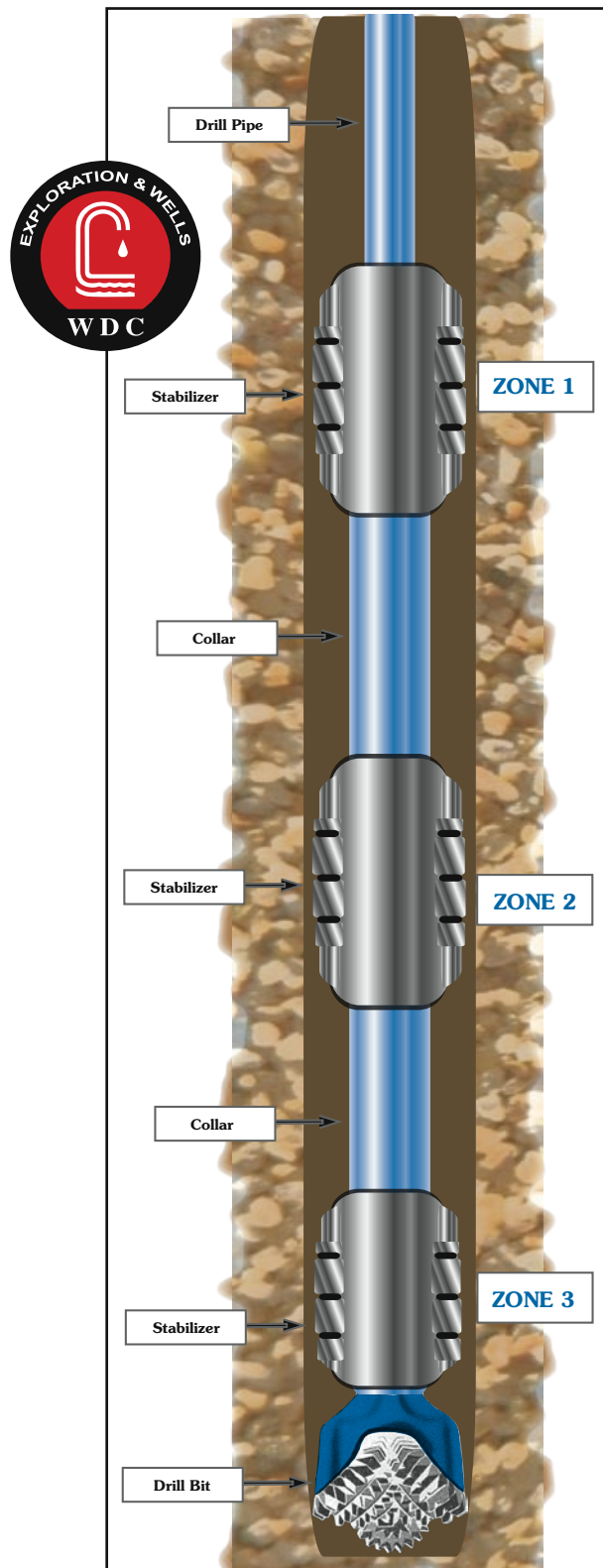


STABILIZATION

Why stabilize? In rotary borings, drill string and bit stabilization is necessary to drill a plumb boring. Stabilization occurs by utilizing specially designed tools within the drill string combined with operator expertise when applying bit weight. An improperly stabilized drill string can result in excessive bit and tooling wear, borehole deviation, and stuck tooling.



DRILL COLLARS

Drill collars are designed to keep the entire drill string in tension, thus improving the performance of the drill bit by helping ensure the drill bit has equal distribution of cutting action on each cone. The combined weight of the collars in a drill string should equal the weight necessary to produce all load required at the bit, plus additional weight to ensure the drill string remains in tension. A drill string operating in tension is held in a relatively straight pendulum manner, minimizing the bending and wear that occur when a drill string is operated in compression.

STABILIZATION

The primary purpose of down hole stabilization is to stabilize the bit. An unstable bit does not rotate on its design center or drill parallel to the axis of the hole consistently. The resulting wobble will cause uneven wear and shock loading of the individual bit cones or side loading of the bit thrust bearings. Uneven bit weight distribution can cause the "bit-skidding" or "bit-walking" that result in borehole deviation.

Various down-hole tooling configurations are used depending on the geologic formation encountered, but generally operate on the principal that three zones of stabilization are considered minimum (see diagram). Two points of stabilization can contact and follow a curve.

WDC maintains the world class expertise and inventory of boring stabilization tooling to ensure plumb borings and well installations in virtually any geologic environment.



Albuquerque 800.914.7506

Elko 775.753.4414

Las Vegas 702.558.9800

Los Angeles 800.974.2769

Minneapolis 877.558.9430

Phoenix 800.584.6471

Sacramento 800.873.3073

San Francisco 510.236.6282