GL01512

GEOTHERMAL POWER CORP.
WELL NO. 15
SEC. 18, T27S, R9W
BEAVER COUNTY, UTAH

Prepared by:

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.
860 Anaconda Tower - 555 Seventeenth Street
Denver, Colorado 80202

September 5, 1978

Helton Engineering & Geological Services, Inc.

WELL DATA SUMMARY

WELL NAME:	Geothermal Power Corporation #15
LOCATION:	Sec. 18, T27S, R9W, Beaver County, Utah
OPERATOR:	Geothermal Power Corporation
ELEVATION:	5544.5 ft. KB; 5539 ft. GL
TOTAL DEPTH:	1890 ft.
STATUS:	Completed as geothermal observation well
SPUD DATE:	Not Known
RIG RELEASED:	11:00 AM 7/20/78
HOLE SIZE:	6-1/2" to 1890 ft.
OBSERVATION CASING:	Ran 90 joints of 1-1/2" Black Pipe (Total of 1890 ft.). Landed at 1890 ft. KB, cemented with 10 sacks construction cement.
LOGS:	Induction, Density, Sonic, Bottom Hole Temperature.
DRILLING CONTRACTOR:	Darrah Drilling Corporation
DRILLING FOREMAN:	C. R. McKay, Helton Engineering & Geological Services, Inc.
ADDITIONAL INFORMATION:	The Helton drilling foreman was called out after the well was spudded, so the first few daily drilling reports are not available.

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. _____ DATE 7/16/78

DEPTH 650 FEET MADE _____ HRS. ON BOTTOM _____

OPERATION W.O.P. Tripping

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping 1
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing 1/2
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

Took United Airlines to Salt Lake City. Arrived approximately 7:15 AM. Took Sky West to Cedar City. Arrived at 9:15 AM. Drove to Milford, Utah. On location approximately 12:00 PM. Rig down - mud pump to recycle mud to main tank out.

Located centrifugal pump - hauled out to location to use until parts arrive from California for pump. Installed same. Owner of rig had let personnel off.

Waited for crews to return.

6:30 AM - 8:00 AM Hooked up centrifugal pump and tripped in hole.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. _____ °F _____ Supervisor: _____

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 2 DATE 7/17/78

DEPTH 870 FEET MADE 210 HRS. ON BOTTOM 14

OPERATION Drilling

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
2	6-1/2	Hughes J33	650			14	None				Used
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED _____

DAILY MUD COST _____

	Hrs. Run	IN	OUT	
DESILTER	14			LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling 14
2. Tripping 2-1/2
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud
10. Repairing 4
11. Coring
12. Testing
13. Logging
14. Casing
15. WOC

OTHERS (SPECIFY)

16. 3-1/2 hrs. Cleaned pits
17. and mud tank went
18. thru mud pump (circ.
19. sand & granite) 12#
20. mud.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM	Tripped in hole. Stuck pipe at 180'. Pulled loose. Reamed same spot several times. No problems going to bottom.
10:30 - 8:30 PM	Drilled.
8:30 - 12:00PM	Dumped pits - mixed new mud. Circulated too much sand & granite. Drilled.
12:00 - 4:00AM	Centrifugal pump out. Trip to town - found another one. Tripped in hole w/8 stands.
4:00 - 8:00 AM	Drilled - worked on pump.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 100 °F Hot Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 3 DATE 7/18/78

DEPTH 890 FEET MADE 20 HRS. ON BOTTOM 2

OPERATION Drilling - WO parts.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 18 WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
2	6-1/2	J33	650	890	240	16	None	3	2	2	Used Bit
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 50 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling	2	6. Surveying		11. Coring		16.	
2. Tripping	2	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud		14. Casing		19.	
5. Slip & Cutline		10. Repairing		15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (*Time & Sequence of Operations to be inserted below*)

8:00 AM - 10:00 Drilling.

10:00 AM 2:00 Centrifugal pump motor went out. Shut rig down until rig equipment repaired. Tripped out - put pipe on bank - waited on parts.

2:00 PM - 8:00 AM Waited on parts.

Note: Formation change approximately 860' - some clay and fine sand.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 4 DATE 7/19/78

DEPTH 890 FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Shut down - tripping.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling		6. Surveying		11. Coring		16.	
2. Tripping	2	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud		14. Casing		19.	
5. Slip & Cutline		10. Repairing		15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 9:00 PM Waited on parts for pump. Should arrive on plane at 7:00 PM.

Crew off - start up in morning.

6:00 AM - 8:00 AM Laid down 4½" drill pipe - picked up 3½" drill pipe.

Well Costs	$
Daily	
Cumulative	

Flow line temperature 80°

WEATHER: TEMP. _____ °F Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 5 DATE 7/20/78

DEPTH 1090 FEET MADE 200 HRS. ON BOTTOM 10

OPERATION Shut down, waiting on repairs to water truck.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 28 WT ON BIT M LBS 20 ROTARY RPM 80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8IF DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890		200	10					
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 11/9 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	10			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

						OTHERS (SPECIFY)	
1. Drilling	10	6. Surveying		11. Coring		16.	
2. Tripping	4½	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud	2½	14. Casing		19.	
5. Slip & Cutline		10. Repairing	truck 7	15. WOC		20.	

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:30 PM	Tripped in hole - regained circulation - conditioned mud.
12:30 PM - 6:30 PM	Drilled.
6:30 PM - 9:00 PM	Cleaned tanks - put new head in 5 x 10 mud pump - mixed mud.
9:00 PM - 1:00 AM	Drilled. Unable to keep up with samples (too fine). Now catching 15 foot samples.
1:00 AM - 8:00 AM	Rear end of water truck torn out on bad roads. Shut rig down. No Water. Contractor to furnish same.

	Well Costs	$
	Daily	
	Cumulative	

Flowline temperature 85°

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 6 DATE 7/?1/78

DEPTH 1320 FEET MADE 230 HRS. ON BOTTOM 8

OPERATION Mixing Mud.

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 23 WT ON BIT M LBS 20 ROTARY RPM 80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8 DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890		450	18					
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD
WT 9 VIS 38 WL _____ GEL _____ FC _____
PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____
WATER _____ OIL _____ CL- _____ PPM
SOLIDS _____ SAND _____ CA++ _____ PPM
AV _____ NV _____ d-exp _____ Pore Press _____
MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	8			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl
OUTPUT _____ cfm Press. _____ psig
MAKE RATING

RIG TIME

1. Drilling	8	6. Surveying		11. Coring		16.	Water Truck Down 4 hrs.
2. Tripping	5	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud	1	14. Casing		19.	
5. Slip & Cutline		10. Repairing		15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:00 PM Down. No Water. Contractor to furnish water.
12:00 AM - 1:00 PM Conditioned mud with chemical and water.
1:00 PM - 9:00 PM Drilled
9:00 PM 12:00 AM Blew manifold gasket on compressor. Shut rig down. Pulled 4½" pipe to be replaced by 3½" pipe. Rig down at 12:00 AM. Transferred water to tanks.
12:00 AM - 6:00 AM Rig down.
6:00 AM - 8:00 AM Mixed mud.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 92°

WEATHER: TEMP. 105 °F Hot Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 7 DATE 7/22/78

DEPTH 1405 FEET MADE 85 HRS. ON BOTTOM 6-1/2

OPERATION Drilling - Repairing Air Compressor

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 26 WT ON BIT M LBS 20 ROTARY RPM 60/80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8 DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890	1405	515	24½				8	4	8	
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD

WT 9 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	6-1/2			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling	6-1/2	6. Surveying		11. Coring		16.	Shut Down 5 hrs.
2. Tripping	9	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud		14. Casing		19.	
5. Slip & Cutline		10. Repairing	3-1/2	15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 11:00 AM Picked up 3-1/2" IF Drill Pipe. Put 500' in hole to replace 4-1/2" pipe.

11:00 AM 2:30 PM Repaired air compressor.

2:30 PM 9:00 PM Drilled

9:00 PM 3:00 AM Made 1/2 trip. Laid down 20 joints - balance in derrick - Shut down for night.

3:00 AM 8:00 AM Rig down.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 96°

WEATHER: TEMP. 105 °F Hot Supervisor: Supervisor

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 8 DATE 7/23/78

DEPTH 1405 FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Rig shut down.

SURVEYS								

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ____

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. 24 hrs. down time.
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM to 8:00 AM — Rig down (on bank). Since arrival have had driller, two rough necks, pusher to relieve driller. (Rest badly needed).

1/2 hr. crew unloaded 1-1/2" casing.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 100°

WEATHER: TEMP. _____ °F _____ Supervisor: _____

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 9 DATE 7/24/78

DEPTH 1690 FEET MADE 285 HRS. ON BOTTOM 13-1/2

OPERATION Drilling

SURVEYS								

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 29 WT ON BIT M LBS 25 - 20 ROTARY RPM 80/60

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes J33	1405		285	13½	14 14 14				Used bit - re-run from this hole - had been used before that.
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9.3 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	13½			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling 13½
2. Tripping 4½
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud
10. Repairing 3½
11. Coring
12. Testing
13. Logging
14. Casing
15. WOC

OTHERS (SPECIFY)

16. 2½ down.
17.
18.
19.
20.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 10:30 AM Down.
10:30 AM - 3:00 PM Tripped in hole - mixed mud.
3:00 PM - 7:00 PM Drilled - 1480' Reamed.
7:00 PM - 10:30 PM Down - repaired air compressor clutch.
10:30 PM - 8:00 AM Drilled to 1680'.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 102° F

WEATHER: TEMP. _____ °F _____ Supervisor: _____

Form HE D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 10 DATE 7/25/78

DEPTH 1890 FEET MADE 200 HRS. ON BOTTOM 16

OPERATION Drilling - Waiting on Schlumberger

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4-½ THD 2-7/8"/3½ DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes	1405	1890	485	29½	10	10	10				Used bit -
		J33											Welded in jets
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	16			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling 16
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. 8 hrs. W.O. Schlumberger
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:00 PM Drilled 1690 - 1890'.

12:00 PM - 8:00 AM Waited on Schlumberger - Mixed mud, conditioned hole.

Schlumberger came out of Grand Junction.

Bit is dull - believed to be in granite.

Mud Logging Unit Released: 12:00 Midnight.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 11 DATE 7/26/78

DEPTH 1890' T.D. FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Laying down drill pipe - rigging up Schlumberger - running logs.

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ____

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes J33	1405	1890	485	29½	10	10	10	6	5	4	
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD							Hrs. Run	IN	OUT	
WT 9	VIS 60	WL	GEL	FC			DESILTER			LB/GAL
PH	APP VIS	PLAS VIS	YLD. PT.				DESANDER			LB/GAL
WATER	OIL	CL-	PPM				DEGASSER			LB/GAL
SOLIDS	SAND	CA++	PPM				COMPRESSOR DATA	MUD DUMPED		bbl
AV	NV	d-exp	Pore Press				OUTPUT	cfm Press.		psig
MUD ADDED							MAKE	RATING		
DAILY MUD COST										

RIG TIME

1. Drilling
2. Tripping 8
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud
10. Repairing
11. Coring
12. Testing
13. Logging 9-1/2
14. Casing
15. WOC

OTHERS (SPECIFY)

16.
17.
18.
19.
20.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 10:30 PM Broke out and laid down 4½ and 3½" drill pipe. Torqued up - heated each joint to break out.

10:30 PM - 8:00 AM Rigged up Schlumberger - Induction Log tool broken - ran logs.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 102° F.

WEATHER: TEMP. 104 °F Hot Supervisor: C. R. McKay

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power #15 DAY NO. 12 DATE 7/27/78

DEPTH 1890' T.D. FEET MADE 0 HRS. ON BOTTON 0

OPERATION Running 1-1/2" casing

SURVEYS								

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ____

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD								Hrs. Run	IN	OUT	
WT	9	VIS	60	WL		GEL	FC	DESILTER			LB/GAL
PH		APP VIS		PLAS VIS		YLD. PT.		DESANDER			LB/GAL
WATER		OIL		CL-			PPM	DEGASSER			LB/GAL
SOLIDS		SAND		CA++			PPM	COMPRESSOR DATA		MUD DUMPED	bbl
AV		NV		d-exp		Pore Press		OUTPUT		cfm Press.	psig
MUD ADDED								MAKE		RATING	
DAILY MUD COST											

RIG TIME

1. Drilling	6. Surveying	11. Coring	16.	OTHERS (SPECIFY)	
2. Tripping	7. Circulating	12. Testing	17.		
3. Service & BOPs	8. Clean to Btm	13. Logging	18.		
4. Reaming	9. Cond. Mud	14. Casing	19.		
5. Slip & Cutline	10. Repairing	15. WOC	20.		

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 3:00 PM Finished running logs. Ran Induction, Density, GR Caliper Sonic, Bottom Hole Temperature.

3:00 PM 12:00 AM Ran 1-1/2" pipe. 90 joints - 1890' KB. (regular black malleable pipe.). Cemented with 10 sacks cement, 18' depth - cut off conductor pipe.

Bottom Hole Temp.: #1 - 144°F
#2 - 146°F
#3 - 148°F

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 104 °F Hot Supervisor: C. R. McKay

Helton Engineering & Geological Services, Inc.

DRILLING TIME LOG

Formation	Start Drlg.	Depth	Finish Drlg.	Depth
Soft	12:40	895	12:50	910
Soft, medium	12:57	910	1:21	925
Soft	1:28	925	1:48	940
"	1:58	940	2:23	955
"	2:29	955	2:55	970
"	3:01	970	3:27	985
"	3:33	985	3:54	1000
"	4:06	1000	4:27	1015
"	4:36	1015	4:57	1030
"	5:06	1030	5:27	1045
"	5:12	1045	5:30	1060
Very fast, soft	5:40	1060	6:00	1075
	6:08	1075	6:30	1090
6:45 - made mud, cleaned mud pump, tightened brakes - 9:00	9:00	1090	9:20	1105
Soft, w/boulders	9:38	1105	10:00	1120
	10:15	1120	10:38	1135
	10:50	1135	11:25	1150
	11:35	1150	12:05	1165
	12:12	1165	12:50	1180
New Day - 7/20/78	1:25	1180	1:45	1195
	1:57	1195	2:20	1210
Soft clay & sands	2:27	1210	2:50	1225
Made mud, tight hole	2:58	1225	3:35	1240
	3:55	1240	4:30	1255
	4:38	1255	5:05	1270
	5:15	1270	6:15	1285
	6:31	1285	7:12	1300
Shut down for lube	7:30	1300	8:20	1315
	8:40	1315		
Worked on compressor				
New Day - 7/21/78	2:30	1315	3:00	1330
	3:20	1330	4:15	1345
	4:35	1345	5:20	1360
	5:35	1360	6:25	1375
Sands, boulders	6:30	1375	7:15	1390
	7:25	1390	8:28	1405
Tripped 9:00				

DRILLING TIME LOG
(Continued)

Formation	Temp.	Start Drlg.	Depth	Finish Drlg.	Depth
New Day 7/23/78	89 F.	3:00	1405	3:34	1420
	91	3:51	1420	4:15	1435
	92	4:20	1435	4:50	1450
	93	4:58	1450	5:25	1465
	96	5:31	1465	6:00	1480
	97	6:07	1480	6:40	1495
Air Comp. Trouble 7:00 - 11:00 down for lube.		6:46	1495	11:10	1510
New Day 7/24/78		11:35	1510	12:20	1525
	98	12:26	1525	1:05	1540
Few boulders and sand	98	1:10	1540	1:45	1555
Disc. staying the	99	1:55	1555	2:30	1570
same - 37 sec.	99	2:35	1570	3:05	1585
	100	3:13	1585	3:47	1600
Harder	100	3:55	1600	4:40	1615
	100	4:50	1615	5:25	1630
Change towers	100	5:35	1630	6:12	1645
	100	6:25	1645	7:00	1660
	98	7:11	1600	7:43	1675
Hard spots	96	7:50	1675	8:15	1690
Boulders about	98	8:25	1690	9:31	1705
5 ft. apart 2" thick	100	9:40	1705	10:07	1720
	100	10:45	1720	11:25	1735
	100	11:35	1735	12:10	1750
	95	12:20	1750	12:40	1765
	95	1:30	1765	1:55	1780
Changed rotary speed to save bit	95	2:05	1780	3:05	1795
	98	3:15	1795	4:00	1810
	100	4:10	1810	4:50	1825
	100	4:55	1825	5:45	1840
6:00-6:45 Lubed rig -	100	6:45	1840	7:57	1855
cleaned desanders	102	8:07	1855	11:08	1870
Chert & granite 1865-70					
		11:17	1870		1885
Out of water					
			1885		1900
Drillers			1900		1915

T.D. 1880 @ 2:00AM

12:00 discontinued drilling, bit worn out. Mixed mud - began conditioning hole. Waited for Well Loggers.

HEL ON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Powe Corp. #15 DAY NO. 13 DATE 7/28/78

DEPTH 1890 FEET MADE _____ HRS. ON BOTTOM _____

OPERATION _____

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ TH D _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED _____

DAILY MUD COST _____

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 11:00 AM Laid down balance of 3-1/2" drill pipe in derrick. Tore down to move out. Welded lock cap on 1-1/2" pipe.

RIG RELEASED: 11:00 AM.

Trip back to Denver.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 105 °F Hot Supervisor: C. R. McKay

OK- File #2
1

GRADIENT TEST WELL #15 T27S R9W SEC 18
LOGGED AUGUST 30TH & 31ST, 1978.

DEPTH (FT)	TEMP (°C)
10	23.45
20	21.90
30	20.30
40	19.55
50	18.75
60	18.65
70	18.60
80	18.65
90	19.20
100	19.75
110	20.15
120	20.65
130	21.15
140	21.70
150	22.25
160	22.85
170	23.35
180	23.75
190	24.25
200	24.65
210	25.10
220	25.45
230	25.85
240	26.30
250	26.75
260	27.35
270	27.85
280	28.25
290	28.65
300	29.15
310	29.65
320	30.05
330	30.45
340	30.90
350	31.40
360	31.85
370	32.30
380	32.70
390	33.20
400	33.65
410	34.20
420	34.70
430	35.05
440	35.50
450	36.00
460	36.40
470	36.75
480	37.15

GRADIENT TEST WELL #15 T27S R9W SEC18

DEPTH (FT)	TEMP (°C)
490	37.55
500	38.00
510	38.35
520	38.75
530	39.20
540	39.65
550	39.90
560	40.20
570	40.55
580	40.80
590	41.05
600	41.45
610	41.80
620	42.15
630	42.50
640	42.75
650	43.10
660	43.40
670	43.60
680	43.85
690	44.10
700	44.40
710	44.65
720	44.85

DEPTH (FT)	TEMP (°C)
730	45.20
740	45.40
750	45.65
760	45.85
770	46.20
780	46.45
790	46.70
800	47.00
810	47.40
820	47.70
830	48.00
840	48.30
850	48.70
860	49.00
870	49.30
880	49.70
890	50.10
900	50.40
910	50.70
920	51.00
930	51.35
940	51.65
950	51.85
960	52.20

GRADIENT TEST WELL # 15 T27S R9W SEC18

DEPTH (FT)	TEMP (°C)
970	52.50
980	52.85
990	53.10
1000	53.55
1010	53.95
1020	54.25
1030	54.55
1040	54.85
1050	55.05
1060	55.40
1070	55.70
1080	56.00
1090	56.30
1100	56.60
1110	56.90
1120	57.20
1130	57.50
1140	57.80
1150	58.10
1160	58.40
1170	58.75
1180	59.05
1190	59.40
1200	59.70

DEPTH (FT)	TEMP (°C)
1210	60.05
1220	60.35
1230	60.65
1240	60.95
1250	61.20
1260	61.45
1270	61.65
1280	61.90
1290	62.05
1300	62.25
1310	62.40
1320	62.55
1330	62.65
1340	62.75
1350	62.80
1360	62.80
1370	62.80
1380	62.85
1390	62.90
1400	62.95
1410	63.05
1420	63.10
1430	63.15
1440	63.30

GRADIENT TEST WELL #15 T27S R9W SEC 18

DEPTH (FT)	TEMP (°C)
1450	63.40
1460	63.50
1470	63.55
1480	63.70
1490	63.80
1500	63.90
1510	63.95
1520	64.05
1530	64.15
1540	64.25
1550	64.35
1560	64.45
1570	64.55
1580	64.70
1590	64.80
1600	64.90
1610	65.10
1620	65.20
1630	65.35
1640	65.50
1650	65.60
1660	65.75
1670	65.90
1680	66.10

	DEPTH (FT)	TEMP (°C)	
	1690	66.25	
	1700	66.40	
	1710	66.60	
	1720	66.75	
	1730	66.95	
	1740	67.15	
	1750	67.35	
	1760	67.55	
	1770	67.75	
	1780	68.00	
	1790	68.20	
	1800	68.40	
	1810	68.60	
	1820	68.85	
	1830	69.10	
	1840	69.35	
	1850	69.55	.020
	1860	69.80	.025
	1870	70.05	.025
Bottom	1880	70.25	.02
	1890	—	
	1900	—	

.023°C/ft 23°C/100ft

75.4°C/1000m

OK - File #1

GEOTHERMAL POWER CORPORATION

Temperature Log #15 - Roosevelt Hot Springs, Utah - Logged 7/30/78

DEPTH	TEMP. °C
0'	
20'	20.75
40'	19.35
60'	20.20
80'	21.14
100'	22.09
120'	22.70
140'	23.59
160'	24.65
180'	25.40
200'	26.10
220'	26.68
240'	27.44
260'	28.29
280'	29.02
300'	29.73
320'	30.58
340'	31.29
360'	32.40
380'	33.17
400'	33.62
420'	34.33
440'	35.02
460'	35.84
480'	36.54
500'	37.25
520'	38.00
540'	38.77
560'	39.41
580'	39.96
600'	40.55
620'	41.15
640'	41.79
660'	42.33
680'	42.81
700'	43.29
720'	43.74
740'	44.27
760'	44.68
780'	45.18
800'	45.70
820'	46.29
840'	46.85
860'	47.54
880'	48.18
900'	48.83
920'	49.41
940'	49.95
960'	50.54
980'	51.08
1000'	51.73
1020'	52.32
1040'	52.86
1060'	53.46
1080'	53.99
1100'	54.56
1120'	55.01
1140'	55.60
1160'	56.38
1180'	56.89
1200'	57.50
1220'	58.04
1240'	58.64
1260'	59.08
1280'	59.59
1300'	59.89
1320'	60.32
1340'	60.65
1360'	60.75
1380'	60.86
1400'	60.96
1420'	61.20
1440'	61.40
1460'	61.66
1480'	61.89
1500'	62.19
1520'	62.37
1540'	62.56
1560'	62.74
1580'	62.89
1600'	63.20
1620'	63.42
1640'	63.79
1660'	64.09
1680'	64.35
1700'	64.84
1720'	65.16
1740'	65.60
1760'	65.98
1780'	66.44
1800'	66.90
1820'	67.42
1840'	68.00
1860'	68.55
1880'	69.31
1889'	69.44 ← leave off

GEOTHERMAL POWER CORP.
WELL NO. 15
SEC. 18, T27S, R9W
BEAVER COUNTY, UTAH

Prepared by:

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.
860 Anaconda Tower - 555 Seventeenth Street
Denver, Colorado 80202

September 5, 1978

Helton Engineering & Geological Services, Inc.

WELL DATA SUMMARY

WELL NAME:	Geothermal Power Corporation #15
LOCATION:	Sec. 18, T27S, R9W, Beaver County, Utah
OPERATOR:	Geothermal Power Corporation
ELEVATION:	5544.5 ft. KB; 5539 ft. GL
TOTAL DEPTH:	1890 ft.
STATUS:	Completed as geothermal observation well
SPUD DATE:	Not Known
RIG RELEASED:	11:00 AM 7/20/78
HOLE SIZE:	6-1/2" to 1890 ft.
OBSERVATION CASING:	Ran 90 joints of 1-1/2" Black Pipe (Total of 1890 ft.). Landed at 1890 ft. KB, cemented with 10 sacks construction cement.
LOGS:	Induction, Density, Sonic, Bottom Hole Temperature.
DRILLING CONTRACTOR:	Darrah Drilling Corporation
DRILLING FOREMAN:	C. R. McKay, Helton Engineering & Geological Services, Inc.
ADDITIONAL INFORMATION:	The Helton drilling foreman was called out after the well was spudded, so the first few daily drilling reports are not available.

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. _____ DATE 7/16/78

DEPTH 650 FEET MADE _____ HRS. ON BOTTOM _____

OPERATION W.O.P. Tripping

SURVEYS								

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED _____

DAILY MUD COST _____

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE _____ RATING _____

RIG TIME

1. Drilling _____
2. Tripping 1
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing 1/2
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

Took United Airlines to Salt Lake City. Arrived approximately 7:15 AM. Took Sky West to Cedar City. Arrived at 9:15 AM. Drove to Milford, Utah. On location approximately 12:00 PM. Rig down - mud pump to recycle mud to main tank out.

Located centrifugal pump - hauled out to location to use until parts arrive from California for pump. Installed same. Owner of rig had let personnel off.

Waited for crews to return.

6:30 AM - 8:00 AM Hooked up centrifugal pump and tripped in hole.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. _____ °F _____ Supervisor: _____

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 2 DATE 7/17/78

DEPTH 870 FEET MADE 210 HRS. ON BOTTOM 14

OPERATION Drilling

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
2	6-1/2	Hughes J33	650			14	None				Used
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER	14			LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE _____ RATING _____

RIG TIME

1. Drilling 14
2. Tripping 2-1/2
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing 4
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. 3-1/2 hrs. Cleaned pits
17. and mud tank went
18. thru mud pump (circ.
19. sand & granite) 12#
20. mud.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM	Tripped in hole. Stuck pipe at 180'. Pulled loose. Reamed same spot several times. No problems going to bottom.
10:30 - 8:30 PM	Drilled.
8:30 - 12:00PM	Dumped pits - mixed new mud. Circulated too much sand & granite. Drilled.
12:00 - 4:00AM	Centrifugal pump out. Trip to town - found another one. Tripped in hole w/8 stands.
4:00 - 8:00 AM	Drilled - worked on pump.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 100 °F Hot Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 3 DATE 7/18/78

DEPTH 890 FEET MADE 20 HRS. ON BOTTOM 2

OPERATION Drilling - WO parts.

SURVEYS

LAST PIPE TALLY ____ BOARD ____ CORRECTION: YES ____ NO ____

WT OF STRING M LBS. 18 WT ON BIT M LBS ____ ROTARY RPM ____

PUMP No. 1 5 x 10 GD IN USE ____ LINERS 5" SPM 50 PRESS 0

PUMP No. 2 ____ IN USE ____ LINERS ____ SPM ____ PRESS ____

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD ____ No. IN HOLE ____

BOTTOM HOLE ASSEMBLY ____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
2	6-1/2	J33	650	890	240	16	None	3	2	2	Used Bit
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 50 WL ____ GEL ____ FC ____

PH ____ APP VIS ____ PLAS VIS ____ YLD. PT. ____

WATER ____ OIL ____ CL- ____ PPM

SOLIDS ____ SAND ____ CA++ ____ PPM

AV ____ NV ____ d-exp ____ Pore Press ____

MUD ADDED ____

DAILY MUD COST ____

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED ____ bbl

OUTPUT ____ cfm Press. ____ psig

MAKE RATING

RIG TIME

1. Drilling 2
2. Tripping 2
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud
10. Repairing
11. Coring
12. Testing
13. Logging
14. Casing
15. WOC

OTHERS (SPECIFY)

16. ____
17. ____
18. ____
19. ____
20. ____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 10:00 Drilling.

10:00 AM 2:00 Centrifugal pump motor went out. Shut rig down until rig equipment repaired. Tripped out - put pipe on bank - waited on parts.

2:00 PM - 8:00 AM Waited on parts.

Note: Formation change approximately 860' - some clay and fine sand.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. ____ °F ____ Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 4 DATE 7/19/78

DEPTH 890 FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Shut down - tripping.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ____

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling		6. Surveying		11. Coring		16.	
2. Tripping	2	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud		14. Casing		19.	
5. Slip & Cutline		10. Repairing		15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 9:00 PM Waited on parts for pump. Should arrive on plane at 7:00 PM.

Crew off - start up in morning.

6:00 AM - 8:00 AM Laid down 4½" drill pipe - picked up 3½" drill pipe.

Well Costs	$
Daily	
Cumulative	

Flow line temperature 80°

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 5 DATE 7/20/78

DEPTH 1090 FEET MADE 200 HRS. ON BOTTOM 10

OPERATION Shut down, waiting on repairs to water truck.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 28 WT ON BIT M LBS 20 ROTARY RPM 80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8IF DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890		200	10					
Ream Bit No.											
Core No.							FEET CUT		FEET REC.		

MUD
WT 11/9 VIS 40 WL _____ GEL _____ FC _____
PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____
WATER _____ OIL _____ CL- - _____ PPM
SOLIDS _____ SAND _____ CA + + _____ PPM
AV _____ NV _____ d-exp _____ Pore Press _____
MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	10			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl
OUTPUT _____ cfm Press. _____ psig
MAKE RATING

RIG TIME

1. Drilling	10	6. Surveying		11. Coring		16.	
2. Tripping	4½	7. Circulating		12. Testing		17.	
3. Service & BOPs		8. Clean to Btm		13. Logging		18.	
4. Reaming		9. Cond. Mud	2½	14. Casing		19.	
5. Slip & Cutline		10. Repairing	truck 7	15. WOC		20.	

OTHERS (SPECIFY)

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:30 PM Tripped in hole - regained circulation - conditioned mud.
12:30 PM - 6:30 PM Drilled.
6:30 PM - 9:00 PM Cleaned tanks - put new head in 5 x 10 mud pump - mixed mud.
9:00 PM - 1:00 AM Drilled. Unable to keep up with samples (too fine). Now catching 15 foot samples.
1:00 AM - 8:00 AM Rear end of water truck torn out on bad roads. Shut rig down. No Water. Contractor to furnish same.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 85°

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 6 DATE 7/?1/78

DEPTH 1320 FEET MADE 230 HRS. ON BOTTOM 8

OPERATION Mixing Mud.

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 23 WT ON BIT M LBS 20 ROTARY RPM 80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8 DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890		450	18					
Ream Bit No.											
Core No.							FEET CUT		FEET REC.		

MUD
WT 9 VIS 38 WL _____ GEL _____ FC _____
PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____
WATER _____ OIL _____ CL- _____ PPM
SOLIDS _____ SAND _____ CA++ _____ PPM
AV _____ NV _____ d-exp _____ Pore Press _____
MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	8			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl
OUTPUT _____ cfm Press. _____ psig
MAKE RATING

RIG TIME

1. Drilling 8
2. Tripping 5
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud 1
10. Repairing
11. Coring
12. Testing
13. Logging
14. Casing
15. WOC

OTHERS (SPECIFY)

16. Water Truck Down 4 hrs.
17.
18.
19.
20.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:00 PM Down. No Water. Contractor to furnish water.
12:00 AM - 1:00 PM Conditioned mud with chemical and water.
1:00 PM - 9:00 PM Drilled
9:00 PM 12:00 AM Blew manifold gasket on compressor. Shut rig down. Pulled 4½" pipe to be replaced by 3½" pipe. Rig down at 12:00 AM. Transferred water to tanks.
12:00 AM - 6:00 AM Rig down.
6:00 AM - 8:00 AM Mixed mud.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 92°

WEATHER: TEMP. 105 °F Hot Supervisor: C. R. McKay

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 7 DATE 7/22/78

DEPTH 405 FEET MADE 85 HRS. ON BOTTOM 6-1/2

OPERATION Drilling - Repairing Air Compressor

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. 26 WT ON BIT M LBS 20 ROTARY RPM 60/80

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4½ THD 3½/2-7/8 DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
3	6-1/2	Varel V2	890	1405	515	24½		8	4	8	
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 40 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	6-1/2			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling 6-1/2
2. Tripping 9
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing 3-1/2
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. Shut Down 5 hrs.
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 11:00 AM Picked up 3-1/2" IF Drill Pipe. Put 500' in hole to replace 4-1/2" pipe.

11:00 AM 2:30 PM Repaired air compressor.

2:30 PM 9:00 PM Drilled

9:00 PM 3:00 AM Made 1/2 trip. Laid down 20 joints - balance in derrick - Shut down for night.

3:00 AM 8:00 AM Rig down.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 96°

WEATHER: TEMP. 105 °F Hot Supervisor: Supervisor

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 8 DATE 7/23/78

DEPTH 1405 FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Rig shut down.

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. 24 hrs. down time.
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM to 8:00 AM — Rig down (on bank). Since arrival have had driller, two rough necks, pusher to relieve driller. (Rest badly needed).

1/2 hr. crew unloaded 1-1/2" casing.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 100°

WEATHER: TEMP. _____ °F _____ Supervisor: _____

Form HE-D1

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 9 DATE 7/24/78

DEPTH 1690 FEET MADE 285 HRS. ON BOTTOM 13-1/2

OPERATION Drilling

SURVEYS

LAST PIPE TALLY BOARD CORRECTION: YES NO

WT OF STRING M LBS. 29 WT ON BIT M LBS 25 - 20 ROTARY RPM 80/60

PUMP No. 1 5 x 10 GD IN USE LINERS 5" SPM 50 PRESS 300

PUMP No. 2 IN USE LINERS SPM PRESS

DRILL PIPE OD 3½/4½ THD 2-7/8/3½ DRILL COLLARS OD 5" THD 3½ IF. No. IN HOLE 3

BOTTOM HOLE ASSEMBLY

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes	1405		285	13½	14 14 14				Used bit - re-
		J33									run from this
											hole - had been
Ream Bit No.											used before that.
Core No.							FEET CUT	FEET REC.			

MUD

WT 9.3 VIS 40 WL GEL FC

PH APP VIS PLAS VIS YLD. PT.

WATER OIL CL- PPM

SOLIDS SAND CA++ PPM

AV NV d-exp Pore Press

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	13½			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED bbl

OUTPUT cfm Press. psig

MAKE RATING

RIG TIME

1. Drilling 13½
2. Tripping 4½
3. Service & BOPs
4. Reaming
5. Slip & Cutline
6. Surveying
7. Circulating
8. Clean to Btm
9. Cond. Mud
10. Repairing 3½
11. Coring
12. Testing
13. Logging
14. Casing
15. WOC

OTHERS (SPECIFY)

16. 2½ down.
17.
18.
19.
20.

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 10:30 AM Down.
10:30 AM - 3:00 PM Tripped in hole - mixed mud.
3:00 PM - 7:00 PM Drilled - 1480' Reamed.
7:00 PM - 10:30 PM Down - repaired air compressor clutch.
10:30 PM - 8:00 AM Drilled to 1680'.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 102° F

WEATHER: TEMP. °F Supervisor:

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 10 DATE 7/25/78

DEPTH 1890 FEET MADE 200 HRS. ON BOTTOM 16

OPERATION Drilling - Waiting on Schlumberger

SURVEYS								

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 5 x 10 GD IN USE _____ LINERS 5" SPM 50 PRESS 300

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD 3½/4-½ THD 2-7/8"/3½ DRILL COLLARS OD 5" THD 3½ IF No. IN HOLE 3

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes	1405	1890	485	29½	10	10	10				Used bit -
		J33											Welded in jets
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- - _____ PPM

SOLIDS _____ SAND _____ CA + + _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER	16			LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling 16	6. Surveying	11. Coring	16.	OTHERS (SPECIFY)	
2. Tripping	7. Circulating	12. Testing	17.	8 hrs. W.O. Schlumberger	
3. Service & BOPs	8. Clean to Btm	13. Logging	18.		
4. Reaming	9. Cond. Mud	14. Casing	19.		
5. Slip & Cutline	10. Repairing	15. WOC	20.		

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 12:00 PM Drilled 1690 - 1890'.

12:00 PM - 8:00 AM Waited on Schlumberger - Mixed mud, conditioned hole.

Schlumberger came out of Grand Junction.

Bit is dull - believed to be in granite.

Mud Logging Unit Released: 12:00 Midnight.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. _____ °F _____ Supervisor: C. R. McKay

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power Corp. #15 DAY NO. 11 DATE 7/26/78

DEPTH 1890' T.D. FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Laying down drill pipe - rigging up Schlumberger - running logs.

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds			COND T	COND B	COND G	REMARKS
4	6-1/2	Hughes J33	1405	1890	485	29½	10	10	10	6	5	4	
Ream Bit No.													
Core No.							FEET CUT			FEET REC.			

MUD

WT 9 VIS 60 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA ++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping 8
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging 9-1/2
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 10:30 PM Broke out and laid down 4½ and 3½" drill pipe. Torqued up - heated each joint to break out.

10:30 PM - 8:00 AM Rigged up Schlumberger - Induction Log tool broken - ran logs.

Well Costs	$
Daily	
Cumulative	

Flowline temperature 102° F.

WEATHER: TEMP. 104 °F Hot Supervisor: C. R. McKay

HELTON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Power #15 DAY NO. 12 DATE 7/27/78

DEPTH 1890' T.D. FEET MADE 0 HRS. ON BOTTOM 0

OPERATION Running 1-1/2" casing

SURVEYS

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT 9 VIS 60 WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 3:00 PM Finished running logs. Ran Induction, Density, GR Caliper Sonic, Bottom Hole Temperature.

3:00 PM 12:00 AM Ran 1-1/2" pipe. 90 joints - 1890' KB. (regular black malleable pipe.). Cemented with 10 sacks cement, 18' depth - cut off conductor pipe.

Bottom Hole Temp.: #1 - 144°F
#2 - 146°F
#3 - 148°F

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 104 °F Hot Supervisor: C. R. McKay

Helton Engineering & Geological Services, Inc.

DRILLING TIME LOG

Formation	Start Drlg.	Depth	Finish Drlg.	Depth
Soft	12:40	895	12:50	910
Soft, medium	12:57	910	1:21	925
Soft	1:28	925	1:48	940
"	1:58	940	2:23	955
"	2:29	955	2:55	970
"	3:01	970	3:27	985
"	3:33	985	3:54	1000
"	4:06	1000	4:27	1015
"	4:36	1015	4:57	1030
"	5:06	1030	5:27	1045
"	5:12	1045	5:30	1060
Very fast, soft	5:40	1060	6:00	1075
	6:08	1075	6:30	1090
6:45 - made mud, cleaned mud pump, tightened brakes - 9:00	9:00	1090	9:20	1105
Soft, w/boulders	9:38	1105	10:00	1120
	10:15	1120	10:38	1135
	10:50	1135	11:25	1150
	11:35	1150	12:05	1165
	12:12	1165	12:50	1180
New Day - 7/20/78	1:25	1180	1:45	1195
	1:57	1195	2:20	1210
Soft clay & sands	2:27	1210	2:50	1225
Made mud, tight hole	2:58	1225	3:35	1240
	3:55	1240	4:30	1255
	4:38	1255	5:05	1270
	5:15	1270	6:15	1285
	6:31	1285	7:12	1300
Shut down for lube	7:30	1300	8:20	1315
	8:40	1315		
Worked on compressor				
New Day - 7/21/78	2:30	1315	3:00	1330
	3:20	1330	4:15	1345
	4:35	1345	5:20	1360
	5:35	1360	6:25	1375
Sands, boulders	6:30	1375	7:15	1390
	7:25	1390	8:28	1405
Tripped 9:00				

DRILLING TIME LOG
(Continued)

Formation	Temp.	Start Drlg.	Depth	Finish Drlg.	Depth
New Day 7/23/78	89 F.	3:00	1405	3:34	1420
	91	3:51	1420	4:15	1435
	92	4:20	1435	4:50	1450
	93	4:58	1450	5:25	1465
	96	5:31	1465	6:00	1480
	97	6:07	1480	6:40	1495
Air Comp. Trouble		6:46	1495	11:10	1510
7:00 - 11:00 down for lube.					
New Day 7/24/78		11:35	1510	12:20	1525
	98	12:26	1525	1:05	1540
Few boulders and sand	98	1:10	1540	1:45	1555
Disc. staying the	99	1:55	1555	2:30	1570
same - 37 sec.	99	2:35	1570	3:05	1585
	100	3:13	1585	3:47	1600
Harder	100	3:55	1600	4:40	1615
	100	4:50	1615	5:25	1630
Change towers	100	5:35	1630	6:12	1645
	100	6:25	1645	7:00	1660
	98	7:11	1600	7:43	1675
Hard spots	96	7:50	1675	8:15	1690
Boulders about	98	8:25	1690	9:31	1705
5 ft. apart 2" thick	100	9:40	1705	10:07	1720
	100	10:45	1720	11:25	1735
	100	11:35	1735	12:10	1750
	95	12:20	1750	12:40	1765
	95	1:30	1765	1:55	1780
Changed rotary speed					
to save bit	95	2:05	1780	3:05	1795
	98	3:15	1795	4:00	1810
	100	4:10	1810	4:50	1825
	100	4:55	1825	5:45	1840
6:00-6:45 Lubed rig -	100	6:45	1840	7:57	1855
cleaned desanders	102	8:07	1855	11:08	1870
Chert & granite 1865-70					
		11:17	1870		1885
Out of water					
			1885		1900
Drillers			1900		1915

T.D. 1880 @ 2:00AM

12:00 discontinued drilling, bit worn out. Mixed mud - began conditioning hole. Waited for Well Loggers.

HEL ON ENGINEERING & GEOLOGICAL SERVICES, INC.

DAILY DRILLING REPORT

(AS OF 8 AM)

WELL Geothermal Powe Corp. #15 DAY NO. 13 DATE 7/28/78

DEPTH 1890 FEET MADE _____ HRS. ON BOTTOM _____

OPERATION _____

SURVEYS							

LAST PIPE TALLY _____ BOARD _____ CORRECTION: YES ___ NO ___

WT OF STRING M LBS. _____ WT ON BIT M LBS _____ ROTARY RPM _____

PUMP No. 1 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

PUMP No. 2 _____ IN USE _____ LINERS _____ SPM _____ PRESS _____

DRILL PIPE OD _____ THD _____ DRILL COLLARS OD _____ THD _____ No. IN HOLE ___

BOTTOM HOLE ASSEMBLY _____

BIT NO.	SIZE	TYPE	DEPTH IN	DEPTH OUT	FT. MADE	TOTAL HRS. RUN	JET SIZE IN 32nds	COND T	COND B	COND G	REMARKS
Ream Bit No.											
Core No.							FEET CUT	FEET REC.			

MUD

WT _____ VIS _____ WL _____ GEL _____ FC _____

PH _____ APP VIS _____ PLAS VIS _____ YLD. PT. _____

WATER _____ OIL _____ CL- _____ PPM

SOLIDS _____ SAND _____ CA++ _____ PPM

AV _____ NV _____ d-exp _____ Pore Press _____

MUD ADDED

DAILY MUD COST

	Hrs. Run	IN	OUT	
DESILTER				LB/GAL
DESANDER				LB/GAL
DEGASSER				LB/GAL

COMPRESSOR DATA MUD DUMPED _____ bbl

OUTPUT _____ cfm Press. _____ psig

MAKE RATING

RIG TIME

1. Drilling _____
2. Tripping _____
3. Service & BOPs _____
4. Reaming _____
5. Slip & Cutline _____
6. Surveying _____
7. Circulating _____
8. Clean to Btm _____
9. Cond. Mud _____
10. Repairing _____
11. Coring _____
12. Testing _____
13. Logging _____
14. Casing _____
15. WOC _____

OTHERS (SPECIFY)

16. _____
17. _____
18. _____
19. _____
20. _____

DRILLING & GEOLOGICAL REMARKS (Time & Sequence of Operations to be inserted below)

8:00 AM - 11:00 AM Laid down balance of 3-1/2" drill pipe in derrick. Tore down to move out. Welded lock cap on 1-1/2" pipe.

RIG RELEASED: 11:00 AM.

Trip back to Denver.

Well Costs	$
Daily	
Cumulative	

WEATHER: TEMP. 105 °F Hot Supervisor: C. R. McKay

GRADIENT TEST WELL #15 T27S R9W SEC 18
LOGGED AUGUST 30TH & 31ST, 1978.

DEPTH (FT)	TEMP (°C)
10	23.45
20	21.90
30	20.30
40	19.55
50	18.75
60	18.65
70	18.60
80	18.65
90	19.20
100	19.75
110	20.15
120	20.65
130	21.15
140	21.70
150	22.25
160	22.85
170	23.35
180	23.75
190	24.25
200	24.65
210	25.10
220	25.45
230	25.85
240	26.30

DEPTH (FT)	TEMP (°C)
250	26.75
260	27.35
270	27.85
280	28.25
290	28.65
300	29.15
310	29.65
320	30.05
330	30.45
340	30.90
350	31.40
360	31.85
370	32.30
380	32.70
390	33.20
400	33.65
410	34.20
420	34.70
430	35.05
440	35.50
450	36.00
460	36.40
470	36.75
480	37.15

GRADIENT TEST WELL #15 T27S R9W SEC18

DEPTH (FT)	TEMP (°C)
490	37.55
500	38.00
510	38.35
520	38.75
530	39.20
540	39.65
550	39.90
560	40.20
570	40.55
580	40.80
590	41.05
600	41.45
610	41.80
620	42.15
630	42.50
640	42.75
650	43.10
660	43.40
670	—
680	43.85
690	94.10
700	44.40
710	44.65
720	44.85

DEPTH (FT)	TEMP (°C)
730	45.20
740	45.40
750	45.65
760	45.85
770	46.20
780	46.45
790	46.70
800	47.00
810	47.40
820	47.70
830	48.00
840	48.30
850	48.70
860	49.00
870	49.30
880	49.70
890	50.10
900	50.40
910	50.70
920	51.00
930	51.35
940	51.65
950	51.85
960	52.20

GRADIENT TEST WELL # 15 T27S R9W SEC18

DEPTH (FT)	TEMP (°C)
970	52.50
980	52.85
990	53.10
1000	53.55
1010	53.95
1020	54.25
1030	54.55
1040	54.85
1050	55.05
1060	55.40
1070	55.70
1080	56.00
1090	56.30
1100	56.60
1110	56.90
1120	57.20
1130	57.50
1140	57.80
1150	58.10
1160	58.40
1170	58.75
1180	59.05
1190	59.40
1200	59.70

DEPTH (FT)	TEMP (°C)
1210	60.05
1220	60.35
1230	60.65
1240	60.95
1250	61.20
1260	61.45
1270	61.65
1280	61.90
1290	62.05
1300	62.25
1310	62.40
1320	62.55
1330	62.65
1340	62.75
1350	62.80
1360	62.80
1370	62.80
1380	62.85
1390	62.90
1400	62.95
1410	63.05
1420	63.10
1430	63.15
1440	63.30

GRADIENT TEST WELL #15 T27S R9W SEC18

DEPTH (FT)	TEMP (°C)
1450	63.40
1460	63.50
1470	63.55
1480	63.70
1490	63.80
1500	63.90
1510	63.95
1520	64.05
1530	64.15
1540	64.25
1550	64.35
1560	64.45
1570	64.55
1580	64.70
1590	64.80
1600	64.90
1610	65.10
1620	65.20
1630	65.35
1640	65.50
1650	65.60
1660	65.75
1670	65.90
1680	66.10

	DEPTH (FT)	TEMP (°C)
	1690	66.25
	1700	66.40
	1710	66.60
	1720	66.75
	1730	66.95
	1740	67.15
	1750	67.35
	1760	67.55
	1770	67.75
	1780	68.00
	1790	68.20
	1800	68.40
	1810	68.60
	1820	68.85
	1830	69.10
	1840	69.35
	1850	69.55
	1860	69.80
	1870	70.05
Bottom	1880	70.25
	1890	—
	1900	—

GEOTHERMAL POWER CORPORATION

Temperature Log #15 - Roosevelt Hot Springs, Utah - Logged 7/30/78

DEPTH	TEMP. °C
0'	
20'	20.75
40'	19.35
60'	20.20
80'	21.14
100'	22.09
120'	22.70
140'	23.59
160'	24.65
180'	25.40
200'	26.10
220'	26.68
240'	27.44
260'	28.29
280'	29.02
300'	29.73
320'	30.58
340'	31.29
360'	32.40
380'	33.17
400'	33.62
420'	34.33
440'	35.02
460'	35.84
480'	36.54
500'	37.25
520'	38.00
540'	38.77
560'	39.41
580'	39.96
600'	40.55
620'	41.15
640'	41.79
660'	42.33
680'	42.81
700'	43.29
720'	43.74
740'	44.27
760'	44.68
780'	45.18
800'	45.70
820'	46.29
840'	46.85
860'	47.54
880'	48.18
900'	48.83
920'	49.41
940'	49.95
960'	50.54
980'	51.08
1000'	51.73
1020'	52.32
1040'	52.86
1060'	53.46
1080'	53.99
1100'	54.56
1120'	55.01
1140'	55.60
1160'	56.38
1180'	56.89
1200'	57.50
1220'	58.04
1240'	58.64
1260'	59.08
1280'	59.59
1300'	59.89
1320'	60.32
1340'	60.65
1360'	60.75
1380'	60.86
1400'	60.96
1420'	61.20
1440'	61.40
1460'	61.66
1480'	61.89
1500'	62.19
1520'	62.37
1540'	62.56
1560'	62.74
1580'	62.89
1600'	63.20
1620'	63.42
1640'	63.79
1660'	64.09
1680'	64.35
1700'	64.84
1720'	65.16
1740'	65.60
1760'	65.98
1780'	66.44
1800'	66.90
1820'	67.42
1840'	68.00
1860'	68.55
1880'	69.31
1889'	69.44