

HDD Water Use Report

Drilling Fluid & Mud-Reuse — Make-up Water Sourcing

PROJECT NAME

Demo - Case #1

CLIENT

ABC Pipeline

CALCULATED BY

John Smith, PE

DATE

June 29, 2026

HDD WATER USE

Drilling Fluid & Mud-Reuse — Water Sourcing Analysis

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1. EXECUTIVE SUMMARY

TOTAL WATER TO SOURCE

393,272 gal

(9,364 bbl) | System Build 121,966 gal | Fluid Lost 147,581 gal | Dilution 123,725 gal

Bore & Fluid Inputs

HDD Length:	1,000 ft
Joint Length:	31.0 ft
Number of Joints:	32.3 ea
Surface System Storage:	50,000 gal

Mud Densities

Initial Mud Density:	10.00 ppg
Target Mud Density:	9.50 ppg
Water (Dilution) Density:	8.33 ppg
Dilution Factor:	0.4274 gal/gal

Drilling Phase Inputs

Phase	Hole / Bit	Hole Dia (in)	Flow (GPM)	Joint Time (min/jt)	Fluid Loss
Pilot Hole	12-3/4" Bit + Mud Motor	12.75	350	15.0	40%
Reaming Pass 1	24" Hole Opener	24.00	200	20.0	30%
Reaming Pass 2	42" Hole Opener	42.00	200	20.0	30%
Swab Pass	36" Barrel Reamer	36.00	100	3.0	25%

2. PHASE THROUGHPUT & FLUID BALANCE

Phase	Open-Hole Vol (gal)	Recirc (GPM)	Phase Time (min)	Total Pumped (gal)	Recovered (gal)	Fluid Lost (gal)	Dilution (gal)	To Source (gal)
Pilot Hole	6,632	210	484	169,355	101,613	67,742	43,424	111,166
Reaming Pass 1	23,499	140	645	129,032	90,323	38,710	38,599	77,309
Reaming Pass 2	71,966	140	645	129,032	90,323	38,710	38,599	77,309
Swab Pass	52,873	75	97	9,677	7,258	2,419	3,102	5,521
TOTAL	71,966	-	-	437,097	289,516	147,581	123,725	271,305

Open-Hole Vol total reflects the largest single pass (max), not a sum, since the hole is progressively enlarged through the same bore.

3. WATER-SOURCING SUMMARY

Component	Volume (gal)	Volume (bbl)
Surface System Build (max open-hole vol + surface storage)	121,966	2,904
Cumulative Fluid Lost Downhole (must be made up)	147,581	3,514
Cumulative Dilution Water (mud density-driven)	123,725	2,946
TOTAL WATER TO SOURCE	393,272	9,364

4. CONCLUSIONS & METHOD

Calculation Summary

Total make-up water to source: 393,272 gal (9,364 bbl).
Initial system build requires 121,966 gal (max open-hole volume 71,966 gal + surface storage 50,000 gal).
Cumulative fluid lost downhole across all phases: 147,581 gal.
Cumulative dilution water to hold target mud density (9.50 ppg): 123,725 gal.

Method & Assumptions

1. Recovered Vol = Recirculation GPM x phase time; Fluid Lost = Total Pumped - Recovered (loss % is an input, not a result).
2. Fluid lost is real fluid that bleeds into the formation and must be replaced.
3. Dilution water = volume of returns reconditioned through the recycler x dilution factor required to hold target muddensity.
4. Dilution factor = (initial - target) / (target - water) = 0.4274 gal/gal; lower with good solids control, higher with reactive formations.
5. Verify water-source permitting and storage capacity against the total sourcing volume before mobilization.