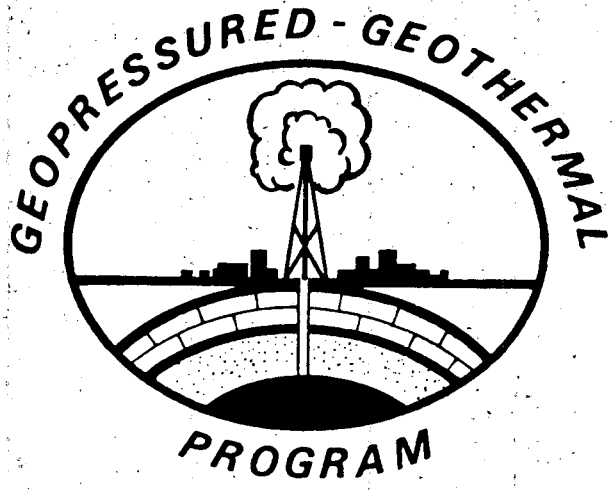
Don Bebout



TESTING GEOPRESSURED GEOTHERMAL RESERVOIRS IN EXISTING WELLS

U.S. DEPARTMENT OF ENERGY
CONTRACT NO. DE-AC08-80ET27081

DETAILED COMPLETION PROGNOSIS

FOR GEOPRESSURED - GEOTHERMAL WELL OF OPPORTUNITY

PROSPECT #1

CLOVIS A. KENNEDY NO. 1 WELL

EATON OPERATING COMPANY, INC.
3100 EDLOE, SUITE 205
HOUSTON, TEXAS 77027
713-627-9764

DISCLAIMER

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713-627-9764

April 3, 1980

Mr. R. T. Stearns
Engineering and Energy Applications Branch
United States Department of Energy
Nevada Operations
Las Vegas, Nevada 89114

Re: IMC Exploration Company
Clovis A. Kennedy #1 Well
Section 32 T10S R2E
Vermilion Parish, Louisiana

Dear Mr. Stearns:

We are recommending that subject well be acquired from IMC Exploration Company and tested as a GEO^2 well of opportunity. A detailed completion, testing and cost estimate is included with this recommendation.

Agreements with IMC, as operator, and the landowners have been proposed and accepted, subject to DOE approval. Agreements with the nine landowners are in the mail for their signing. The IMC agreement will be signed once all landowners have signified their agreement in writing.

The Clovis A. Kennedy Well was formerly a well which was recently shut in as uneconomical to produce. It is equipped with 5-1/2" 23.5# P-110 casing to total depth of 16,180', 2-3/8" tubing, packer and a 15,000# X-mas tree. IMC has agreed to sell the Kennedy Well and a nearby salt water disposal well to Eaton. The consideration for this sale will be Eaton's assumption of plugging and abandonment liability for both well bores. IMC will retain ownership of the X-mas tree and the tubing until abandonment if they so choose.

It is doubtful the 5-1/2" casing can be recovered economically. However, we would make an evaluation attempt at recovery prior to plugging.

Estimated costs for workover, testing and plugging are summarized as follows:

Estimated cost to clean out, complete and plug Kennedy Well	$ 648,000
Estimated cost to recomplete and plug salt water disposal well	55,000
Estimated cost to conduct test program	407,000
EOC well test fee	112,500
Total Estimated Cost	$ 1,222,500

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Eaton Operating Co., Inc.
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The Kennedy Well has a Bol Mex F-1 water sand present from 15,826 to 15,942 feet behind the 5-1/2" casing which apparently meets all parameters for a successful GEO^2 test. The top of the water sand (F-1) is some seven hundred feet below the present producing perforations which will be squeezed off.

We believe this is a good GEO^2 prospect which can be recompleted, tested and plugged with considerable savings as compared to taking over a newly drilled well.

Yours truly,

EATON OPERATING COMPANY

B. A. Eaton

B. A. Eaton, President and Project Manager

cc: Messrs. Clifton Carwile
Bennie DiBona
Robert Holliday
Keith Westhusing

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TESTING GEOPRESSURED - GEOTHERMAL RESERVOIRS IN EXISTING WELLS

DETAILED COMPLETION PROGNOSIS FOR GEOPRESSURED - GEOTHERMAL WELL OF OPPORTUNITY PROSPECT #1

CLOVIS A. KENNEDY NO. 1 WELL

EATON OPERATING COMPANY
3100 EDLOE, SUITE 205
HOUSTON, TEXAS 77027

APRIL 3, 1980

PREPARED FOR THE DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY
UNDER CONTRACT NO. DE-AC08-80ET27081

DOE CONTRACT NO.
DE-AC08-80ET-27082

Eaton Industries of Houston, Inc.
Eaton Operating Co., Inc.
3100 Edloe
Houston, Texas 77027
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CLOVIS A. KENNEDY WELL #1
SECTION 32-10S-2E
PERRY POINTE FIELD
VERMILION PARISH, LOUISIANA

INTRODUCTION

This prospective well of opportunity was originally drilled and completed as a gas producer by Wrightsman Investment Company in early 1973. The original and present producing interval was from 15,216 to 15,238 feet. IMC Exploration Company, Inc. acquired the property from Wrightsman and is the present owner operator.

The well is presently shut in as a non-economic producer and IMC proposed to perform plug and abandonment operations in April, 1980. This well has a good geopressured - geothermal water sand behind the 5-1/2" casing that has 94 feet of net sand thickness. Pursuant to DOE/NVO authorization of March 11, 1980, Eaton negotiated an option agreement with IMC whereby IMC would delay their abandonment operations for a period of ninety (90) days to permit DOE to evaluate the well for geopressure - geothermal testing.

The IMC - Eaton option agreements provide that IMC will delay plugging the well until June 15, 1980. If Eaton exercises its option to acquire the well, IMC will sell the well bore, and an adjacent salt water disposal well, to Eaton for the sole consideration of Eaton assuming the obligation to plug and abandon the wells in accordance with lease and regulatory requirements. If Eaton does not exercise its option, then Eaton will pay IMC $95,000 cash and IMC will proceed with plugging and abandonment at the termination of the option period.

An agreement, subject to DOE's final approval, has been finalized with each of the landowners under the Kennedy #1 well for a total sum of $35,000.

Estimated cost to recomplete and plug both the Kennedy well and the salt water disposal well is $703,000.

GEOLOGY

The subsurface geology of the zone of interest has been developed primarily through electric log and drill cuttings analysis. Seismic data in the area for the zone of interest are virtually non-existent.

The target sand is the Bol Mex "F1" which occurs at a depth of 15,826 to 15,942 feet (KB) in the C.A. Kennedy #1 well (See ISF/ Sonic log in Figure 1). The Bol Mex series of sands extends from 15,215 to 16,084 feet (KB) as shown in the ISF log in Figure 2.

A structure map of the top of the target Bol-Mex "F" sand is presented in Figure 3. As indicated by this map, the prospect area is bounded by growth faults and consists of more than 1000 acres. The test well is located between two anticlinal structures, near the base of the intervening trough. The fault nearest the test well occurs about 1300 feet to the south.

Within the reservoir, (as defined by the growth faults) the Bol-Mex "F1" sand ranges in gross thickness between 20 to 135 feet. It appears to thin significantly in the northeastern sector of the fault block. However, within about 3,500 feet, the minimum observed thickness is 85 feet. Gross sand thicknesses determined from logs of wells within one mile of the No. 1 C.A. Kennedy well are presented as follows:

WELL	GROSS SAND THICKNESS, ft.
Wrightman Inv. No.1 C. A. Kennedy, et al	116
Wrightman Inv. No. 3 C. A. Kennedy	135
McCulloch Oil No. 1 E. H. McCall, et al	85
IMC, Inc. Hayes No. 1	120

RESERVOIR CHARACTERISTICS

The predicted reservoir characteristics of the Bol Mex "F1" sand and the basis for their determination are presented as follows:

-Net Sand Thickness

The net sand thickness was determined to be 94' feet based upon analysis of the SP log. Excursions of the SP curve toward the shale base line which represent shale streaks of at least 1 foot were subtracted from the gross sand thickness to obtain this value.

-Porosity

Porosities calculated from the sonic log range from 15% to 32% and average 22%. A matrix velocity of 17,500 ft/sec and a Δt for the shale of 100 micro-seconds/ft. were assumed. The porosity distribution is as follows:

Gross Interval	Net Sand Thickness, ft.	Average Porosity, %
15,826 - 896	59	19
15-896 - 910	9	31
15,910 - 918	6	21
15,918 - 924	5	32
15,924 - 942	15	25
15,826 - 942	94	22

-Pressure

The average pressure in the target sand is estimated to be about 13,590 psi based upon a measurement of 13,000 psi initial pressure in the Bol Mex "A" sand (depth of 15,230') and a gradient of about .9 psi/ft (17.2#/gal mud) for the interval below this sand.

-Temperature

The average sand temperature is estimated to be about 278°F based upon a BHT of 274°F @ 16,287' measured after circulation had been stopped for 6 hours. Ten degrees, or about 1/3 of the AAPG correction, was added to the BHT to obtain this value.

RESERVOIR CHARACTERISTICS (con't)

-Salinity

Calculated salinity is about 100,000 ppm based upon analysis of SP logs, using corrected values of SP and a measured R_{mf} of .30 mv at 73°F.

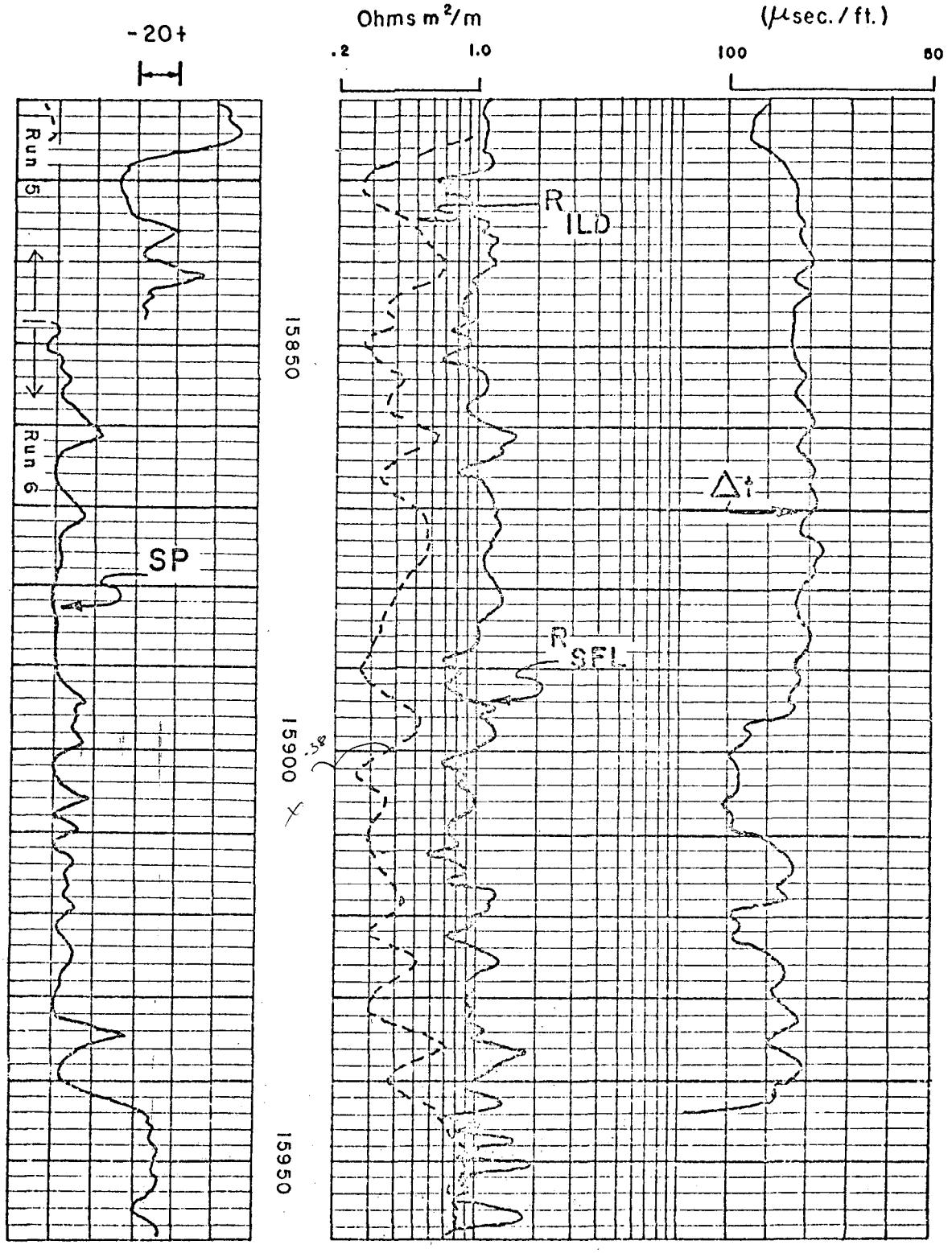

Figure 1 ISF SONIC LOG

WRIGHTMAN INVESTMENT CO., NO. I CLOVIS A. KENNEDY, ET AL

VERMILLION PARISH, LOUISIANA

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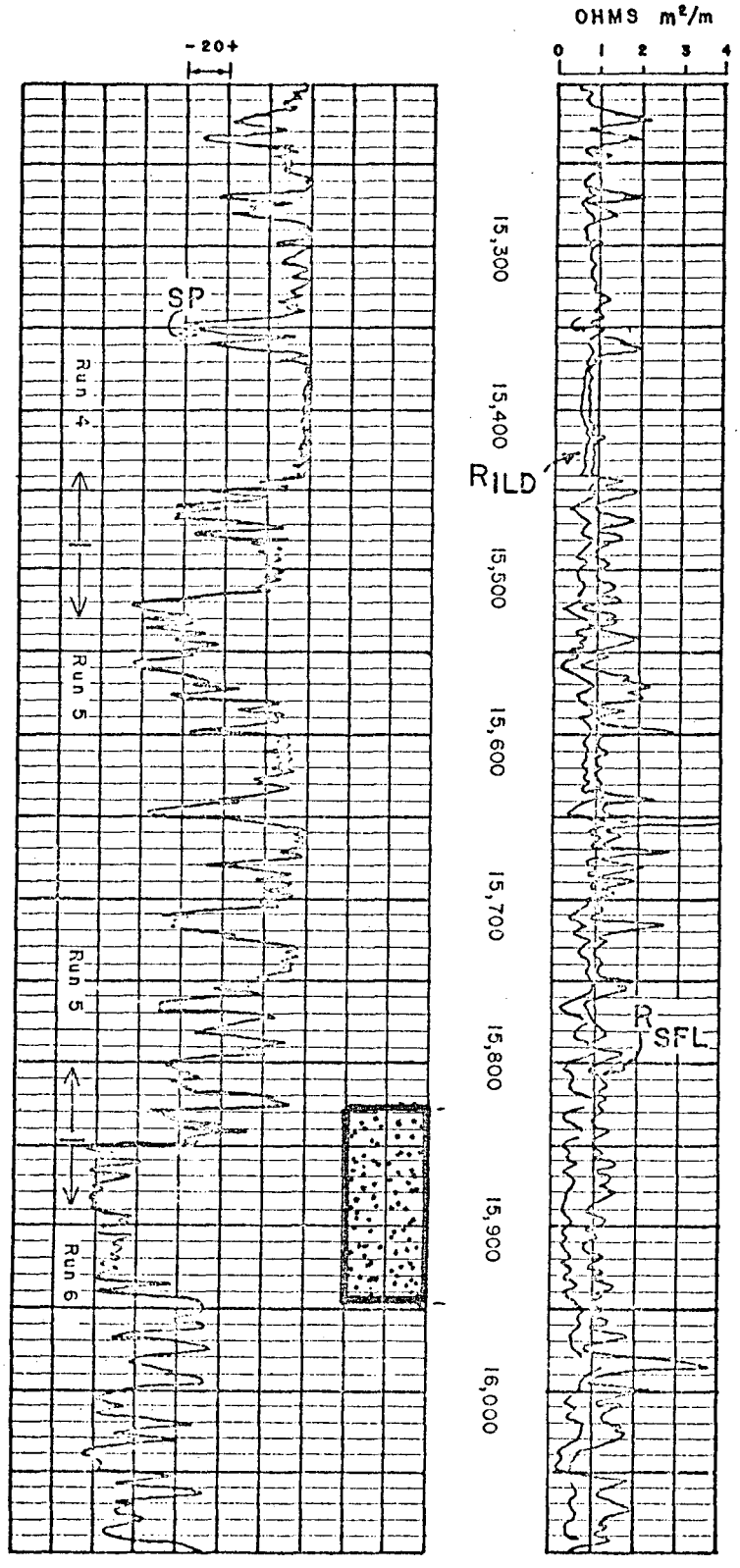

ISF LOG

WRIGHTMAN INVESTMENT CO., NO.1 CLOVIS A. KENNEDY, ET AL

VERMILLION PARISH, LOUISIANA

Figure 2

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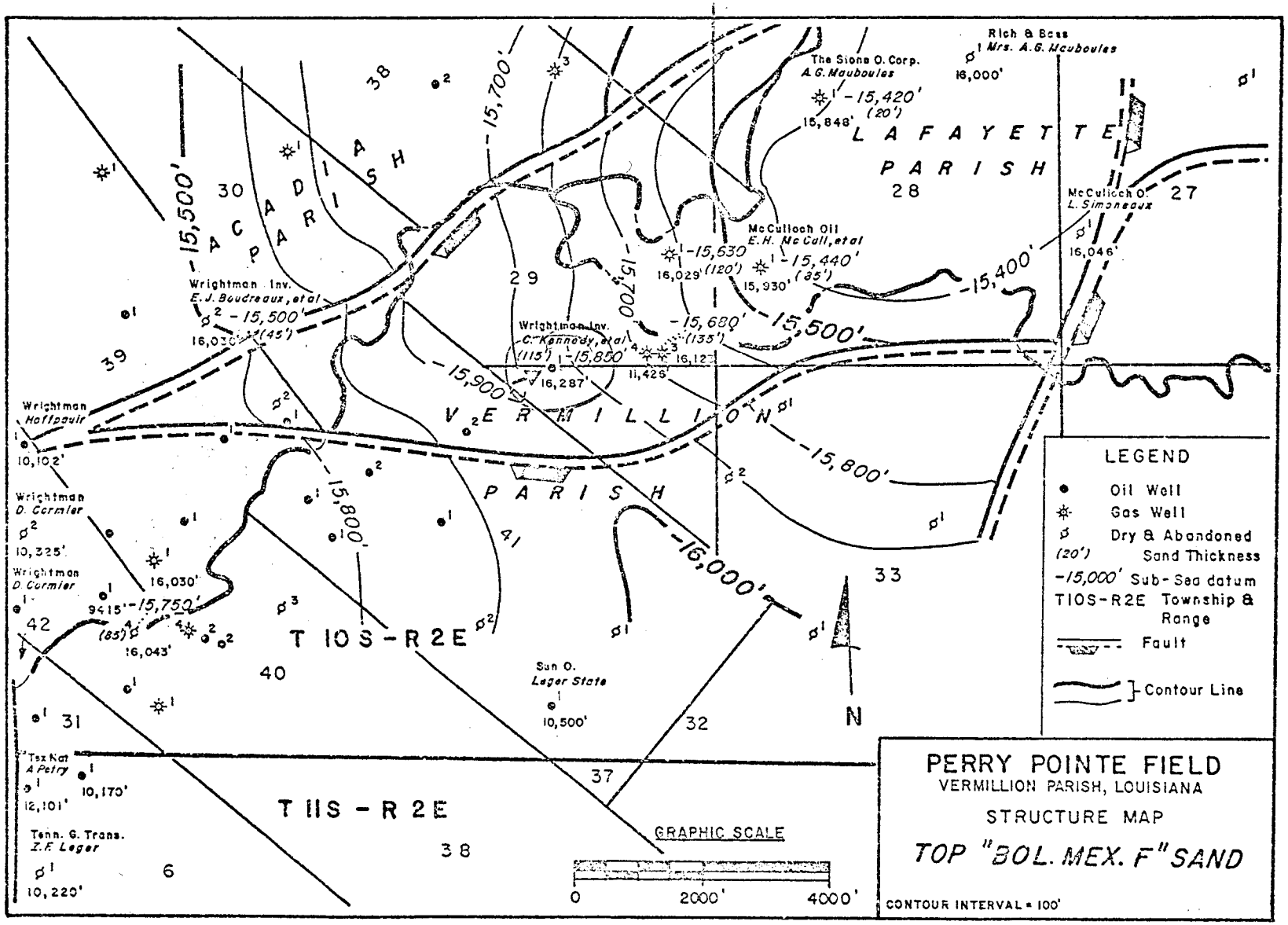

Figure 3

13 B m. Grimsby SWLA

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TABLE I

TOTAL ESTIMATED COST

TO COMPLETE, TEST AND PLUG

IMC CLOVIS A. KENNEDY WELL #1

Workover and Plug Test Well	$ 648,000
Test Operations	407,000
Workover and Plug Salt Water Disposal Well	55,000
EOC Well Test Fee	112,500
Total Estimated Cost	$ 1,222,500

WORKOVER PROCEDURE FOR TEST WELL

PRESENT MECHANICAL CONDITION

Figure 4 illustrates the actual present mechanical condition of the well. The well has a shut in tubing pressure of 2,800 psi and a pressure of 5,200 psi on the 5-1/2" casing. The casing pressure indicates either parted tubing or a tubing leak. The packer fluid is a 17.4 ppg mud. Some amount of fishing will most likely be required to clean out the well.

WORKOVER OPERATION

1. Move in workover rig of appropriate size and prepare 300 bbl of 17 ppg liquid mud. Attempt to bleed pressure off 5-1/2" casing while pumping mud into tubing. Lubricate mud into casing if necessary to kill well.

2. Nipple down X-mas tree and nipple up 10,000 psi BOP's and choke manifold.

3. Attempt to pull tubing out of hole. If tubing will not come free, run free point and cut and recover free tubing. Wash over remaining tubing and cut and recover in several sections. A rental string of 2-7/8" drill pipe will be used as the fishing string. (The tubing recovered from the well and sections of the X-mas tree will be reconditioned, if possible, and used for the testing program. Otherwise tubing and X-mas tree valves will be rented.)

4. Mill over and recover packer or push same to bottom.

5. Go in hole with squeeze tool and squeeze perforation 15,216-15,238' with 200 sacks of cement.

6. Drill out cement and go in hole with squeeze tool. Displace work string with 9.0 ppg salt water close squeeze tool and check if perforations are leaking. If necessary, squeeze again until perforations are sealed off.

7. Run gamma ray, cement bond log from plug back depth to top of cement in 5-1/2" casing. Run casing inspection log from PBD to surface. Run hydrocarbon evaluation log from bottom to 15,000'. Block squeeze test zone if necessary.

8. Displace mud with 9.8 ppg salt water and lay down work string.

9. Go in hole with 2-3/8" tubing and hang same at 15,800'.

10. Install test tree (see Figure 5) and make wire line run with dummy tool to check for perforating gun.

11. Move out workover rig.

12. Rig up through-tubing perforating gun with high pressure lubricator go in hole and perforate 15,850-15,945'. This will take five runs.

13. Commence production tests.

PLUG & ABANDONMENT OPERATION

1. After production tests are completed, kill well with mud by pumping down tubing and circulating up annulus.

2. Move in workover rig.

3. Nipple down test tree and nipple up BOPS.

4. Pull tubing string out of hole. Set cement retainer at 15,150' and squeeze perforations with 200 sacks of cement. Spot 50 sacks of cement on top of retainer.

5. Run free point on 5-1/2" casing and cut casing at free point and recover same, if practical.

6. Spot cement plug from 100' below cut point to 200' above cut casing.

7. Run free point on 9-5/8" casing and cut casing at free point and recover same.

8. Set cement retainer at 2,900'± and pump 200 sacks of cement below retainer and spot 100 sacks of cement on top of retainer.

9. Spot 100 sacks of cement from 100' below ground to surface.

10. Cut 13-3/8" casing and 20" pipe and weld 1/4" plate on top.

11. Move out rig and restore location.

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IMC, NO.1 CLOVIS A. KENNEDY

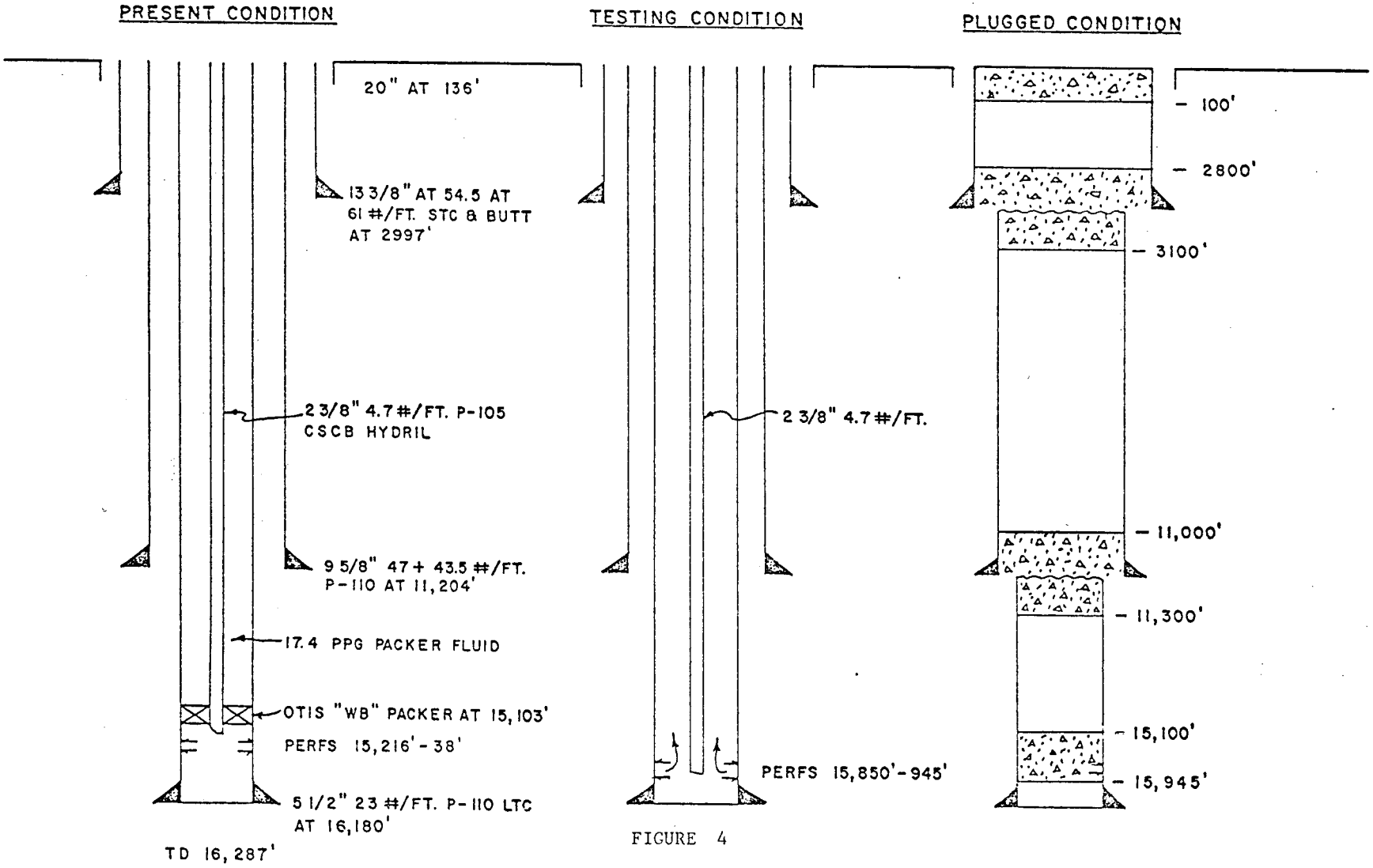

FIGURE 4

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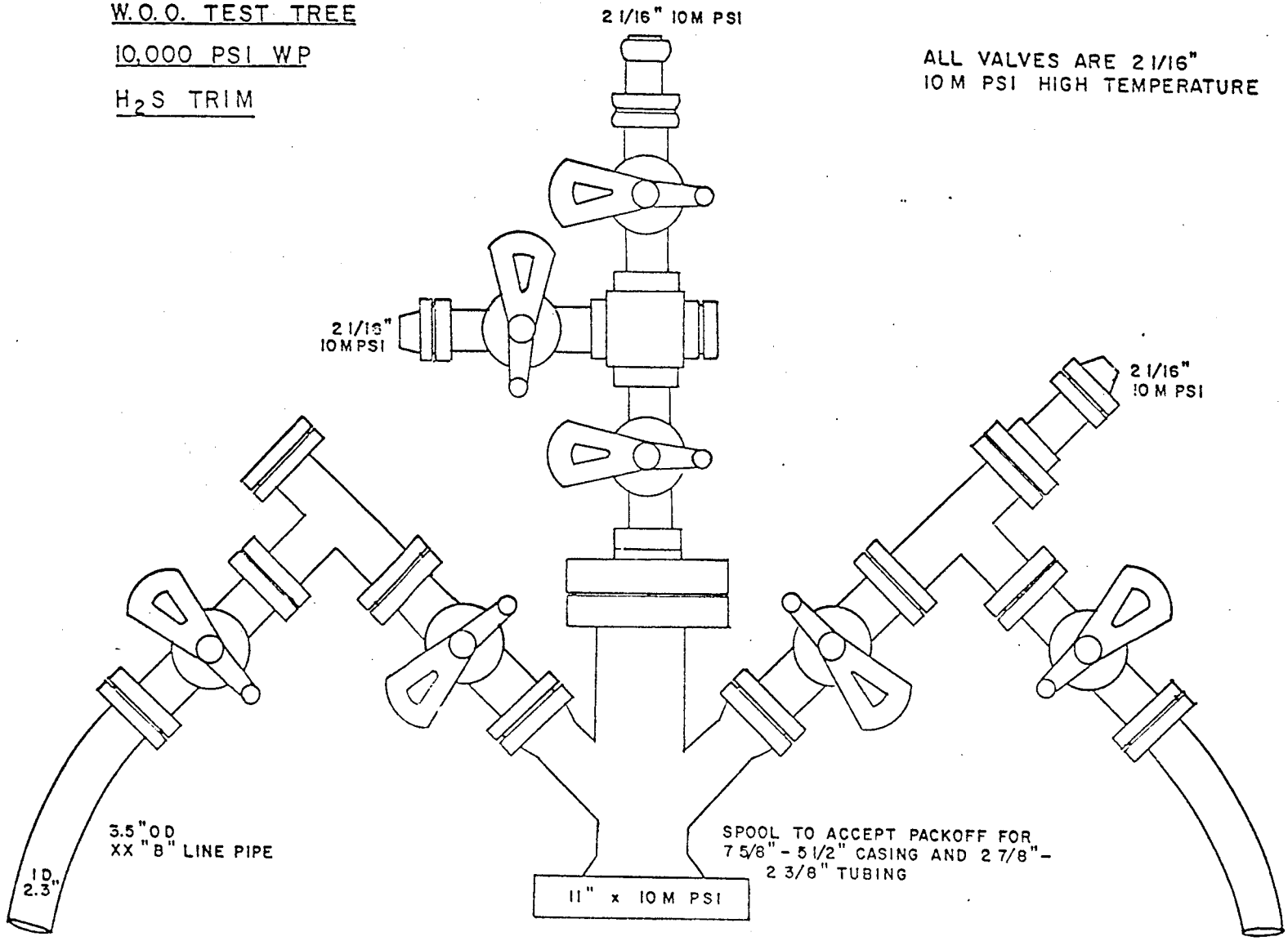

EATON OPERATING COMPANY, INC.
FIGURE 5

TABLE II

ESTIMATED COST

TO WORKOVER AND PLUG

IMC CLOVIS A. KENNEDY WELL #1

1.	Landowners Fee	$ 35,000
2.	Location Expense & Clean Up	25,200
3.	Rig (30 Days + Moving Costs)	170,000
4.	Mud - Chemicals	33,500
5.	Cementing	17,000
6.	Electric Logging & Perforating	60,000
7.	Contract Services & Fishing	55,000
8.	Tool & Equipment Rental	46,300
9.	Professional Services	40,000
10.	Other Workover Costs (Bits, welding, trucking, fuel, packer, nipples, wellhead modification, communication, acid, nitrogen)	50,000
11.	Well Control Insurance	30,000
12.	Unanticipated Workover Costs (10% of Above)	56,000
13.	Overhead and G & A	30,000
	Total	$648,000

WORKOVER PROCEDURE FOR DISPOSAL WELL

PRESENT MECHANICAL CONDITION

Figure 6, illustrates the actual mechanical condition of the disposal well. The operator was disposing approximately 1,300 barrels of water per day through 20' of perforations prior to termination of the disposal operation. Our plan is to open additional perforations and run larger tubing in the well to accommodate high disposal rates.

WORKOVER OPERATION

1. Move in workover rig and fill tubing and casing with 9.5 ppg salt water.
2. Nipple down X-mas tree and nipple up blow out preventors.
3. Pull tubing and packer out of hole.
4. Go in hole with bit and circulate out any sand or debris from bottom. Pull out of hole.
5. Run casing perforating gun in the hole and perforate 2760-2830'.
6. Run packer and 3-1/2" tubing in hole and set packer at about 2700'.
7. Hook up pump and check for disposal capacity of 10,000 BWPD (292 GPM). If disposal capacity is satisfactory, hang tubing and nipple down BOPS.
8. Install X-mas tree and move rig off.
9. Proceed with well testing.

PLUG & ABANDONMENT OPERATION

1. Move in rig and fill tubing with 9.5 ppg salt water.
2. Nipple down X-mas tree and nipple up BOPS.
3. Pull tubing and packer out of hole and go in hole with cement retainer. Set retainer at 2500'± and pump 200 sacks of cement below retainer and spot 25 sacks of cement above retainer.
4. Spot 30 sacks of cement from 200' below ground level to surface.
5. Cut 5-1/2" casing and weld metal plate on top.
6. Move out rig and clean up location.

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DISPOSAL WELL
IMC, NO. I CLOVIS A. KENNEDY

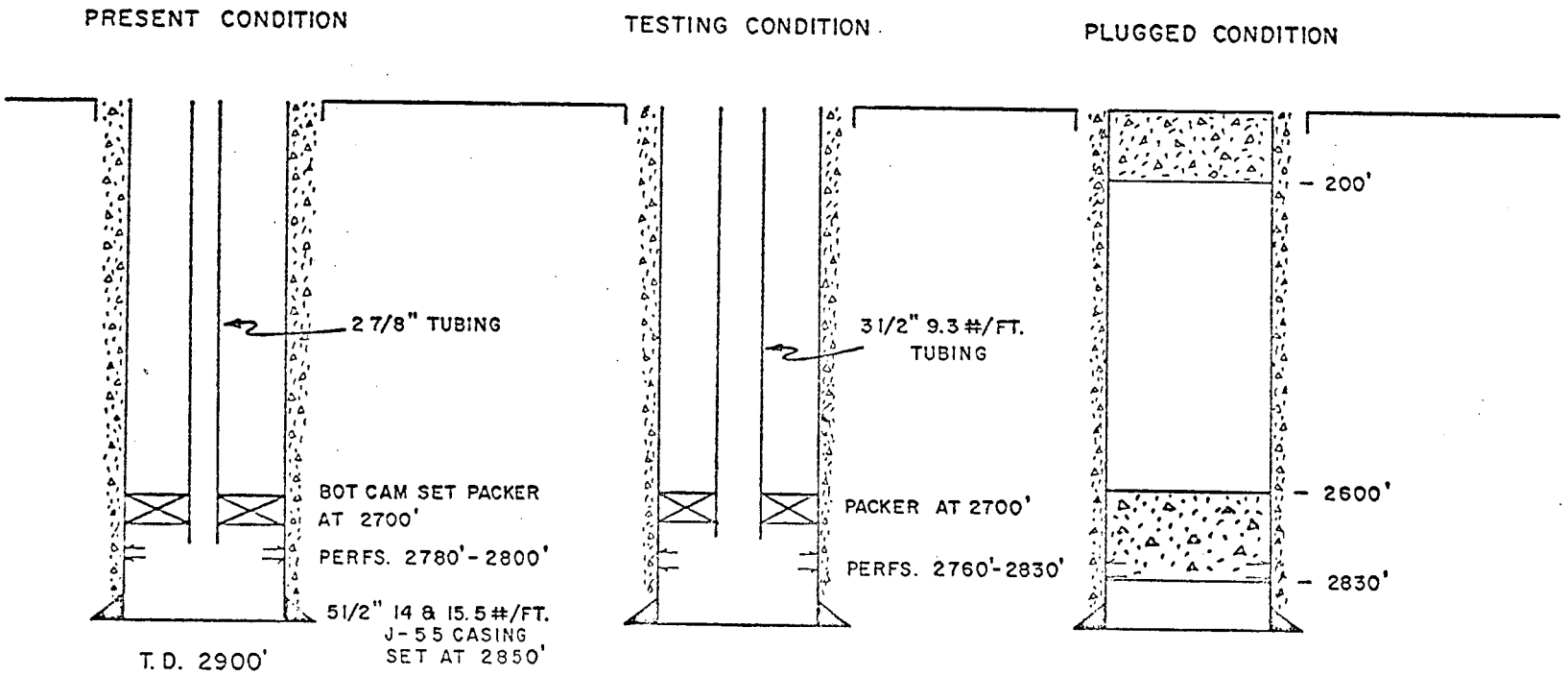

FIGURE 6

Eaton Industries of Houston, Inc.
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TABLE III

ESTIMATED COST TO WORKOVER

AND PLUG DISPOSAL WELL

IMC CLOVIS A. KENNEDY WELL #1

1.	Location Expense & Clean Up	$ 1,500
2.	Rig (4 Days @ 5,000/Day)	20,000
3.	Cementing	4,900
4.	Perforating	10,000
5.	Contract Services	3,000
6.	Tool & Equipment Rental	6,000
7.	Professional Services	2,000
8.	Other Workover Costs	3,000
9.	Unanticipated Workover Costs (10% of Above)	3,000
10.	Overhead and G & A	1,600
	Total	$ 55,000

WELL TEST PROCEDURE

IMC CLOVIS A. KENNEDY WELL NO. 1

Surface test equipment will be installed as shown on Figure 7. Both the tubing and casing will be full of salt water.

TEST OPERATION

1. When well is ready to flow, run Hewlett Packard pressure gauge and temperature gauge to bottom of tubing at 15,850'. Obtain pressure and temperature gradient data every 1000' while going in hole. After reaching bottom, wait for pressure and temperature to stabilize. Make sure surface pressure and surface temperature recorders are working.

2. Flow well at 2400 BPD rate for 48 hours. Separator will be bypassed until at least one annular volume (250 BBLS) has flowed out of the well and sand production has stopped.

3. Shut well in for 96 hours or until build up of reservoir pressure is complete.

4. Pull Hewlett Packard pressure gauge out of hole and run bottom hole fluid sampler.

5. Produce 1 to 5 barrels of fluid and take sample of "fresh" fluid at bottom. Pull out of hole with sampler and run Hewlett Packard gauge back in well.

6. Open well up slowly to a rate of 5,000 BFPD over a 2 minute period. Bypass sand production to pit again as necessary. Flow well for 48 hours.

7. Increase flow rate to 10,000 BFPD for 24 hours.

8. Open well up to maximum flow rate for 12 hours. The maximum flow rate for this well is expected to be 12,500 BFPD.

9. Shut well in for reservoir pressure build up analysis. The build up period may take about 8 days and during this time the surface production equipment will be disconnected and removed from the location.

10. A second bottom hole fluid sample will be taken at the end of the build up period.

The entire testing operation is expected to last approximately 21 days.

The procedures above may be altered as necessary to obtain the desired data.

Data collection points are indicated on Figure 7 by circled letters and are listed below.

DATA POINT	DESCRIPTION
A.	Bottom Hole Pressure and Temperature and Fluid Sample
B.	Surface Pressure Recorder and Dead Weight Tester
C.	Fluid Flow Meter
D.	Fluid Flowing Temperature
E.	Primary Fluid Sampling Line
F.	Separator Pressure
G.	Separator Temperature
H.	Gas Meter
I.	Gas Sample Point
J.	Separator Water Sample Point
K.	Fluid Flow Meters
L.	Disposal Well Surface Pressure
M.	Disposal Well Bottom Hole Pressure

FLUID SAMPLING PROCEDURE

1. When the test schedule is known, advance phone calls will be made to the following organizations to alert them should they desire to take their own samples.

   - McNeese State University
   - USGS - Menlo Park & Bay St. Louis
   - University of Texas
   - L.S.U.

   All third party sampling must be approved and supervised by the Eaton Engineer in charge to insure proper safety and operational procedures. IGT will maintain records and follow up on comparison of results.

2. When the well has flowed at 2400 BPD for several hours after bottoms up (step 2 of operating procedure), begin taking brine and gas samples. Analyze for time sensitive chemistry in the IGT field laboratory on location. Less critical analyses will be performed on samples sent back to the IGT - Chicago laboratory. Samples for radioactivity analysis will be provided to the USGS. High pressure samples will be flashed to atmoshperic pressure at location for gas/water ratio determination and two samples each of brine and gas will be taken at separator pressure for laboratory analysis.

3. During the 96 hour build up, surface lines will be examined for scale formation and examples of any scale found will be shipped to IGT for analysis.

4. Take two bottom hole samples at end of build up period. A few barrels of brine will be flowed so that the samples are fresh reservoir brine. Ship to IGT - Chicago for analysis.

5. During the stepwise increases in flow rate, sample collection and analysis at each rate will be as follows:

   a. At least twice daily, collect wellhead pressure samples and flash to determine gas/H_2O ratio until it is clear that consistent and more accurate data is being obtained from the separator.

   b. Perform daily on site analyses of samples from the separator consistent with the McNeese State University recommended procedures.

c. Daily, collect samples from the separator gas and liquid output for subsequent lab analysis consistent with the McNeese State University recommended procedures.

d. If IGT's field gas chromatograph and CO_2 instrumentation are operational, perform field gas analysis of samples collected at several different separator operating pressures. Consistency of gas composition from the well will be checked by daily performance of the same analyses on gas obtained by flashing wellhead pressure samples.

6. During the last day of flow through the separator, additional separator pressure gas and liquid samples will be collected and retained up to one year for future analyses to resolve unanticipated issues. A few gallons of raw and acidified brine will also be stored at atmospheric pressure.

7. During disassembly of the testing equipment, it will be examined for any evidence of scale or corrosion. Observations will be documented and samples of any scale found will be shippped to IGT for analysis.

8. Take two final bottom hole samples at end of final build up to moving off location. Flow a few barrels first to insure that sample is fresh reservoir fluid.

DATA ACQUISITION SYSTEM

IGT is now constructing the mobile trailer for use on the Wells of Opportunity program. The front part of the trailer will be the mobile chemical laboratory, the center will be the work area and storage area and the last part will be the electonic data gathering area.

The data acquisitions system inside the trailer will consist of six channels of strip chart recorders, a multichannel digital data logger, tape drive and small computer. The digital components will interface with each other via an IEEE-488 bus. Analog signals from the surface pressure and temperature transducers will all be recorded on digital tape and up to 6 of the pressures and temperatures will be simultaneously displayed on the strip chart recorder. If the digital data system from the service company that provides the bottom hole pressure gauges is compatible with the IEEE-488 interface bus then the digital bottom hole pressures will also be recorded on the IGT digital data tapes.

The mini computer will be used to edit and interpret the digital data and to sometimes control the data logger. It can also be used to transmit data via telephone to host computers or networks if a telephone is available. Some analysis of the data may be performed on location. The data tapes will be further reduced and the results reported after anlysis by the IGT computer in Chicago.

TABLE IV

ESTIMATED COST TO TEST WELL

IMC CLOVIS A. KENNEDY WELL #1

1.	Test Equipment Service Rental	$ 60,000
2.	Flow Loops & Manifolding	15,000
3.	Wire Line Unit With Mast & Lubricator	105,000
4.	Lighting & Power	15,000
5.	Contract Labor	25,000
6.	Corrosion Inhibitor Service	10,000
7.	Supervision	20,000
8.	Contract Sampling & Analysis (IGT)	80,000
9.	Other testing Costs	30,000
10.	Unanticipated Testing Costs (10% of Above)	36,000
11.	Overhead and G & A	11,000
	Total	$ 407,000

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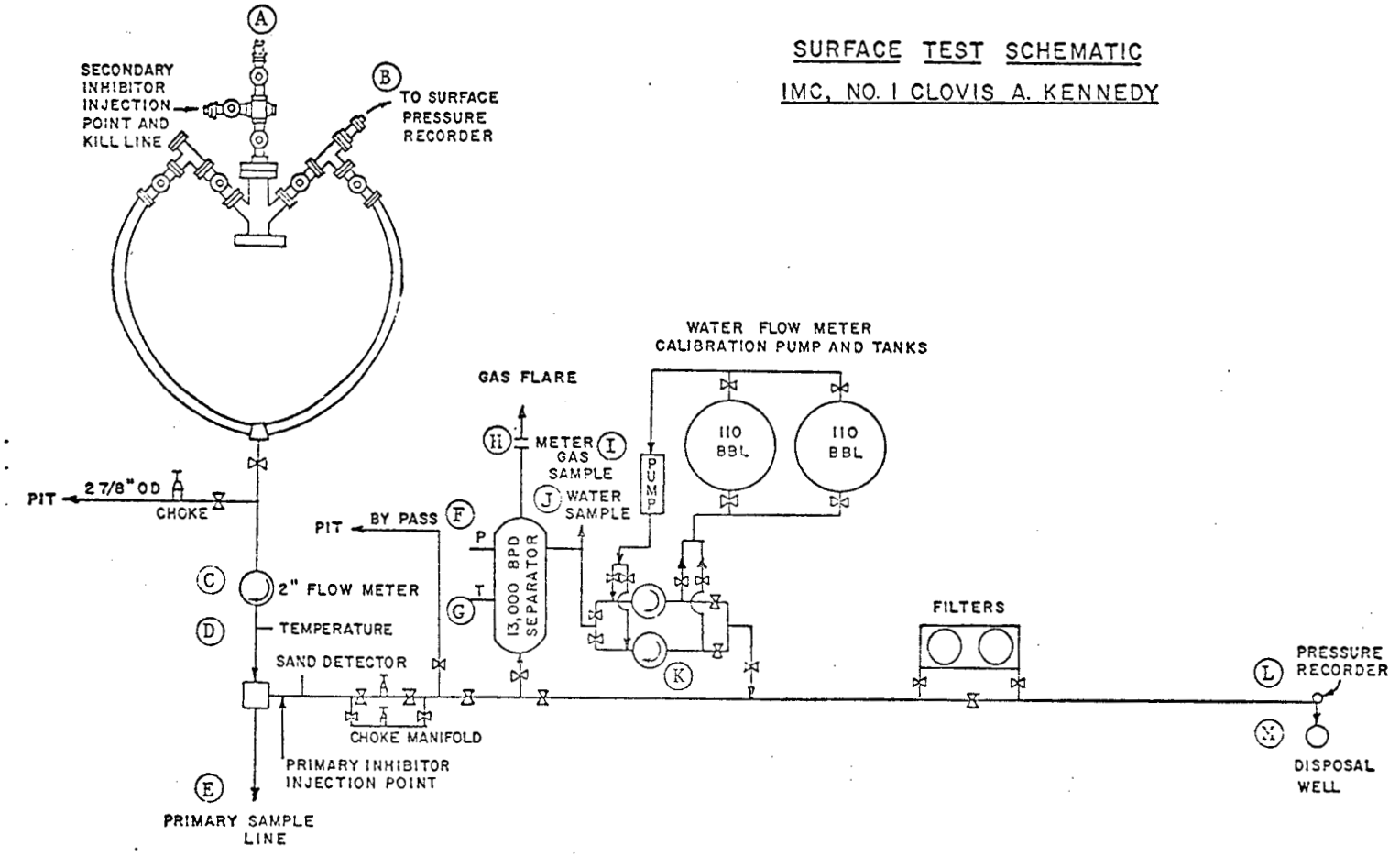

EATON OPERATING COMPANY, INC.

FIGURE 7

COST ANALYSIS

ESTIMATED COST VS. RECORDED COST

Well Name IMC Clovis A. Kennedy Well No. 1

Field or Prospect Perry Point Field

CAPITAL BUDGET CATEGORY	LEDGER DETAIL CODE NO.	ORIGINAL AFE ESTIMATE	RECORDED COST
Location		26,700	
Drilling Contractor Charge		0	
Drilling Bits		2,000	
Drilling Mud & Chemicals		0	
Power, Fuel & Water		23,000	
Equipment Rentals		52,300	
Specialized Drilled Service		112,500	
Transportation - Personnel		3,000	
Transportation, Equip. & Sup.		10,000	
Casing - Drilling		0	
Unanticipated Major Drilling Expense		95,000	
Casing - Completion		0	
Company Labor & Supervision		62,000	
Production Equipment		40,300	
Completion Fluids		43,500	
Completion Cost		454,900	
Production Facilities		100,000	
Miscellaneous		197,300	
TOTALS		$ 1,222,500	$

A.F.E. No. _____

Date 4-3-80

DRILLING WELL COST ESTIMATE - SUPPORTING DATA

Sheet One of 5

WELL NAME & NO. IMC Clovis A. Kennedy #1 FIELD Perry Point

DEVELOPMENT TO _____ EXPLORATORY TO _____ PREPARED BY RZK

	NATURE OF EXPENDITURE	ESTIMATED COST	SUPPLEMENT NUMBER____	REVISED TOTAL	WELL COST SUB TOTAL
DRILLING COST	LOCATION - TANGIBLE:				
	(a) Lumber: Road & Turnaround ☐ Keyway ☐				
	Cellar ☐ Bridge ☐ Heliport ☐				
	Pipe Racks ☐ Cattle Guard ☐				
	(b) Shell ☐ Gravel ☐: Road & Turnaround				
	Location Site				
	(c) Steel: Pipe Racks ☐ Cattle Guard ☐ Bridge ☐				
	TOTAL TANGIBLE. Capital Budg. Cat. Exp. 32	$	$	$	
	Capital Budg. Cat. Dev. 52	$	$	$	
	INTANGIBLE				
	(a) Surveying $_____ Soil Samples $_____				
	(b) Surface Damage Claims ☐ Cleanup ☐				
	(c) Clearing & Dredging				
	(d) Building Road & Turnaround ☐ Bridge ☐				
	Cattle Guard ☐ Cellar ☐ Pipe Racks ☐				
	(e) Mud Pits, Water Pit, & Reserve Pit				
	(f) Driving Piling and Framing Keyway				
	(g) Construct Airstrip ☐ Heliport ☐				
	(h) Shelling ☐ Sandbagging ☐ Graveling ☐ (Labor)				
	(i) Transportation - Air, Land, Marine				
	(j) Other				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 32	$	$	$	
	Cap. Budg. Cat. Dev. 52	$	$	$	
	TOTAL LOCATION	$ 26,700	$	$	$
	DRILLING CONTRACTORS CHARGES - INTANGIBLE				
	(a) Lump Sum Move In, R.U., R.D., & Move Out				
	(b) Move In_____ days @ $_____				
	(c) Footage Contract_____ ft. @ $_____				
	(d) Daywork Contract_____ days @ $_____				
	_____ days @ $_____				
	(e) Drilling Tools and Equipment Furnished by Contractor as Additional Cost to Union				
	(f) Third Party Labor & Catering Services				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 33	$	$	$	$
	Cap. Budg. Cat. Dev. 53	$	$	$	$
DRLG. & COMP	DRILLING BITS. INTANGIBLE				
	(a) Diamond Bits				
	(b) Conventional Bits. Drlg. $_____ Comp. $_____				
	TOTAL INTANGIBLE- Cap. Budg. Cat. Exp. 34	$	$	$	$
	Cap. Budg. Cat. Dev. 54	$ 2,000	$	$	$

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A.F.E. No. _____

DRILLING WELL COST ESTIMATE - SUPPORTING DATA

Sheet Two of 5

	NATURE OF EXPENDITURE	ESTIMATED COST	SUPPLEMENT NUMBER ___	REVISED TOTAL	WELL COST SUB TOTAL
DRILLING COST	DRILLING MUD & CHEMICALS - INTANGIBLE				
	(a) Drilling Mud & Chemicals (bulk, sack, liquid)				
	(b) Crude Oil, Diesel Oil or Asphalt				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 35	$	$	$	$
	Cap. Budg. Cat. Dev. 55	$ 0	$	$	$
DRLG. & COMP.	POWER, FUEL & WATER - INTANGIBLE				
	(a) Power ☐ Water ☐ Fuel ☐				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 36				$
	Cap. Budg. Cat. Dev. 56	23,000			$
DRILLING COST	EQUIPMENT RENTALS - INTANGIBLE				
	(a) Blowout Preventers & Manifold (Drilling Only)				
	(b) Drill Pipe & Collars ☐ Subs ☐ Kelly ☐				
	(c) Stabilizers ☐ Drilling Jars ☐ Underreamer ☐				
	(d) Automatic Driller ☐ Kelly Spinner ☐				
	(e) Degasser ☐ Desilter ☐ Centrifuge ☐				
	(f) Automatic Mud Monitoring Equipment				
	(g) Personnel Safety Equipment				
	(h) Other				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 37	$	$	$	$
	Cap. Budg. Cat. Dev. 57	$ 52,300	$	$	$
	SPECIALIZED DRILLING SERVICES - INTANGIBLE				
	(a) Labor & Equipment to Drive Conductor Pipe				
	(b) Casing Crews & Equipment to Run Casing Strings and Drilling Liners				
	(c) Casing Testing & Inspection Service				
	(d) Electrical Surveys Including Sidewall Samples				
	(e) Cement & Cementing Services				
	(f) Directional Surveys				
	(g) Conventional Coring Tools & Services				
	(h) Directional Drilling Tools & Operator				
	(i) Drilling Engineering Consultant				
	(j) Mud Engineer ☐ Mud Logging Service ☐				
	(k) Air Compressor Charges for Air Drilling				
	(l) Formation Testing: D.S.T. ☐ Wireline Test ☐				
	(m) Perforating for Above Testing				
	(n) Abandonment Cost - Rental Tools & Services				
	(o) Misc. Contract Labor & Welding Services				
	(p) Other EOC	112,500			
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 38	$	$	$	$
	Cap. Budg. Cat. Dev. 58	$ 112,500	$	$	$

A.F.E. No. _____

DRILLING WELL COST ESTIMATE - SUPPORTING DATA

Sheet three of 5

	NATURE OF EXPENDITURE	ESTIMATED COST	SUPPLEMENT NUMBER ___	REVISED TOTAL	WELL COST SUB TOTAL
DRILLING & COMPLETION	TRANSPORTATION - PERSONNEL - INTANGIBLE				
	(a) Airplanes - Drilling $_____ Completion $_____				
	(b) Helicopters - Drilling $_____ Completion $_____				
	(c) Crew Boats - Drilling $_____ Completion $_____				
	(d) Automobiles - Drilling $_____ Completion $_____				
	(e) Standby Boat - Drilling $_____ Completion $_____				
	TOTAL INTANGIBLE. (Drilling) Cap. Budg. Cat. Exp. 39	$	$	$	$
	(Drilling) Cap. Budg. Cat. Dev. 59	$	$	$	$
	(Completion) Cap. Budg. Cat. Exp. 39	$	$	$	$
	(Completion) Cap. Budg. Cat. Dev. 59	$ 3,000	$	$	$
	TRANSPORTATION - MATERIAL, EQUIPMENT & SUPPLIES - INTANGIBLE.				
	(a) Airplanes - Drilling $_____ Completion $_____				
	(b) Helicopters - Drilling$_____ Completion $_____				
	(c) Trucking - Drilling $_____ Completion $_____				
	(d) Cargo Vessels - Drilling $_____ Completion $_____				
	(e) Tugs - Drilling $_____ Completion $_____				
	(f) Barges - Drilling $_____ Completion $_____				
	(g) Other Marine Equip. Drilling $_____ Completion $_____				
	TOTAL INTANGIBLE. (Drilling) Cap. Budg. Cat. Exp. 40	$	$	$	$
	(Drilling) Cap. Budg. Cat. Dev. 60	$	$	$	$
	(Completion) Cap. Budg. Cat. Exp. 40	$	$	$	$
	(Completion) Cap. Budg. Cat. Dev. 60	$10,000	$	$	$
DRILLING COST	CASING - DRILLING - TANGIBLE				
	(a) ___" Drive Pipe _____ ft. @ $ _____				
	(b) ___" Conductor _____ ft. @ $ _____				
	(c) ___" Surface _____ ft. @ $ _____				
	(d) ___" Protection _____ ft. @ $ _____				
	(e) ___" Liner _____ ft. @ $ _____				
	(f) Liner Hanging Equipment				
	(g) Casing Heads and Hangers				
	(h) Floating Equip., Scratchers & Centrolizers				
	(i) Drilling Spools				
	(j) Other				
	TOTAL TANGIBLE. Cap. Budg. Cat. Exp. 41	$	$	$	$
	Cap. Budg. Cat. Dev. 61	$ 0	$	$	$
DRLG. & COMP.	UNANTICIPATED MAJOR DRILLING EXPENSE - INTANGIBLE				
	(a) Contract Daywork _____ days @ $_____				
	(b) Tools Lost in Hole				
	(c) Circulating Fluids & Lost Circulation Material				
	(d) Fishing Tools, Equipment, Services & Expenses				
	(e) Transportation. - Land,,Marine & Air				
	(f) Outside Engineering or Consulting Expense				
	(g) Directional Drilling Tools, Equipment & Services				
	(h) Cementing Services & Cement				
	(i) Pumping Services				
	(j) Other				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 46		$	$	$
	Cap. Budg. Cat. Dev. 66	95,000	$	$	$

A.F.E. No. _____

DRILLING WELL COST ESTIMATE - SUPPORTING DATA

Sheet four of 5

	NATURE OF EXPENDITURE	ESTIMATED COST	SUPPLEMENT NUMBER ___	REVISED TOTAL	WELL COST SUB TOTAL
COMPLETION COST	CASING - COMPLETION - TANGIBLE				
	(a) ___" Production ___ ft. @ $ ___				
	(b) ___" Liner ___ ft. @ $ ___				
	(c) ___" Tie Back ___ ft. @ $ ___				
	(d) Liner Hanging Equipment				
	(e) Floating Equipment, Centralizers & Scratchers				
	(f) Casing Heads and Hangers				
	(g) Other				
	TOTAL TANGIBLE. Cap. Budg. Cat. Exp. 42	$	$	$	$
	Cap. Budg. Cat. Dev. 62	$ 0	$	$	$
COMP. & DRLG	COMPANY LABOR AND SUPERVISION - INTANGIBLE				
	(a) Labor - Drilling $___ Completion $___				
	(b) Supervision - Drilling $___ Completion $___				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 31	$	$	$	$
	Cap. Budg. Cat. Dev. 51	$62,000	$	$	$
COMPLETION COST	PRODUCTION EQUIPMENT - TANGIBLE				
	(a) ___" Tubing ___ ft. @ $ ___	21,300			
	___" Tubing ___ ft. @ $ ___				
	___" Tubing ___ ft. @ $ ___				
	(b) ___" Kill String ___ ft. @ $ ___				
	(c) Xmas Tree - Tbg. Head & Upper Section	15,000			
	(d) Pumping Unit, Rods & Pump				
	(e) Packers, Retainers, Blast Joints	3,000			
	(f) Landing Nipples & Storm Chokes	1,000			
	(g) Gas Lift Mandrels & Valves				
	(h) Other				
	TOTAL TANGIBLE. Cap. Budg. Cat. Exp. 45	$	$	$	$
	Cap. Budg. Cat. Dev. 65	$40,300	$	$	$
	COMPLETION FLUIDS - INTANGIBLE				
	(a) Completion Fluids & Chemicals				
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 43				$
	Cap. Budg. Cat. Dev. 63	43,500			$
	COMPLETION COST - INTANGIBLE				
	(a) Contract Daywork 35 days @ $ ___	190,000			
	(b) Rental Completion Tools:				
	Blowout Preventers & Manifolds				
	Drill Pipe, Collars, Kelly & Subs				
	Power Tubing Tongs ☐ Scrapers ☐				
	Retrievable Cementers & Bridge Plugs				
	Rental Well Testing Equipment				
	Drill Stem Testing Equipment IGT	80,000			
	(c) Casing Crews & Equipment				
	(d) Cement & Cementing Services (Casing)				
	(e) Electric Logging (Inside Casing)	30,000			
	(f) Perforating	40,000			
	(g) Squeeze Cementing Services & Cement	21,900			
	(h) Acidizing, Fracturing & Swabbing	25,000			
	(i) Gravel Packing				
	(j) Tubular Goods Testing & Inspection	15,000			
	(k) Extra Contract Labor & Welding Services				
	(l) Other	53,000			
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 44	$	$	$	$
	Cap. Budg. Cat. Dev. 64	$454,900	$	$	$

A.F.E. No. _____

DRILLING WELL COST ESTIMATE - SUPPORTING DATA

Sheet five of 5

	NATURE OF EXPENDITURE	ESTIMATED COST	SUPPLEMENT NUMBER ____	REVISED TOTAL	WELL COST SUB TOTAL
COMP. COST	PRODUCTION FACILITIES - TANGIBLE				
	(a) Surface Production Equipment & Material	15,000			
	(b) Construction Costs - Labor, Tools, Etc.	25,000			
	(c) Equipment Rentals - Marine & Construction	60,000			
	TOTAL TANGIBLE. Cap. Budg. Cat. Exp. 47	$	$	$	$
	Cap. Budg. Cat. Dev. 67	$ 100,000	$	$	$
DRILLING COST	MISCELLANEOUS - INTANGIBLE				
	(a) Drilling Permits	35,000			
	(b) Insurance Premiums	30,000			
	(c) "Other" Services & Supplies	132,300			
	TOTAL INTANGIBLE. Cap. Budg. Cat. Exp. 48	$	$	$	$
	Cap. Budg. Cat. Dev. 68	$ 197,300	$	$	$
		DRILLING	COMPLETION	TANGIBLE	INTANGIBLE
	TOTAL EXPLORATORY DRILLING AFE $_____	$	$	$	$
	TOTAL DEVELOPMENT DRILLING AFE $_____	$	$	$	$
		1,222,500			

SITE-SPECIFIC ENVIRONMENTAL INFORMATION CHECKLIST

GEOPRESSURED-GEOTHERMAL WELL TEST PROGRAM

WELL IMC EXPLORATION CLOVIS A KENNEDY #1

LOCATION Vermilion Parish, Louisiana

A. GENERAL

1. Is the proposed site located in the area covered by the "Gulf Coast Programmatic Environmental Assessment, Geothermal Well Testing, the Frio Formation of Texas and Louisiana, "October 1977? Yes X No _____ If no, explain.

2. Has a Federal, state and/or local environmental assessment been conducted previously for the proposed test well or other wells in the area? Yes _____ No X If yes, provide a copy, if available.

3. Have all required permits, licenses, and/or agreements for proposed project been obtained? Yes _____ No X If no, explain.
Cannot apply until Agreement with landowner finalized.

4. Does the project site fall within the habitat of rare or endangered species? Yes _____ No X If yes, explain.

5. Are known archeological sites, historic sites, or natural landmarks within or visible from the site area? Yes _____ No X
If yes, explain.

6. Will expected continuous noise levels from site operations be 65 dBA or less at the nearest residence?
Yes X No _____ If no, explain.

B. SITE CONSTRUCTION

1. Will additional land clearing be required for the test well (e.g., drill pad, road construction, mud reserve pits, pipeline)?

Yes_____ No__X__ If yes, describe.

2. Will additional land clearing be required for the disposal well (e.g., drill pad, reserve pits, utilities, road construction, pipeline)?

Yes_____ No__X__ If yes, describe.

3. Will the site and related roads be treated to minimize dust?

Yes_____ No__X__ If no, explain.

Use Boards - Marshland

4. Are portable sanitary facilities or an approved septic system to be used at the site? Yes__X__ No_____ If no, explain.

5. Will liquid and solid wastes be disposed in accordance with local regulations? Yes__X__ No_____ If no, explain.

6. Will erosion control be required for excavated areas?

Yes_____ No__X__ If yes, explain.

7. Will dredge spoil be deposited in swamp forest or marshland?

Yes_____ No__X__ If yes, explain.

8. Upon completion of proposed test program, will the site be restored to as natural a condition as possible by regrading, filling, and reseeding? Yes X No_____ If no, explain.

C. WELL TESTING AND SAFETY

1. Is fluid production from the well during testing expected to be 2 weeks or less in duration per formation? Yes X No_____ If no, explain.

2. Is the total dissolved solids of the produced geopressure fluid expected to be 90,000 mg/l or less? Yes X No_____ If no, explain.

3. Is the volume of geopressure fluid to be produced and injected expected to be 300,000 barrels or less? Yes X No_____ If no, explain.

4 Is the temperature of produced geopressured fluid expected to be 260° C or less? Yes X No_____ If no, explain.

5. Will the gas content of the produced fluid be flared? Yes X No_____ If no, explain.

6. Will blowout preventers rated to at least 10,000 psi be used? Yes X No_____ If no, explain.

7. Will production tubing rated to at least 20,000 psi, be used?

   Yes_____ No__X___ If no, explain.

8. Can safety valves be operated from remote locations?

   Yes__X___ No_____ If no, explain.

9. Will the test tree be rated to at least 10,000 psi?

   Yes__X___ No_____ If no, explain.

10. Will a test well directional survey be conducted? Yes_____

    No__X___ If yes, at what interval?_____, If no, explain.

11. Will a lined pond be used to hold all liquid effluents and production fluids that are not injected? Yes__X___ No_____

    If no, explain.

12. Has an injection permit been obtained? Yes_____ No__X___

    If no, explain. Cannot apply until Agreement with landowner finalized.

13. Will H_2S monitors be located on site? Yes_____ No_____

    If no, explain.

14. Will fire extinguishers be located on site? Yes__X___ No_____

    If no, explain. No history of H_2S in area.

15. Do contingency plans exist for evacuating personnel should a blowout occur or high levels of H_2S be detected? Yes__X___

    No_____ If no, explain.

16. Will high-pressure engineering and mud logging personnel be on site during production will drilling operations? Yes X

No_____ If no, explain.