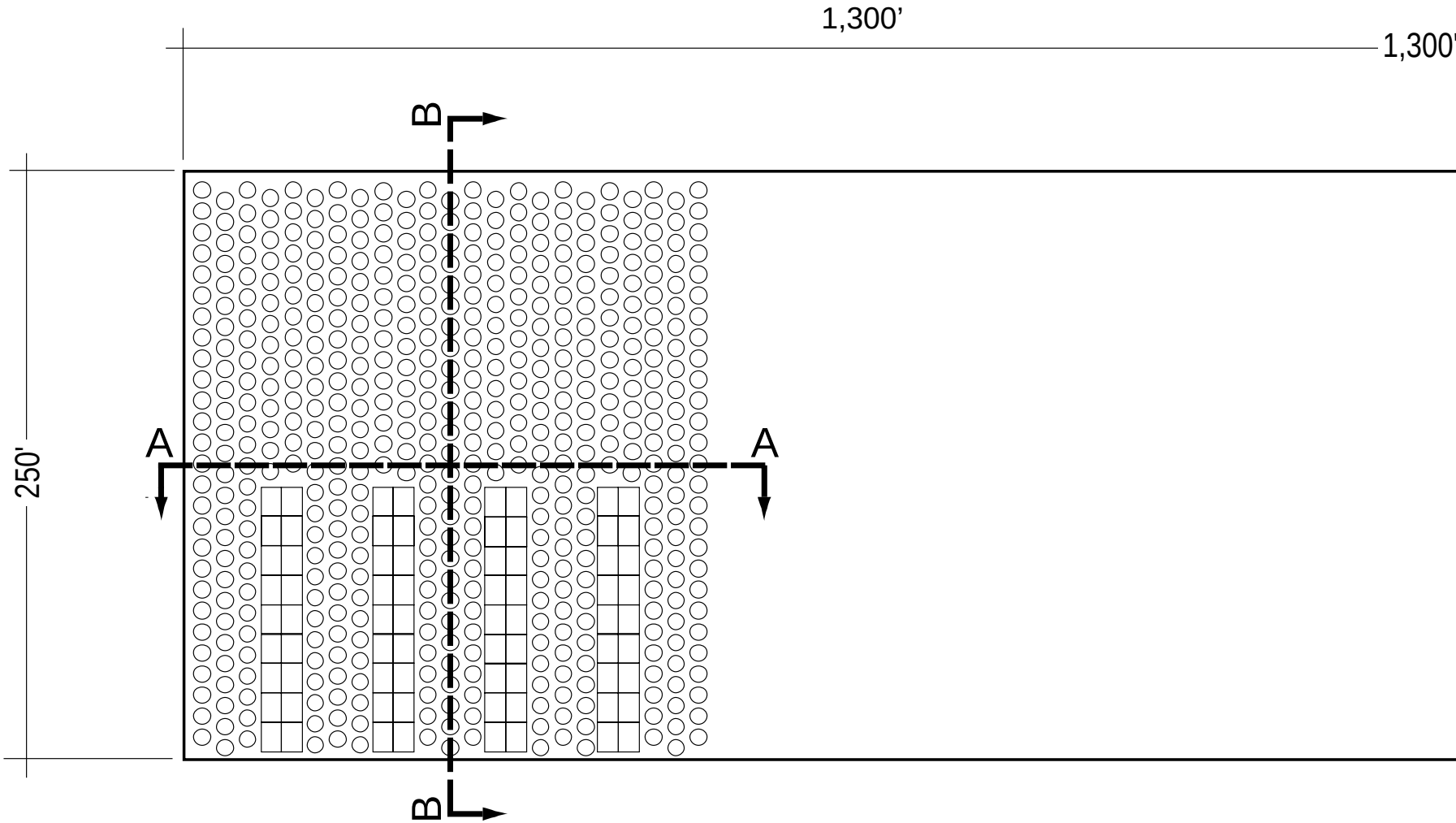
Barnwell LLRW Disposal Site Transition / Closure Activities

- **Capping project for 7 acres scheduled for Spring 2008**
- **Phase I closure starts July, 2008**
  - D&D several onsite buildings
  - Cap remaining completed trenches
  - Grade site to final topography
  - Eliminate unnecessary equipment
  - Verify performance objectives

Trench Design / Construction Options Considered for In-Region Operations

- Pre-staged Vault Array
- Class A, B, C Progressive Trench
- Existing Class B/C Trench

Pre-Staged Vault Array



ENERGYSOLUTIONS

Class A/B/C Trench
Phased Trench Construction

Plan View

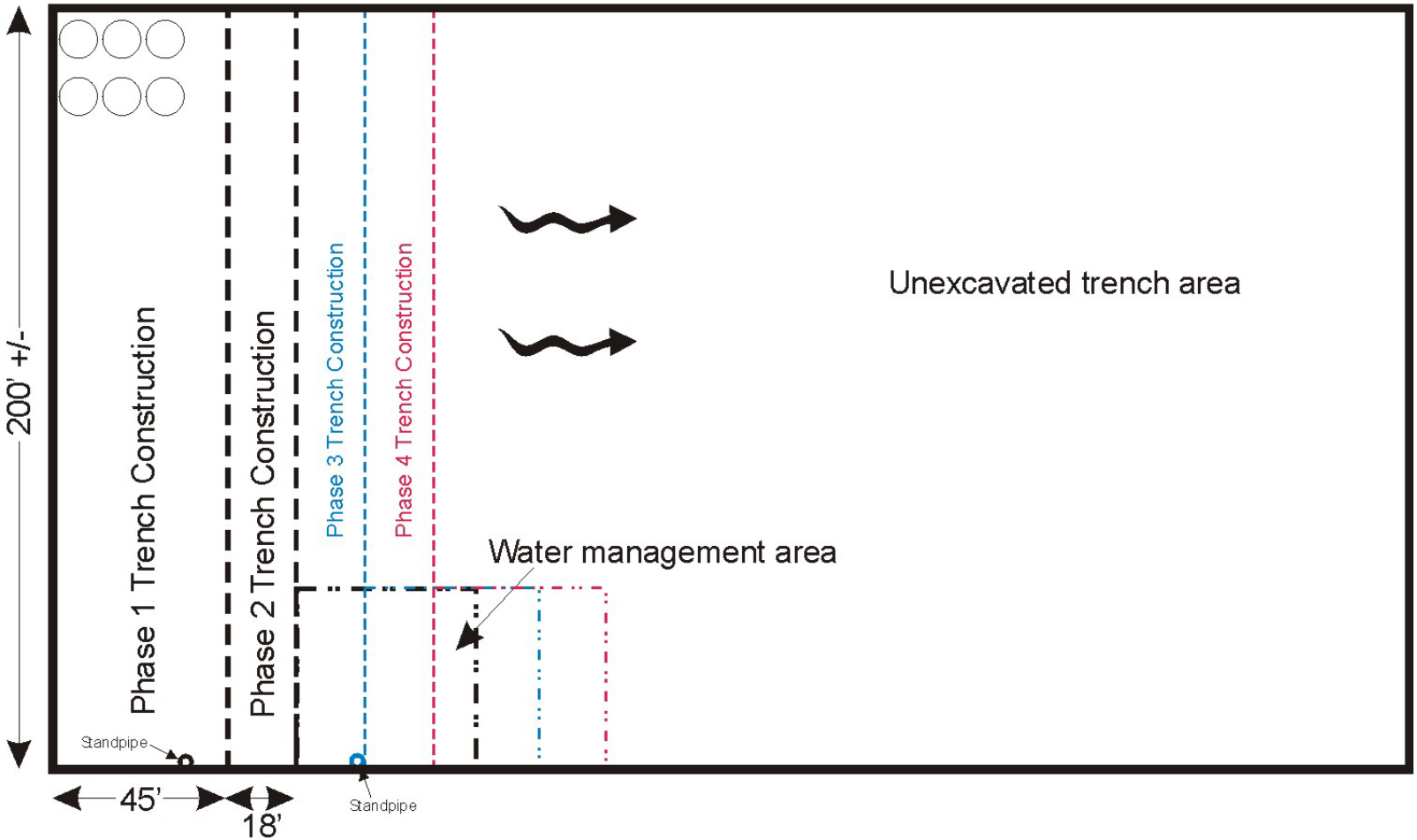


Figure 4.4-1

Class B/C Trench



Trench Option Comparisons

Parameter	Pre-Staged	Class A,B,C	Class B/C
Licensing Effort	High	Medium	Complete
Constructability	Potentially Difficult	Moderately Difficult	Already Established
Personnel Exposures	Potentially Low	Moderate	Low
Stormwater Management	Potentially Difficult	Potentially Low	Low
Enhanced Cap Costs	High	Low	Medium

Cost Comparisons for 300 Vaults

Parameter	Pre-Staged	Class A,B,C	Class B/C
Design Prep.	$42,000	Completed	Completed
Trench Walls	$30,046	$19,206	$37,308
Excavation	$29,444	$34,891	$43,600
Sand Install.	$72,685	$78,756	$129,968
Low Perm. Lay.	$10,000	$0	$0
Initial Cover	$18,617	$8,704	$7,243
Vault Costs	$1,820,100	$1,820,100	$1,820,100
Capping Costs	$116,000	$59,706	$81,882
Total Cost	$2,138,892	$2,021,363	$2,120,101

Atlantic Compact Volume Projections

- **High-end waste volume**
  - 11,344 cubic feet A/B/C 2008/2009
  - 7,500 cubic feet held waste 2008/2009
  - Large components
  - Hardware
- **Low-end waste volume**
  - Less than 4,000 cubic feet B/C only

Cost Scenarios Estimated

- **Institutional Costs for Completed Site Areas**
  - Site maintenance and monitoring
- **Operating Costs with No Waste Acceptance**
  - Disposal operating license maintenance
- **4,000 Cubic Feet Class B, C Only**
  - One trench, no hardware or components
- **11,000 Cubic Feet Class A, B, C**
  - One trench, no hardware or components

General Cost Estimating Assumptions

- Existing regulatory and license requirements
- Cost structure for all scenarios except institutional costs based on PSC application structure
- Labor and material costs based on FY 06-07 rates
- License fees and other reimbursable costs outside the control of site operator based on FY 06-07 rates
- Waste volume scenarios include costs of trench construction, disposal vaults, and license maintenance

Institutional Costs (Completed Portion of Site)

- Environmental monitoring
- Basic Site Maintenance
- Security
- Insurance
- Utilities and support
- License fees

Institutional Costs (Completed Portion of Site)

Category of Costs	Annual Estimate
Environmental Monitoring	$577,804
Site Maintenance	$192,917
Site Security	$176,936
Insurance	$477,443
Utilities, Accounting, etc.	$446,691
Site Operator Costs Total	$1,871,791
G&A and Margin (14%)	$530,137
License Fees	$215,362
Total Institutional Costs	$2,617,290

Operating License Costs (No Waste Accepted)

- Includes Institutional Costs
- Fixed Costs: building maintenance, additional license maintenance, limited equipment
- Variable Costs: none in this scenario
- Irregular Costs: monitoring well management
- Reimbursable Costs: Taxes and fees (pass-through costs)
- Statutory margin: allowed margin on fixed, variable, and irregular costs only

Operating License Costs (No Waste Accepted)

Category of Costs	Annual Estimate
Fixed Costs	$2,548,427
Variable Costs	$0
Irregular Costs	$49,000
Site Operator Costs Total	$2,597,427
Reimbursable Costs	$353,466
Statutory Margin	$753,254
Total Operating Costs	$3,704,147

In-Region Class B,C Only Scenario

- 4,000 cubic feet Class B,C waste
- Waste acceptance and active disposal operations two to three months per year
- One trench design for routine wastes
- Disposal of irradiated hardware and large components not included in cost estimates

4,000 Cubic Feet Class B,C Costs

- Includes institutional costs and other costs described for no waste scenario
- Fixed costs increased to support amount of waste received
- Variable costs proportional to amount of waste received including vault costs
- Irregular costs includes trench construction
- Increased reimbursable costs proportional to amount of waste received

4,000 Cubic Feet Class B,C Costs

Category of Costs	Annual Estimate
Fixed Costs	$3,862,618
Variable Costs	$215,858
Irregular Costs	$77,000
Site Operator Costs Total	$4,155,476
Statutory Margin	$1,205,088
Reimbursable Costs	$595,466
Total Operating Costs	$5,956,030

In-Region Class A,B,C Scenario

- 11,000 cubic feet Class A,B,C waste
- Waste acceptance throughout the year
- Disposal of waste when it is received
- One trench design for routine wastes
- Disposal of irradiated hardware and large components not included in cost estimates

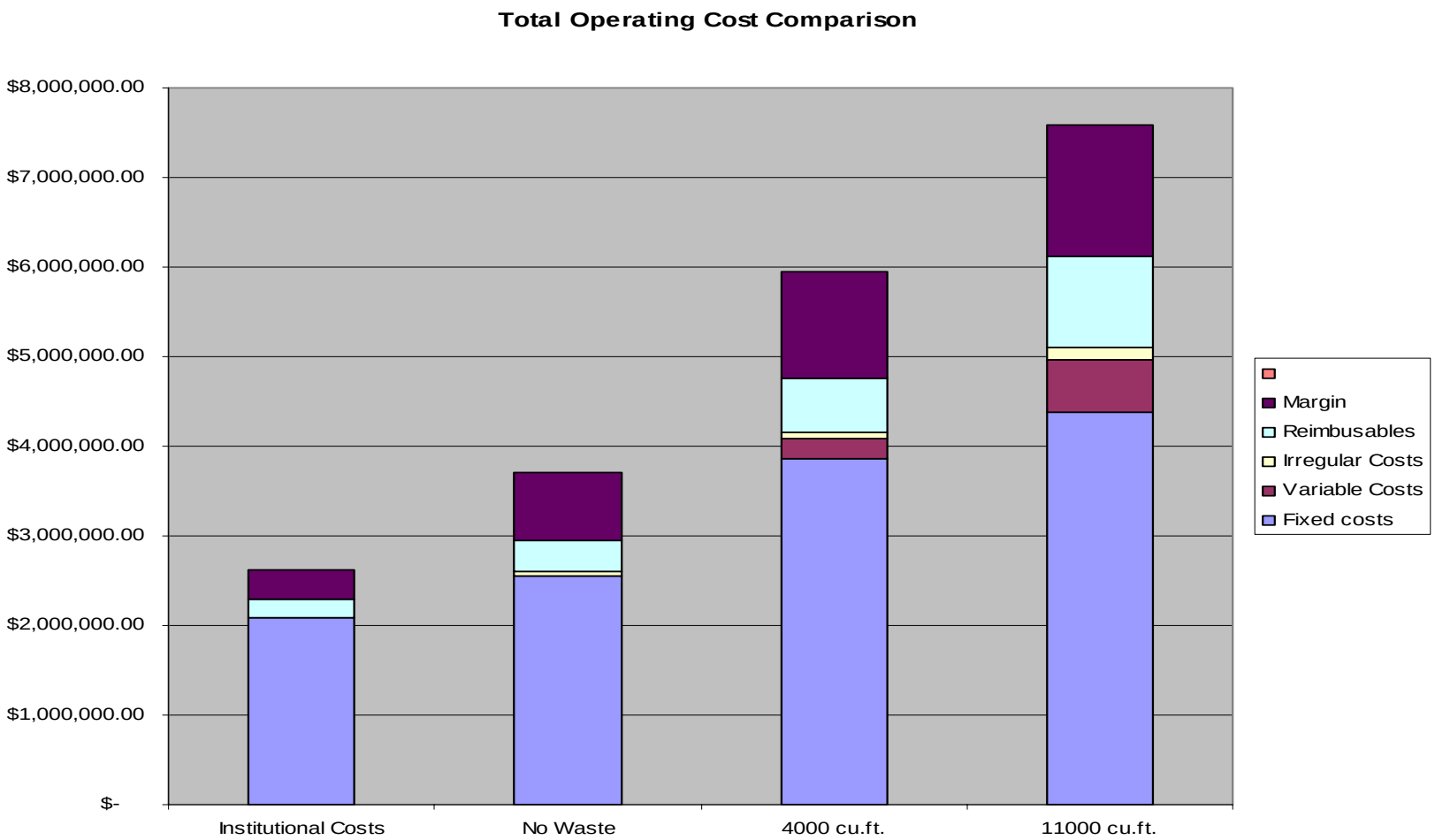
11,000 Cubic Feet Class A,B,C Costs

- Includes institutional costs and other costs described for no waste scenario
- Fixed costs increased to support amount of waste received
- Increased variable costs proportional to amount of waste received
- Additional irregular costs for trench construction and backfill
- Additional reimbursable costs proportional to amount of waste received

11,000 Cubic Feet Class A,B,C Costs

Category of Costs	Annual Estimate
Fixed Costs	$4,376,967
Variable Costs	$592,456
Irregular Costs	$126,000
Site Operator Costs Total	$5,095,423
Statutory Margin	$1,477,673
Reimbursable Costs	$1,018,966
Total Operating Costs	$7,592,062

Total Operating Cost Comparison



Summary Costs Table (in $000s)

Cost Category	Institutional Costs	No Waste	4,000 Cu. Ft.	11,000 Cu. Ft.
Fixed	$2,081	$2,548	$3,863	$4,377
Variable	0	0	$216	$592
Irregular	0	$49	$77	$126
Site Operator Costs Total	$2,081	$2,597	$4,156	$5,095
Margin	$321	$753	$1,205	$1,478
Reimbursable	$215	$353	$595	$1,019
Total Op Costs	$2,617	$3,704	$5,956	$7,592

Approximate Labor Resource Requirements

(FTE's – full time equivalents – not staffing levels)

Labor Categories	Institutional	No Waste	4,000 cu. ft.	11,000 cu. ft.
Management/Accounting/ Support Staff	2	2	3	5
Security	4	4	5	5
Environmental	6	7	7	7
Compliance & HP	1	3	4	5
Operations	1	3	5	7
Total	14	19	24	29

URS Conceptual Design Report
(October 4, 2007 Draft Report)

- Costs do not include license amendment, initial construction, vault procurement
- No allowance for training
- Appears most of the costs we call “Institutional Costs” are not included
- Part time, year-round operations appear impractical

Conclusions

- **Low volumes will require significant changes in waste acceptance and operating approach**
- **Completed Site Activities must continue, but should not be the burden of Atlantic Compact generators**
- **Transition Period to In-Region Operations**
  - 2 – 3 year time frame
  - Phase I closure activities and acceptance
  - Continued use of existing trenches
  - Held waste receipt and disposal
  - Procedure revisions and approvals
- **It appears that existing disposal pricing with sufficient waste volume could cover the direct costs of In-Region Operations disposal**