Form 9–331
Dec. 1973

Form Approved.
Budget Bureau No. 42–R1424

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9–331–C for such proposals.)

1. oil well ☐ gas well XX other

2. NAME OF OPERATOR
Southland Royalty Company

3. ADDRESS OF OPERATOR
P.O. Drawer 570, Farmington, NM 87499

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1050' FNL & 1610' FWL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

5. LEASE
SF-077874

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Hanks

9. WELL NO.
13E

10. FIELD OR WILDCAT NAME
Basin Dakota

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Section 12, T27N, R10W

12. COUNTY OR PARISH
San Juan

13. STATE
New Mexico

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
6063' GL

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	☐		☐
FRACTURE TREAT	☐		☐
SHOOT OR ACIDIZE	☐		☐
REPAIR WELL	☐		☐
PULL OR ALTER CASING	☐		☐
MULTIPLE COMPLETE	☐		☐
CHANGE ZONES	☐		☐
ABANDON*	☐		☐
(other) X Alter Production Casing & Cement Program			

RECEIVED
DEC 7 1983
OIL CON. DIV.

RECEIVED
DEC 05 1983
BUREAU OF LAND MANAGEMENT
FARMINGTON RESOURCE AREA

(NOTE: Report results of multiple completion or zone change on Form 9–330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

SOUTHLAND ROYALTY COMPANy proposes to alter production casing and production casing cementing program as follows:

Production Casing: No DV tools will be run. Float equipment will be Bakerline guide shoe and Bakerline self fill flapper float collar run one joint above shoe. Five (5) Bakerline centralizers (bow-spring) will be spaced every other joint above shoe.

Production Casing Cement: Lead slurry will be 771 sacks (1689 cu.ft.) of 8.8 ppg foamed (46 quality) slurry to cover from 6316' to surface. Tail slurry will be 76 sacks (90 cu.ft.) of Class "B" neat cement. Volumes were computed on a 5-1/2" X 9" annular volume assumption. Volume will be adjusted after caliper log is run.
DOWELL CEMENTING PROPOSAL ATTACHED

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE Dist. Engineer DATE 12-02-83

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

APPROVED
DEC 06 1983
AREA MANAGER
FARMINGTON RESOURCE AREA

will be received
3.F.

*See Instructions on Reverse Side

NMOCC

Mr. Bob Fielder

Southland Royalty Company

High Performance Foam Cementing Recommendation

Hawks 13E Well

San Juan County, New Mexico

November 17, 1983

DOWELL DIVISION OF DOW CHEMICAL U.S.A.

PO BOX 1650
Farmington, NM
November 17, 1983

Mr. Bob Fielder
Bloomfield Hwy
Farmington, NM 87410

Dear Bob,

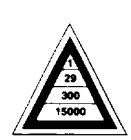
Please find enclosed Dowell's high performance foam cement recommendation for your Hawks 13E well in San Juan County, New Mexico.

Foamed cement is an ideal system in this area where formations as the Point Lookout and naturally fractured Gallup may break-down under the hydrostatic weight of common lightweight cement systems. Dowell's expertise in foam cementing techniques provides assurance that this well can be adequately and safely cemented in a single stage with high performance foamed cement.

Discussion:

The foam cement system that we suggest has a density of 8.8 ppg at calculated intervals in your well. By matching the mud weight needed to maintain circulation we can be sure to place a full column of competent cement. The Farmington district has thoroughly tested the class "B" cement which will be used as the base slurry. 24 hour compressive strengths of the 8.8 ppg foamed system were evaluated at our Tulsa Research Center and proved more than adequate at 650-700 psi. This system was develped for any special well conditions experienced and modified by a computer stimulator. The hydraulic seal of foam cement between casing and formation will help prevent corrossion of tubulars and migration or formation waters. Elimination of stage tools and excessive water slurries by a foam cement is a positive advantage in reducing the chances of inadequate fill-up and expensive remedial work.

Dowell's design for the Hawks 13E is highly technical but begins with Safety. By utilizing specialized equipment, trained personnel and computer derived pumping procedures the foam cement service is as safe as more common field operations.



Since control of the compressive nature of foam cement is critical when pumping, a multi-armed caliper log is essential to finalize all design parameters. However, for this recommendation we have chosen a given wellbore diameter to present this tentative program.

Well Parameters:

Total depth	6640'
Casing set	8 5/8" O.D.; 7.9" ID. set to 200'
Longstring	5½", 15 lbs casing
9" O.H.	from 6640' to surface
Foamed cement	placement from 6316' to surface
Tail slurry	6640' to 6315'
Mud weight	9.1 ppg circulating
Critically sensitive Formations	Point Lookout at 4307' Gallup at 5485'

Pumping Schedule:

To insure a clean casing and reduce mud contaminations, a series of chemical washes and weighted spacers to be pumped at 6-8 BPM.

A) Pump 10 bbls fresh water
B) Pump 20 bbls chemical wash 100
C) Pump 20 bbls spacer 3000

Tentatively designed foamed cement system to be modified by actual wellbore conditions.

D) 178 bbls batch mixed class "B" cement with .5% D65 (turbulence inducer) 1% S1 calcium chloride and 1.75% BVOW F52.1 foaming agent.

This is to be modified into foam with 73,000 SCF nitrogen at a total rate of 8 BPM.

E) Drop top rubber plug
F) Displace to float collar with fresh water.

If returns are circulated prior to displacement shut in annulus until plug bumps.

Enclosed is a cost estimate. However we feel that some of the equipment necessary to safely pump foam cement should be noted. To insure a correct foamed cement weight a homegenous base slurry must be mixed. This is accomplished with Dowell's paddle type batch mixer. Accurate nitrogen rates, pumper densities and pumper pressures will be monitored by Dowell's exclusive Treatment Monitoring Vehicle.

The T.M.V. is a computer enhanced monitoring system that will allow precise control of all pumping procedures to insure maximum quality control. Full wellhead control will be maintained by a series of adjustable chokes in the return flow line. All these techniques and procedures are essential to provide maximum performance with little hazards.

Cost Estimate:

Tools:	$ 1,164.00
Slurry:	19,659.51
Nitrogen:	1,679.00
Total:	$22,502.51

Tools Include:

1 Guide shoe
1 Float collar
1 Top rubber plug
15 Centralizers
1 Thread lock kit

*Costs are estimates only. Actual costs will be determined upon completion of the proposed treatment.

Safety:

Dowell has established on on location safety policy to which Dowell personnel must adhere. A prejob tailgate safety meeting will be held with company representatives and other on location personnel to familiarize everyone with existing hazards and safety procedures. Remote control pumping units will be utilized to remove personnel form high risk potentially hazardous areas. We would appreciate close cooperation between customer representatives and the Dowell representative to insure a smooth and safe operation.

EPA:

Dowell, Division of Dow Chemical USA has a fundamental concern for all who use our products and services and for the environment in which we live. As a part of our longstanding product stewardship program, we have provided our customers with Dowell technology to help make environmentally sound decisions when dealing with the disposal or treatment of wastes that might be generated as a result of the services we provide.

In addition, we feel an obligation to carry out our services within the framework of the laws and regulations governing our operations, including the disposal of wastes. As a result of the promulgation of the Resource Conservation and Recovery Act (RCRA), a number of requirements must be met when an operation is involved in the management of hazardous wastes. The "Site Specific" nature of the regulation suggests that the plant owner is in the best position to be the "Generator". We will continue to support our customers to help insure the proper dispoal of these wastes. If you have any questions about the handling and disposal of our products, feel free to contact your Dowell representative.

We appreciate the opportunity to submit this recommendation for your approval. If more information is desired, please advise. We are looking forward to performing this treatment for you out of our Farmington, New Mexico District which can be reached at 505-325-5096.

Sincerely,

Rick C. Klem
District Engineer
Farmington, NM 87401

RCK/dlg

CUSTOMER COPY

DOWELL INC.

COMPANY:SOUTHLAND
COUNTY: SAN JUAN
FIELD: BASIN DAKO

WELL:HAWKS 13E
STATE:NEW MEXIC
SALESMAN:RICK KLEM

NON-NITRIFIED CEMENT CAP		SPACER/WASH-1		SPACER/WASH-2	
SACKS	DENSITY	BBLS	DENSITY	BBLS	DENSITY
0.	0.0	20.	8.4	20.	8.4

FOAMED CEMENT QUALITY	FOAMED CEMENT DENSITY	FOAMED CEMENT YIELD	SACKS OF BASE CEMENT	SACKS OF TAIL-IN CEMENT	TAIL-IN CEMENT DENSITY	TAIL-IN CEMENT YIELD
46.26	8.8	2.19	771.	76.	15.6	1.18

N2 STAGE	DEPTH OF MIDPT (FT)	ANNULAR VOLUME (BBL)	BBLS OF CEMENT	TOTAL N2 PER STAGE (SCF)	SCF N2 PER BBL	SCF N2 PER MIN AT 4 BPM
1	710.	50.2	28.0	2635	94.	375
2	1729.	50.2	27.6	6529	236.	945
3	2748.	50.2	27.2	10401	383.	1530
4	3767.	50.2	26.8	14182	530.	2118
5	4786.	50.2	26.4	17805	675.	2700
6	5805.	50.2	26.0	21216	816.	3264
		TOTAL N2		72768	SCF	

P:

CEMENTING

TECHNICAL INFORMATION SHEET

DOWELL FOAMED CEMENT

DOWELL Foamed Cement is a mixture of nitrogen and a cement-slurry formulation which reduces the hydrostatic pressure encountered in cementing operations. By reducing this hydrostatic pressure, long intervals containing weak formations can be cemented in a single stage.

Multi-stage cementing can be expensive, time consuming and sometimes aggravating. DOWELL Foamed Cement can eliminate the cost of stage cementing tools, the extra rig-time costs associated with stage cementing and is normally more economical than bubble-type lightweight cement additives—especially those additives which collapse at moderate bottom-hole pressures. (A foamed cement job was recently performed at bottom-hole pressures exceeding 5000 psi.)

DOWELL R&D has developed a system of additives and foamers which control foam stability and reduce foamed cement permeability. These additives, and the mixing technique, help in producing and placing a foamed cement with the desired density, high strength and low permeability.

DOWELL Foamed Cement can be designed to produce slurries weighing from 6 to 11 ppg after being pumped into position. Since the hydrostatic pressure compresses the foam in the slurry, the nitrogen content should be altered during the job to help produce a uniform density throughout the length of the slurry column (see Figure 1).

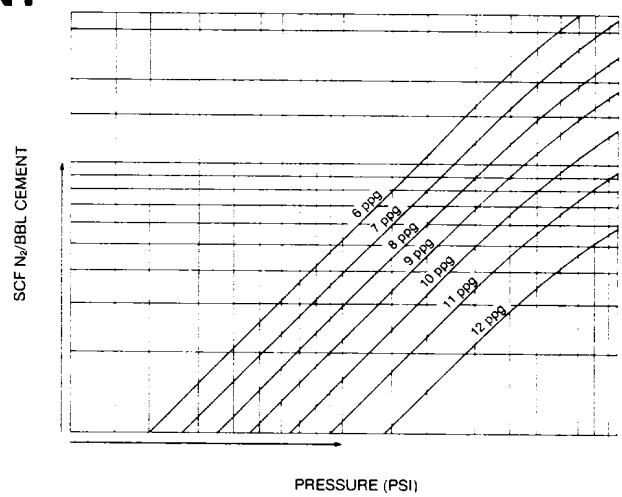


FIGURE 1. Slurry density is controlled by increasing N_2 as down-hole pressures increase.

STRENGTH

DOWELL Foamed Cement shows higher compressive strength than conventional lightweight cements which depend upon addition of excess water for density reduction. Reducing the density of a cement slurry by the use of excess water usually reaches a point of diminishing returns near 11 ppg where strength diminishes rapidly as more water is used. As the weight of the slurry nears the weight of water, impractical amounts of water must be added for additional density reduction. Since nitrogen is much lighter than water, less volume is needed to reduce the cement's density, resulting in a higher compressive strength (see Figure 2).

PERMEABILITY

Along with providing higher compressive strength, DOWELL Foamed Cement has low permeability. Conventional lightweight cement systems have always been needed by the petroleum industry. However, their practicality has been limited by the fact that cement permeability normally increases as slurry density decreases, so that very lightweight slurries often have high permeabilities. Now, DOWELL Foamed Cement makes possible the design for permeabilities of less than 0.1 md at slurry weights of 8 to 11 ppg.

DOWELL DIVISION OF DOW CHEMICAL U.S.A., AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY, HOUSTON, TEXAS 77042

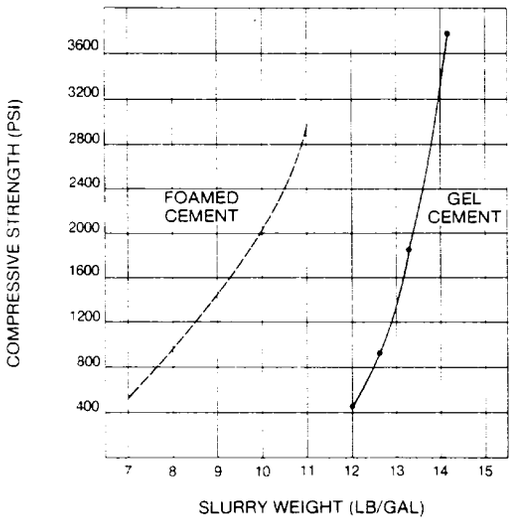


FIGURE 2. Comparison of Foamed Cement and Gelled Cement

DOWELL Foamed Cement can also be used in geothermal wells. The inert gas trapped in the set cement reduces heat loss through the cement sheath, making DOWELL Foamed Cement useful for thermal recovery applications where steam is used.

ADVANTAGES

- Reduces Hydrostatic Pressure
- Permits Single-Stage Cementing
- Superior Compressive Strength
- Low Permeability
- Economical
- Geothermal Applications

TSL-4055
9817.5M