

DIAMOND DRILL RIG PROPOSED FOR THE HAY MOUNTAIN PROJECT

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As in all of Liberty Star's projects we spend a lot of time and energy to select the very best and most cost effective equipment for our projects. The Titan Drilling R-40 Deep Hole Exploration Drill Rig meets our criteria in spades. Design and built under the direction of Jeff Camsell as a result of his long experience in the Nevada gold country, where drilling is particularly challenging. I first met Jeff something more than 10 years ago when he was Senior Driller-Manager for a large drilling company we were working with and whenever I asked a difficult question the answer was call Jeff Camsel – he'll know, and he always did. An intense worker, and outstandingly knowledgeable about all aspects of drilling, Jeff branched out to form his own drilling company, and to design and build the R-40 deep hole rig. We have selected Jeff to be our driller (Drill Company) and he has given us a very competitive bid for our Hay Mountain Project.



The drill Jeff has designed is multipurpose and can traverse steep and muddy ground on the rubber tracks, exerting less pressure on the ground than a human footprint. It does not need a bulldozed road which is particularly important to make less initial impact nor require very expensive remediation after drilling is completed. You can see it is relatively small but without a human standing next to it, it appears smaller than it really is.

Photo 2 shows the rig with the mast partially up with a driller kneeling next to the left track giving a sense of scale. Note that the rig which is getting ready to drill a hole is parked on a plastic sheet so any oil or grease drips fall on the sheet and not on the ground. After drilling is complete the rig pulls off the impermeable sheet and it is rolled up and disposed in an approved land fill.

Photo 3, 4, and 5 show the rig on its latest project in American Samoa from which it has just returned. The compactness of the rig and associated equipment is relatively small and light and easy to move.



The rig as it is shown in **photo 5**, is fully equipped as it would be for drilling at Hay Mountain but the Solids Recovery Unit (SRU) see [NR 195](#) [02/24/2015], would be mounted on a towable trailer rather than on a skid mount as it is here.

Photo 5: “The 2-stage mud mixing tank is to the right of the drill, and to the right of it is a blue & yellow painted skid mounted solids recovery unit; in the foreground is an inflatable water bladder. Please note that at the time these pictures were taken we had no fluid return from the hole. “ Alan Roberts, Titan Drilling.

R-40 PERFORMANCE SPECIFICATIONS

Depth capacity coring (Parallel Wall Rods)

B wireline	3200 m (10,500 ft)
N wireline	2470 m (8,100 ft)
H wireline	1675 m (5,500 ft)
F wireline	1097 m (3,600 ft)

Depths are based on vertical dry hole

Depth capacity coring (V-Wall Rods)

B wireline	N/A
N wireline	3082 m (10,112 ft)
H wireline	2092 m (6865 ft)
F wireline	1371 m (4500 ft)

Depths are based on vertical dry hole

Main hoist

Single line capacity:	37,110 lb
Line speed:	135 ft/min
Cable size:	90 Feet 3/4 in rotation resistant

Wire line

Capacity: 9000 ft of 1/16 in

Line pull:	bare drum: 3198 lb
	full drum: 801 lb

Line speed:	bare drum: 574 ft/min
	full drum: 1486 ft/min

Mast and feed system

Telescopic mast:	
Feed travel:	11.5 ft
Feed speeds:	fast and slow with variable control
Thrust:	29,820 lb
Pull:	56,548 lb
Drilling angle:	-45 to 90 degrees
Feed pull length:	20 ft

Power unit

Manufacturer:	Perkins 6.6 Tier 5
Rated Power:	235 HP
RPM:	2100
Engine type:	Diesel turbocharged/water cooled
Cooling:	Water

Drill head and spindle speed

Power: 160cc variable speed hydraulic motor
drive: 4 in chain driven in oil bath

Ratio	Speed, rpm	Torque, ft-lb
1st	6.63:1	129-227
2nd	3.17:1	270-432
3rd	1.72:1	488-796
4th	1.00:1	856-1369

Range selection: manual control from operator's station

Hinged head: swing away

Clank assembly

Type: hydraulic open, spring closed
Maximum inside diameter: 4.58 in
Holding capacity: 50,000 lb

Weight Including MST-1500

Rubber Track Mercedes Carrier
Weight: 34,700 lb

Dimensions

Length:	22 ft
Width:	8'6"
Height:	17'8"

Standard equipment

- Hydraulic mast clamp
- Telescopic Mast
- Large crown sheave wheels
- Fuel tank 60 gal
- Hydraulic oil reservoir fill pump & filtration
- Hydraulic mast motor
- Hydraulic mast pump, P&C W1112B&C
- Max flow: 57 gal/min
- Max pressure: 1100 psi
- 8ft custom drill shack
- Hydraulic mast raise
- 4 hydraulic leveling jacks
- Tier III engine
- Safety guards
- Fuel filter & water separator
- Hydraulic P-size rod holder
- RPM meter



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Photo 6 shows the Performance Specs with an inset view of the rig. We will drill either P (PQ) Large size to 2,000 feet or H Intermediate size (HQ) to 2,000 feet depending on the drilling characteristics of the rock and mineral intervals. Larger is always better, as the recovery is generally better and the sample is better, but it is somewhat more expensive. Assuming the H (HQ) is adequate we will probably do most of the drill holes in this size. One other item is worth noting and that is the Power of the Diesel engine at 235 horse power – allowing plenty of power to get through difficult areas of rock, and hoist stuck drill pipe. The other things you can look at if you like – this is a complete spec sheet.

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