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MEMORANDUM FOR: Hubert J. Miller, Chief
 High-Level Waste Technical
 Development Branch
 Division of Waste Management

FROM: Robert J. Wright
 High-Level Waste Technical
 Development Branch
 Division of Waste Management

SUBJECT: TRIP REPORT: NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
 PEER REVIEW, LAS VEGAS, AUGUST 24-28, 1981

Organization of Meeting

This meeting, the eighth in a series, covered a broader spectrum of NNWSI project activities than previous peer reviews. The reviewers (identified in figures 1, 2, 3) were divided among three general subjects: geology/hydrology, geotechnical/geoengineering studies, and environmental studies. From Monday morning, August 24, through early Tuesday afternoon, presentations were made by the investigators to the collective peer review group. Then, through early Thursday afternoon, the three review groups separately heard and discussed presentations on selected topics. Finally, the collective review group met in executive session through Friday.

About 130 observers were on hand.

On Tuesday I provided to the collective group a short overview on the present status of 10 CFR 60.

Developments since the February NRC visit

The most striking impression to me is the reorientation of the work along lines that correspond to the observations made in the NRC trip report covering the February trip to NTS. Especially notable is the attention now being given to 10 CFR 60, which was described as "the glue that holds the pieces together." The requirements of the site characterization report and the approach for the NRC review were accurately described (figures 4, 5 and 6). The schedule for SCR preparation and the NRC review (three months) was presented (figure 7) and discussed. The U. S. Geological Survey showed a schedule of 19 geologic, hydrologic and geophysical studies for which the SCR is the "driving force" in planning. The SCR was described as a "very good vehicle to inform the public" about project activities.

Other developments, too, are consonant with NRC's trip observations:

- The Bullfrog tuff is being assessed as to its strength and the anticipated stresses on underground openings at repository depth. Other tuffs, including one above the water table and less than 1000 feet deep, are being examined for favorability.

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- Quality assurance was mentioned as an integral part of several studies.

- During September, the parameters of seismic exploration will be studied on Yucca Mountain to determine whether a refined seismic approach will work.

- There is improved integration of project elements.

- An interface with the national program is planned on performance assessment.

Project Schedule

A reorientation of project planning has taken place since introduction of the test and evaluation facility (TEF) concept. The TEF is intended to demonstrate (and win public confidence in) methods of receiving, transporting, retrieving, and shielding two to three hundred HLW waste packages. It will be constructed at one of three places: NTS, BWIP, or salt.

The present schedule is:

1982 October. 3D performance assessment of tuff horizons.
December. Select horizon and locate exploratory shaft (ES).

1983 March. Start site preparation for the ES. See figures 8 and 9 for cost estimates and activities schedule.
June. Submit the SCR to NRC.
September. Start to sink ES.

1984 June. Complete repository conceptual design report.

1985 September. "Confirm site" for TEF.

1986 December. Start at-depth test facility for detailed site characterization. Start TEF, if NTS is selected, among three sites, for the TEF.

The schedule for national program activities is shown in figure 10. The NNWSI program through FY 86 is shown in figure 11.

Comments

There is a new note, in the NNWSI project, of heightened attention to licensing needs and programmatic milestones. A number of geoscience and geotechnical questions are, naturally, outstanding. These are being addressed and there is a sense of improved coordination among the tasks.

However, two problems are presented to us in the planning for the site characterization report.

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1. The SCR will cover only the ES and the limited testing therein. This is perceived as satisfying the site characterization function described in 10 CFR 60.

2. Only 3 months allowed for analyses of the SCR by NRC.

ORIGINAL SIGNED BY

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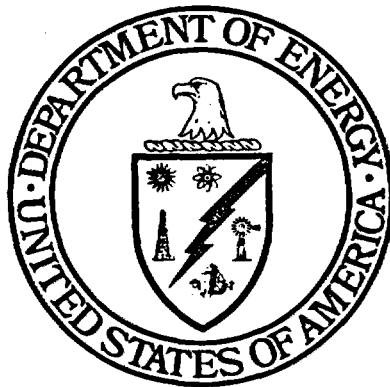
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As stated

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DATE	9/ /81	9/16/81					

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS

PEER REVIEW

RIVIERA HOTEL
LAS VEGAS, NEVADA



AUGUST 24-28, 1981

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE - LAS VEGAS, NEVADA

NNWSI
GEOLOGICAL/HYDROLOGICAL
PEER REVIEW

SESSION CHAIRMAN: W. S. TWENHOFEL

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JOHN B. FARR

WESTERN GEOPHYSICAL CO.

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Figure 1

NNWSI
GEOTECHNICAL/GEOENGINEERING

PEER REVIEW

SESSION CHAIRMAN: M. P. KUNICH
PEER LIAISON: JOA. FERNANDEZ

PEER REVIEWER

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UNIVERSITY OF MINNESOTA

JOSEPH BUSCH

KAISER ENGINEERS

PETER K. FROBENIUS

BECHTEL NATIONAL, INC.

Figure 2

NNWSI
ENVIRONMENTAL STUDIES

PEER REVIEW

SESSION CHAIRMAN:

Henry
H. L. MELANCON

PEER LIAISON:

RD
C. LINCOLN

PEER REVIEWER

AFFILIATION

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FORD, BACON & DAVIS

HELEN F. GRAM

LOS ALAMOS TECHNICAL
ASSOCIATES

ROBERT F. KAUFMAN

CONVERSE WARD DAVIS
DIXON, INC.

Figure 3

NRC: v12/11

OBJECTIVES OF SITE CHARACTERIZATION

• Collect sufficient information so that construction application will be complete, and that meaningful evaluation will be possible regarding site suitability and compatibility of design aspects of the repository for the particular site.

• Collect necessary data from alternative sites and media to permit NRC to make a NEPA finding on the site proposed in DOE's license application

Figure 4

SITE CHARACTERIZATION REPORT*

- WHERE WE ARE
 - GEOGRAPHICAL
 - TECHNICAL

- HOW WE GOT THERE
 - SELECTION METHOD/CRITERIA

- WHY CHOSEN

- ISSUES AND MEANS OF RESOLUTION

- SITE CHARACTERIZATION PROGRAM/QA

- R&D

*10CFR60 (ADMIN) - FEBRUARY 25, 1981

Figure 5

NRC REVIEW OF SCR

1. HAVE IMPORTANT ISSUES BEEN IDENTIFIED?
2. DOES SCR SPECIFICALLY ADDRESS AND LEAD TO RESOLUTION OF EACH ISSUE?
3. ARE TESTING AND ANALYTICAL METHODS APPROPRIATE?
4. RE #3, HAVE ALTERNATIVE METHODS BEEN EVALUATED THOROUGHLY?
5. WILL THE DATA GENERATED IN THE TESTING AND USED IN THE ANALYSES BE OF ADEQUATE QUALITY?

Figure 6

NNWSI SITE CHARACTERIZATION REPORT

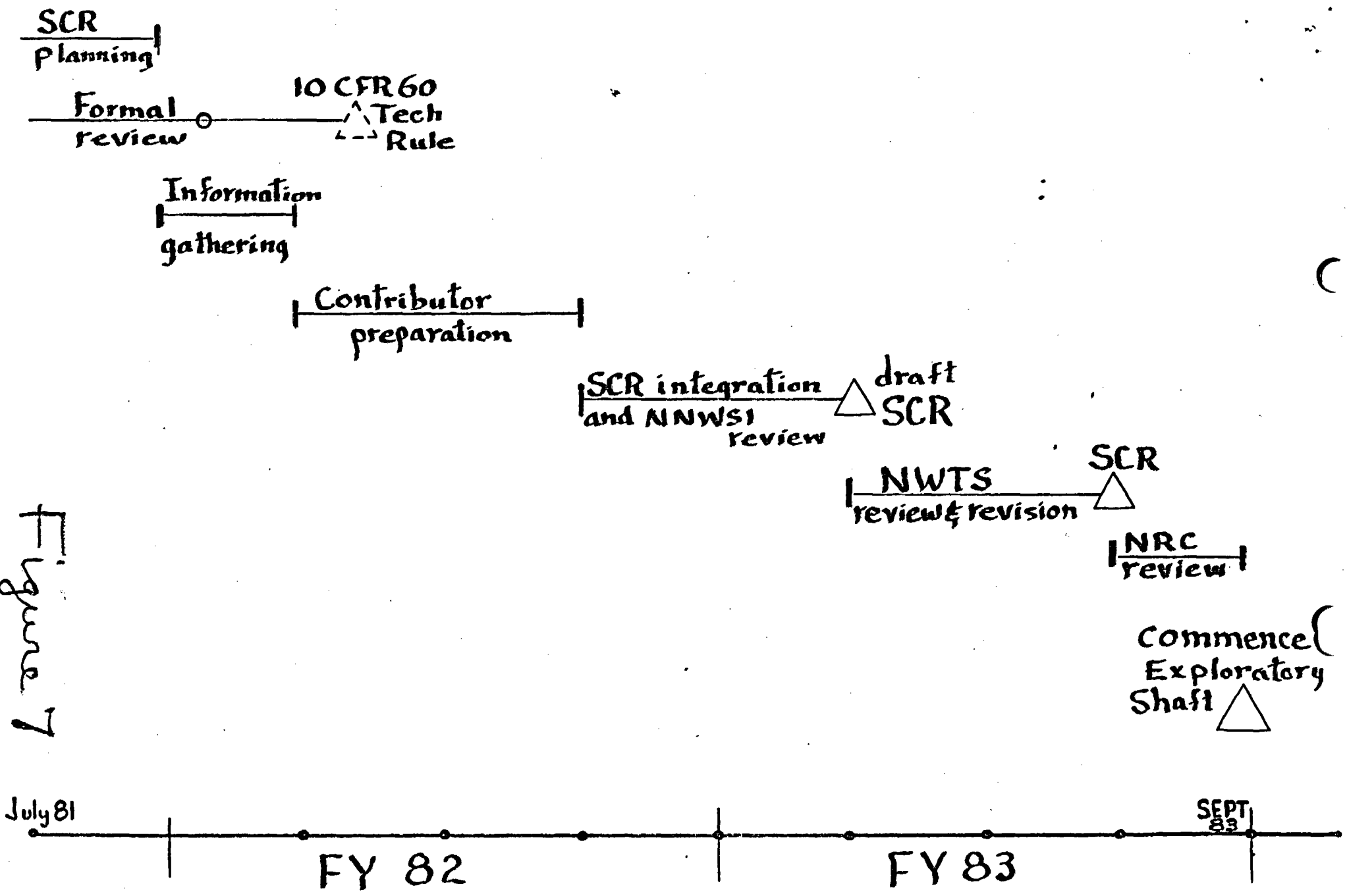


Figure 7

**EXPLORATORY SHAFT
PROJECT COST ESTIMATE**

(DOLLARS IN THOUSANDS)

ENGINEERING	\$2,200
CONSTRUCTION	
SITE WORK AND SURFACE FACILITIES	4,100
DRILLING AND CASING	23,300
MINING	14,600
MAINTENANCE AND OPERATIONS	<u>3,800</u>
SUBTOTAL BASIC OPERATING EXPENSE	\$48,000
CAPITAL EQUIPMENT	<u>6,400</u>
TOTAL BASIC PROJECT ESTIMATE	\$54,400

ADDITIONAL CAPITAL EQUIPMENT \$2,200 to 7,800

ADDITIONAL OPERATING EXPENSE EQUIPMENT 0 to 2,200

TOTAL PROJECT COST ESTIMATE (RANGE) \$56,600 to 62,300

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Figure 8

EXPLORATORY SHAFT

DESIGN AND CONSTRUCTION SCHEDULE

ACTIVITY	START	COMPLETE
CONCEPTUAL DESIGN REPORT (DRAFT)	4/81	9/81
TITLE I AND II ENGINEERING		
SITE WORK AND SURFACE FACILITIES	4/82	3/84
DRILLING OPERATIONS	10/82	5/83
MINING OPERATIONS	10/83	5/84
CONSTRUCTION AND TITLE III ENGINEERING		
SITE WORK AND SURFACE FACILITIES	1/83	5/84
DRILLING OPERATIONS	9/83	5/84
OUTFITTING SHAFT AND SURFACE PLANT	6/84	7/84
MINING	8/84	11/84
HORIZONTAL DRILLING	12/84	9/85
CAPITAL EQUIPMENT PROCUREMENT		
SITE WORK AND SURFACE FACILITIES	4/82	1/84
DRILLING	10/82	6/83
MINING	10/82	1/84

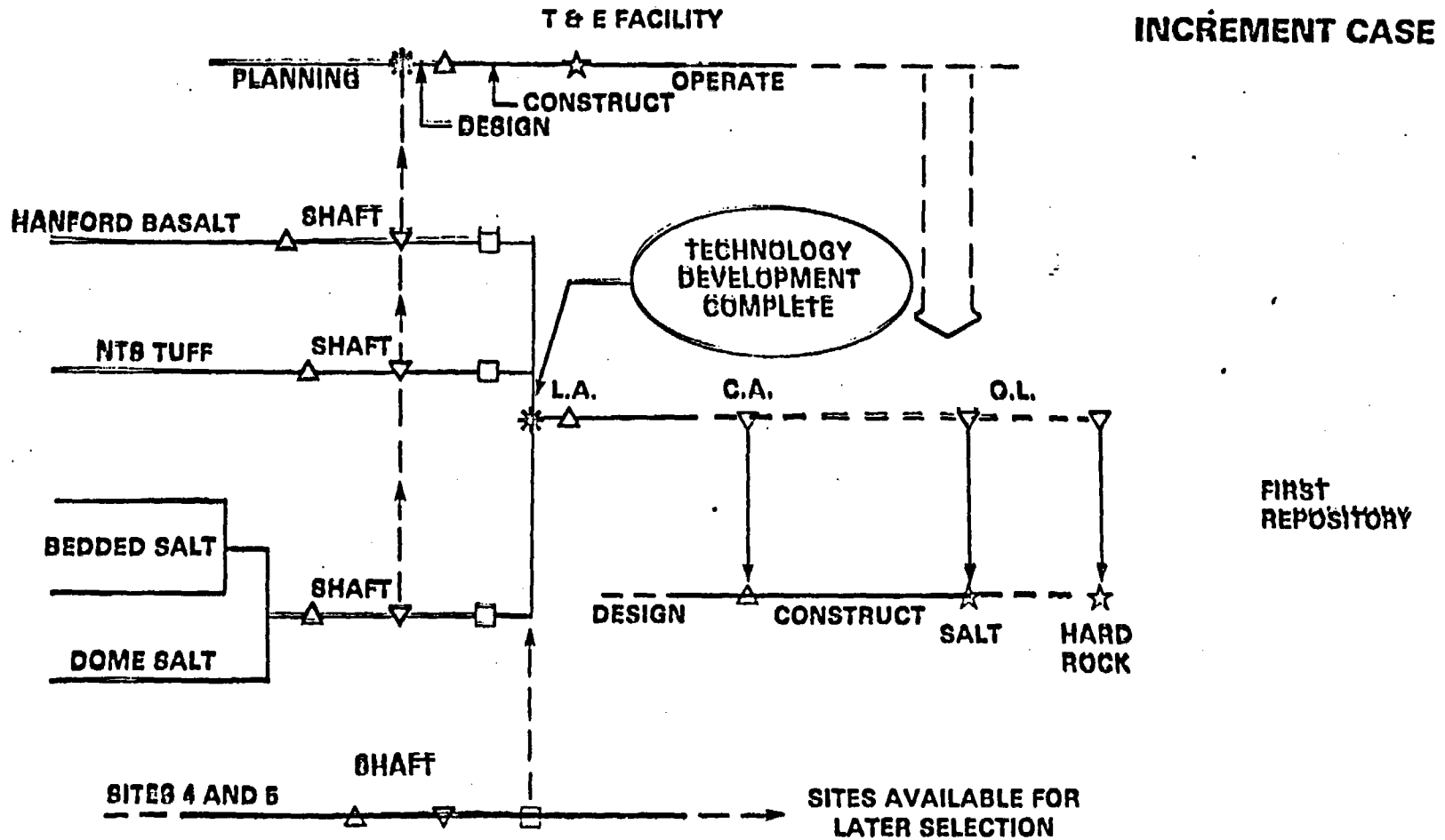
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Figure 9

TERMINAL ISOLATION PROGRAM

FISCAL YEARS 81 83 85 87 89 91 93 95 97 99 01 03 05



- △ START
- ▽ COMPLETE
- ★ STARTUP
- REPOSITORY SITE SUITABILITY DETERMINED
- * SITE SELECTION

- L.A. LICENSE APPLICATION
- C.A. CONSTRUCTION AUTHORIZATION
- O.L. OPERATING LICENSE

Figure 10

NNWSI PROJECT INTEGRATION

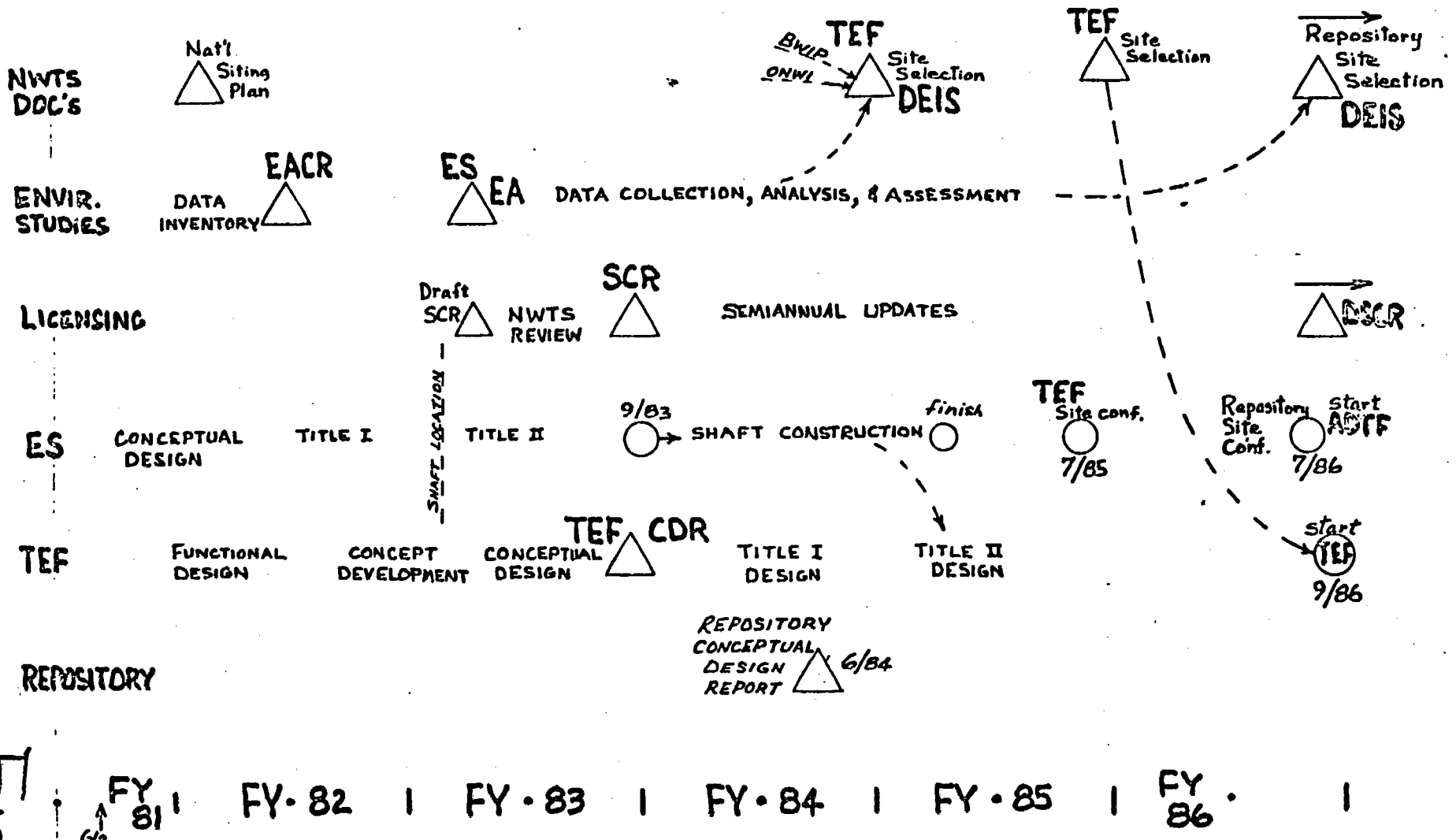


Figure 11

FY-81 | FY-82 | FY-83 | FY-84 | FY-85 | FY-86