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CENTRAL NEVADA TEST AREA

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U. S. ATOMIC ENERGY COMMISSION CONTRACT AT(26-1)-38

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Las Vegas, NV 89193

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INTRODUCTION

The purpose of this document is to establish a detailed plan for disposition of the 37 drilled holes which were used by the AEC in Central Nevada. Five of the holes will be assigned to the U. S. Bureau of Land Management (BLM). See Appendix E. Abandoning or plugging the remaining 32 holes will be accomplished in two phases. The three large-diameter holes (UC-3, UC-3 Cannister and UC-4) will be plugged for safety and in a manner that will permit ease of reentry. Phase I will cover operations on 28 holes in Fiscal Year 1974. Phase II will cover future abandonment of the 4 water monitoring holes if and when monitoring is no longer required. The plan is based on the parameter of geology, safety, and ecology. This document establishes the abandonment objectives and provides a program for achieving these objectives. A list of equipment and material required to accomplish the program and an estimate of time required to complete the work is included in the plan.

As a matter of courtesy, the AEC will advise the Nevada State Engineer of the abandonment program details. Copies of this plan will also be sent to the Bureau of Land Management.

A. Objectives

The objectives of the abandonment program are as follows:

1. Plug UC-3, UC-3 Cannister and UC-4 in a manner that will allow them to be easily reentered if required.

2. Abandon the other holes so that all possible contamination remains below ground level.

3. Eliminate all potential hazards to man and wildlife.

4. Abandon the monitoring holes, after they are no longer required, using a minimum of equipment and material.

B. Hydrologic Conditions

Fresh water is present in all of the AEC drilled holes in Central Nevada. Holes in Little Fish Lake, Hot Creek, Little Smokey, Antelope, Monitor and Ralston Valleys are to be plugged or abandoned at this time. The static water level ranges from above ground level to 565 feet below ground level. Water movement through the formation tends to be lateral or downward at most of the locations to be abandoned.

C. Program of Abandonment

The main premise upon which the abandonment program is based is the requirement to completely seal all holes below ground level and to eliminate all safety hazards.

In preparing the abandonment program, it was assumed that the abandonment procedures would be accomplished by using as much equipment and materials from the Central Nevada Test Site as possible. Because of the lack of necessary services in this remote area, available services from NTS, Reno, Ely or Tonopah will be utilized. Cement plugs can be placed in UCE-10 and UCE-18 by Halliburton under their present contract. Cement plugs required for all other holes can be furnished by local ready mix concrete suppliers at less cost than is possible by Halliburton. Small amounts (3 to 5 cu. ft.) of cement can be mixed and placed by hand in the very small-diameter holes. Fabrication and methods of placing and securing the surface plugs and completely sealing all holes, except UC-3, UC-3 Cannister, UC-4, UCE-10 and UCE-18, will be accomplished in a manner similar to the operations conducted on Amchitka Island.

This work shall be accomplished using the minimum amount of labor and supervised by a qualified drilling engineer. Specifically, the labor needed includes truck operators, a front end loader operator, welders, crane operators and laborers. From experience gained during the abandonment operations at Amchitka, having qualified laborers and an expert welder available will accelerate the abandonment operation. It is anticipated that while operations such as excavating or cutting casing are proceeding on one hole; other plugging operations will continue simultaneously. It is further anticipated that, when possible, the holes will be prepared for plugging ahead of time so that the cement contractor can plug several holes during each trip to the work site.

1. Surface Plugs

Ten-foot cement plugs in the top of the casing appear to be adequate for all of the holes that are being abandoned at this time except UCE-10 and UCE-18. See Appendix D.

A total volume of approximately 3550 cubic feet of slurry will be required for surface plugs. The volume required for each hole varies from one cubic foot in the 2-3/8 inch tubing strings to 392 cubic feet required for each of the three large-diameter holes.

To retain the cement plugs in the upper 10 feet of the casing, wooden plugs, like those used on Amchitka Island, will be placed in the open casing. See Drawing No. M2950-01. Prior to running the plug, the fluid level must be lowered to 10 feet. The wooden plugs will be secured to the casing by attaching 1/2 or 3/4 inch rebar to the casing, so that the wooden plug and cement plug cannot possibly move down the hole. The numerous uncemented annular spaces will be bridged and cemented using a supported split plate as shown on Drawing No. M2953-01.

The successful use of wooden plugs on Amchitka Island is a good recommendation for their use at Central Nevada. Wooden plugs are less expensive to fabricate and install than other plug types. Installation of a Baker type plug using a Birdwell truck and mast would cost $1,680.00 (including mileage) for the first 4-1/2 inch plug and from $555.00 to

$1,059.00 (depending on size) per hole thereafter. In addition, Birdwell will charge $300.00 set up charge for each hole. The costs therefore dictate that wooden plugs be procured and used.

2. Rat Holes and Mouse Holes

For definitive purposes, these holes are shallow (30' to 40' deep) vertical drilled holes adjacent to the rig floor. Rat holes are used as a place to set the kelly out of the way when it is not being used, and mouse holes are used for making drill pipe connections. The holes are not used once the drilling rig is moved away. Information concerning the number and the type of these holes presently open at Central Nevada is not available. If they do exist they will be abandoned by cutting the casing off at ground level and then filling the open hole to the surface with cement or native material. If cement is to be used it may be placed either with Halliburton equipment or by hand. All rat holes and mouse holes associated with the UC-I Complex, that can be located, will be sampled by Rad-Safe before they are plugged.

3. Troughs

A number of locations have 3 foot x 15 foot troughs built into the pad. These troughs will be filled with dirt within 1 foot of the surface and capped with cement.

4. Installation of Cover Plates

To protect the holes against leakage, steel plates, having a suitable minimum thickness, should be welded over the casing stubs. In all possible instances, the plate should be welded to the surface casing, thereby protecting the area inside the casing and also the annuli between casing strings. All annular voids at the surface should be plugged with cement before the steel plate is installed.

5. Installation of Markers and a Monument

The exact location and identification of all drilled holes (except those assigned to BLM) at Central Nevada will be identified by prefabricated steel markers.

A number of the holes have been previously plugged with cement to the surface. A cover plate should be welded to the surface casing with 4 feet of 4 inch pipe welded and gussetted to the plate in a vertical position. A name plate should then be properly secured to the pipe.

When cementing surface plugs in the other holes, a vertical marker (4 inch pipe) should be installed with a visible identification plate. The pipe should be of sufficient length to be set 3 feet into the cement and protrude 4 feet above ground level.

It is anticipated that these identification plates will be prefabricated and will identify the hole by number and Nevada State coordinates.

Bead welding of the data on the plate at the site would be more expensive than in-plant engraving or die stamping. It is recommended that prefabricated identification plates be used as hole markers. See F&S Drawing No. M2959-01.

A permanent stone or concrete monument with appropriate markers will be erected over Emplacement Hole SGZ of Faultless.

D. Equipment and Material

The abandonment program will require the following equipment and material:

1. Equipment

a. Jack hammer and compressor - Government-owned 600 Ingersall Rand compressor and air hammers are currently on site and will be required for removing the cement around the wellheads to allow installation of the cover plate one foot below the surface.

b. Front end loader - one cubic yard capacity, required for filling cellars, troughs and rat holes with native soil prior to capping them with cement.

c. Truck with winch or "A" frame - required for lowering large wooden plugs into holes and bailing holes to plug depth. This equipment will also be used to remove wellhead equipment.

d. Four pickups - required for hauling tools, cement mixing pans, sack cement, and personnel.

e. Electric welding machine with a supply of welding rod - required for welding on plates and markers and welding plug support to casing stubs.

f. Acetylene cutting torch with a supply of acetylene and oxygen - required for cutting casing, etc.

g. Crane - required for heavy lifting at UC-4, UC-3 and UC-3 Cannister if the hole is surface plugged. Will be used in the event the casing in UC-3 Cannister is floated out of the hole.

2. Material

a. Wooden plugs - (Check I.D. Against Weight)

3 each - 1.9" for 2-3/8" tubing

5 each - 3-7/8" for 4-1/2" casing

2 each - 4-1/2" for 5-1/2" casing

2 each - 6-7/8" for 7-5/8" casing

2 each - 7-3/4" for 8-5/8" casing

6 each - 8-7/8" for 9-5/8" casing

2 each - 12-1/4" for 12-1/4" hole

7 each - 12-1/2" for 13-3/8" casing

2 each - 19" for 20" casing

b. Annulus plugs

4 each - 9-5/8" x 13-3/8"

1 each - 5-1/2" x 13-3/8"

1 each - 4-1/2" x 9-5/8"

1 each - 4-1/2" x 7-5/8"

1 each - 54" x 94" (UC-3 Cannister)

c. Other Material

90' of 3/4" cable

330' - 1 inch rebar for plug holders

400 sq. ft. of 1/2" steel plate

260' of 4" casing - (pipe for markers)

26 markers

3550 cubic feet of slurry

Miscellaneous handling equipment

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APPENDIX A

SCHEDULE FOR PLUGGING OPERATIONS

WITH TIME ESTIMATE

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Plugging operations will be conducted on the following holes during Fiscal Year 1974:

	Hole Number	Estimated Time (In Hours) for Plugging Operations
Hot Creek Valley		
	UC-1	36
	UC-1-1-1	4
	UC-1-1-2	4
	UC-1-P-1	4
	UC-3	24
	UC-3 Cannister Hole	24
	UC-3-1-1	4
	UC-3-1-2	4
	UC-3-1-3	4
	UC-3-1-4	4
	UC-3-1-5R	4
	UC-4	48
	UCE-11	4
	*UCE-18	12
	UCE-20	2

*UCE-18 will be used as the water source for all Phase I plugging operations and then abandoned.

	Hole Number	Estimated Time (In Hours) for Plugging Operations
Hot Creek Valley		
	HTH-3	4
	HTH-5	6
	HTH-21-1	6
	Total	198 Hours
Little Smokey Valley		
	UCE-14	6
	UCE-21	2
	UCE-23	4
	HTH-21	3
	Total	15 Hours
Antelope Valley		
	UCE-13	5
Little Fish Valley		
	UCE-9	6
	UCE-10	6
	UCE-12a	4
Monitor Valley		
	UCE-3	4

	Hole Number	Estimated Time (In Hours) for Plugging Operations
Ralston Valley		
	UCE-1	4
	Total	29 Hours

The following holes in Hot Creek Valley are sampling points in the long-term hydrologic monitoring program. If the program is eventually terminated they may be abandoned.

UC-1-P-1S	8
UC-1-P-2	16
HTH-1	3
HTH-2	6
Total	33 Hours
Grand Total	275 Hours

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APPENDIX B

EQUIPMENT DRAWINGS

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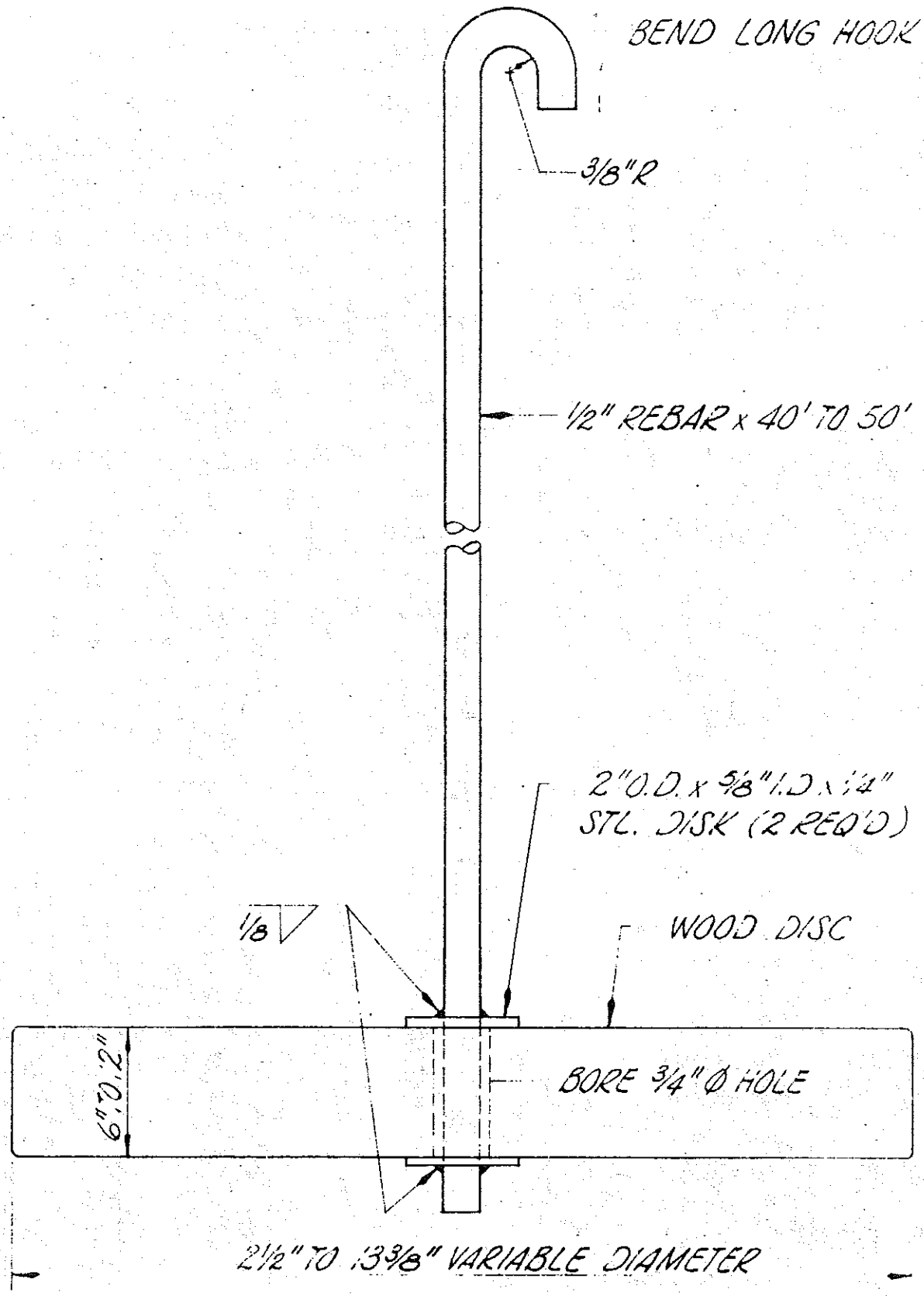
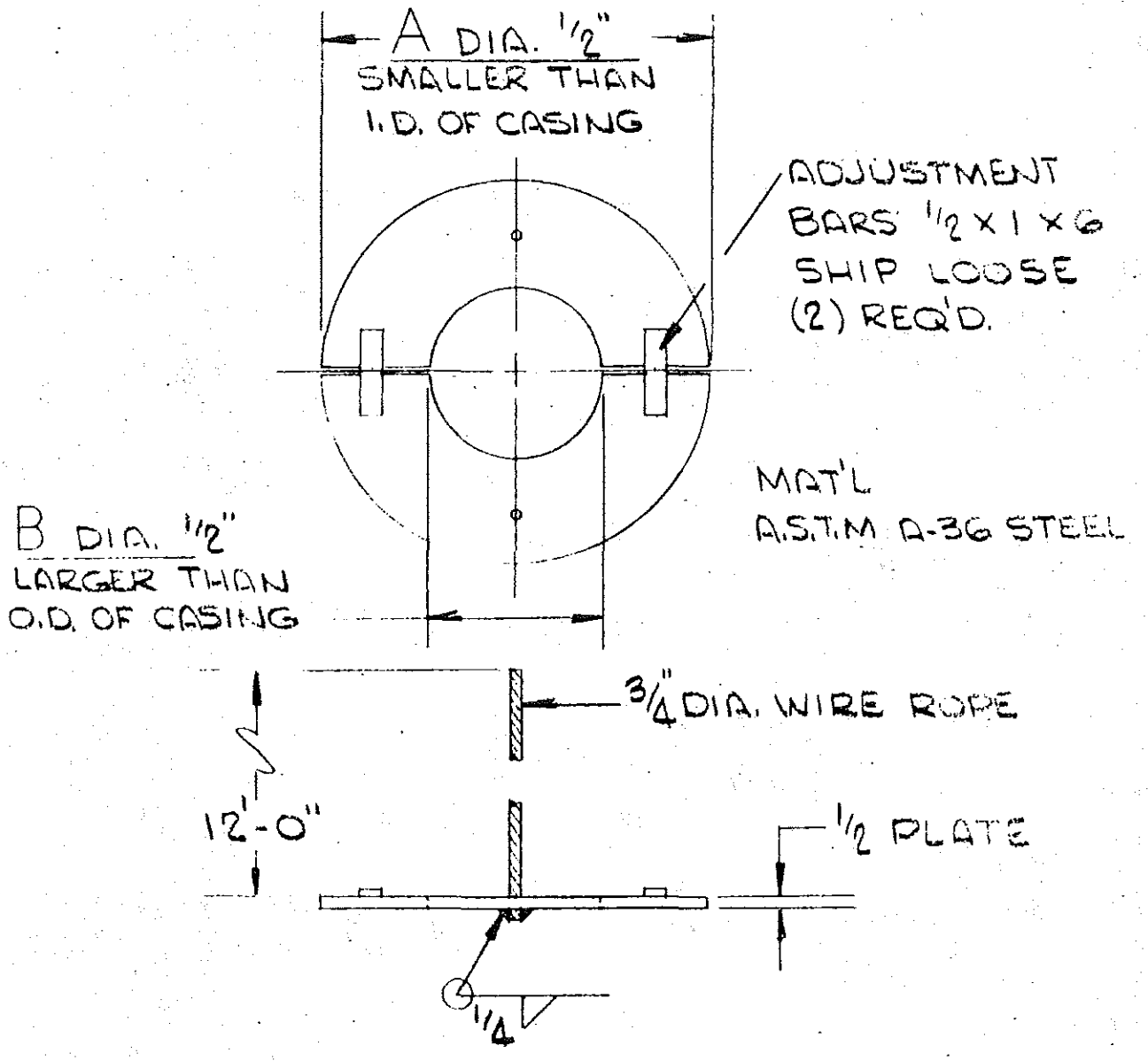


PREPARED BY **FENIX & SCISSON, INC.** ENGINEERS & CONTRACTORS LAS VEGAS, NEVADA	FOR **U.S. ATOMIC ENERGY COMMISSION** NEVADA OPERATIONS OFFICE — LAS VEGAS, NEVADA
CNSTA HOLE ABANDONMENT PROGRAM BRIDGING PLUG	DRAWING NO. M 2950-01

DRAWN	CHECKED	DATE	SCALE	SHEET ____ OF ____
B. FISHER	[illegible]	10-25-72	N.T.S.	



HOLE	CASING	A -1/2	B +1/2	HOLE	CASING	A -1/2	B +1/2
UC1-P-15	10 3/4 X 4 1/2	9 1/2	5	HTH-4	20 X 13 3/8	18 1/2	13 7/8
UC1-P-2, 25, 25R	13 3/8 X 9 5/8	12	10 1/8	HTH-4	13 3/8 X 5 1/2	12 1/8	6
UC1-P-2, 25, 25R	9 5/8 X 5 1/2	8 1/2	6	HTH-21-1	13 3/8 X 9 5/8	12 1/8	10 1/8
UC-3 CANNISTER	94 X 54	93 1/2	55 1/8				
UCE-10	9 5/8 X 4 1/2	8 1/2	5				
UCE-11	7 5/8 X 4 1/2	7	5				
UCE-14	9 5/8 X 4 1/2	9 1/8	5				
HTH-2	13 3/8 X 9 5/8	12 1/8	10 1/8				

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FOR
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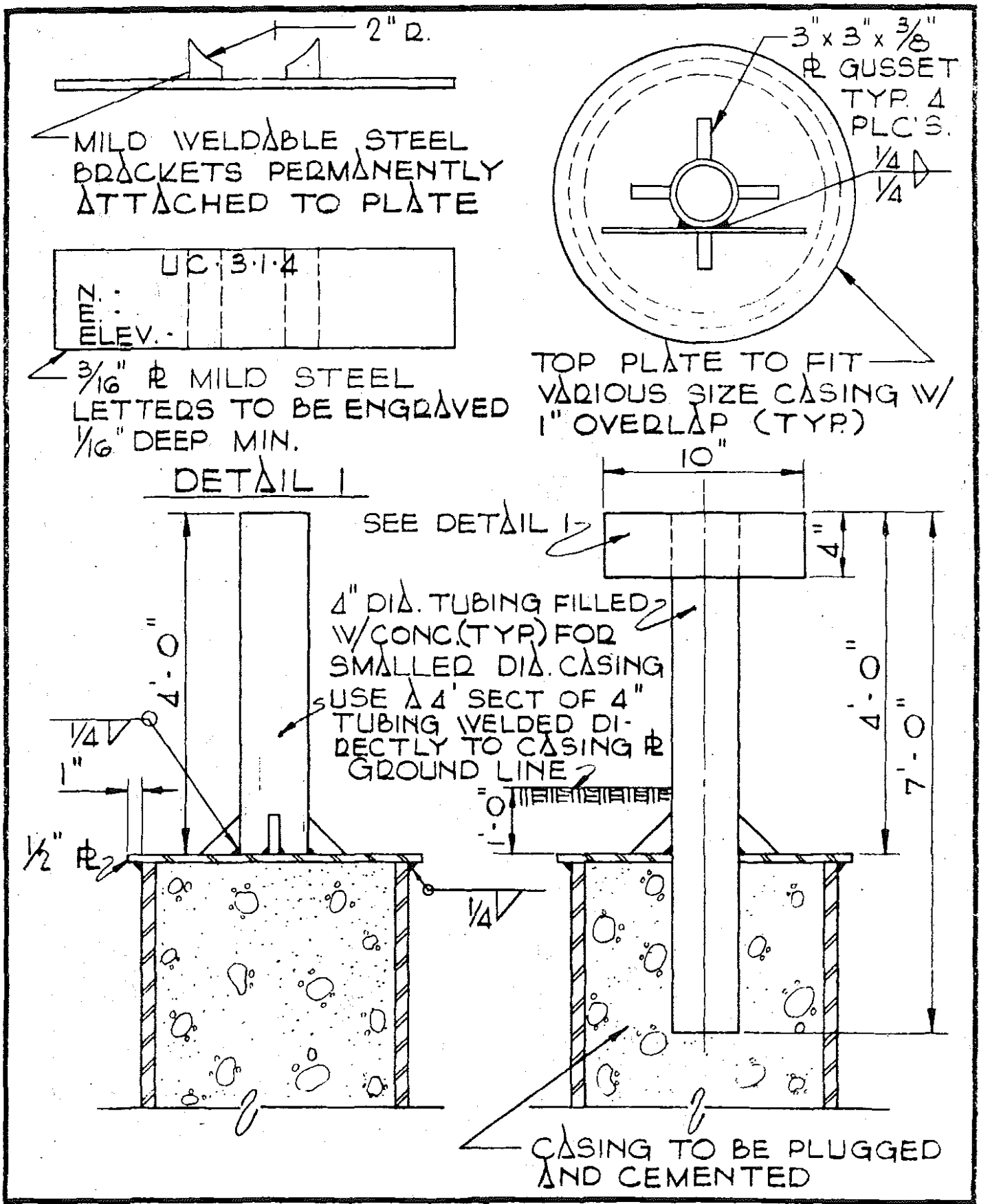
NEVADA OPERATIONS OFFICE LAS VEGAS, NEVADA

CNSTA HOLE ABANDONMENT PROGRAM
CEMENTING PLUG

DRAWING NO. M2953-01

DRAWN HOGE | CHECKED [illegible] | DATE 10-25-72 | SCALE NONE | SHEET ____ OF ____



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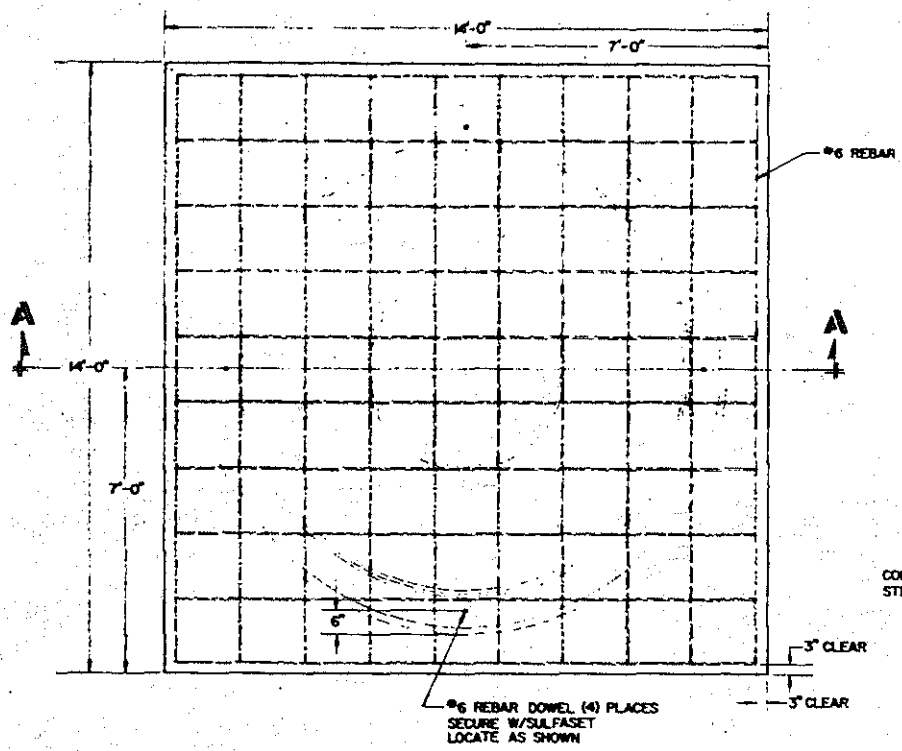
FENIX & SCISSON, INC. ENGINEERS & CONTRACTORS LAS VEGAS, NEVADA	**U.S. ATOMIC ENERGY COMMISSION** NEVADA OPERATIONS OFFICE LAS VEGAS, NEVADA

HOLE MARKER
CENTRAL NEVADA ABANDONMENT PROGRAM

DRAWING NO. M 2959-01

DRAWN	CHECKED	DATE	SCALE	SHEET ___ OF ___
D.B.			NONE	

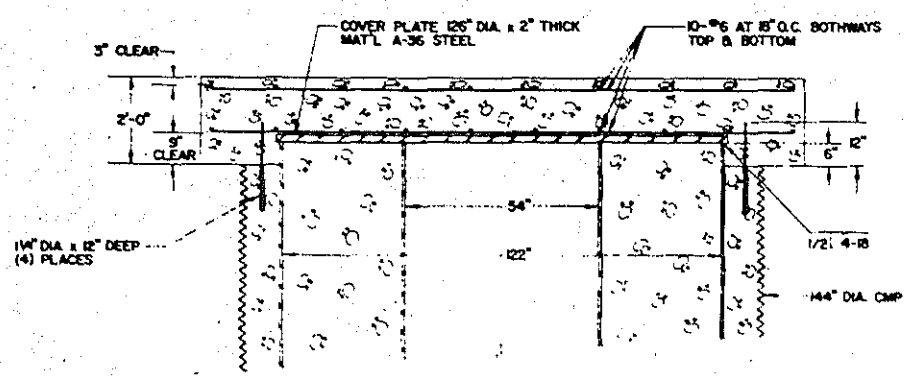


1. CONSTRUCTION REQUIREMENTS, SPECIFICATIONS AND TESTS FOR MATERIALS SHALL BE IN ACCORDANCE WITH PARTS 2 & 3 OF ACI STANDARD 318-71.
2. CONCRETE SHALL BE MADE FROM EITHER TYPE IA OR IIA AIR-ENTRAINING PORTLAND CEMENT.
3. CONCRETE TO HAVE 4000psi COMPRESSIVE STRENGTH IN 28 DAYS.
4. HIGH-EARLY-STRENGTH CEMENT, CALCIUM CHLORIDE AND ACCELERATING TYPE ADMIXTURES SHALL NOT BE USED.
5. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 3".
6. A RETARDING ADMIXTURE SHALL BE USED WHENEVER NECESSARY TO PREVENT COLD JOINTS DUE TO QUANTITY OF CONCRETE PLACED.
7. REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000psi AND SHALL CONFORM TO ASTM SPECIFICATION A-615 GRADE 60.
8. REINFORCEMENT SPLICES:
   LAP TOP BARS 18"
   LAP BOTTOM BARS 12"

REINFORCING BAR

BILL OF MATERIAL			
NO.	SIZE	LENGTH	TOTAL WEIGHT
40	6	13'-6"	811 LBS
4	6	2'-0"	12 LBS
		TOTAL	823 LBS

CONCRETE = 14.5 CU. YDS.
STEEL PLATE 2" x 126" DIA. 7060 LBS



SECTION A-A

DATE: 2-20-73
SCALE: 1/4" = 1'-0"

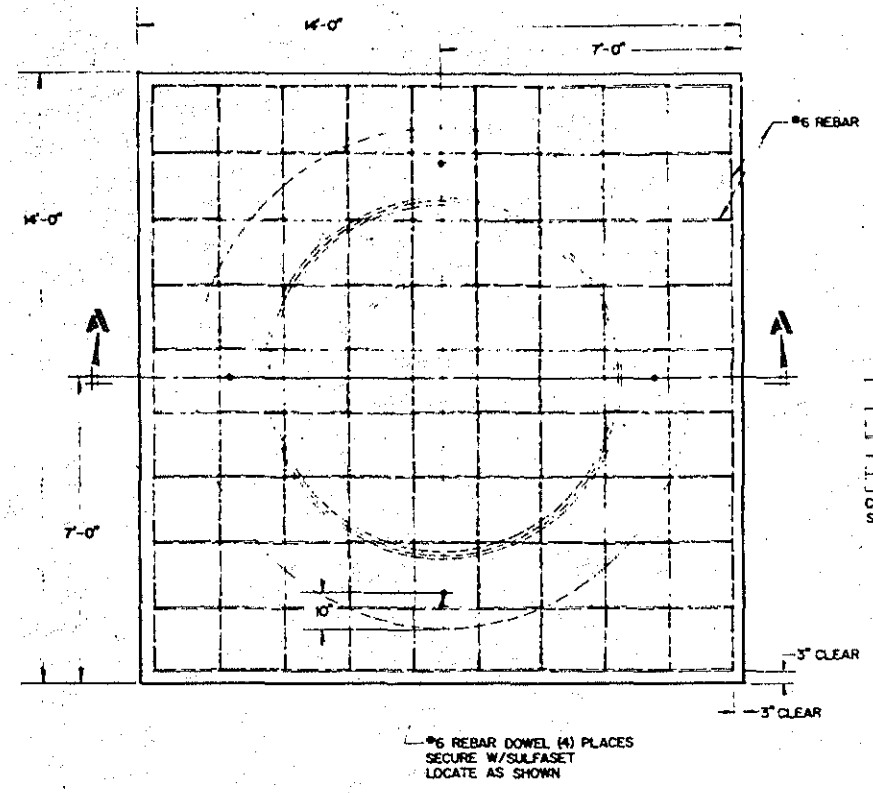
U. S. ATOMIC ENERGY COMMISSION
NEVADA OPERATIONS OFFICE
LAS VEGAS, NEVADA

N. STRAUSS
R. FISHER

UC-3
CONCRETE PAD COVER
CENTRAL NEVADA
ABANDONMENT PROGRAM

FIDEX & SCHISON, INC.
ENGINEERS AND CONTRACTORS
MERCURY NEVADA

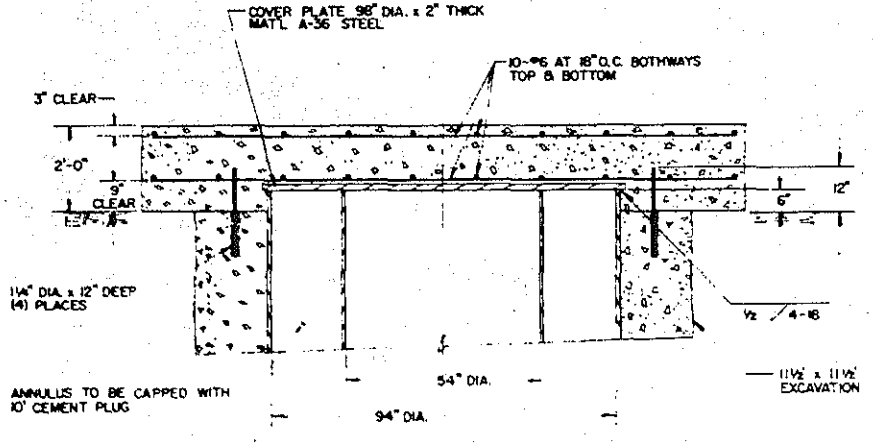
M-2968-01 | 0



REINFORCING BAR
BILL OF MATERIAL

NO.	SIZE	LENGTH	TOTAL WEIGHT
40	6	13'-6"	811 LBS
4	6	2'-0"	12 LBS
		TOTAL	823 LBS

CONCRETE = 14.5 CU. YDS.
STEEL PLATE 2" x 98" DIA. 4270 LBS



SECTION A A

-NOTES-

1. CONSTRUCTION REQUIREMENTS, SPECIFICATIONS AND TESTS FOR MATERIALS SHALL BE IN ACCORDANCE WITH PARTS 2 & 3 OF ACI STANDARD 318-71.
2. CONCRETE SHALL BE MADE FROM EITHER TYPE IA OR IIA AIR-ENTRAINING PORTLAND CEMENT.
3. CONCRETE TO HAVE 4000 psi COMPRESSIVE STRENGTH IN 28 DAYS.
4. HIGH-EARLY-STRENGTH CEMENT, CALCIUM CHLORIDE AND ACCELERATING TYPE ADMIXTURES SHALL NOT BE USED.
5. MAXIMUM AGGREGATE SIZE SHALL NOT EXCEED 3".
6. A RETARDING ADMIXTURE SHALL BE USED WHENEVER NECESSARY TO PREVENT COLD JOINTS DUE TO QUANTITY OF CONCRETE PLACED.
7. REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 psi AND SHALL CONFORM TO ASTM SPECIFICATION A-615 GRADE 60.
8. REINFORCEMENT SPLICES:
   LAP TOP BARS 18"
   LAP BOTTOM BARS 12"

DATE: 2-20-73
SCALE: 3/4" = 1'-0"

U. S. ATOMIC ENERGY COMMISSION
NEVADA OPERATIONS OFFICE — LAS VEGAS, NEVADA

DESIGNED: K. STRAUSS
DRAWN: G. PISTER

UC-3 CANNISTER HOLE
CONCRETE PAD COVER
CENTRAL NEVADA
ABANDONMENT PROGRAM

PEDRIX & SCHSSON, INC.
ENGINEERS AND CONTRACTORS
LAS VEGAS, NEVADA

DRAWING NUMBER: M-2969-01
REV: 0

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APPENDIX C

LOCATION MAP AND COMPLEX MAPS

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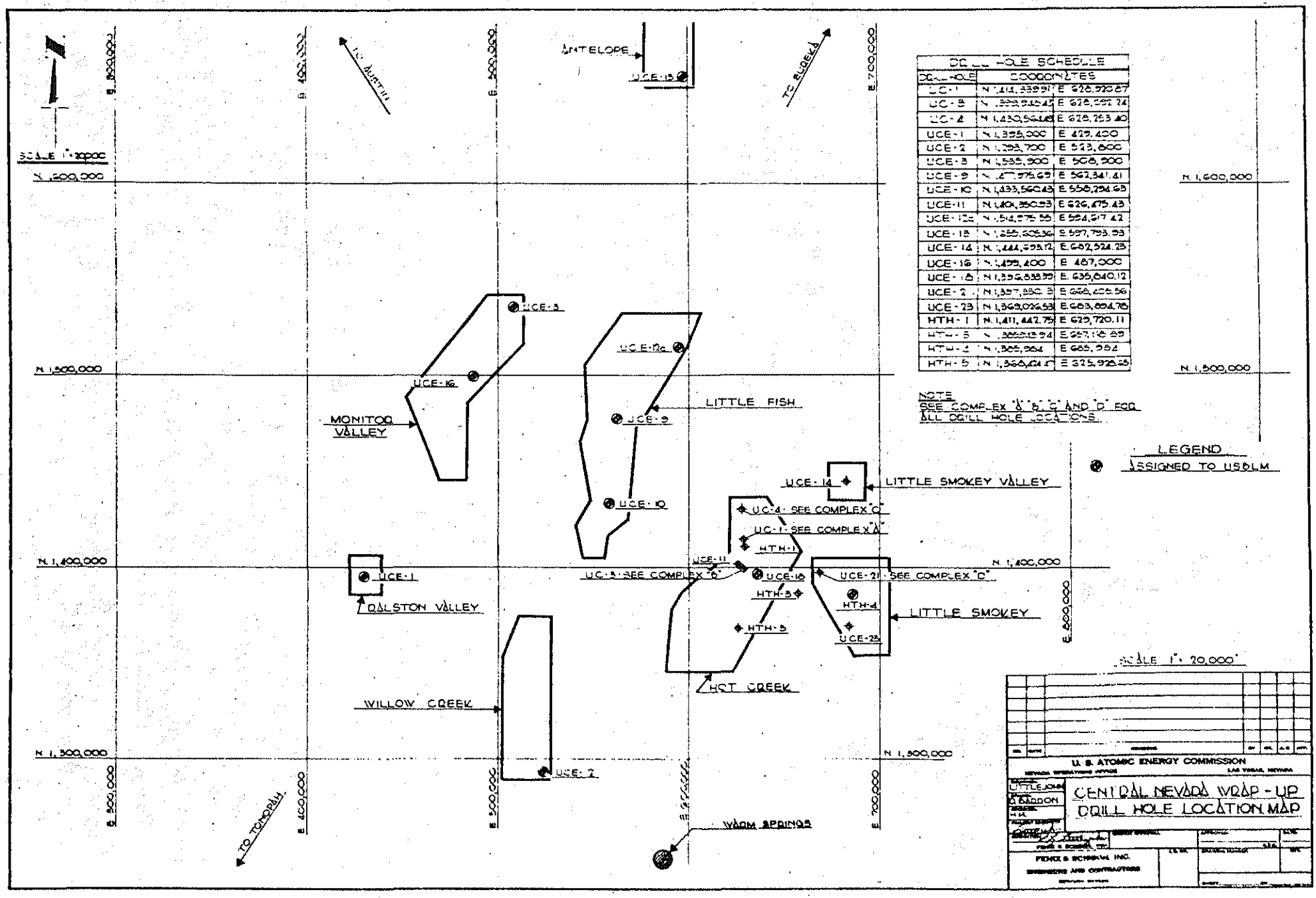
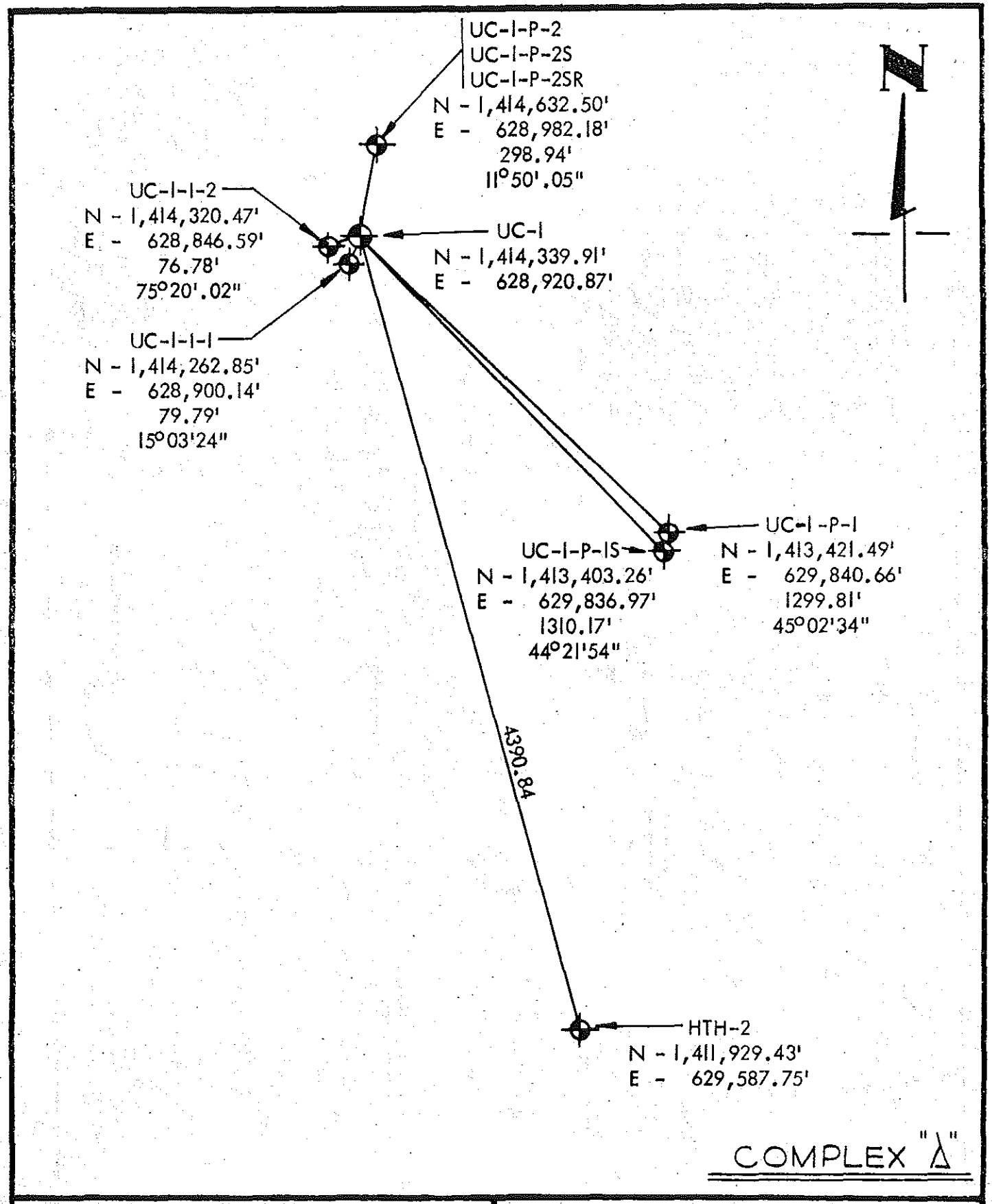


DRILL HOLE SCHEDULE

DRILL HOLE	COORDINATES	
UC-1	N 1,411,339.91	E 628,920.67
UC-3	N 1,393,936.42	E 628,557.24
UC-4	N 1,430,564.48	E 628,253.40
UCE-1	N 1,355,000	E 427,400
UCE-2	N 1,293,700	E 523,800
UCE-3	N 1,535,900	E 508,900
UCE-9	N 1,477,975.69	E 562,341.41
UCE-10	N 1,433,560.43	E 556,254.63
UCE-11	N 1,404,350.53	E 626,475.43
UCE-12a	N 1,514,575.55	E 554,517.42
UCE-13	N 1,255,605.36	E 597,793.53
UCE-14	N 1,444,595.12	E 682,524.73
UCE-16	N 1,455,400	E 487,000
UCE-18	N 1,396,838.39	E 639,840.12
UCE-21	N 1,357,350.3	E 666,425.56
UCE-23	N 1,363,026.53	E 663,604.76
HTH-1	N 1,411,442.75	E 625,720.11
HTH-3	N 1,365,015.94	E 667,116.89
HTH-4	N 1,365,964	E 665,984
HTH-5	N 1,366,424.57	E 625,928.25

NOTE
SEE COMPLEX "A", "B", "C" AND "D" FOR ALL DRILL HOLE LOCATIONS.



COMPLEX "A"

PREPARED BY	FOR
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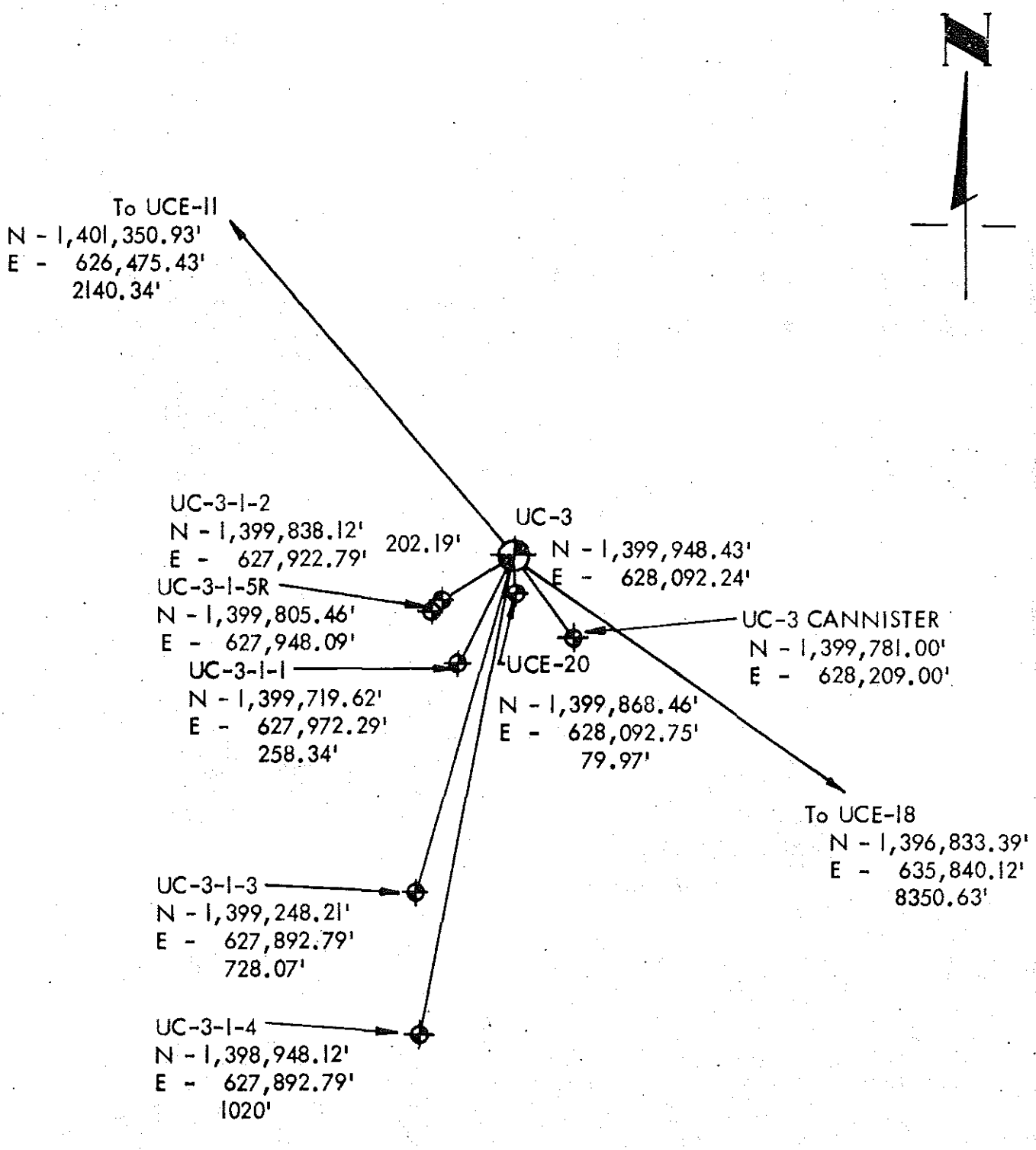
CNSTA ABANDONMENT	DRAWING NO. UC-1 COMPLEX

DRAWN	CHECKED	DATE	SCALE 1" = 400'	SHEET ____ OF ____



COMPLEX "B"

PREPARED BY	FOR	
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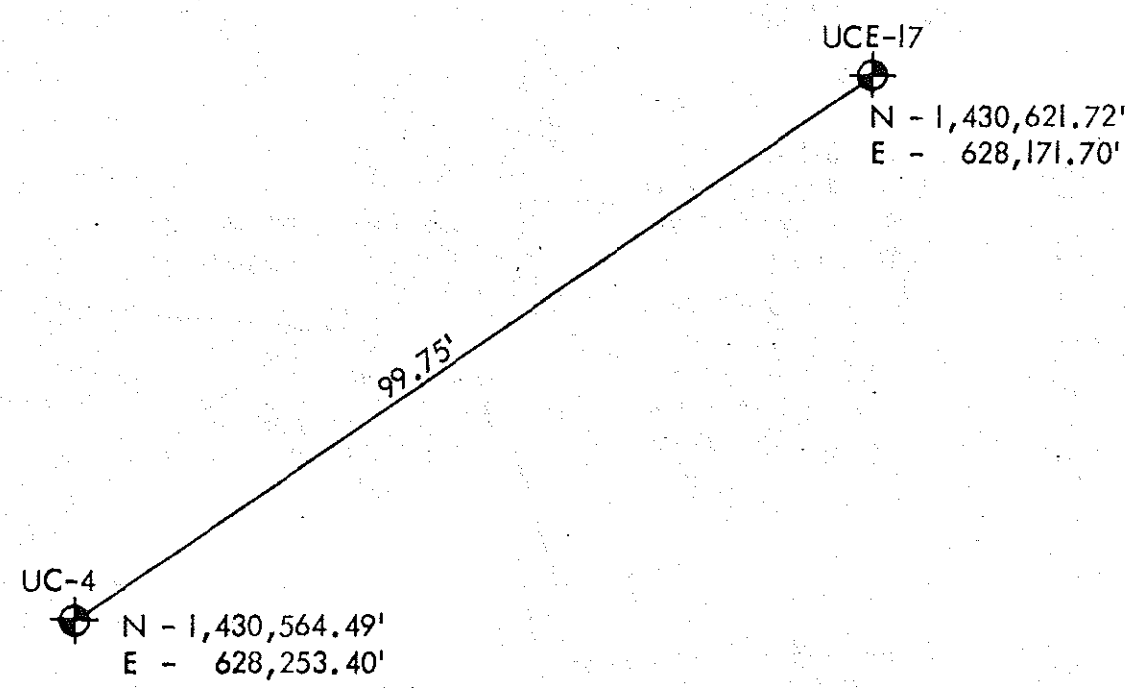
CNSTA ABANDONMENT		DRAWING NO. UC-3 COMPLEX

DRAWN	CHECKED	DATE	SCALE 1" = 300'	SHEET ____ OF ____

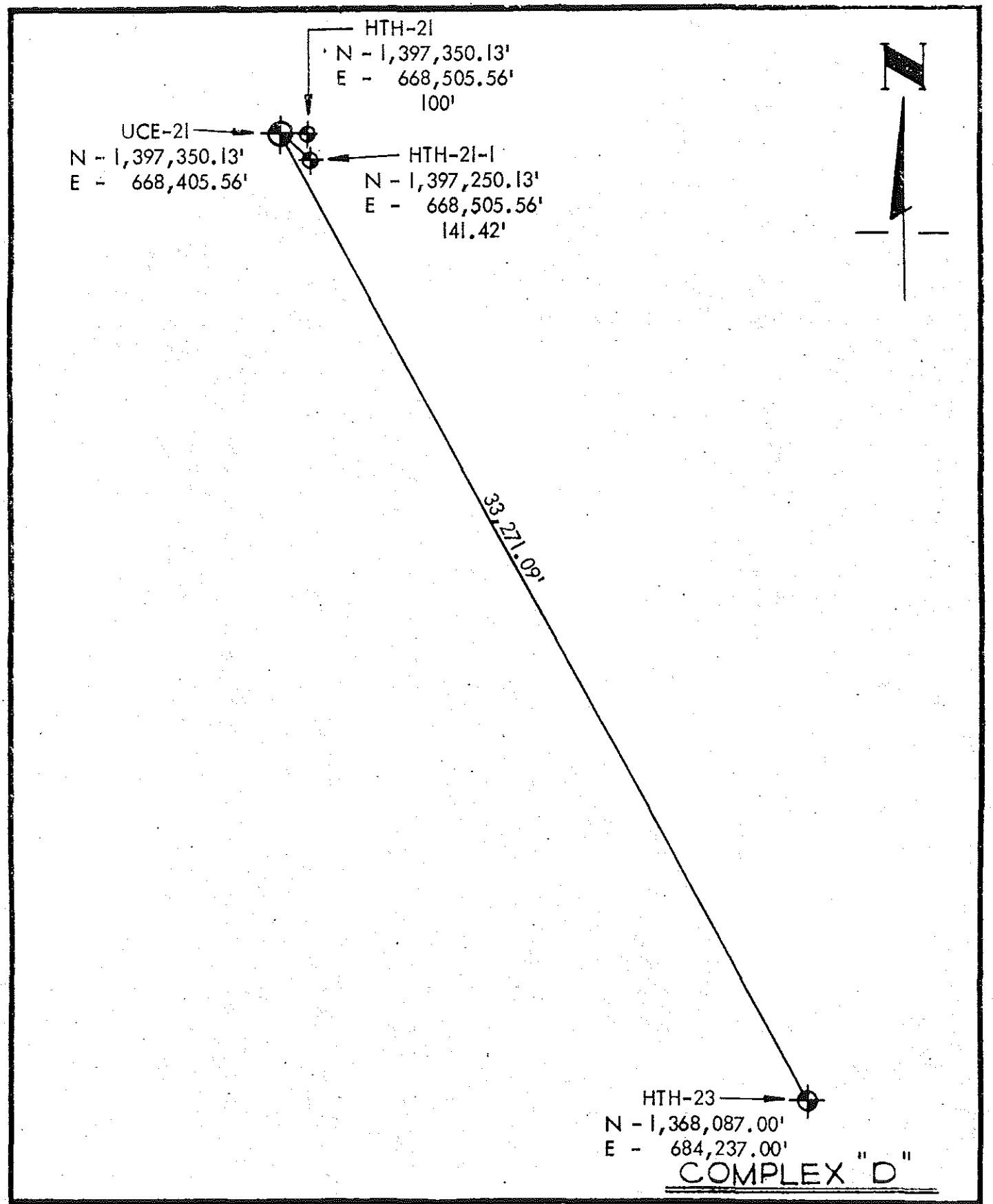


COMPLEX "C"

PREPARED BY **FENIX & SCISSON, INC.** ENGINEERS & CONTRACTORS LAS VEGAS, NEVADA	FOR **U.S. ATOMIC ENERGY COMMISSION** NEVADA OPERATIONS OFFICE LAS VEGAS, NEVADA

CNSTA ABANDONMENT	DRAWING NO. UC-4 COMPLEX

DRAWN	CHECKED	DATE	SCALE 1" = 100'	SHEET ____ OF ____



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CNSTA ABANDONMENT	DRAWING NO. UCE-21 COMPLEX

DRAWN	CHECKED	DATE	SCALE 1" = 4000'	SHEET ____ OF ____

APPENDIX D

HOLE CONFIGURATIONS AND ABANDONMENT PROGRAMS

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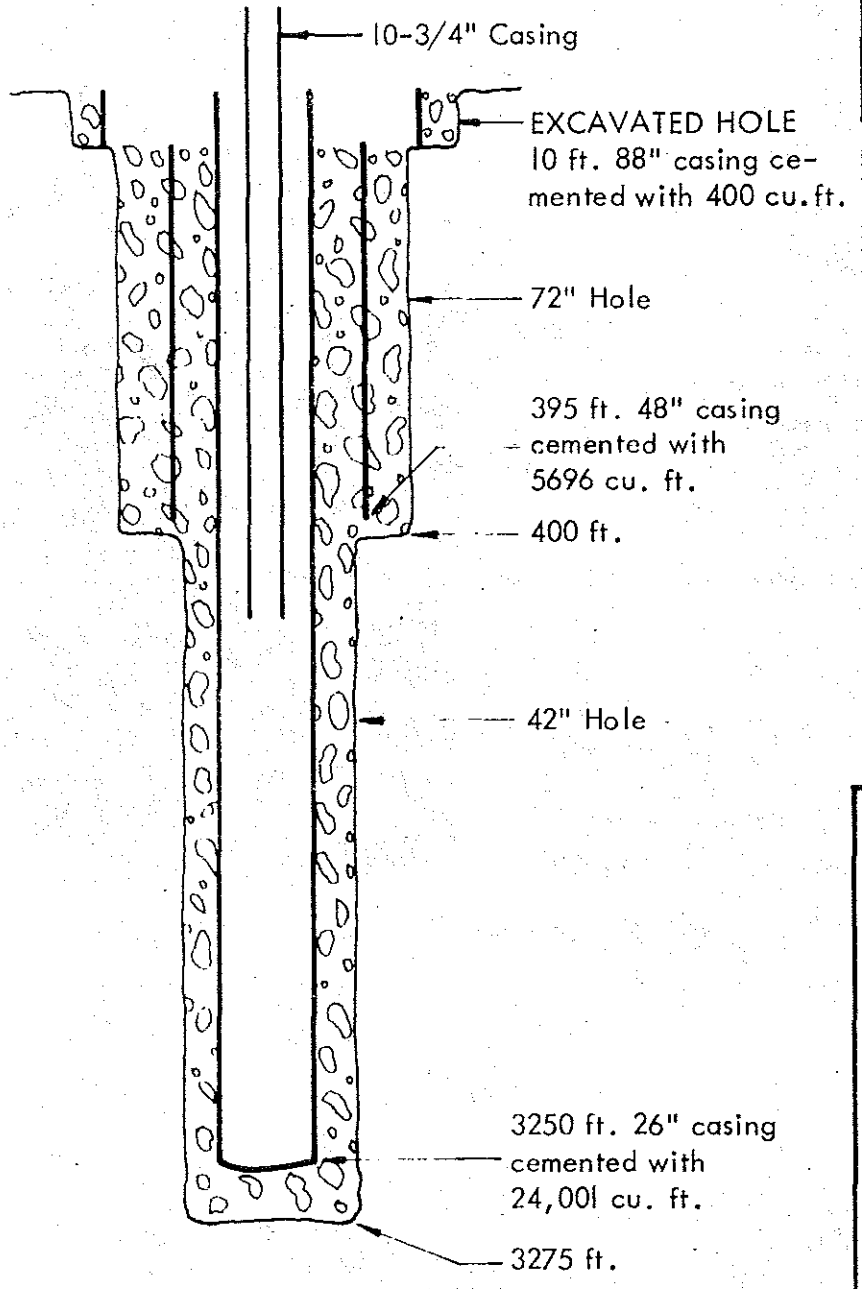


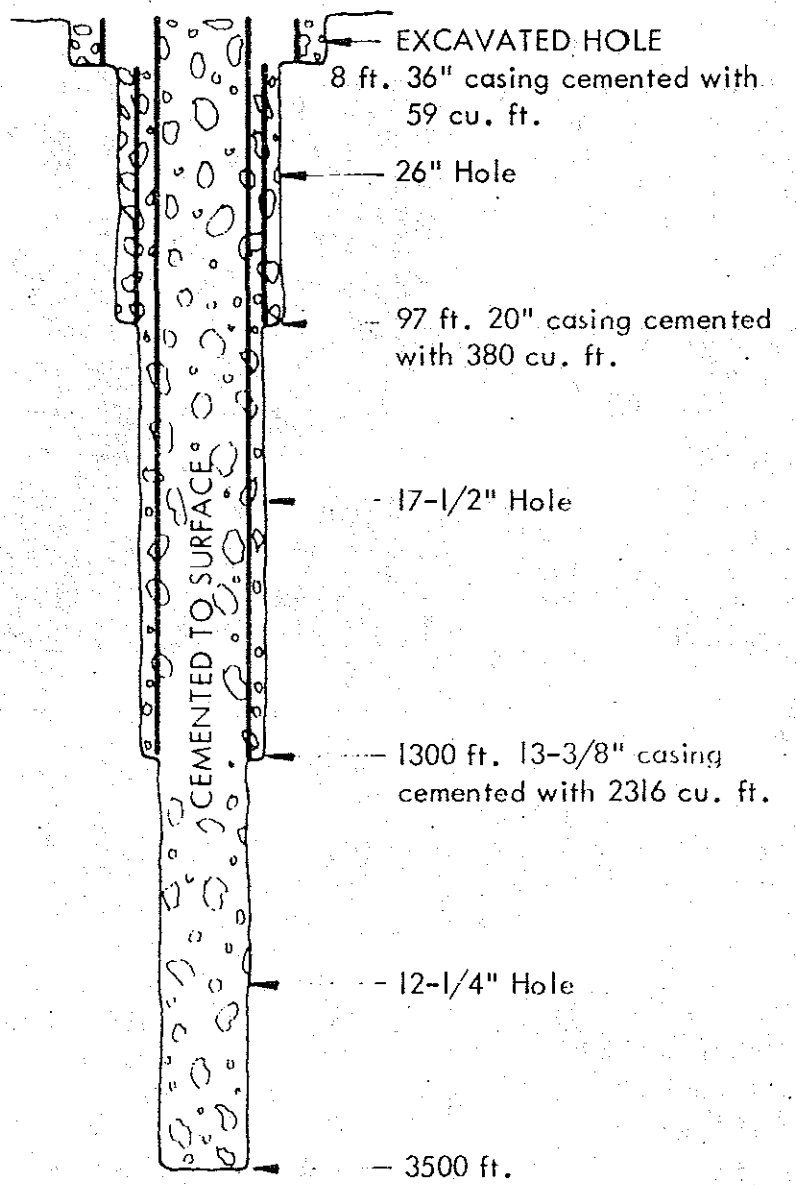
NOTE: This hole has been expended.

UC-1
N - 1,414,339.91'
E - 628,920.87'
Gr. Elev. 6104.00'

ABANDONMENT PROGRAM

1. Rad-Safe monitoring is required throughout plugging operations on all holes in UC-1 Complex.
2. Cut away 88" casing and chip away annular cement between 88" and 48" casing to 1' below ground level.
3. Cut away 48" casing to 1' below ground level.
4. Chip away 48" x 26" annular cement to 1' below pad level.
5. Cut off 26" casing 1' below pad level.
6. Remove stemming material from 26" casing and cut off 10-3/4" emplacement casing 1' below pad level.
7. Weld plate and marker to 88" casing, place rebar, and backfill to pad level with 45 cu. ft. of concrete.
8. Find mouse hole and rat hole if possible and take samples from the bottom of each.
9. Plug mouse hole or rat hole with dirt and top off with cement.

UC-1-I-1
N - 1,414,262.85'
E - 628,900.14'
Gr. Elev. 6102.40'

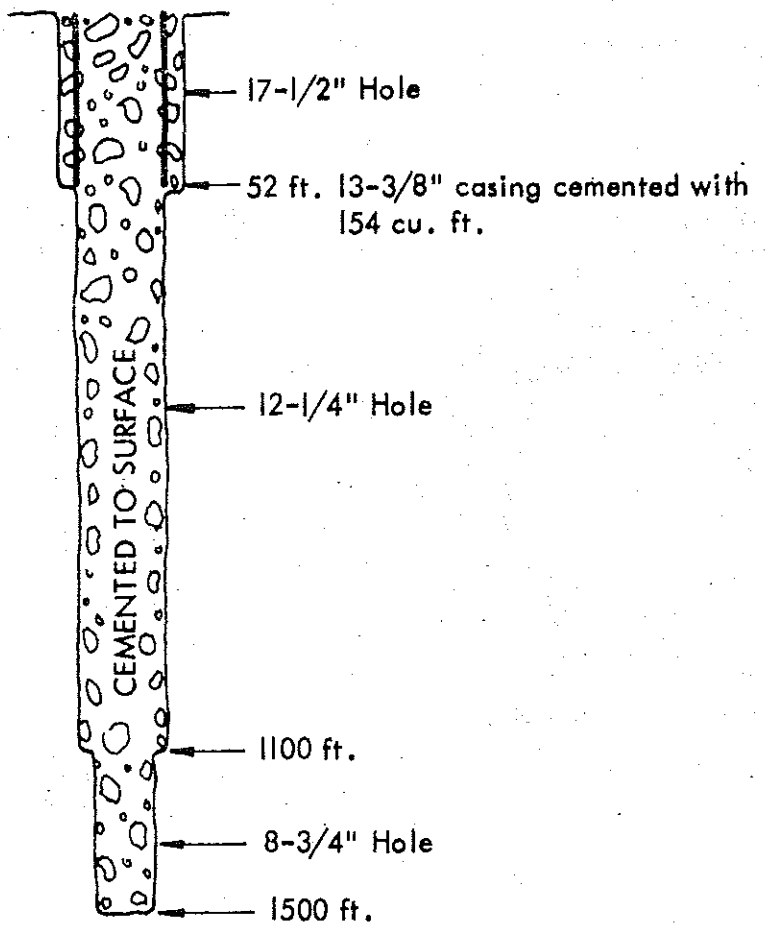


NOTE: This hole is cemented to the surface using 4426 cu. ft. in 4 stages.

ABANDONMENT PROGRAM

1. Rad-Safe monitoring is required on this hole.
2. Remove framework and [illegible] from hole.
3. Excavate around wellhead [illegible] 1' below surface to 36" casing.
4. Cut off casing and remove cement.
5. Weld plate and marker to 36" casing, cover plate wit cement and level location.
6. Rad-Safe will sample rat hole and mouse hole.
7. Plug rat hole or mouse hole with dirt and top off wit cement.

UC-I-I-2
N - 1,414,320.47'
E - 628,846.59'
Gr. Elev. 6103.70'



NO PHOTOGRAPH

NOTE: This hole has been cemented to the surface with 1993 cu. ft. of cement in 5 stages.

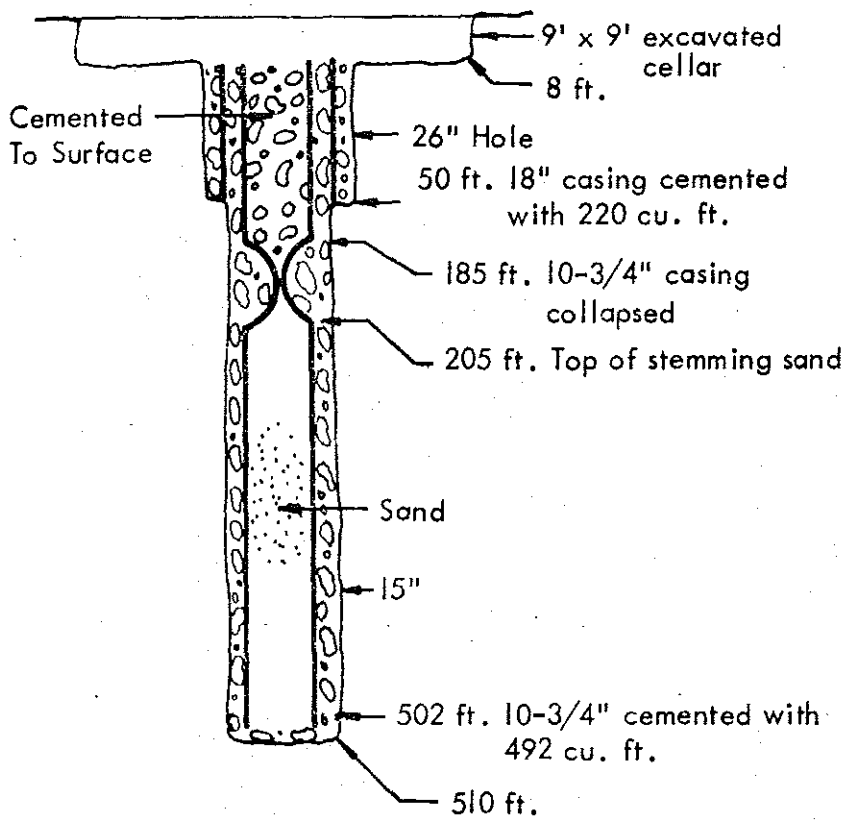
ABANDONMENT PROGRAM

This hole has been abandoned by being filled with cement to the surface.

1. Rad-Safe monitoring required on this hole.

2. Weld plate and marker to 13-3/8" casing.

UC-1-P-1
N - 1,413,421.49'
E - 629,840.66'
Gr. Elev. 6034.97'



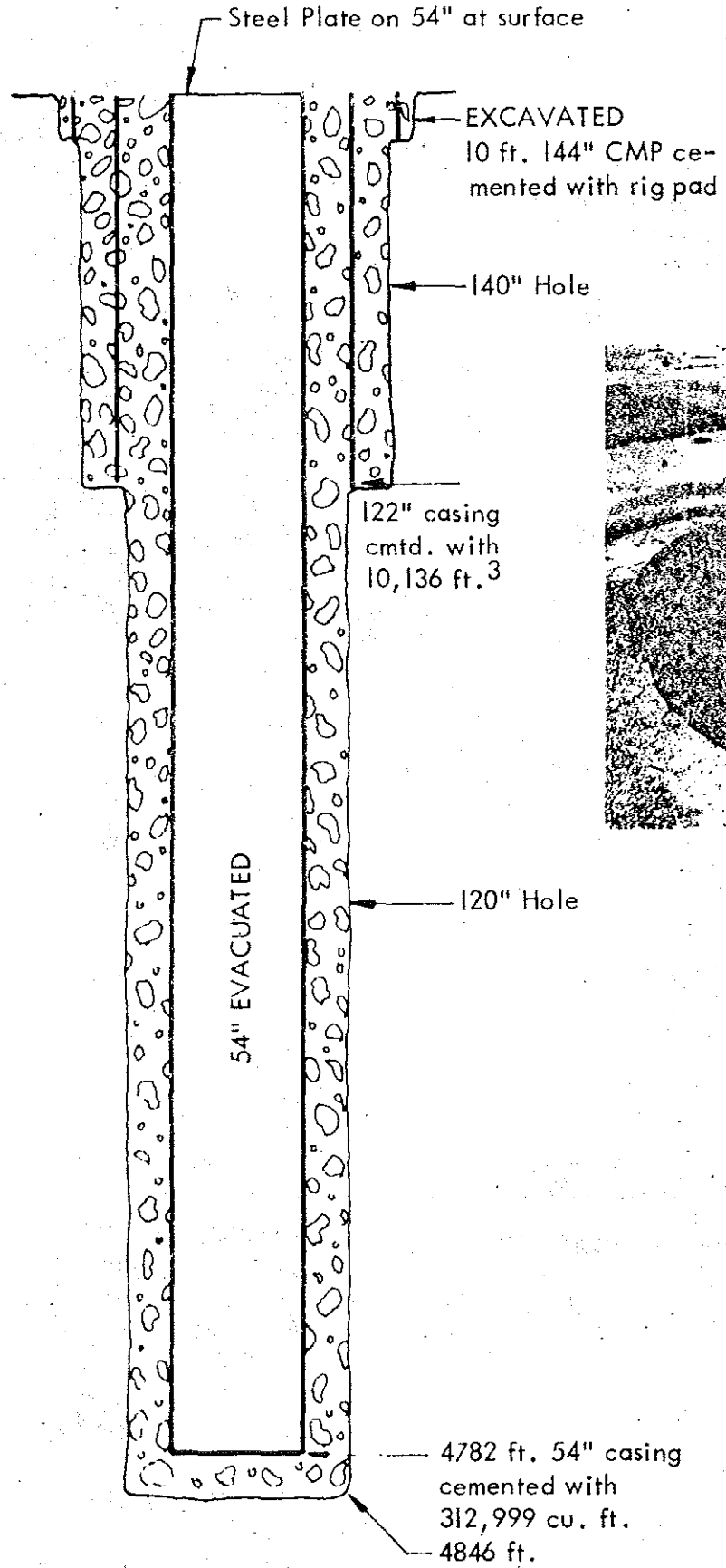
NO PHOTOGRAPH

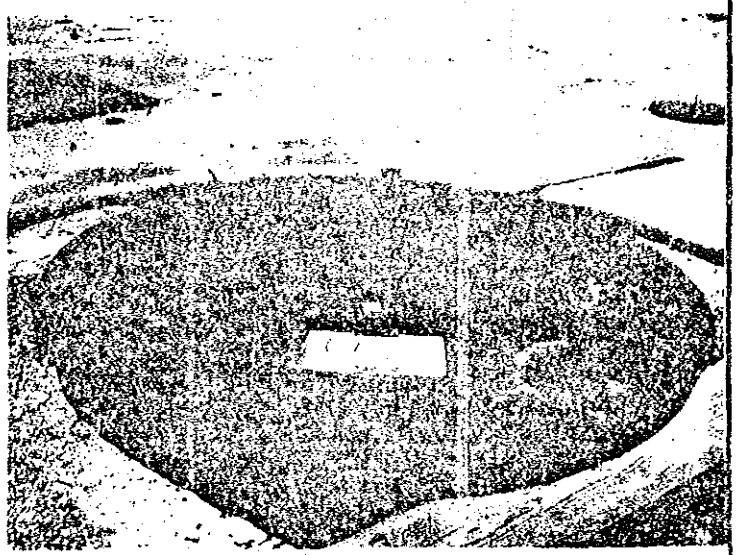
NOTE: The 10-3/4" casing was cut off at 8 ft. and a Series 900 (3000 psi) casing head and Shaffer Series 960 containment valve (10" Bore) were installed. Top of head flange 8 ft. below G.L. Top of valve 7 ft. below G.L. Valve is closed. Top of sand in 10-1/4" casing is 205 ft. HOLE ABANDONED IN THIS CONDITION.

ABANDONMENT PROGRAM

1. Rad-Safe monitoring required on this hole.
2. Remove wellhead equipment from hole.
3. Hang 10-3/4" wooden plug 10' below stub of casing.
4. Fill casing with app. 5.4 cu.ft. of cement.
5. Weld plate and marker to 18" casing and backfill cellar with dirt.

UC-3
N - 1,399,948.43'
E - 628,092.24'
Gr. Elev. 5758.95'

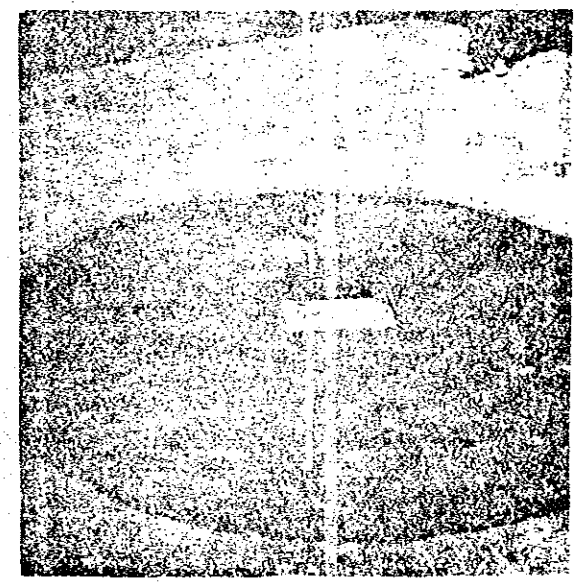


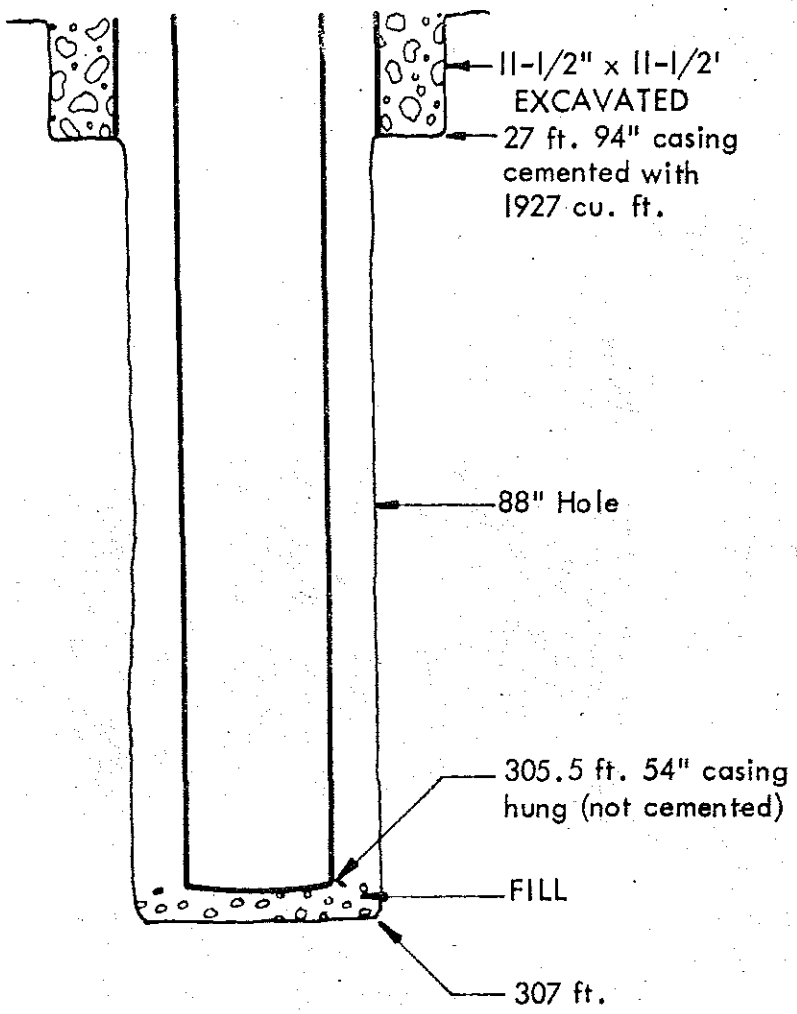


ABANDONMENT PROGRAM

1. Safety belts shall be worn by all workers around open hole.
2. Remove hole cover and weld 2" plate on 54" casing.
3. Build form for 14' x 14' x 2' concrete hole protector.
4. Install rebar as per drawing.
5. Pour 392 cu. ft. of Redi-Mix concrete.
6. Install marker and plate.
7. Backfill rat hole or mouse hole with dirt and top out with concrete.
8. Remove concrete forms.

UC-3 CANNISTER HOLE
N - 1,399,781.00' ±2'
E - 628,209.00' ±2'
Gr. Elev. 5760' ±2'





NOTES: Casing

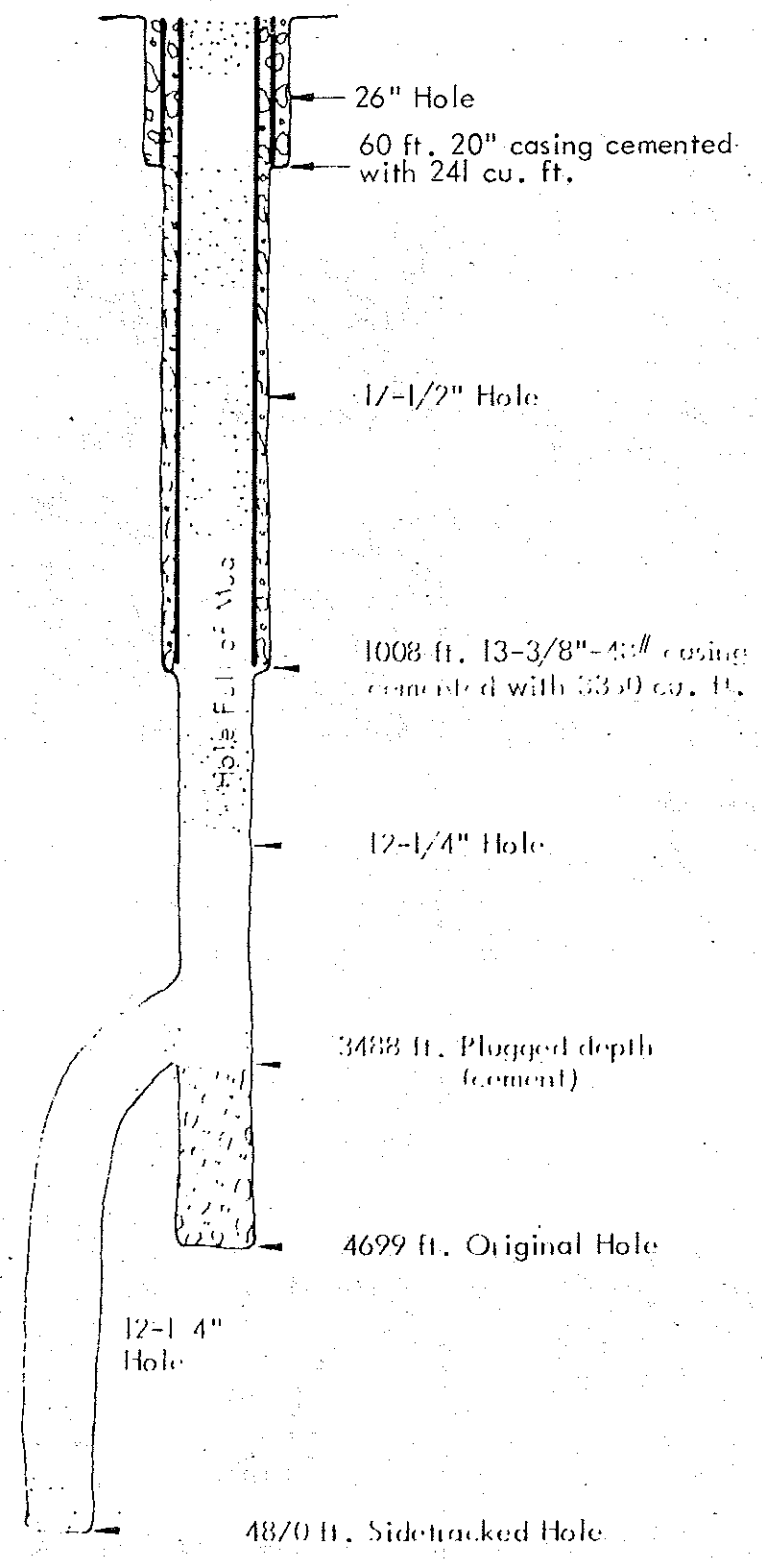
Joint	Thickness	Ring Spacing	Depth
1	1-5/16"	24"	305'-298'
2-5	5/8"	40"	298'-0'

3 - 5" OD Grout Lines.

ABANDONMENT PROGRAM

1. Safety belts shall be worn by all workers around open hole.
2. Remove plate from 54" casing and weld 3 lifting eyes to top of casing.
3. While holding 54" casing with crane, remove steel plate between 54" and 94" casing.
4. Run prefabricated split plug in 94" x 54" annulus to 10' and cement to pad level with 323 cu.ft. of Redi-Mix concrete.
5. Weld 2" plate on 54" casing.
6. Build form for 14' x 14' x 2' concrete hole protector.
7. Install rebar as per drawing.
8. Pour 392 cu.ft. of Redi-Mix concrete.
9. Install marker and plate.
10. Remove concrete form.

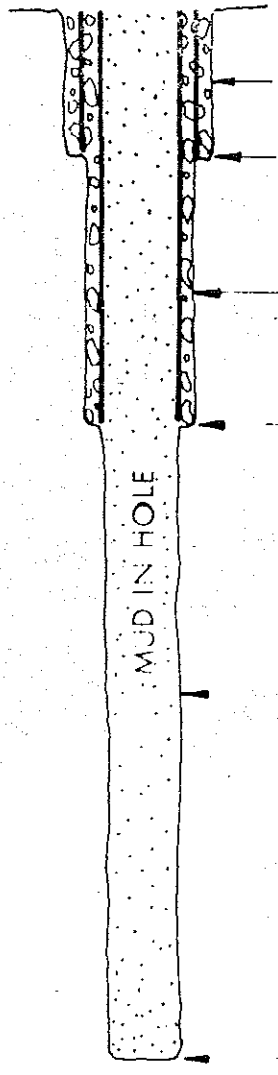
UC-3-I-1
N - 1,399,719.62'
E - 627,972.29'
Gr. Elev. 5758.10'



ABANDONMENT PROGRAM

1. Chip away cement between 20" and 13-3/8" casing to 1' below pad level.
2. Cut off both casing strings and place wooden plug in 13-3/8" casing at 10'.
3. Fill 13-3/8" casing to surface with 1 9 cu. ft. of cement.
4. Weld plate and marker to 20" casing and back fill with cement to pad level.
5. Fill suction trough with cement and plug rat hole or mouse hole with dirt and top off with cement.

UC-3-I-2
N - 1,399,838.12'
E - 627,922.79'
Gr. Elev. 5758.98'



26" Hole

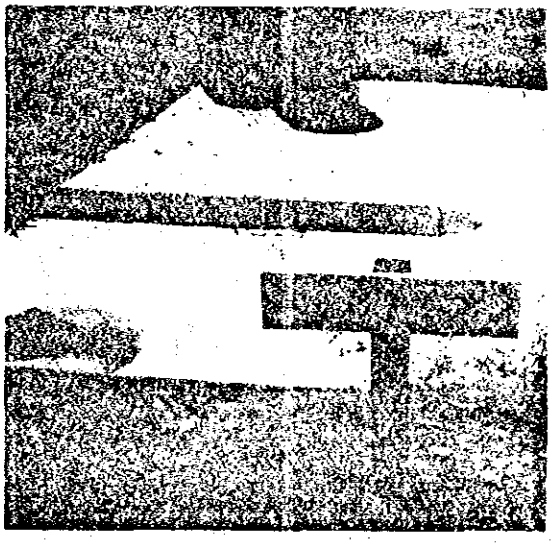
60 ft. 20" casing cemented with 237 cu. ft.

17-1/2" Hole

410 ft. 13-3/8"-48# casing cemented with 440 cu. ft.

12-1/4" Hole

2550 ft.



ABANDONMENT PROGRAM

1. Remove suction trough and chip away cement between the 20" x 13-3/8" annulus to 1' below pad level.

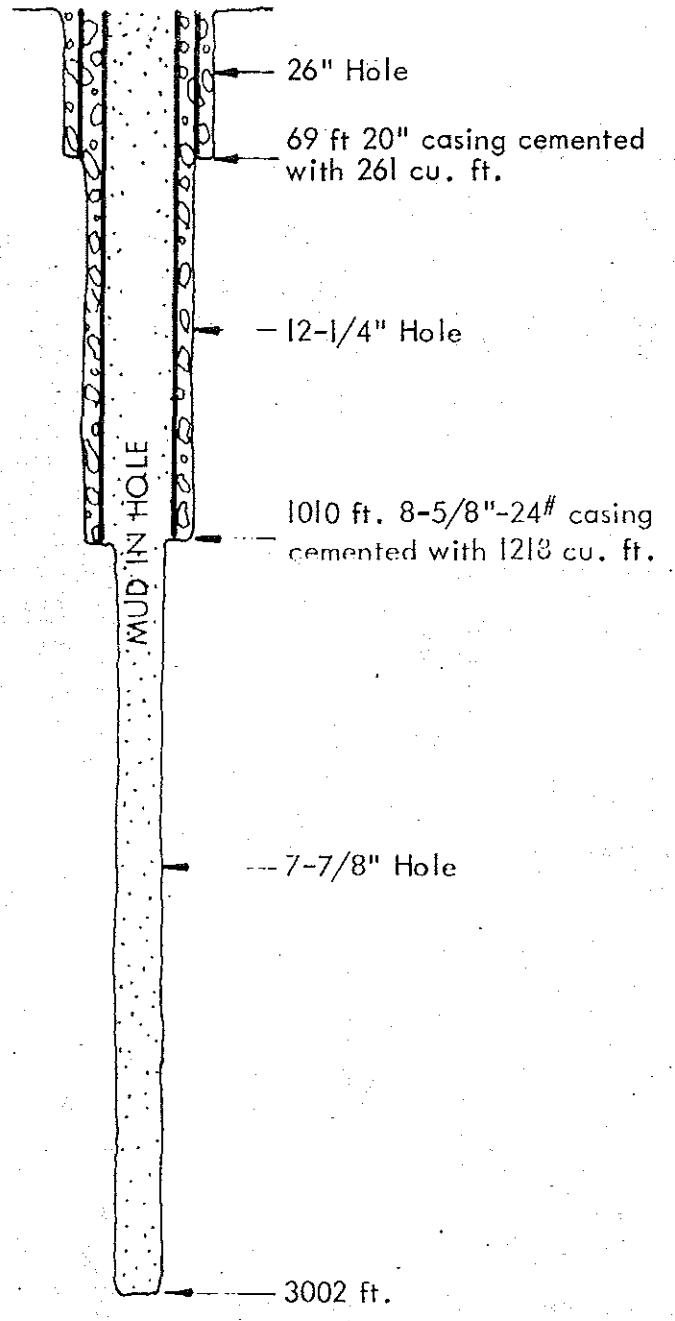
2. Cut off casing and place wooden plug in 13-3/8" casing 10' below ground level.

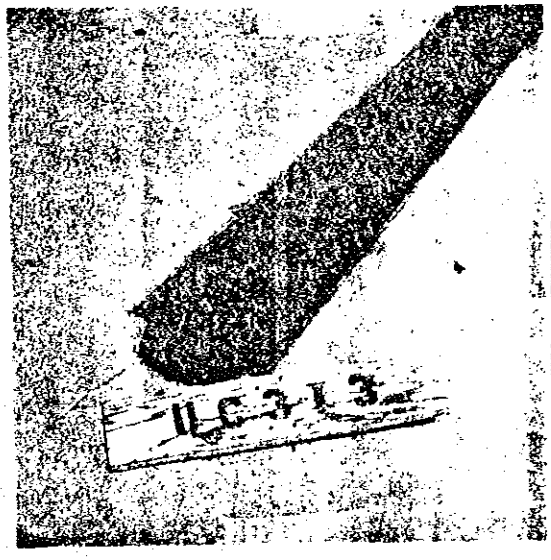
3. Fill 13-3/8" casing with 9 cu.ft. cement to top of stub and weld plate and marker to 20" casing.

4. Remove plate from trough and backfill with dirt and top off with 1' of concrete to pad level.

5. Plug rat hole or mouse hole with dirt and top off with cement.

UC-3-I-3
N - 1,399,248.21'
E - 627,892.79'
Gr. Elev. 5748.88'





ABANDONMENT PROGRAM

1. Remove suction trough cover and chip away cement between the 20" x 8-5/8" annulus to 1' below pad level.

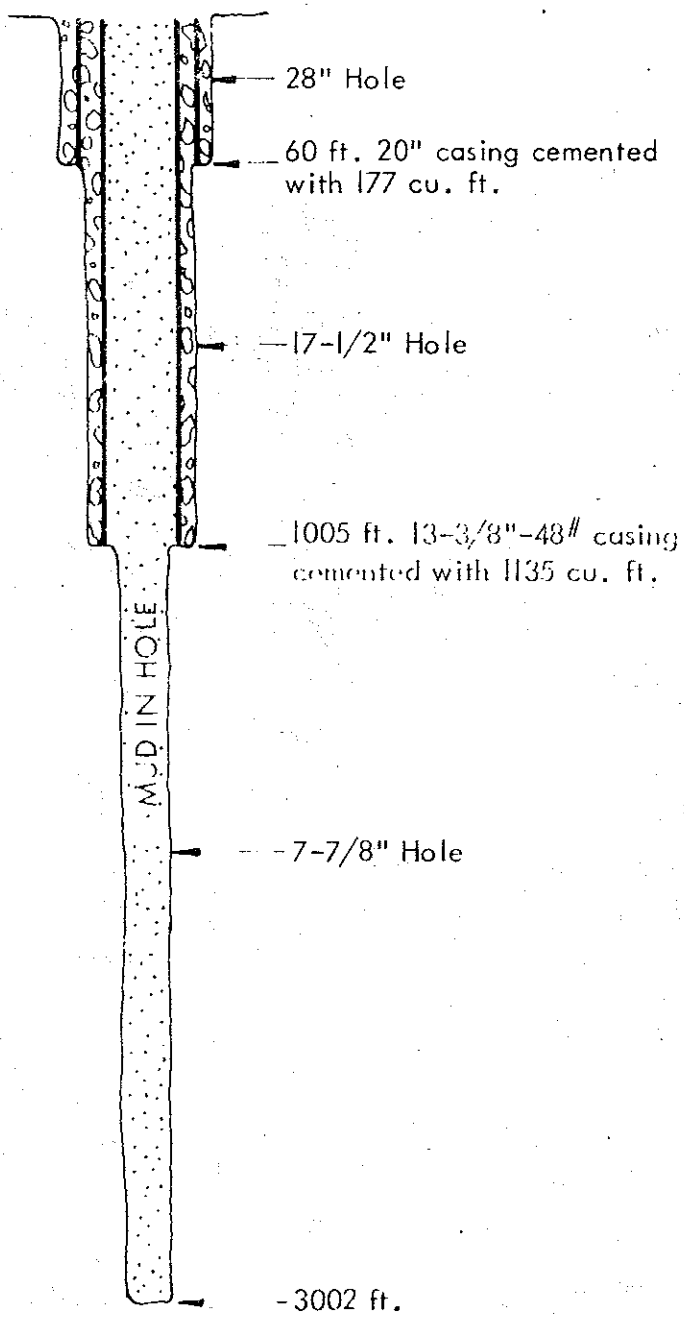
2. Cut off casing and place wooden plug in 8-5/8" casing 10' below ground level.

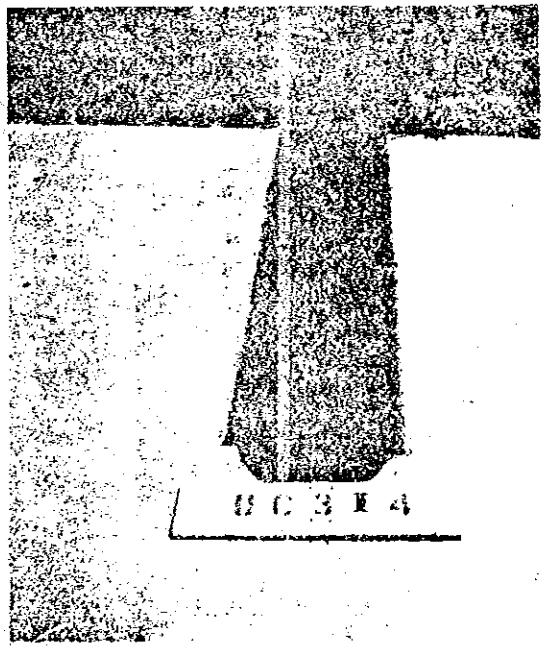
3. Fill 8-5/8" casing with 4 cu. ft. cement to top of stub and weld plate and marker to 20" casing.

4. Remove plate from trough, backfill with dirt and top off with 1' of concrete to pad level.

5. Plug rat hole or mouse hole with dirt and top off with cement.

UC-3-I-4
N - 1,398,948.12'
E - 627,892.79'
Gr. Elev. 5746.15'





ABANDONMENT PROGRAM

1. Remove suction trough [illegible] and chip away cement [illegible] the 20" x 13-3/8" [illegible] 1' below pad level.

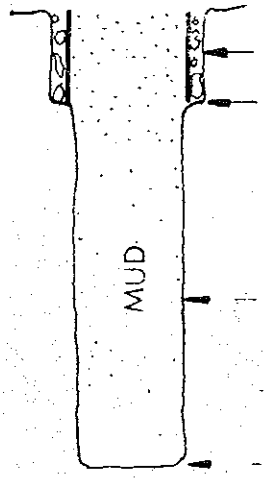
2. Cut off casing 1' below pad level and place wooden [illegible] at 10' inside 13-3/8" casing.

3. Fill 13-3/8" casing with [illegible] cu. ft. cement to top of stub and weld plate and marker to 20" casing.

4. Remove plate from trough, backfill with dirt and top off with 1' of concrete to pad level.

5. Plug rat hole or mouse hole with dirt and top off with cement.

UC-3-I-5R
N - 1,399,805.46'
E - 627,948.09'
Gr. Elev. 5758.67'

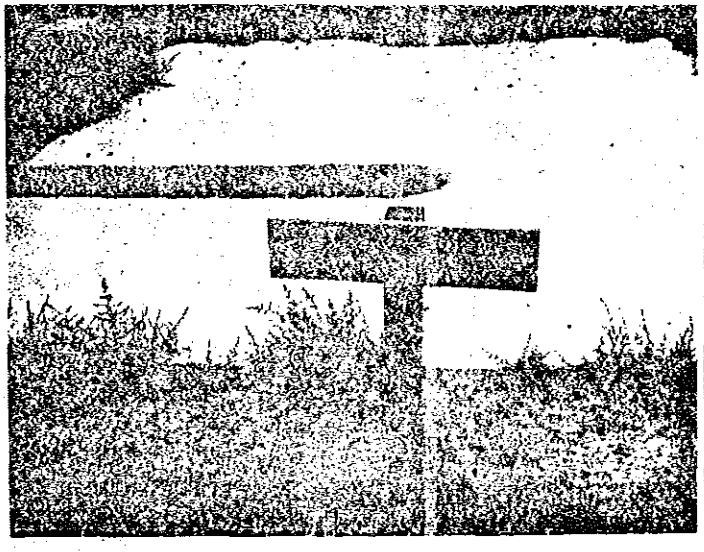


26" Hole

40 ft. 13-3/8"-48# casing cemented with 178 cu. ft.

12-1/4" Hole

360 ft.



ABANDONMENT PROGRAM

1. Remove plate from hole and suction trough.

2. Chip away cement around 13-3/8" casing to 1' below pad level.

3. Hang wooden plug at 10' inside 13-3/8" casing and cement back to stub with 9 cu. ft. of cement.

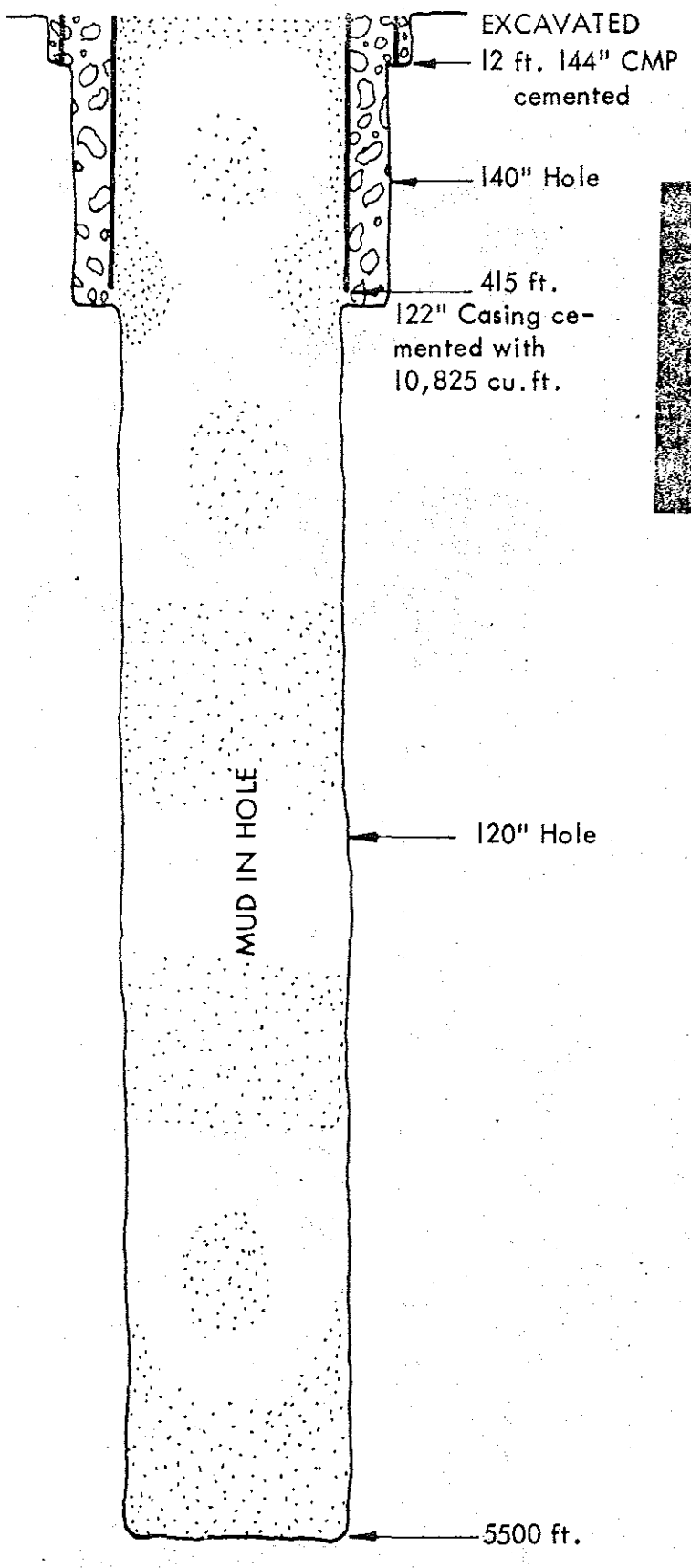
4. Weld plate and marker over 13-3/8" stub and fill with cement to pad level.

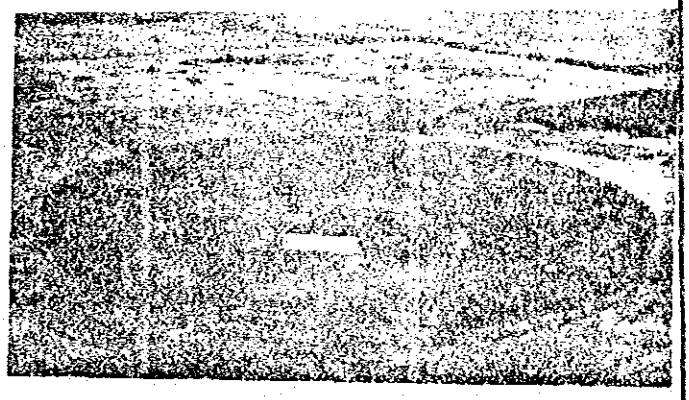
5. Remove plate from trough, backfill with dirt and top out with 1' of concrete to pad level level.

6. Plug rat hole with dirt and top out with 1' of cement to pad level.

RETURN TO DOE/NV TECHNICAL INFORMATION
RESOURCE CENTER

UC-4
N - 1,430,564.49'
E - 628,253.40'
Gr. Elev. Not Available

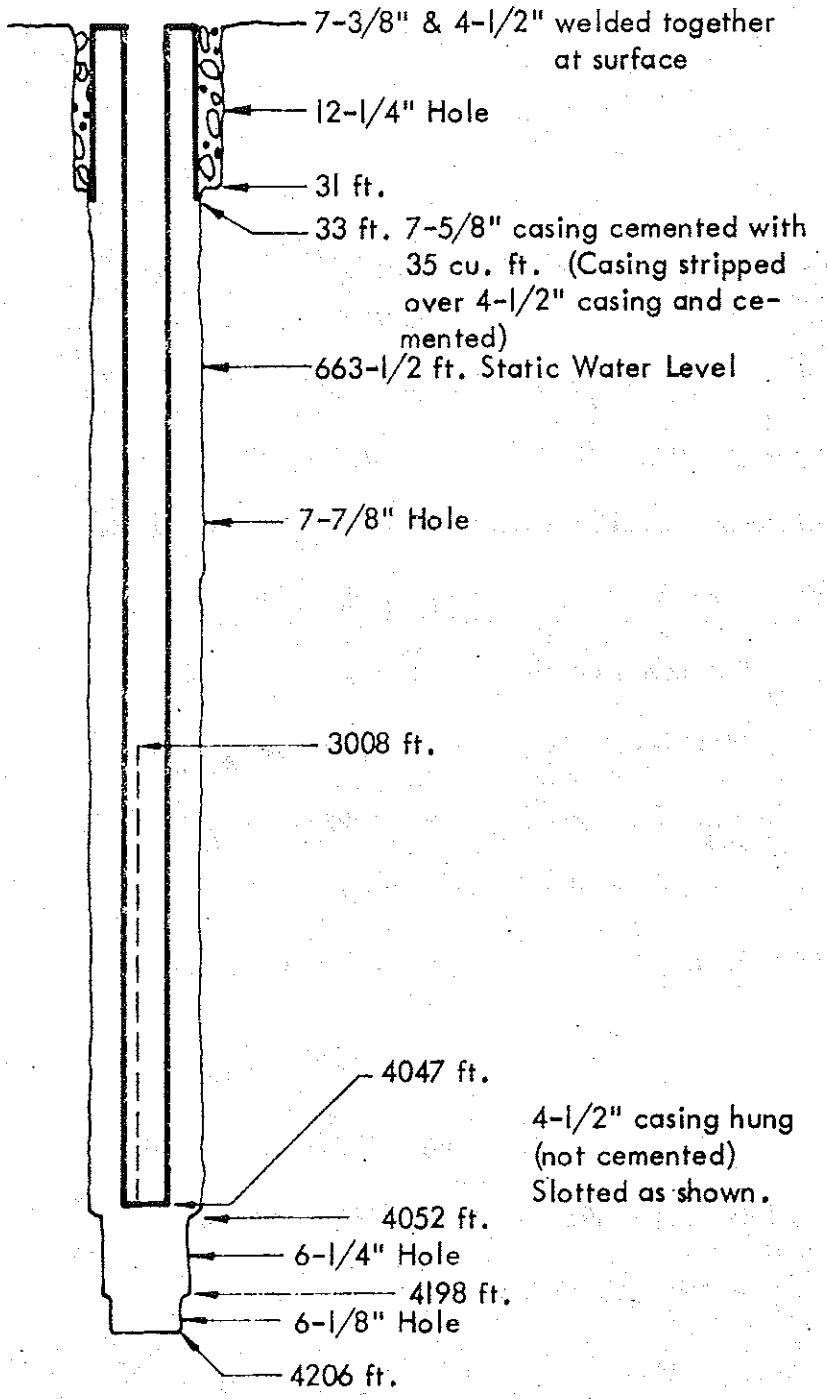


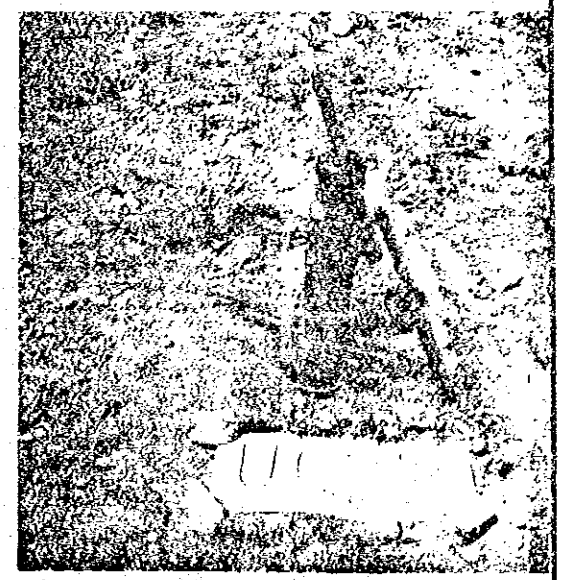


ABANDONMENT PROGRAM

1. Safety belts shall be worn by all workers around open hole.
2. Remove hole cover and weld 2" plate on 122" casing.
3. Build form for 14' x 14' x 2' concrete hole protector.
4. Install rebar as per drawing.
5. Pour 392 cu. ft. of Redi-Mix concrete.
6. Install marker and plate.
7. Backfill rat hole or mouse hole with dirt and top out with concrete.
8. Remove form.

UCE-11
N - 1,401,350.93'
E - 626,475.43'
Gr. Elev. 5788.21'





ABANDONMENT PROGRAM

1. Remove bull plug and handle from 4-1/2" casing.
2. Cut clamp and let 4-1/2" casing drop.
3. Cut off 7-5/8" casing 1' below ground level.
4. Set wooden plug in 7-5/8" casing at 10' and fill with 3 cu.ft. of cement.
5. Weld plate and marker to 7-5/8" casing and backfill with dirt.

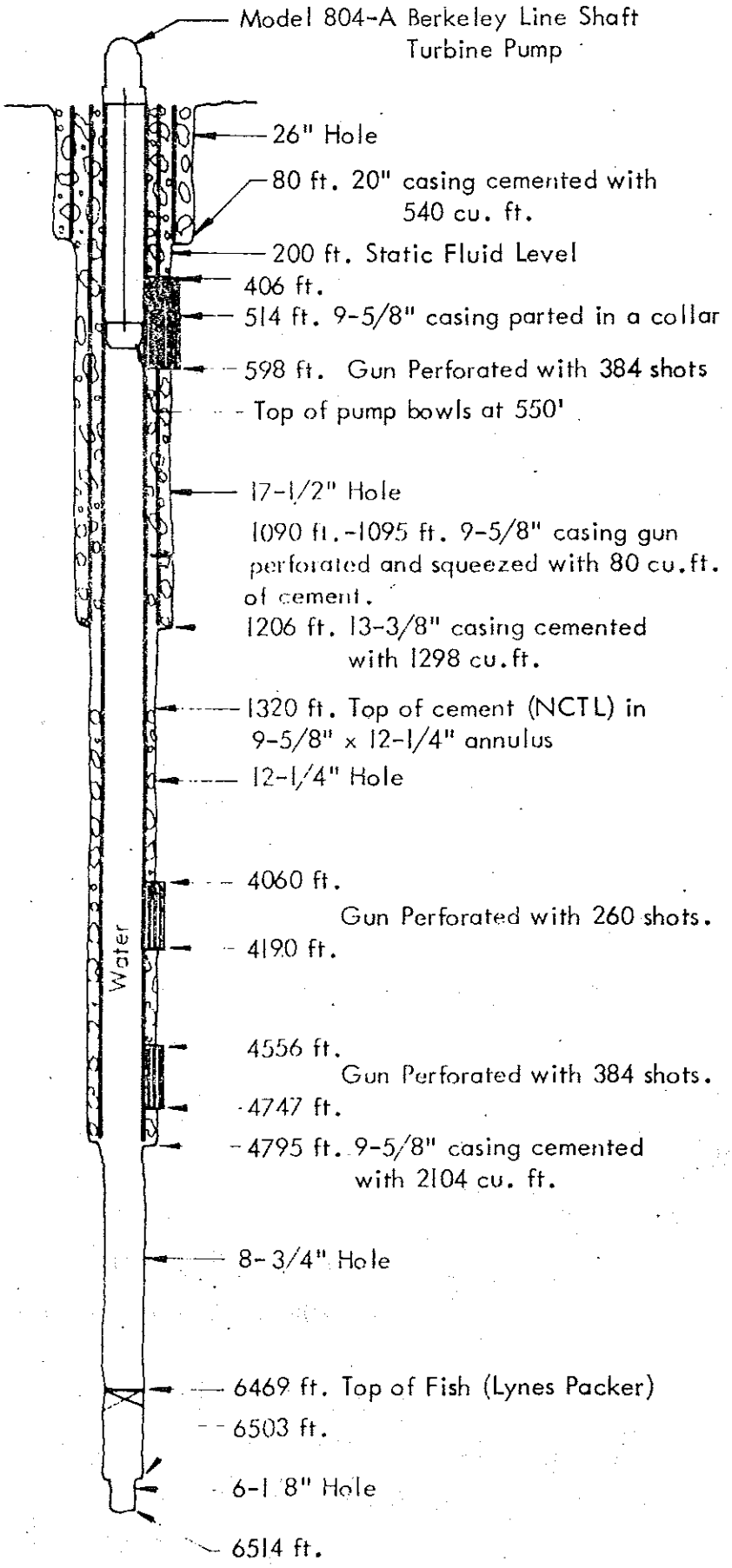
UCE-18

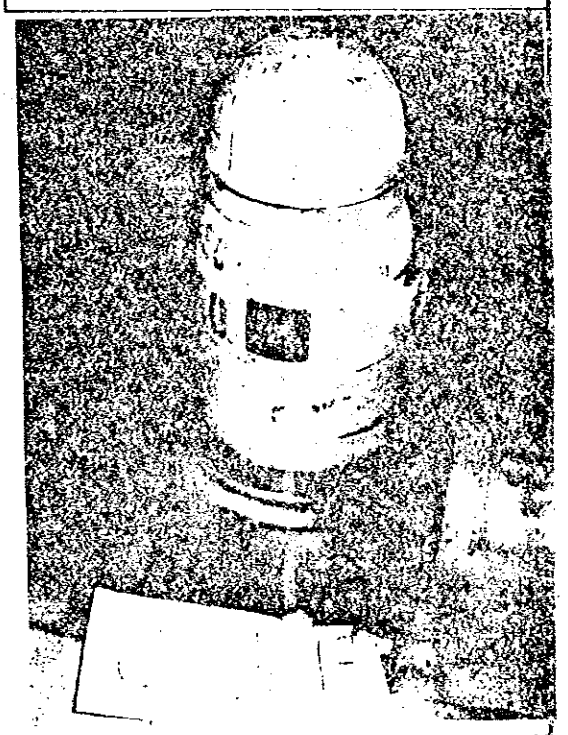
UCE-18 in the northern part of Hot Creek Valley was drilled to 6514' encountering 4090' of alluvium, 115' of tuffaceous sediments, 175' of lake beds and gypsum, 2064' of rhyolite, and 70' of tuff.

A prolific water producing zone from approximately 5530 feet to 5915 feet (fractured rhyolite) has a static water level approximately 190 feet below ground level. The water from this deep zone has more dissolved solids (including a higher percent of natural radioactive material) than the shallow alluvium. The open shallow zone at 406 feet to 598 feet (alluvium) has a static water level 330 feet below ground level. It is possible that the undesirable water from the prolific lower zone may migrate upward into the shallow alluvium through the perforations from 406 feet to 598 feet. See Pages 20-24 of USGS Central Nevada - 23.

The water from the deeper zone can be shut out of the upper alluvium by a plug below 600 feet. A plug below 1500 feet would increase the reliability of the seal if the uncemented section of 9-5/8 inch casing becomes parted at some future time.

UCE-18
N - 1,396,833.39'
E - 635,840.12'
Gr. Elev. 5763.16'

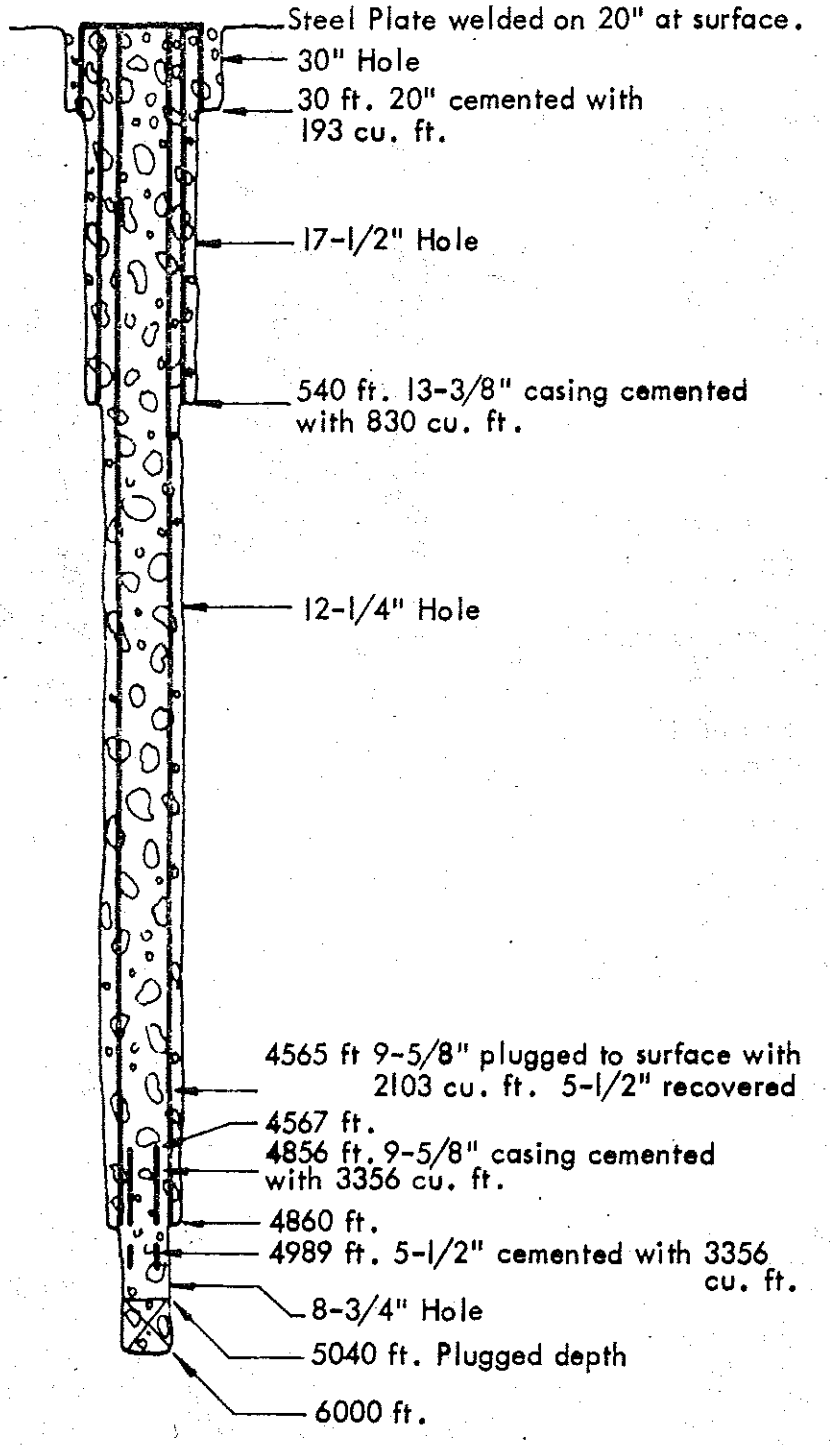




ABANDONMENT PROGRAM

1. Unflange flow line from wellhead and remove boards from cellar.
2. Unbolt shaft turbine pump from wellhead.
3. Procure crane services and remove pump, rods and bowl from hole.
4. Install 9-5/8" x 2" swage on 9-5/8" casing.
5. Hook up pump truck to swage on 9-5/8" casing. Mix and pump 700 cu.ft. of 8% Class A Bentonite Cement plus 3% Calcium Chloride into casing, monitoring pressure. Wait on cement 4 hours or until cup samples harden.
6. Remove swage from casing. If casing is full, go to Step #7. If cement has equalized down in 9-5/8" casing, mix and pour casing full of neat cement.
7. Weld plate and marker to 20" casing and backfill cellar with dirt.

UCE-20
N - 1,399,868.46'
E - 628,092.75'
Gr. Elev. 5759.00'



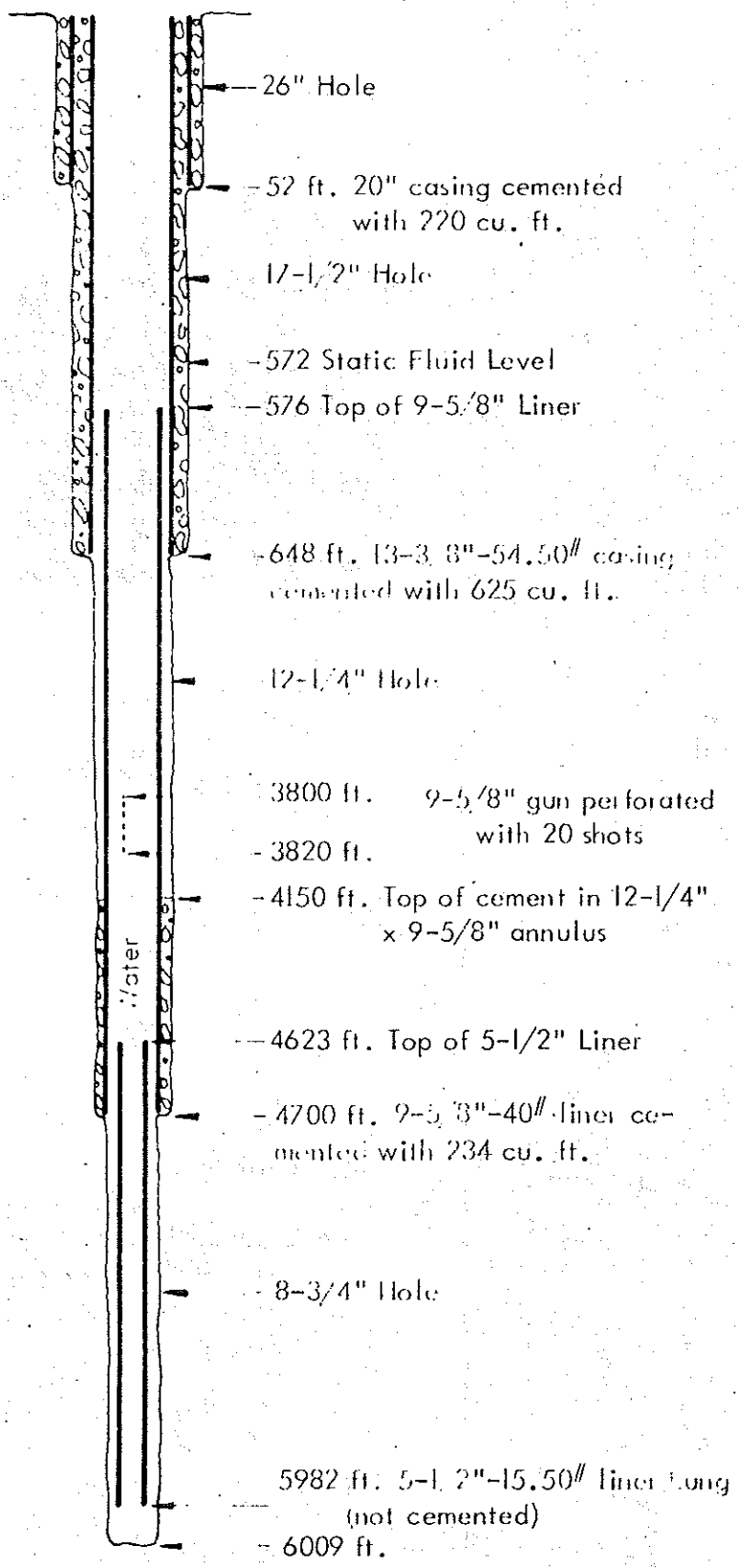
NO PHOTOGRAPH

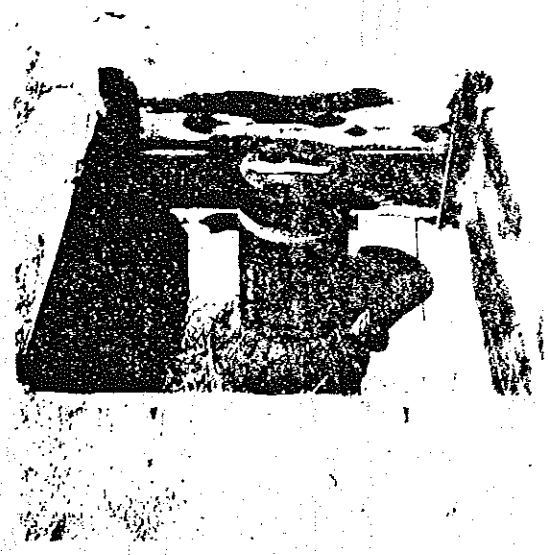
ABANDONMENT PROGRAM

This hole has been plugged solidly with cement from 6000 ft. to the surface, and has been abandoned in this condition.

1. Weld marker to plate and backfill with dirt.

HTH-3
N - 1,385,943.94'
E - 657,118.39'
Gr. Elev. 5914.60'

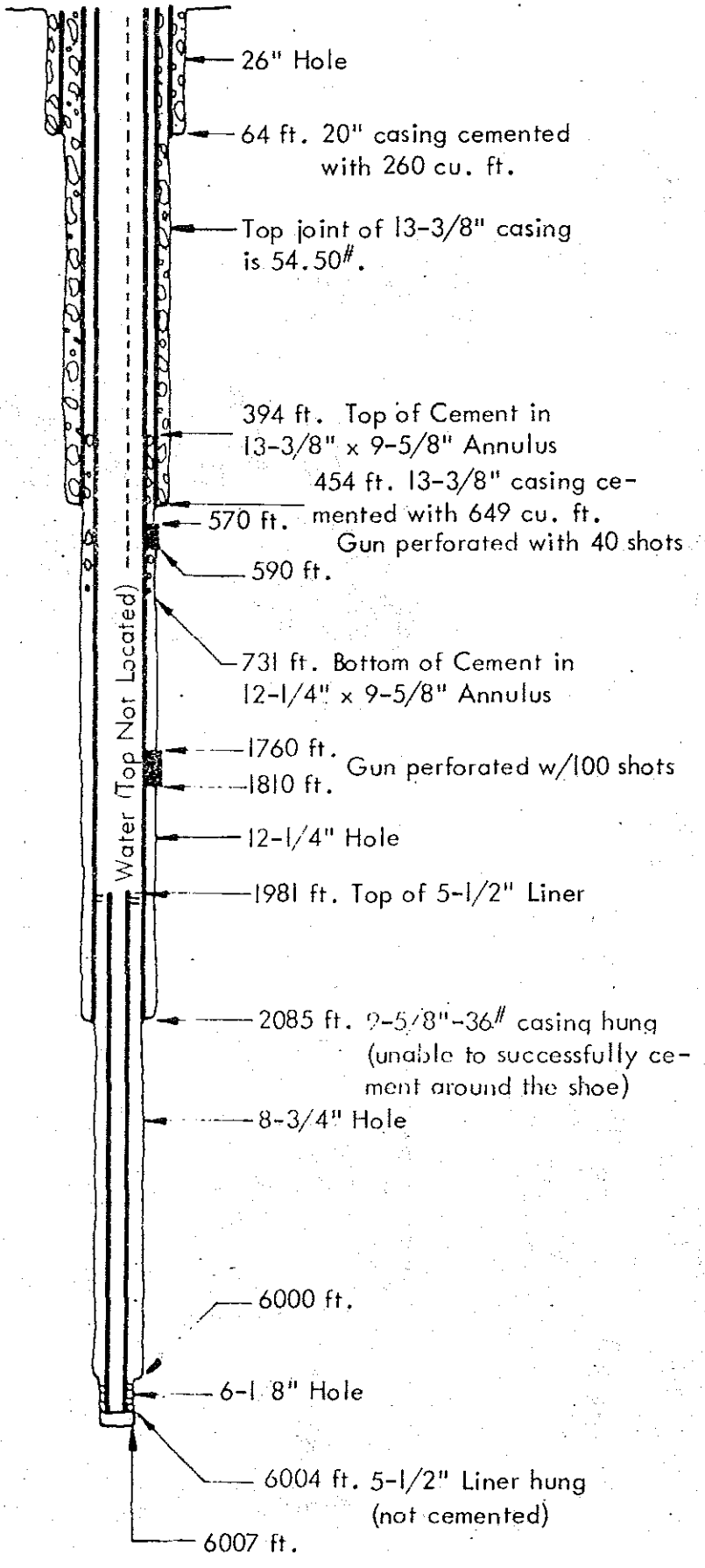


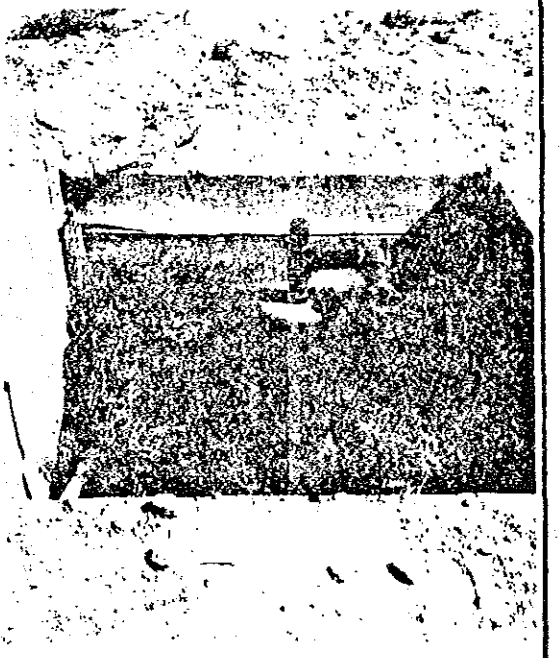


ABANDONMENT PROGRAM

1. Cut off 13-3/8" casing 6" below 20" orange peel.
2. Set wooden plug at 10' inside 13-3/8" casing.
3. Cement to top of stub with approx. 9 cu. ft. of cement.
4. Weld plate and marker on 20", remove cellar form and back-fill with dirt.

HTH-5
N - 1,368,424.47'
E - 625,928.65'
Gr. Elev. 5495.60'

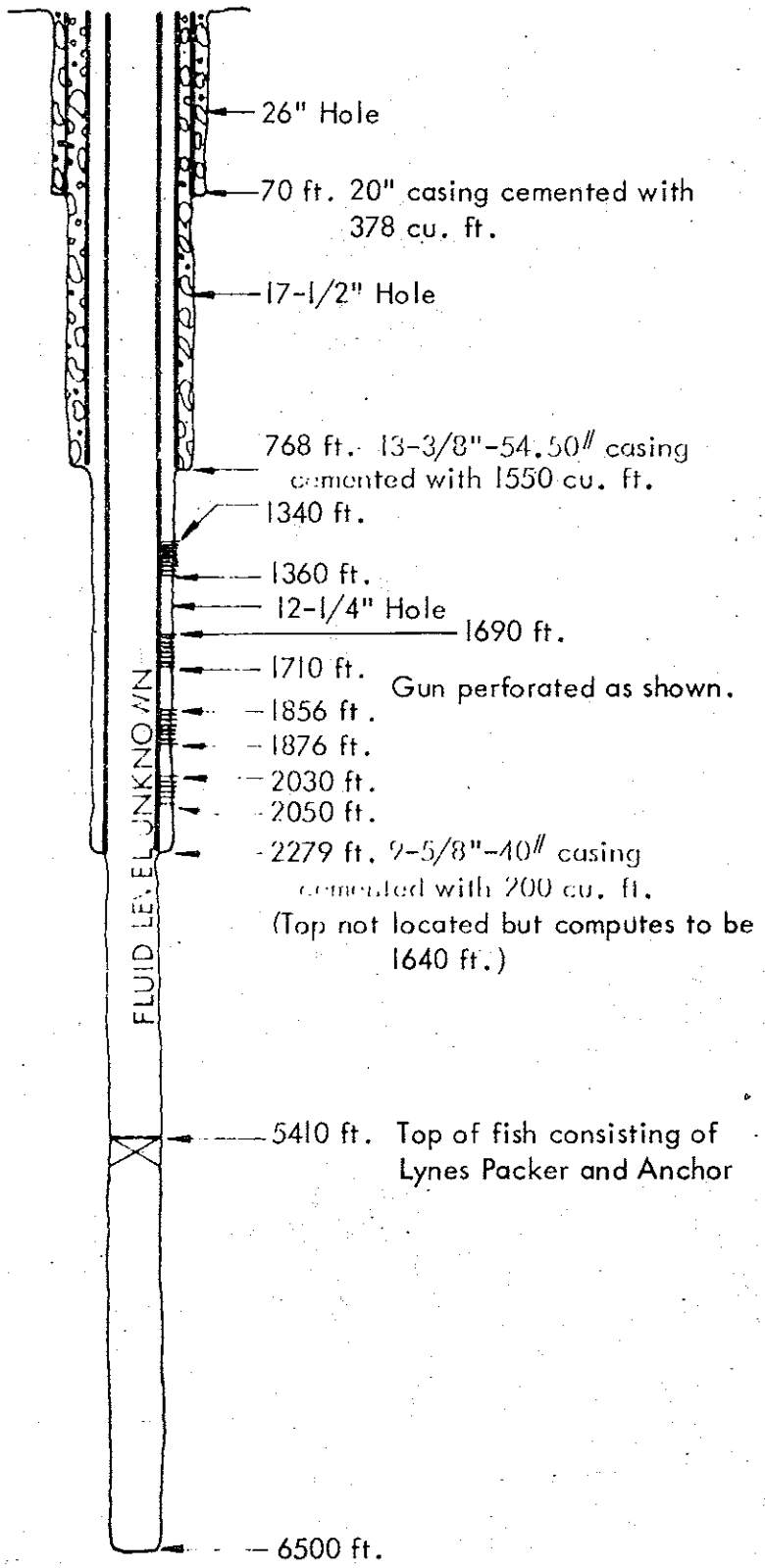


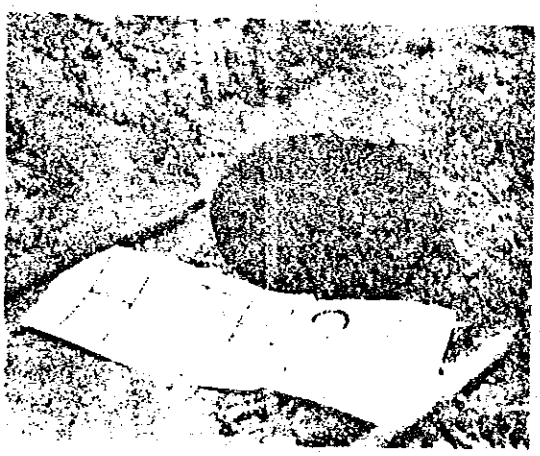


ABANDONMENT PROGRAM

1. Excavate around 13-3/8" casing to top of 20" orange peel
2. Cut off 13-3/8" x 9-5/8" orange peel and 13-3/8" casing 6" above 20" casing
3. Cut off 9-5/8" at top of 13-3/8" casing
4. Form bridge in 13-3/8" x 9-5/8" annulus to a depth of 10' and fill with approx 4 cu. ft. of cement.
5. Set wooden plug at 10' inside 9-5/8" casing and cement with 5 cu ft. of cement.
6. Weld plate and marker to 13-3/8", remove cellar form and backfill with dirt.

HTH-21-1
N - 1,397,250.13'
E - 668,505.56'
Gr. Elev. 5862.60'

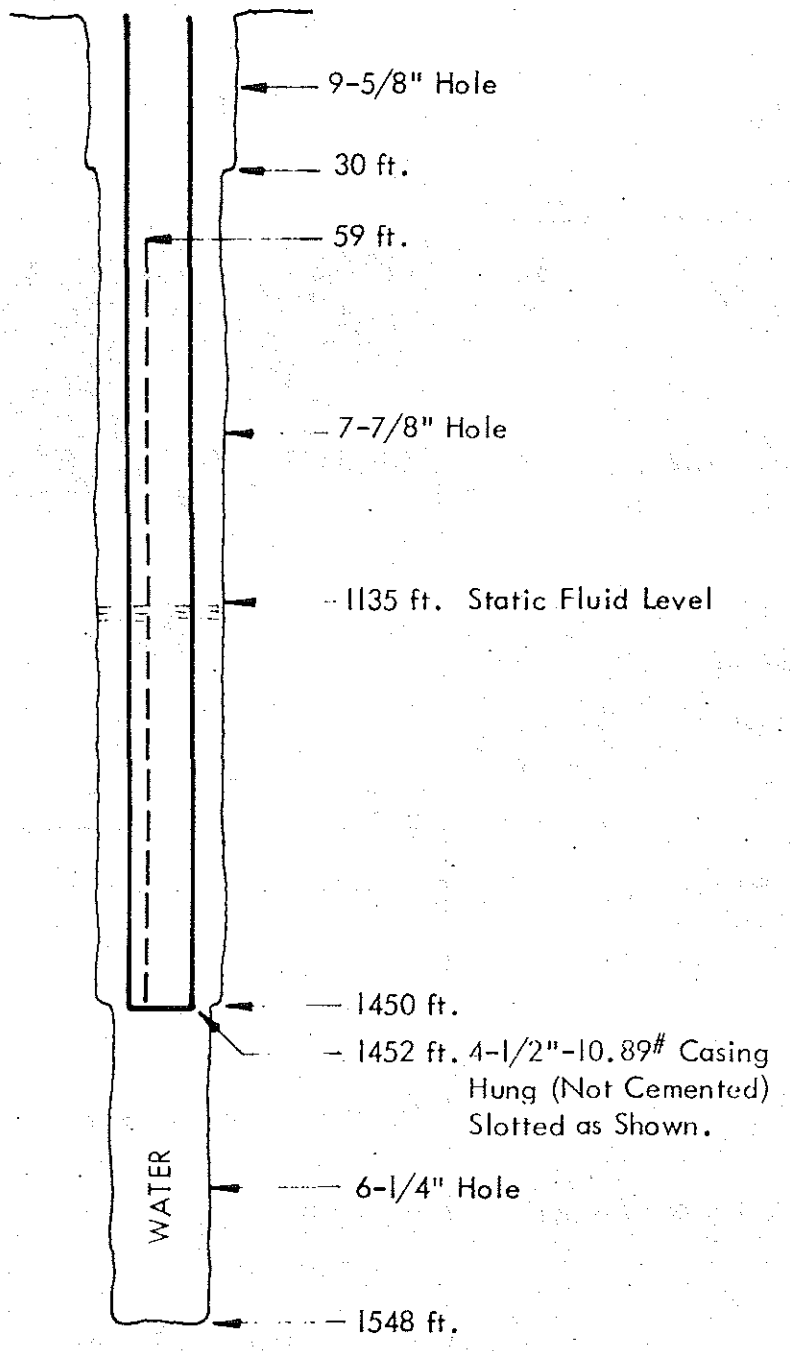




ABANDONMENT PROGRAM

1. Excavate around 9-5/8" casing to orange peel of 13-3/8" x 9-5/8".
2. Cut off orange peel to 6" below top of 13-3/8" casing.
3. Cut off 9-5/8" casing at the stub of 13-3/8".
4. Form bridging plug in 13-3/8" x 9-5/8" annulus at 10' below cut.
5. Cement annulus with approx. 4 ft.^{3} of cement.
6. Set wooden plug in 9-5/8" casing at 10' and cement with 5 ft.^{3} of cement.
7. Weld plate and marker to 20" casing and backfill with dirt.

UCE-14
N - 1,444,693.12'
E - 682,524.23'
Gr. Elev. 6240.63'



ABANDONMENT PROGRAM

1. Excavate a 3' x 3' cellar around the 9-5/8" hole.

2. If hole is open, form a bridging plug in the 9-5/8" x 4-1/2" annulus and fill with cement from a depth of 20'.

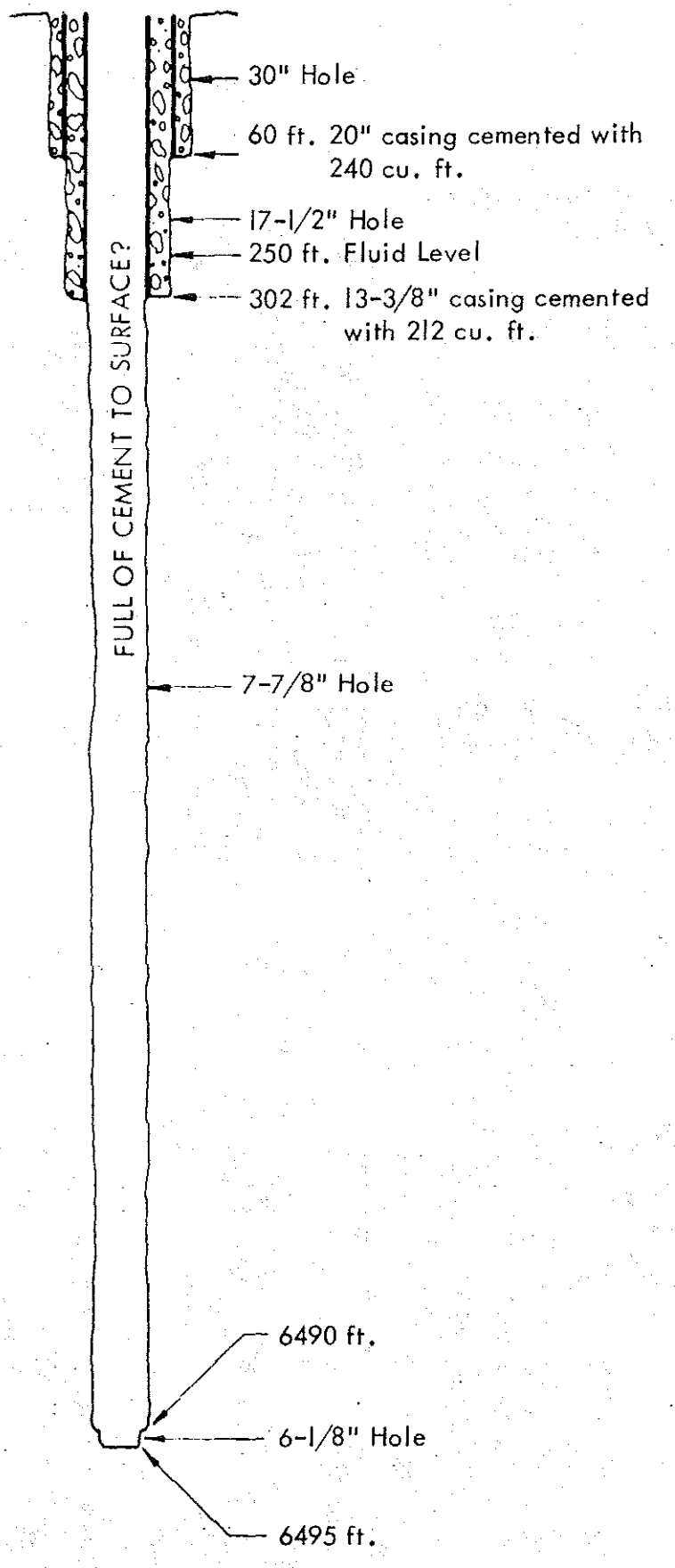
3. Fabricate a 3' x 3' x 1/2" split steel plate with 4-1/2" opening in center and weld solidly to 4-1/2" casing at the bottom of cellar.

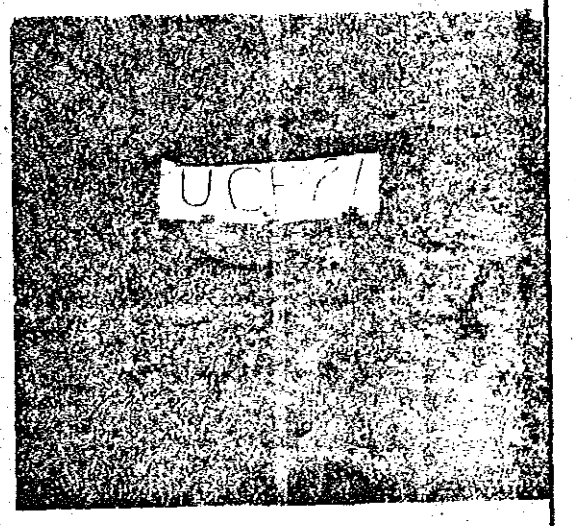
4. W.O.C. and cut off 4-1/2" casing 6" above steel plate.

5. Set wooden plug at 10' inside the 4-1/2" casing and cement to top of stub with 1 cu. ft. of cement.

6. Weld cap and marker over 4-1/2" casing and backfill with dirt.

UCE-21
N - 1,397,350.13'
E - 668,405.56'
Gr. Elev. 5863.40'



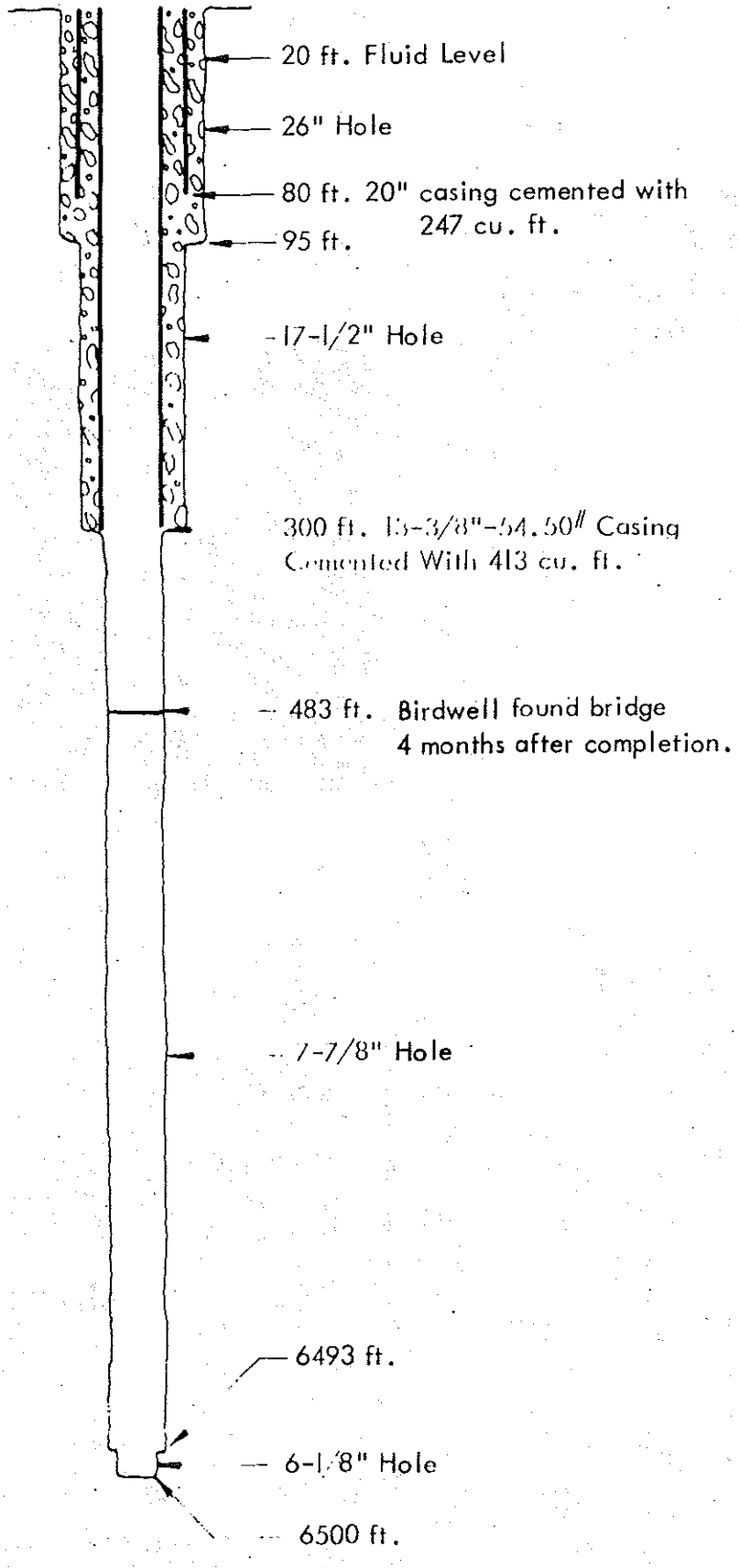


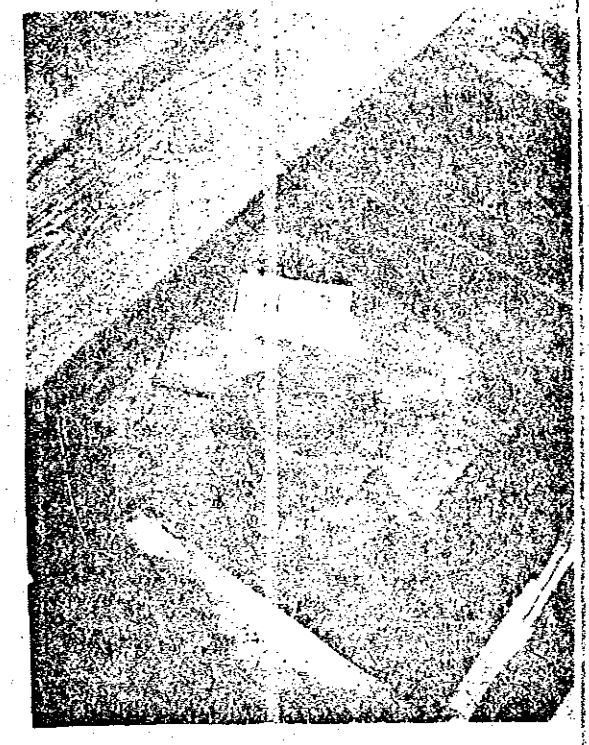
ABANDONMENT PROGRAM

1. Excavate around 20" casing to 1' below ground level.
2. If 20" x 13-3/8" orange peel is below, cut off 13-3/8" casing 1' below surface.
3. Set wooden plug in 13-3/8" at 10' and fill with app. 9 cu. ft. of cement.
4. Weld plate and marker to 13-3/8" and backfill with dirt.

NOTE: If 20" is exposed 1' below ground, weld plate and marker to 20" casing.

UCE-23
N - 1,369,026.53'
E - 383,894.78'
Gr. Elev. 5799.00'

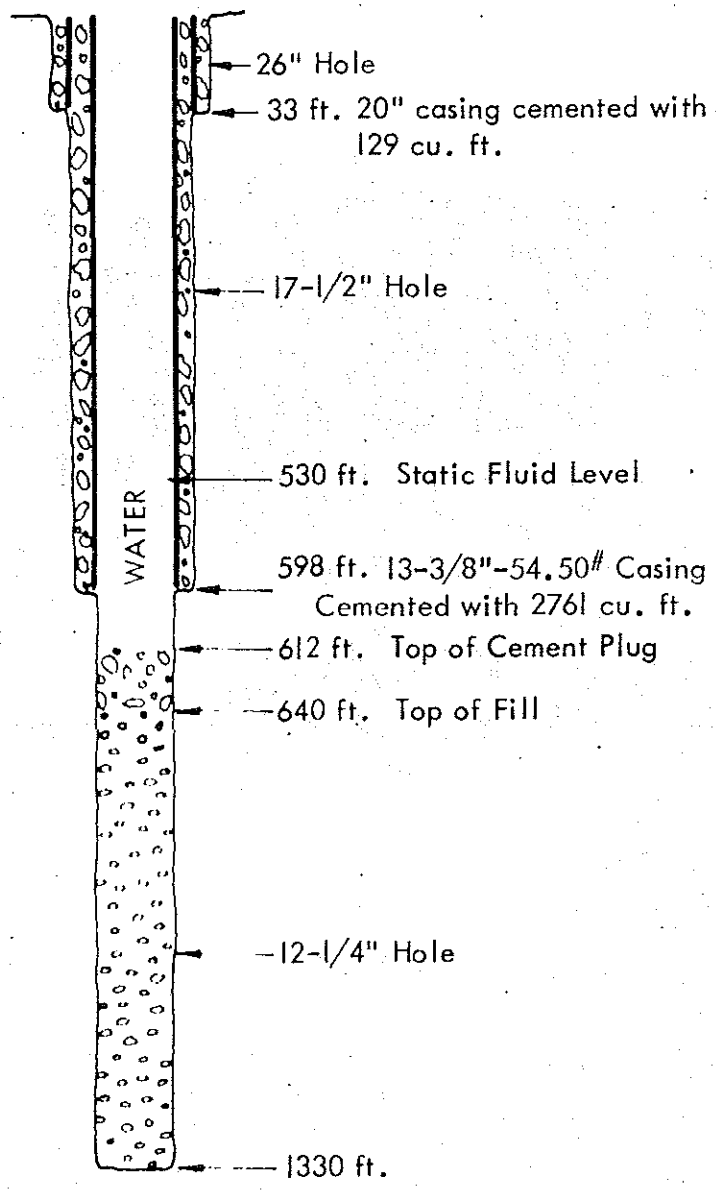


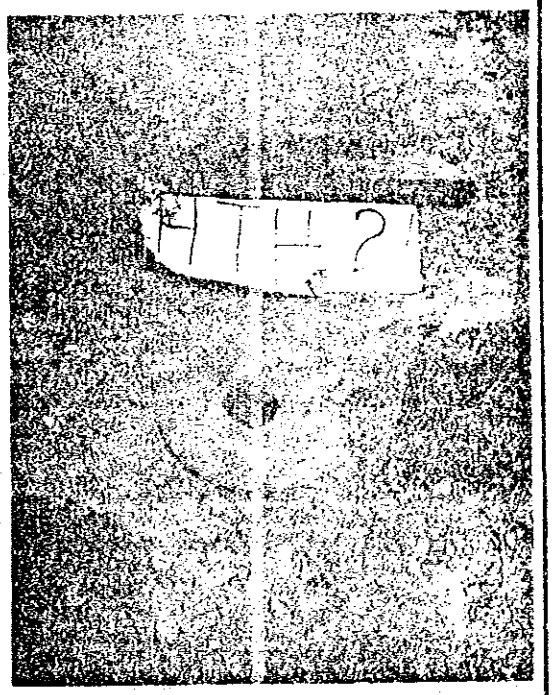


ABANDONMENT PROGRAM

1. Cut off 20" and 13-3/8" casing below orange peel.
2. Set wooden plug at 10' inside 13-3/8" casing and cement to stub with 9 ft.^{3} of cement.
3. Weld plate and marker to 20" casing and backfill cellar with dirt.

HTH-21
N - 1,397,350.13'
E - 668,505.56'
Gr. Elev. 5862.90'

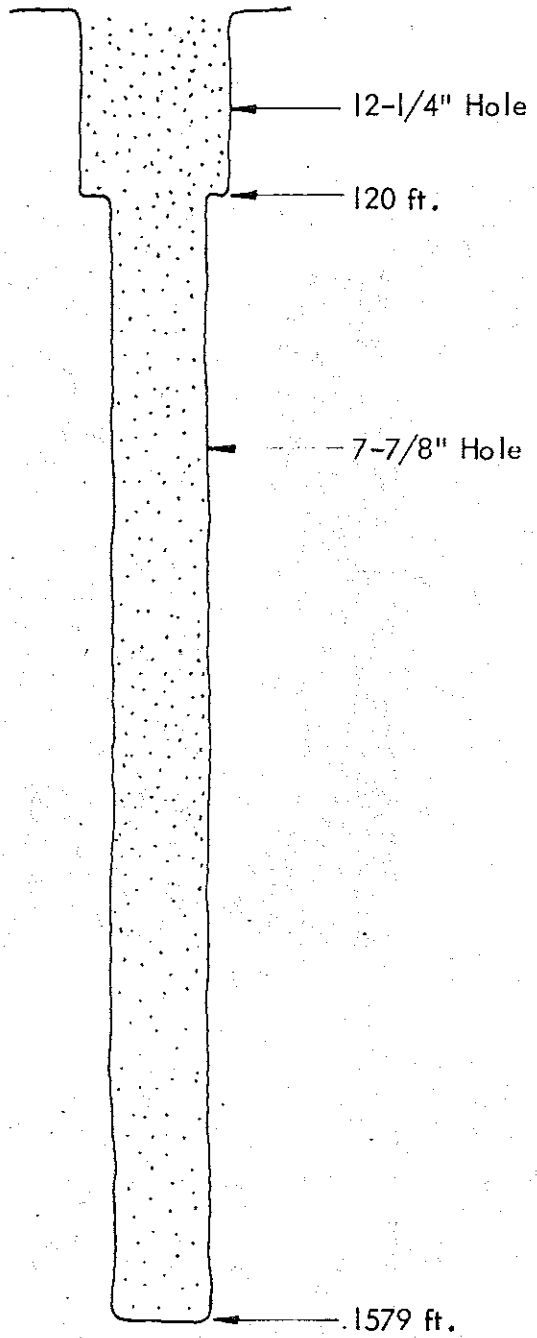


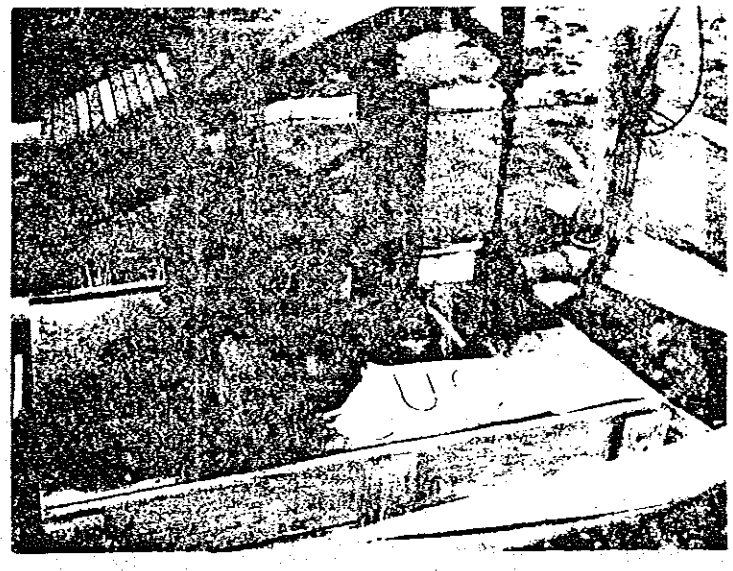


ABANDONMENT PROGRAM

1. Excavate around 13-3/8" casing.
2. Cut off 13-3/8" casing at 1' below ground level and set wooden plug at 10'.
3. Cement to stub of 13-3/8" with approx. 9 cu.ft. of cement.
4. Weld plate and marker to top of 20" casing and backfill with dirt.

UCE-13
N - 1,655,605.36'
E - 597,793.93'
Gr. Elev. 6401.31'





ABANDONMENT PROGRAM

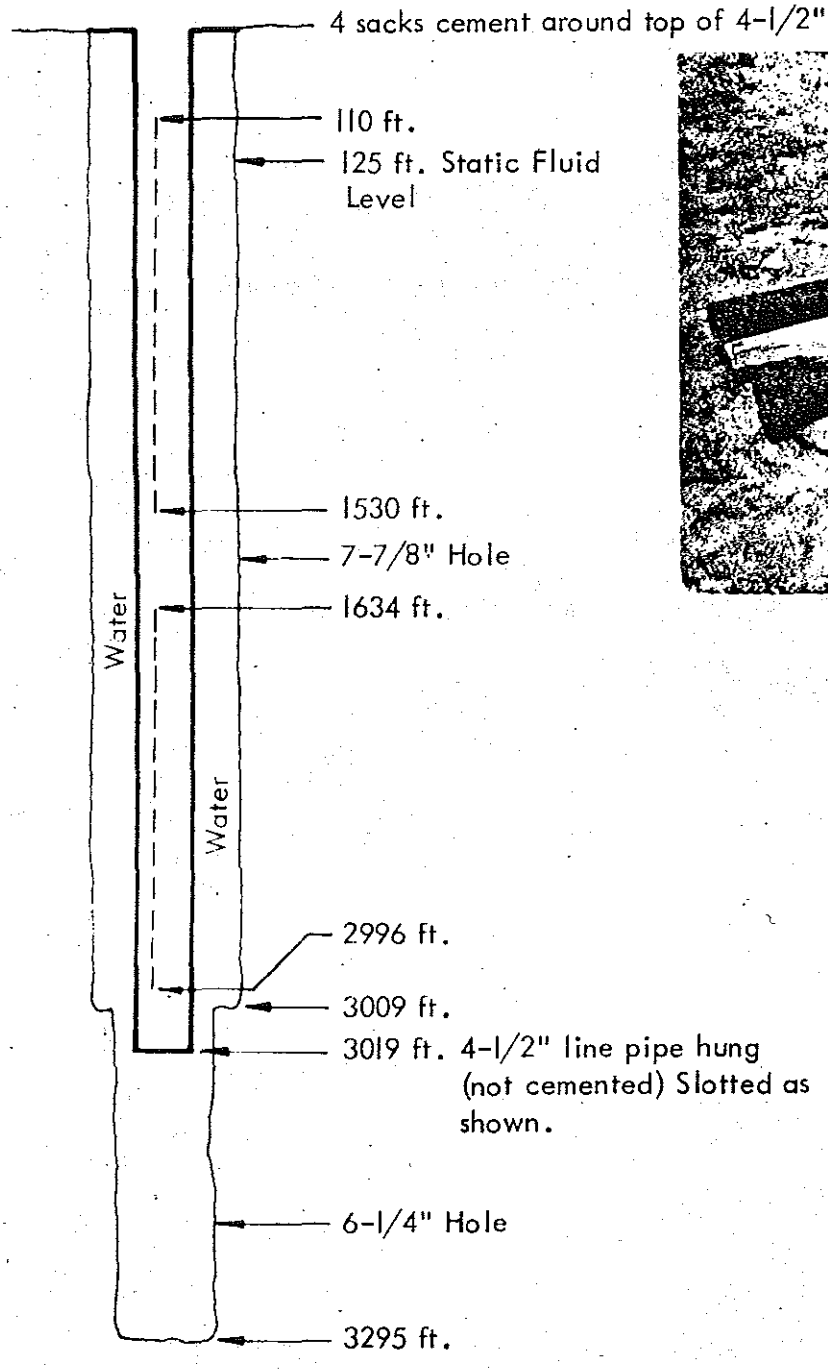
1. Remove all surface equipment from location.

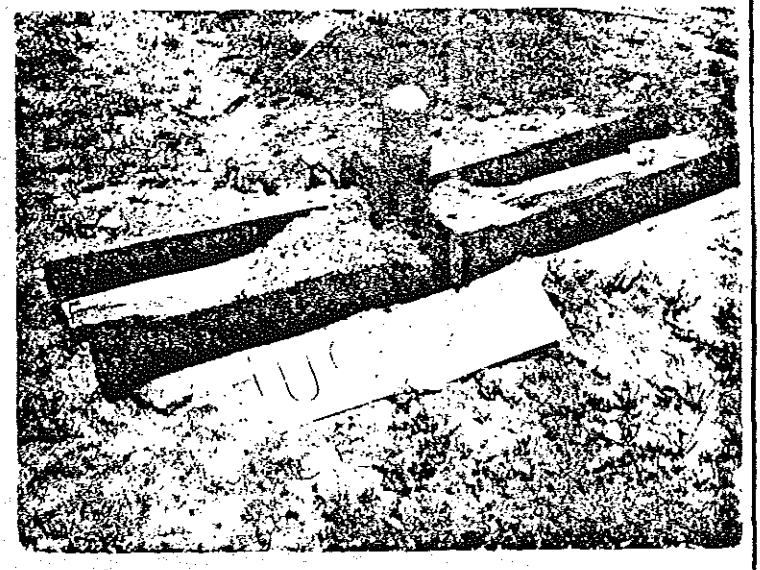
2. Procure crane services and remove rods and tubing from hole.

3. Get wooden plug at 10' inside 12-1/4" hole and cement to surface with 9 cu.ft.

4. Place marker in concrete before it sets.

UCE-9
N - 1,477,975.69'
E - 562,341.41'
Gr. Elev. 6879.63'





ABANDONMENT PROGRAM

1. Remove bull plug from 4-1/2" casing.
2. Chip away cement from surface to 2' below ground level.
3. Release casing clamp and let 4-1/2" casing drop.
4. Set wooden plug at 10' inside 7-7/8" hole and cement with 3.5 cu.ft.
5. Place marker in cement before it sets.

NOTES:

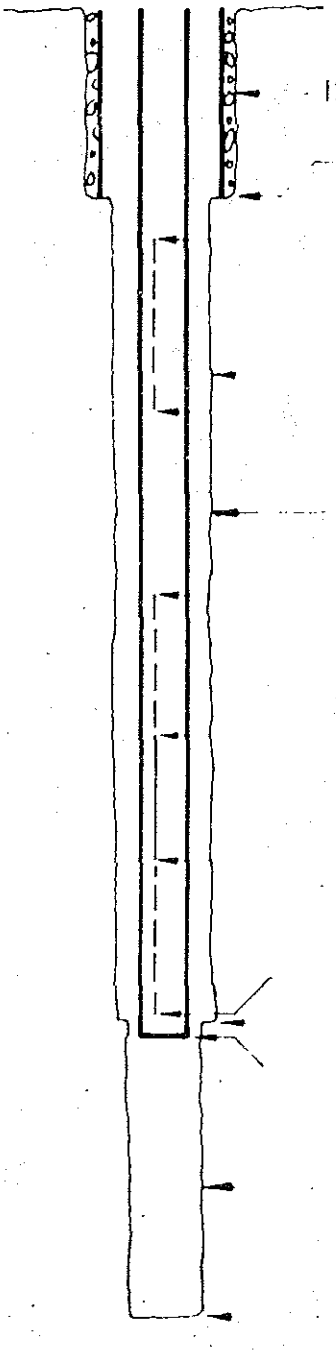
(1) If 4-1/2" casing does not drop, cut casing off at ground level.
(2) Form 4-1/2" x 7-7/8" bridge and cement to surface with 2.3 cu.ft.
(3) Set wooden plug at 10' inside 4-1/2" and cement to top with 1 cu.ft.
(4) Weld cap and marker to 4-1/2" casing and backfill with dirt.

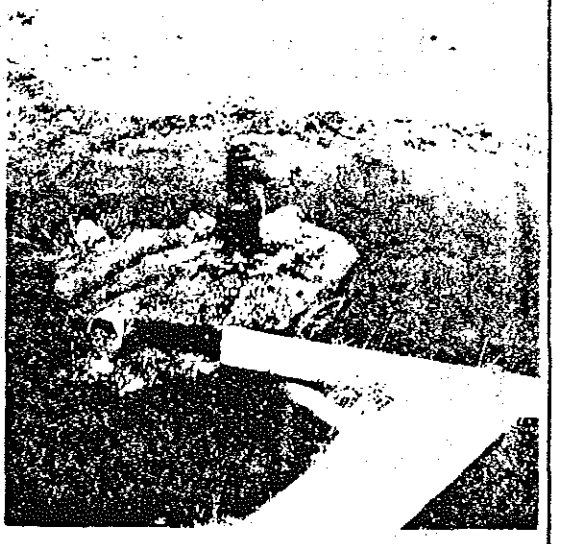
UCE-10

UCE-10 in the Southern part of Little Fish Lake Valley was drilled to 2963 feet encountering 2660 feet of alluvium and 303 feet of dolomite. According to USGS this hole flows warm water containing a fairly high percent of dissolved solids.

If UCE-10 is plugged at the top, water may circulate into the shallow alluvium just below the surface casing. It might be worthwhile to plug this hole with cement from near total depth to surface.

UCE-10
N - 1,433,560.43'
E - 558,294.63'
Gr. Elev. 6497.36'





ABANDONMENT PROGRAM

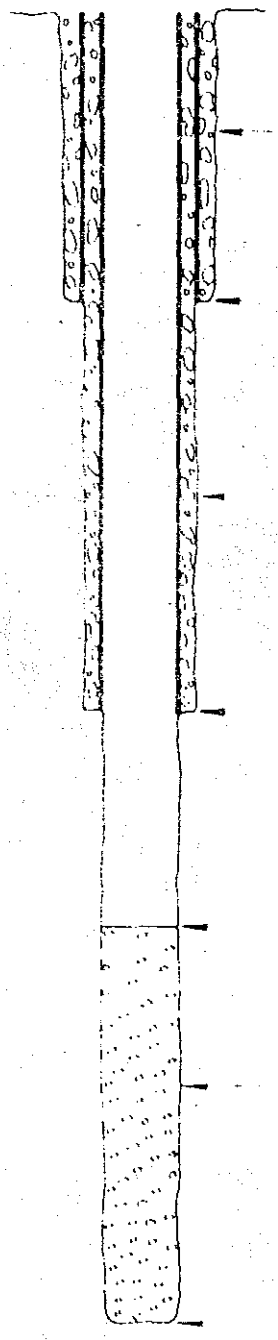
1. Hook up cement truck to valve on 4-1/2" casing. Pump 60 barrels water into casing, monitoring pressure.

2. Mix and pump into casing 700 cu. ft. of 8% Class A Bentonite Cement plus 3% Calcium Chloride. Monitor pressure while pumping. Do not displace cement with water. Wait on cement 4 hours or until cup samples harden.

3. Remove valve from casing. If casing is full of cement, go to Step #4. If cement has equalized down in casing, mix and pour casing full of neat cement.

4. Cut casing off 1' below ground level. Weld on cap and marker. Back fill with dirt.

UCE-12a
N - 1,514,975.55'
E - 594,617.42'
Gr. Elev. 6924.90'



ABANDONMENT PROGRAM

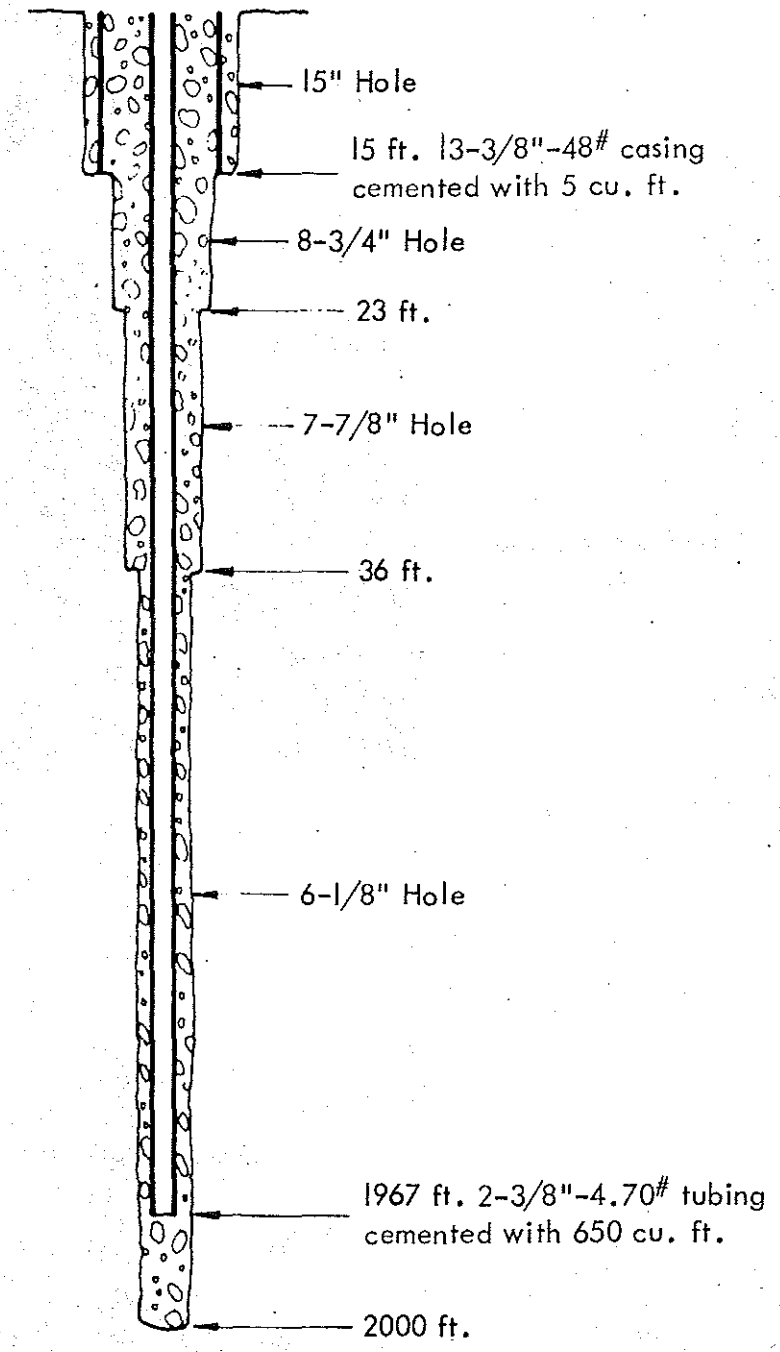
1. Excavate around 10-3/4" casing to 1' below surface.

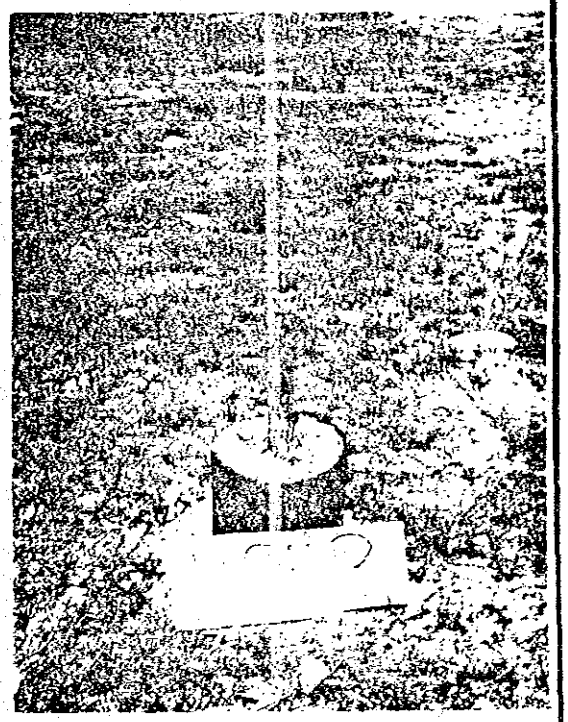
2. Cut off 10-3/4" and 7-5/8" casing 1' below ground level.

3. Set wooden plug in 10" below 7-5/8" casing and cement to top of pipe with 3 cu. ft.

4. Weld plate and marker to 7-5/8" casing and backfill with dirt

UCE-3
N - 1,535,900.00'
E - 508,900.00'
Gr. Elev. 7100' ± 50'

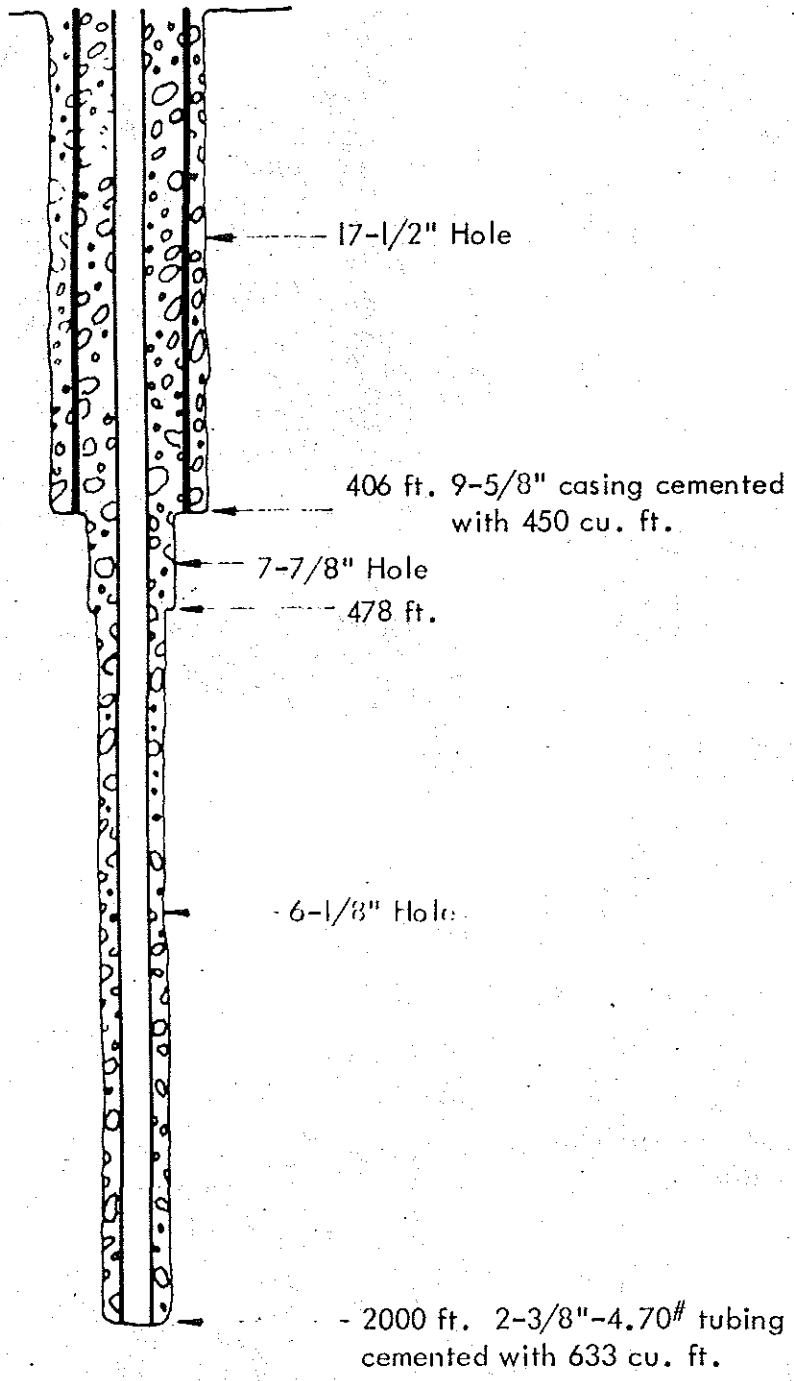


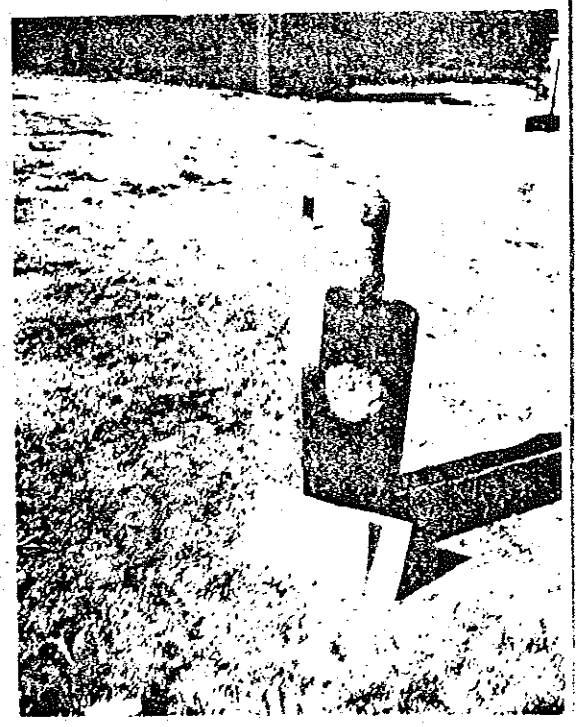


ABANDONMENT PROGRAM

1. Cut off 13-3/8" casing and 2-3/8" tubing to 1' below ground level.
2. Chip away annular cement between the casing and tubing to 1' below ground level.
3. Set wooden plug in 2-3/8" tubing at 10' and fill to top of tubing with approx. 1 cu.ft. of cement.
4. Weld plate and marker to 13-3/8" casing and backfill with dirt.

UCE-1
N - 1,395,000.00'
E - 429,400.00'
Gr. Elev. 7050' ± 50'





ABANDONMENT PROGRAM

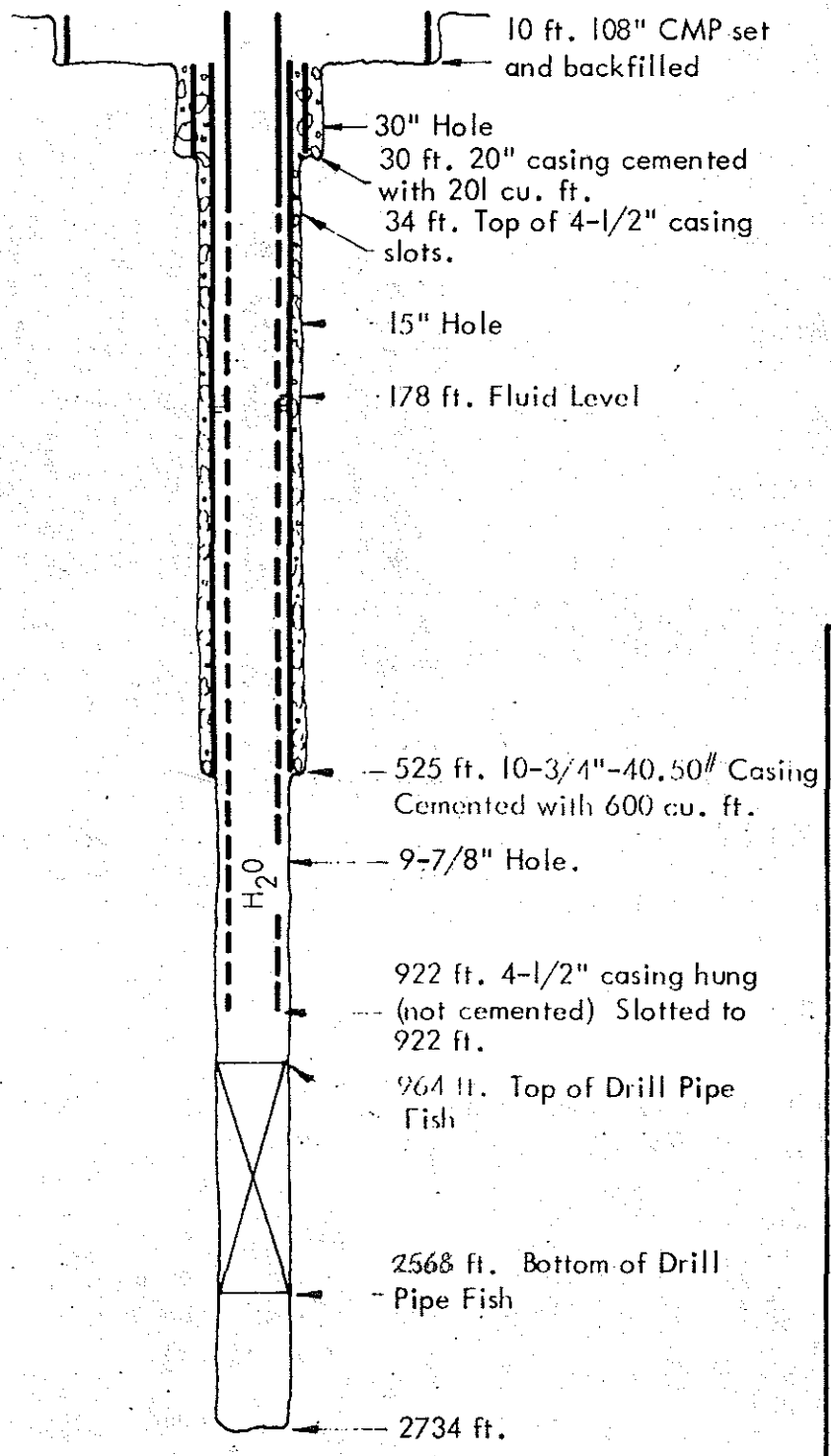
1. Cut off 9-5/8" casing and 2-3/8" tubing to 1' below ground level.

2. Chip away annular cement between the casing and the tubing to 1' below ground level.

3. Set wooden bridging plug at 10' below surface in 2-3/8" tubing and fill with 1 cu.ft. of cement.

4. Weld plate and marker to 9-5/8" casing and backfill with dirt.

UC-1-P-1S
N - 1,413,403.26'
E - 629,836.97'
Gr. Elev. 6034.60'



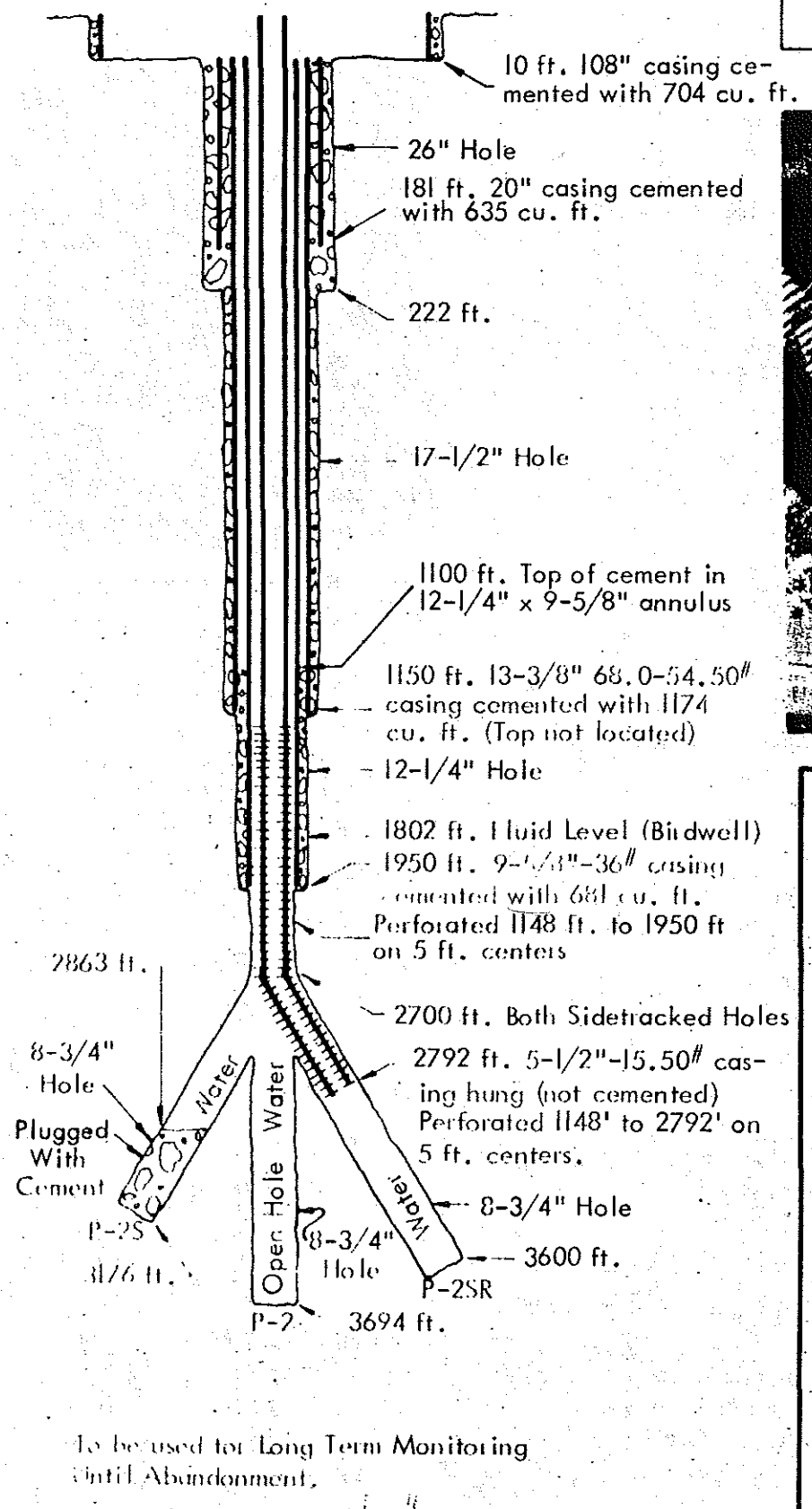
NOTE: Set slips in 10-1/4" x 4-1/2" casing head and installed a 4-1/2" 2000 psi valve on top of 4-1/2" O.D. casing. Valve at G.L. Hole is capable of producing water.

To be Used for Long Term Monitoring until Abandonment.

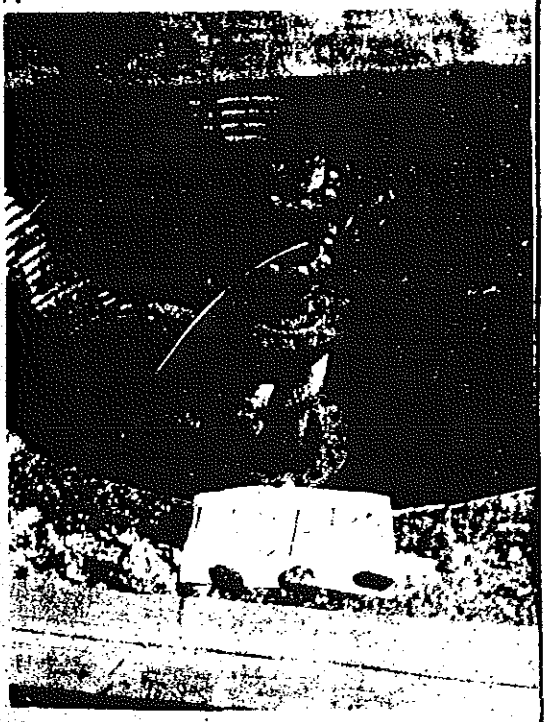
ABANDONMENT PROGRAM

1. Rad-Safe monitoring required on this hole.
2. Remove valve from top of 4-1/2" O.D. casing.
3. Excavate around wellhead so 10-3/4" casing can be cut off below slips.
4. Cut off 4-1/2" casing as low as possible and cut off 10-3/4" casing below slips.
5. If 4-1/2" casing does not drop stuff bridging material to 10' in 10-3/4" x 4-1/2" annulus and cement to surface with 4 cu.ft. of cement.
6. Hang wooden plug in 4-1/2" casing to 10' and fill to surface with 1 cu.ft. of cement.
7. Weld plate and marker to 20" casing.
8. Cut off 108" casing to 1' below ground level, remove, and backfill cellar with dirt.

UC-1-P-2, 2S, 2SR
N - 1,414,632.50'
E - 628,982.18'
Gr. Elev. 6084.50'



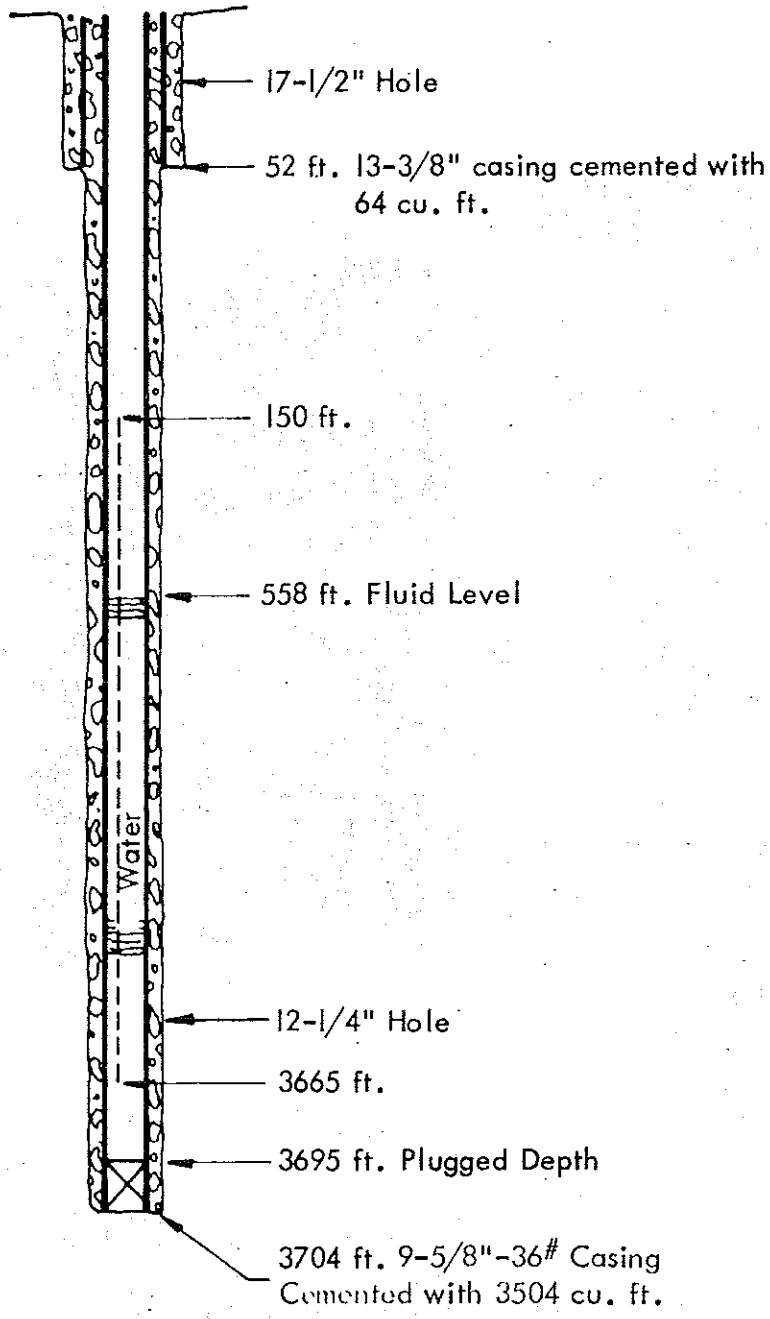
To be used for Long Term Monitoring Until Abandonment.

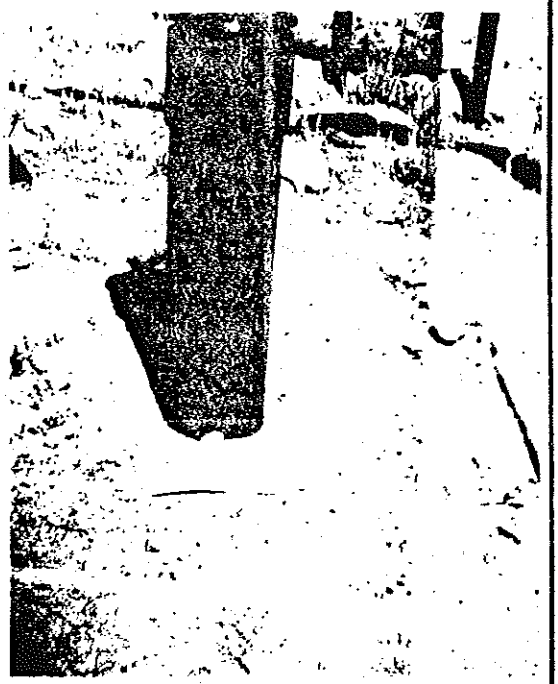


ABANDONMENT PROGRAM

1. Rad-Safe monitoring required on this hole.
2. Remove debris from location.
3. Remove wellhead equipment and cut off flange to 13-3/8" casing.
4. If 5-1/2" casing does not drop, stuff sacks in annulus of 13-3/8" x 9-5/8" casing to 10' and fill with cement.
5. Repeat Step 4 for 5-1/2" x 9-5/8" annulus.
6. Hang wooden plug in 5-1/2" casing to 10' and fill to surface with cement.
7. Place steel plate and marker over casing stubs and weld to 20" casing.
8. Cut off 108" casing to 1' below ground level, remove and backfill cellar with dirt.
9. Fill rat hole or mouse hole with dirt and top off with cement.

HTH-1
N - 1,411,442.75'
E - 629,720.11'
Gr. Elev. 6010.80'





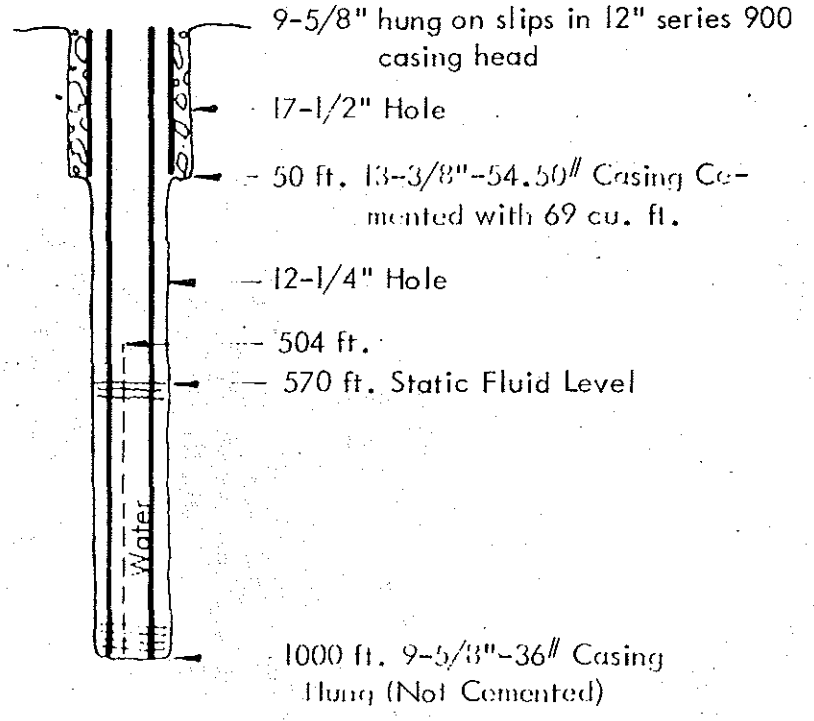
NOTE: 9-5/8" casing was gun perforated as shown with 2710 shots.

To be Used for Long Term Monitoring Until Abandonment.

ABANDONMENT PROGRAM

1. Excavate around 9-5/8" casing to 1' below surface.
2. Cut off 9-5/8" casing one foot below ground level and set wooden plug at 10'.
3. Cement to top of stub with approx. 5 ft.^{3} of cement.
4. Weld plate and marker to 9-5/8" casing and backfill with dirt.

HTH-2
N - 1,411,929.43'
E - 629,587.75'
Gr. Elev. 6024.80'



NOTE: 9-5/8" casing is slotted from 504 ft. to 1000 ft.

To be Used for Long Term Monitoring Until Abandonment.

ABANDONMENT PROGRAM

1. Excavate around casing to expose 12" - 900 series head.
2. Cut off head from 13-3/8" casing and form 13-3/8" x 9-5/8" annular plug. Cement from 10' with 4 ft.^{3} of cement.
3. Cut off 9-5/8" and set wooden plug at 10' and cement back to stub with 5 ft.^{3} of cement.
4. Weld plate and marker to 13-3/8" casing and backfill with dirt.

APPENDIX E

HOLES ASSIGNED TO THE BUREAU OF LAND MANAGEMENT

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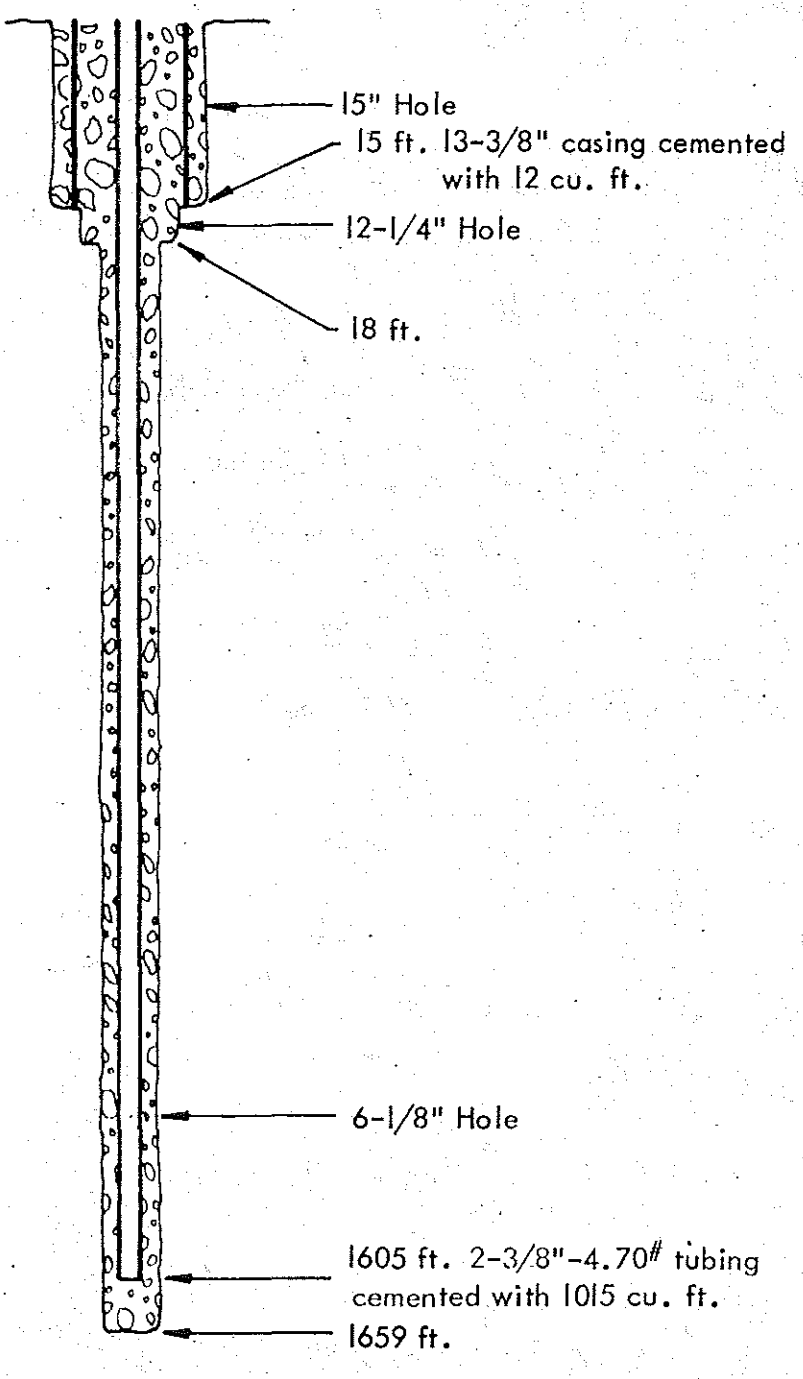
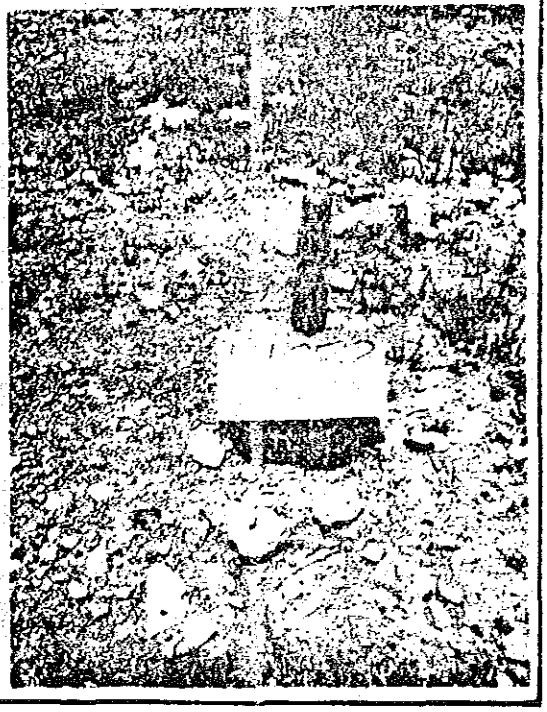
The following holes will be assigned to the United States Bureau of Land Management:

Hole Number	Locale
UCE-2	Willow Creek
UCE-16	Monitor Valley
UCE-17	Hot Creek Valley
HTH-4	Little Smokey
HTH-23	Hot Creek Valley

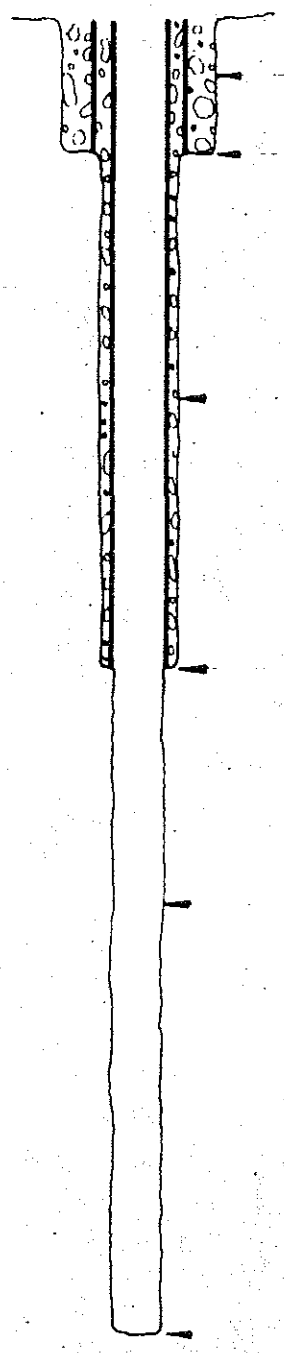
UCE-2
N - 1,293,700.00'
E - 523,800.00'
Gr. Elev. 6200' ± 50'

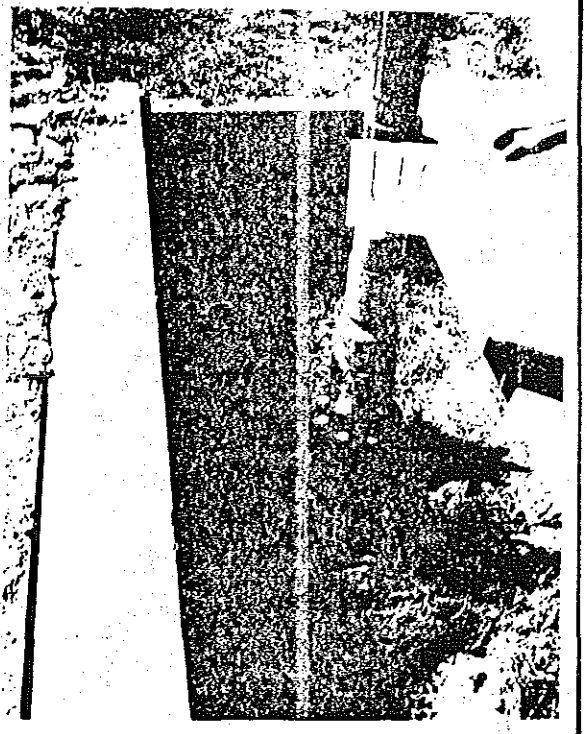




This Hole has been Assigned to the Bureau of Land Management.

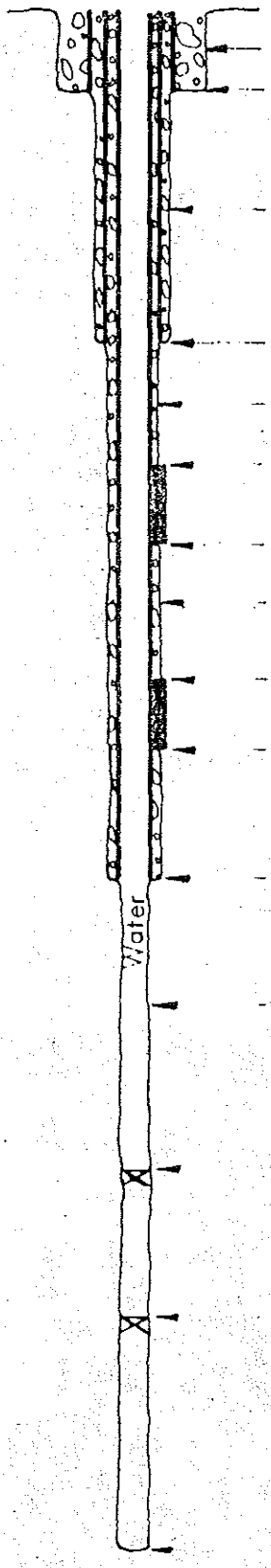
UCE-16
N - 1,499,400.00'
E - 487,000.00'
Gr. Elev. 6875.00' ± 25'





This Hole has been Assigned to the Bureau of Land Management.

UCE-17
N - 1,430,621.72'
E - 628,17[illegible].70'
Gr. Ele[illegible] 65-[illegible].39'



30" Hole

34 ft. 20" casing cemented with 207 cu. ft.

17-1/2" Hole

501 ft. 13-3/8" casing cemented with 713 cu. ft.

535 ft. Static Water Level

785 ft.

Gun Perforated, 2 holes/ft.

915 ft.

12-1/4" Hole

1770 ft.

Gun Perforated, 2 holes/ft.

1840 ft.

2279 ft. 9-5/8"-36.00# casing cemented with 1566 cu. ft.

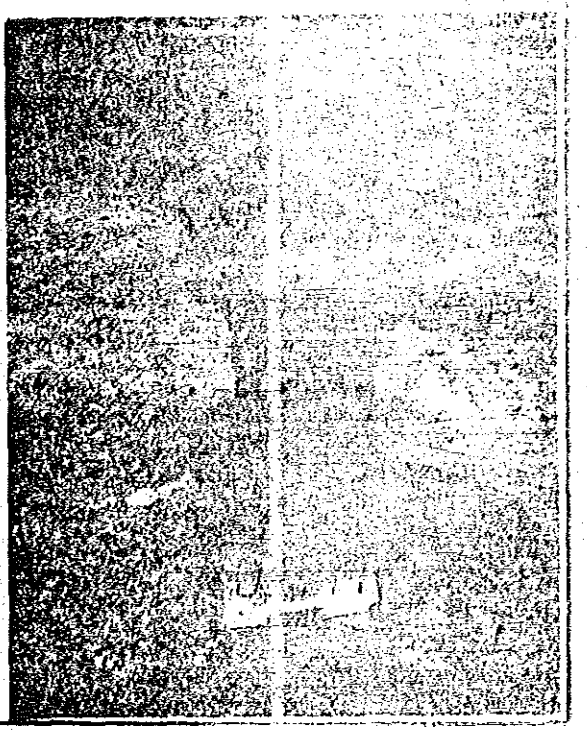
8-3/4" Hole

6576 ft. Top of Fish (Lynes Packer Elements)

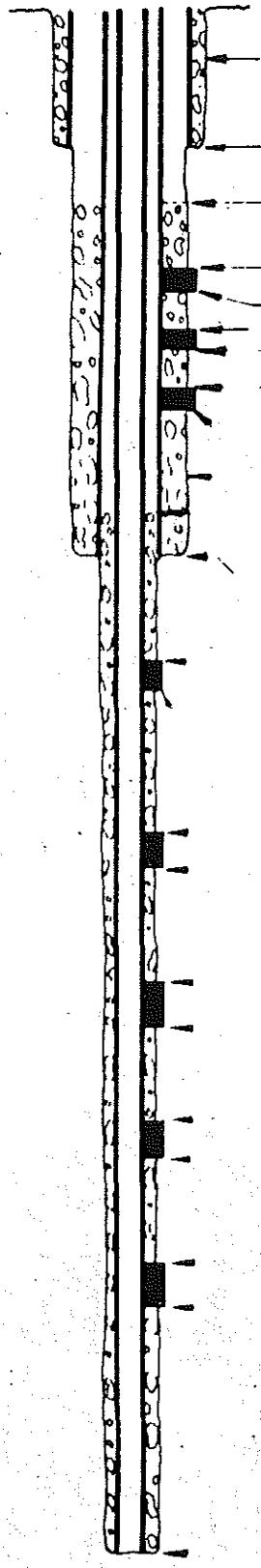
Bottom of Fish at unknown depth (Lynes Packer)

7978 ft.

This Hole has been Assigned to the Bureau of Land Management.



HTH-4
N - 1,385,984.00'
E - 685,984.00'
Gr. Elev. 5828.20'



26" Hole

63 ft. 20" casing cemented with 278 cu. ft.

360 ft. Top of Cement

505 ft.

520 ft.

575 ft.

585 ft.

870 ft.

890 ft.

Gun perforated 13-3/8" casing with 90 shots prior to running 5-1/2" casing.

17-1/2" Hole

1260 ft. Top of Cement in 13-3/8" x 5-1/2" casing annulus

1500 ft. 13-3/8" casing cemented with 1600 cu. ft.

2020 ft.

2050 ft.

3480 ft.

3510 ft.

Gun perforated 5-1/2" casing as shown with 300 shots.

4420 ft.

4450 ft.

5450 ft.

5480 ft.

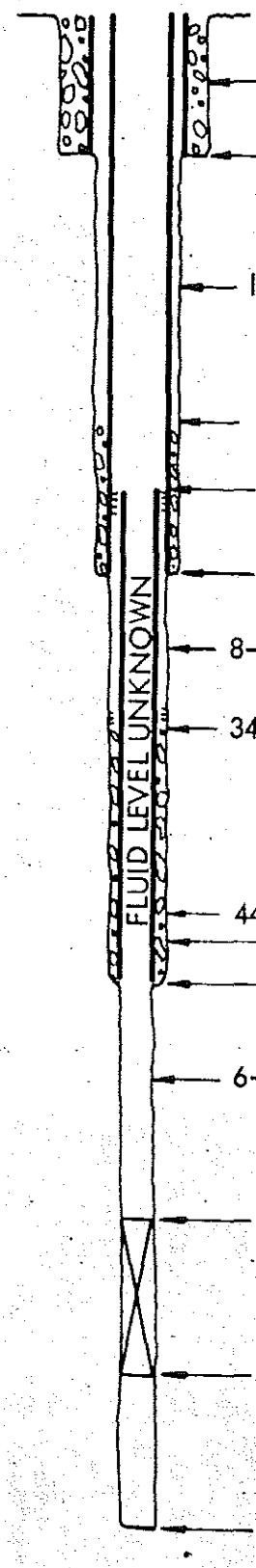
5850 ft.

5880 ft.

6040 ft. 5-1/2" cemented with 5016 cu. ft.

This Hole has been Assigned to the Bureau of Land Management.

HTH-23
N - 1,368,087.00'
E - 684,237.00'
Gr. Elev. 5795.39'



30" Hole

61 ft. 20" casing cemented with 216 cu. ft.

12-1/4" Hole

1050 ft. Top of Cement in 12-1/4" x 9-5/8" Annulus

1152 ft. Top of 7-5/8" Liner

1244 ft. 9-5/8" casing cemented with 200 cu. ft.

8-3/4" Hole

3484 ft. Top of cement in 8-3/4" x 7-5/8" Annulus

4420 ft.

4433 ft. 7-5/8" Liner parted.

4510 ft. 7-5/8" Liner cemented with 311 cu. ft.

6-3/4" Hole

6445 ft. Top of Drill Pipe Fish

7178 ft. Bottom of Drill Pipe Fish

7503 ft.

This Hole has been Assigned to the Bureau of Land Management.