CLINCH RIVER

BREEDER REACTOR PLANT

DOE/TVA/PMC

SITE REDRESS PLANNING

TASK FORCE REPORT

JANUARY 1984

TABLE OF CONTENTS

SUMMARY AND CONCLUSIONS

The CRBRP Redress Planning Task Force conducted preliminary evaluations of site use and redress options and reached the following conclusions:

A. No specific near term use of the site was identified.

B. General industrial development of the site is the use most likely to occur.

C. Site redress activities should be designed to enhance potential development of the site for industrial use.

D. Completion of the previously designed barge unloading facility, railroad spur, and sewage treatment plants would not be cost-effective at this time and should not be included in the final redress plan.

E. Final redress plan development and implementation should achieve an environmentally stable site which should not require further monitoring or site maintenance.

F. DOE and TVA should continue to exchange information pertaining to specifics of the site redress plan to ensure that mutual interests are preserved.

G. Conceptual alternative 2 is preferred because it achieves the most favorable balance between construction costs and the potential for industrial development while accomodating satisfactory compliance with NRC requirements.

1.0 INTRODUCTION

1.1 Purpose and Objectives

The purpose of this report is to provide a description of the conceptual alternatives and site redress recommendations developed by the Site Redress Planning Task Force.

To assist in developing the site redress plan, the DOE CRBRP Project Director established a joint DOE, TVA, PMC Redress Planning Task Force. The objectives of this joint task force are to:

A. develop site redress planning concepts that comply fully with NRC requirements and, as determined by DOE and TVA, taking into account the site's potential for industrial use;

B. develop site redress planning concepts that achieve an appropriate balance between maintaining the site in an environmentally acceptable condition and that maximize development parameters that increase the feasibility of generic types of industrial uses;

C. identify facility concepts, if any, feasible in the near term, and to identify specific redress activities which may be compatible with such possible use; and

D. present the two or three most realizable alternatives at a joint DOE/TVA meeting and recommend a preferred conceptual alternative to be included in the development of the final site redress plan.

2.0 SITE HISTORY AND DESCRIPTION

2.1 Site History

The CRBRP site is located on a peninsula formed by the Clinch River approximately two miles upstream of the Highway 58 crossing of the river (Gallaher Bridge) in Roane County. The site is on a 1,346 acre tract of land owned by the Federal Government in the custody of TVA. The site area is typical East Tennessee ridges and valleys. TVA granted a right of entry in August 1982 to DOE-CRBRP to about 600 acres of the tract to begin site preparation activities authorized by the Nuclear Regulary Commission (NRC).

The Constructor for the CRBRP, Stone & Webster Engineering Corporation (SWEC), started site preparation and excavation work in September 1982. Work authorized by the NRC included:

. Excavation and backfill

- Non-safety related permanent improvements including a site access road, railroad spur to site, barge unloading facility, sewage treatment plant, and water line

- Construction support facilities including roads, parking areas, quarry, buildings, fire protection system, electric power, concrete batch plant.

Site preparation and excavation and the start of the construction support facilities was curtailed on October 28, 1983. During the thirteen months of work, the following was accomplished:

- About 240 acres of the site was cleared and grubbed. This includes not only the main plant area and contiguous laydown areas but also the access road, areas for spoil and a portion of the remote quarry area.

- About 1.5 million cubic yards of overburden was excavated. The overburden, a cohesive soil, was placed in structural fill, designated random fill, or was spoiled due to organic content, high moisture content or other unsuitable conditions.

- About 1.5 million cubic yards of rock was excavated in the Nuclear Island (NI) excavation and from two main ridges. Most of the rock (limestone and siltstone) was crushed to a three inch maximum size and placed in Class B structural fills.

- The permanent access road was completed through the top of subgrade. Subsequent to curtailment of construction twelve inches of crushed limestone aggregate was placed on the access road to provide an all-weather surface for continuing access to the site. The on-site portion of the railroad embankment, contiguous to the access road, was completed.

- An eight-inch water line from DOE's Bear Creek Filtration Plant off-site was completed to road station 50+00 (approximately 6450 feet).

- A construction power substation was completed by TVA taking power from the Ft. Loudoun-K31 161 KV transmission line and providing 25 KVA of 13.8 KV power. SWEC completed approximately 2,000 feet of underground distribution to two construction substations.

- Four pre-engineered metal buildings from 4,000-5,000 square feet were erected.

- A concrete ringer crane pad, appoximately 80 feet by 80 feet, was constructed on the east side of the NI excavation at elevation 814.

- A dual concrete batch plant capable of producing 250 cubic yards per hour was erected and put into operation.

The authorized site preparation activities not initiated were deferred because of limited funding.

2.2 Site Description

The site consists of an all-weather access road of approximately 6500 feet from a public road (Bear Creek Road) to the plant area and the following relatively level, stabilized areas:

The Craft Parking Lot at average elevation of 836 (14 acres)

Plant and laydown areas at average elevation of 810 (20 acres)

Other level areas at lower elevations (10 acres)

Within and contiguous to the plant area are the Nuclear Island (NI) excavation, the normal cooling tower (NCT) excavation and the emergency cooling tower (ECT) excavation which, with their side slopes projected to plant area elevations of 810, total 24 acres. See attached Sketch 1.

Non-topographic features of the site, besides the all-weather access road, include the 8-inch water line to road station 50+00, approximately 2000 feet of underground power distribution, four pre-engineered metal buildings, concrete batch plant, construction power substation, and the concrete ringer crane pad.

3.0 ENVIRONMENTAL AND REGULATORY REQUIREMENTS

3.1 DOE Committed To Redress The Site.

On November 30, 1981, the Applicants (DOE, PMC and TVA) submitted a request to the Nuclear Regulatory Commission (NRC) for authorization under 10 CFR 50.12 to conduct site preparation activities prior to issuance of a Limited Work Authorization. In response to questions contained in a NRC Commission Order of December 24, 1981, the Applicants committed to redress impacts resulting from site preparation if a construction permit was not granted (reference 1, p. 11,12). The applicants redress plan contemplated backfilling and compacting the excavations for permanent plant facilities and other depressions within the construction area (ref. 1, p. 81-83). Grading to facilitate drainage would leave the site in a condition most compatible with intended future industrial development whereas redress of the site to its original contours (full redress) would be inconsistent with future industrial use (ref. 1, pg. 84).

The Commission's authorization acknowledged the Applicants' and Staff's statements that the site could be substantially returned to its original condition, but that the site is zoned for industrial use and full redress may not be necessary to minimize environmental impact(reference 2, p. 20,21).

The Applicants have committed to develop an appropriate plan for site redress and seek review and approval from the NRC Staff (ref. 3, p.6). Furthermore, the Applicants would not object to the Atomic Safety and Licensing Board (ASLB) formalizing such an obligation in an ASLB Order. It is DOE's intent to satisfy the conditions of the Licensing Agreement (ref. 4, p. 4, par. 5) between TVA and DOE which require that the CRBRP site be appropriately restored.

3.2 Applicable Permit and Regulatory Approvals

The CRBRP Project Office developed a matrix to identify all non-NRC permits and approvals in effect at the time of termination (Appendix A). Four permits and approvals will be maintained in an active status during the site redress phase. These permits and approvals will be terminated in accordance with the schedule indicated on the permit and approval matrix. The permits and approvals which will be required during site redress are listed below.

- US EPA NPDES permit No. TN 0028801 - authorization to discharge into the waters of the U.S.
- Federal Aviation Administration - Permit for structures over 200 feet
- Federal Communications Commission - Frequency authorization for construction phase radios
- State of Tennessee - CWA Section 401 Certification of the NPDES permit

The proposed permit and approval plan (Appendix A) is contingent upon securing approval from the appropriate regulatory agency. Site redress evaluation further assumes that there will be no significant adverse impact upon: 1) archaeological and historical significant areas; 2) flood plains or wetlands; 3) rare or unusual species; 4) navigable waters; 5) air quality; and 6) easements controlled by other agencies.

The permit and approval matrix provides a schedule for terminating the permits and approvals which will not be required for site redress.

3.3 NRC Environmental Measures and Controls

The NRC environmental requirements during CRBRP Plant construction are contained in NURG-0139 "Supplement to Final Environmental Statement" (SFES) (ref. 5). The environmental control measures contained in the SFES primarily restate criteria contained in non-NRC permits and approvals identified in Appendix A. Specific NRC criteria contained in the SFES Section 4.6.1.1 which address additional conditions which could be effected by site redress are as follows:

. Blasting restrictions	Par. 3
. Access and encroachment on the Bensley Cemetary	Par. 4
. Site access road control	Par. 10,12
. Transmission line maintenance	Par. 13
. Protection of critical ecological elements	Par. 16
. Fire prevention control	Par. 19

4.0 POTENTIAL USES FOR THE CRBRP SITE

A subgroup of the CRBRP Site Redress Task Force investigated numerous potential uses for the site. The goal of the subgroup was to provide information regarding future uses which could influence the site redress plan. Near term uses which could use some or all of the current excavation were considered, but none were identified as likely in the near future. Redress options should not preclude the identified uses in the future. Other specific alternative uses assumed filling in the major NI excavation but were not based on any specific redress options such as grading elevations, etc. Again, no near term uses were identified. The following lists were compiled based on limited data regarding the possiblity of relocating a planned project (e.g. coal gasification) or matching a potential project to the site, (e.g, a DOE experimental reactor).

Uses Identified but Eliminated

1. TVA power plant inventory site
2. Atmospheric fluidized bed combustion demonstration plant site
3. Coal gasification site
4. Private sector fusion experiment
5. High temperature gas reactor lead plant site
6. Welding research institute

Uses Identified but Considered Unlikely in the Near Term

1. Low level radwaste facility
2. Spent fuel storage and/or disposal
3. Industrial hazardous waste management facility
4. Experimental use by University of Tennessee
5. Oak Ridge airport
6. Experimental use by other Federal Agencies
7. DOE fusion demonstration
8. DOE experimental reactor
9. Military reactor projects
10. DOE waste repository

Although any one of the specific uses listed above could emerge in the future, it is the consensus of the Task Force that generalized industrial development is considered the type of use most likely to occur in the future.

5.0 SITE REDRESS ALTERNATIVES

5.1 General

As noted earlier, redress of the site is an obligation of the Project. As a minimum, the site must be reconfigured and otherwise redressed to provide an environmentally stable, self-draining, self-maintaining and aesthetically acceptable site that can be left unattended.

Redress alternatives considered two general categories:

- Topographic approaches which accomplish the minimum requirements noted above and which maintain the potential of the site for future idustrial use.

- Completion or addition of site development features such as a railroad spur, a barge facility, sewage treatment plant, or a water line to ensure the value of the site for potential industrial uses.

5.2 Common Criteria to All Alternatives

In addressing various alternatives, the following criteria were assumed to apply:

- Excavations will be filled at least to minimum elevations sufficient to provide self-drainage to the Clinch River.

- No area outside the present cleared area will be disturbed.

- Borrow materials to be used in backfilling excavations and topographic reconfigurations will be taken from locations on the site which are within the present cleared area.

- The area identified on plant construction drawings as the Craft Parking Lot, about 14 acres, with an average elevation of 836 will remain "as is". About 80% of the area is underlain with rock and there is no justification for removing the rock to the general plant elevation of 810.

- Pre-engineered metal buildings and the dual batch plant will be removed while the substation will be de-energized.

5.3 Conceptual Redress Alternatives

Two conceptual schemes for accomplishing redress of the CRBRP Site were considered which would leave the site in a configuration environmentally stable and suitable for industrial use. The major cost item included in each alternative was excavation work.

The two alternative approaches for site redress which appear most feasible for further refinement and assessments are:

- Alternate 1 - Backfill the NI excavation, the NCT excavation and trench and the ECT excavation to the general plant grade of 810. Material to fill excavations would be borrowed from Spoil Areas 2, 3 and 6, the East Laydown Area, the CBI Area, and the South Plant Area. This would provide a site with two major useable areas - the Craft Parking Lot (14± acres) and the general plant area at an average elevation of 810 (47± acres). See Sketch 2.

- Alternate 2 - Backfill the NI excavation, the NCT excavation and trench and the ECT excavation to about elevation 780. Establish a drainage "spine" from the excavations in a plant south direction to the Clinch River. Material would be borrowed from Spoil Areas 2, 3 and 6, the East Laydown Area and the CBI Area. This would provide a site with three major useable areas - the Craft Parking Lot (14± acres), the West Area (29± acres) and the East Area (25± acres). The excavation and redress activities would result in a perimeter road along the north side of the plant area which would provide additional access to the lower portion of the peninsula. The Bear Creek Water line would be completed from the present terminus of road station 50+00 to 71+30. See Sketch 3.

5.4 Advantages and Disadvantages of Alternatives

The principal advantage of Alternate 1 is that it provides the most flexibility for future use. Except for the Craft Parking Lot, the site is left at one general elevation, about 810.

The disadvantages of Alternate 1 are the higher cost and longer construction schedule and less net useable acreage for industrial use. To backfill the excavations with material to support industrial structures will require borrowing from and eliminating some presently stabilized fills.

A preliminary estimate indicates that as much as 1.3 million cubic yards of material may have to be moved at a cost of $5.8 million. Optimistically, this work might be completed in seven months. However, the schedule is sensitive to the final determination of the stability required in the excavation backfills.

The principal advantage of Alternate 2, other than lower cost and schedule considerations, is that it provides the most net useable, stabilized area to support industrial structures. Since the excavations will be part of a drainage "spine", requirements for backfill will be smaller than in alternative 1 and material can be borrowed from spoil areas and other non-stabilized areas. In addition, Alternative 2 includes the completed water line and additional access to the lower portion of the peninsula, both important development parameters for the potential development of the site for industrial purposes.

The disadvantage of Alternate 2 is the less flexible site topography. The reconfigured site will have three areas - the Craft Parking Lot (14 acres), a West Area (29 acres), and an East Area (25 acres). This will not provide as much flexibility in locating future roads and railroad spurs.

A preliminary estimate for Alternate 2 indicates that about 750 thousand cubic yards of material may have to be moved at a cost of $3.3 million with about $76,000 additional dollars necessary to complete the water line. A schedule of six months for accomplishment should be readily achievable.

5.5 Completion or Addition of Non-Topographic Features

The completion of the following non-topographic improvements which were planned, designed, and approved for construction by NRC in the authorization permit, were not completed during site preparation. They would, if completed, enhance the value of the site for future use, but were rejected from consideration during redress due to the extreme high cost for the derived benefit cost and the negative effect on the redress construction schedule completion date of November 1984.

The barge unloading facility adjacent to the access road at about road station 22+00. It is estimated to cost about $1.2 million.

The railroad spur from the K-25 spur to the site. It is estimated to cost about $1.8 million. If completed as planned, it would have limited value since it would be subject to severe security restrictions where it passes through K-25.

The sewage treatment plants on-site. The designed plants would have a capacity of 65,000 gpd and are estimated to cost about $600 thousand to complete.

The addition of the following improvements would enhance the value of the site for industrial use.

Construction of a railroad spur to the site outside of the K-25 security fence (present design utilizes existing track through K-25). An estimate has not been made for this routing, but it would be about 14,000 feet longer than the present design, would require bridges over two roads and one creek, and thus cost considerably more than present design.

Upgrading the existing gravel road that connects with State Highway 95 and the intersection of Bethel Valley Road which serves the National Laboratory. This would provide a more direct route to the Pellissippi Parkway and to East I-40 via Route 95. This would be a major and costly construction task.

None of the additional improvements considered in this subsection were incorporated into either alternative due to their high cost, potential environmental impacts, and negative effect on the redress construction schedule.

6.0 RECOMMENDATIONS

The CRBRP Project Redress Planning Task Force recommends that conceptual Alternative 2 be considered for further development and be implemented in the Project's Site Redress Plan. This conceptual alternative is considerably less expensive than Alternative 1, complies with all NRC requirements, and accounts for the site's potential for industrial use.

REFERENCES

1. Letter: Gordon L. Chipman to Nunzio J. Palladino, "Clinch River Breeder Reactor Plant Docket No. 50-537 (section 50.12 Request)", dated January 18, 1982.

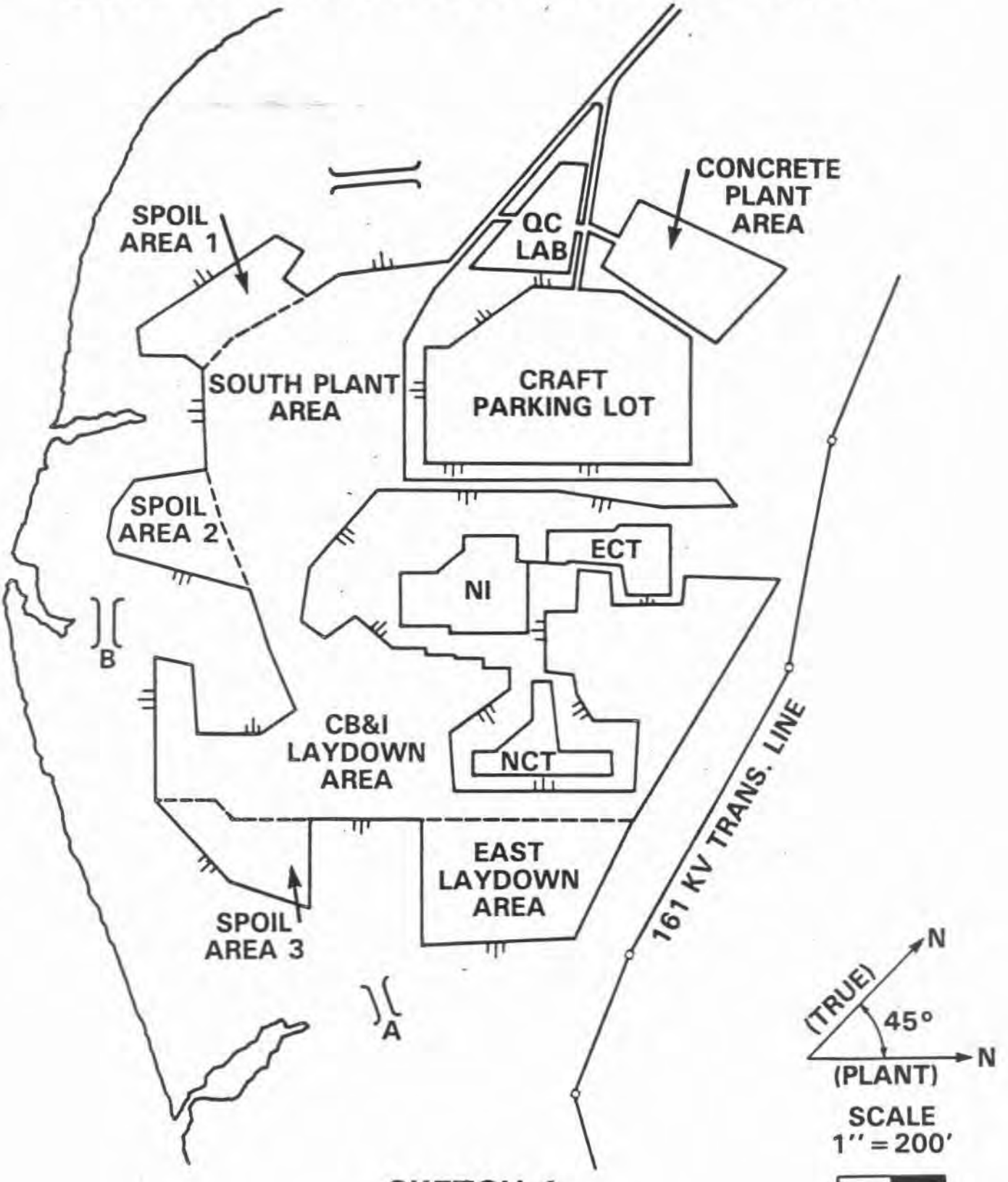
2. Docket 50-537 CLI-82-23, Memorandum and Order, dated August 17, 1982.

3. Docket 50-537, Applicants Response to Motion of Natural Resources Defense Council, Inc. to Intervene, dated December 5, 1983.

4. Licensing Agreement between Tennessee Valley Authority and United States Department of Energy, dated August 18, 1982.

5. NUREG-0139, "Supplement to Final Environmental Statement Related to Construction and Operation of Clinch River Breeder Reactor Plant, Docket No. 50-537" October 1982.

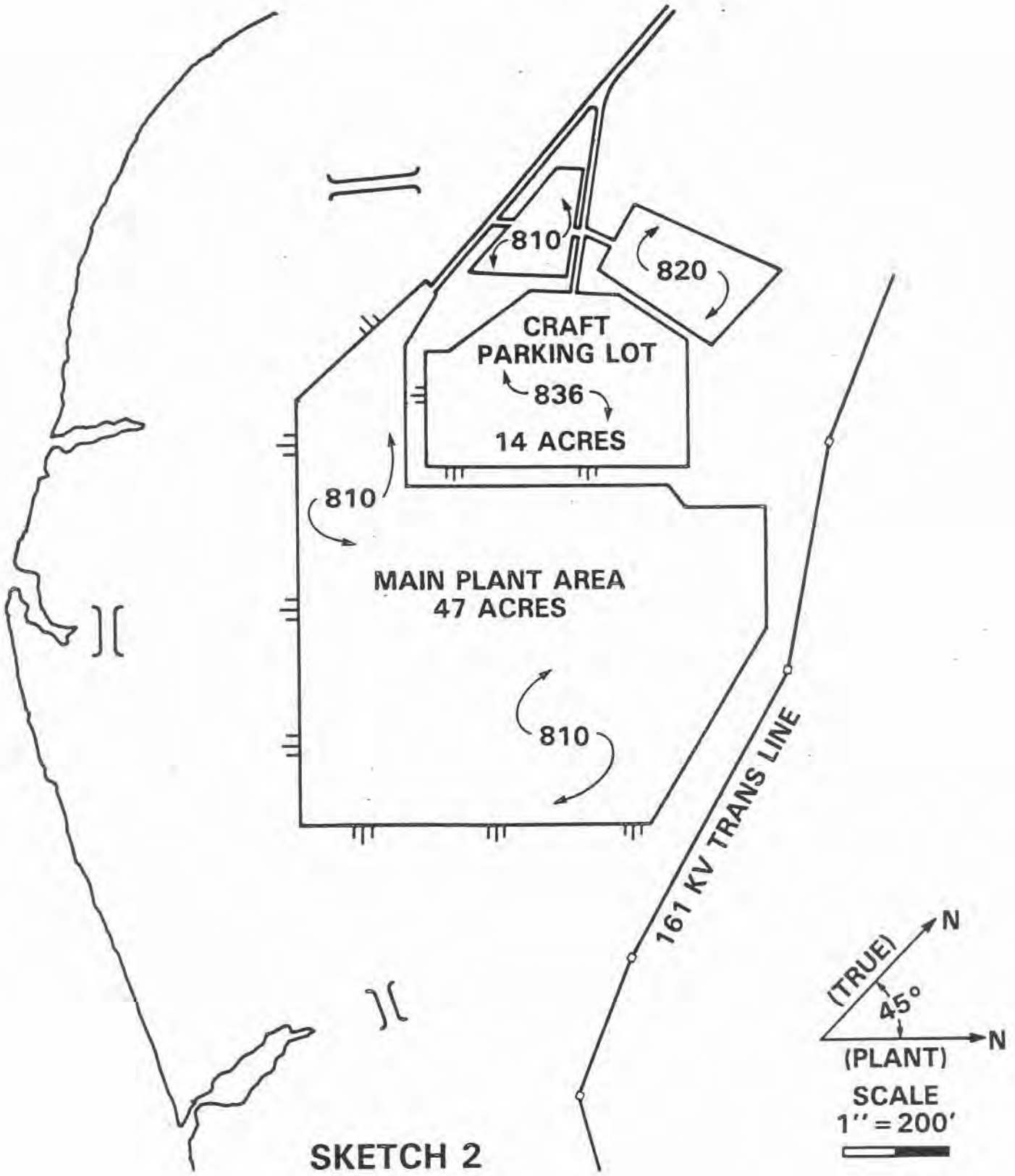
CRBRP SITE OCTOBER 1983



SKETCH 1

1-84-3643-16-1

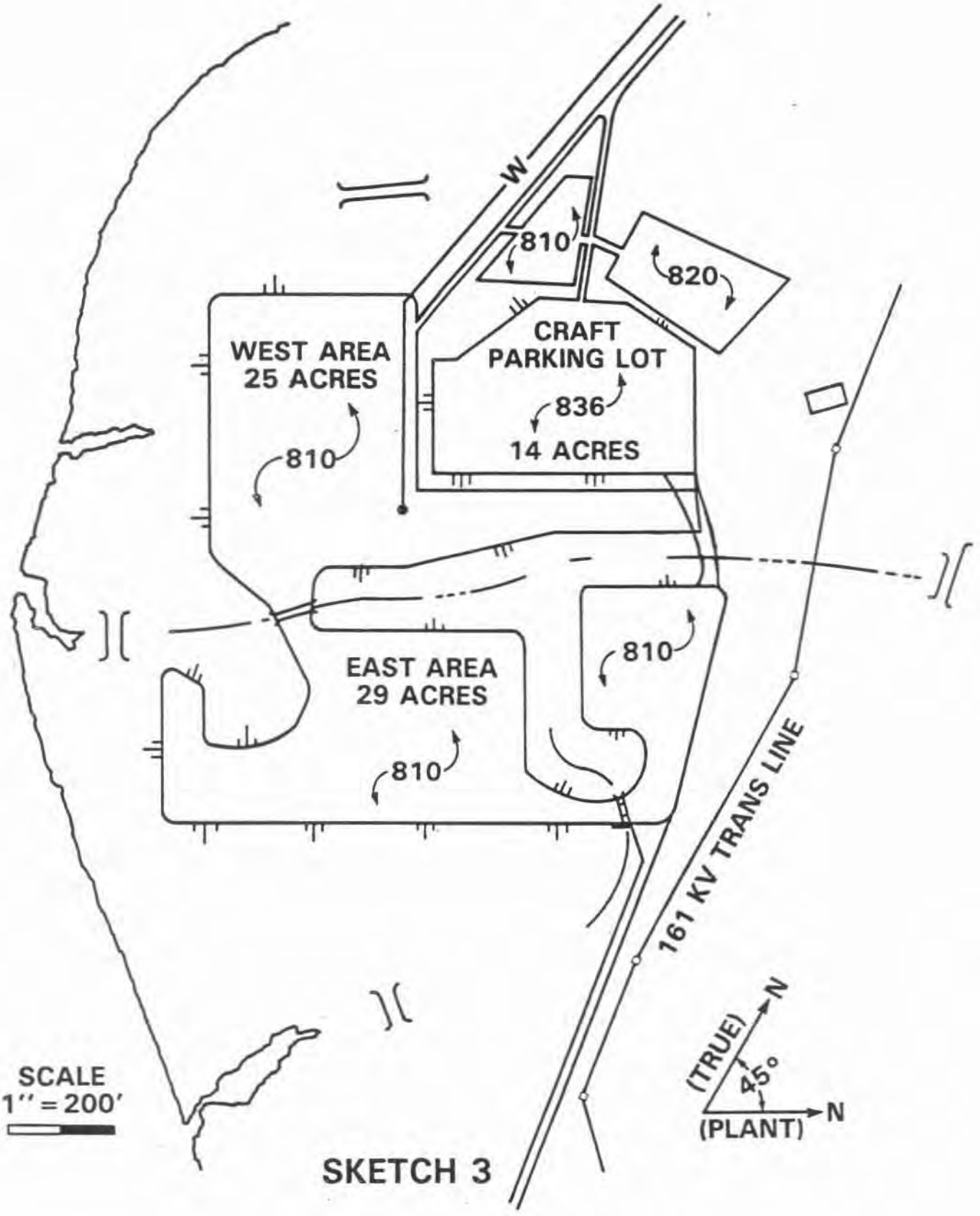
ALTERNATE 1



SKETCH 2

1-84-3643-17

ALTERNATE 2



SKETCH 3

1-84-3643-18-1

Table 3.7.2-1

Clinch River Breeder Reactor Plant Project's
Non-NRC Approvals Listing

	Agency	Type of Approval(s) or License(s)	Issue/ Effective Date	Need for Site Redress	Expiration Date	Status	Method of Termination	Reporting Requirements	Comments
Federal									
1	Department of Transportation, U.S. Coast Guard	Navigational Aids Assessment	11-30-81	No	None	No private aids for navigational markings are required	None	None	Terminated on 12/7/83 by telephone
2	Department of Army, Corps of Engineers	Permit No. 42,362, Barge facility, Intake and Outfall Structures & Fills (main site)	05-06-77	No	05-06-84	Partial completion of activities covered by this permit	Cease all activities covered by this permit	None	Terminate with a letter by 2/1/84
3		Permit A42,362, Turn & Acceleration Lane	10-19-83	No	10-19-86	Work covered by this permit has not commenced	Do not begin this work	Notify agency when the work is begun and completed	Terminate with a letter by 2/1/84
4	U.S. Environmental Protection Agency, Water Management Division	Authorization to discharge under the National Pollution Discharge Elimina- System Permit No. TN0028801	02-01-83	Yes	01-31-88	The conditions of the permit are in effect	Formal notification of EPA to terminate	As listed in the permit	Terminate with a letter by 6/1/85
5	Tennessee Valley Authority, Division of Land and Forest Resources	Section 26A permit Approval of Plans- for the main site activities	04-19-77	No	None	Partial completion of activities covered by this approval	Inform TVA of completed activities & other proposed activities	None	Terminate with a letter by 2/1/84
6		Section 26A permit Approval of Plans- modification to include additional activities	02-18-83	No	None	Activities covered by this approval have been completed	Inform TVA of completed activities	None	Terminate with a letter by 2/1/84

Clinch River Breeder Reactor Plant's
Non-NRC Approvals Listing

	Agency	Type of Approval(s) or License(s)	Issue/ Effective Date	Need for Site Redress	Expiration Date	Status	Method of Termination	Reporting Requirements	Comments
7		Section 26A permit- approval of plans for the turn and acceleration lane	10-26-83	No	None	Work covered by this approval will not be performed	Inform TVA of intentions	None	Terminate with a letter by 2/1/84
8	Federal Aviation Air Space & Procedures Branch	Permits for structures 200 ft. or more above the ground		Yes, until towers are removed					Permits are held by TVA Request TVA to terminate permit when towers are sold.
9	Federal Communications Commission, National Telecommunication and Information	Assignment of frequency authorization for construction phase radios operational phase receives/transmitters	07-08-83	Yes	None	Construction phase authorizations obtained only	Request DOE-ORO to have authorizations invalidated	None	Authorizations are held by DOE-ORO, operational phase authorizations were never obtained. Terminate with a letter by 12/1/84
	State								
10	State of Tennessee, Division of Air Pollution Control	The determination that a Prevention of Significant Deteriation review was not required	03-18-82	No	None	In effect, the PO agreed to limit emissions	Inform TN to mutually invalidated agreement	None	Terminate with a letter by 2/17/84
11		Three construction permits for two concrete batch plants and one boiler using No. 2 diesel fuel	04-25-83	No	09-01-83	Invalid	Not applicable	None	For item 12; Terminate with a letter by 2/17/84
12		Three operating permits two concrete batch plants & one boiler using No. 2 diesel fuel	11-15-83	No	None	The units will no longer be operated	Inform TN that the activity will not be conducted	None	Permits for the batch plants have not been issued. A permit was received for the boiler.

Clinch River Breeder Reactor Plant's
Non-NRC Approvals Listing

	Agency	Type of Approval(s) or License(s)	Issue/ Effective Date	Need for Site Redress	Expiration Date	Status	Method of Termination	Reporting Requirements	Comments
13		Authorization to open burn		Maybe		As needed	Formal notification not required		See TN statutes and regulations for open burning
14	Division of Water Management	CWA Section 401 Certification of the NPDES permit	07-15-82	Yes	01-31-88	Partially satisfied	Request TN to terminate requirements	None	Terminate with a letter by 2/1/84
15		Approval to Construct Sewage Treatment Plants	06-30-83	No	06-30-84	Sewage treatment plants will not be constructed	Inform TN that the plants will not be constructed.	None	Terminate with a letter by 2/1/84
16		Approval to Construct Potable Water Main	06-30-83	Yes	06-30-84	Water main is being constructed	Inform TN of status & completion of water main	None	Terminate with a letter by 2/17/84
17		CWA Section 401 Certification of the Corps of Engineers Permit No. A42,362, Turn & Acceleration Lane	09-22-83	No	10-19-86	Work covered by this certification will not be performed	Inform TN of status	None	Terminate with a letter by 2/1/84