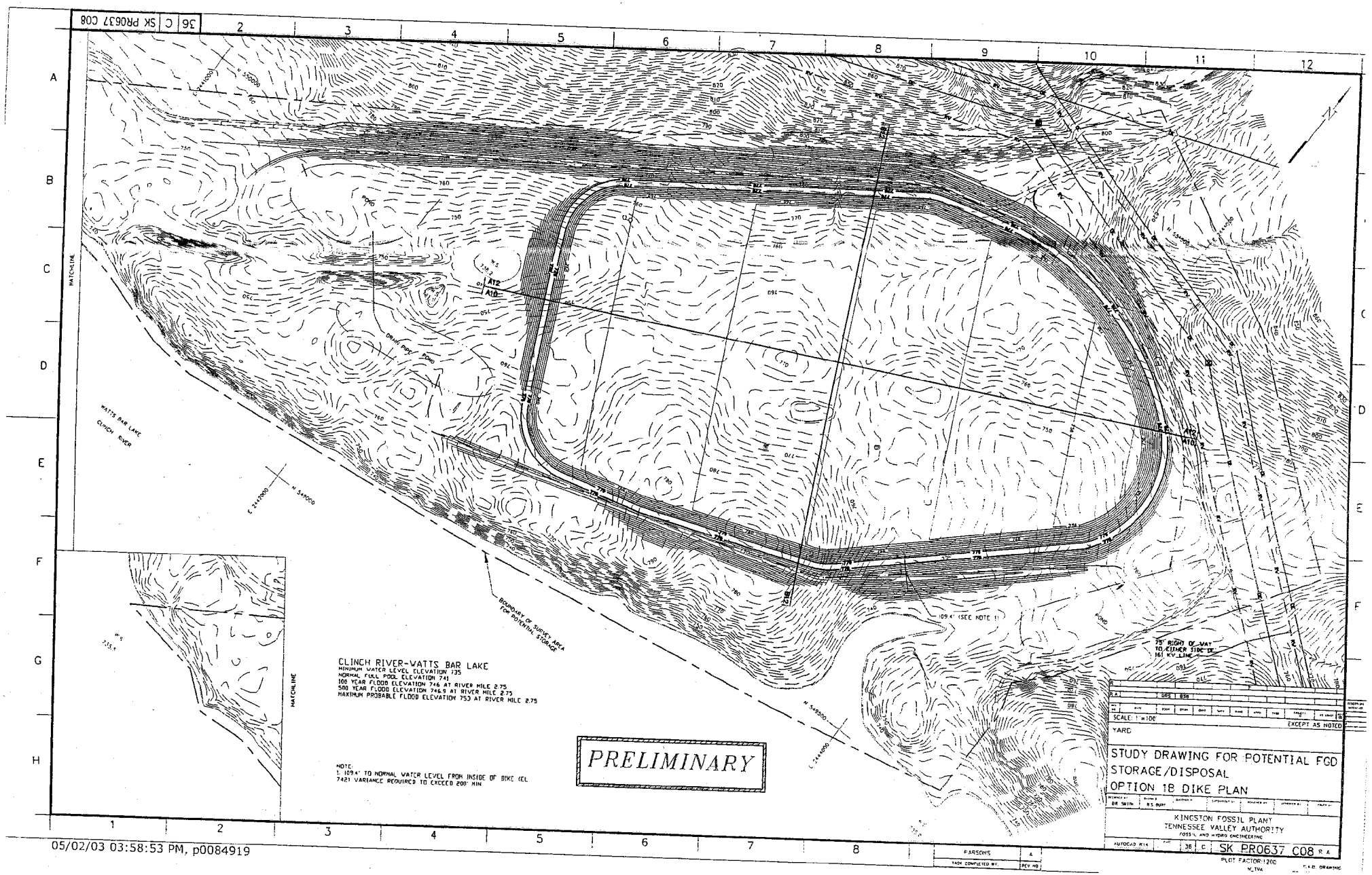

36 | C | SK PR0637 C08

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Kingston Fossil Plant - Summary of Gypsum Disposal Options

	DESCRIPTION	POTENTIAL VOLUME[1] (million cy)	SITE PREP COSTS[6,7] (1000$)	COSTS PER CUBIC YARD	PERMITTING ISSUES	ADVANTAGES	DISADVANTAGES
1A	New facility located in greenfield site at the peninsula area	3:1 Slope: 9.3 4:1 slope: 7.5	$9,400[2,4]	▪ $ 1.01 For 3:1 ▪ $ 1.25 For 4:1	▪ Karst geology makes permitting complex but not impossible. Will require individual 404 permit	▪ Adds additional disposal capacity to plant. ▪ Can be permitted now but may not be permit able in the future.	▪ Unknown extent of soft soil layer may reduce stack height and volume; foundation drain beneath liner may be required. ▪ May have major opposition from lakefront home owners
1B	New facility located in greenfield site at the peninsula area – reduced footprint	3:1 Slope: 7.0 4:1 slope: Not computed	$7,400[2,4]	▪ $ 1.06 for 3:1	▪ Avoids 404 permitting issue.	▪ Adds additional disposal capacity to plant ▪ Smaller footprint may offset disadvantages associated with underlying soft soils. ▪ Avoids 404 Permit.	▪ Unknown extent of soft soil layer may reduce stack height and volume; foundation drain beneath liner may be required. ▪ Smaller footprint sacrifices about 30% volume compared with 1A.
2A	Gypsum stack segregated from ash stack; gypsum co-located with ash disposal in existing ash pond – conversion to dry ash	3:1 Slope: 12.1 4:1 slope: 9.8	$25,000[3,5]	▪ $ 2.07 for 3:1 ▪ $ 2.55 for 4:1	▪ Will require a major permit modification with full permit package but will not require a full HydroGeo report.	▪ Site is favorable for wet stacking. ▪ Disposal volume is greater than either Option 1A or 1B. . ▪ Should be easy to permit.	▪ Does not add disposal capacity to plant. ▪ Additional costs required for dry stacking ash.
2B	Gypsum stack and ash stack combined; gypsum co-located with ash disposal in existing ash pond – conversion to dry ash	3:1 Slope: 18.7 4:1 slope: 15.2	$23,000[3,5]	▪ $ 1.23 for 3:1 ▪ $ 1.51 for 4:1	▪ Same as 2A.	▪ Offers the largest potential for disposal volume. ▪ Site is favorable for wet stacking. ▪ Should be easy to permit.	▪ Does not add disposal capacity to plant. ▪ Additional costs required for dry stacking ash.
3A	Gypsum stack segregated from ash stack; gypsum co-located with ash disposal in existing ash pond – continue wet ash stacking	3:1 Slope: 12.1 4:1 slope: 9.8	$25,000[3,5]	▪ $ 2.07 for 3:1 ▪ $ 2.55 for 4:1	▪ Same as 2A.	▪ Site is favorable for wet stacking. ▪ Disposal volume is greater than either Option 1A or 1B. ▪ Should be easy to permit.	▪ Does not add disposal capacity to plant. ▪ Labor intensive.
3B	Gypsum stack and ash stack combined; gypsum co-located with ash disposal in existing ash pond – continue wet ash stacking	3:1 Slope: 18.7 4:1 slope: 15.2	$23,000[3,5]	▪ $ 1.23 for 3:1 ▪ $ 1.51 for 4:1	▪ Same as 2A.	▪ Offers the largest potential for disposal volume. ▪ Site is favorable for wet stacking. ▪ Should be easy to permit.	▪ Does not add disposal capacity to plant. ▪ Labor intensive

Footnotes: (see next page)

FGD DISPOSAL UPDATE
MAY 6, 2003

I. Marketing Overview – Cherie Miller

II. Plant by Plant Update – Larry Bowers

- A. COF
- B. BRF
- C. KIF

III. KIF – Dry Fly Ash Conversion – Missy Hedgecoth

KINGSTON FOSSIL PLANT

- **RECOMMENDATION**
- **Continue to refine costs of all options.**

KINGSTON FOSSIL PLANT

- ***MAJOR UNCERTAINIES FOR BOTH SITES***
- **Cost Of Pond Under Drain System**
- **Cost Of Karst Mitigation At The Peninsula**
- **Cost Of Soft Soil Mitigation At The Peninsula**
- **What Height And Side Slope Combination Will Meet Earthquake Stability Requirements At Either Site?**
- **Economics Of Dry Fly Ash Conversion**

KINGSTON FOSSIL PLANT

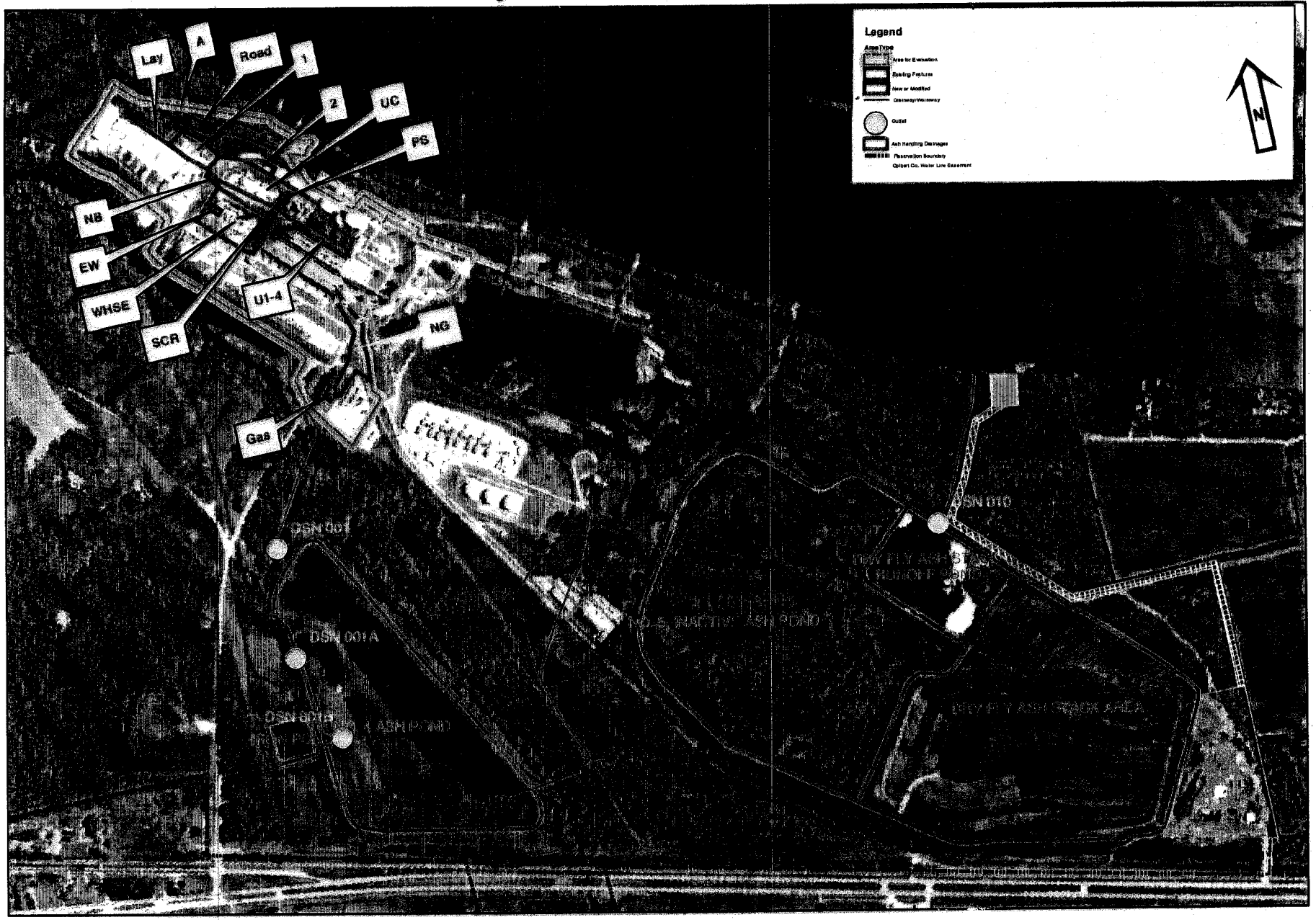
- **POND AREA OPTIONS**
- ADVANTAGES
- Should Be A Less Contentious Permitting Exercise (some opposition is likely)
- Allows For A Consolidated Disposal Operation
- Will Be Less Costly to Permit.
- DISADVANTAGES
- Utilizes Air Space That Would Eventually Be Used For Fly Ash.
- Depending on the Option Selected, May Be More Operationally Complex

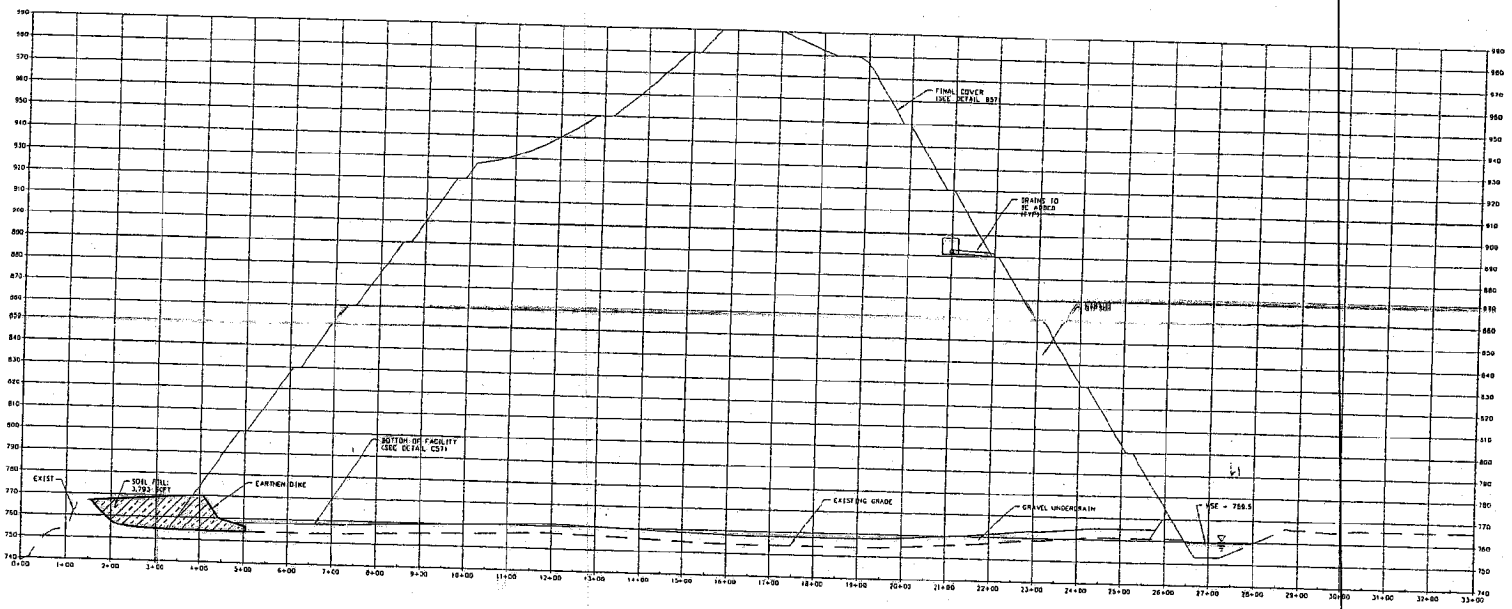
KINGSTON FOSSIL PLANT

- **PENNINSULA AREA**
- ADVANTAGES
- Adds To The Overall Disposal Capacity Of The Plant
- Can Be Permitted Now; May Not Be Possible To Permit Later.
- Does Not Impact Current Ash Handing Operation.
- DISADVANTAGES
- May Be A Very Contentious Permitting Exercise.
- Requires Both State and Federal Permits
- Disturbs a Very Nice Area of the Plant
- Requires Operation Of A Remote Disposal Area
- Will require extensive site investigation and may require Sink Hole Mitigation

Colbert Borrow Area #1
Colbert Softball Field Borrow Area #2

Figure 4 Colbert NOx Removal Footprint





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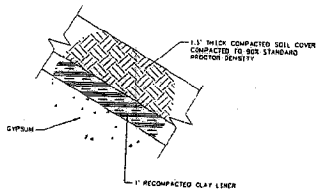

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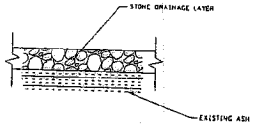

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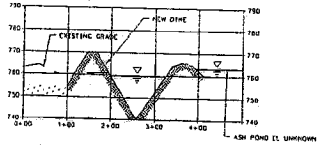

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PRELIMINARY

SCALE: 1"=100 EXCEPT AS NOTED

YARD

STUDY DRAWING FOR POTENTIAL FGD STORAGE/DISPOSAL - FINAL COVER OPTION 3A - CROSSECTIONS

KINGSTON FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | 36 | C | SK PR0637 C57 | R A

PLOT FACTOR:1200

PARSONS

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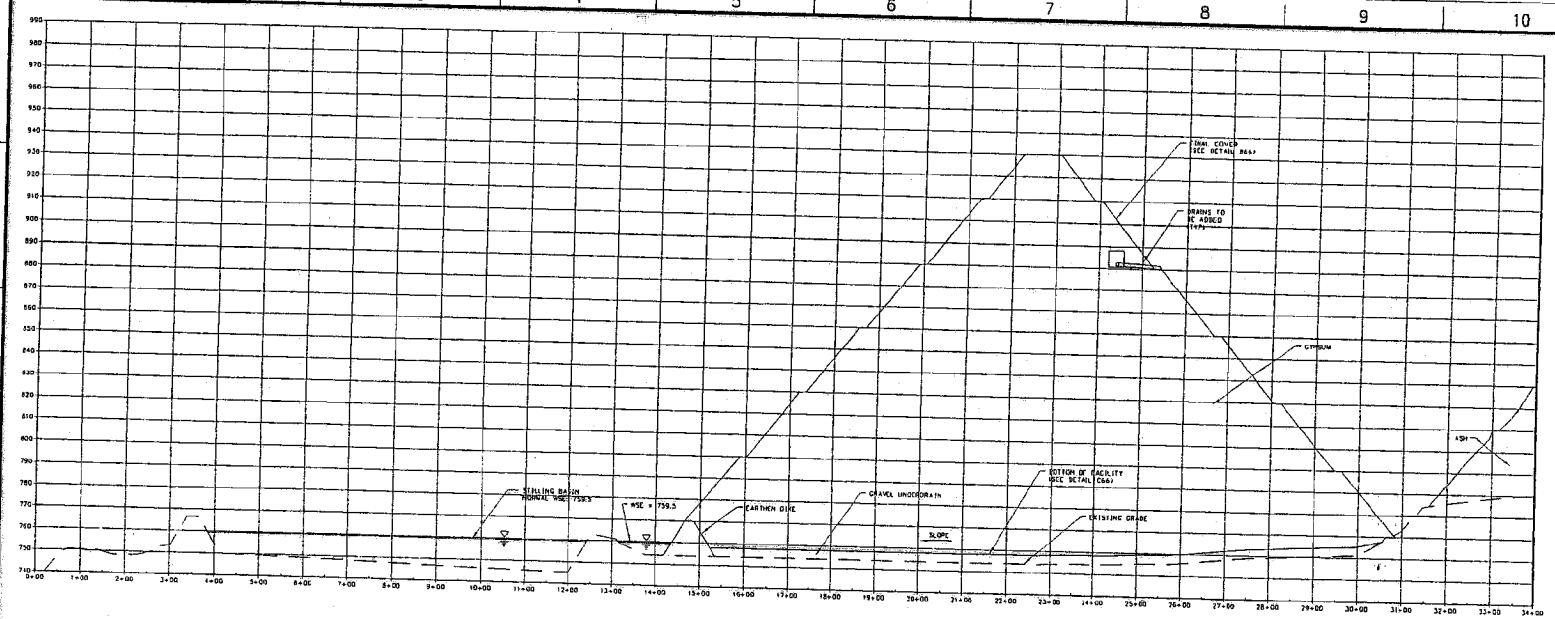

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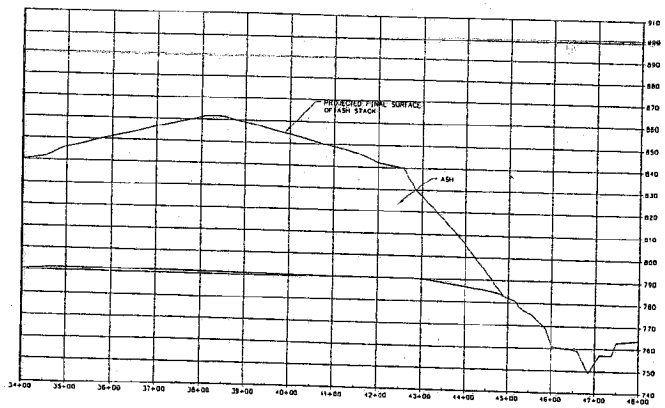

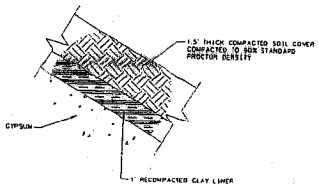

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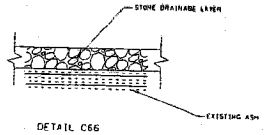

DETAIL C66

PRELIMINARY

SCALE: 1" = 100' EXCEPT AS NOTED

YARD

STUDY DRAWING FOR POTENTIAL FGD STORAGE/DISPOSAL - FINAL COVER OPT 3A - 4:1 SLOPE - CROSSECTIONS

KINGSTON FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | 36 | C | SK PR0637 C66 R A

PLOT FACTOR=1.000

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PARSONS | A

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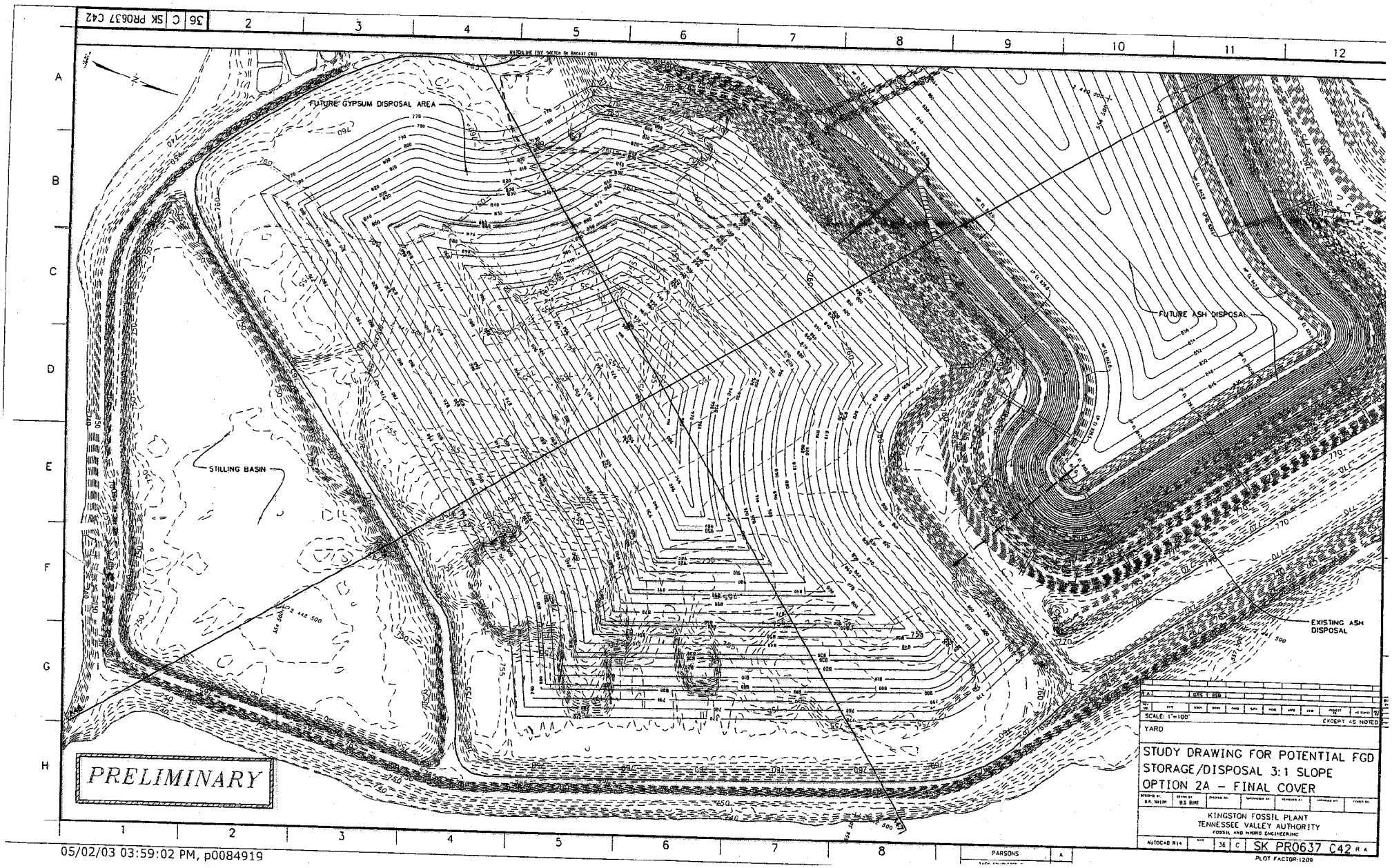

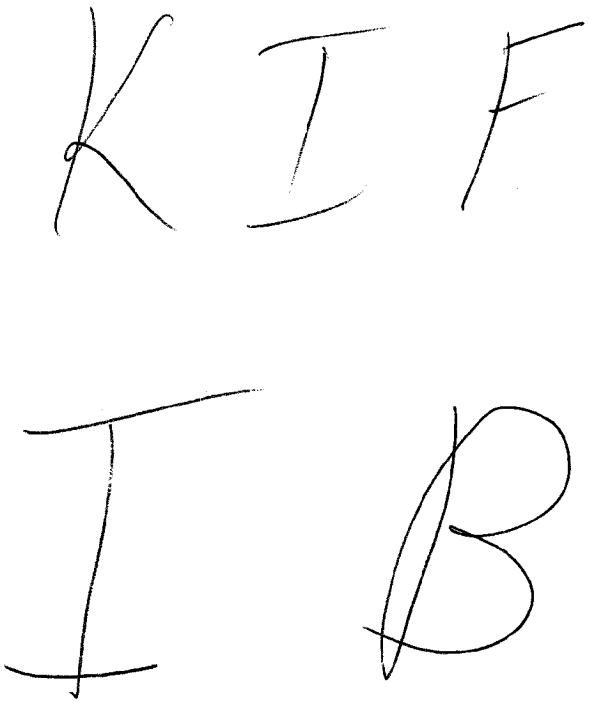

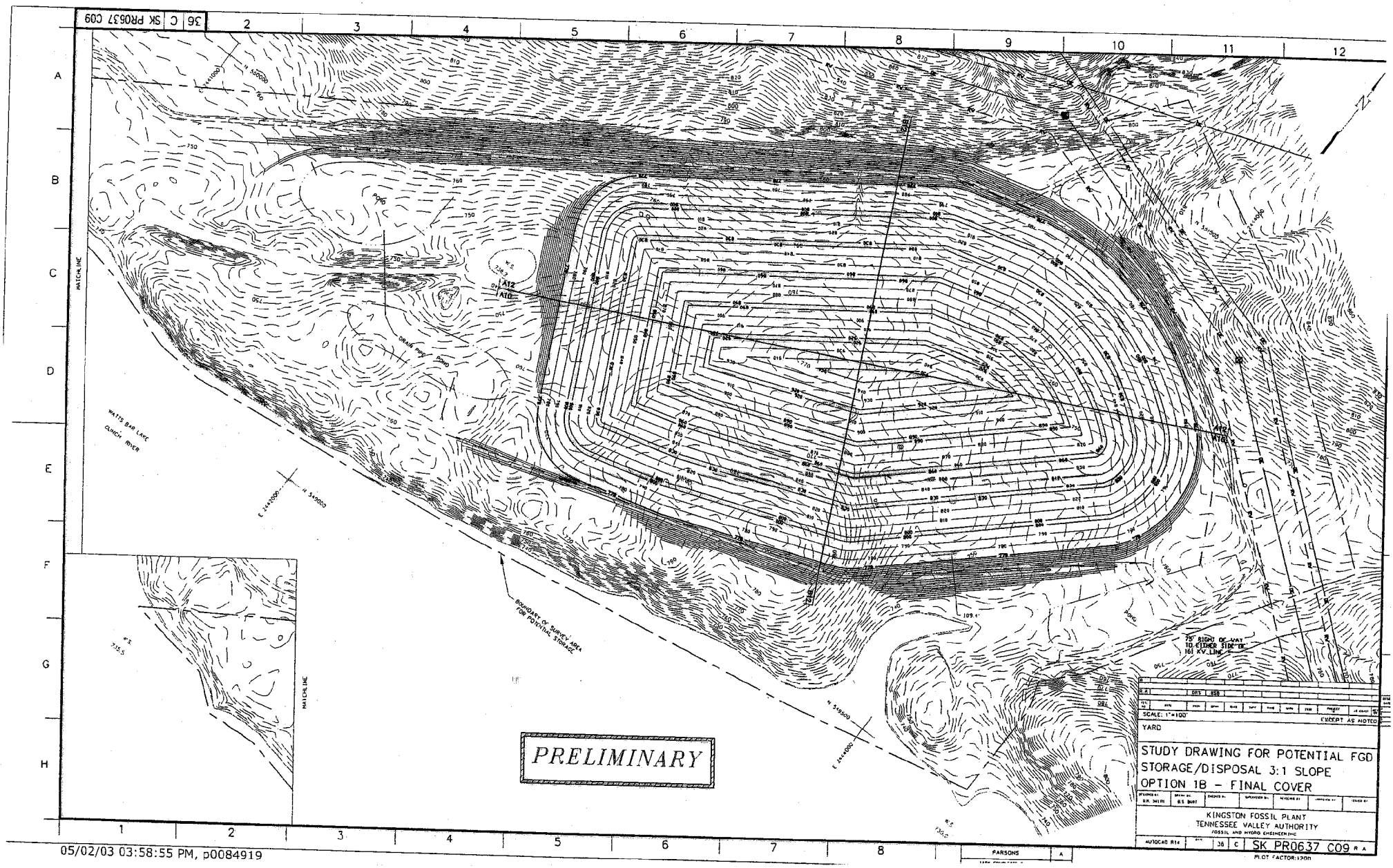

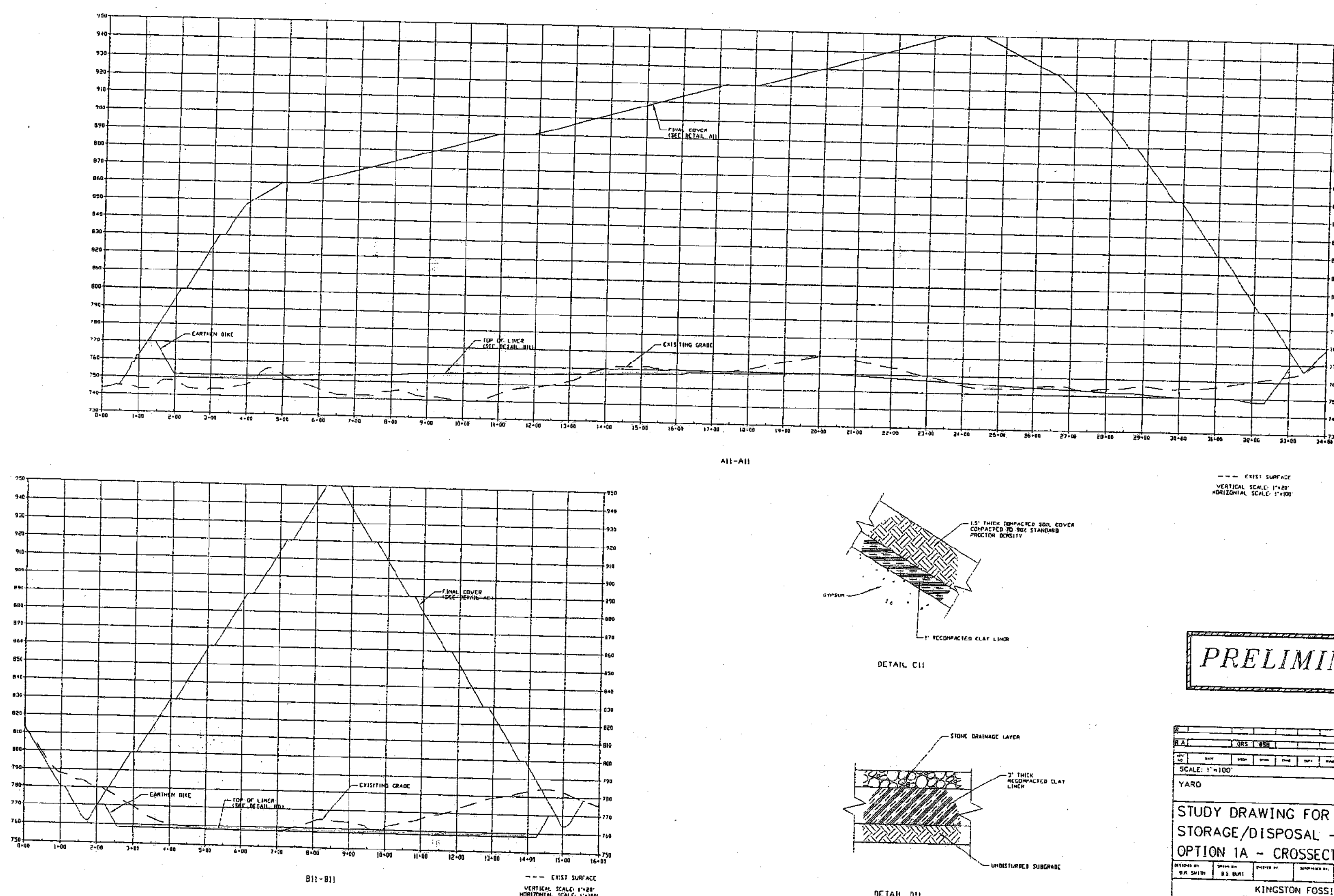

PRELIMINARY

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YARD

STUDY DRAWING FOR POTENTIAL FGD STORAGE/DISPOSAL - FINAL COVER OPTION 1A - CROSSECTIONS 3:1 SLOPE

KINGSTON FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | 36 | C | SK PR0637 C11 | R A

PARSONS

36 C SK PR0637 C11

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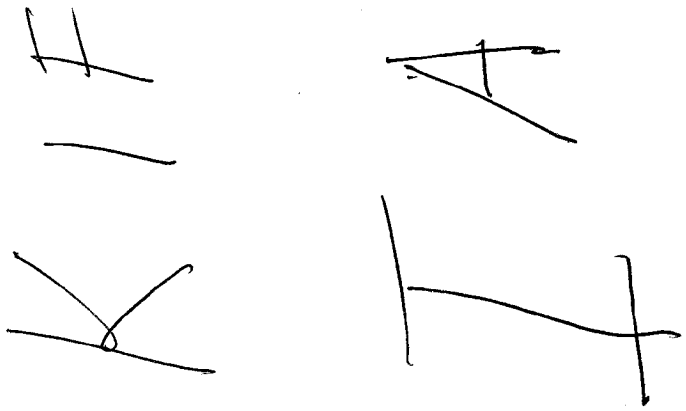
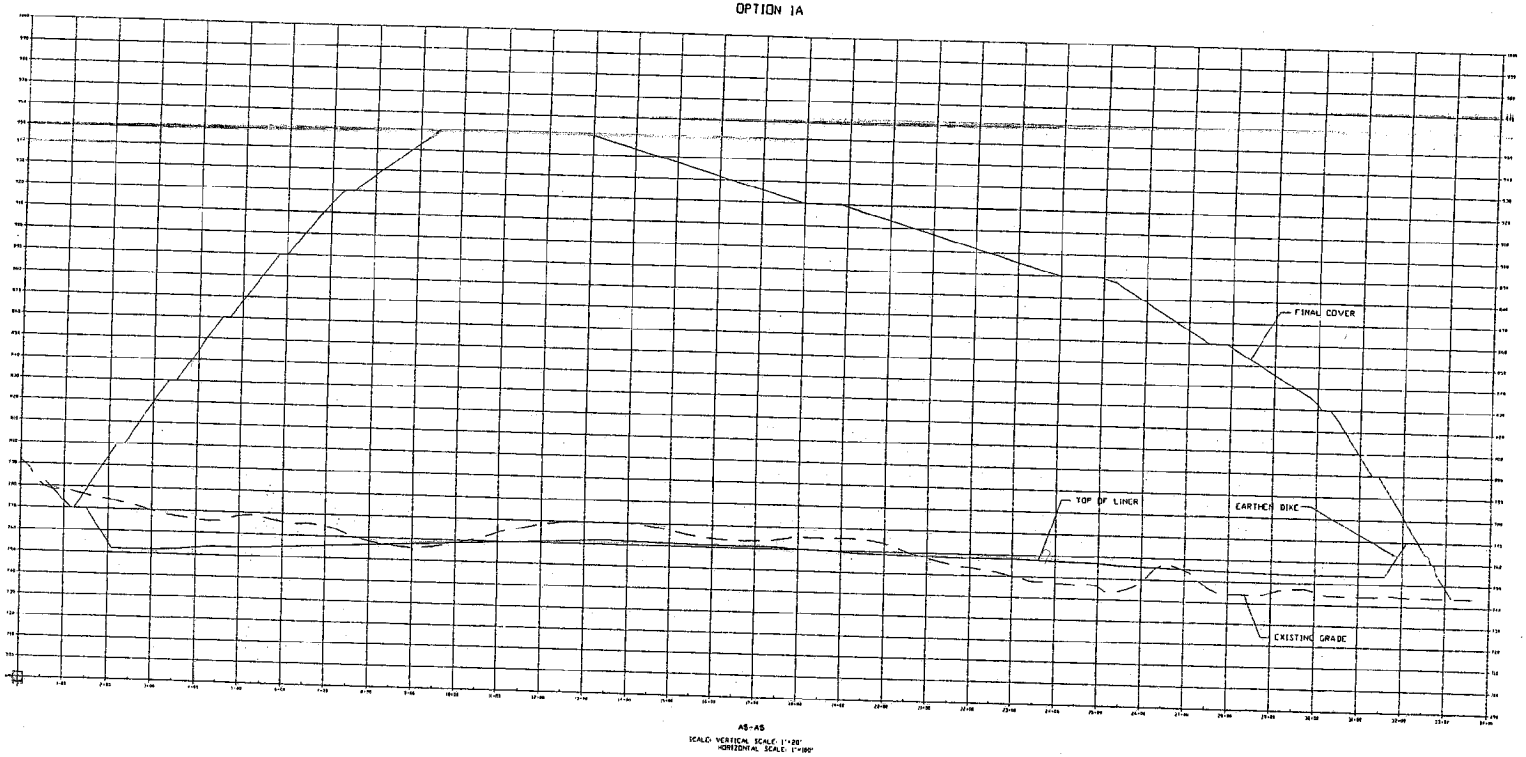


OPTION 1A



A-A
SCALE: VERTICAL SCALE: 1"=20'
HORIZONTAL SCALE: 1"=100'

PRELIMINARY

SCALE: 1"=100'
EXCEPT AS NOTED
YARD

STUDY DRAWING FOR POTENTIAL FGD
STORAGE/DISPOSAL 3:1 SLOPE
OPTION 1A – CROSS SECTION

KINGSTON FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | 36 | C | SK PR0637 C05 R A

PLOT FACTOR:1200

PARSONS
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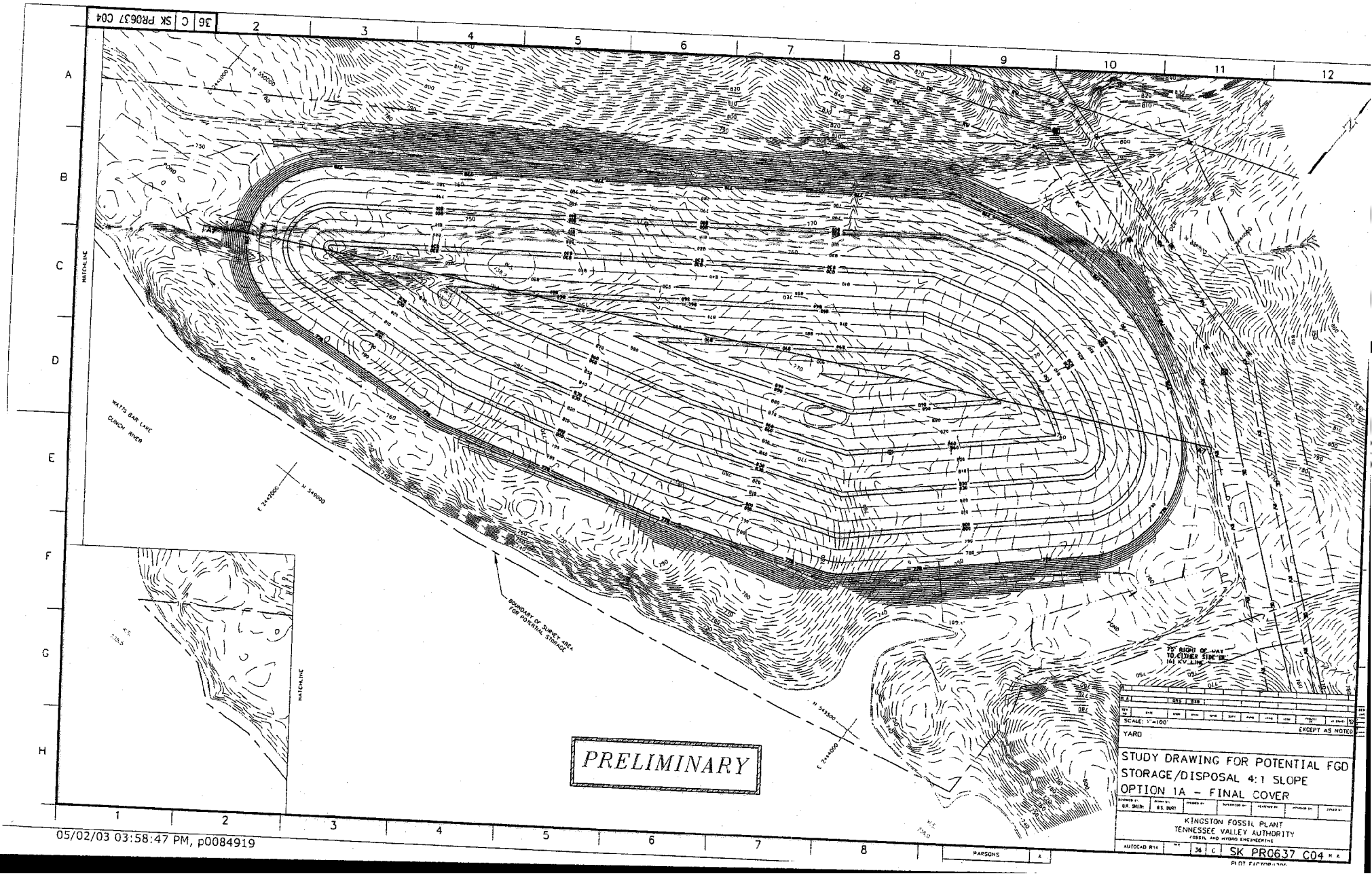
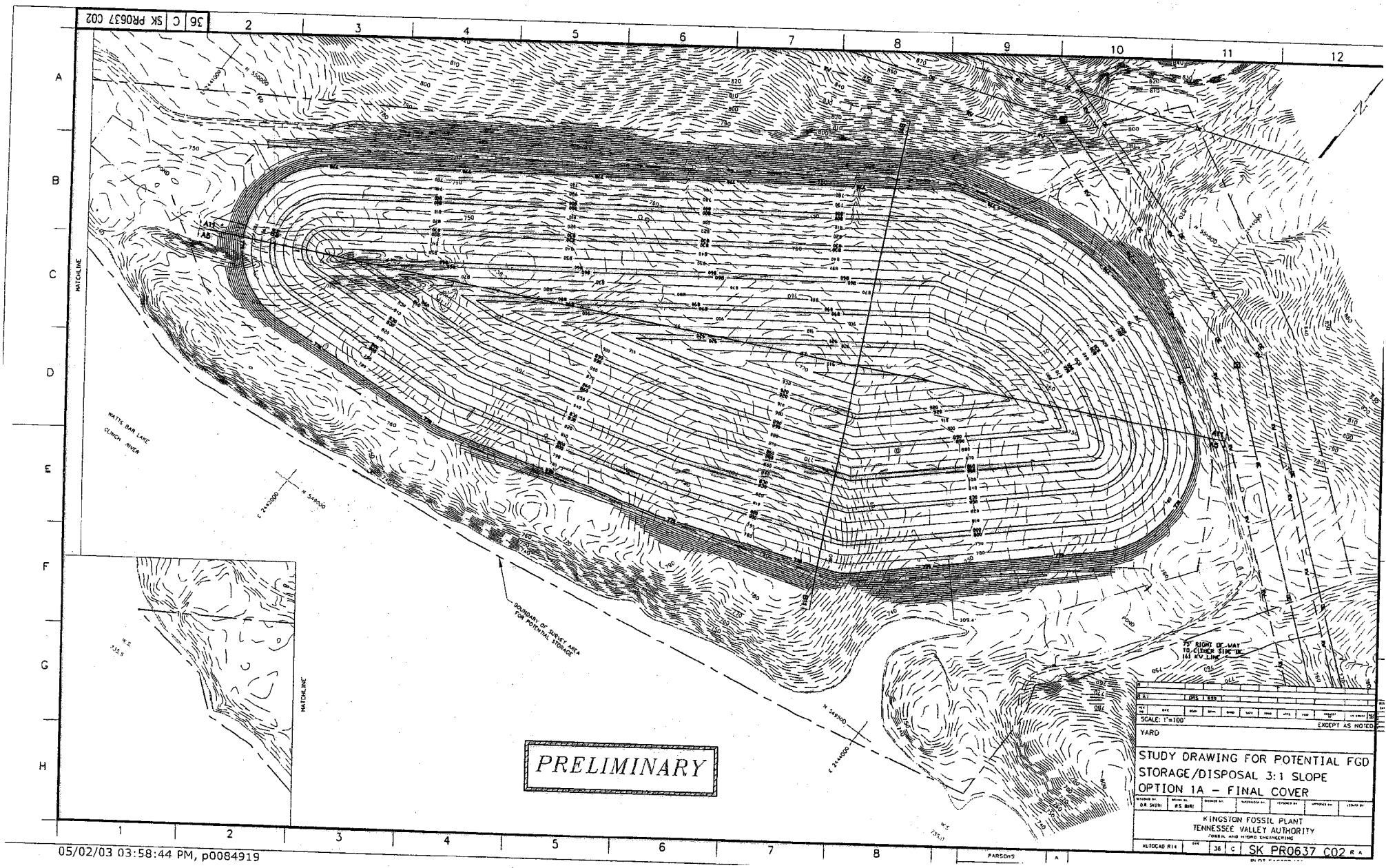
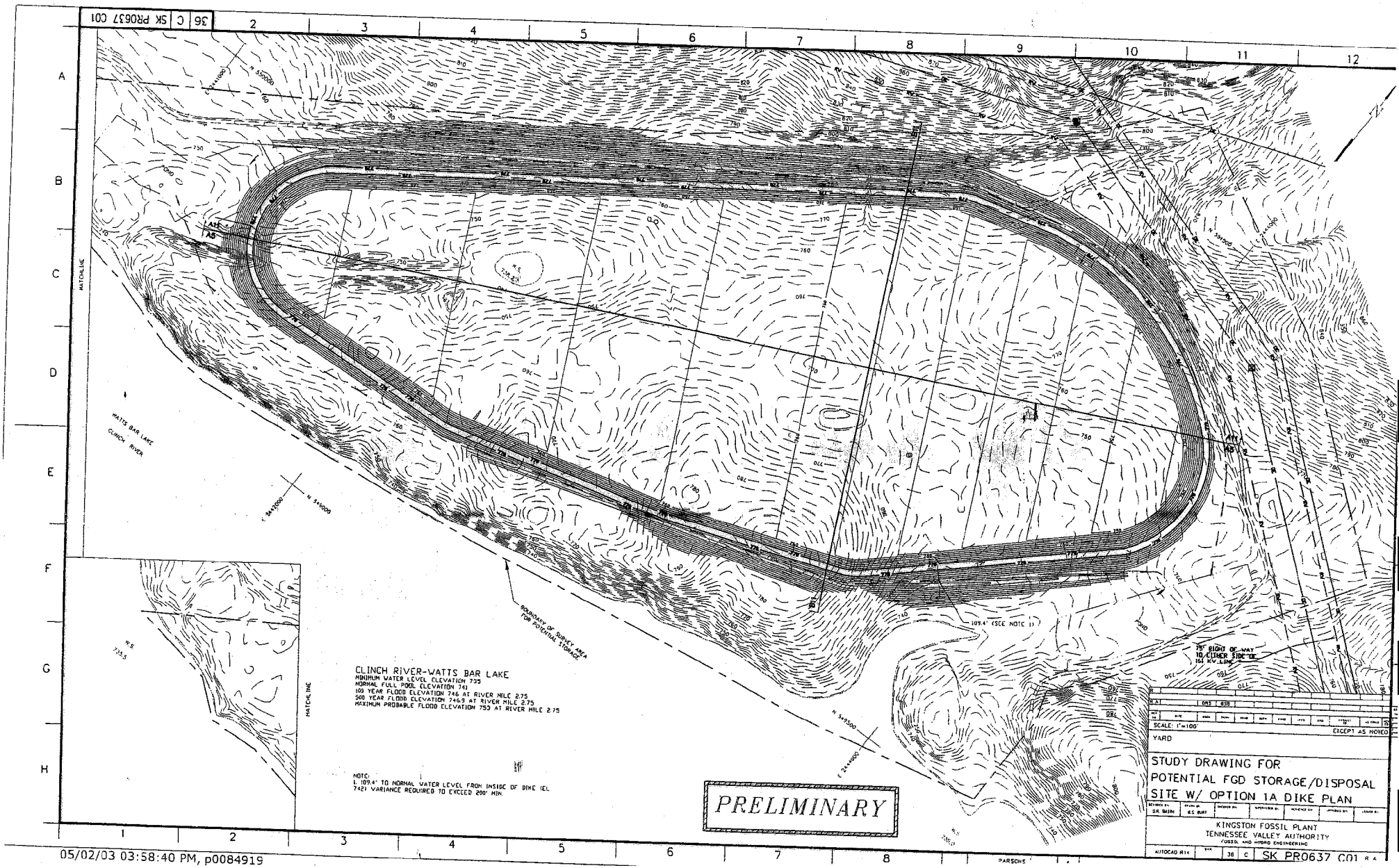


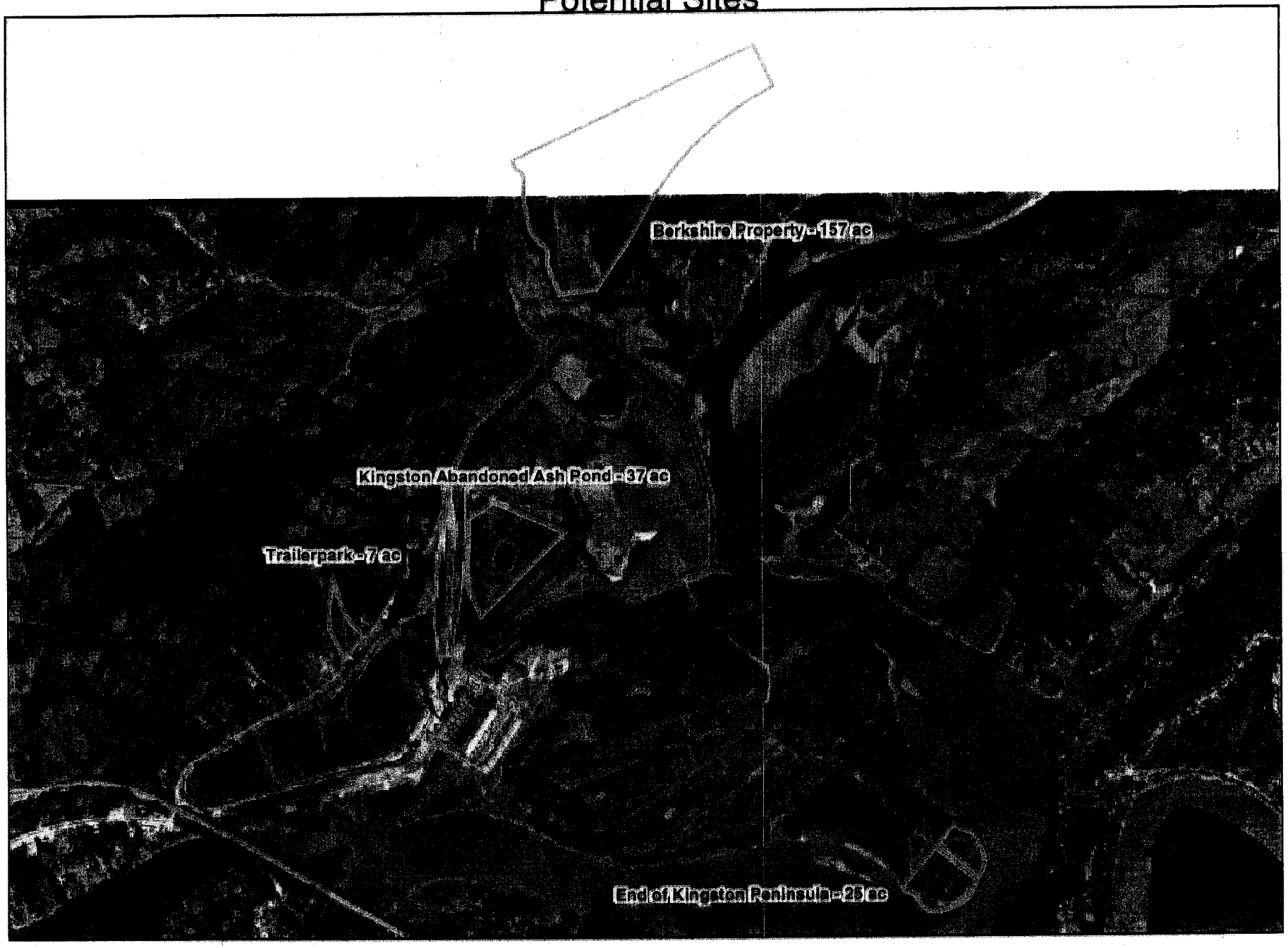




Footnotes

1. Volume is measured in cubic yards. Gypsum production estimates are measured in tons. A density of 1 ton/cy (approx 75 lb/cf) is assumed for the study.
2. Costs for Options 1A and 1B do not include a foundation drain beneath the facility liner.
3. Costs for Options 2A,2B, 3A,3B include costs for a 4 foot thick underdrain installed beneath the gypsum (installed at CUF). This represents a significant cost difference (about 20% of the total). Detailed design can address the appropriate size of the underdrain.
4. Additional costs for addressing karst issues are unknown.
5. Due to similarity between Options 2 and 3, costs developed for Option 2 are essentially the same for Option 3.
6. Costs don't include drainage features built into the stack as it develops. Closure costs are also excluded. The cost of dry flash conversion is not included with the costs of 2A& 2B.
7. **IT IS HIGHLY PROBABLE THAT THE COSTS FOR THE POND OPTIONS CAN BE REDUCED CONSIDERABLELY.**

Potential Sites



Legend

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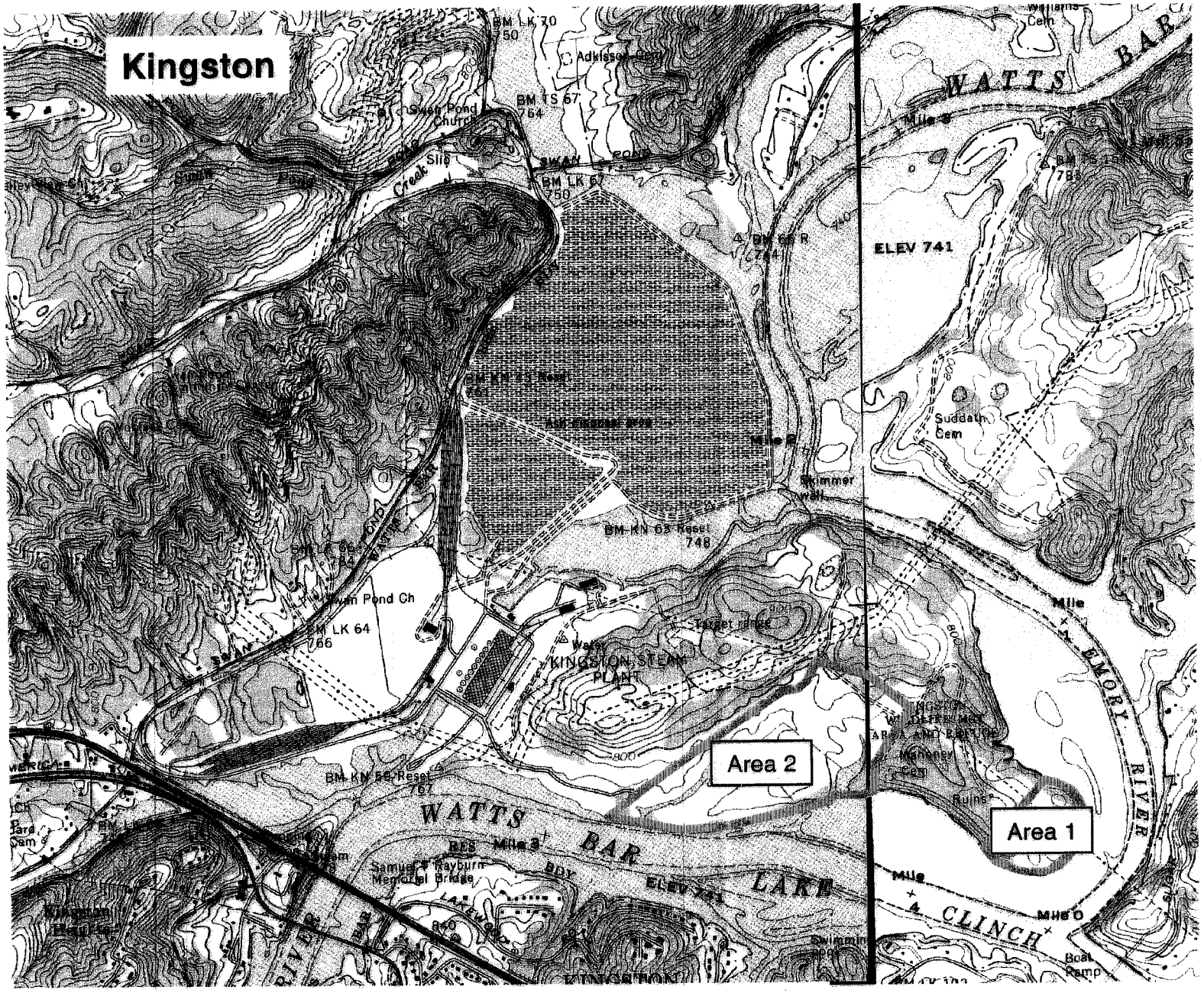

KIF

Site Locations