Case Histories EWD5®

	Depth Out: <u>9,293ft</u>	
Field: West Delta 73	Depth In: <u>4,730ft</u>	
Area: Gulf of Mexico - Offshore	Footage: <u>4,563ft</u>	
	ROP: <u>Average 45ft/hr</u>	
Tool Size Serial #: <u>6%"x7%" EWD® & 6%7¼ ES®</u>		
Drilling Hrs: 103 hours	In Hole Hours: 357 hours	
BHA: 61/2 Rock Bit, EWD, 11/2° Motor, ES, NMDC, LWD, etc		
WOB : 6-30K RPM :45	Hole DEV <u>: 31°-0°-55°</u>	
Rotary Torq Off Bottom: 4K ft lbRotary To	rq on Bottom:6-8k ft lbHook Load:	
Mud Type: <u>WBMMud Wt: 10.2</u> p	ppg Visc:60	
GPM: 300 SP Press: 3,250	Dpsi BHT:	

Comments:

Enter side track @ 31°through milled out window. Activate EWD and drop angle to vertical and turn azimuth 180°then rebuild angle to 55°. A full gauge ES was used to help drop angle while a ½" under gauge was used to rebuild angle, all this directional work was done with only 14% sliding.

8 bit trips and 2 short trips were made with no drag or overpull noticed at the window. A new EWD was used for each bit trip (not necessary). Wear was minimal and Company man required new tool every bit trip.

Expected ROP was 25-30ft/hr. Average ROP was 45ft/hr with rates as high as \pm 60ft/hr. The ES was pulled from BHA in the last 300-400ft to reduce drag. No difference noticed.

	Denth Out: 15 200ft	
	Depth Out: <u>15,308ft</u>	
Field: Eugene Island #24	Depth In: <u>13,148ft</u>	
Area: Gulf of Mexico - Offshore	Footage: 2,160ft	
	ROP: Average 30ft/hr	
Tool Size Serial #: <u>9%</u> " x12"_S#41012-30		
Drilling Hrs: 72 hours	n Hole Hours: 117 hours	
BHA: 9%"PDC Bit, EWD, 1.5° motor, MWD, 9%" Stabilizer		
WOB <u>: 6-25K</u> RPM: <u>50-60</u>	Hole DEV: <u>Build 7° - 45°</u>	
Rotary Torq off Bottom: 4-6 k ft lbRotary Torq on Bottom: 4-6 k ft lbHook Load: 370 k		
Mud Type: <u>SBM</u> Mud Wt: <u>16.9 p</u>	ogVisc:_54	
GPM: <u>640-700</u> SP Press: <u>3,200</u>	-3,700 psiBHT:	
Comments:		
10¾" Expandable liner run and cemented.		
RIH with EWD and drilled cement and shoe track.		
Drilling from 13,148 ft to 15,010 ft at average ROP of 40 ft/hr. Angle built very successfully		
from 7° to 45° with only 37% sliding.		
Rotating ROP 80-120 ft/hr and sliding ROP 30-60 ft/hr.		

From the top of sand at 15,219 ft to 15,308 ft the ROP dropped to 10 to 15 ft/hr. The mud motor was stalling.

EWD showed 70% wear due to abrasive sands. Two bi-centers (SRWD) ran in hole and completely worn out in last few hundred feet

	Depth Out: <u>17,626ft</u>	
Field: South Timbalier 72	Depth In: <u>13,893ft</u>	
Area: Gulf of Mexico - Offshore	Footage: <u>3,733ft</u>	
	ROP: <u>Average 40ft/hr</u>	
Tool Size Serial #: <u>6¾"x 8¼" EWD Serial # 467-48/#467-132</u>		
Drilling Hrs: 97 hours In	Hole Hours: 178 hours	
BHA: 6¾" Bit, Rotary Steerable, MWD, LWD, 6¾" Stab, EWD, 4¾" DC, 6¾" Stab		
WOB : 0-18,000K RPM : <u>50-120</u>	Hole DEV <u>: 4° - 53°</u>	
Rotary Torq Off Bottom: 4-6K ft lbsRotary Torq on Bottom: 5-7.5k ft lbs _Hook Load: 375,000 lbs		
Mud Type: Synthetic Based Mud	Wt: 16.1ppg Visc: 77 funnel	
<u>GPM: 267-282 gpm</u> SP Pr	ess: 3,600 – 4,200 psi BHT: 295° F	

Comments:

After running liner, drilled out cement with RSS BHA with EWD. Drilled and reamed shale in several 50 to 100 feet sand sections while building the inclination from 4° to 53° and turning the azimuth from 32° to 48°.

Lost circulation at 17,626 feet, began circulating to control well plus pumped LCM.

Decided to place cement plug at 16,250 feet and only run 7" liner in top part of hole. Cement was strung out up the hole on trip out of the hole.

Ran EWD above near bit stabilizer and rock bit to make a wiper trip to ensure a clean (cement free) hole to run liner.

Liner ran to bottom and cemented successfully.