



Code Of Practice for Cost Effective Boreholes

*"Contract Management and
Categorization of Risk"*

An International Perspective
Tom Armstrong

Contract Management, Supervision and Payment

TYPICAL PROBLEM AREAS

- Claim bore is deeper than reality
- Incorrect screen placement
- Use of bentonite instead of polymer
- Insufficient /poor specification of gravel
- Not enough development
- Inadequate test pumping
- Claim successful but actually dry bore
- Payment delays: problem in many countries

Contract Supervision

- In Zambia: Field supervisors tend to be:
 - Few in number and less experienced
 - Poorly compensated and
 - Reliant on drillers for logistical support
- Tri-partite agreement on work outputs: Community, supervisor and contractor – all three parties “sign-off” on individual borehole construction

Contract Management,

- Streamline BoQ and consider lump sum payment per borehole
- Clients should take assurance on drillers reputation and contract financial retention
- Field supervisors tend to be:
 - Few in number and less experienced
 - Poorly compensated and
 - Reliant on drillers for logistical support
- Clients to pay invoices promptly
- Community, supervisor and contractor – all 3 “signs-off” on borehole construction
- Drillers to accept limited dry drilling risk

Borehole Siting

COMMUNITY PRIORITISED PREFERENCE ON LOCATION

- For hand-pump yields (20 litres in 100secs), there is no need to maximise yield and hydro-geological survey is not always necessary.
- Boreholes to be located optimum central convenience to users
- Community to indicate 3 preferred areas to drill in their locale

Borehole Siting (Cont)

ANECDOTE

In Central Equatoria State, S Sudan, in 1980s, JB Drilling constructed some 350 boreholes in consolidated basement rock

- Some 175 boreholes (50%) were drilled with expert consultant hydro-geological siting and supervision, resulting in 70% success and with payment for both wet and dry bores
- Some 175 boreholes (50%) were drilled without expert consultant hydro-geological siting and supervision, resulting in 71% success and payment only for wet boreholes

Borehole Siting (Cont)

CATEGORISE RISK

- As there is no defined database, then informed Hydro-geologists classify "***Drilling Potential***" in each community into Categories:
 - Category A High = say > 90% success rate
 - Category B Medium = say 60 to 90% success rate
 - Category C Low = say < 60% success rate
- Under Categories A & B - Driller surveys and/or select actual sites, in the preferred areas of community
- Under Category C - Client surveys ALL Category C bore areas with both Resistivity profiling *and* Electro-magnetic (EM) techniques and selects actual sites

Borehole Siting (Cont)

CATEGORY PAYMENT STRUCTURE

- **CATEGORY A:** Dry bores not paid. Driller to site and his unit rates will include the risk of dry bores. The number of dry bores in any one community is limited to 3 max.
- **CATEGORY B:** Limited payment made for dry bores according to a formula (see over)
- **CATEGORY C:** Client defines sites and pays for both wet and dry bores.

Borehole Siting (Cont)

Category B: Limited Payment formula

COMMUNITY SELECTS 3 PREFERRED AREAS

- 1st bore success: 100% paid, move on
If 1st bore dry: No payment
- 2nd bore success: 100% paid, move on
If 2nd bore dry: 50% paid
- 3rd bore success: 100% paid, move on
If 3rd bore dry: 50% paid, move on

In event of three dry bores, Client to survey;
and any further drilling under Category C

Key Points for Drilling Sector

BUILD A HEALTHY DRILLING SECTOR

- Private sector rigs promote price efficiency
- Make strategy for private sector involvement
- Avoid subsidised operations:
 - Donated rigs / equipment ignores risk & destabilises competitive drilling sector
- Register and License all Drillers
- Encourage formation of Drillers Association

Key Points for Consideration in Sudan

- UNICEF Expenditure on Drilling Equipment for Sudan (1999 to 2007) = US\$ 6.8 million
 - *What has this equipment actually achieved?*
- Suggest need for an analysis of the Productivity of Govt drilling rigs



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THANK YOU !



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