NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
BETTY RIVERA
Cabinet Secretary

July 23, 2002

Lori Wrotenbery
Director
Oil Conservation Division

Dugan Production Corporation
709 E. Murray Dr
PO Box 420
Farmington, New Mexico 87499-0420

Attn: Mr. John Alexander

> **Re:** *Injection Pressure Increase -) 82*
> *Sanchez O'Brien Well No. 1 SWD*
> *San Juan County, New Mexico*

Dear Mr. Alexander:

Reference is made to your request dated July 1, 2002 (received in this office July 3, 2002), to increase the surface injection pressure on the above referenced SWD well. This request is based on a step rate test conducted on the well on June 6, 2002. After reviewing test results, we feel an increase in injection pressure is justified at this time.

With size and type of tubing remaining 2 7/8 inch set at 3210 feet, you are authorized to increase the surface injection pressure to the following:

| Well and Location	Maximum Surface Injection Pressure
Sanchez O'Brien Well No. 1 SWD (API: 30-045-25298) 1650 FSL, 990 FWL, Sec 6, T24N, R9W, NMPM, San Juan County	2200 PSIG Water

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,
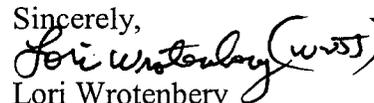
Lori Wrotenbery
Director

cc: Oil Conservation Division – Aztec
        Files: SWD-694; IPI 2002

dugan production corp.
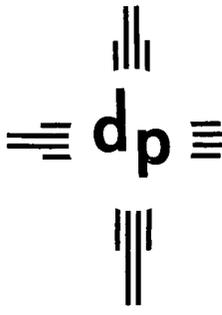
July 1, 2002

Mr. David Catanach
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Step Rate Test   (30-045-25298)
        Dugan Production Corp.'s
        Sanchez O'Brien #1 SWD
        San Juan County, New Mexico

Dear Mr. Catanach:

I would like to request approval for an increase in the injection pressure allowed at the subject well. The step rate test went to completion. Please find American Energy Services' graph & pump data, along with Tefteller's downhole recording data, on the enclosed disk.

Thank you for your help and please feel free to contact me if you have any questions.

Sincerely,

Terry Kochis
Petroleum Engineer

TK:sh

Enclosures

cc: Mr. Charlie Perrin, OCD-Aztec

Sanchez O'Brian 1 SWD - Step Rate Test
June 6th, 2002

BHP @ 1 st. Fracture = 2834 PSI &
BHP @ 2nd. Fracture = 2994 PSI
Based on Graph Below

BHP (PSI)

Bottomhole Fracture Pressure Intercept

Rate Intercept

Bottomhole Pressure (PSI)

Rate (BPM)
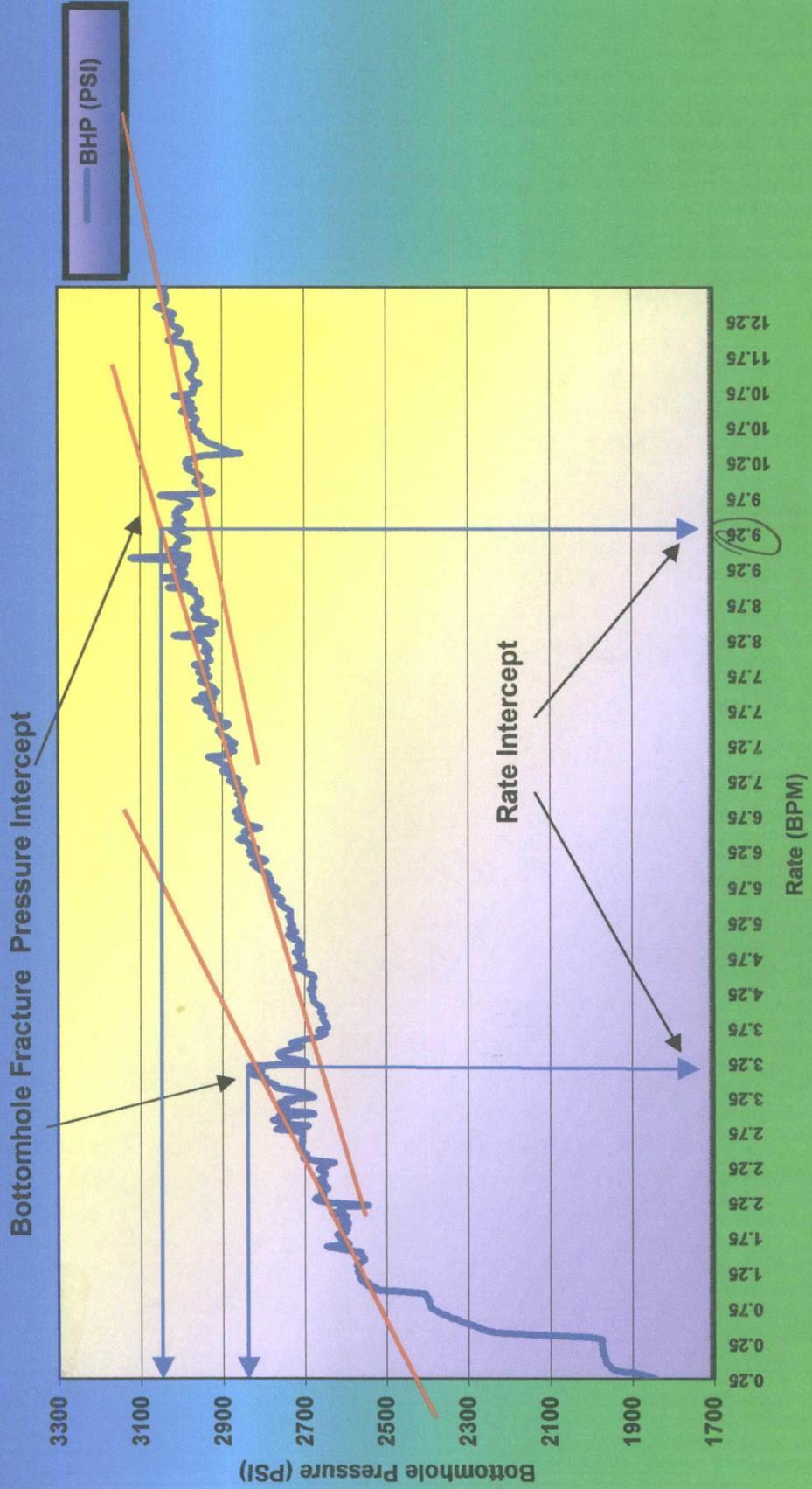
9.25 BPM @ 3000 PSI

Jones, William V

From:	John Alexander [johncalexander@duganproduction.com]
Sent:	Wednesday, July 24, 2002 12:59 PM
To:	Will Jones
Subject:	Sanchez O'Brien 1 SRT

July 24, 2002

Will:

I found surface data in one of the files that had previously been sent to you. It was difficult to recognize that it was surface pressure, but American Energy said that it was. The original file had a file extension of "CMT". I have attached two items. One is a new graph in jpeg format. The new graph includes the surface pressure and a new axis showing the rate in relation to time. I have attached an Excel spreadsheet where all of the data plotted on the graph is recorded. I left the temperature column in, but of course you don't really need that. The well had 2-7/8" plastic lined tubing set in a packer at 3210'.

Let me know if I can provide any additional information. Thanks for you help.

John Alexander
Dugan Production Corp.
505-325-1821

Dugan's Sanchez O'Brien #1
SRT 6/6/02

Legend:
- TP
- BHP

Pressure (y-axis): 2,300; 2,400; 2,500; 2,600; 2,700; 2,800; 2,900; 3,000; 3,100

Rate - BPM (x-axis): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Handwritten annotations:
- 1500 psi < (Surface) with FRICTION
- 74' - 18'
- 2640 psi Surface
- 2680 = BHP - 50 psi

Dugan - 4 townships in San Juan Cty

API	WELL NAME	NS	EW	UL1	UL2	Sec	Twp	Rge	TVD	Land Type	Well Type	Orig FORM (or NOTES)	P&A Date	STATUS	Latest Pool

Production

Totals = 58645 8556 8581 246586 39931 31075 253952 44820 80960

GAS2002 OIL2002 WAT2002 GAS2001 OIL2001 WAT2001 GAS2000 OIL2000 WAT2000 POOL PROP

injection

26230 86317 127301

WATER INJ 2002 WATER INJ 2001 WATER INJ 2000

Dugan's Sanchez O'Brien #1
SRT 6/6/02
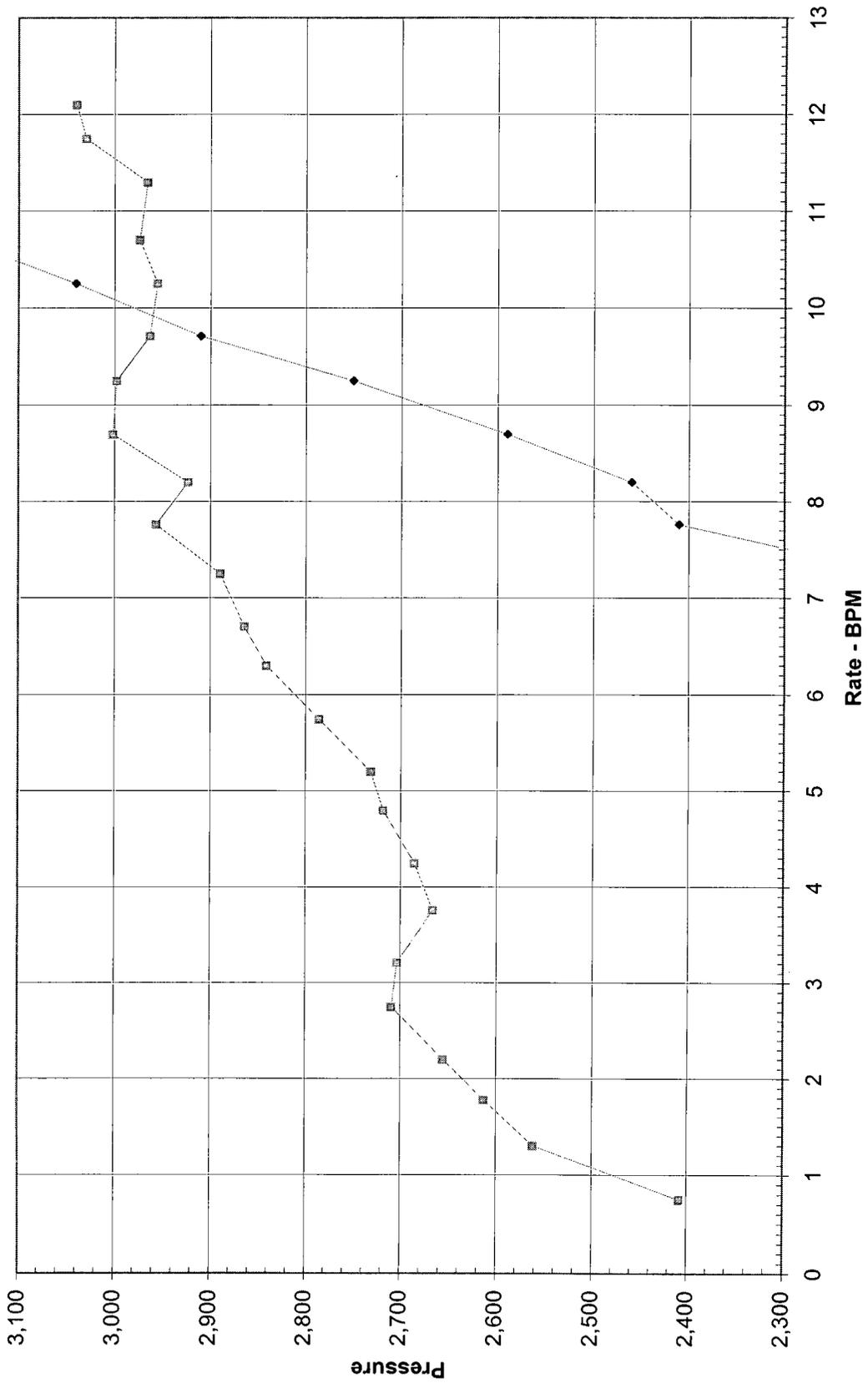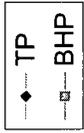
Sanchez O'Brien 1 SWO SRT

BHP vs. Rate/Time
Fit 3: Linear
Fit 2: Linear
Surface Pressure
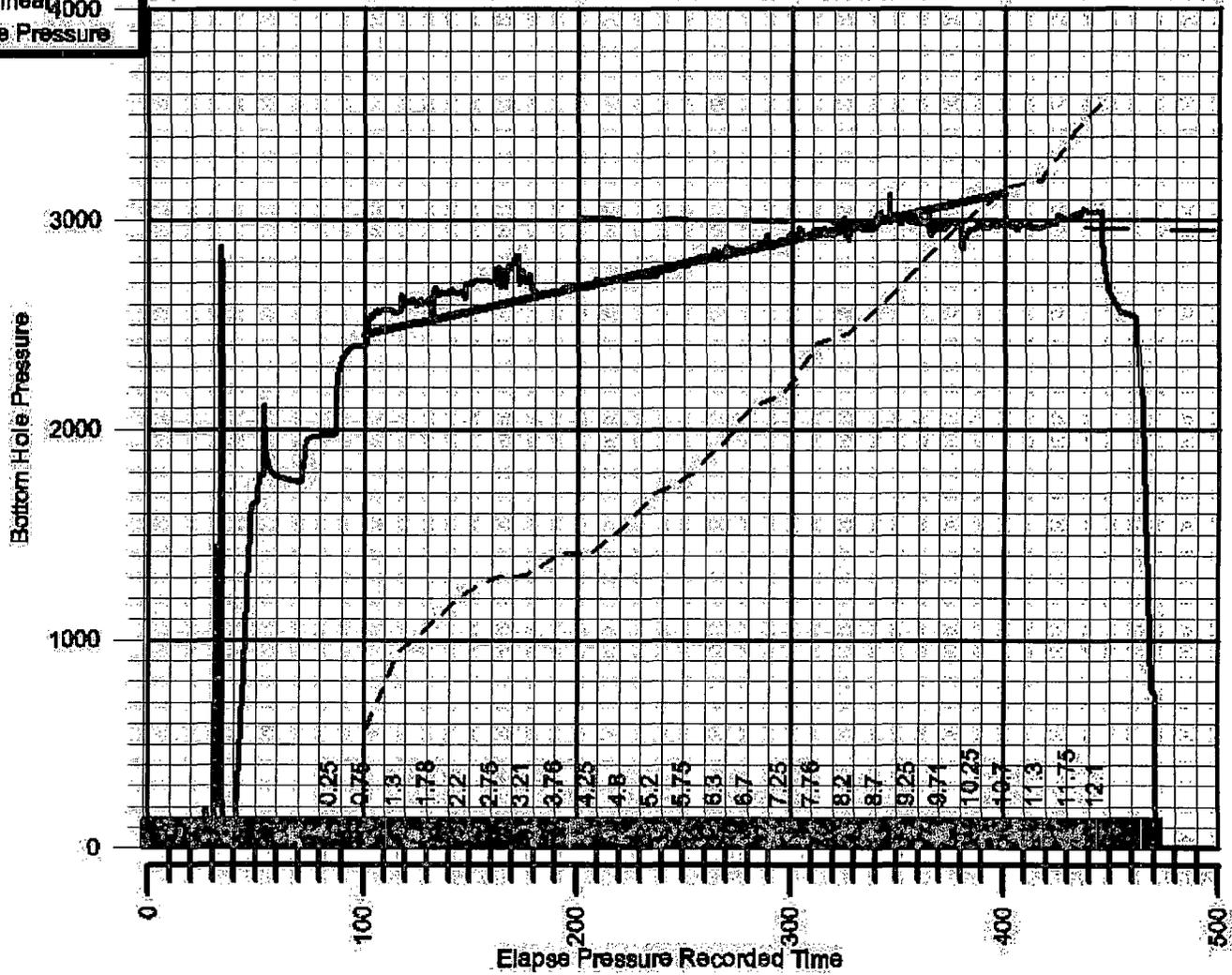
$\dfrac{4.25\,B}{M} \quad \dfrac{42\,Gal}{BG}$

FRICTION LOSS FOR WATER IN FEET PER 100 FEET OF PIPE

2 INCH NOMINAL DISCHARGE		STEEL SCHEDULE 40 ID = 2.067 INCHES e/D = 0.00087		
CFS	GPM	V ft/sec	V²/2g feet	hf feet per 100 feet of pipe
0.00446	2	0.191	0.000558	0.0151
0.00668	3	0.287	0.00128	0.0302
0.00891	4	0.382	0.00227	0.0497
0.0111	5	0.478	0.00355	0.0731
0.0134	6	0.574	0.00511	0.1004
0.0156	7	0.669	0.00696	0.131
0.0178	8	0.765	0.00909	0.168
0.0201	9	0.860	0.0115	0.205
0.0223	10	0.956	0.0142	0.248
0.0267	12	1.15	0.0205	0.343
0.0312	14	1.34	0.0278	0.453
0.0356	16	1.53	0.0364	0.578
0.0401	18	1.72	0.0460	0.717
0.0446	20	1.91	0.0568	0.868
0.0490	22	2.10	0.0686	1.03
0.0535	24	2.29	0.0818	1.20
0.0579	26	2.49	0.0960	1.39
0.0624	28	2.68	0.111	1.60
0.0668	30	2.87	0.128	1.82
0.0780	35	3.35	0.174	2.42
0.0891	40	3.82	0.227	3.10
0.100	45	4.30	0.288	3.85
0.111	50	4.78	0.355	4.67
0.123	55	5.26	0.430	5.59
0.134	60	5.74	0.511	6.59
0.145	65	6.21	0.600	7.69
0.156	70	6.69	0.696	8.86
0.167	75	7.17	0.799	10.1
0.178	80	7.65	0.909	11.4
0.189	85	8.13	1.03	12.8
0.201	90	8.60	1.15	14.2
0.212	95	9.08	1.28	15.8
0.223	100	9.56	1.42	17.4
0.245	110	10.52	1.72	20.9
0.267	120	11.5	2.05	24.7
0.290	130	12.4	2.40	28.8
0.312	140	13.4	2.78	33.2
0.334	150	14.3	3.20	38.0
0.356	160	15.3	3.64	43.0
0.379	170	16.3	4.11	48.4
0.401	180	17.2	4.60	54.1
0.423	190	18.2	5.13	60.1
0.446	200	19.1	5.68	66.3
0.490	220	21.0	6.86	80.0
0.535	240	22.9	8.18	95.0
0.579	260	24.9	9.60	111
0.624	280	26.8	11.14	128
0.668	300	28.7	12.8	148
0.713	320	30.6	14.5	166
0.758	340	32.5	16.4	187
0.802	360	34.4	18.4	209
0.847	380	36.3	20.5	233
0.891	400	39.2	22.7	258

2½ INCH NOMINAL DISCHARGE		STEEL SCHEDULE 40 ID = 2.469 INCHES e/D = 0.000729		
CFS	GPM	V ft/sec	V²/2g feet	hf feet per 100 feet of pipe
0.00668	3	0.201	0.000628	0.0129
0.00891	4	0.268	0.00112	0.0213
0.0134	6	0.402	0.00251	0.0432
0.0178	8	0.536	0.00447	0.0712
0.0223	10	0.670	0.00698	0.105
0.0267	12	0.804	0.0100	0.145
0.0312	14	0.938	0.0137	0.191
0.0356	16	1.07	0.0179	0.243
0.0401	18	1.21	0.0226	0.300
0.0446	20	1.34	0.0279	0.362
0.0490	22	1.47	0.0338	0.430
0.0535	24	1.61	0.0402	0.502
0.0579	26	1.74	0.0472	0.580
0.0624	28	1.88	0.0547	0.663
0.0668	30	2.01	0.0626	0.753
0.0780	35	2.35	0.0855	1.00
0.0891	40	2.68	0.112	1.28
0.100	45	3.02	0.141	1.60
0.111	50	3.35	0.174	1.94
0.123	55	3.69	0.211	2.32
0.134	60	4.02	0.251	2.72
0.145	65	4.36	0.295	3.16
0.156	70	4.69	0.342	3.63
0.167	75	5.03	0.393	4.13
0.178	80	5.36	0.447	4.66
0.189	85	5.70	0.504	5.22
0.201	90	6.03	0.565	5.82
0.212	95	6.37	0.630	6.45
0.223	100	6.70	0.698	7.11
0.245	110	7.37	0.844	8.51
0.267	120	8.04	1.00	10.0
0.290	130	8.71	1.18	11.7
0.312	140	9.38	1.37	13.5
0.334	150	10.05	1.57	15.4
0.356	160	10.7	1.79	17.4
0.379	170	11.4	2.02	19.6
0.401	180	12.1	2.26	21.9
0.423	190	12.7	2.52	24.2
0.446	200	13.4	2.79	26.7
0.490	220	14.7	3.38	32.2
0.535	240	16.1	4.02	38.1
0.579	260	17.4	4.72	44.5
0.624	280	18.8	5.47	51.3
0.668	300	20.1	6.28	58.5
0.780	350	23.5	8.55	79.2
0.891	400	26.8	11.2	103
1.000	450	30.2	14.1	130
1.114	500	33.5	17.4	160
1.225	550	36.9	21.1	193
1.337	600	40.2	25.1	230

NOTE: No allowance has been made for age, differences in diameter, or any abnormal condition of interior surface.

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Link to the Mc Nally home page