BASALT WASTE ISOLATION PROJECT
ENVIRONMENTAL REVIEW

BER-006

Drillhole DC-33

September 1987

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76 RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

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PDR WASTE
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BER-006

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BWIP ENVIRONMENTAL REVIEW

Borehole DC-33
T12N, R25E, Sec. 11
Benton County, Washington

INTRODUCTION:

This report details the results, conclusions, and recommendations of a Basalt Waste Isolation Project (BWIP) Environmental Review (BER) on a site scheduled for site characterization activity.

PURPOSE:

The purpose of this action is to drill a borehole.

NEED:

There is a need to monitor the response of the underground water level to pumping from the planned large-scale hydraulic test.

ACTION:

A drill pad will be cleared of vegetation and topsoil, gravel will be placed on the cleared pad, and a borehole will be drilled.

PRESENT USE:

The proposed site is mature sagebrush and cheatgrass and is used as wildlife habitat.

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SUMMARY OF RECOMMENDATIONS

ADDITIONAL INFORMATION REQUIRED:

1. None

RECOMMENDATIONS:

1. The solid waste in the drilling reserve pit must be tested to determine whether it is dangerous waste. If it is not, the waste must be disposed of in accordance with the SWMA. If it is dangerous waste, compliance with the HWMA is required. The dangerous wastes would have to be stored properly onsite and transported offsite for permanent disposal in accordance with the HWMA. Whether dangerous or nondangerous, the solid waste should be stored in a manner that facilitates its retrieval.

2. In order to minimize environmental disturbance to nesting migratory birds, we recommend that construction not occur between March 1 and June 15. This delay will ensure that any birds that may have nested in the area have time to rear their young and leave the area.

3. Save, store, and protect 15 cm (6 in.) of topsoil. Place the topsoil in a continuous berm along one or more sides of the proposed work pad. Water the topsoil berm lightly, daily for two weeks or until a crust forms or vegetation appears. Avoid eroding the soil with excess water pressure.

4. Water the site during construction to minimize the release of particulates.

5. Avoid travel off established roads and pads onto undisturbed areas.

6. We recommend that the activity proposed for this site proceed as planned.

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BER ECOLOGICAL EVALUATION FORM
FIELD CHECKLIST

This checklist must accompany each BER Team during each site visit. The Task Leader or the Lead Scientist must ensure that the checklist is completely filled out. The information in the checklist will assist in writing the site visit report. Please indicate in the yes column if activities are the result of construction (C) and/or operation (O).

1. SITE IDENTIFICATION:

   a. Range, township, section (e.g., R25E, T12N, S10):
   R25E, T12N, Sec. 11

   b. When did BER Site visit occur?
   Date: 4/23/87, 7/15/87, 7/20/87, 7/22/87 (site moved)

   c. Specific vegetative type (e.g., sagebrush, cheatgrass):
   Sagebrush, cheatgrass

   d. Terrain and soil (e.g., flat, sandy/silt):
   flat, sandy

   e. Location of nearest human activity:
   The 200-West Area fence is about 100 m (328 ft) north of the site.

   f. When will site preparation begin?
   1987

   g. When will site operation end?
   1987

2. STATUS OF PROJECT:	YES	NO
a. Study Plan/Project Description available?	X	
b. Map available with scale and dimensions?	X	
c. Photographs available?	X	
d. Site activity partially completed? Specify percentage of site activity completed: _____		X
f. Has site been staked?	X	

3. AFFECTED ENVIRONMENT:

a. Evidence of past disturbance? (If yes, describe): _____		X

   b. Size of area to be disturbed:
   2.3 hectares (5.8 acre)

	YES	NO
c. Size of area surveyed by BER Team: 3.3 hectare (8.3 acre)		
4. AIR:		
Will the proposed activity:		
a. result in any gaseous discharges to the environment? Pad construction and drilling will release small amounts of exhaust.	C	
b. result in any particulate releases to the environment? Construction of the pad could result in an increase of particulates in the atmosphere near the site.	C	
c. result in impacts? (If yes, specify mitigation): Minor localized impact might occur from particulates. No impacts are anticipated from exhaust. Watering during construction will minimize release of particulates.	X	
5. WATER:		
Will the proposed activity:		
a. result in any liquid discharges to the environment? Drilling liquids may leak into the ground from the drilling reserve pit.	C	
b. alter streamflow rates?		X
c. release soluble solids to the environment? Soluble solids may be released if present in rock cuttings.	C	
d. intercept aquifers? The purpose of the drilling is to intercept aquifers.	C	
e. cause fluids/liquids to be stored on site (gasoline,diesel,etc)? Fuel will be stored onsite during construction and drilling.	C	
f. cause sewage to be discharged to the environment?		X
g. cause impacts to the water?		X
h. result in impacts? (if yes, specify mitigation):		X

	YES	NO
6. LAND FACILITIES USE:		
Will the proposed activity:		
a. conflict with any existing land use? Presently the site is used for wildlife habitat which will be lost temporarily.	C&O	___
b. be located on a 100 or 500 year floodplain?	___	X
c. be located on wetlands?	___	X
d. generate a volume of solid waste for disposal: 1) hazardous, radioactive? 2) other? (specify): drilling mud and cuttings	C	___
e. result in a potential for erosion?	___	X
f. necessitate excavation? A reserve pit will be excavated.	C	___
g. possibly impact land? Mitigation? (If yes, specify mitigation): Involves reclamation of the site upon closure.	X	___
h. require new utilities or modification to existing utilities?	___	X
7. NOISE:		
Will the proposed activity:		
a. increase noise levels? Noise levels will increase during site construction and drilling.	C	___
b. cause any noise impacts? (If yes, specify mitigation): Increased noise levels could cause some localized avoidance of this area by some animals. No significant impacts are anticipated. No mitigation is required.	C	___
8. CHEMICAL RADIOLOGICAL:		
Will the proposed activity:		
a. require use of carcinogens, pesticides, or toxic substances?	___	X
b. increase offsite radiation dose?	___	X

	YES	NO
9. CULTURAL RESOURCES:		
a. Has the site been surveyed for cultural resources? See "Cultural Resources Review Form" page 13 of this report.	X	
b. Is there evidence of cultural, archaeological, paleontological, or religious sites?		X
c. Does the site require further investigation?		X
d. Was the site cleared (approved) for proposed activities? (If so, when?) 7/20/87	X	
e. Was a determination made that this site cannot be disturbed? (If so, when?) _____		X
10. BIOLOGICAL RESOURCES:		
a. Does the site contain the type habitat for threatened (T) & endangered (E) plants?		X
b. Are T and E plant species present? (If yes, which species?)_____.		X
c. Does the site contain habitat that could support T, E, or candidate (C) animal species? (If yes, which species?) Pygmy rabbit.	X	
d. Is an onsite survey of T & E species necessary?	X	
e. Are T, E, or candidate (C) species present? (If yes which species?) _____.		X
f. Will impacts occur to any of these species or their habitats? Habitat will be lost.	X	
g. Can impacts be mitigated? Reclaim site upon closure	X	
11. REGULATORY REVIEW:		
a. Has a regulatory review been completed on this site? See "Regulatory Review Form" page 7 of this report.	X	

(Signed): Robert L Newell (Title): TASK LEADER (Date): 9/8/87

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BER REGULATORY AND POLICY REVIEW FORM

Subject: Drillhole DC-33
Date of Report: August 7, 1987
Site Visit or Documentation Review?: Site Visit, July 22, 1987
Description: This regulatory report covers the clearing and preparation of a drill pad as well as the drilling of Borehole DC-33.
Regulatory Compliance Checklist: See the checklist, page 11.

Considerations and Concerns: One of the major regulatory considerations of borehole drilling is the storage and disposal of drilling muds/fluids and any underground materials brought to the surface. The waste fits the definition of a solid waste under the federal Resource Conservation and Recovery Act (RCRA), the Washington Hazardous Waste Management Act (HWMA) (RCW 70.105), and the Solid Waste Management Act (SWMA) (RCW 70.95). These three statutes and their implementing regulations govern the regulation of solid waste. Because the federal government has authorized the State to implement RCRA in Washington, the HWMA and the SWDA have been used to determine compliance requirements. [NOTE: This analysis has been conducted using revised regulations WAC 173-303, which were published as final in the Washington State Register and became effective July 26.]

The following steps need to be taken to ensure regulatory compliance during drilling operations:

1. Determine the appropriate means of storing the solid waste generated during drilling. The means of storing the solid waste must be decided before it is determined through testing during drilling operations whether the solid waste is "dangerous waste," as defined by HWMA. Two options exist for storage: 1) storing the wastes as they are being generated in containers (WAC 173-303-200 and 173-303-630) or tanks (WAC 173-303-200 and 173-303-640), both of which meet HWMA requirements for temporary site storage for dangerous waste generators; or 2) storing the wastes in a mud pit designed in an environmentally safe manner to minimize the migration of dangerous constituents, should they be present (i.e., if testing shows that the wastes are dangerous, the design should allow for immediate and easy retrieval).

2. Test the solid waste to determine whether it is dangerous. As a generator of solid waste, the Basalt Waste Isolation Project (BWIP) is required to test this waste to determine if it is dangerous waste under the procedures set forth at WAC 173-303-070. The HWMA applies (beyond the testing requirement) only to dangerous waste. If tests show this material is a nondangerous solid waste, the SWMA applies.

   Analyses to determine the composition of the bentonite drilling muds being used, including an extraction procedure (EP) toxicity test, was conducted by the Hanford Environmental Health Foundation (HEHF). The results of this analysis are included (see page 12). This analysis indicates that the drilling mud itself is not "dangerous" waste. However, it is uncertain whether the groundwater or sediments incidentally brought to the surface during drilling could in some instances be considered dangerous

waste. It may also be possible that constituents in the groundwater might interact with the drilling muds to produce dangerous waste. It must be emphasized here that the probabilities of any of these scenarios producing dangerous constituents are low, but are not now fully known. A conclusive determination of whether the solid waste is dangerous cannot be made without testing the wastes during operations.

A waste is dangerous if it is listed as such at WAC 173-303-081 through 084, if it meets characteristics as defined in WAC 173-303-090 [ignitability, corrosivity, reactivity, or extraction procedure (EP) toxicity], or if it meets the criteria provided in WAC 173-303-101 through 103. Approved testing procedures detailed in these regulations must be used.

3. <u>If the solid wastes ARE NOT dangerous, the following steps apply</u>. The SWMA and its implementing regulations (WAC 173-304) provide requirements for regulation of solid waste. The solid (and nondangerous) waste can probably be classified as inert waste under WAC 173-304-100(40), which requires disposal in an inert waste landfill (WAC 173-304-461). Inert waste is nonhazardous solid waste that is expected to retain its physical and chemical structure under expected conditions of disposal. This landfill must have a permit; operations, closure and postclosure plans; an annual report; vadose zone monitoring in lieu of liners in an arid location; and groundwater monitoring wells. The Hanford Site solid waste landfill in the 600 Area accepts inert and demolition waste, and it is expected that it could be used for final disposal of the drilling mud. However, this landfill does not yet have a State-issued permit.

4. <u>If the solid wastes ARE dangerous, the following steps apply</u>.

   A. WAC 173-303-170 through 173-303-230 provides requirements for generators of dangerous waste when that waste or wastes exceeds the quantity exclusion limits defined in WAC 173-303-070 (see item D below). If the Project is a generator of dangerous waste, it must notify the Washington Department of Ecology (WDOE) by completing and submitting a Washington state notification of dangerous waste activities (Form 2) and obtain an EPA/State identification number. DOE would also have to prepare a manifest in accordance with WAC 173-303-180 before transporting dangerous waste or offering dangerous waste for transport off the site of generation. The information required on the manifest pertains to the treatment, storage, or disposal (TSD) facility designated to accept the waste for permanent disposal. Dangerous waste must be prepared for transport by following the procedures set forth at WAC 173-303-190.

   B. If the wastes are subject to WAC 173-303, they must be stored onsite in a tank or container (see 173-303-200), or moved offsite immediately to a TSD facility.

   C. If dangerous waste or hazardous substances are intentionally or accidentally spilled or discharged into the environment (unless otherwise permitted) such that public health or the environment are threatened, regardless of quantity, authorities must be notified and immediate action taken to

mitigate and control the spill or discharge (WAC-173-303-145). In addition, WDOE may require cleanup, testing to determine the amount or extent of contaminated materials, etc.

D. The requirements for "small quantity generators" are outlined here. Note that the definition of small quantity generator in WAC 173-303 is different than that in the RCRA regulations. [Small quantity generation under WAC 173-303 is a category roughly equivalent to the conditionally exempt category of the RCRA regulations (40 CFR 261).] Under WAC 173-303-070, a small quantity generator is a person that generates, accumulates, or stores a quantity (or aggregated quantity) of waste that meets or falls below what are termed "quantity exclusion limits" (QELs). QELs are defined in WAC 173-303-070 and listed in WAC 173-303-080 through 173-303-103. A small quantity generator is not subject to the requirements of the Washington dangerous waste regulations except for the provisions relating to designation of dangerous wastes and disposal at an onsite or offsite permitted facility. Recent amendments to WAC 173-303 have added an annual reporting requirement as well, if a State identification number has been obtained.

Special accumulation standards (WAC 173-303-201) apply to persons who exceed the QELs but generate less than 1000 kg (2200 lb) per month and do not accumulate onsite more than 1000 kg (2200 lb) of dangerous waste. These standards are roughly similar to those set in RCRA for what it terms "small quantity generators." Under these special accumulation standards, dangerous waste can be stored onsite for up to 180 days without a permit; if the quantities set in the special accumulation standards are exceeded, dangerous waste can be stored onsite for only 90 days without a permit.

The 180 (or 90) day timeframe commences on the date it is generated; or on the date that the quantity (or aggregated quantity) of dangerous waste being accumulated by a small quantity generator first exceeds the quantity exclusion limit (QEL) for such waste (or wastes): or on the date the quantity of dangerous waste being accumulated in a satellite area exceeds 55 gal of dangerous waste or 1 qt of acutely hazardous waste [WAC 173-303-200(2)]. A satellite area is defined in this section of the regulations as a location at or near any point of generation where wastes initially accumulate.

Thus the total mass of the waste and the individual masses of the hazardous constituents must be determined to establish whether the Project is a small quantity generator or falls under special accumulation standards.

E. If the wastes are dangerous, they must be transported offsite by a licensed transporter to a permitted TSD facility before the appropriate time limits expire.

F. If dangerous waste is not transported offsite within 90 days (180 days if wastes fall under special accumulation standards), the Project becomes the operator of a storage facility and must meet the stringent requirements of TSD facilities, including the application for a TSD facility permit. The requirements for owners and operators of TSD facilities are set forth at WAC 173-303-280 through 173-303-395. It may be possible that under

these circumstances, current Hanford Site Interim Status Part B permits could cover BWIP site characterization activities, or be amended to do so. It must be emphasized, however, that maintaining a generator status is preferable to becoming the operator of a TSD facility.

G. The regulations cite that the discovery of any extremely hazardous waste (a subset of dangerous waste as defined in WAC 173-303-101) would require the transport of this waste to the Washington State extremely Hazardous Waste Management Facility to be located on the Hanford Site (WAC 173-303-700). There is as yet no such facility; Washington State is currently shipping such waste to facilities in Oregon, Idaho, or California.

We examined the question of air emissions from site clearing and drilling. The suspension of dust particulates is to be controlled, if necessary, by spraying, and emissions are not expected to approach regulatory standards.

Policy Considerations: State Water Rights. A letter from Secretary of Energy John S. Herrington to Washington Governor Booth Gardner on October 4, 1985, stated that while the project had a reserved water right sufficient to conduct site characterization, DOE-RL, in the spirit of cooperation and as a matter of comity, would submit the permit application for the use of water for site characterization activities if the Hanford Site were approved for site characterization. We understand the permit was applied for, but a permit has not yet been granted. It is therefore recommended that this issue be addressed before the project uses Columbia River water for drilling Borehole DC-33.

Conclusions: The solid waste in the drilling reserve pit must be tested to determine whether it is dangerous waste. If it is not, the waste must be disposed of in accordance with the SWMA. If it is dangerous waste, compliance with the HWMA is required. The dangerous wastes would have to be stored properly onsite and transported offsite for permanent disposal in accordance with the HWMA. Whether dangerous or nondangerous, the solid waste should be stored in a manner that facilitates its retrieval.

Signed:

For SEK. 9/8/87 — 9/8/87

Susan E. King, Scientist — Date

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REGULATORY COMPLIANCE CHECKLIST.

The following is a list of federal and state statutes and executive orders identified as being applicable or potentially applicable to any or all site characterization activities. The middle and right hand columns indicate the degree of applicability of each statute/executive order to the site characterization activity that is the subject of this BER.

SUBJECT: Bore Hole 33

ACTS/EOs	MAY APPLY[a]	TRIGGERED[b]
Clean Air		
Noise Control		
National Historic Preservation		
American Indian Religious Freedom		
Archaeological Resources Protection		
Endangered Species		
Bald and Golden Eagle Protection		
Migratory Bird Treaty		
Federal Water Pollution Control		
Safe Drinking Water		
Floodplain/Wetland		
RCRA		X
CERCLA		
Toxic Substances Control		
Washington Clean Air		
General Regulation 80-7 (County Air)		
Washington Noise Control		
Washington Clean Water		
Washington Safe Drinking Water		
Washington Hazardous Waste		X
Washington Solid Waste		X
Other: Water Rights		X

(a) The applicability of the statute/executive order to this site characterization activity was examined in detail, and it was determined that no action was required for compliance.

(b) Requirements of the statute/executive order are triggered by this site characterization activity and are discussed in the text preceding this checklist.

Results of EP Toxicity Analyses of Bentonite Clay and Drilling Mud Samples for Heavy Metal Content*

Constituent	EP Toxicity Limit	Maximum Measurement
Arsenic	5ppm	1ppm
Barium	100ppm	0.5ppm
Cadmium	1ppm	0.02ppm
Chromium	5ppm	0.03ppm
Lead	5ppm	0.2ppm
Silver	5ppm	0.02ppm
Selenium	1ppm	0.003ppm
Mercury	0.2ppm	0.03ppm

* Table source: Rockwell Hanford Operations, memo 7/15/87, no. 78510-8GE-87-093

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BER CULTURAL RESOURCES REVIEW FORM

Subject: DC-33
Date of Report: July 20, 1987
Location: SW1/4 NE1/4 Sec 11 T12N R25 E
N 442,011 E 2,214,205 (Washington State plane coordinates)
Cultural Resources Personnel: N.A. Cadoret and K.A. Hoover
Date of Literature Review: June 24, 1987
List of Literature Reviewed: National Register of Historic Places: Rice, 1980, 1984a, 1984b; Relander 1956; Schuster 1975 (see literature cited).
Date of Site Visit: July 20, 1987

Survey Techniques Employed: A general archaeological survey was conducted at 20 m (65.6 ft) intervals over the entire proposed drill site as per BWIP procedures for Cultural Resource Reviews of Planned Site Characterization Activities.

Cultural Resources Observed: None

Cultural Resource Potentials: While the archaeological survey revealed no trace of cultural resources, and the area is not known or observed to be important to Indian peoples as a food gathering or religious site, removal of over 15 cm (6 in.) of surface sediments, subsequent drilling, and excavation of pits for drilling-mud storage could conceivably disturb subsurface cultural resources. This, however, is unlikely.

Conclusions and Recommendations: Drilling operations will have no impact on any known cultural properties. However, the site should be monitered by a PNL archaeologist during construction for any potential subsurface cultural resources.

Prepared By: Date 9/10/87

Natalie A. Cadoret
Technical Specialist

Karin A. Hoover
Scientist

Authorized By:

James C. Chatters
Senior Research Scientist

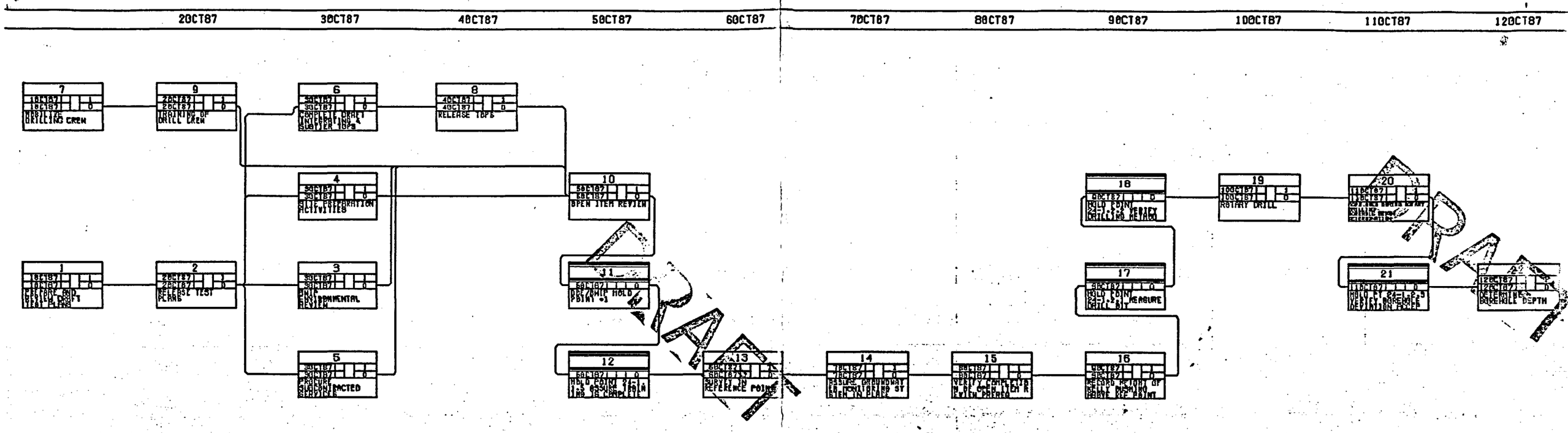
Literature Cited:

Relander, C. 1956. Drummers and Dreamers. Caxton Printers, Caldwell, Idaho.

Rice, D. G. 1984a. "Archaeological Inventory of the Basalt Waste Isolation Project, Hanford Reservation, Washington." Letter Report SD-BWI-TA-006 to Rockwell Hanford Operations, Richland, Washington.

Rice, D. G. 1984b. "Archaeological Survey of the Basalt Waste Isolation Project Reference Repository Location and Associated Drill Borehole Site Locations. Letter Report SD-BWI-TA-007 to Rockwell Hanford Operations, Richland, Washington.

Schuster, H. H. 1975. Yakima Indian Traditionalism. Dissertation, University Microfilms, Ann Arbor, Michigan.



TWIMC:

This is a summary of the Actions planned/specified for drilling DC-24. Logging which occurs during drilling is also included

FKC
9/5/87

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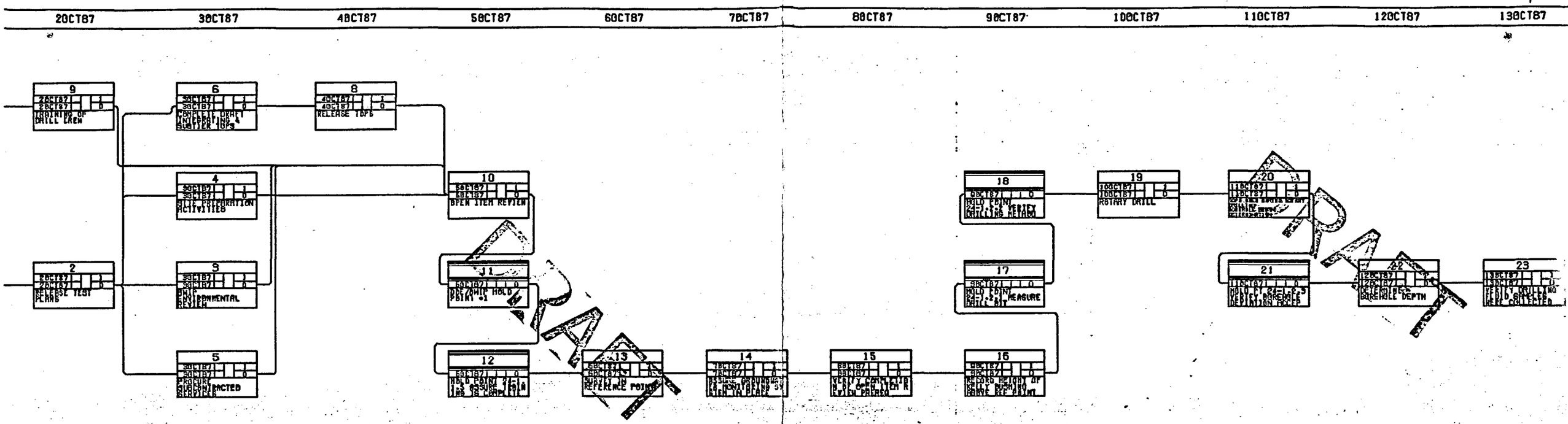

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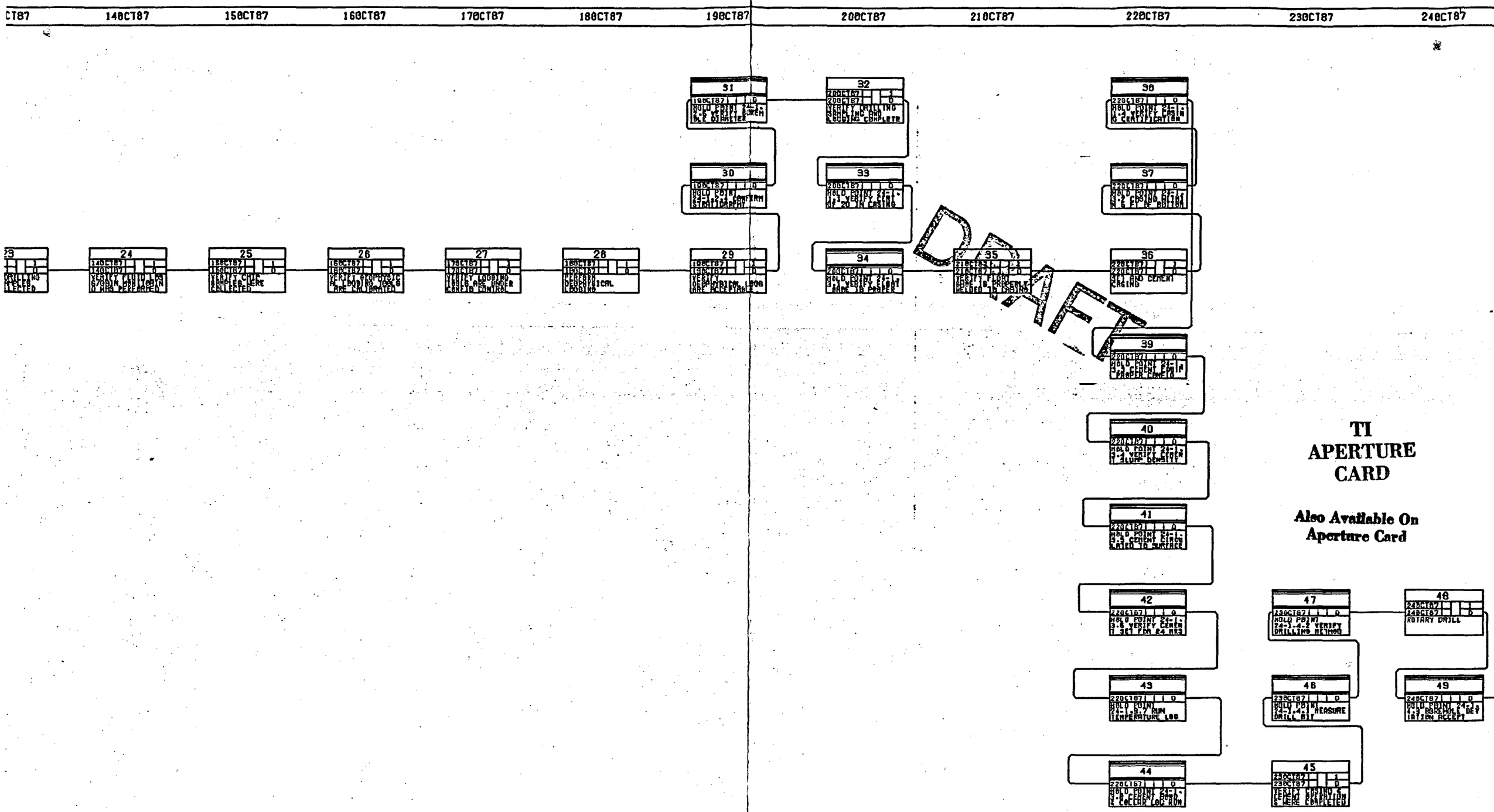

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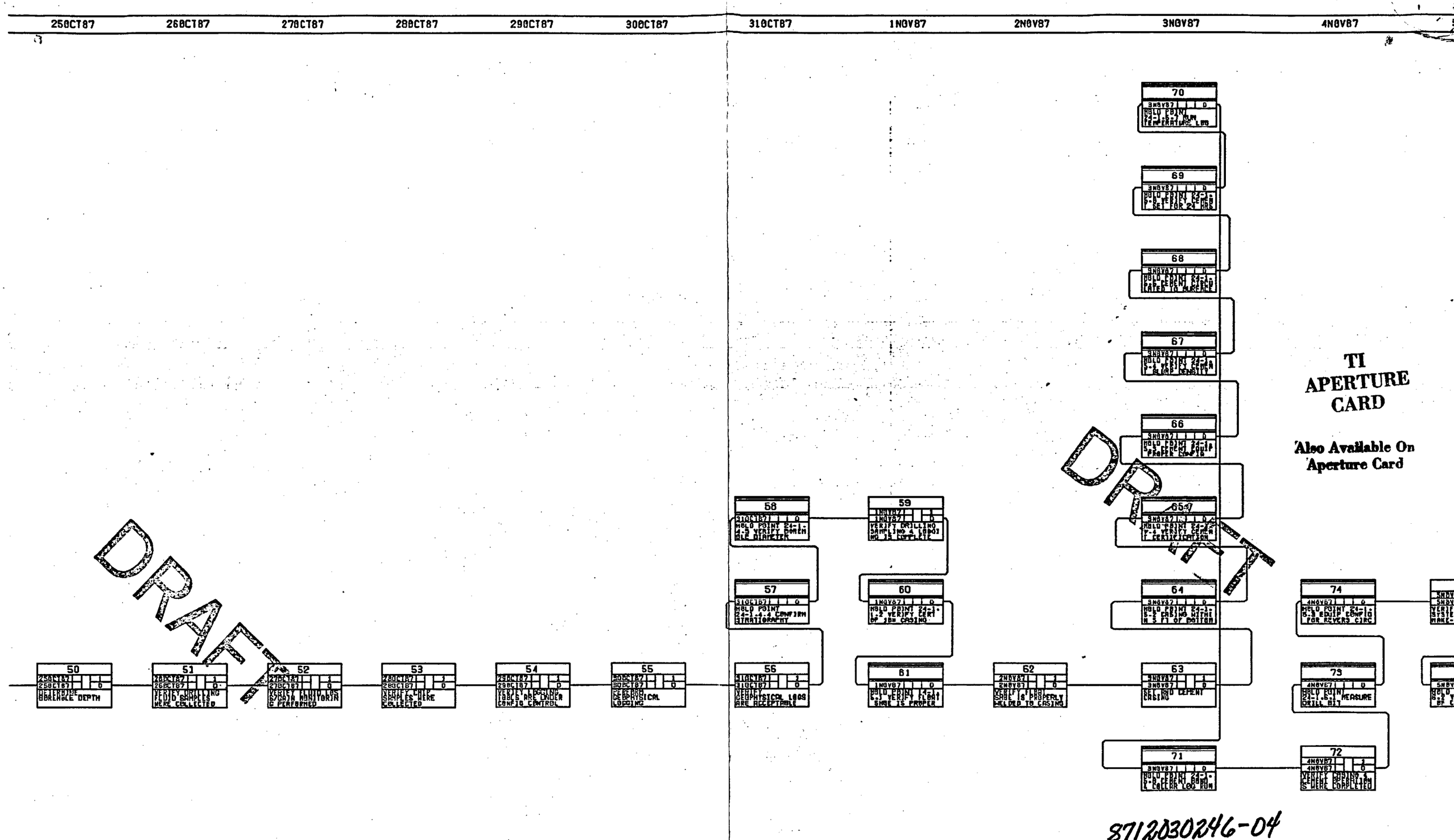
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50
DETERMINE BOREHOLE DEPTH
51
VERIFY DRILLING FLUID SAMPLES WERE COLLECTED
52
VERIFY FLUID LOS SCAN MONITORIN G PERFORMED
53
VERIFY CHIP SAMPLES WERE COLLECTED
54
VERIFY LOGGING TOOLS ARE UNDER CONFIG CONTROL
55
PERFORM GEOPHYSICAL LOGGING
56
VERIFY GEOPHYSICAL LOGS ARE RECEPTIBLE
57
HOLD POINT 24-1-4 CONFIRM STRATIGRAPHY
58
HOLD POINT 24-1-4.3 VERIFY BOREH OLE DIAMETER
59
VERIFY DRILLING SAMPLING & LOGGI NG IS COMPLETE
60
HOLD POINT 24-1-1.2 VERIFY CERT OF 18" CASING
61
HOLD POINT 24-1-6.1 VERIFY FLOAT SHOE IS PROPER
62
VERIFY FLOAT SHOE IS PROPERLY WELDED TO CASING
63
SET AND CEMENT CASING
64
HOLD POINT 24-1-6.2 CASING WITHI N 5 FT OF BOTTOM
65
HOLD POINT 24-1-7.4 VERIFY CEMEN T CERTIFICATION
66
HOLD POINT 24-1-5.5 EQUIP CONFIG PROPER CONFIG
67
HOLD POINT 24-1-7.1 VERIFY CEMEN T BLOCK DENSITY
68
HOLD POINT 24-1-7.2 CAP CEMENT CURED TO ALLOWABLE
69
HOLD POINT 24-1-7.3 T-SET FOR 24 HRS
70
HOLD POINT 24-1-7.5 TEMPERATURE LOG
71
HOLD POINT 24-1-8.0 CEMENT BOND LOGGING
72
VERIFY CASING & CEMENT OPERATION S WERE COMPLETED
73
HOLD POINT 24-1-6.4 MEASURE DRILL BIT
74
HOLD POINT 24-1-6.3 EQUIP CONFIG FOR REVERS CIRC
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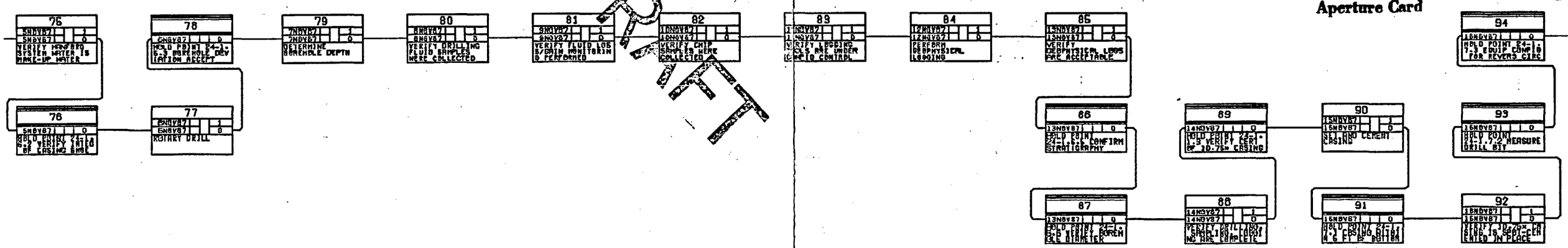

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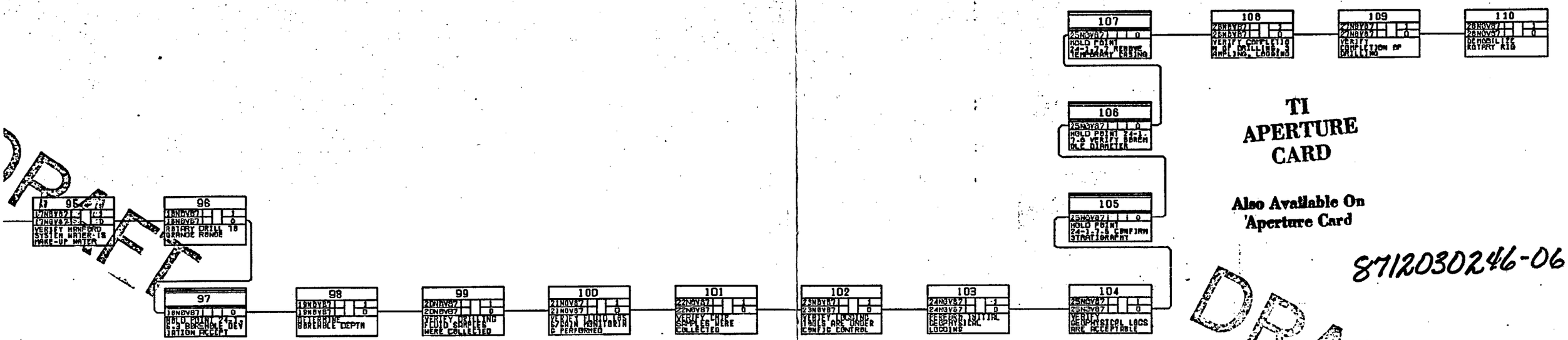

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PROJECT/2 - V85A4	
PROJECT BWIP	
START DATE 10CT87	COMPLETION 28NOV87
MODE O/FE	RUN SEP 09, 1987
PLOT 'E.S.C. '	PAGE 1 SHEET 1 / 1

1924
Box 2

See pocket 4 for enclosure

PDR-1
LPDR WM-10(2)

WM DOCKET CONTROL CENTER

'87 SEP 18 A10:00

WM Record File 101

WM Project 10
Docket No.
PDR ✓
X LPDR ✓(B)

Distribution:
PDR NEB
Wastler
Youngblood
Still
(Return to WM, 623-SS)

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