

Granite Wash Casing Profile

Texas Panhandle (District 10)
Western Oklahoma

HALLIBURTON

OKC Granite Wash Conference – March 6, 2008

Surface Casing Regulations

District 10 Office is located in Pampa, Texas

Texas Railroad Commission - District 10 – Jan 1996

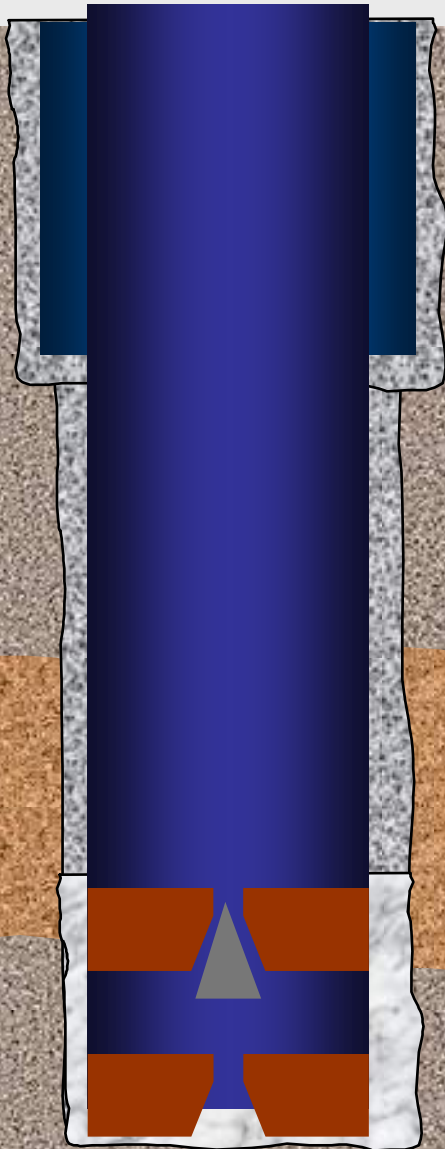
“Zone of Critical Cement”

Bottom 20% of casing string with a minimum of 300 ft
At multiple stage cementing tool – immediate 300 ft
above tool

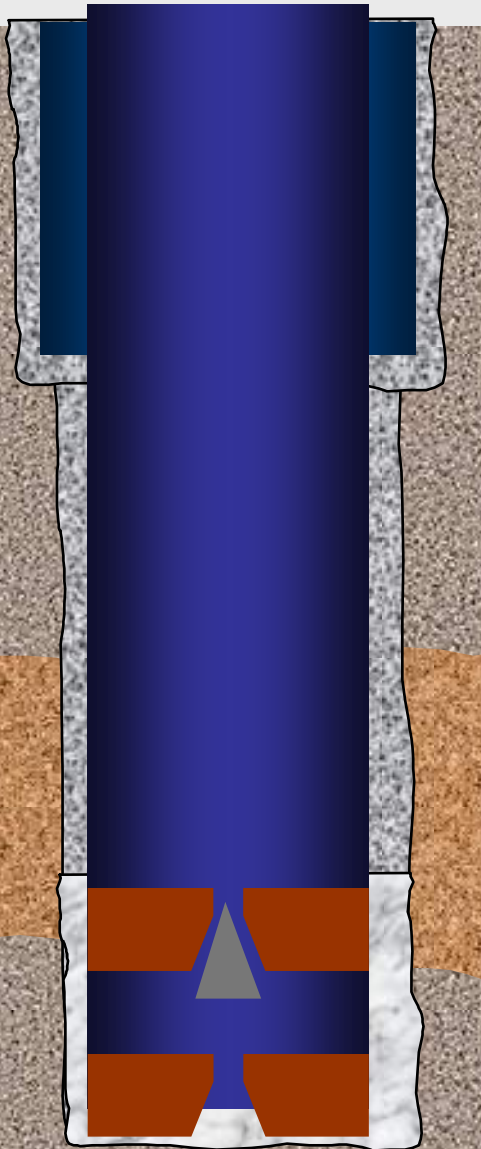
Cement Blend Requirements

Cement in the “Zone Of Critical Cement” must meet
and/or exceed a compressive strength of 500 psi
before drill out and 1,200 psi in 72 hrs

Cement above the “Zone of Critical Cement”
may contain extenders, however the cement must
have a minimum compressive strength of 350 psi in
24 hrs after placement. Also the slurry weight cannot
be less than 12.7 #/gal with an API free water of no
more than 6 mls per 250 mls of cement according to
API RP 10R test procedure



Surface Casing Regulations



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Centralizers

Surface casing string shall be centralized at the casing shoe

If a multi-stage cementer is used, above and below the tool

Plus 100 ft below the base of the usable quality water, a centralizer shall be placed every fourth joint to the ground surface or to the bottom of the cellar

“Operators must notify the District Office in the event that the cement does not circulate to the ground surface”

“A temperature survey or cement bond log well be required in the event that the cement is not circulated to the ground surface”

Surface Casing Regulations

Texas Railroad Commission - District 10 – Nov 2005

Maximum casing depth will not exceed 3500 ft

Surface casing shall be set before drilling into known shallow oil and gas formations.

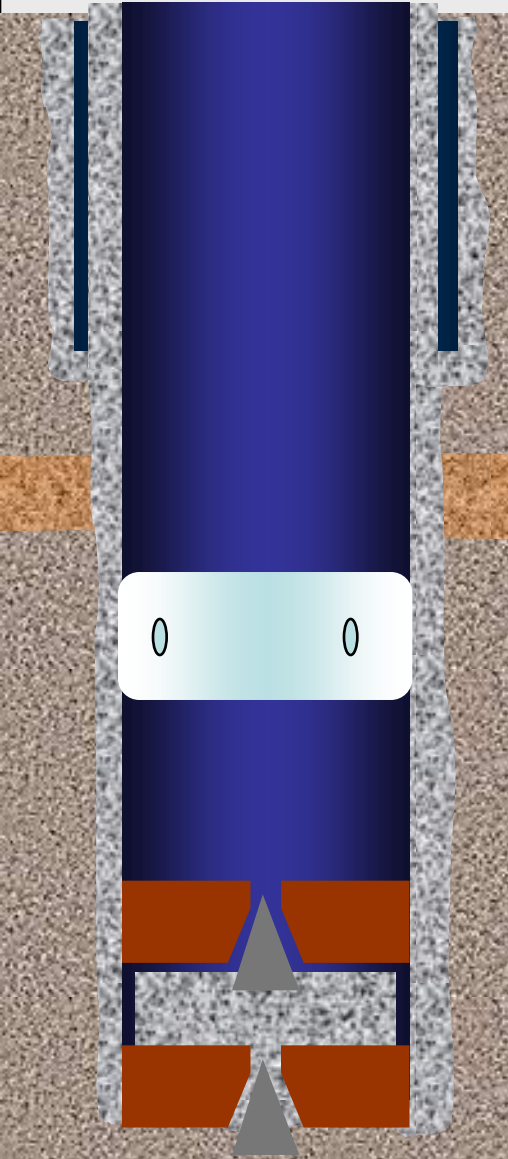
“Zone of Critical Cement”

**Bottom 20% of casing string with a minimum of 300 ft
From multiple stage cementing tool to the surface**

Cement Blend Requirements

Cement in the “Zone Of Critical Cement” must meet and/or exceed a compressive strength of 500 psi before drill out and 1,200 psi in 72 hrs

Cement above the “Zone of Critical Cement” may contain extenders, however the cement must have a minimum compressive strength of 350 psi in 24 hrs after placement. Also the slurry weight cannot be less than 12.7 #/gal with an API free water of no more than 6 mls per 250 mls of cement according to API RP 10R test procedure



Surface Casing Regulations

Texas Railroad Commission - District 10 – Nov 2005

Excess Cement

“Operators are encouraged to use 150% excess is calibration of surface hole is not determined”

Surface casing below 2500 ft will require a multiple stage cementing tool at least 50 ft below potable water, cement must be circulated to the surface

Centralizers

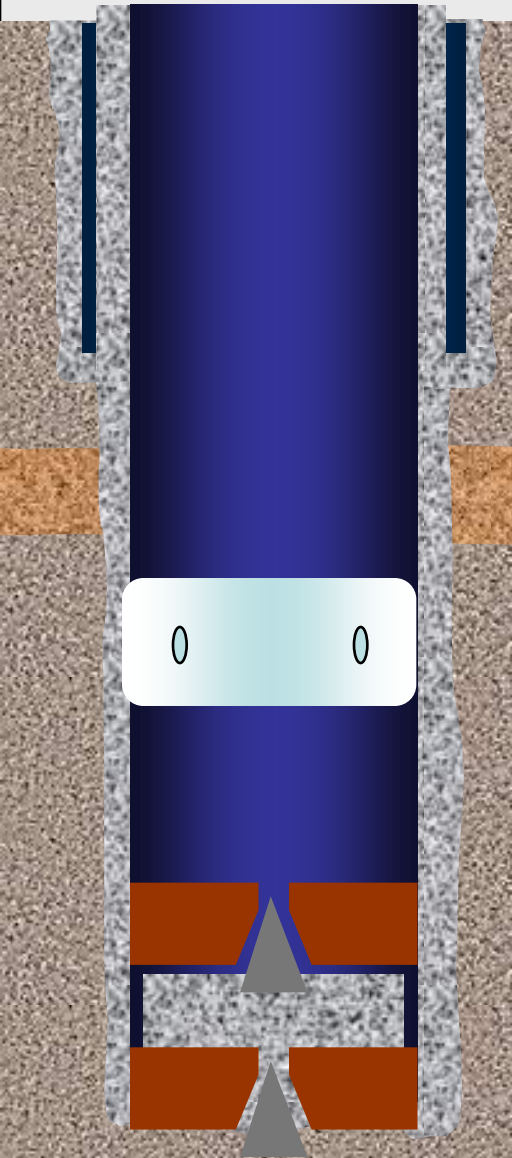
Centralize the shoe

Centralize above and below the multiple stage cementing collar

Plus 100 ft below the base of the usable quality water, a centralizer shall be placed every fourth joint to within 140 ft of the ground surface

“Operators must notify the District Office in the event that the cement does not circulate to the ground surface”

“A temperature survey or cement bond log well be required in the event that the cement is not circulated to the ground surface”



Texas Panhandle Vertical Well



Intermediate Casing

9 5/8" casing set above the Brown Dolomite
Cemented to the surface, single stage

Production String

Casing run to total depth

Cemented across the productive zones of interest

2 stage procedure to place cement across the Brown Dolomite interval

Optional single stage cementing procedure using ultra light cement slurry to place cement from the total depth to above the Brown Dolomite interval

Productive Interval

Texas Panhandle Horizontal Well



Intermediate Casing

9 5/8" casing set in the Penn Shale, below the Brown Dolomite; Cemented to the surface, single or two stage Kick Off Point – Below the Cleveland and above the Oswego

Production String - Without the 7" casing string

Horizontal section cemented to place the top of the cement +/- 500 ft above the Kick Off Point
Cement placed across the Brown Dolomite with a single stage ultra-light cement slurry or two stage cementing process

Productive Interval

Texas Panhandle Horizontal Well



The diagram illustrates a horizontal wellbore system. A vertical blue line represents the wellbore, which curves 90 degrees to become horizontal. The wellbore is surrounded by a grey, textured material representing cement. The background is divided into two main geological layers: a light brown, textured layer at the top and a darker brown, wood-grained layer at the bottom. The horizontal section of the wellbore is located within the darker layer. A white rectangular box with a black border is positioned to the right of the vertical section of the wellbore, containing text about the intermediate casing and production string. A yellow text label 'Productive Interval' is located at the bottom of the horizontal section of the wellbore.

Intermediate Casing

9 5/8" casing set in the Penn Shale, below the Brown Dolomite; Cemented to the surface, single or two stage Kick Off Point – Below the Cleveland and above the Oswego

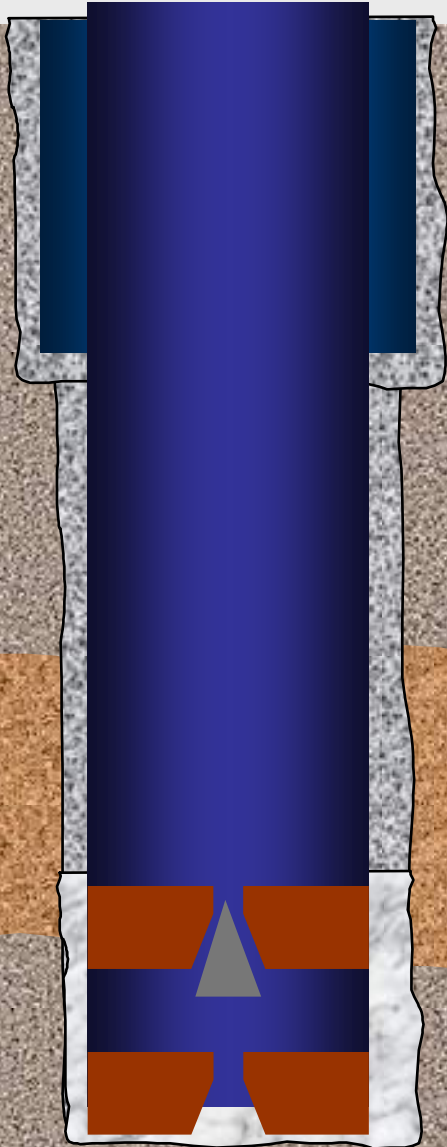
Optional 7" casing string set through the curve; cemented to +/- 500 ft above the Kick Off Point

Production String With the 7" casing string

Single stage cementing process to place the top of cement +/- 500 ft above the Kick Off Point

Productive Interval

Surface Casing Regulations



Oklahoma Corporation Commission (165:10-3-4c)

Minimum Surface Pipe Depth

“surface casing shall be run and cemented from bottom to top with a minimum setting depth which is greater of:

- Ninety (90) feet below the surface or***
- Fifty (50) feet below the base of treatable water”***

Maximum Surface Pipe Depth

“Shall not be more than 250 feet below the base of treatable water”

Minimum Cement Setup Time

“The cement behind the surface casing shall set at least eight (8) hours before further drilling.”

Western Oklahoma Vertical Well



The diagram shows a vertical wellbore in a cross-section. The wellbore is filled with a blue fluid. The casing is shown in blue and grey. The wellbore is surrounded by a brown, textured material representing the reservoir. At the bottom, there is a green, textured layer representing the productive interval. The wellbore is shown with a cement seal at the bottom, indicated by a grey triangle. The wellbore is shown with a cement seal at the bottom, indicated by a grey triangle.

Intermediate Casing

Set to cover low reservoir pressure or lost circulation intervals.

Cemented to cover the intervals of concern.

Production String or Production Liner

Casing run to total depth

Cemented with a “light weight” cement slurry with the TOC inside the intermediate casing string.

Production liners have a minimum 300 ft overlap and minimum 200 ft of cap cement above the liner hanger.

Productive Interval



Links to State Commissions

- Railroad Commission of Texas
 - [RRC: Railroad Commission Rules](#)
- Oklahoma Corporation Commission
 - [Oklahoma Corporation Commission-Home](#)

