AUTHORITY TO DRILL A WELL FORM

E.A. # 215
D.A. #1311

Canada Oil and Gas Lands Administration / Administration du pétrole et du gaz des terres du Canada

Nova Scotia	☐	West Coast	☐	Exploratory	☒
Newfoundland	☐	Northern	☒	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: NSM et al BLUEBERRY CREEK K-53

Operator: NSM RESOURCES LTD. Drilling Program No.: N/A

Contractor: SPARTAN DRILLING Permit or Lease No.: EA 215

Drilling Rig or Unit: Rig #12 Estimated Well Cost: 5,535,600

Location Unit: K Section: 53 Grid Area: 64 - 50 -126 -15

Coordinates: Lat.: 64° 42' 34" N Long.: 126°25'42.8" W

Area: Ft. Norman, N.W.T. Field/Pool: WILDCAT

Elevation ~~RT~~/KB: 350.5 m (ASL) Ground: ~~Sea~~ 346.48 m ~~DRK~~

Approx. Spud Date: 86/02/05 Estimated Days on Location: 60

Anticipated Total Depth: 2800 m KB Target Horizon(s): BEAR ROCK

UVI: 300K536450126150

EVALUATION PROGRAM

Ten-metre sample intervals: NONE

Five-metre sample intervals: 20 mKB to T.D.

Canned sample intervals: ALL

Conventional cores at: AT GEOLOGIST'S DISCRETION

Logs and Tests: DLL-SP, BHCS-GRC, CNL-FDC, SURF TO T.D. Velocity Survey (surf. to T.D.)

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth (m KB) ~~Below Seafloor~~	Cementing Program (Volumes):
339mm	81.1 kg/m	J-55	175m	30t Permafrost to surface
2445mm	53.6 kg/m	J-55	700m	40t to surface
114.3mm	17.26 kg/m	J-55 - ST&C	2800-2130	
114.3mm	15.63 kg/m	J-55 - ST&C	2130-480m	2 stage to surface
114.3mm	17.26 kg/m	J-55 - LT&C	480-0m	

B.O.P. Equipment: 1 annular, 2 single gates 21 m.p.a.

Diverter to be installed on 339mm string

Other Information: 508mm conductor casing set @ 15m 5.5t permafrost cement to surface

Signed: F. T. Hodgins Title: Vice President, Drilling and Production

Date: 21 Jan 1986 Company: NSM Resources LTD.

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

ADEQUATE
REVIEWED BY Ken
DATE 86 02 06

Signed: [signature] Engineering Branch

Date: 6 Feb 1986

File: 9211-N9-3-1

Department of Energy, Mines and Resources / Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development / Ministère des Affaires indiennes et du Nord Canadien

Canada

WELL TERMINATION RECORD

Canada Oil and Gas Lands Administration / Administration du pétrole et du gaz des terres du Canada

D.A. 1511

				Well Status	
Nova Scotia	☐	West Coast	☐	Suspended	☐
Newfoundland	☐	Northern	☒	Completed	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Abandoned	☒

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations.

WELL DATA

Well Name: NSM ET AL BLUEBERRY CREEK K-53 Area: FT. NORMAN

Grid Area: 64-50-126-15 Field/Pool: WILD CAT

Permit or Lease No.: E.A. 215 Final Coordinates: Lat.: 64°42'34" N Long: 126°25'42.8" W

Drilling Unit: Spartan Rig # 12 Elevations /KB: 350 m /GL: 346.48 m

Spud Date: 86-02-08 @ 00:00 hrs Released: 86-04-04 Total Depth: 2965 m KB

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
340mm	81.27kg/m	K55	193m	24 tonnes Arctic Set
244.5 mm	53.6 kg/m	K55	698m	40 tonnes "G" Neat

PLUGGING PROGRAM

Approval of the following program was obtained by (person) ROBERT G. LOCK from (person) KEM SINGH of the Canada Oil and Gas Lands Administration by means of TELEPHONE on APRIL 1st 19 86

Type of Plug:	Interval:	Felt:	Cement and Additives:
#1 Cement	2965-2865 m KB.	No feel	6.5 tonnes "G" + 5% CLO2
#2 Cement	2625-2525 m KB.	2515m	7.75 tonnes "G" + 5% CLO2
#3 Cement	1850-1750 m KB	1742m	10.4 tonnes "G" + 5% CLO2
#4 Cement	1315-1215 m KB	1192m	28.5 tonnes "G"
#5 Cement	727-667 m KB	600m	10 tonnes "G"

Lost Circulation/Overpressure Zones: 111m

Equipment left on Seafloor (Describe):

Provision for Re-entry (Describe and attach sketch):

Cores: Type: Intervals: NIL

Other Downhole Completion/Suspension Equipment:

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: F. T. Nadir P. Eng. Title: Consulting Engineer

Name: F. T. Nadir Date: February 11, 1987

Acknowledged by: Engineering Branch

Date: 20 May 87

File: 9211-N9-3-1

Department of Energy, Mines and Resources / Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development / Ministère des Affaires indiennes et du Nord canadien

Canada

CONOCO
WELL
SUMMARY
(Handwritten)

CONOCO

NSM BLUEBERRY CREEK K-53
WELL SUMMARY

Date	Depth (m)	Comments	Bit #
			311mm 1A
86-2-9	0	Spud	
2-10	76		
2-11	128	lost circ @ 128 m, mix LCM	
2-12	184	lost circ @ 161m, mix LCM - OK	
2-13	193	run 340mm csg @ 193m, cmt to surface	
2-14	193	WOC, nipple up Hydril	
2-15		nipple up, drill out	311mm 1B
2-16	432	drlg, no problems MW = 1190	
2-17	563	drlg, TFB	
2-18	693	drlg, hole tight @ 584m MW = 1200, VIS = 54	311mm 2E
2-19	696	losing circ, POH to run csg	
2-20	696	run 244mm csg to 690 m	
2-21	696	WOC, nipple up	
2-22	702	test BOP's, drill out	222mm 1
2-23	971	run leakoff test to 15 kN/m, drlg, MW = 1120	
2-24	1095	drlg	
2-25	1188	TFB, bridge @ 910 m	222mm 2
2-26	1289	drlg, dev - 4-5° MW = 1140 VIS = 45	
2-27	1333	drlg, dev - 3°	
2-28	1370	drlg, dev - 3°	
3-1	1442	TFB, drlg, dev - 2°	222mm 3
3-2	1515	drlg, dev - 2°	
3-3	1617	drlg, TFB MW = 1160, VIS = 52, WL = 6	222mm 4
3-4	1706	drlg, dev - 1½°	
3-5	1812	drlg, dev - 3¼°	
3-6	1904	drlg, dev - 1°	
3-7	1934	TFB, keyseat @ 1220 - 1455	222mm 5
3-8	2024	Fish, drlg ream 1880 - 1920 MW = 1150, VIS = 52, WL = 7	
3-9	2106	drlg, dev - 1°	
3-10	2172	drlg	
3-11	2226	drlg	
3-12	2277	drlg, trip for washout, dev - 2-3°	
3-13	2277	TFB pick up mwd, bridge @ 1239, ream 1239 - 1305	222mm 6
3-14	2312	ream 1258 - 1486, bridge @ 2101, ream 2101 - 2277, drlg	
3-15	2397	drlg, dev - 2° MW - 1168 VIS - 62 WL - 9	

CONOCO

3-16	2461	drlg	
3-17	2484	drlg, MM running multishot	
3-18	2558	drlg, ream 2485-80, no fill	222aa 7
3-19	2626	drlg, dev - 2° MW-1140, vis-A, wl-8	
3-20	2682	drlg, dev - 2-4°	
3-21	2732	drlg, dev - 5°	
3-22	2765	TFB	
3-23	2765	keyseat, stuck @ 1293	
3-24	2781	TFB, bridge @ 1240, 1500, 2033, 2309	222aa 8
		ream 1240-1424	
3-25	2833	drlg MW-1150 vis-70 wl-9	
3-26	2882	drlg	
3-27	2905	TFB	222aa 9
3-28	2965-TD	drlg, ream dev-2° 2193-2223 MW-105 vis-40 wl-8	
3-29	2965	log, bridge @ 1320a Computalog	
3-30	2965	clean out hole, run Dual-Sonic	
3-31	2965	run CNL, velocity survey	
4-1		DST #1 - pkr bad, DST #2 2538-2565	
9			
4-2		DST #3 1788-1815 no test	
4-3		set plugs 2965-2865, 2625-2525, 1850-1750	
4-4		set plugs 1315-1215, 727-667	
4-5		start rigging out	
4-6		rig out	
4-7		rig @ staging site	
Final Cost - $41,321 Cdn			

CONOCO

K53 BIT RECORD

BIT	SIZE	TYPE	IN	OUT	METRES	HOURS	F/PH	WOB	RPM	COND
1A	444	SDT	15	193	178	25	7	8-10	100/120	3-2-I
1B	311	SDT	193	536	343	39	9	15-18	120/140	6-6-I
2B	311	SDT	536	698	160	21	8	15-18	100/140	2-1-I
1	222	F2	698	1095	397	34	12	12-14	100/130	2-5-I
2	222	F2	1095	1334	239	51	4.7	14	100/110	1-4-I
3	222	506H	1334	1442	108	31	3.5	10-12	120	4-3-I
4	222	F2	1442	1929	487	105	4.6	15-18	90	3-8-I
5	222	F2	1929	2277	348	94	3.7	10-15	100	3-3-I
6	222	F3	2277	2483	206	60	3.4	12-14	60/70	3-4-I
7	222	F3	2483	2765	282	103	2.7	14-16	80/90	8-8-
8	222	F3	2765	2905	140	58	2.4	14	80	4-3-I
9	222	F4	2905	2965	60	24	2.5	15-18	70	

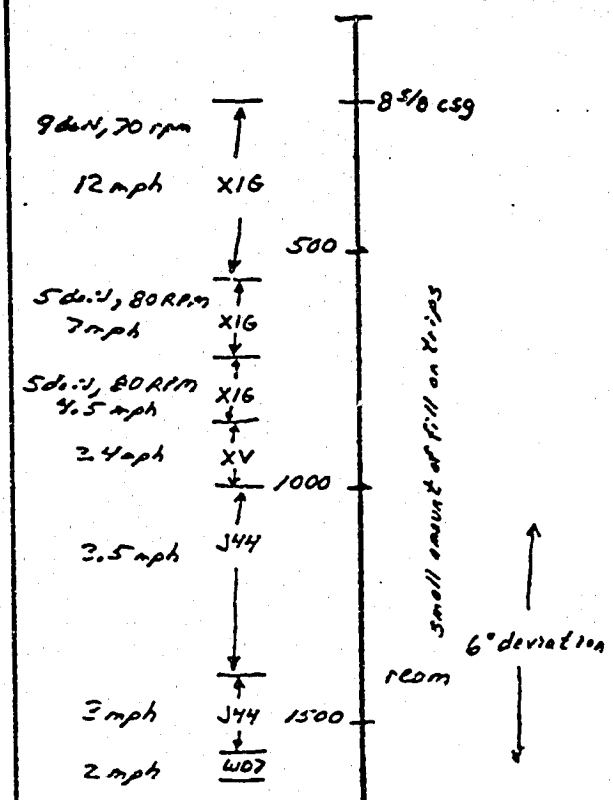
K53 LITHOLOGY

0-500 m ... Conglomerate, siltstone, shale

500-2350 ... Shale, siltstone

2350-2575 ... Limestone

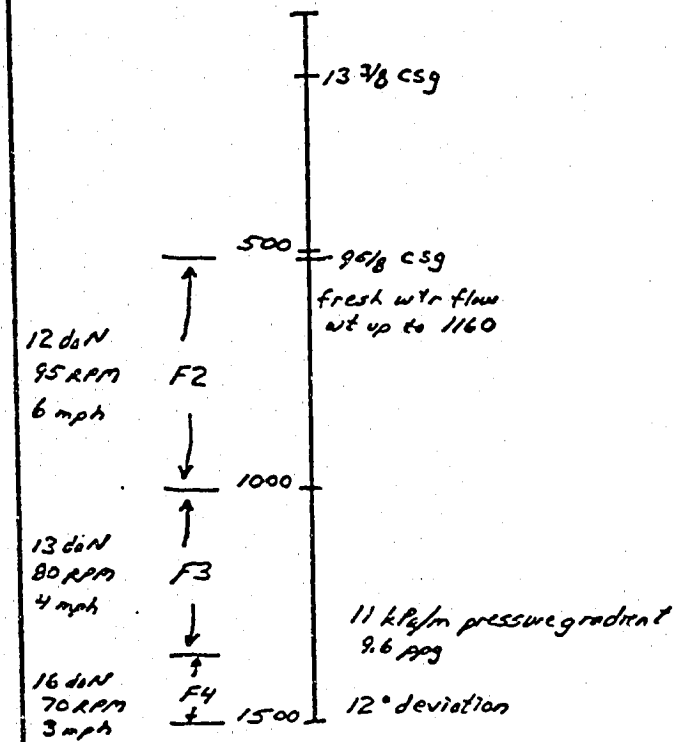
2575-2965 ... Dolomite, anhydrite



East Mackay B45

1971

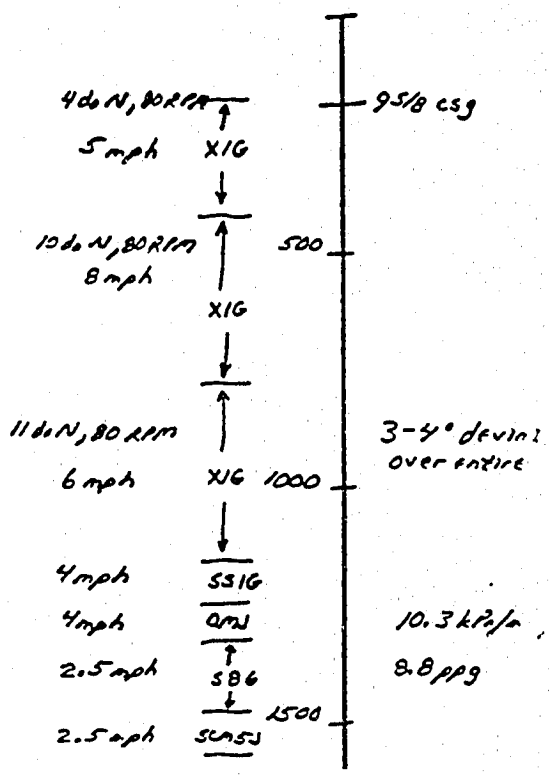
25 days to TD



Windy Island A-53

1985

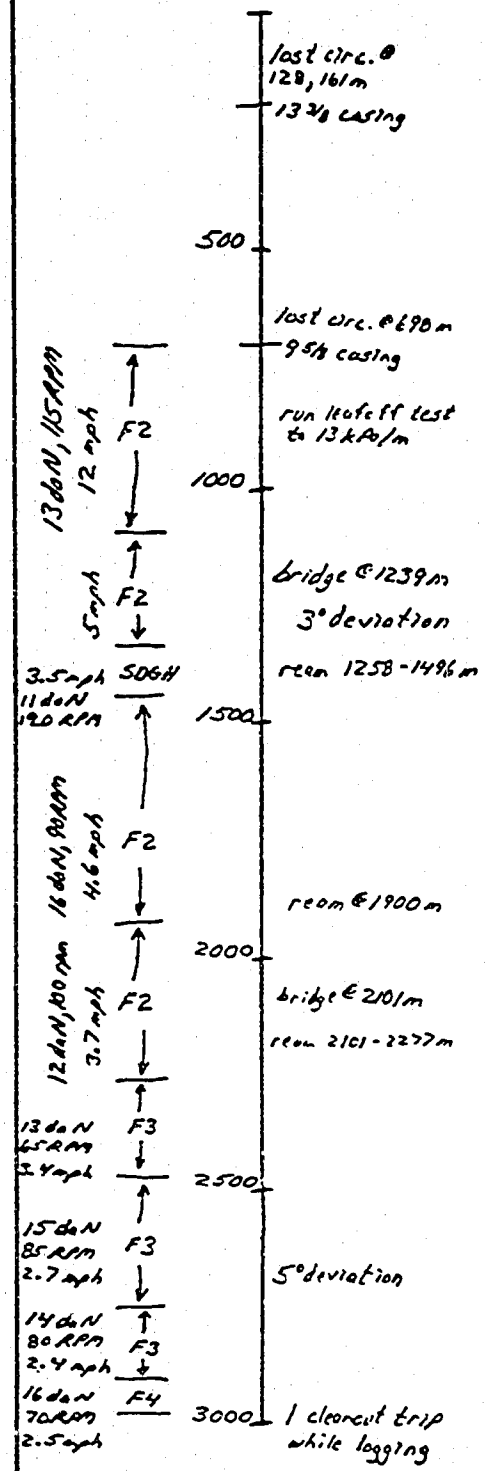
19 days to TD



Bluefish K-71

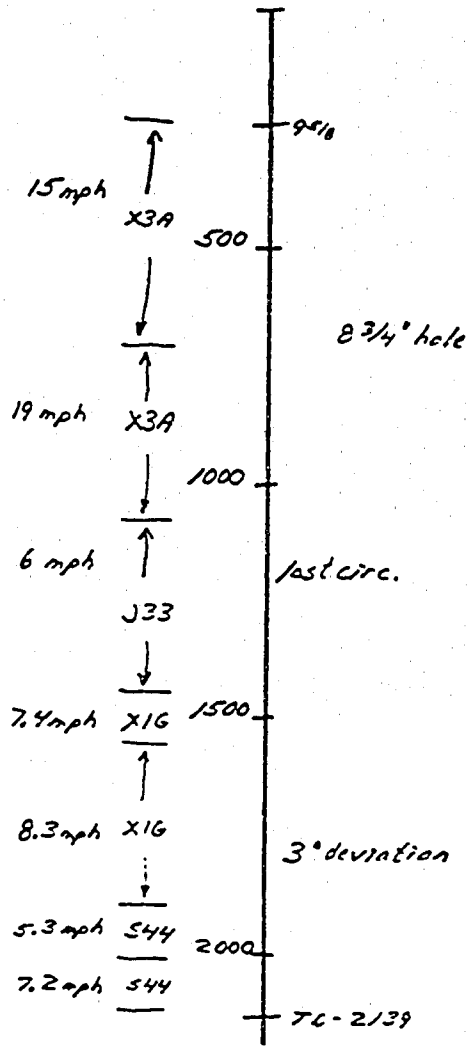
1973

22 days to TD



NSM K-53

1986



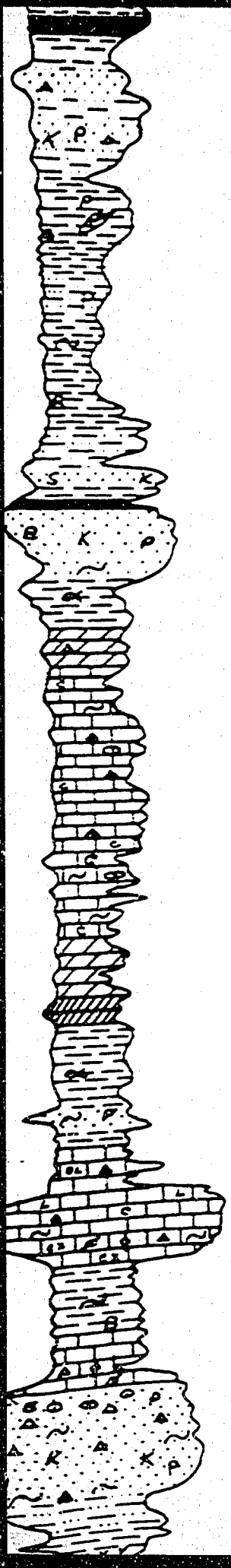
Little Beer I-70

1972

17 days to TD

DAYMAR REPORT

DAYMAR REPORT



DAYMAR

WELL LOGGING LTD.

HYDROCARBON

NSM ET AL BLUEBERRY CREEK

K-53

Northwest Territories, Canada

NSM RESOURCES LTD.

OTTAWA COPY

CALGARY, ALBERTA

9911-NW-3-1

GEOLOGICAL REPORT

on

NSM ET AL BLUEBERRY CREEK

K-53

Northwest Territories

for

NSM RESOURCES LTD.

CANADA O AND NDS
ADMIN ET DU
CAL NDA
SEP 2 1986
ENGINEERING AND CONTROL
TECHNIQUE ET DU CONTROLE

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Composite and Lithological Log ..... Included

February 1986

Gary Timmons
Geologist
250-9189

WELL DATA SUMMARY

Well Name:	NSM ET AL BLUEBERRY CREEK
Location:	K-53
Operator:	NSM RESOURCES LTD.
Contractor:	Spartan Drilling Ltd. #12
Province:	Northwest Territories
Area:	Bear Rock
Licence No.:	Drilling Authority #1311
Spud Date:	February 9, 1986 @ 00:01 hrs
Elevations:	Ground Level 346.48 m Kelly Bushing 349.98 m
Conductor Pipe:	508 mm conductor pipe set at 15 m, cemented with 5.5 tonnes of permafrost cement
Permafrost Casing:	Drilled 444 mm hole, set 193 m of casing with 27 joints of 339 mm, J-55, ST&C, cemented with 24 tonnes of Arctic Set cement
Surface Casing:	Drilled 311 mm hole, set 698 m of casing with 53 joints of 244 mm, J-55, ST&C, cemented with 40 tonnes of Neat cement
Production Casing:	Dry and abandoned, rig released April 4, 1986 @ 08:00 hours
Logs Run:	BHCS, DIL (Computalog) CNL-FDC (Computalog) VSP (Century Geophysical)
Geologist:	Gary Timmons - Daymar Well Logging Ltd. 250-9189
Drilling Supervisor:	Floyd Domeij - Adventure Consulting Ltd. Dal Seely - Seely Oilfield Supervision Ltd.
Toolpushers:	Gary Skinner, Ron Lesy, Ron Sutley - Spartan Drilling Ltd.

NSM ET AL BLUEBERRY CREEK K-53

FORMATION TOPS

Formation	Sample	E-Log	Subsea
Summit Creek	surface	--	--
East Fork Sandstone Member	160	160	+ 189.98
East Fork Shale/Slater River Undivided	429	429	- 79.02
Basal Cretaceous	1258	1256	- 906.02
Imperial	1286	1285	- 935.02
Canol	2252	2241	-1891.02
Hume	2361	2361	-2011.02
Lower Hume	2425	--	--
Landry	2538	--	--
Manitoe	2570	--	--
Bear Rock	2594	2593	-2243.02
Ronning	--	--	--
Total Depth	2965	2965	-2615.02

DEVIATION SURVEYS

27 m	1/2°
37 m	1/4°
47 m	1/4°
57 m	1/8°
76 m	1/16°
86 m	1/8°
96 m	1/4°
114 m	1/4°
123 m	1/2°
128 m	1/2°
133 m	1/2°
143 m	1/2°
153 m	3/4°
162 m	1 1/8°
173 m	1°
183 m	1/2°
193 m	3/4°
204 m	1/2°
213 m	0°
223 m	1/8°
240 m	3/4°
250 m	1/2°
259 m	1/4°
269 m	1/2°
279 m	3/4°
288 m	1/8°
297 m	7/8°
308 m	1/2°
318 m	1/2°

Deviation Surveys

345 m	3/8°
374 m	7/8°
403 m	1 1/16°
412 m	1/2°
441 m	1/4°
470 m	1/8°
498 m	1/2°
526 m	1°
555 m	7/8°
584 m	3/8°
613 m	1/8°
671 m	1/2°
733 m	3/4°
762 m	3/4°
799 m	3/4°
828 m	3/4°
847 m	7/8°
875 m	7/8°
905 m	1°
932 m	1 1/8°
961 m	1 1/8°
990 m	1 1/4°
1019 m	1°
1057 m	7/8°
1095 m	1 1/8°
1118 m	7/8°
1142 m	7/8°
1171 m	1/8°
1210 m	4°

Deviation Surveys

1219 m	5°
1228 m	5 1/2°
1239 m	4 7/8°
1248 m	4 3/8°
1257 m	4 1/4°
1267 m	4°
1276 m	3 3/4°
1286 m	3 3/4°
1295 m	3°
1305 m	3°
1314 m	3 1/16°
1324 m	3 1/2°
1337 m	3 1/2°
1347 m	3°
1357 m	3°
1366 m	2 7/8°
1376 m	2 1/2°
1385 m	2 1/16°
1395 m	1 15/16°
1404 m	1 15/16°
1425 m	2°
1433 m	1 1/2°
1452 m	1 1/16°
1471 m	1 1/16°
1486 m	1 3/4°
1495 m	1 1/4°
1505 m	1 3/4°
1514 m	1 3/4°
1524 m	1°

Deviation Surveys

1542 m	3/4°
1561 m	3/4°
1580 m	1/2°
1619 m	1 1/2°
1628 m	1 3/4°
1637 m	1 3/4°
1647 m	1 1/2°
1656 m	1 1/4°
1666 m	7/8°
1685 m	3/4°
1714 m	3/4°
1733 m	5/8°
1765 m	1/4°
1789 m	7/8°
1809 m	1 1/8°
1828 m	1°
1857 m	1 1/4°
1886 m	3/4°
1915 m	7/8°
1944 m	7/8°
1982 m	2 3/4°
2001 m	2°
2020 m	7/8°
2029 m	1°
2049 m	7/8°
2077 m	1 1/8°
2097 m	1°
2125 m	1 1/8°
2153 m	1 1/2°

Deviation Surveys

2172 m	2°	
2191 m	3°	
2201 m	3 1/4°	
2210 m	3°	
2220 m	2 1/2°	
2238 m	2 1/2°	
2249 m	1 7/8°	
2268 m	2 1/2°	
2307 m	misrun	
2316 m	2 1/8°	
2354 m	2 1/4°	
2394 m	1 3/4°	
2431 m	misrun	
2438 m	1.6°	N24E
2462 m	1.4°	N58E
2518 m	1 3/4°	S75E
2565 m	2 3/4°	S59E
2594 m	2 1/2°	S48E
2622 m	2 1/2°	S49E
2660 m	4°	S36E
2678 m	5°	S31E
2696 m	5°	S27E
2716 m	5°	S28E
2745 m	5°	S25E
2793 m	5 1/4°	S25E
2830 m	4°	S25E
2877 m	3 1/2°	S33E
2924 m	2 1/2°	S45E
2961 m	1 1/2°	S77E

Metric

BIT RECORD

Province	Field	LSD	Section	Twnshp	Range	Operator	KB Elev.
Northwest Territories					W	NSM RESOURCES LTD.	349.98 m

Location	Contractor	Rig No.	Tool Pusher
K-53	Spartan Drilling Ltd.	12	Gary Skinner, Ron Lesy Ron Sutley

No.	Size	Make	Type	Jets	Depth Out	Metres Drilled	Hours	Dull Cond T	B	G	No of DC	Wt. on Bit.	RPM	Vert Dev	Pump Pres
1A	444	Smith	SDT	3X18	193	193	24 3/4	3	2	I		10/15	120/130		1700
1B	311	Smith	SDT	3x18	536	343	39	6	3	I		16/18	120/140		9500
2B	311	Smith	SDT	3x16	698	162	21 3/4	2	1	I		15/17	120/130		8000
1	222	Smith	F2	2x8.7 1x7.9	1095	403	34 1/2	2	5	I		12/15	100/120		8000
2	222	Smith	F2	3x8.7	1334	339	50 3/4	1	4	I		7/15	110/130		9500
3	222	Smith	SDGH	3x8.7	1442	108	31 1/2	4	3	I		9/18	90		9600
4	222	Smith	F2	1x9.5 2x8.7	1929	487	105 1/4	3	8	I		9/18	90		9600
5	222	Smith	F2	1x9.5 2x8.7	2277	348	94 1/2	3	3	I		8/18	60/110		9800
6	222	Smith	F3	2x9.5 1x8.7	2483	206	59 3/4	3	4	I		12/18	60/70		9800
7	222	Smith	F3	2x9.5 1x8.7	2765	282	102 3/4	8	8	1/4		10/18	80/95		9000
8	222	Smith	F3	2x9.5 1x8.7	2905	140	58 1/4	4	3	I		14/16	70/80		9300
9	222	Smith	F4	2x9.5 1x8.7	2965	60	23 3/4					16/18	75		9500

DRILL STEM TESTS

DST #1 LANDRY 2537 - 2577 m

Inflate Straddle

Misrun - Could not get a seat

DST #2 LANDRY 2538 - 2568 m

Inflate Straddle

10/60/60/120

PF: Dead
VO: Dead

IH	30307 kPa
FH	29963 kPa
PF	8668/8668 kPa
ISI	9699/9012 kPa
FF	8897 kPa
FSI	10128 kPa

Recovered 857 m inhibitor treated water cushion
28 m mud

DST #3 IMPERIAL 1788 - 1815 m

Inflate Straddle

10/60/partial misrun

PF: Weak air blow, no gas to surface
VO: Skidded, packer blown

IH	21194 kPa
FH	20908 kPa

Recovered 194 m water cushion
84 m mud

LITHOLOGY AND FORMATION EVALUATION

SUMMIT CREEK

Formation Top: Surface
Age: Tertiary
Interval: 0 - 160 m (160 m)

The Blueberry Creek K-53 well spudded in the Summit Creek formation. The Sampling began at 15 m underneath the 508 mm conductor pipe. The formation consists of a massive sandstone section overlying an interbedded sandstone, siltstone, shale and coal sequence. The contact with underlying East Fork Sandstone Member is sharp and is picked at the base of the interbedded clastic and coal sequence. The section 15-65 m consists of massive sandstone. The sandstone is light gray, salt and pepper, very fine grained, poor consolidated, siliceous, argillaceous, light and dark chert grains, argillaceous grains, vari-colored chert pebbles, carbonaceous flakes, pyritic, glauconitic, subangular, well sorted, good intergranular porosity 18%, no shows, with siderite concretions, brown, crypto crystalline, arenaceous, dense. The section 65-160 m consists of interbedded sandstone, siltstone, shale and coal. The sandstone is clear, light gray, very fine grained, poor consolidated, siliceous, argillaceous, dark chert grains, argillaceous grains, subangular, well sorted, good intergranular porosity 18%, no shows. The siltstone is medium gray, siliceous, argillaceous. The shale is dark gray, blocky, micro micaceous, silty, carbonaceous plant fragments. The Summit Creek formation is interpreted to represent a large alluvial fan derived from the uplift of the Mackenzie Mountains. The Yorath & Cooke report (Yorath & Cooke, 1981, page 35), also refers to a section of Summit Creek formation southeast of Fort Norman which appears to represent the product of a fluvial system that developed in conjuction with the eastward encroaching alluvial fan (Yorath & Cooke, 1981, page 36). The Summit Creek formation in Blueberry Creek K-53 appears to be the product of a fluvial system rather than an alluvial fan deposit. The fluvial interpretation helps explain the glauconite in the massive sandstone (15-65 m) in the upper part of the Summit Creek. The sandstone may be a point bar deposit which Yorath & Cooke discuss on page 36, however, such an interpretation is highly speculative from chip samples. The presence of marine indicators (glauconite) and the absence of coarse continental clastics (conglomerate) in the Summit Creek make the fluvial interpretation more favorable than an alluvial fan interpretation.

Conclusion: The Summit Creek has no mud gas or sample shows. The sandstone appears to be wet. Zone of little interest.

EAST FORK SANDSTONE MEMBER

Formation Top: 160 m
Age: Upper Cretaceous
Interval: 160 - 429 m (269 m)

The East Fork Sandstone tops at 160 m. The formation consists of sandstone, with interbeds of siltstone and shale. The contact with the overlying Summit Creek formation is sharp and is picked at the base of the interbedded clastic coal sequence. The contact with the underlying East Fork shale is sharp and is picked at the base of the last sandstone bed at 429 m. The section 160-429 m consists of numerous sandstone beds with interbedded siltstone and shale. The sandstone is generally light gray, fine grained, unconsolidated, argillaceous, light and dark chert grains, chert peb

bles, trace glauconite, pyritic, argillaceous grains, subrounded, medium sorted, good intergranular porosity 20%, no shows. The siltstone is medium gray, siliceous, argillaceous, carbonaceous flakes. The shale is dark gray, blocky, micro micaceous, silty, pyritic, carbonaceous flakes. The section 160-429 m has a number of similarities to Yorath & Cooke's description of the sandstone member of the East Fork formation (Yorath & Cooke, 1981, page 32), namely color (gray), grain size (fine to medium), argillaceous and the fact that the sandstones are cherty and immature. The rare occurrences of glauconite suggest a marine environment of deposition.

Conclusion: The East Fork Sandstone has no mud gas or sample shows. All of the sandstone beds appear wet. Zone of little interest.

EAST FORK/SLATER RIVER UNDIVIDED

Formation Top: 429 m
Age: Cretaceous
Interval: 429 - 1258 m (829 m)

The East Fork/Slater River Undivided tops at 429 m. The formation consists of massive shale, with minor siltstone interbeds. The contact with the overlying East Fork sandstone is sharp and is picked at the base of the sandstone unit at 429 m. The contact with the underlying basal cretaceous is sharp and is picked at the base of a massive shale section and the top of a relatively clean siltstone section at 1258 m. The section 429-525 m consists of shale, with siltstone interbeds. The shale is dark gray, blocky, pyritic, silty, arenaceous, with siderite concretions which are brown, crypto crystalline, carbonaceous flakes, dense. The siltstone is medium gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, pyritic, glauconitic. The section 525-585 m consists of shale, with minor siltstone. The shale is dark gray, blocky, micro micaceous, pyritic, with black ironstone nodules and siderite concretions, which are brown, crypto crystalline, dense. The siltstone is medium gray, siliceous, argillaceous, arenaceous, pyritic, carbonaceous flakes, argillaceous grains, trace micaceous. The section 585-925 m consists of shale, with minor siltstone. The shale is dark gray, black, blocky, becoming subfissile, micro micaceous, silty, pyritic, pelecypod prisms, trace fish scales. The siltstone is medium gray, siliceous, argillaceous, carbonaceous flakes, glauconitic. The section 925-970 m consists of shale, with siltstone stringers. The shale is black, platy, micro micaceous, trace silty, pyritic, pelecypod prisms, fish scales. The siltstone stringers are medium gray, siliceous, argillaceous, calcareous, fish scales. The section 970-1258 m consists of shale, black, subfissile, micro micaceous, pelecypod prisms, trace silty, trace pyritic. The transition between the East Fork and Slater River is impossible to see in samples, however, there are sections that are characteristically East Fork and sections that are characteristically Slater River. The transition between the East Fork and Slater River is not clear in samples, however, there are sections that are characteristically East Fork and sections that are characteristically Slater River. The East Fork (Yorath & Cooke, 1981, page 32), describes the formation as being shale, medium to dark gray, blocky, mudstone, with ironstone concretions and pelecypod prisms. The shale in the upper part of the East Fork/Slater River Undivided in Blueberry Creek K-53 looks very similar to the above description. The Slater River (Yorath & Cooke, 1981, page 26), describes the formation as being black shale, with poor preserved fish scales and pelecypod prisms throughout. The Lexicon of Geologic Names also makes mention of a fish scale horizon in the Slater River formation. The shale in the lower part of the East Fork/Slater River Undivided

in Blueberry Creek K-53 looks similar to the above, in particular, the section 925-970 m containing many fish scales.

Conclusion: The East Fork/Slater River Undivided has no reservoir development. There are no mud gas or sample shows. Zone of little interest.

BASAL CRETACEOUS (NOT FORMALIZED NAME)

Formation Top: 1258 m
Age: Lower Cretaceous
Interval: 1258 - 1286 m (28 m)

The Basal Cretaceous tops at 1258 m. The section consists of siltstone, with sandstone and shale interbeds. The contact with the overlying East Fork/Slater River Undivided is sharp and is picked at the base of the massive shale sequence and at the top of a siltstone and shale sequence. The contact with the underlying Imperial formation is not sharp and is picked where the siltstone decreases in chip samples using a correlation to the Dodo Canyon K-03 offset well. The section 1258-1286 m consists of siltstone, with shale interbeds and minor sandstone. The siltstone is light brown grading downwards to light gray, siliceous, argillaceous, slightly calcareous, glauconitic, argillaceous grains, trace dark chert, tite, spotty dead oil staining. The shale is black, dark gray, splintery, micro micaceous, glauconitic, dense. The section above seems to correlate to a basal cretaceous unit in the Aquitaine Dodo Canyon K-03 well from 2867-2977 feet. The glauconite and siderite concretions are present in abundance in the both wells.

Conclusion: The Basal Cretaceous has no reservoir development. There are no mud gas or sample shows. Zone of little interest.

IMPERIAL

Formation Top: 1286 m
Age: Upper Devonian
Interval: 1286 - 2252 m (922 m)

The Imperial tops at 1286 m. It consists of interbedded shale and siltstone. The contact with the overlying Basal Cretaceous is not sharp and picked at the base of a siltstone section. The contact with the underlying Canol is gradational and is picked where the shale appears to become siliceous. The section 1286-1375 m consists of shale, with minor siltstone interbeds. The shale is dark gray, splintery, micro micaceous, trace silty, pyritic, trace glauconitic, shell fragments, pelecypod prisms, ostracods. The siltstone is medium gray, siliceous, argillaceous, calcareous, glauconitic. The section 1375-1875 m consists of interbedded siltstone and shale, with minor sandstone. The siltstone is green, maroon, yellow and gray, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, ostracods. The shale is dark gray, green, black, trace maroon, splintery, micro micaceous, carbonaceous flakes, pyritic, pelecypod prisms, ostracods, crinoids. The sandstone is light gray, very fine grained, siliceous, argillaceous, calcareous, dark chert, subangular, well sorted, trace ostracods, tite, no shows. The section 1875-2194 m consists of shale, with minor siltstone interbeds. The shale is dark gray, black, trace maroon, splintery, micro micaceous, pyritic, carbonaceous flakes, trace glauconitic, trace silty, pelecypod prisms, trace crinoids, trace ostracods. The siltstone is

gray, green, yellow, siliceous, argillaceous grains, carbonaceous flakes, micaceous. The section 2194-2252 m consists of shale, black, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms. The top of the Imperial appears to be a gradational pick. The green shales and siltstones are characteristic of the Imperial. There are some other interesting correlations to the Dodo Canyon K-03 offset well, namely the ostracods, crinoids and carbonaceous flakes which help verify the section.

Conclusion: The Imperial has no mud gas or sample shows. There is no reservoir development in the Imperial. Zone of little interest.

CANOL

Formation Top: 2252 m
Age: Middle Devonian
Interval: 2252 - 2361 m (109 m)

The Canol tops at 2252 m. It consists of siliceous, bituminous shale. The contact with the overlying Imperial is gradational and is picked where the shale appears to become siliceous. The contact with the underlying Hume is sharp and is picked at the change form shale to limestone. The section 2252-2361 m consists of shale, black, blocky, siliceous, trace calcareous, trace black chert, trace pyritic, trace white dolomite veining, bituminous. There are traces of limestone, dark brown, crypto crystalline, dense.

Conclusion: The Canol has no reservoir development. The shale is an excellent source rock with high mud gas readings throughout. This zone should be looked at closely on the E-logs for possible fractures.

HUME

Formation Top: 2361 m
Age: Middle Devonian
Interval: 2361 - 2425 m (64 m)

The Hume tops at 2361 m. It consists of fragmental limestone. The contact with the overlying Canol is sharp and is picked at the change from shale to limestone. The contact with the underlying Lower Hume is fairly sharp and is picked where the section begins to shale out. The section 2361-2425 m consists of fragmental limestone. The limestone is a mottled buff-brown, very fine to occasional fine fragmental packstone, bioclastic debris, argillaceous, indistinct fossils, ostracods, crinoids, gastropods, dense, no shows, stylolitic.

Conclusion: The Hume has no reservoir development. There are no mud gas or sample shows. The formation will not test hydrocarbons.

LOWER HUME

Formation: 2425 m
Age: Middle Devonian
Interval: 2425 - 2538 m (113 m)

The Lower Hume tops at 2425 m. It consists of interbedded fragmental limestone and

shale. The contact with the overlying Hume is fairly sharp and is picked where the Hume begins to shale out. The contact with the underlying Landry is sharp and is picked at the transition from a shale and limestone sequence to a clean limestone. The section 2425-2538 m consists of interbedded fragmental limestone and shale. The limestone is generally a mottled, brown, buff, very fine to occasional fine fragmental packstone, less commonly a wackestone, bioclastic debris, argillaceous, trace pyritic, ostracods, crinoids, dense, no shows, stylolitic. The limestone becomes dolomitic, cherty and pelletoidal in the lower section. The shale is dark gray, blocky, micromicaceous, calcareous.

Conclusion: The Lower Hume has no reservoir development. There are no mud gas or sample shows. The formation will not test hydrocarbons.

LANDRY

Formation Top: 2538 m
Age: Middle Devonian
Interval: 2538-2570 m (32 m)

The Landry tops at 2538 m. It consists of pelletoidal limestone. The contact with the overlying Lower Hume is fairly sharp and is picked at the transition from a shale and limestone sequence to a relatively clean pelletoidal limestone. The contact with the underlying Manitoe is sharp on the drill-rate plot. The chip sample, however, changes gradually from limestone to dolomite. The section is interpreted to have a sharp contact but this was not seen in samples. The section 2538-2570 m consists of pelletoidal limestone. The limestone is a mottled, buff, brown, fine pelletoidal packstone, bioclastic debris, argillaceous, pyritic, indistinct fossils, ostracods, crinoids, gastropods, dense, no shows, stylolitic.

Conclusion: The Landry has no reservoir development. There are no mud gas or sample shows. The formation will not test hydrocarbons.

MANITOE

Formation Top: 2570 m
Age: Middle Devonian
Interval: 2570-2594 m (24 m)

The Manitoe tops at 2570 m. It consists of dolomite with some thin shale interbeds. The contact with the overlying Landry is not sharp in samples, however, there is a sharp drilling break. The contact with the underlying Bear Rock is sharp and is picked at the top of the anhydrite. The section 2570-2594 m consists of porous dolomite with thin shale interbeds. The dolomite is buff, brown, micro crystalline, calcareous, intercrystalline and trace vuggy porosity 2% (fast drilling break may indicate high on porosity), no shows, bituminous.

Conclusion: The Manitoe has some reservoir development. The bitumen and lack of mud gas shows indicate the formation is probably wet.

BEAR ROCK

Formation Top: 2594 m
Age: Middle Devonian
Interval: 2594-2965 m total depth (371+metres)

The Bear Rock tops at 2594 m. It consists of interbedded anhydrite and dolomite. The contact with the overlying Manitoe is sharp and is picked at the transition from dolomite to the first anhydrite. The Blueberry Creek K-53 well suspended drilling in the Bear Rock formation at 2965 m. The section 2594-2879 m consists of interbedded anhydrite and dolomite. The anhydrite is generally white, yellow, micro crystalline, dolomitic, dense. The dolomite is generally brown, micro crystalline, anhydritic, dense, no shows, stylolitic. The section 2879-2965 m consists of interbedded anhydrite and dolomite. The anhydrite is yellow, white, crypto crystalline, dense. The dolomite is buff, brown, very fine crystalline, anhydrite, trace intercrystalline and vuggy porosity 4%, predominantly dense, no shows.

Conclusion: The Bear Rock has fair reservoir development. There are no mud gas or sample shows. The formation appears wet.

WELL SUMMARY

The Blueberry Creek K-53 prospect was drilled on NSM acreage west of Bear Rock to test a "flower structure" thought to have been formed by SW-NE trending wrench faults. Primary objectives in the well were a cretaceous clastic wedge sequence (ie: Ronning Group). Secondary objectives in the well were Devonian limestones and dolomites. (ie: Hume and Bear Rock). The Cretaceous sequence in the Blueberry Creek K-53 prospect had no Little Bear sandstone development. The Devonian section encountered on the K-53 was thicker and deeper than what had been anticipated. The well reached a total depth of 2965 m in the Bear Rock formation without penetrating the Ronning. There is some porosity development in the Manitoe and Bear Rock dolomites, however, both formations appear wet. The Blueberry Creek K-53 prospect does not have any hydrocarbon horizons.

SAMPLE DESCRIPTIONS

20 m — Sandstone, 100%, medium gray, very fine grained, siliceous, very argillaceous, silty, carbonaceous flakes, glauconitic, argillaceous grains, trace pyritic, subrounded, well sorted, tite, no shows

25 m — Sandstone, 100%, as above

30 m — Sandstone, 100%, light gray, salt and pepper, very fine grained, poor consolidated, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, subrounded, well sorted, good intergranular porosity 18%, no shows

35 m — Sandstone, 100%, as above, trace siltstone, medium gray, siliceous, argillaceous

40 m — Sandstone, 100%, light gray, salt and pepper, very fine grained, poor consolidated, siliceous, argillaceous, light and dark chert, argillaceous grains, vari-colored chert pebbles, subangular, well sorted, good intergranular porosity 18%, no shows, trace shale, dark gray, blocky, micro micaceous, silty

45 m — Siderite, 20%, brown, crypto crystalline,trace carbonaceous flakes, dense, (probably concretions on nodules), Sandstone, 40%, as above, Siltstone, 30%, medium gray, siliceous, argillaceous,carbonaceous flakes, Shale, 10%, as above

50 m — Sandstone, 90%, light gray, very fine grained, siliceous, argillaceous, argillaceous grains, carbonaceous flakes, pyritic, trace glauconitic, dark chert, sideritic, subrounded, well sorted, tite, no shows, Siderite, 10%, arenaceous, as above, trace shale

55 m — Sandstone, 80%, as above, Siderite, 10%, as above, Shale, 10%, dark gray, blocky, micro micaceous, arenaceous, carbonaceous flakes

60 m — Sandstone, 80%, light gray, very fine grained, siliceous, argillaceous, argillaceous grains, carbonaceous flakes, pyritic, glauconitic,dark chert, sideritic, subrounded, well sorted, tite, no shows, Siderite, 20%, brown, crypto crystalline, arenaceous, dense, trace shale

65 m — Sandstone, 80%, light gray, very fine grained, siliceous, argillaceous, argillaceous grains, carbonaceous flakes, very pyritic, sideritic, dark chert, subrounded, well sorted, tite, no shows, Siderite, 20%, as above

70 m — No sample - probably drilling clay as sample washes away to nothing

75 m — No sample - as above

80 m — No sample - as above

Sample Descriptions

85 m — Note* poor quality sample - Sandstone, 10%, clear, light gray, very fine grained, siliceous, argillaceous, trace dark chert, trace argillaceous grains, subangular, well sorted, fair intergranular porosity 15%,no shows, Siltstone, 40%, medium gray, siliceous, argillaceous, Shale, 40%, dark gray, blocky, micro micaceous, silty, carbonaceous plant fragments, Coal, 10%

90 m — Siltstone, 60%, light gray, siliceous,argillaceous, Shale, 30%, dark gray, blocky, micro micaceous, carbonaceous flakes, Coal, 10%, trace sandstone, trace siderite

95 m — Siltstone, 30%, as above, Shale, 50%, as above, Coal, 20%, trace siderite

100 m — Shale, 70%, dark gray, blocky,micro micaceous, Coal, 30%, trace siltstone, trace siderite

105 m — Sandstone, 20%, clear, light gray, very fine grained, siliceous, argillaceous, argillaceous grains, subangular, well sorted, tite, no shows, Siltstone, 20%, light gray, siliceous, argillaceous, Shale, 30%, as above, carbonaceous flakes, Coal, 30%

110 m — Sandstone, 40%, trace glauconitic, trace poor intergranular porosity 6%, no shows, Siltstone, 20%, as above, Shale, 20%, medium gray, blocky, micro micaceous, silty,sideritic, Siderite, 20%, brown,crypto crystalline, dense

*Note: Lost circulation at 111 m, samples very poor quality

115 m — Sandstone, 30%, clear, light gray, very fine grained, poor consolidated, siliceous, argillaceous, dark chert, argillaceous grains, subangular, well sorted, good intergranular porosity 18%, no shows, Siltstone, 20%, light gray, siliceous, argillaceous, Shale, 20%, dark gray, blocky, micro micaceous, carbonaceous flakes, Coal, 30%, trace siderite

120 m — Sandstone, 20%, as above, Siltstone, 20%, medium gray, siliceous, argillaceous, glauconitic, Shale, 20%, as above, Coal, 40%

125 m — Sandstone, 30%, medium gray, siliceous, argillaceous, dark chert, argillaceous grains, subangular, well sorted, fair intergranular porosity 15%, no shows, Siltstone, 20%, as above, Shale, 10%, as above, Coal, 40%

130 m — No sample - bypass shaker

135 m — No sample - bypass shaker

140 m — Shale, 50%, dark gray, blocky, micro micaceous, Siltstone, 20%, medium gray, siliceous, argillaceous, Coal, 30%

145 m — Sandstone, 20%, clear, very fine grained, poor consolidated, siliceous, argillaceous, pyritic, dark chert, argillaceous grains, subangular, well sorted, good intergranular porosity 20%, no shows, Siltstone, 20%, medium gray, siliceous, argillaceous, Shale, 30%, dark gray, blocky, micro mica-

Sample Descriptions

ceous, silty, Coal, 30%

150 m — Sandstone, 20%, clear, very fine grained, siliceous, argillaceous, glauconitic, argillaceous grains, dark chert, subangular, well sorted, fair intergranular porosity 10%, no shows, Siltstone, 10%, as above, Shale, 50%, medium gray, blocky, micro micaceous, silty, pyritic, Coal, 20%

155 m — Sandstone, 20%, light gray, very fine grained, siliceous, argillaceous, argillaceous grains, pyritic, trace glauconitic, subangular, well sorted, good intergranular porosity 15%, no shows, Siltstone, 10%, light gray, siliceous, argillaceous, Shale, 70%, medium gray, blocky, micro micaceous, pyritic, trace chert pebbles, trace siderite, trace coal

160 m — Sandstone, 20%, carbonaceous flakes, as above, Siltstone, 10%, as above, Shale, 70%, as above, trace chert pebbles, trace siderite, trace coal

165 m — Sandstone, 70%, light gray, medium grained, poor consolidated, siliceous, argillaceous, light and dark chert grains, chert pebbles, pyrite, argillaceous grains, subrounded, poor sorted, good intergranular porosity 25%, no shows, Shale, 30%, dark gray, blocky, micro micaceous, pyritic, trace siderite, trace coal, trace siltstone

170 m — Sandstone, 70%, light gray, fine grained, poor consolidated, siliceous, argillaceous, light and dark chert grains, trace chert pebbles, trace pyritic, argillaceous grains, subrounded, poor sorted, good intergranular porosity 25%, no shows, Siltstone, 20%, medium gray, siliceous, argillaceous, arenaceous, Shale, 10%, dark gray, blocky, micro micaceous

175 m — Sandstone, 60%, medium grained, as above, Sandstone, 30%, light gray, very fine grained, siliceous, argillaceous, pyritic, light and dark chert, subrounded, well sorted, tite, no shows, Shale, 10%, as above, trace siderite

180 m — Sandstone, 10%, very fine grained, as above, Siltstone, 30%, medium gray, siliceous, argillaceous, Shale, 60%, medium gray, blocky, micro micaceous, silty

185 m — Siltstone, 30%, pyritic, as above, Shale, 70%, as above, trace sandstone

190 m — Siltstone, 20%, medium gray, siliceous, argillaceous, pyritic, Shale, 80%, medium gray, blocky, micro micaceous, silty, pyritic, trace sandstone

193 m — Sandstone, 60%, medium gray, very fine grained, grading to siltstone, siliceous, argillaceous, subrounded, well sorted, tite, no shows, Shale, 40%, medium gray, blocky, micro micaceous, silty, pyritic, set 339 mm permafrost casing at 193 m

200 m — Note* poor sample - Sandstone, 30%, medium gray, fine grained, siliceous, very argillaceous, pyritic, light and dark chert, argillaceous grains, subrounded, medium sorted, tite, no shows, Shale, 70%, dark gray, blocky, micro micaceous, pyritic, trace casing cement

Sample Descriptions

205 m — Sandstone, 90%, light gray, fine grained, poor consolidated, siliceous, argillaceous, light and dark chert, pyritic, argillaceous grains, subrounded, medium sorted, good intergranular porosity 18%, no shows, Shale, 10%, dark gray, blocky, micro micaceous

210 m — Shale, 100%, dark gray, blocky, micro micaceous, silty, pyritic, trace coal, abundant casing cement

215 m — Shale, 100%, dark gray, arenaceous, as above, trace sandstone, abundant casing cement

220 m — Sandstone, 60%, light gray, fine grained, unconsolidated, argillaceous, light and dark chert, pyritic, subrounded, medium sorted, good intergranular porosity 18%, no shows, Siltstone, 30%, medium gray, siliceous, argillaceous, arenaceous, Shale, 10%, dark gray, blocky, micro micaceous, pyritic, trace coal

225 m — Sandstone, 40%, trace carbonaceous flakes, as above, Siltstone, 20%, trace carbonaceous flakes, as above, Shale, 40%, dark gray, blocky, micro micaceous, silty, pyritic, trace coal

230 m — Sandstone, 60%, medium gray-brown, fine grained, siliceous, kaolinitic, light and dark chert, vari-colored chert pebbles, argillaceous grains, pyritic, subrounded, poor sorted, fair intergranular porosity 12%, no shows, Siltstone, 20%, medium gray, siliceous, argillaceous, pyritic, arenaceous, Shale, 20%, dark gray, blocky, micro micaceous, silty

235 m — Sandstone, 60%, as above, Siltstone, 20%, as above, Shale, 20%, as above

240 m — Sandstone, 40%, as above, Siltstone, 20%, medium gray, siliceous, argillaceous, arenaceous, Shale, 40%, dark gray, blocky, micro micaceous, silty, trace coal, abundant casing cement

245 m — Sandstone, 30%, light gray, fine grained, poor consolidated, siliceous, argillaceous, light and dark chert grains, chert pebbles, argillaceous grains, pyritic, carbonaceous flakes, subrounded, poor sorted, good intergranular porosity 18%, no shows, Siltstone, 30%, medium gray, siliceous, argillaceous, arenaceous, Shale, 40%, dark gray, blocky, micro micaceous, silty, carbonaceous flakes

250 m — Sandstone, 40%, light gray, fine grained, unconsolidated, trace siliceous, argillaceous, light and dark chert, chert pebbles, pyritic, subrounded, poor sorted, good intergranular porosity 18%, no shows, Siltstone, 10%, as above, Shale, 50%, dark gray, blocky, micro micaceous, carbonaceous flakes, trace coal

255 m — Note* poor sample - Shale, 100%, dark gray, blocky, micro micaceous, trace coal, trace sandstone, trace casing cement

260 m — Sandstone, 60%, light gray, fine grained, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, carbonaceous flakes, suban-

gular, poor sorted, fair intergranular porosity 15%, no shows, Shale, 40%, dark gray, blocky, micro micaceous, silty, trace coal

265 m — Sandstone, 50%, with chert pebbles, as above, Siltstone, 20%, medium gray, siliceous, argillaceous, disseminated pyrite, arenaceous, rare glauconite, Shale, 30%, dark gray, blocky, micro micaceous, silty

270 m — Sandstone, 30%, light gray, brown, very fine grained, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, carbonaceous flakes with large red pebbles, subrounded, well sorted, tite, no shows, Siltstone, 40%, medium gray, siliceous, argillaceous, pyritic, Shale, 30%, as above

275 m — Sandstone, 30%, light gray, fine grained, poor consolidated, siliceous, argillaceous, light and dark chert, chert pebbles, argillaceous grains, pyritic, subrounded, poor sorted, poor intergranular porosity 18%, no shows, Siltstone, 20%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 50%, dark gray, blocky, micro micaceous, carbonaceous flakes

280 m — Sandstone, 30%, poor consolidated in part, as above, Siltstone, 30%, medium gray, siliceous, argillaceous, arenaceous, Shale, 40%, dark gray, blocky, micro micaceous, carbonaceous flakes

285 m — Sandstone, 30%, medium gray, very fine grained, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, rare glauconite, carbonaceous flakes, subrounded, well sorted, tite, no shows, Siltstone, 20%, medium gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 50%, dark gray, blocky, micro micaceous, carbonaceous flakes

290 m — Sandstone, 40%, light gray, very fine grained, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, subrounded, well sorted, tite, no shows, Siltstone, 10%, medium gray, siliceous argillaceous, carbonaceous flakes, Shale, 50%, dark gray, blocky, micro micaceous, pyritic

295 m — Sandstone, 10%, as above, Siltstone, 10%, as above, Shale, 80%, as above

300 m — Sandstone, 80%, light gray, fine grained, unconsolidated, argillaceous, light and dark chert, pyritic, subrounded, medium sorted, good intergranular porosity 20%, no shows, Shale, 20%, as above

305 m — Sandstone, 50%, as above, chert pebbles, Siltstone, 20%, medium gray, siliceous, argillaceous, Shale, 30%, dark gray, blocky, micro micaceous, silty, pyritic, trace coal

310 m — Sandstone, 10%, medium gray, siliceous, argillaceous, light and dark chert, argillaceous grains, subrounded, well sorted, tite, no shows, Shale, 90%, as above, trace coal

315 m — Sandstone, 20%, light gray, fine grained, unconsolidated, argillaceous, light and dark chert, pyritic, subrounded, medium sorted, good intergranu-

lar porosity 18%, no shows, Siltstone, 50%, medium gray, siliceous, very argillaceous, Shale, 30%, dark gray, blocky, micro micaceous, silty

320 m — Siltstone, 90%, as above, Shale, 10%, as above, trace pyrite

325 m — Siltstone, 20%, as above, Shale, 80%, dark gray, blocky, micro micaceous, silty, pyritic, chert pebbles, trace sandstone

330 m — Siltstone, 70%, medium gray, siliceous, argillaceous, arenaceous, micaceous, Shale, 30%, as above, trace sandstone

335 m — Sandstone, 50%, light gray, fine grained, unconsolidated, light and dark chert, pyritic, chert pebbles, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 40%, medium gray, siliceous, argillaceous, carbonaceous flakes, rare glauconite, Shale, 10%, dark gray, blocky, micro micaceous, pyritic, trace siderite

340 m — Sandstone, 90%, as above, Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes

345 m — Sandstone, 80%, as above, poor sorted, Siltstone, 20%, as above

350 m — Sandstone, 50%, as above, Siltstone, 40%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 10%, dark gray, blocky,micro micaceous, silty, carbonaceous flakes

355 m — Sandstone, 60%, light gray, fine grained, unconsolidated, light and dark chert, pyritic, argillaceous grains, chert pebbles, subrounded, medium sorted,good intergranular porosity 20%, no shows, Siltstone, 40%, as above

360 m — Siltstone, 20%, as above, Shale, 80%, dark gray, blocky, micro micaceous, silty, trace sandstone, trace pyrite

365 m — Sandstone, 40%, light gray, fine grained, unconsolidated, light and dark chert, chert pebbles, pyritic, argillaceous grains, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 40%, grading to sandstone, light gray, siliceous, argillaceous, carbonaceous flakes, glauconitic, arenaceous, pyritic, Shale, 20%, pyritic, as above

370 m — Sandstone, 30%, as above, Siltstone, 50%, medium gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, pyritic, chert pebbles, Shale, 20%, dark gray, blocky, micro micaceous

375 m — Sandstone, 60%, as above, Siltstone, 30%, medium gray, siliceous, argillaceous, glauconitic, argillaceous grains, carbonaceous flakes, Shale, 10%, dark gray, blocky, micro micaceous, silty

380 m — Siltstone, 80%, as above, chert pebbles, Shale, 20%, as above, pyritic

385 m — Sandstone, 60%, light gray, fine grained, unconsolidated, light and dark chert, pyritic, argillaceous grains, chert pebbles, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 30%, medium

Sample Descriptions

gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 10%, as above

390 m — Sandstone, 80%, as above, glauconitic, Siltstone, 10%, as above, Shale, 10%, dark gray, blocky, micro micaceous, silty

395 m — Sandstone, 30%, as above, Siltstone, 50%, medium gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, pyritic, Shale, 20%, as above

400 m — Sandstone, 60%, light gray, fine grained, unconsolidated, light and dark chert, chert pebbles, pyritic, argillaceous grains, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 30%, light gray, as above, Shale, 10%, dark gray, blocky, micro micaceous, silty, carbonaceous flakes

405 m — Sandstone, 40%, as above, Siltstone, 50%, as above, medium gray, Shale, 10%, dark gray, blocky, micro micaceous, silty, pyritic, carbonaceous flakes

410 m — Sandstone, 50%, as above, medium gray, Siltstone, 40%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 10%, as above

415 m — Siltstone, 20%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 80%, dark gray, blocky micro micaceous, silty, pyritic, carbonaceous flakes

420 m — Siltstone, 30%, as above, Shale, 70%, as above

425 m — Shale, 100%, dark gray, blocky, micro micaceous

430 m — Sandstone, 80%, light gray, unconsolidated in part, argillaceous, light and dark chert, very pyritic, rounded, poor sorted, good intergranular porosity 20%, no shows, Shale, 20%, siderite nodules?, brown, crypto crystalline, disseminated pyrite, dense

435 m — Sandstone, 60%, as above, chert pebbles, Siltstone, 20%, medium gray, siliceous, argillaceous, arenaceous, argillaceous grains, Shale, 20%, dark gray, blocky, micro micaceous, carbonaceous flakes, pyritic

440 m — Note* poor sample - Siltstone, 30%, as above, chert pebbles, Shale, 70%, dark gray, blocky, micro micaceous, silty, pyritic, siderite nodules, brown, crypto crystalline, dense

445 m — Note* poor sample - Siltstone, 10%, as above, Shale, 90%, dark gray, blocky, micro micaceous, silty, arenaceous, pyritic, chert pebbles, siderite nodules, brown, crypto crystalline, dense

450 m — Note* poor sample - Shale, 100%, dark gray, blocky, micro micaceous, silty, pyritic, carbonaceous flakes, chert pebbles

Sample Descriptions

455 m — Note* poor sample - Shale, 100%, dark gray, blocky,micro micaceous, silty, pyritic, carbonaceous flakes, arenaceous, siderite nodules, brown, crypto crystalline, dense

460 m — Note* poor sample - Shale, 100%, as above

465 m — Note* poor sample - Siderite, 30%, (concretions?), brown, crypto crystalline, dense, Siltstone, 20%, medium gray, siliceous, argillaceous, arenaceous, Shale, 50%, dark gray, blocky, micro micaceous, pyritic, silty, arenaceous

470 m — Note* poor sample - Siderite, 40%, (concretions?), as above, Siltstone, 20%, as above, Shale, 40%, as above

475 m — Note* poor sample - Sandstone, 20%, medium gray, fine grained, poor consolidated?, siliceous, argillaceous, light and dark chert, argillaceous grains, pyritic, subrounded, medium sorted, no visual porosity, no shows, Siderite, 30%, as above, Shale, 50%, dark gray, blocky, micro micaceous, silty, arenaceous

480 m — Sandstone, 20%, as above, Siltstone, 20%, medium gray, siliceous, argillaceous, arenaceous, pyritic, Shale, 60%, dark gray, blocky,micro micaceous, silty, pyritic, siderite (concretions?), brown, crypto crystalline, dense

485 m — Siltstone, 30%, medium gray, grading to sandstone,siliceous, argillaceous, micaceous, glauconitic, argillaceous grains, Siderite, 30%, (concretions), brown, crypto crystalline, carbonaceous flakes, dense, Shale, 40%, dark gray, blocky, micro micaceous, silty, arenaceous, pyritic

490 m — Siltstone, 30%, medium gray grading to sandstone, siliceous, argillaceous, arenaceous, carbonaceous flakes, pyritic, glauconitic, Sandstone, 10%, medium gray, very fine grained, siliceous, argillaceous, silty, light and dark chert, carbonaceous flakes, pyrite, chert pebbles, subrounded,well sorted, tite, no shows, Shale, 50%, dark gray, blocky, micro micaceous, silty, pyritic, Siderite, 10%, as above

495 m — Siltstone, 40%, medium gray, siliceous, argillaceous, carbonaceous flakes, chert pebbles, Shale, 40%, as above, Siderite, 20%, as above

500 m — Siltstone, 20%, as above, pyritic, Shale, 70%, dark gray, blocky, micro micaceous, Siderite, 10%, brown, crypto crystalline, dense

505 m — Shale, 80%, dark gray, blocky, micro micaceous, silty, pyritic, carbonaceous flakes, Siderite, 20%, as above

510 m — Siltstone, 30%, medium gray, grading to sandstone,siliceous, argillaceous, carbonaceous flakes, pyritic, glauconitic, Shale, 60%, as above, Siderite, 10%, brown, crypto crystalline, carbonaceous flakes, dense

515 m — Siltstone, 30%, medium gray, siliceous, argillaceous, arenaceous, carbonaceous flakes, pyritic, Shale, 70%, dark gray, blocky, micro micaceous,

silty, pyritic, trace siderite

520 m — Siltstone, 30%, medium gray, siliceous, argillaceous, carbonaceous flakes, pyritic, arenaceous, Shale, 60%, dark gray, blocky, micro micaceous, silty, pyritic, Siderite, 10%, (concretions), brown, crypto crystalline, dense

525 m — Siltstone, 20%, as above, Shale, 70%, dark gray, blocky, micro micaceous, silty, Siderite, 10%, as above, trace loose sandstone

530 m — Sandstone, 40%, light gray, medium grained, unconsolidated, light and dark chert, pyritic, argillaceous grains, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 20%, as above, Shale, 40%, dark gray, blocky, micro micaceous, silty, pyritic, trace siderite

535 m — Sandstone, 30%, as above, fair grained, Siltstone, 10%, medium gray, siliceous, argillaceous, trace glauconitic, arenaceous, Shale, 60%, dark gray, blocky, micro micaceous, silty, pyritic

540 m — Siltstone, 20%, medium gray, siliceous, argillaceous, Shale, 70%, dark gray, blocky, micro micaceous, pyritic, Siderite, 10%, (concretions), brown, crypto crystalline, dense

545 m — Siltstone, 20%, as above, Shale, 80%, dark gray, blocky, micro micaceous, ironstone nodules

550 m — Siltstone, 20%, medium gray, siliceous, argillaceous, pyritic, Shale, 80%, as above

555 m — Siltstone, 10%, as above, Shale, 90%, dark gray, blocky, micro micaceous, pyritic

560 m — Shale, 100%, as above

565 m — Siltstone, 30%, medium gray, siliceous, argillaceous, arenaceous, pyritic, carbonaceous flakes, argillaceous grains, trace mica, Shale, 60%, dark gray, blocky, micro micaceous, pyritic, Siderite, 10%, brown, crypto crystalline, dense, no shows

570 m — Siltstone, 20%, as above, Shale, 80%, as above, silty, trace siderite

575 m — Sandstone, 20%, light gray, fine grained, unconsolidated, light and dark chert, argillaceous grains, pyritic, subrounded, medium sorted, good intergranular porosity 20%, no shows, Siltstone, 10%, medium gray, siliceous, argillaceous, Shale, 60%, dark gray, blocky, micro micaceous, ironstone nodules, Siderite, 10%, brown, crypto crystalline, dense

580 m — Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes, Sandstone, 10%, as above, Shale, 80%, dark gray, blocky, micro micaceous, pyritic, ironstone nodules, trace siderite

585 m — Sandstone, 10%, as above, Siltstone, 20%, as above, Shale, 70%, as above

Sample Descriptions

590 m — Siltstone, 30%, medium gray, siliceous, argillaceous, glauconitic, pyritic, Shale, 70%, dark gray, blocky, micro micaceous, silty, pyritic, pelecypod prisms, trace siderite

595 m — Siltstone, 20%, medium gray, siliceous, argillaceous, Shale, 80%, dark gray, blocky, micro micaceous, pyritic, pelecypod prisms, trace siderite

600 m — Siltstone, 10%, as above, pyritic, Shale, 90%, dark gray, blocky, micro micaceous, pyritic, pelecypod prisms, indistinct fossils

605 m — Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes, arenaceous, pyritic, Shale, 80%, dark gray, blocky, micro micaceous, pyritic, pelecypod prisms, Siderite, 10%, concretions?, brown, crypto crystalline, dense

610 m — Siltstone, 20%, medium gray, siliceous, argillaceous, carbonaceous flakes, arenaceous, Shale, 80%, dark gray, blocky, micro micaceous, silty, pelecypod prisms

615 m — Siltstone, 20%, as above, Shale, 80%, dark gray, blocky, micro micaceous, silty, pyritic, siderite concretions?, brown, crypto crystalline, dense, trace sandstone

620 m — Siltstone, 10%, medium gray, siliceous, argillaceous, glauconitic, Shale, 90%, dark gray, blocky, micro micaceous, pyritic, trace siderite

625 m — Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 90%, as above, pelecypod prisms, trace siderite

630 m — Siltstone, 30%, medium gray, siliceous, argillaceous, carbonaceous flakes, glauconitic, Shale, 60%, dark gray, blocky, micro micaceous, silty, pyritic, pelecypod prisms, Siderite, 10%, concretions?, brown, crypto crystalline, dense

635 m — Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 90%, dark gray, blocky, micro micaceous, pyritic, trace siderite

640 m — Siltstone, 10%, medium gray, siliceous, argillaceous, glauconitic, Shale, 90%, black, blocky, micro micaceous, trace fish scales?, pyritic, pelecypod prisms, trace siderite

645 m — No sample

650 m — Siltstone, 10%, medium gray, siliceous, argillaceous, glauconitic, pyritic, Shale, 90%, dark gray, blocky, micro micaceous, pyritic, pelecypod prisms, ironstone nodules

655 m — Siltstone, 10%, medium gray, siliceous, argillaceous, pyritic, Shale, 90%, dark gray, blocky, micro micaceous, carbonaceous flakes, pyritic, pelecypod prisms

Sample Descriptions

660 m — Siltstone, 10%, medium gray, siliceous, argillaceous, Shale, 90%, dark gray, blocky, micro micaceous, pyritic

665 m — Siltstone, 10%, as above, Shale, 90%, silty, pelecypod prisms, as above

670 m — Siltstone, 10%, as above, Shale, 90%, as above

675 m — Siltstone, 20%, medium gray, siliceous, argillaceous, trace chert pebbles, Shale, 80%, dark gray, blocky, micro micaceous, pyritic, pelecypod prisms

680 m — Siltstone, 20%, as above, Shale, 80%, as above

685 m — Shale, 100%, dark gray, blocky, micro micaceous, pyritic, trace siltstone

690 m — Shale, 100%, as above, trace siltstone

695 m — Siltstone, 10%, medium gray, siliceous, argillaceous, carbonaceous flakes, Shale, 90%, black, blocky, micro micaceous, pyritic, pelecypod prisms

Run 244 mm casing to 698 metres

700 m — Shale, 80%, dark gray, blocky, micro micaceous, Casing cement and metal from shoe 20%

705 m — Shale, 90%, as above, Casing cement and metal from shoe 20%

710 m — Shale, 90%, black, blocky, micro micaceous, Casing cement 10%

715 m — Shale, 100%, as above

720 m — Shale, 100%, black, blocky, micro micaceous

725 m — Shale, 100%, as above

730 m — Shale, 100%, as above, trace pelecypods

735 m — Shale, 100%, black, subfissile, micro micaceous, pelecypod prisms

740 m — Shale, 100%, dark gray, blocky, micro micaceous

745 m — Shale, 100%, as above

750 m — Shale, 100%, as above, trace silty

755 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty, pyritic, pelecypod prisms

760 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty, pelecypod prisms

765 m — No sample

Sample Descriptions

770 m — Shale, 100%, dark gray, micro micaceous, trace silty

775 m — Shale, 100%, black, blocky, micro micaceous, trace silty

780 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty, pelecypod prisms

785 m — Shale, 100%, as above, siltstone stringers, medium gray, siliceous, argillaceous

790 m — Shale, 100%, dark gray, blocky, micro micaceous, pyritic, trace silty

795 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty

800 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty

805 m — Shale, 100%, black, blocky, micro micaceous, trace silty, pelecypod prisms

810 m — Shale, 100%, dark gray, blocky, micro micaceous, pyritic, trace silty

815 m — Shale, 100%, dark gray, blocky, micro micaceous, trace silty

820 m — Shale, 100%, black, blocky, subfissile, micro micaceous, trace silty, pelecypod prisms

825 m — Shale, 100%, dark gray, blocky, micro micaceous

830 m — Shale, 100%, black, subfissile, micro micaceous

835 m — Shale, 100%, trace silty, trace pelecypod prisms, as above

840 m — Shale, 100%, black, subfissile, micro micaceous, pyritic, siltstone stringers

845 m — Shale, 100%, dark gray, subfissile, micro micaceous, pelecypod prisms, siltstone stringers

850 m — Siltstone, 10%, medium gray, siliceous, argillaceous, Shale, 90%, black, subfissile, micro micaceous, pelecypod prisms

855 m — Shale, 100%, black, subfissile, micro micaceous

860 m — Siltstone, 10%, medium gray, siliceous, argillaceous, Shale, 90%, black, blocky, micro micaceous, pyritic

865 m — Shale, 100%, dark gray, blocky, micro micaceous

870 m — Shale, 100%, pelecypod prisms, as above

875 m — Shale, 100%, dark gray, blocky, micro micaceous, silty, pyritic

Sample Descriptions

880m — Siltstone, 20%, medium gray, siliceous, argillaceous, calcareous, Shale, 80%, black, blocky, micro micaceous, silty

885 m — Shale, 100%, dark gray, blocky, micro micaceous

890 m — Shale, 100%, as above

895 m — Shale, 100%, pelecypod prisms, as above

900 m — Shale, 100%, dark gray, blocky, micro micaceous

905 m — Shale, 100%, black, blocky, micro micaceous, pelecypod prisms

910 m — Shale, 100%, black, platy, micro micaceous, pelecypod prisms

915 m — Shale, 100%, trace siltstone stringers, as above

920 m — Shale, 100%, black, platy, micro micaceous, pelecypod prisms

925 m — Shale, 100%, as above

930 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, fish scales? (orange chitin), Shale, 90%, black, platy, micro micaceous, pyritic, fish scales? (orange chitin)

935 m — Shale, 100%, black, platy, micro micaceous, pelecypod prisms, fish scales? (orange chitin), trace siltstone, as above, trace bentonite, light gray, blocky

940 m — Shale, 100%, dark gray, platy, micro micaceous, fish scales?

945 m — Shale, 100%, black, fissile, micro micaceous, pelecypod prisms

950 m — Shale, 100%, black, fissile, micro micaceous, pyritic, fish scales?, trace silty, trace siltstone

955 m — Shale, 100%, black, fissile, micro micaceous, trace silty

960 m — Shale, 100%, pelecypod prisms, as above

965 m — Shale, 100%, black, fissile, micro micaceous, trace silty

970 m — Shale, 100%, fish scales?, as above

975 m — Shale, 100%, black, fissile, micro micaceous, trace silty,pelecypod prisms

980 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, glauconitic, Shale, 90%, black, fissile, micro micaceous, pelecypod prisms

985 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, Shale, 90%, black, fissile, micro micaceous

Sample Descriptions

990 m — Shale, 100%, black, fissile, micro micaceous, trace silty

995 m — Shale, 100%, as above

1000 m — Shale, 100%, trace pyritic, as above

1005 m — Shale, 100%, black, fissile, micro micaceous, trace silty

1010 m — Shale, 100%, black, fissile, micro micaceous, siltstone stringers

1015 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, Shale, 90%, black, fissile, micro micaceous

1020 m — Shale, 100%, as above, trace siltstone

1025 m — Shale, 100%, trace carbonaceous flakes, as above

1030 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, Shale, 90%, black, fissile, micro micaceous, pelecypod prisms

1035 m — Shale, 100%, as above, trace siltstone, trace bentonite, light gray, blocky, disseminated pyrite

1040 m — Shale, 100%, as above, trace siltstone

1045 m — Shale, 100%, black, fissile, micro micaceous, pelecypod prisms, trace siltstone

1050 m — Shale, 100%, as above, trace siltstone

1055 m — Shale, 100%, as above

1060 m — Shale, 100%, black, fissile, micro micaceous, pelecypod prisms

1065 m — Shale, 100%, black, fissile, micro micaceous, pelecypod prisms

1070 m — Shale, 100%, black, fissile, micro micaceous, pelecypod prisms

1075 m — Shale, 100%, black, platy, micro micaceous, pelecypod prisms

1080 m — Shale, 100%, as above

1085 m — Shale, 100%, abundant pelecypod prisms, as above

1090 m — Shale, 100%, black, platy, micro micaceous, pelecypod prisms

1095 m — Shale, 100%, dark gray, platy, splintery in part, micro micaceous, pelecypod prisms

1100 m — Shale, 100%, dark gray, platy, splintery in part, micro micaceous, pelecypod prisms

Sample Descriptions

1105 m — Shale, 100%, black, fissile, splintery, micro micaceous, pelecypod prisms

1110 m — Shale, 100%, as above, trace bentonite

1115 m — Shale, 100%, as above

1120 m — Shale, 100%, black, fissile, splintery, micro micaceous, pelecypod prisms, trace siltstone

1125 m — Shale, 100%, as above, trace bentonite

1130 m — Shale, 100%, as above

1135 m — Shale, 100%, black, fissile, splintery, micro micaceous, pelecypod prisms

1140 m — Shale, 100%, dark gray, fissile, splintery, micro micaceous, pelecypod prisms, trace bentonite

1145 m — Shale, 100%, as above, trace bentonite

1150 m — Shale, 90%, black, fissile, splintery, micro micaceous, pelecypod prisms, silty, Siltstone, 10%, medium gray, siliceous, argillaceous, trace calcareous, micaceous, trace bentonite

1155 m — Note* poor sample - Shale, 100%, dark gray, splintery, micro micaceous, trace bentonite

1160 m — Note* poor sample - Shale, 100%, pelecypod prisms, as above, trace bentonite

1165 m — Shale, 100%, dark gray, splintery, micro micaceous, pelecypod prisms, trace bentonite

1170 m — Shale, 100%, as above, trace bentonite

1175 m — Shale, 100%, as above, trace bentonite

1180 m — Shale, 100%, dark gray, splintery, micro micaceous, pelecypod prisms, trace pyritic, trace bentonite, light gray, blocky, micaceous

1185 m — Shale, 100%, dark gray, splintery, micro micaceous, pelecypod prisms, trace bentonite, as above

1190 m — Shale, 100%, black, splintery, micro micaceous, pelecypod prisms, trace bentonite, light gray, blocky, pyritic, micaceous

1195 m — Shale, 100%, as above, trace bentonite

1200 m — Shale, 100%, as above, trace siltstone, trace bentonite

1205 m — Shale, 100%, black, subfissile, micro micaceous, pelecypod prisms, trace bentonite

Sample Descriptions

1210 m — Shale, 100%, black, splintery, micro micaceous, pelecypod prisms, trace bentonite, light gray, blocky, pyritic, trace siltstone

1215 m — Shale, 100%, black, splintery, micro micaceous, pelecypod prisms, trace bentonite, trace siltstone, medium gray, siliceous, argillaceous, trace calcareous

1220 m — Shale, 100%, as above, trace siltstone, medium gray, siliceous, argillaceous, trace calcareous, pyritic

1225 m — Shale, 100%, as above

1230 m — Shale, 100%, black, splintery, micro micaceous, pelecypod prisms

1235 m — Shale, 100%, as above, trace bentonite

1240 m — Shale, 100%, black, splintery, micro micaceous, pelecypod prisms, trace bentonite

1245 m — Shale, 100%, black, splintery, micro micaceous, pyritic, pelecypod prisms

1250 m — No sample

1255 m — Shale, 100%, black, splintery, micro micaceous, pyritic, pelecypod prisms

1260 m — Siltstone, 50%, light brown, siliceous, argillaceous, slightly calcareous, glauconitic, argillaceous grains, trace dark chert, tite, spotty dead oil staining , Shale, 50%, black, splintery, micro micaceous, glauconitic, pyritic, trace loose sandstone grains, clastic, rounded

1265 m — Siltstone, 40%, light gray, brown, siliceous, argillaceous, slightly calcareous, glauconitic, argillaceous grains, trace dark chert,tite, spotty dead oil staining, Siderite, 10%, (concretion?), brown,crypto crystalline, glauconitic, dense, Shale, 50%, black, splintery, micro micaceous, glauconitic, pyritic

1270 m — Siltstone, 20%, as above, Shale, 80%, as above

1275 m — Siltstone, 30%, light gray, siliceous, argillaceous, slightly calcareous, glauconitic, trace dark chert, Shale, 70%, dark gray, splintery, micro micaceous, glauconitic, pyritic, trace loose rounded quartz grains

1280 m — Siltstone, 30%, very glauconitic, as above, Shale, 60%, dark gray, splintery, micro micaceous, pyritic, Siderite, 10%, (concretions?),brown, micro crystalline, glauconitic, dense

1285 m — Siltstone, 30%, light gray, siliceous, argillaceous, slightly calcareous, glauconitic, trace dark chert, Sandstone, 10%, light gray, very fine grained, siliceous, slightly calcareous, glauconitic, trace dark chert quartz overgrowths, angular, well sorted, tite, no shows, Siderite, 10%, brown, micro crystalline, dense, Shale, 50%, dark gray, splintery, micro micaceous, pyritic

Sample Descriptions

1290 m — Siltstone, 10%, as above, Shale, 90%, dark gray, subfissile, splintery, micro micaceous, pyritic, pelecypod prisms

1295 m — Siltstone, 10%, medium gray, siliceous, argillaceous, Shale, 90%, dark gray, splintery, micro micaceous

1300 m — Shale, 100%, dark gray, splintery, micro micaceous, glauconitic, pelecypod prisms

1305 m — Siltstone, 20%, medium gray, siliceous, very argillaceous, calcareous, glauconitic, Shale, 80%, dark gray and black, splintery, micro micaceous, pelecypod prisms, pyritic

1310 m — Siltstone, 20%, medium gray, siliceous, argillaceous, calcareous, glauconitic, Shale, 80%, as above

1315 m — Shale, 100%, dark gray and black, splintery, micro micaceous, pelecypod prisms, trace siltstone

1320 m — Shale, 100%, as above

1325 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, glauconitic, Shale, 90%, dark gray and black, splintery, micro micaceous, pelecypod prisms

1330 m — Shale, 100%, dark gray, splintery, trace waxy, micro micaceous, pyritic, pelecypod prisms, trace siltstone

1335 m — Shale, 100%, dark gray, splintery, trace waxy, micro micaceous, pyritic, glauconitic, trace silty, pelecypod prisms

1340 m — Shale, 100%, dark gray, splintery, micro micaceous, trace silty, pyritic, trace glauconitic, shell fragments, ostracods

1345 m — Siltstone, 20%, medium gray, siliceous, very argillaceous, calcareous, Shale, 80%, dark gray and black, splintery, micro micaceous, pyritic, ostracods, pelecypod prisms

1350 m — Note* poor sample - Shale, 100%, dark gray and black, splintery, micro micaceous, trace silty, trace calcareous, ostracods, pelecypod prisms

1355 m — Shale, 100%, dark gray and black, splintery, micro micaceous, trace calcareous, pelecypod prisms, abundant ostracods

1360 m — Shale, 100%, dark gray and black, splintery, micro micaceous, trace calcareous, shell fragments

1365 m — Shale, 100%, dark gray and black, splintery, micro micaceous, trace silty, trace pyritic, ostracods

1370 m — Shale, 100%, dark gray and black, splintery, micro micaceous, trace silty, pelecypod prisms

Sample Descriptions

1375 m — Shale, 100%, as above

1380 m — Siltstone, 30%, light gray, green, trace yellow, siliceous, argillaceous, calcareous, ostracods, Shale, 70%, dark gray and black, splintery, micro micaceous, trace silty, trace calcareous, pelecypod prisms

1385 m — Siltstone, 30%, green-yellow, siliceous, argillaceous, calcareous, Shale, 70%, pyritic, as above

1390 m — Siltstone, 20%, green, trace yellow, siliceous, argillaceous, calcareous, ostracods, Shale, 80%, dark gray and black, splintery, micro micaceous, silty, trace calcareous

1395 m — Siltstone, 20%, green, trace yellow, siliceous, argillaceous, calcareous, Shale, 80%, as above

1400 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, Shale, 80%, dark gray and black, splintery, micro micaceous

1405 m — Siltstone, 20%, as above, Shale, 80%, dark gray and black,splintery, micro micaceous, glauconitic

1410 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, micaceous, Shale, 80%, dark gray and black, splintery,micro micaceous, pelecypod prisms

1415 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, Shale, 80%, as above

1420 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, Shale, 70%, black, dark gray, maroon, splintery, micro micaceous, trace pyritic

1425 m — Siltstone, 30%, green-yellow, maroon, siliceous, angular, calcareous, ostracods, Shale, 70%, black, dark gray, maroon, splintery,micro micaceous

1430 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, Shale, 70%, as above

1435 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, Shale, 70%, waxy, as above

1440 m — Siltstone, 10%, green-yellow, siliceous, argillaceous, calcareous, glauconitic, Shale, 90%, dark gray, black, maroon, splintery, micro micaceous, pelecypod prisms

1445 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, ostracods, Shale, 70%, dark gray, green, splintery, micro micaceous, micaceous, pyritic, glauconitic, pelecypod prisms

1450 m — Siltstone, 30%, green-yellow, trace maroon, siliceous, argillaceous, cal-

Sample Descriptions

careous, argillaceous grains, glauconitic, micaceous, ostracods, Shale, 70%, dark gray, green, splintery, micro micaceous, pyritic, glauconitic, pelletoidal, pelecypod prisms

1455 m — Siltstone, 40%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, Shale, 60%, black, green, maroon, splintery, micro micaceous, ostracods, pyritic

1460 m — Siltstone, 40%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, trace pyritic, carbonaceous flakes, Shale, 60%, green, gray, maroon, splintery, micro micaceous, pyritic, pelecypod prisms

1465 m — Note* poor sample - Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, glauconitic, Shale, 80%, as above

1470 m — Note* poor sample - Siltstone, 30%, green-yellow, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 70%, dark gray and black, splintery, micro micaceous

1475 m — Siltstone, 10%, as above, Shale, 90%, dark gray, splintery, micro micaceous, trace glauconitic

1480 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, trace micaceous, carbonaceous flakes, Shale, 80%, dark gray, splintery, micro micaceous, pelecypod prisms

1485 m — Siltstone, 20%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, trace carbonaceous flakes, trace pyritic, Shale, 80%, dark gray, maroon, splintery, micro micaceous, pelecypod prisms

1490 m — Siltstone, 20%, green-yellow, trace maroon, siliceous, argillaceous, calcareous, glauconitic, Shale, 80%, dark gray, splintery, micro micaceous

1495 m — Siltstone, 10%, trace carbonaceous flakes, as above, Shale, 90%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms, pyritic

1500 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, carbonaceous flakes, glauconitic, Shale, 80%, dark gray, black, trace maroon, splintery, micro micaceous, pelecypod prisms

1505 m — Siltstone, 30%, green-yellow, siliceous, argillaceous, calcareous, argillaceous grains, glauconitic, trace pyritic, Shale, 70%, dark gray, black, as above

1510 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, micaceous, argillaceous grains, indistinct fossils, Shale, 70%, dark gray, trace maroon, splintery, micro micaceous

1515 m — Siltstone, 30%, green-yellow, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, micaceous, argillaceous grains, Shale, 70%,

Sample Descriptions

dark gray, black, trace maroon, splintery, micro micaceous

1520 m — Siltstone, 20%, as above, Shale, 80%, dark gray, green, black, splintery, waxy, micro micaceous, pyritic, pelecypod prisms

1525 m — Siltstone, 20%, green-yellow, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, micaceous, argillaceous grains, Shale, 80%, dark gray, green, black, splintery, waxy, micro micaceous, pelecypod prisms

1530 m — Note* poor sample - Siltstone, 20%, as above, Shale, 80%, as above

1535 m — Siltstone, 40%, light gray, green, siliceous, calcareous, argillaceous, glauconitic, argillaceous grains, carbonaceous flakes, micaceous, Shale, 60%, dark gray, black, splintery, micro micaceous, pyritic, glauconitic

1540 m — Siltstone, 30%, trace maroon, as above, Shale, 70%, dark gray, black, splintery, micro micaceous, glauconitic, pelecypod prisms, carbonaceous flakes

1545 m — Siltstone, 20%, light gray, green, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, micaceous, Shale, 80%, dark gray, black, splintery, micro micaceous, pelecypod prisms

1550 m — Shale, 100%, dark gray, splintery, micro micaceous, pelecypod prisms, trace siltstone

1555 m — Shale, 100%, as above, trace siltstone

1560 m — Siltstone, 20%, green-yellow, trace maroon, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1565 m — Siltstone, 20%, as above, Shale, 80%, dark gray, maroon, splintery, micro micaceous, trace pyritic, pelecypod prisms

1570 m — Siltstone, 20%, green, gray, trace yellow, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, argillaceous grains, pyritic, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, pyritic, pelecypod prisms, crinoids

1575 m — Siltstone, 30%, green-yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, Shale, 70%, dark gray, trace maroon, splintery, micro micaceous, ostracods

1580 m — Siltstone, 40%, green, maroon, yellow, as above, Shale, 60%, dark gray, splintery, micro micaceous, pelecypod prisms

1585 m — Siltstone, 40%, green, maroon, as above, Shale, 60%, dark gray, green, trace maroon, splintery, micro micaceous, pyritic

1590 m — Note* poor sample - Siltstone, 40%, green, maroon, siliceous, argillaceous,

calcareous, glauconitic, argillaceous grains, carbonaceous flakes, Shale, 60%, dark gray, maroon, splintery, micro micaceous

1595 m — Note* poor sample - Siltstone, 60%, gray, green, maroon, trace yellow, as above, Shale, 40%, pyritic, as above

1600 m — Siltstone, 40%, green, maroon, yellow, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, Shale, 60%, dark gray, green, splintery, micro micaceous, pelecypod prisms

1605 m — Siltstone, 50%, indistinct fossils, ostracods, as above, Shale, 50%, dark gray, green, splintery, micro micaceous

1610 m — Siltstone, 30%, green, maroon, siliceous, argillaceous, trace calcareous, argillaceous grains, carbonaceous flakes, glauconitic, micaceous, Shale, 70%, dark gray, splintery, micro micaceous, carbonaceous flakes, shell fragments

1615 m — Siltstone, 40%, green, maroon, yellow, siliceous, argillaceous, trace calcareous, glauconitic, argillaceous grains, carbonaceous flakes, micaceous, Shale, 60%, dark gray, maroon, splintery, trace waxy, micro micaceous, pelecypod prisms

1620 m — Siltstone, 40%, as above, Shale, 60%, dark gray, maroon, splintery, trace waxy, micro micaceous, trace siderite (concretions?), brown, crypto crystalline, dense

1625 m — Siltstone, 20%, green, maroon, as above, Shale, 80%, dark gray, splintery, micro micaceous, pelecypod prisms

1630 m — Siltstone, 30%, gray, brown, green, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, argillaceous grains, micaceous, Shale, 70%, dark gray, trace maroon, splintery, micro micaceous, trace siderite, concretions?, brown, crypto crystalline, dense

1635 m — Siltstone, 20%, medium gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, glauconitic, argillaceous grains, ostracods, micaceous, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous

1640 m — Siltstone, 20%, medium gray, trace yellow, siliceous, argillaceous, calcareous, carbonaceous flakes, glauconitic, argillaceous grains, micaceous, Shale, 80%, dark gray, black, trace maroon, splintery, micro micaceous, trace carbonaceous flakes, trace pelecypods

1645 m — Siltstone, 40%, green, maroon, yellow, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, micaceous, argillaceous grains, Shale, 60%, dark gray, black, trace maroon, splintery, micro micaceous, pelecypod prisms

1650 m — Siltstone, 30%, green, yellow, maroon, siliceous, argillaceous, calcareous, glauconitic, argillaceous grains, carbonaceous flakes, micaceous, Shale,

Sample Descriptions

70%, dark gray, splintery, micro micaceous, carbonaceous flakes, pyritic

1655 m — Siltstone, 40%, as above, Shale, 60%, pelecypod prisms, as above

1660 m — Note* poor sample - Siltstone, 30%, as above, Shale, 70%, dark gray, splintery, micro micaceous, carbonaceous flakes, pelecypod prisms

1665 m — Siltstone, 40%, gray-green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 60%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1670 m — Siltstone, 30%, glauconitic, as above, Shale, 70%, as above

1675 m — Siltstone, 40%, green, gray, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 60%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms, pyritic

1680 m — Siltstone, 20%, as above, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, trace indistinct shell fragments

1685 m — Siltstone, 30%, medium gray, green, maroon, siliceous, argillaceous, trace calcareous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, Shale, 70%, dark gray, splintery, micro micaceous, carbonaceous flakes, pyritic, pelecypod prisms

1690 m — Siltstone, 30%, as above, Shale, 70%, dark gray, splintery, micro micaceous

1695 m — Siltstone, 60%, gray, green, maroon, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, argillaceous grains, micaceous, Shale, 40%, pyritic, as above

1700 m — Siltstone, 50%, as above, Shale, 50%, dark gray, trace maroon, splintery, micro micaceous, pyritic, pelecypod prisms

1705 m — Siltstone, 40%, medium gray, trace maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 60%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1710 m — Sandstone, 10%, light gray, very fine grained, siliceous, argillaceous, calcareous, trace dark chert, subangular, well sorted, tite, no shows, Siltstone, 30%, medium gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, Shale, 60%, dark gray, trace maroon, splintery, micro micaceous, pyritic, pelecypod prisms

1715 m — Sandstone, 10%, light gray, maroon, very fine grained, siliceous, argillaceous, calcareous, silty, trace dark chert, subangular, well sorted, tite, no shows, Siltstone, 30%, as above, Shale, 60%, dark gray, green, trace maroon, splintery, micro micaceous, pelecypod prisms

1720 m — Sandstone, 10%, light gray, maroon, very fine grained, very calcareous,

trace pyritic, ostracods, dark chert, trace glauconite, subangular, well sorted, tite, no shows, Siltstone, 40%, medium gray, trace green, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 50%, dark gray, trace green, trace maroon, splintery, micro micaceous, pelecypod prisms

1725 m Sandstone, 10%, pink, very fine grained, very calcareous, dark chert, glauconitic, subangular, well sorted, tite, no shows, Siltstone, 30%, glauconitic, as above, Shale, 60%, dark gray, trace maroon, splintery, micro micaceous, trace pyritic

1730 m Sandstone, 10%, pink, green, very fine grained, siliceous, calcareous, dark chert, glauconitic, trace pyritic, subrounded, well sorted, tite, no shows, Siltstone, 30%, medium gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, Shale, 60%, dark gray, green, maroon, splintery, micro micaceous, pelecypod prisms

1735 m Sandstone, 10%, pink, yellow, very fine grained, siliceous, calcareous, glauconitic, dark chert, subangular, well sorted, tite, no shows, Siltstone, 20%, as above, Shale, 70%, dark gray, green, trace maroon, splintery, micro micaceous

1740 m Siltstone, 40%, gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, Shale, 60%, dark gray, splintery, micro micaceous, trace sandstone

1745 m Siltstone, 30%, medium gray, green, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, Shale, 70%, pelecypod prisms, as above

1750 m Siltstone, 30%, gray, green, maroon, as above, Shale, 70%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1755 m Siltstone, 40%, gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, glauconitic, ostracods, Shale, 60%, dark gray, splintery, micro micaceous, pelecypod prisms, trace pyritic

1760 m Siltstone, 60%, gray, green, maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, glauconitic, argillaceous grains, micaceous, Shale, 40%, dark gray, splintery, micro micaceous, glauconitic, pyritic, pelecypod prisms

1765 m Siltstone, 30%, gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 60%, dark gray, splintery, micro micaceous, pelecypod prisms, shell fragments, ostracods, Sandstone, 10%, brown, fine grained, very calcareous, trace siliceous, black nodules (ironstone?), carbonaceous, rounded, medium sorted, tite, no shows

Sample Descriptions

1770 m — Siltstone, 30%, as above, Shale, 70%, dark gray, splintery, micro micaceous, shell fragments

1775 m — Siltstone, 20%, glauconitic, as above, Shale, 80%, pelecypod prisms, as above

1780 m — Siltstone, 10%, gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1785 m — Siltstone, 40%, gray, green, trace maroon, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 60%, dark gray, splintery, micro micaceous, trace pyritic, pelecypod prisms

1790 m — Siltstone, 40%, light gray, siliceous, trace calcareous, argillaceous grains, carbonaceous flakes,glauconitic, Shale, 60%, dark gray, splintery, micro micaceous, shell fragments

1795 m — Siltstone, 40%, trace green, ostracods, as above, Shale, 60%, dark gray, splintery, micro micaceous

1800 m — Siltstone, 50%, light gray, trace green, trace maroon, siliceous, trace calcareous, argillaceous grains, carbonaceous flakes, glauconitic, micaceous, ostracods, Shale, 50%, dark gray, trace green, splintery, micro micaceous, pelecypod prisms

1805 m — Siltstone, 60%, light gray, trace green, siliceous, trace calcareous, argillaceous, argillaceous grains, carbonaceous flakes, micaceous, glauconitic, Shale, 40%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

1810 m — Siltstone, 50%, light gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 50%, dark gray, splintery, micro micaceous, trace shell fragments

1815 m — Siltstone, 60%, light gray, green, trace maroon, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, glauconitic, micaceous, indistinct shell fragments, Shale, 40%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

1820 m — Siltstone, 50%, light gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 50%, dark gray, splintery, micro micaceous, pelecypod prisms

1825 m — Siltstone, 40%, as above, Shale, 60%, dark gray, trace green, splintery, trace waxy, micro micaceous

1830 m — Siltstone, 40%, light gray, trace green, trace maroon, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 60%, dark gray, splintery, micro micaceous, pelecypod prisms

Sample Descriptions

1835 m — Siltstone, 50%, light gray, as above, Shale, 50%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms, trace siderite

1840 m — Siltstone, 60%, light gray, green, trace maroon, siliceous, argillaceous, trace calcareous, carbonaceous flakes, argillaceous grains, micaceous, Shale, 40%, trace pyritic, as above, trace siderite

1845 m — Siltstone, 60%, as above, Shale, 40%, dark gray, splintery, micro micaceous, pelecypod prisms

1850 m — Siltstone, 50%, medium gray, trace green, siliceous, argillaceous, trace calcareous, carbonaceous flakes, argillaceous grains, Shale, 50%, dark gray, splintery, micro micaceous, trace carbonaceous flakes

1855 m — Siltstone, 20%, trace maroon, as above, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, shell fragments

1860 m — Siltstone, 20%, medium gray, trace green, siliceous, argillaceous, trace calcareous, carbonaceous flakes, argillaceous grains, Shale, 80%, dark gray, splintery, micro micaceous

1865 m — Siltstone, 40%, light gray, trace maroon, siliceous, argillaceous, trace calcareous, carbonaceous flakes, pelecypod prisms, Shale, 60%, dark gray, splintery, micro micaceous, glauconitic, metasomatic, pelecypod prisms (pyritized)

1870 m — Siltstone, 50%, light gray, trace green, trace maroon, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, pyritic, Shale, 50%, dark gray, splintery, micro micaceous, pelecypod prisms, trace siderite

1875 m — Siltstone, 50%, light gray, trace green, as above, Shale, 50%, dark gray, splintery, micro micaceous

1880 m — Siltstone, 20%, light gray, green, siliceous, argillaceous, calcareous, trace glauconitic, carbonaceous flakes, argillaceous grains, Shale, 80%, dark gray, splintery, micro micaceous, pyritic, shell fragments

1885 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, splintery, micro micaceous, carbonaceous flakes, shell fragments

1890 m — Siltstone, 20%, as above, Shale, 80%, black, splintery, micro micaceous, carbonaceous flakes, pyritic, crinoids

1895 m — Siltstone, 10%, green, gray, trace maroon, siliceous, argillaceous, trace calcareous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous, pyritic

1900 m — Note* poor sample (burnt) - Siltstone, 30%, as above, Shale, 70%, dark gray, splintery, micro micaceous

Sample Descriptions

1905 m — Siltstone, 20%, light gray, green, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, trace pyritic, trace shell fragments

1910 m — Siltstone, 20%, pyritic, micaceous, as above, Shale, 80%, dark gray, trace maroon, splintery, micro micaceous, pyritic, trace shell fragments

1915 m — Siltstone, 10%, light gray, green, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous, pyritic

1920 m — Siltstone, 20%, gray, green, yellow, siliceous, argillaceous, calcareous, Shale, 80%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

1925 m — Siltstone, 20%, light gray, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, micaceous, Shale, 80%, dark gray, splintery, micro micaceous

1930 m — Siltstone, 20%, as above, Shale, 80%, dark gray, splintery, micro micaceous, pelecypod prisms

1935 m — Siltstone, 10%, as above, Shale, 90%, pyritic, as above

1940 m — Siltstone, 10%, light gray, green, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

1945 m — Siltstone, 10%, trace maroon, micaceous, as above, Shale, 90%, dark gray, splintery, micro micaceous, pyritic

1950 m — Siltstone, 20%, light gray, green, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 80%, pelecypod prisms, as above

1955 m — Siltstone, 10%, as above, Shale, 90%, dark gray, splintery, micro micaceous, pelecypod prisms

1960 m — Siltstone, 10%, green, gray, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, glauconitic, micaceous, Shale, 90%, trace metasomatic pelecypod prisms (pyritized)

1965 m — Siltstone, 10%, green, gray, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, micaceous, Shale, 90%, dark gray, splintery, micro micaceous, pelecypod prisms

1970 m — Siltstone, 10%, gray, green, maroon, as above, Shale, 90%, pyritic, as above

1975 m — Siltstone, 10%, gray, green, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, micaceous, glauconitic, Shale, 90%, dark

Sample Descriptions

gray, splintery, micro micaceous, pyritic, pelecypod prisms, crinoids

1980 m — Shale, 100%, dark gray, splintery, micro micaceous, metasomatic pelecypod prisms (pyritized), trace siltstone

1985 m — Shale, 100%, dark gray, splintery, micro micaceous, pelecypod prisms, trace siltstone

1990 m — Siltstone, 10%, medium gray, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous, metasomatic pelecypod prisms (pyritized)

1995 m — Shale, 100%, dark gray, splintery, micro micaceous, pyritic, ostracods, trace siltstone

2000 m — Siltstone, 10%, green, gray, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, splintery, micro micaceous, carbonaceous flakes

2005 m — Shale, 100%, dark gray, splintery, micro micaceous, trace siltstone

2010 m — Shale, 90%, dark gray, splintery, micro micaceous, pyritic, Siltstone, 10%, green, gray, siliceous, argillaceous, micaceous, carbonaceous flakes, argillaceous grains

2015 m — Siltstone, 10%, green, gray, siliceous, argillaceous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous

2020 m — Siltstone, 20%, as above, Shale, 80%, dark gray, splintery, micro micaceous, pyritic, metasomatic pelecypod prisms (pyritized)

2025 m — Siltstone, 10%, as above, Shale, 90%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

2030 m — Siltstone, 10%, green, gray, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

2035 m — Siltstone, 10%, as above, Shale, 90%, dark gray, splintery, micro micaceous

2040 m — Shale, 100%, pyritic, as above, trace siltstone

2045 m — Shale, 100%, dark gray, splintery, micro micaceous, silty, pelecypod prisms

2050 m — Siltstone, 10%, green, gray, siliceous, argillaceous, carbonaceous flakes, Shale, 90%, dark gray, trace maroon, splintery, micro micaceous, pelecypod prisms

2055 m — Siltstone, 10%, as above, Shale, 90%, dark gray, green, splintery, micro micaceous, pyritic, pelecypod prisms

Sample Descriptions

2060 m — Shale, 100%, dark gray, trace green, trace maroon, splintery, micro micaceous, trace siltstone

2065 m — Siltstone, 10%, gray, green, siliceous, argillaceous, calcareous, glauconitic, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, splintery, micro micaceous, pelecypod prisms

2070 m — Shale, 100%, dark gray, splintery, micro micaceous, trace glauconitic, trace silty, trace siltstone

2075 m — Shale, 100%, dark gray, splintery, micro micaceous, trace silty, trace siltstone

2080 m — Shale, 100%, dark gray, splintery, micro micaceous, trace siltstone

2085 m — Shale, 100%, as above, trace siltstone

2090 m — Shale, 100%, black, splintery, micro micaceous, trace siltstone

2095 m — Shale, 100%, black, splintery, micro micaceous, trace siltstone

2100 m — Shale, 100%, dark gray, black, trace brown, splintery, micro micaceous, pelecypod prisms, trace siltstone

2105 m — Siltstone, 10%, green, gray, siliceous, argillaceous, calcareous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray, black, splintery, micro micaceous, trace siderite concretions?, brown, crypto crystalline, dense

2110 m — Siltstone, 10%, as above, Shale, 90%, trace green, pelecypod prisms, as above

2115 m — Siltstone, 10%, green, gray, siliceous, argillaceous, calcareous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

2120 m — Siltstone, 10%, as above, Shale, 90%, dark gray, as above

2125 m — Shale, 100%, dark gray, black, splintery, micro micaceous, pelecypod prisms, trace siltstone

2130 m — Shale, 100%, dark gray, black, trace green, as above, trace siltstone

2135 m — Shale, 100%, dark gray, black, splintery, micro micaceous, pyritic, trace siltstone

2140 m — Shale, 100%, dark gray, black, splintery, micro micaceous, pyritic

2145 m — Shale, 100%, dark gray, black, splintery, micro micaceous

2150 m — Shale, 100%, dark gray, black, carbonaceous flakes, as above, trace siltstone

Sample Descriptions

2155 m — Shale, 100%, dark gray, black, splintery, micro micaceous, trace siltstone

2160 m — Siltstone, 10%, medium gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 90%, as above

2165 m — Shale, 100%, dark gray, trace black, trace brown, trace maroon, splintery, micro micaceous, pyritic, trace siltstone

2170 m — Shale, 100%, dark gray, black, splintery, micro micaceous, pyritic, pelecypod prisms, trace shell fragments, trace siltstone

2175 m — Shale, 100%, black, trace maroon, splintery, micro micaceous, pyritic, trace siltstone, trace siderite

2180 m — Siltstone, 10%, medium gray, siliceous, argillaceous, argillaceous grains, carbonaceous flakes, Shale, 90%, dark gray, black, trace maroon, splintery, micro micaceous, pyritic, pelecypod prisms

2185 m — Siltstone, 10%, as above, Shale, 90%, dark gray, splintery, micro micaceous, pyritic, carbonaceous flakes, trace siderite

2190 m — Siltstone, 10%, as above, Shale, 90%, dark gray, black, splintery, micro micaceous, pelecypod prisms, pyritic, trace siderite

2195 m — Siltstone, 10%, medium gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, pyritic, Shale, 90%, dark gray, micro micaceous, metasomatic, pelecypod prisms (pyritized)

2200 m — Siltstone, 10%, light gray, green, siliceous, argillaceous, carbonaceous flakes, argillaceous grains, Shale, 90%, dark gray and black, splintery, micro micaceous, trace siderite, brown, crypto crystalline, dense

2205 m — Shale, 100%, black, splintery, micro micaceous, pyritic, pelecypod prisms, trace siltstone

2210 m — Shale, 100%, as above, trace siltstone

2215 m — Shale, 100%, black, dark gray, trace maroon, splintery, micro micaceous, pyritic, pelecypod prisms, trace siltstone

2220 m — Shale, 100%, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms

2225 m — Shale, 100%, black, fissile, splintery in part, micro micaceous, pyritic, trace siltstone

2230 m — Shale, 100%, black, trace dark gray, splintery, fissile, micro micaceous, pyritic, trace siltstone

2235 m — Shale, 100%, black, splintery, micro micaceous, pyritic, trace siltstone

Sample Descriptions

2240 m — Shale, 100%, black, splintery, micro micaceous, pyritic, pelecypod prisms

2245 m — Shale, 100%, black, dark gray, splintery, micro micaceous, pelecypod prisms

2250 m — Shale, 100%, pyritic, as above

2255 m — Shale, 100%, black, splintery, siliceous, pyritic, black chert, pelecypod prisms, trace coal stringers, trace white dolomite veins, bituminous

2260 m — Shale, 100%, black, blocky, siliceous, pyritic, black chert, bituminous

2265 m — Shale, 90%, black, blocky, siliceous, pyritic, black, chert, trace white dolomite veins, bituminous, Shale, 10%, dark gray, splintery, micaceous

2270 m — Shale, 100%, black, blocky, splintery in part, siliceous, pyritic, black chert with white specks, trace white dolomite veins, bituminous

2275 m — Shale, 100%, black, blocky, siliceous, pyritic, black chert, trace white dolomite veins, bituminous, trace limestone, dark brown, crypto crystalline, dense

2280 m — Note* trip sample - Shale, 70%, black, blocky, siliceous, black chert, bituminous, Shale, 30%, dark gray, subfissile, micro micaceous, silty (cavings)

2285 m — No sample

2290 m — Shale, 100%, black, subfissile, siliceous, pyritic, bituminous

2295 m — Shale, 100%, black, blocky, siliceous, white calcareous veins, bituminous

2300 m — Shale, 100%, black, subfissile, siliceous, trace calcareous, trace pyritic, white calcareous veins, bituminous

2305 m — Shale, 100%, black, blocky, siliceous, trace calcareous, pyritic, bituminous, trace brown shale

2310 m — No sample

2315 m — Shale, 100%, black, blocky, siliceous, trace calcareous, pyritic, bituminous, trace dark gray shale

2320 m — Shale, 100%, as above, trace black chert, trace limestone, dark brown, micro crystalline, argillaceous, dense

2325 m — Shale, 100%, black, blocky, siliceous, trace calcareous, black chert, bituminous, trace siltstone (cavings)

2330 m — Shale, 100%, as above, trace siltstone (cavings)

2335 m — Shale, 100%, black, blocky, siliceous, trace calcareous, pyritic, bituminous

Sample Descriptions

2340 m — Shale, 100%, black, blocky, siliceous, trace dolomite, pyritic, bituminous

2345 m — Shale, 100%, black, blocky, siliceous, pyritic

2350 m — Shale, 100%, black, subfissile, siliceous, pyritic, white calcareous specks, bituminous

2355 m — Shale, 100%, black, subfissile, siliceous, pyritic, bituminous

2360 m — Shale, 100%, black, blocky, siliceous, pyritic, white calcareous specks, pelecypod prisms, bituminous

2365 m — Limestone, 40%, mottled, light and dark brown, very fine fragmental packstone, bioclastic debris, argillaceous, indistinct fossils, dense, no shows, Shale, 60%, black, blocky, siliceous, pyritic, white calcareous specks, bituminous

2370 m — Limestone, 50%, mottled, light and dark brown, very fine fragmental packstone, bioclastic debris, argillaceous, dense, no shows, Limestone, 20%, dark brown, crypto crystalline, argillaceous, dense, Shale, 30%, black, blocky, siliceous, white calcareous specks, bituminous

2375 m — Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, dense, no shows, Shale, 30%, pyritic, as above

2380 m — Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, dense, no shows, stylolites, Shale, 30%, black, blocky, siliceous, pyritic, bituminous

2385 m — Limestone, 70%, as above, Shale, 30%, black, blocky, siliceous, bituminous

2390 m — Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomite, dense, no shows, stylolites, Shale, 30%, black, dark gray, splintery, micro micaceous, pyritic, pelecypod prisms, bituminous

2395 m — Limestone, 70%, mottled, buff, brown, fine fragmental packstone, bioclastic debris, argillaceous, trace dolomite, dense, no shows, stylolites, Shale, 30%, dark gray, black, blocky, micro micaceous, trace bituminous

2400 m — Limestone, 70%, mottled, buff, brown, fine fragmental packstone, bioclastic debris, argillaceous, indistinct fossils, dense, no shows, stylolites, Shale, 30%, dark gray, blocky, micro micaceous, trace pyritic

2405 m — Limestone, 70%, mottled, buff, brown, fine fragmental packstone, bioclastic debris, argillaceous, indistinct fossils, dense, no shows, stylolites, Shale, 30%, dark gray, green, blocky, silty

2410 m — Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomite, indistinct fossils, ostra-

cods, dense, no shows, stylolites, Shale, 30%, dark gray, splintery, micro micaceous

2415 m Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, trace pyritic, ostracods, dense, no shows, Shale, 30%, as above

2420 m Limestone, 70%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, pyritic, dense, no shows, stylolites, Shale, 30%, as above

2425 m Limestone, 60%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, crinoids, gastropods, indistinct fossils, dense, no shows, stylolites, Shale, 40%, dark gray, blocky, calcareous

2430 m Limestone, 40%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, pyritic, crinoids, ostracods, dense, no shows, Shale, 60%, dark gray, blocky, micro micaceous

2435 m Limestone, 60%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, pyritic, ostracods, crinoids, dense, no shows, stylolites, Shale, 40%, dark gray, blocky, micro micaceous, calcareous

2440 m Limestone, 40%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, indistinct fossils, dense, no shows, Shale, 60%, dark gray, blocky, micro micaceous

2445 m Limestone, 40%, mottled, dark brown, buff, very fine fragmental packstone, bioclastic debris, argillaceous, indistinct fossils, trace pyritic, dense, no shows, Shale, 60%, dark gray, blocky, micro micaceous, calcareous in part

2450 m Limestone, 50%, mottled, dark brown, buff, very fine fragmental packstone, bioclastic debris, argillaceous, ostracods, dense, no shows, Shale, 50%, as above

2455 m Limestone, 60%, mottled, buff, brown, fragmental wackestone, bioclastic debris, argillaceous, trace pyritic, ostracods, indistinct fossils, dense, no shows, Shale, 40%, dark gray, blocky, micro micaceous, calcareous

2460 m Limestone, 60%, mottled, buff, brown, fragmental wackestone, bioclastic debris, argillaceous, pyritic, ostracods, crinoids, indistinct fossils, dense, no shows, Shale, 40%, as above

2465 m Limestone, 60%, mottled, buff, brown, medium fragmental packstone, bioclastic debris, argillaceous, pyritic, crinoids, ostracods, dense, no shows, Shale, 40%, as above

2470 m Limestone, 80%, mottled, buff, brown, fragmental wackestone, bioclastic debris, argillaceous, crinoids, dense, no shows, stylolites, Shale, 20%,

Sample Descriptions

dark gray, blocky, micro micaceous, calcareous

2475 m — Limestone, 60%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, pyritic, indistinct fossils, dense, no shows, stylolites, Shale, 40%, dark gray, blocky, micro micaceous, calcareous

2480 m — Note* trip sample - Limestone, 40%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, pyritic, crinoids, dense, no shows, stylolites, Shale, 60%, as above

2485 m — Limestone, 50%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, gastropods, crinoids, dense, no shows, stylolites, Shale, 50%, as above

2490 m — Limestone, 40%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, dense, no shows, Shale, 60%, dark gray, blocky, micro micaceous, calcareous

2495 m — Limestone, 40%, mottled, buff, brown, fragmental wackestone, bioclastic debris, pelletoidal, argillaceous, pyritic, crinoids, dense, no shows, Shale, 60%, as above

2500 m — Limestone, 50%, mottled, buff, brown, fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, crinoids, ostracods, dense, no shows, Shale, 50%, as above

2505 m — Limestone, 60%, mottled, buff, brown, fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic, trace chert, trace pyritic, crinoids, dense, no shows, Shale, 40%, dark gray, blocky, micro micaceous, calcareous

2510 m — Limestone, 60%, mottled, buff, brown, very fine fragmental packstone, bioclastic debris, argillaceous, trace dolomitic chert, trace pyritic, ostracods, dense, no shows, stylolites, Shale, 40%, as above

2515 m — Limestone, 50%, mottled, buff, brown, fragmental wackestone, bioclastic debris, trace pelletoidal, argillaceous, disseminated pyrite, ostracods, dense, no shows, stylolites, Shale, 50%, pelecypod prisms, as above

2520 m — Limestone, 50%, mottled, buff, brown, fragmental wackestone, bioclastic debris, argillaceous, dolomitic, crinoids, dense, no shows, Shale, 50%, dark gray, blocky, micro micaceous, calcareous, pyritic

2525 m — Limestone, 40%, mottled, buff, brown, fine pelletoidal packstone, bioclastic debris, argillaceous, disseminated pyrite, dense, no shows, stylolites, Shale, 60%, dark gray, blocky, micro micaceous, calcareous, trace siltstone

2530 m — Limestone, 60%, mottled, buff, dark brown, fine fragmental packstone, bioclastic debris, pelletoidal, argillaceous, trace dolomitic, pyritic, dense, no shows, Shale, 40%, dark gray, blocky, micro micaceous, calcareous, fossils

Sample Descriptions

2535 m Limestone, 60%, mottled, buff, dark brown, fine pelletoidal packstone, recrystallized matrix, bioclastic debris, argillaceous, dense, no shows, stylolites, Shale, 40%, dark gray, blocky, micro micaceous, calcareous, pyritic

2540 m Limestone, 60%, mottled, buff, dark brown, fine fragmental packstone, bioclastic debris, argillaceous, pyritic, indistinct fossils, dense, no shows, stylolites, Shale, 40%, as above

2545 m Limestone, 60%, mottled, brown, buff, very fine fragmental packstone, bioclastic debris, argillaceous, pyritic, indistinct fossils, dense, no shows, stylolites, Shale, 40%, dark gray, blocky, micro micaceous, calcareous

2550 m Limestone, 70%, mottled, brown, buff, fine pelletoidal packstone, bioclastic debris, argillaceous, trace pyritic, ostracods, dense, no shows, stylolites, Shale, 30%, as above

2555 m Limestone, 80%, mottled, brown, buff, fine pelletoidal packstone, argillaceous, dense, no shows, stylolites, Shale, 20%, as above

2560 m Limestone, 70%, mottled, brown, buff, fine pelletoidal packstone, argillaceous, pyritic, dense, no shows, stylolites, Shale, 30%, dark gray, blocky, micro micaceous, calcareous, pelecypod prisms

2565 m Limestone, 80%, mottled, brown, buff, fine pelletoidal packstone, gastropods, indistinct fossils, dense, no shows, stylolites, Shale, 20%, dark gray, blocky, micro micaceous, calcareous

2570 m Limestone, 90%, mottled, brown, buff, fine pelletoidal packstone, oolitic, trace argillaceous, trace pyritic, crinoids, indistinct fossils, dense, no shows, stylolites, Shale, 10%, as above

2575 m Limestone, 60%, mottled, brown, buff, fine pelletoidal packstone, recrystallized matrix, trace pyritic, ostracods, dense, no shows, stylolites, Dolomite, 10%, dark brown, micro crystalline, calcareous, pin point porosity, no shows, Shale, 30%, dark gray, blocky, micro micaceous

2580 m Dolomite, 40%, buff, brown, micro crystalline, calcareous, intercrystalline porosity 2%, Limestone, 40%, mottled, brown, buff, fine pelletoidal packstone, recrystallized matrix, trace pyritic, dense, no shows, stylolites, Shale, 20%, as above

2585 m Dolomite, 60%, dark brown, buff, micro crystalline, calcareous, intercrystalline porosity 2%, no shows, bituminous, Limestone, 20%, indistinct fossils, as above, Shale, 20%, as above

2590 m Dolomite, 90%, brown, micro crystalline, calcareous, intercrystalline and vuggy porosity 2%, no shows, bituminous, stylolites, Shale, 10%, dark gray, splintery, micro micaceous

2595 m Dolomite, 90%, brown, micro crystalline, calcareous, intercrystalline

Sample Descriptions

porosity 2%, no shows, bituminous, Shale, 10%, as above

2600 m — Anhydrite, 30%, buff, crypto crystalline, dolomitic, dense, Dolomite, 50%, brown, micro crystalline, calcareous, anhydritic, dense, no shows, Shale, 20%, as above

2605 m — Anhydrite, 20%, as above, Dolomite, 60%, brown, micro crystalline, trace calcareous, anhydritic, trace intercrystalline porosity, predominantly dense, trace bitumen, Shale, 20%, dark gray, splintery, micro micaceous

2610 m — Anhydrite, 40%, buff, crypto crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, calcareous, anhydritic, dense, no shows, Shale, 20%, dark gray, blocky, micro micaceous, calcareous

2615 m — Anhydrite, 20%, buff, crypto crystalline, dolomitic, dense, Dolomite, 60%, brown, micro crystalline, calcareous, anhydritic, dense, no shows, Shale, 20%, dark gray, splintery, micro micaceous

2620 m — Anhydrite, 30%, as above, Dolomite, 50%, as above, Shale, 20%, as above

2625 m — Anhydrite, 30%, buff, crypto crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 30%, dark gray, splintery, micro micaceous

2630 m — Anhydrite, 30%, buff, micro crystalline, dolomitic, dense, Dolomite, 40%, as above, Shale, 30%, as above

2635 m — Anhydrite, 20%, as above, Dolomite, 60%, brown, micro crystalline, trace very fine crystalline, anhydritic, dense, no shows, stylolites, Shale, 20%, as above

2640 m — Anhydrite, 30%, buff, white, micro crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, trace pyritic, dense, no shows, Shale, 30%, dark gray, splintery, micro micaceous, calcareous, crinoids

2645 m — Anhydrite, 30%, white-yellow, micro crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, trace pyritic, dense, no shows, Shale, 30%, dark gray, splintery, micro micaceous

2650 m — Anhydrite, 50%, as above, Dolomite, 30%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 20%, as above

2655 m — Anhydrite, 40%, as above, Dolomite, 30%, as above, Shale, 30%, as above

2660 m — Anhydrite, 50%, white-yellow, micro crystalline, dolomitic, dense, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 30%, dark gray, splintery, micro micaceous

2665 m — Anhydrite, 20%, as above, Dolomite, 60%, stylolites, as above, Shale, 20%, as above

Sample Descriptions

2670 m Anhydrite, 50%, white-yellow, micro crystalline, dolomitic, dense, pyritic, Dolomite, 30%, brown, micro crystalline, trace very fine crystalline, anhydritic, dense, no shows, Shale, 20%, as above

2675 m Anhydrite, 30%, white-yellow, micro crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 30%, dark gray, splintery, micro micaceous

2680 m Anhydrite, 20%, as above, Dolomite, 40%, as above, Shale, 40%, as above

2685 m Anhydrite, 30%, as above, Dolomite, 40%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 30%, dark gray, splintery, micro micaceous

2690 m Anhydrite, 30%, white, yellow, micro crystalline, dolomitic, dense, Dolomite, 30%, as above, Shale, 40%, as above

2695 m Anhydrite, 20%, as above, Dolomite, 40%, as above, Shale, 40%, trace pyritic, as above

2700 m Anhydrite, 20%, as above, Dolomite, 60%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 20%, dark gray, splintery, micro micaceous

2705 m Anhydritic, 10%, white-yellow, micro crystalline, dense, Dolomite, 70%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 20%, dark gray, splintery, micro micaceous

2710 m Anhydrite, 10%, as above, Dolomite, 70%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 20%, as above, trace siltstone

2715 m Anhydrite, 10%, as above, Dolomite, 70%, as above, Shale, 20%, as above

2720 m Anhydrite, 10%, white, yellow, micro crystalline, dolomitic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 50%, dark gray, splintery, micro micaceous

2725 m Anhydrite, 10%, as above, Dolomite, 50%, as above, Shale, 40%, as above

2730 m Anhydrite, 10%, as above, Dolomite, 60%, as above, Shale, 30%, as above

2735 m Anhydrite, 10%, white, micro crystalline, dolomitic, dense, Dolomite, 50%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 40%, dark gray, splintery, micro micaceous

2740 m Anhydrite, 10%, as above, Dolomite, 50%, as above, Shale, 40%, as above

2745 m Anhydrite, 20%, white, yellow, micro crystalline, dolomitic, dense, Dolomite, 40%, as above, Shale, 40%, as above

2750 m Anhydrite, 20%, white-yellow, micro crystalline, dolomitic, dense, stylo-

lites, Dolomite, 40%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 40%, dark gray, splintery, micro micaceous

2755 m — Anhydrite, 20%, white, yellow, micro crystalline, dolomitic, dense, Dolomite, 40%, as above, Shale, 40%, as above

2760 m — Anhydrite, 20%, as above, Dolomite, 50%, as above, Shale, 30%, as above

2765 m — Note* trip sample - Anhydrite, 10%, white, yellow, micro crystalline, dolomitic, dense, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 70%, dark gray, green, blocky,micro micaceous, silty

2770 m — Anhydrite, 20%, as above, Dolomite, 20%, brown, micro crystalline, anhydritic, trace poor vuggy porosity, predominantly dense, no shows, Shale, 60%, as above

2775 m — Anhydrite, 20%, as above, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 60%, dark gray, green, blocky, micro micaceous, silty

2780 m — Anhydrite, 20%, white-yellow, micro crystalline, dolomitic, dense, Dolomite, 20%, as above, Shale, 60%, as above

2785 m — Anhydrite, 30%, as above, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 50%, as above

2790 m — Anhydrite, 30%, yellow-white, crypto crystalline, dolomitic, dense, Dolomite, 20%, as above, Shale, 50%, dark gray, green, splintery, micro micaceous, silty, pyritic

2795 m — Anhydrite, 30%, trace pyritic, as above, Dolomite, 30%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 40%, dark gray-green, splintery, micro micaceous, silty

2800 m — Anhydrite, 40%, yellow, white, crypto crystalline, micro crystalline in part, dolomitic, dense, Dolomite, 30%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 30%, dark gray, blocky, micro micaceous

2805 m — Anhydrite, 30%, as above, Dolomite, 40%, as above, Shale, 30%, dark gray, trace green, blocky, micro micaceous, silty

2810 m — Anhydrite, 20%, yellow-white, crypto crystalline, dolomitic, rare pyritic, dense, Dolomite, 40%, brown, micro crystalline, anhydritic, rare pyritic, dense, no shows, Shale, 40%, dark gray, blocky, micro micaceous, trace silty

2815 m — Anhydrite, 30%, yellow-white, crypto crystalline, dense, Dolomite, 30%, as above, Shale, 40%, dark gray, blocky,micro micaceous

Sample Descriptions

2820 m — Anhydrite, 30%, as above, Dolomite, 30%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 40%, as above

2825 m — Anhydrite, 30%, as above, Dolomite, 40%, pyritic, as above, Shale, 30%, as above

2830 m — Anhydrite, 30%, yellow, white, crypto crystalline, dolomitic, dense, Dolomite, 30%, brown, micro crystalline, anhydritic, trace pyritic, dense, no shows, Shale, 40%, dark gray, blocky, micro micaceous

2835 m — Anhydrite, 50%, pyritic, as above, Dolomite, 20%, brown,micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 30%, as above

2840 m — Anhydrite, 40%, yellow, white, crypto crystalline, dolomitic, dense, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 40%, as above

2845 m — Anhydrite, 40%, as above, Dolomite, 20%, as above, Shale, 40%, dark gray, blocky, micro micaceous

2850 m — Anhydrite, 40%, micro crystalline in part, as above, Dolomite, 10%, as above, Shale, 50%, as above

2855 m — Anhydrite, 30%, yellow, white, crypto crystalline, dolomitic, dense, Dolomite, 10%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 60%, pyritic, as above, trace siltstone

2860 m — Anhydrite, 30%, as above, Dolomite, 10%, stylolites, as above, Shale, 60%, dark gray, blocky, micro micaceous, trace siltstone

2865 m — Anhydrite, 30%, as above, Dolomite, 10%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 60%, as above

2870 m — Anhydrite, 30%, yellow, white, crypto crystalline, dolomitic, dense, Dolomite, 10%, brown, micro crystalline, anhydritic, dense, no shows, Shale, 60%, as above

2875 m — Anhydrite, 40%, as above, Dolomite, 10%, as above, Shale, 50%, dark brown, gray, blocky, micro micaceous

2880 m — Anhydrite, 40%, yellow-white, crypto crystalline, dolomitic, dense, Dolomite, 20%, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Shale, 40%, dark gray, green, blocky, micro micaceous, silty

2882 m — Circulated sample - Anhydrite, 40%, as above, Dolomite, 30%, buff, brown, micro crystalline, trace very fine crystalline, trace anhydritic,no visual porosity, no shows, stylolites, Shale, 30%, dark gray, blocky, micro micaceous

2885 m — Dolomite, 20%, buff, very fine crystalline, trace anhydritic, trace poor intercrystalline porosity, predominantly no shows, stylolites, Anhydrite,

40%, yellow-white, crypto crystalline, dolomite rhombs, dense, stylolites, Shale, 40%, dark gray, blocky, micro micaceous, pyritic

2890 m Dolomite, 20%, buff, very fine crystalline, trace anhydritic, dense, no shows, Anhydrite, 40%, yellow, white, crypto crystalline, dolomitic, dense, Shale, 40%, dark gray, splintery, micro micaceous

2895 m Dolomite, 20%, buff, very fine crystalline, trace anhydritic, trace poor intercrystalline and vuggy porosity, predominantly dense, no shows, Anhydrite, 40%, yellow, white, crypto crystalline, dolomitic, dense, Shale, 40%, dark gray, splintery, micro micaceous

2900 m Dolomite, 20%, buff, brown, micro crystalline, very fine crystalline in part, trace anhydritic, trace poor intercrystalline porosity, predominantly dense, no shows, stylolites, Anhydrite, 30%, as above, Shale, 50%, as above

2905 m Note* trip sample - Dolomite, 10%, buff, brown, micro crystalline, anhydritic, dense, no shows, stylolites, Anhydrite, 20%, as above, Shale, 70%, dark gray, blocky, micro micaceous

2910 m Dolomite, 10%, brown, micro crystalline, trace very fine crystalline, trace anhydritic, trace poor intercrystalline porosity, predominantly dense, no shows, Anhydrite, 20%, as above, Shale, 70%, dark gray, splintery, micro micaceous

2915 m Dolomite, 10%, buff, brown, very fine crystalline, trace anhydritic, dense, no shows, stylolites, Anhydrite, 30%, yellow, white, gray, micro crystalline, dolomitic, shaly, dense, Shale, 60%, dark gray, splintery, micro micaceous

2920 m Dolomite, 20%, buff, brown, very fine crystalline, trace anhydritic, dense, no shows, Anhydrite, 30%, yellow, white, as above, Shale, 50%, as above

2925 m Dolomite, 20%, buff, very fine crystalline, anhydritic, trace poor intercrystalline porosity, predominantly dense, no shows, stylolites, Anhydrite, 30%, yellow, white, micro crystalline, dolomitic, dense, Shale, 50%, dark gray, splintery, micro micaceous

2930 m Dolomite, 10%, as above, Anhydrite, 40%, shaly, as above, Shale, 50%, as above

2935 m Dolomite, 10%, buff, brown, micro crystalline, anhydritic, trace poor vuggy porosity, predominantly dense, no shows, Anhydrite, 50%, yellow-white, micro crystalline, dolomitic, dense, Shale, 40%, as above

2940 m Dolomite, 40%, dark gray, micro crystalline, trace argillaceous, dense, no shows, Anhydrite, 30%, yellow-white, crypto crystalline, dolomitic, dense, Shale, 30%, dark gray, splintery, micro micaceous, pyritic

2945 m Dolomite, 30%, anhydritic, as above, Anhydrite, 40%, yellow, white, crypto crystalline, dense, Shale, 30%, as above

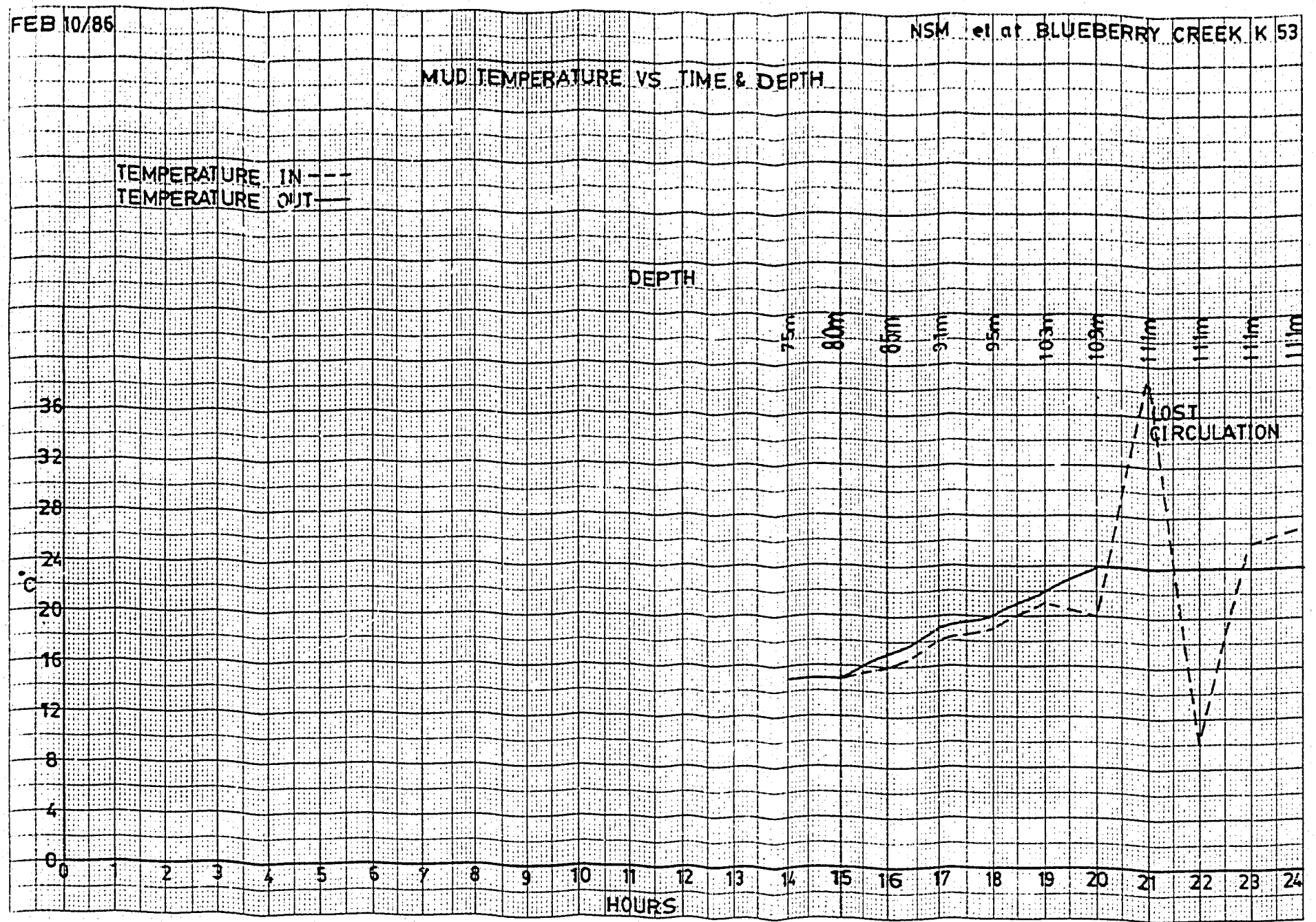
Sample Descriptions

2950 m — Dolomite, 30%, buff, brown, very fine crystalline, anhydritic, dense, no shows, Anhydrite, 40%, as above, Shale, 30%, as above

2955 m — Dolomite, 10%, as above, Anhydrite, 60%, yellow, white, crypto crystalline, dolomitic, dense, Shale, 30%, dark gray, splintery, micro micaceous, pyritic

2960 m — Dolomite, 40%, buff, brown, very fine crystalline, anhydritic, trace poor intercrystalline porosity, predominantly dense, no shows, stylolites, Anhydrite, 30%, as above, Shale, 30%, dark gray-green, splintery, micro micaceous, pyritic

2965 m — Dolomite, 30%, buff, brown, very fine crystalline, anhydritic, dense, no shows, stylolites, Anhydrite, 40%, yellow, white, crypto crystalline, dolomitic, dense, Shale, 30%, dark gray, splintery, micro micaceous


FEB 10/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN - - -
TEMPERATURE OUT ——
DEPTH
75m
80m
85m
91m
95m
103m
109m
111m
111m
111m
111m
LOST CIRCULATION
°C
36
32
28
24
20
16
12
8
4
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

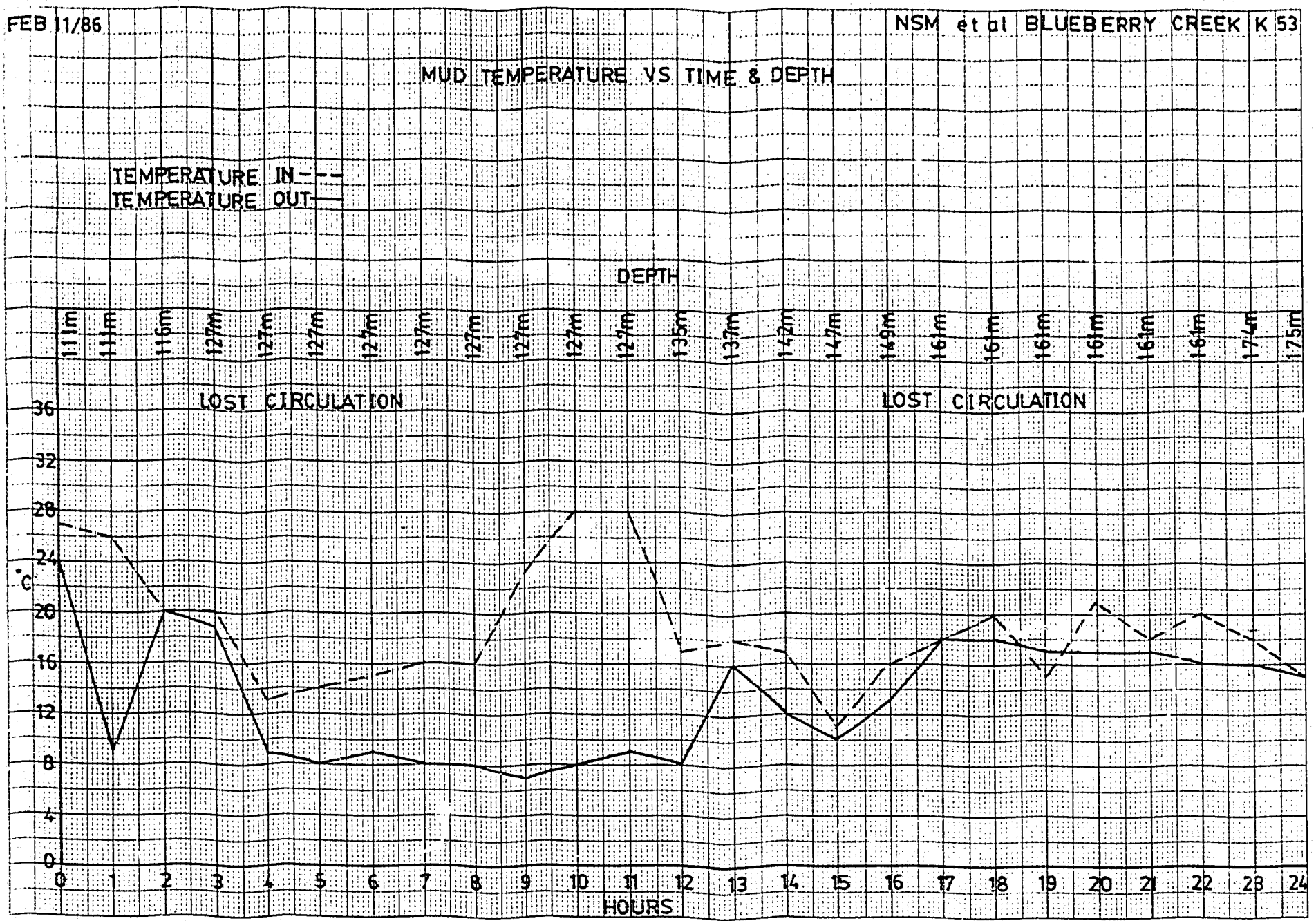
K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

FEB 11/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

TEMPERATURE IN - - -
TEMPERATURE OUT ——



K·E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO

FEB 12/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATUE VS TIME & DEPTH

TEMPERATUE IN- - -
TEMPERATUE OUT——

DEPTH

175m 175m 175m 175m 181m 184m 184m 185m 190m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m 193m

LOST CIRCULATION

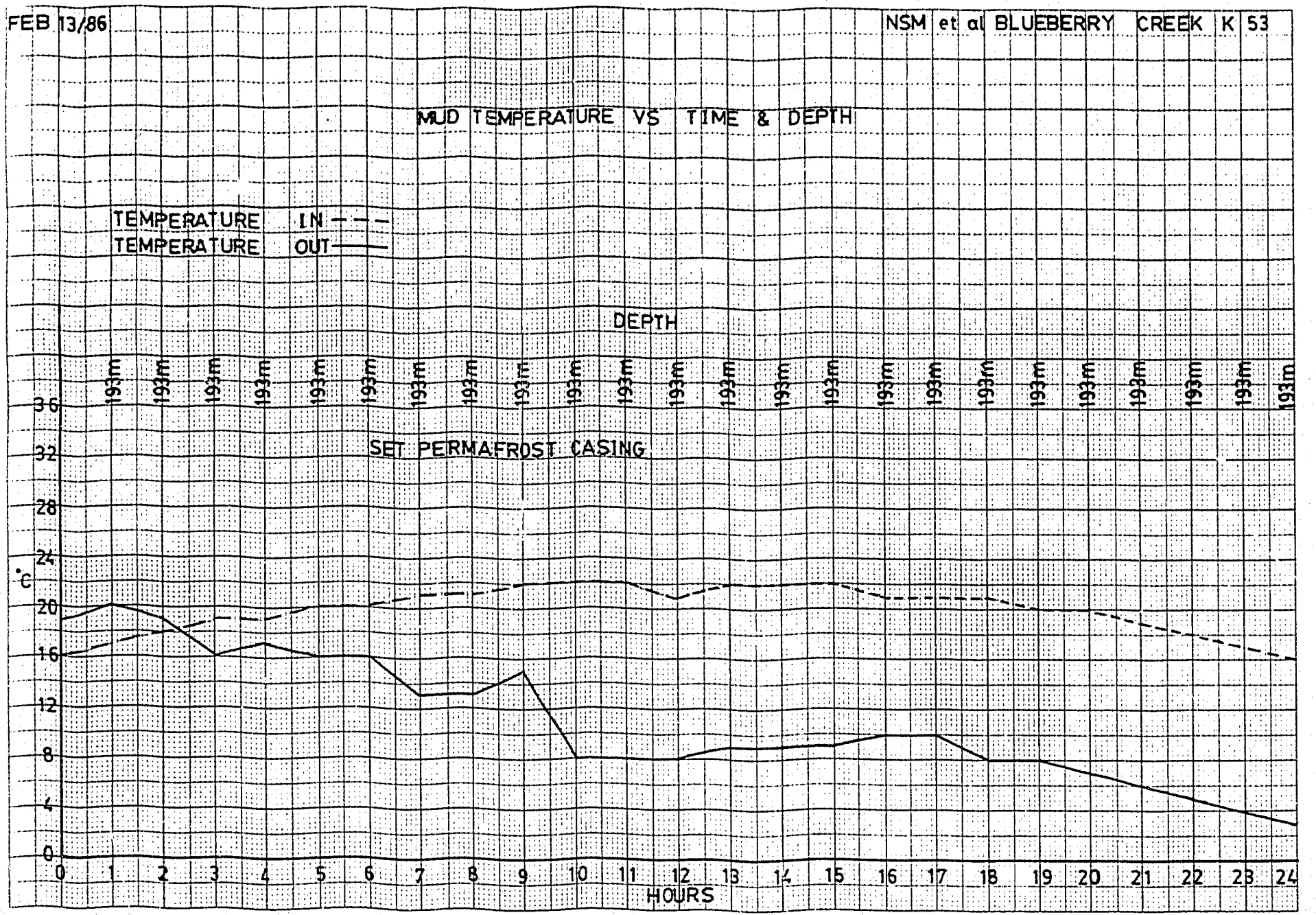
SET CASING

°C

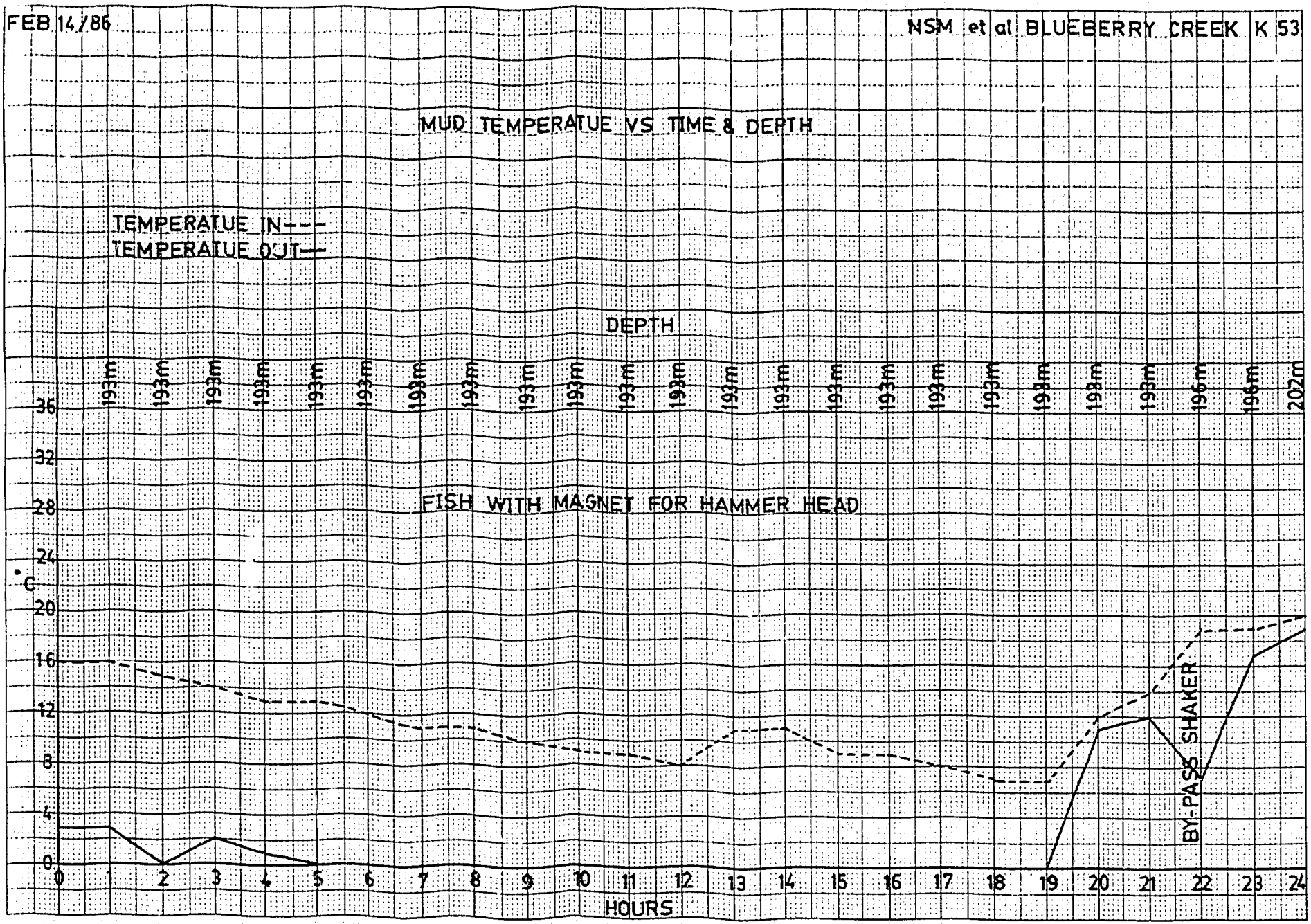
36 32 28 24 20 16 12 8 4 0

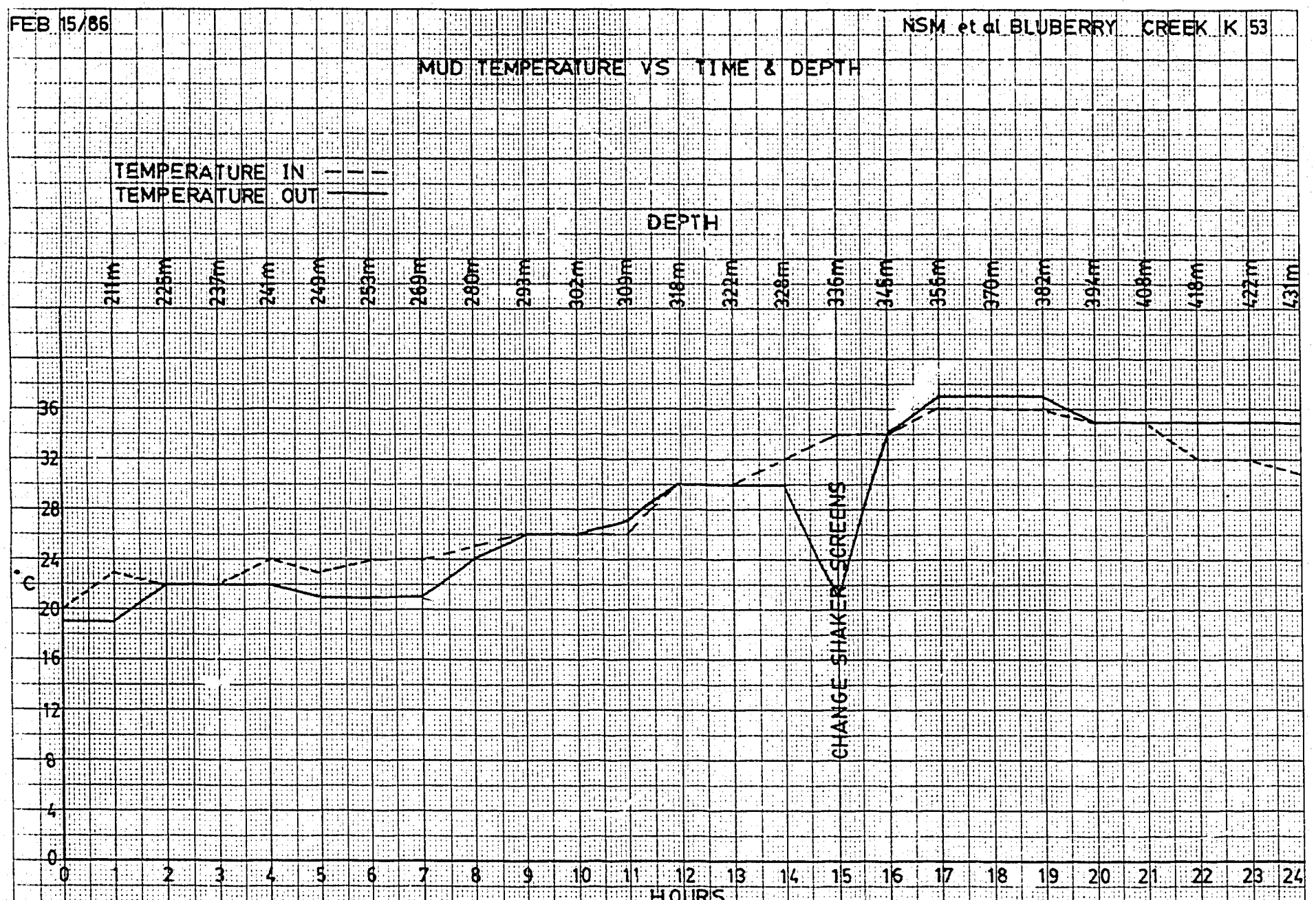
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

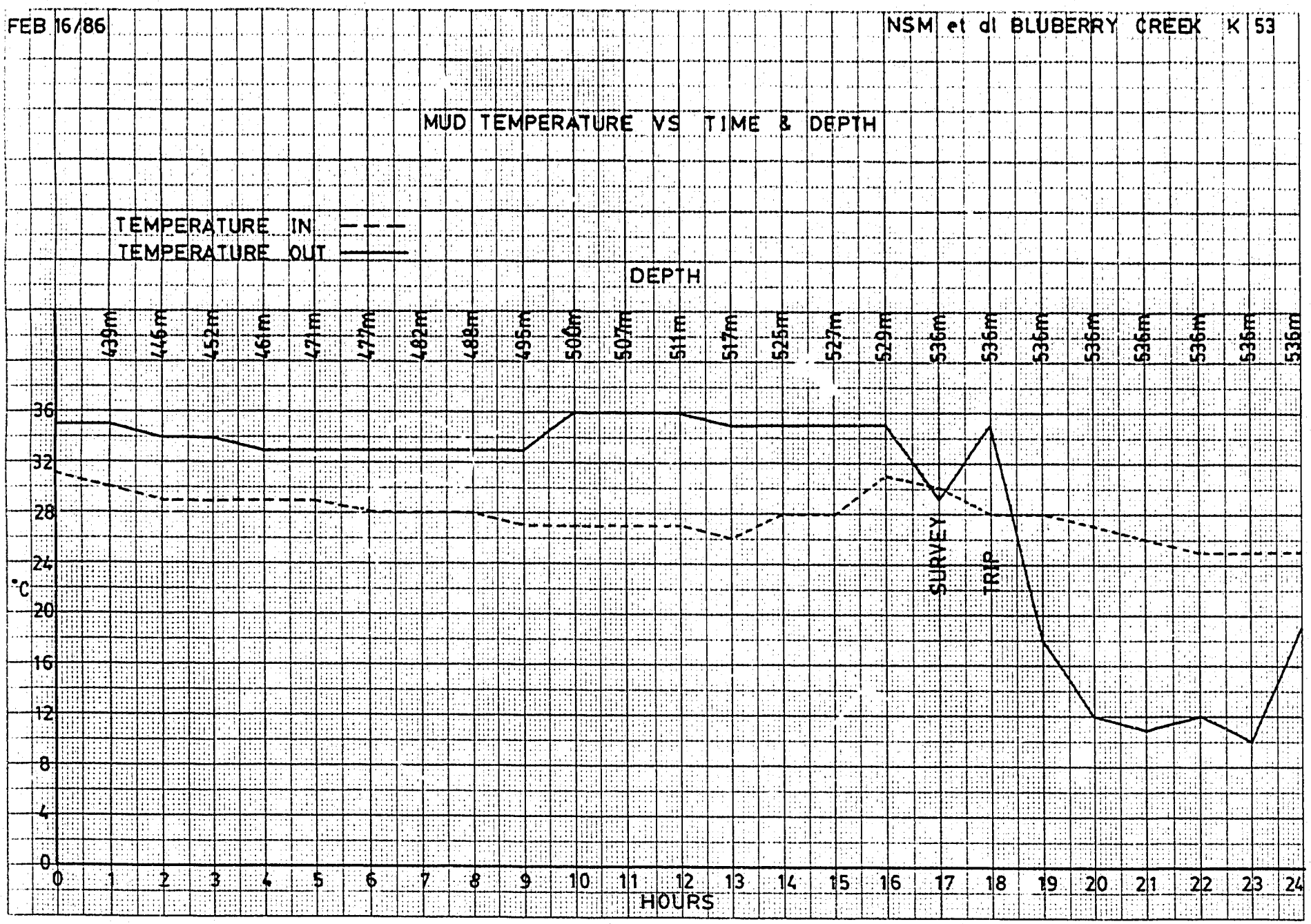
HOURS


FEB 13/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN - - -
TEMPERATURE OUT ———
DEPTH
193m
SET PERMAFROST CASING
°C
36
32
28
24
20
16
12
8
4
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

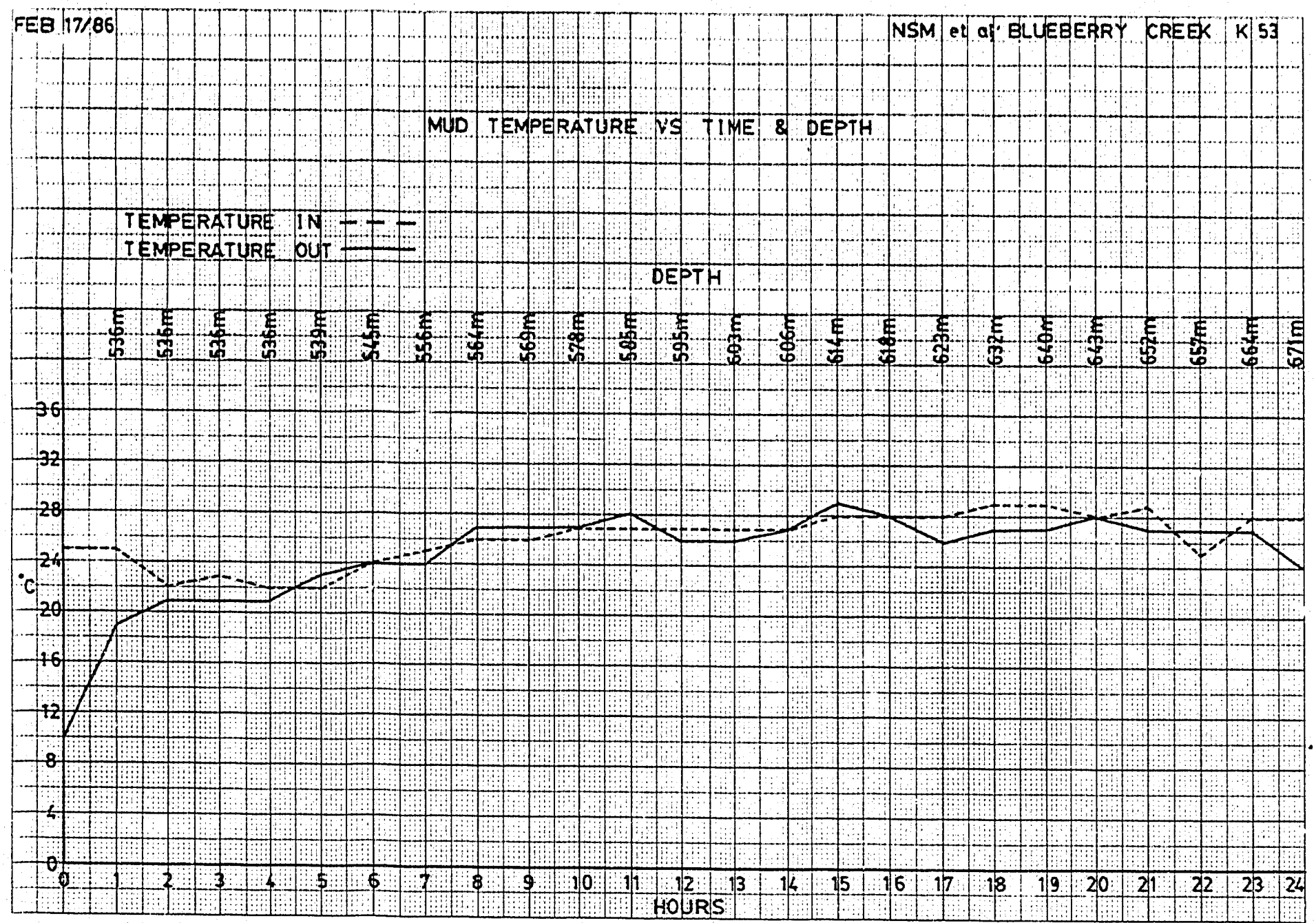
K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

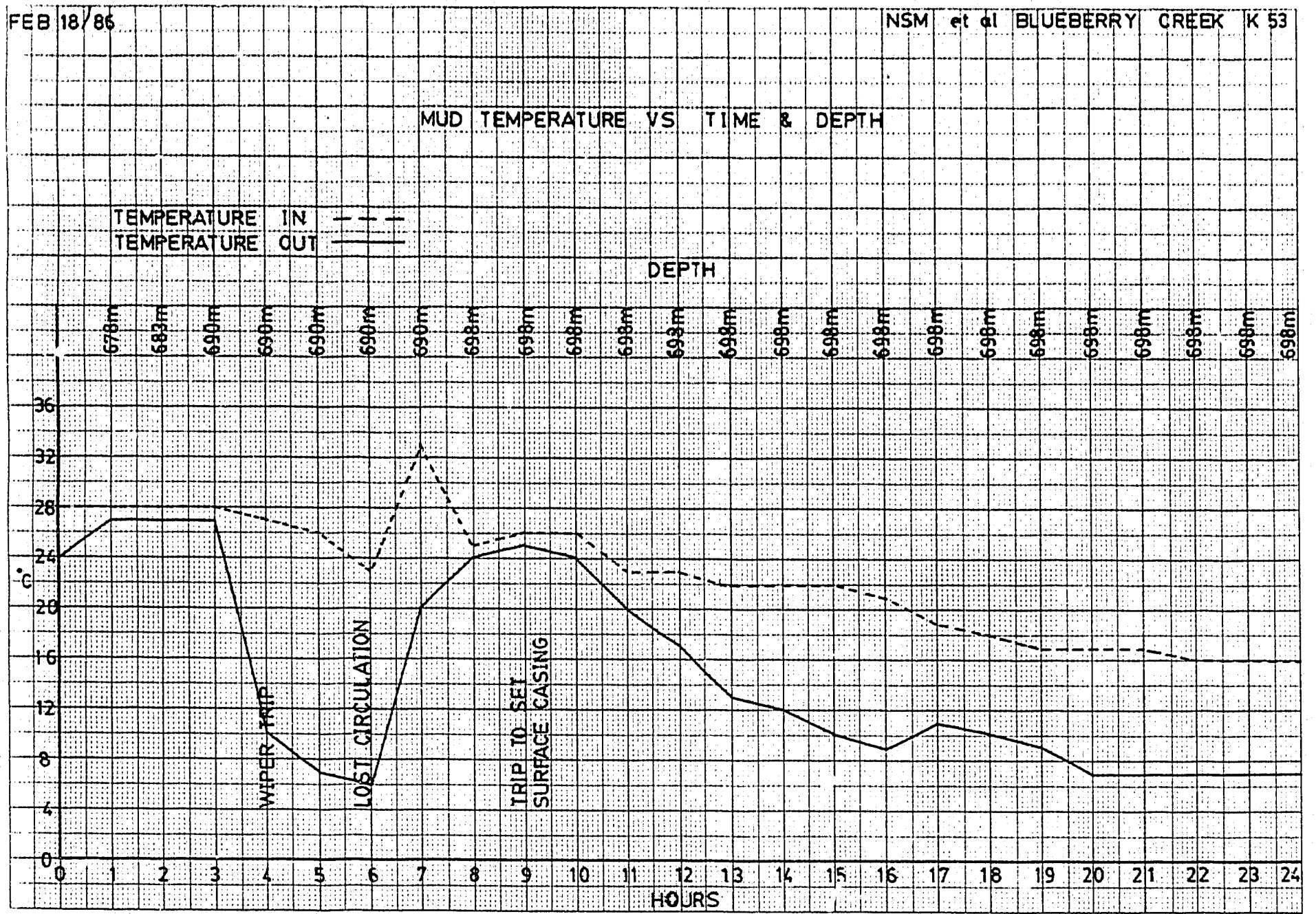



FEB 15/86
NSM et al BLUBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN
TEMPERATURE OUT
DEPTH
211m
225m
237m
241m
249m
253m
269m
280m
293m
302m
309m
318m
322m
328m
336m
346m
356m
370m
382m
394m
408m
418m
427m
431m
CHANGE SHAKER SCREENS
°C
0
4
8
12
16
20
24
28
32
36
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

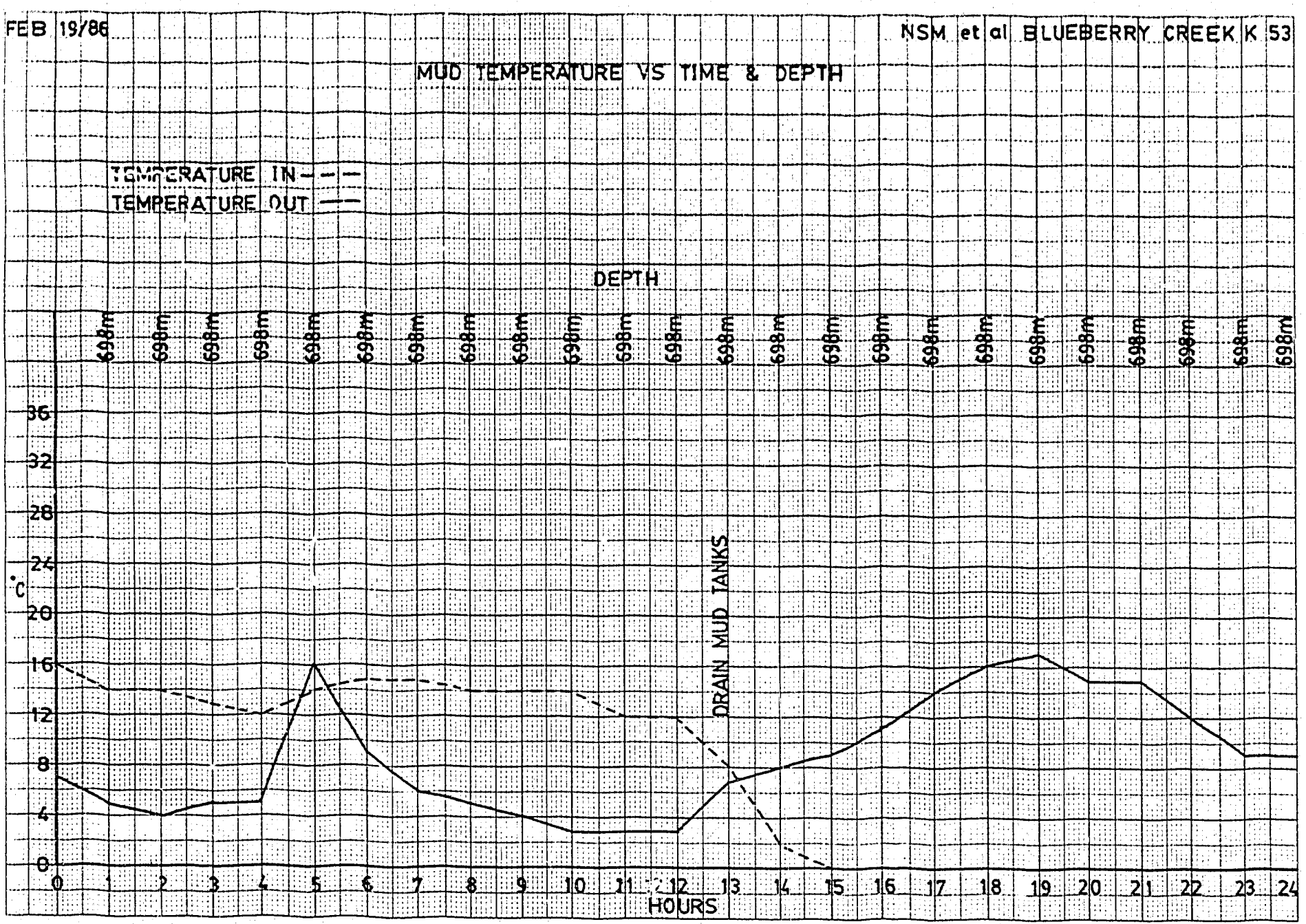

FEB 16/86
NSM et al BLUBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN
TEMPERATURE OUT
DEPTH
439m
446m
452m
461m
471m
477m
482m
488m
495m
506m
507m
511m
517m
525m
527m
529m
536m
536m
536m
536m
536m
536m
536m
536m
SURVEY
TRIP
°C
0
4
8
12
16
20
24
28
32
36
HOURS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

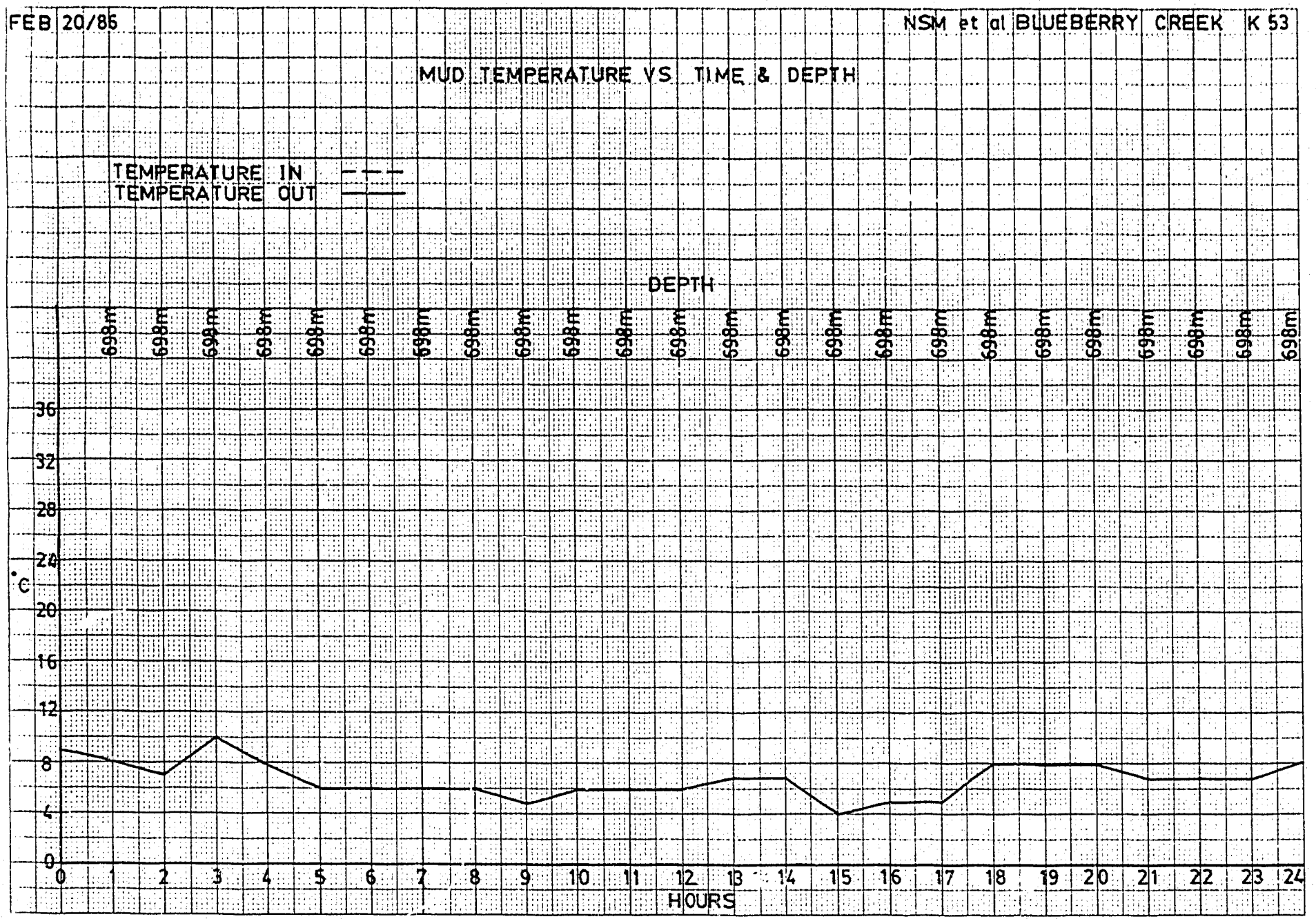
K•E 10 X 10 TO THE CENTIMETER




FEB 18/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN
TEMPERATURE OUT
DEPTH
678m
683m
690m
690m
690m
690m
690m
698m
698m
698m
698m
693m
698m
698m
698m
698m
698m
698m
698m
698m
698m
698m
698m
698m
698m
36
32
28
24
20
16
12
8
4
0
°C
WIPER TRIP
LOST CIRCULATION
TRIP TO SET SURFACE CASING
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO.




FEB 20/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN
TEMPERATURE OUT
DEPTH
698m
°C
36
32
28
24
20
16
12
8
4
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

FEB 21/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

TEMPERATURE IN - - -
TEMPERATURE OUT ——

DEPTH

698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m 698m

°C

36
32
28
24
20
16
12
8
4
0

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

HOURS

K•Σ 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

FEB 22/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

TEMPERATURE IN---
TEMPERATURE OUT——

DEPTH

698m 698m 698m 698m 703m 708m 708m 708m 708m 714m 724m 733m 750m 768m 775m 790m 808m 818m 830m 846m 856m 863m 874m 886m

°C

36
32
28
24
20
16
12
8
4
0

ADD PREMIX

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

HOURS

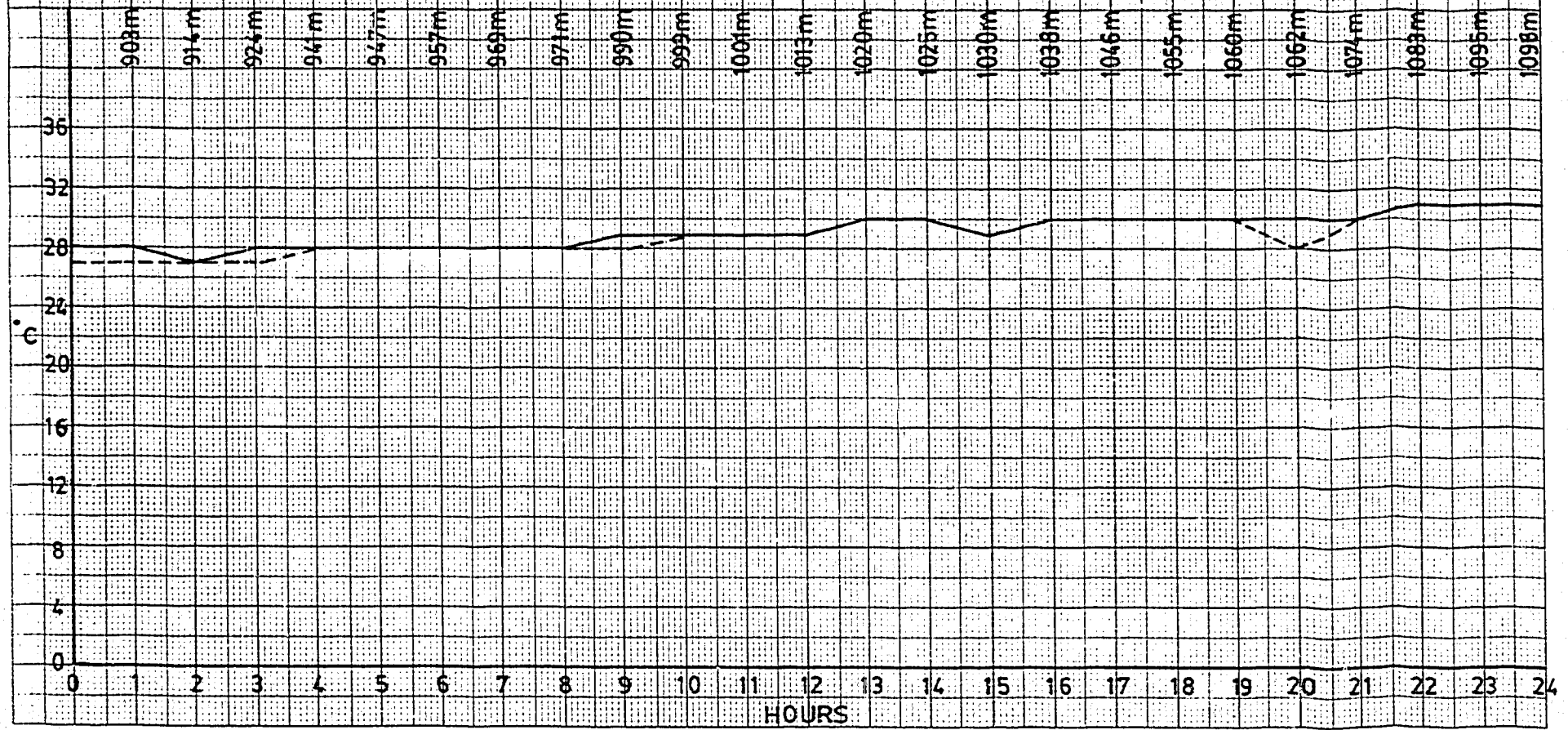
K•E 10 X 10 TO THE CENTIMETER 25 X 25 CM
KEUFFEL & ESSER CO MADE IN U.S.A.

FEB 23/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

TEMPERATURE IN – – –
TEMPERATURE OUT ———



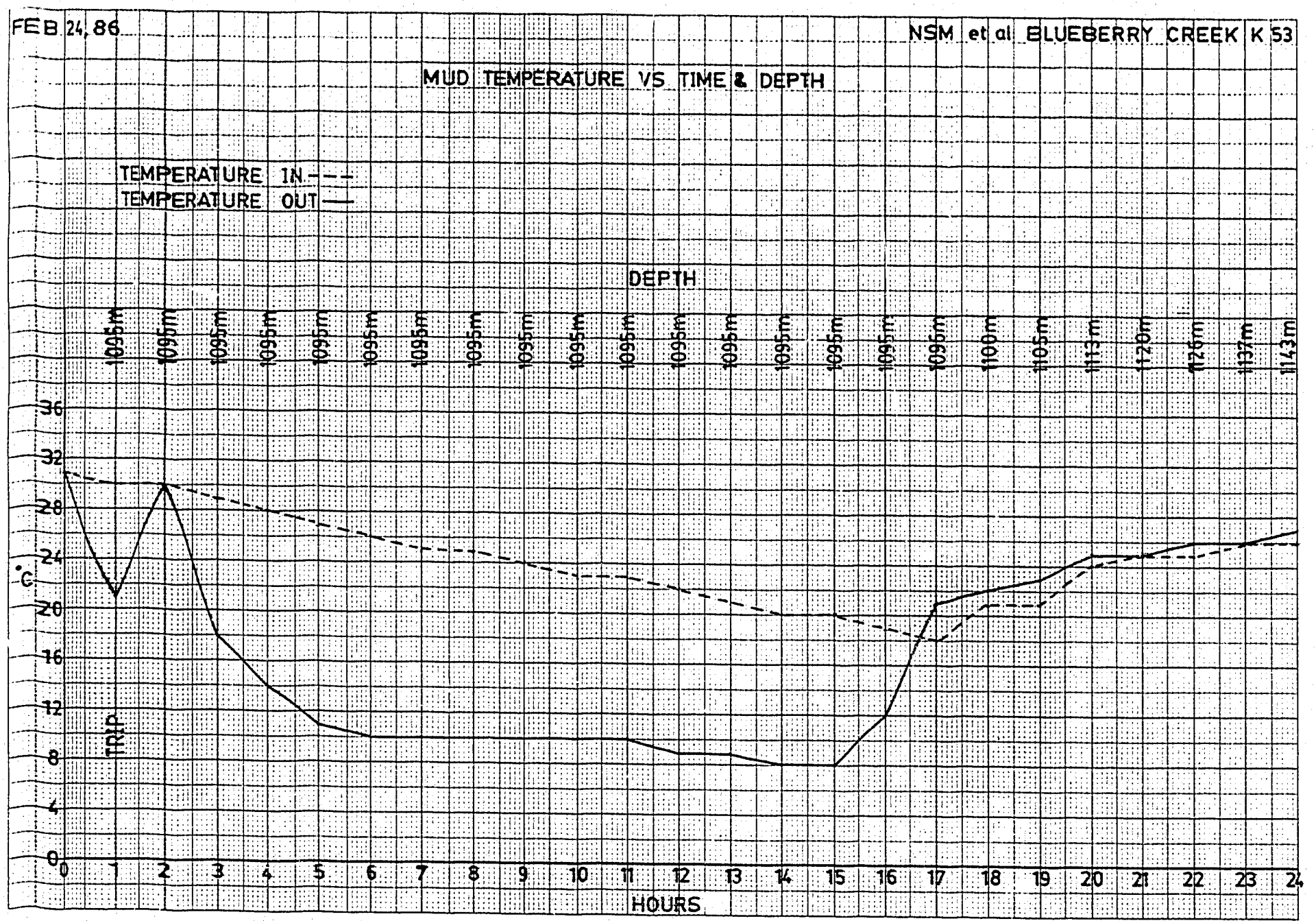
K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

FEB 24, 86

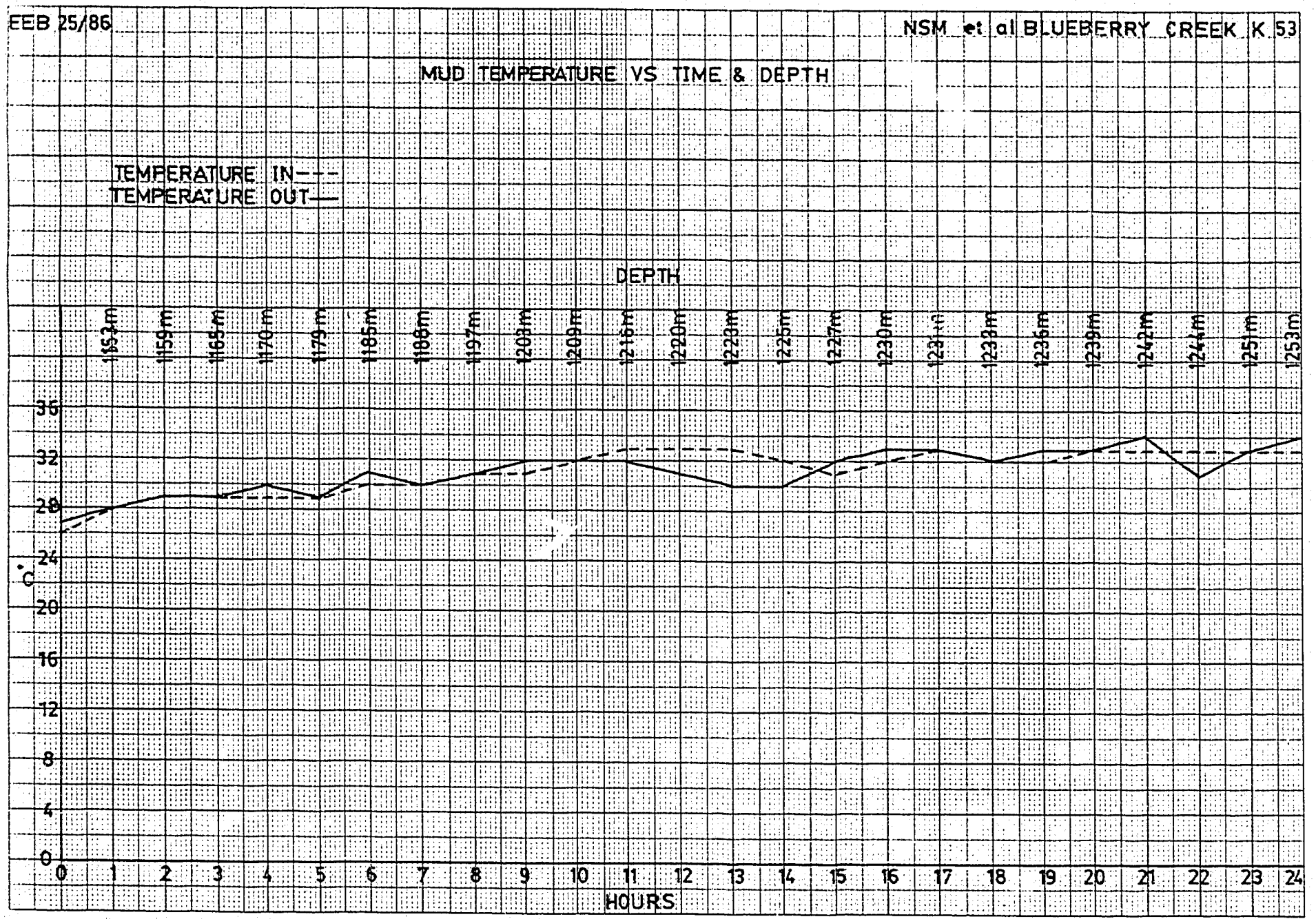
NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

TEMPERATURE IN - - -
TEMPERATURE OUT ——



K•E 10 X 10 TO THE CENTIMETER 461510

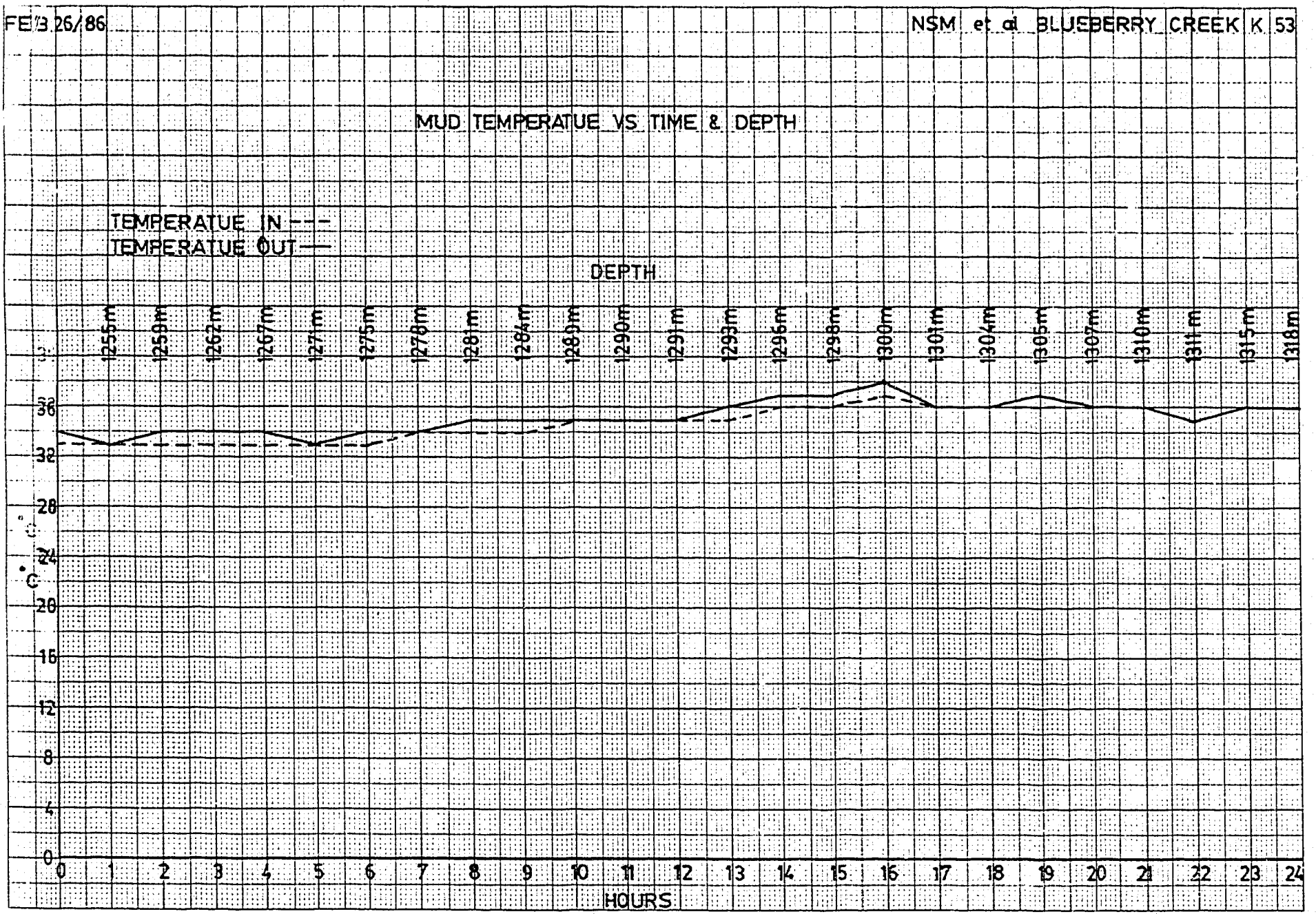


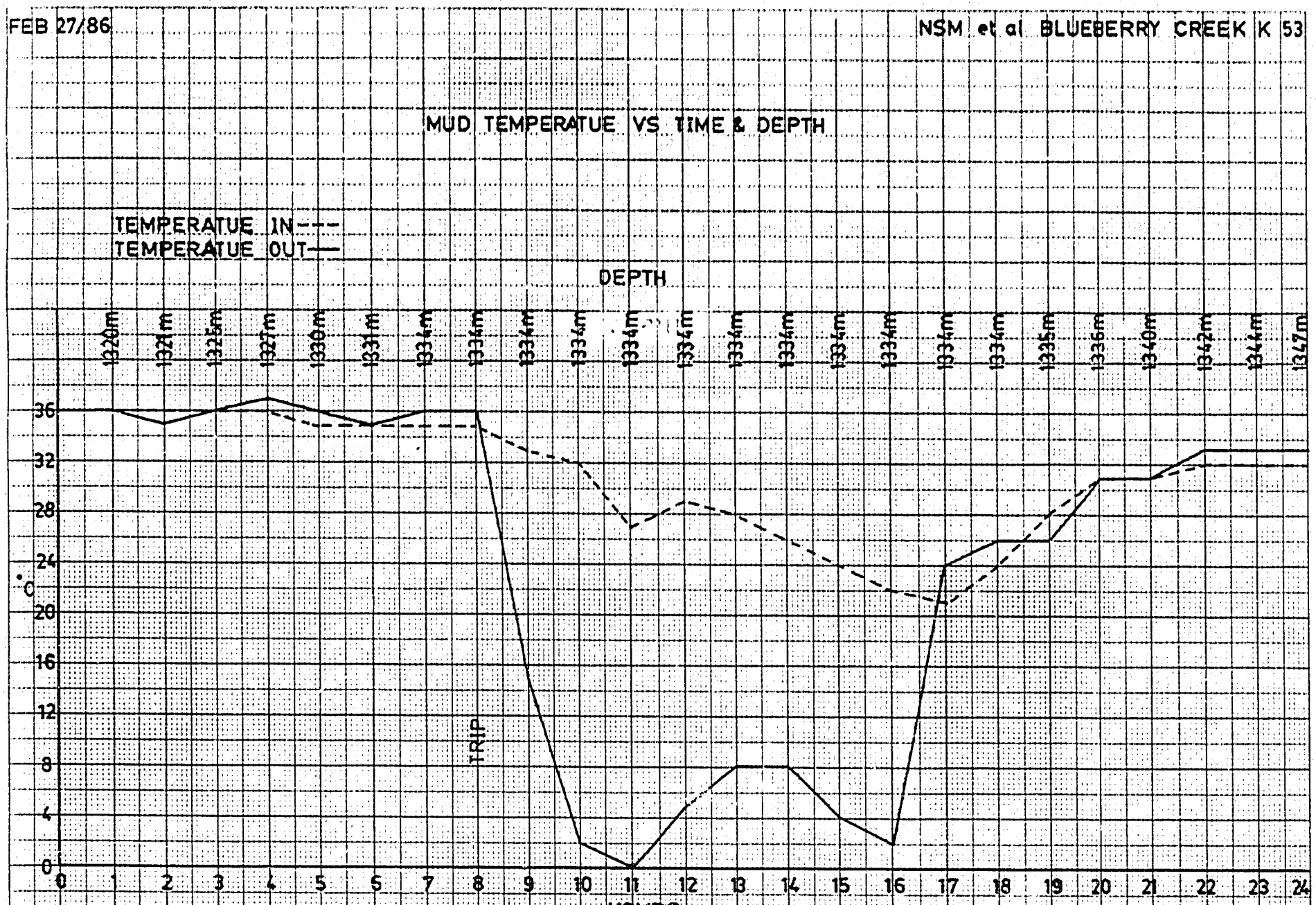
FE/3 26/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATUE VS TIME & DEPTH

TEMPERATUE IN ---
TEMPERATUE OUT ——




FEB 27/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
TEMPERATUE IN---
TEMPERATUE OUT——
DEPTH
1320m
1321m
1325m
1327m
1330m
1331m
1334m
1334m
1334m
1334m
1334m
1334m
1334m
1334m
1334m
1334m
1334m
1335m
1336m
1340m
1342m
1344m
1347m
36
32
28
24
20
16
12
8
4
0
°C
TRIP
0 1 2 3 4 5 5 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

K+E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

FEB 28/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

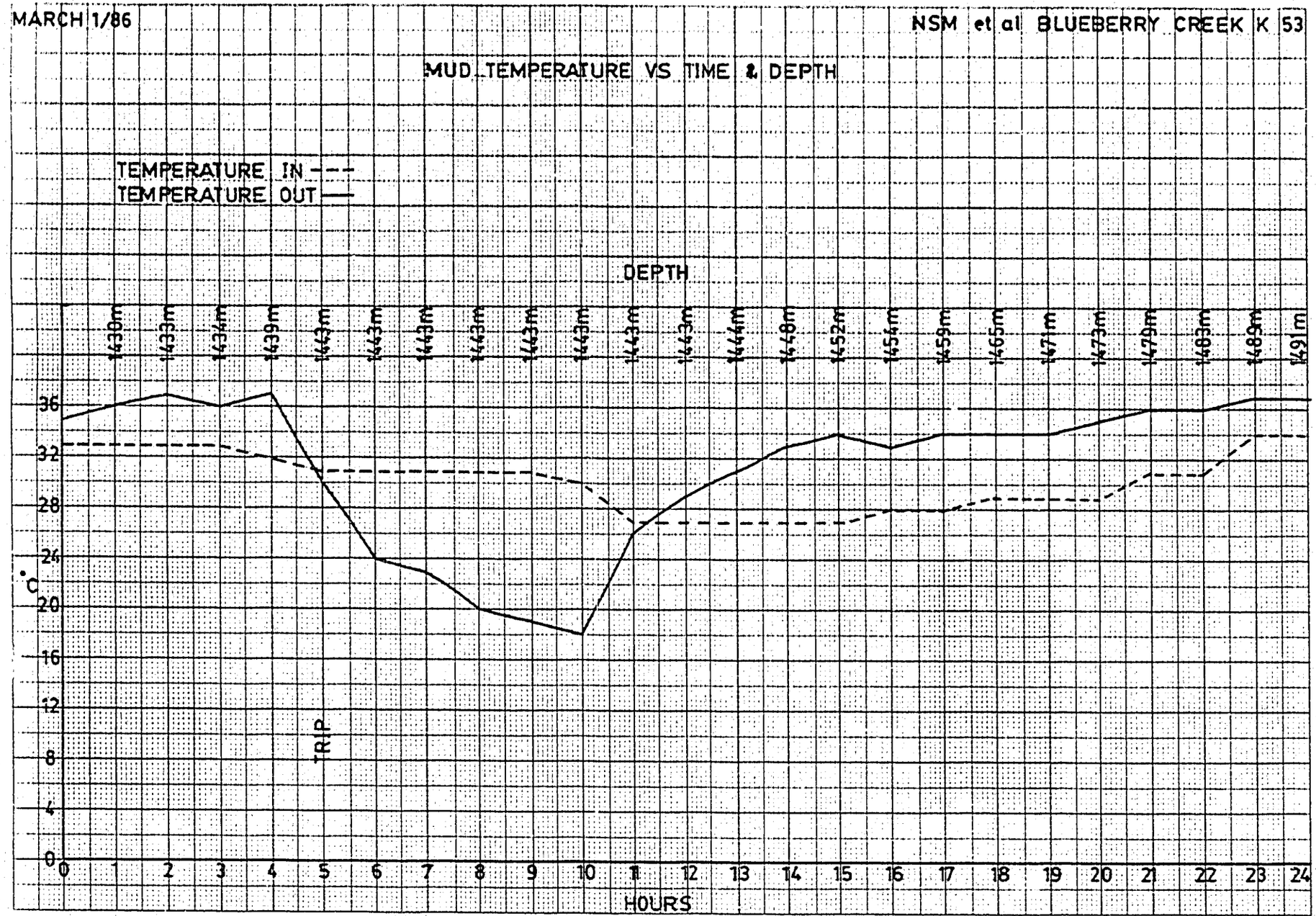
TEMPERATURE IN---
TEMPERATURE OUT——

DEPTH

1352m 1355m 1357m 1361m 1365m 1367m 1370m 1373m 1375m 1377m 1380m 1384m 1388m 1392m 1394m 1400m 1404m 1407m 1412m 1413m 1416m 1417m 1423m 1427m

°C
36
32
28
24
20
16
12
8
4
0

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS


MARCH 1/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN - - -
TEMPERATURE OUT ——
DEPTH
1430m
1433m
1434m
1439m
1443m
1443m
1443m
1443m
1443m
1443m
1443m
1443m
1444m
1448m
1452m
1454m
1459m
1465m
1471m
1473m
1479m
1483m
1489m
1491m
36
32
28
24
20
16
12
8
4
0
°C
TRIP
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

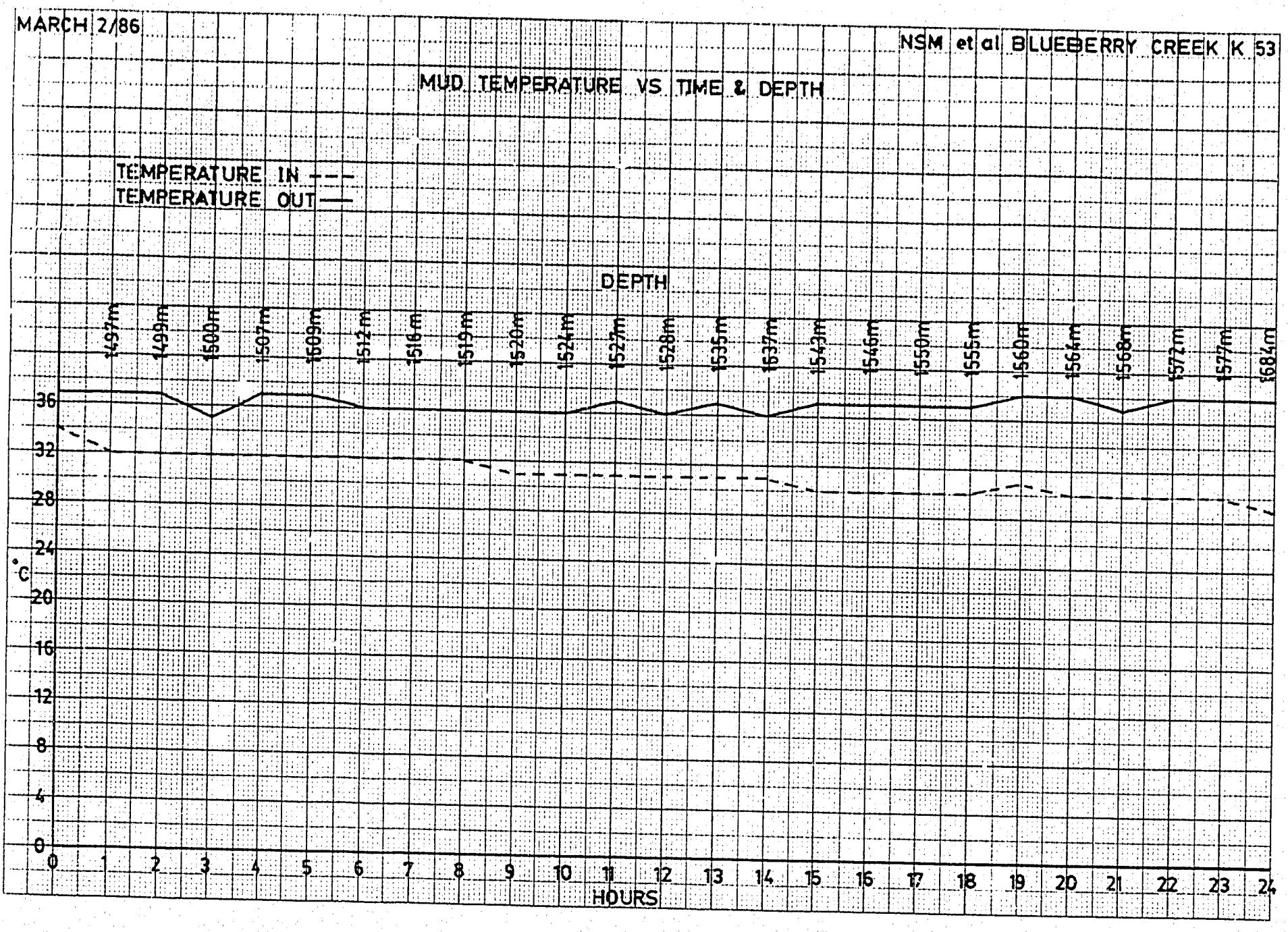
K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

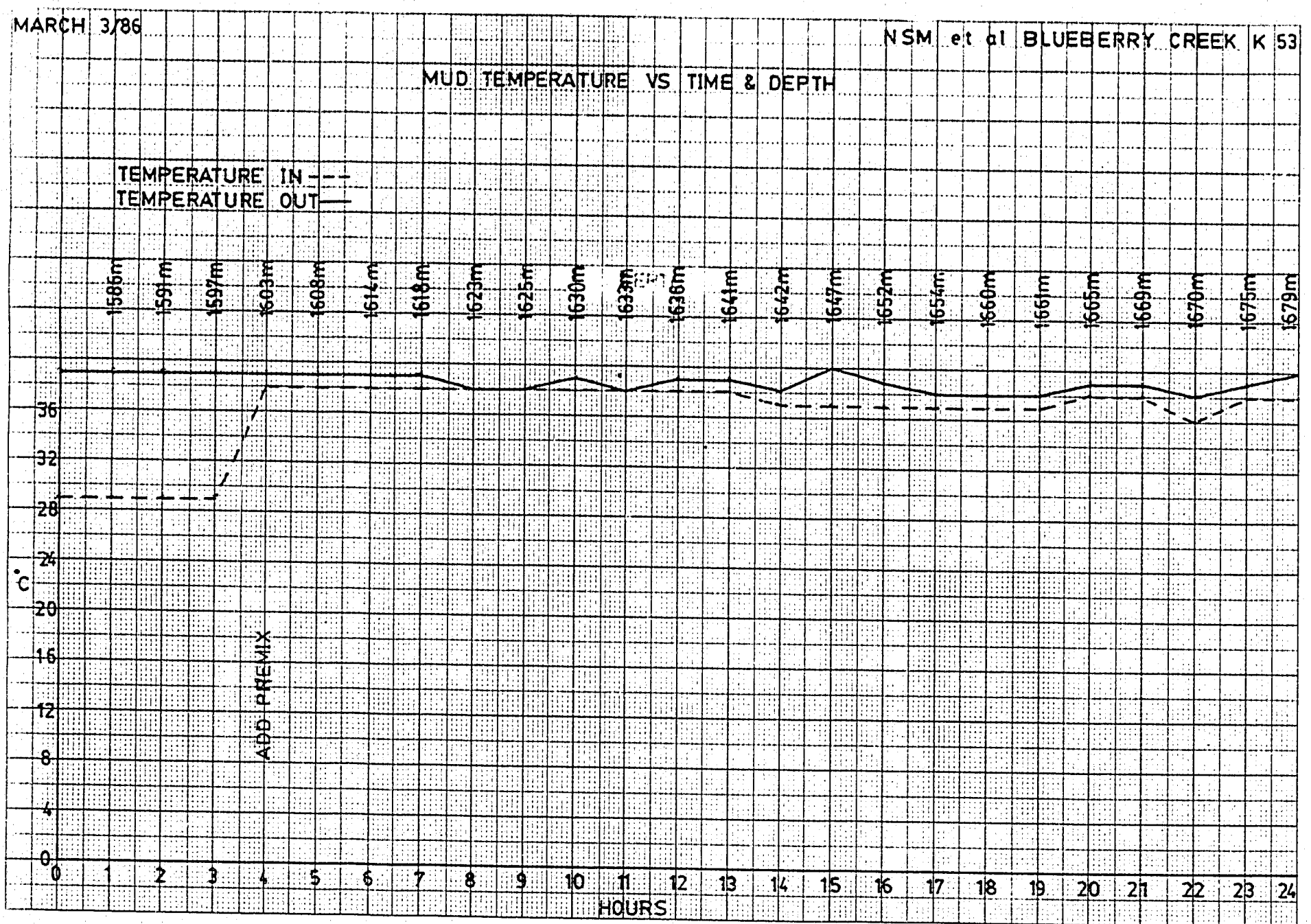
MARCH 2/86

NSM et al BLUEBERRY CREEK K 53

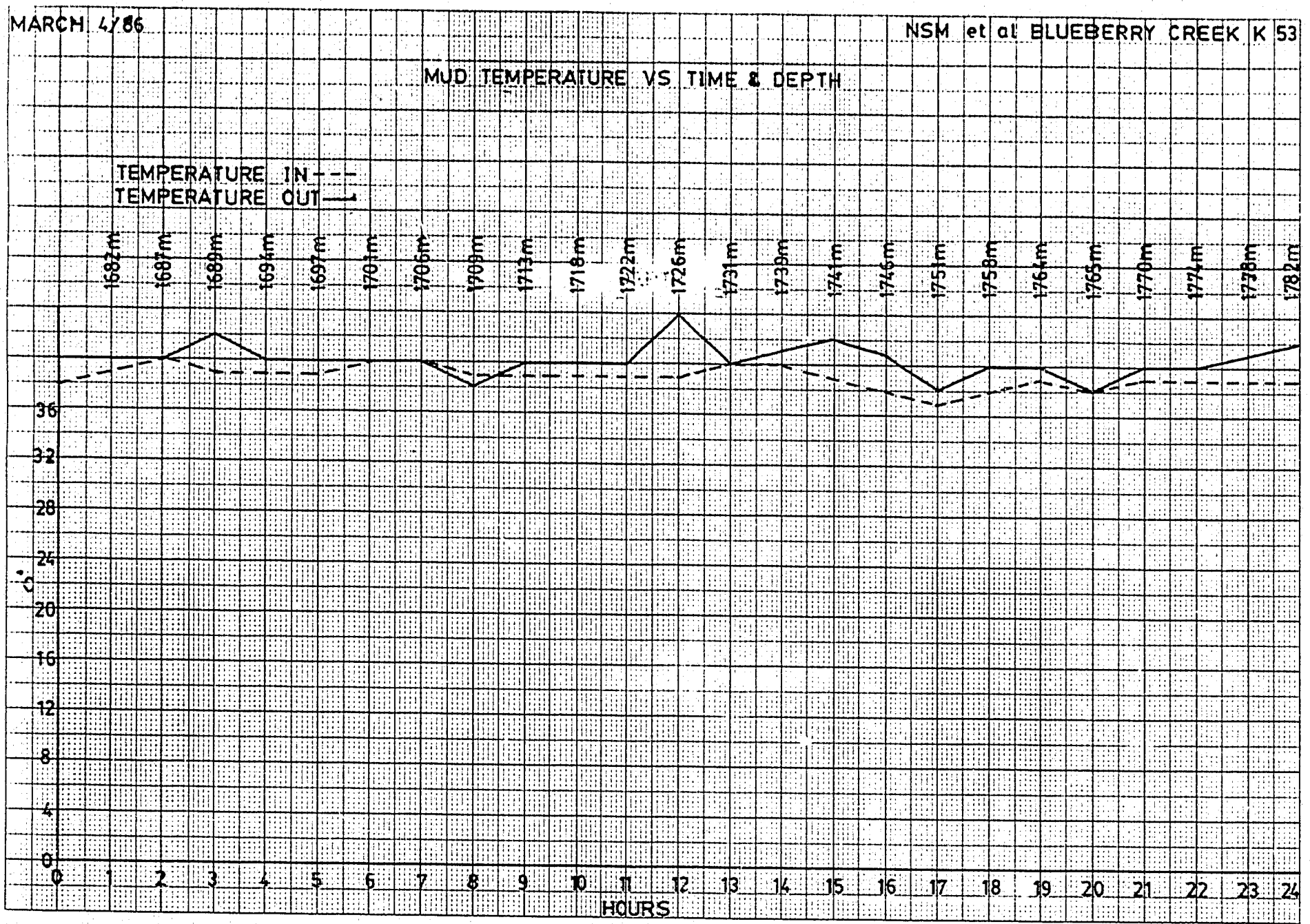
MUD TEMPERATURE VS TIME & DEPTH

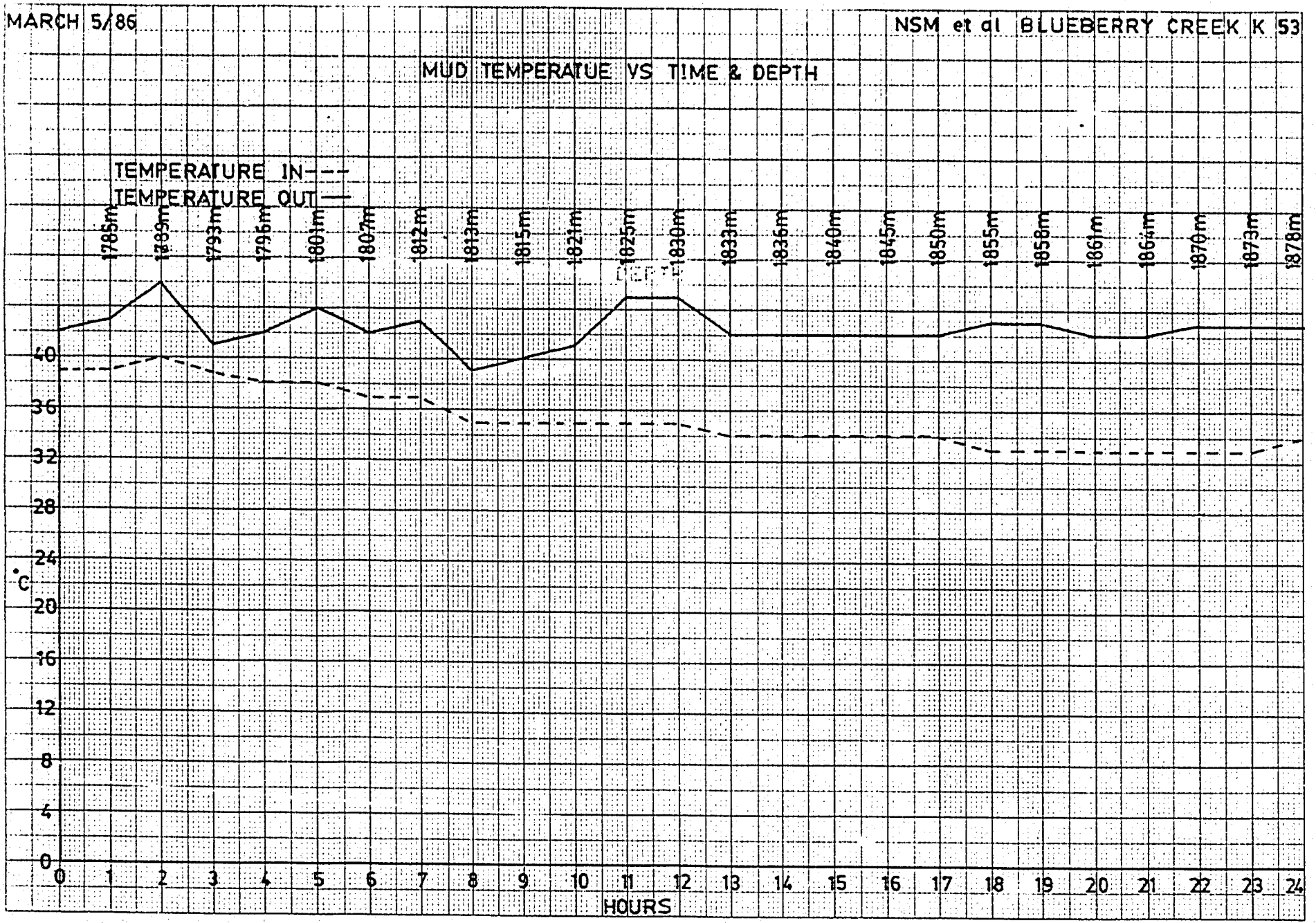
TEMPERATURE IN - - -
TEMPERATURE OUT ——

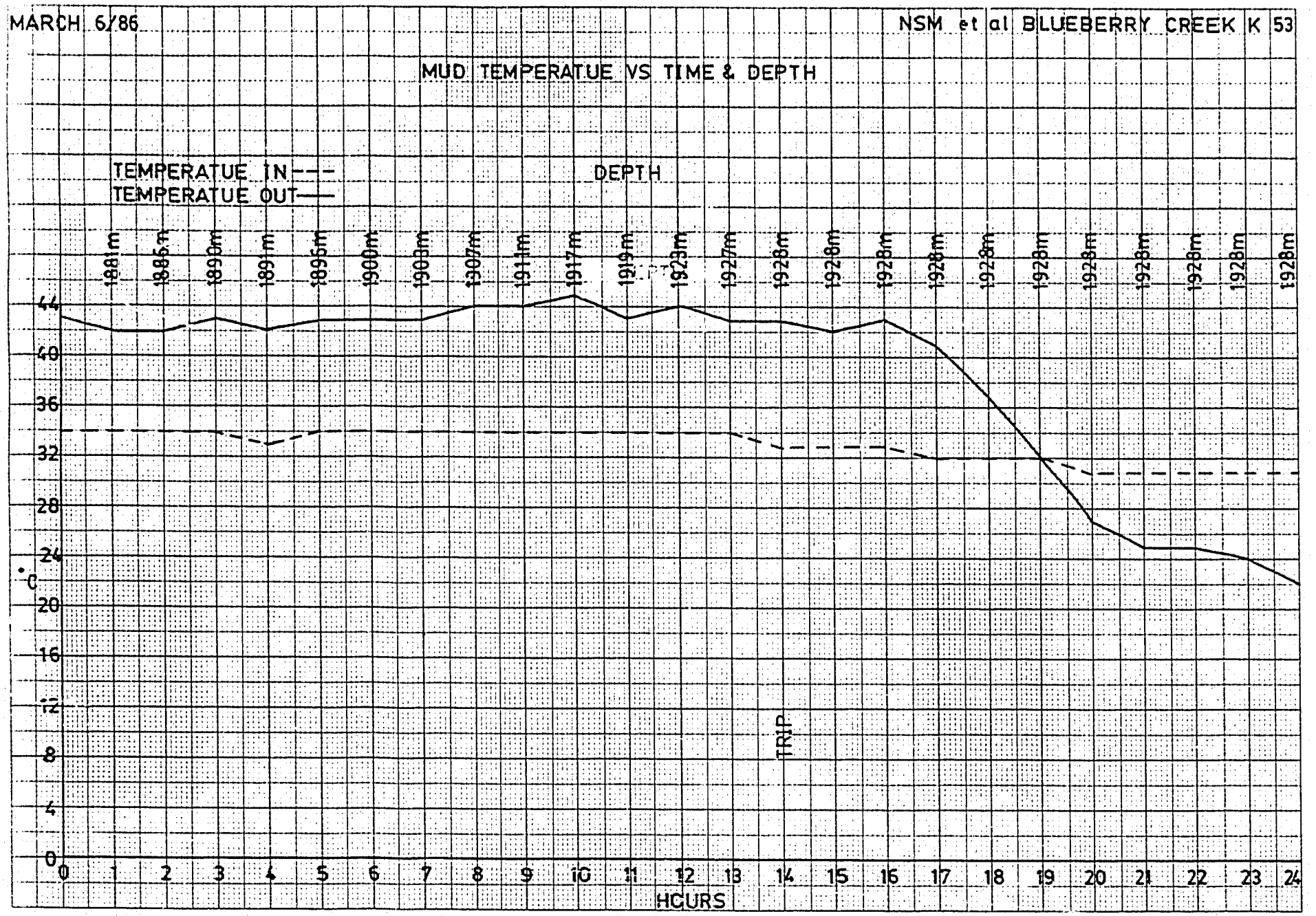



MARCH 3/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATURE VS TIME & DEPTH
TEMPERATURE IN - - -
TEMPERATURE OUT ——
1586m
1591m
1597m
1603m
1608m
1614m
1618m
1623m
1625m
1630m
1633m
1638m
1641m
1642m
1647m
1652m
1654m
1660m
1661m
1665m
1669m
1670m
1675m
1679m
ADD PREMIX
°C
0
4
8
12
16
20
24
28
32
36
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

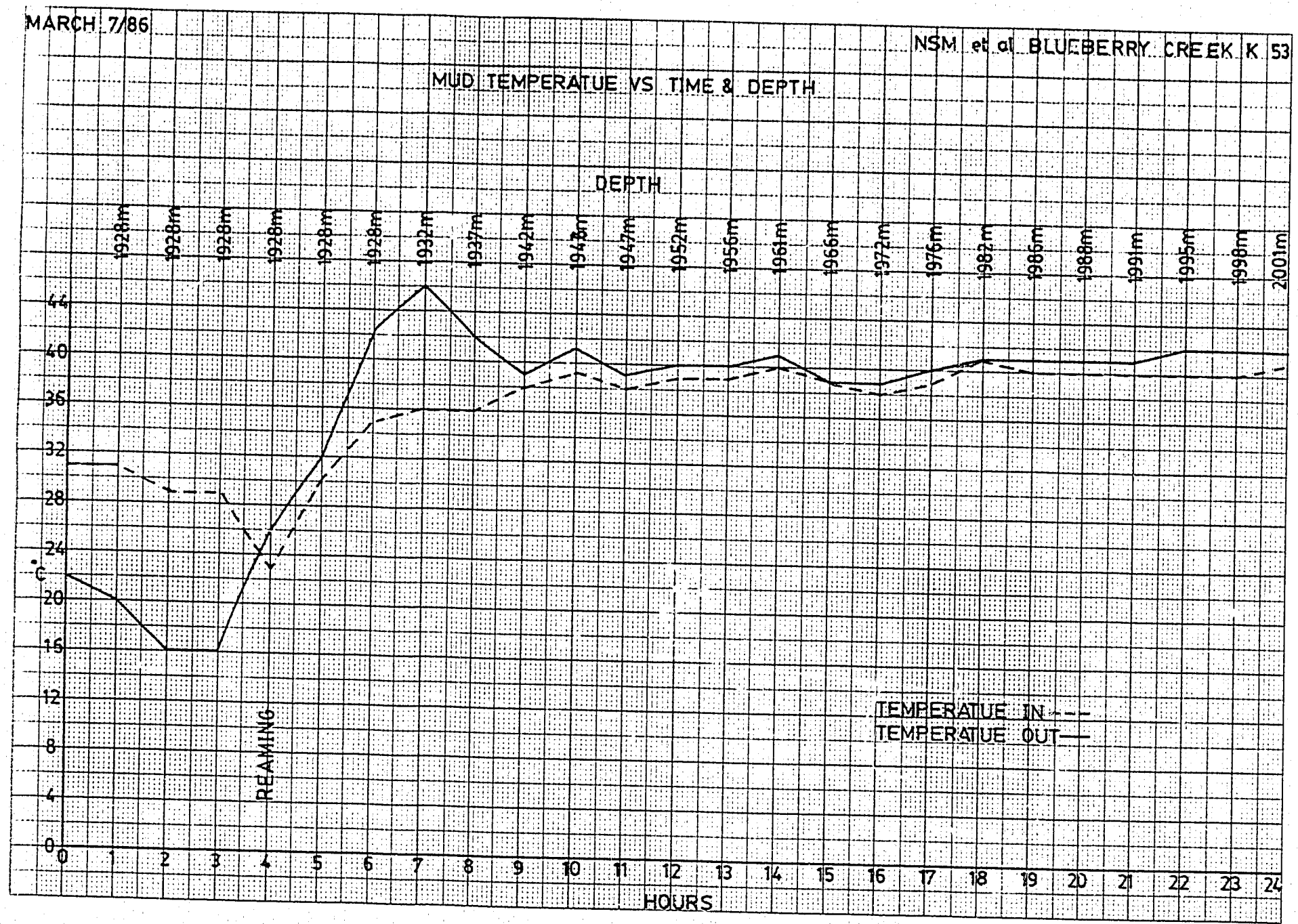
K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO



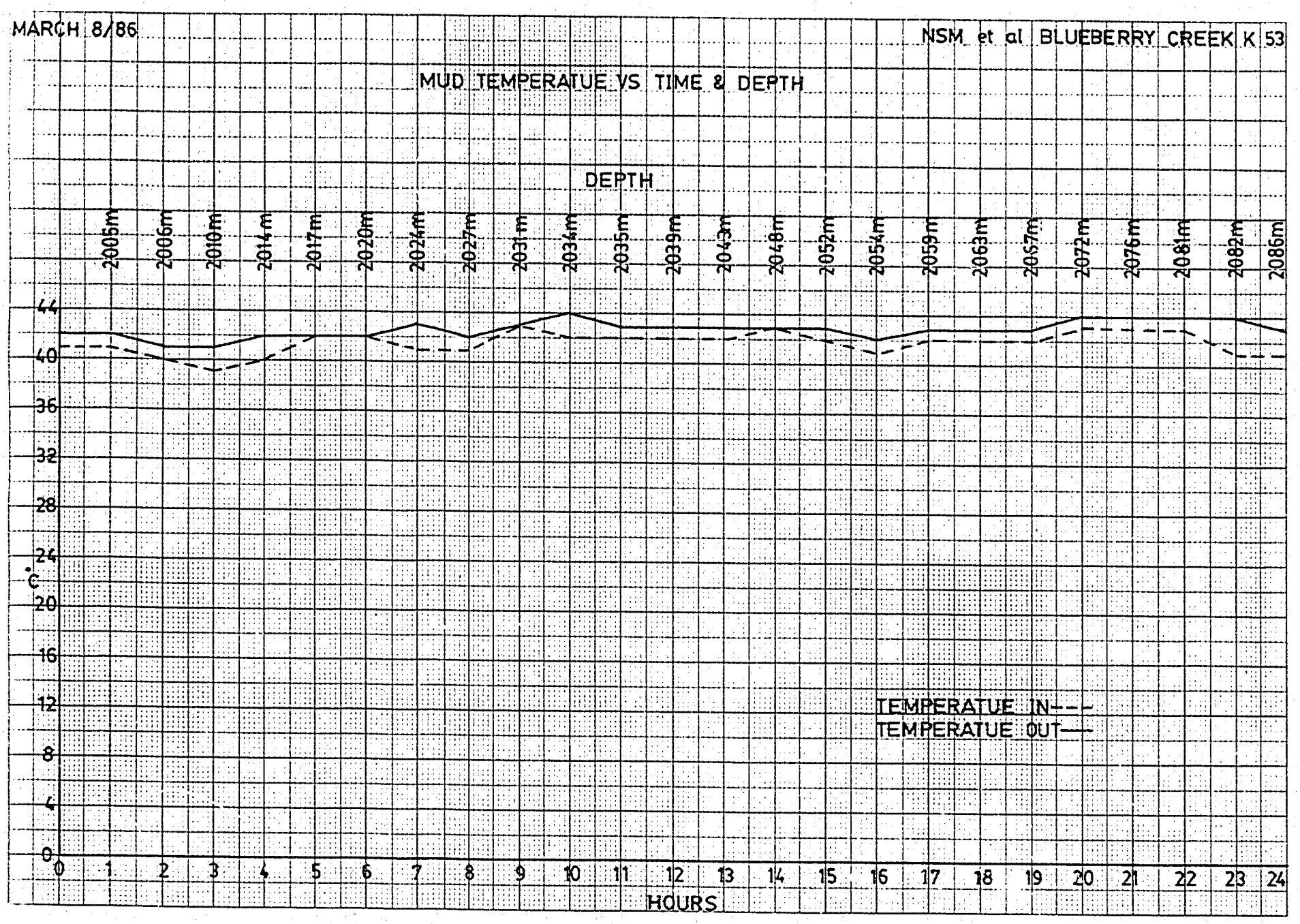

MARCH 5/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
TEMPERATURE IN---
TEMPERATURE OUT——
1785m
1789m
1793m
1796m
1801m
1807m
1812m
1813m
1815m
1821m
1825m
1830m
1833m
1836m
1840m
1845m
1850m
1855m
1858m
1861m
1864m
1870m
1873m
1878m
40
36
32
28
24
20
16
12
8
4
0
°C
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS


MARCH 6/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
TEMPERATUE IN---
TEMPERATUE OUT——
DEPTH
1881m
1885m
1890m
1897m
1895m
1900m
1903m
1907m
1911m
1917m
1919m
1929m
1927m
1928m
1928m
1928m
1928m
1928m
1928m
1928m
1928m
1928m
1928m
1928m
44
40
36
32
28
24
20
16
12
8
4
0
°C
TRIP
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

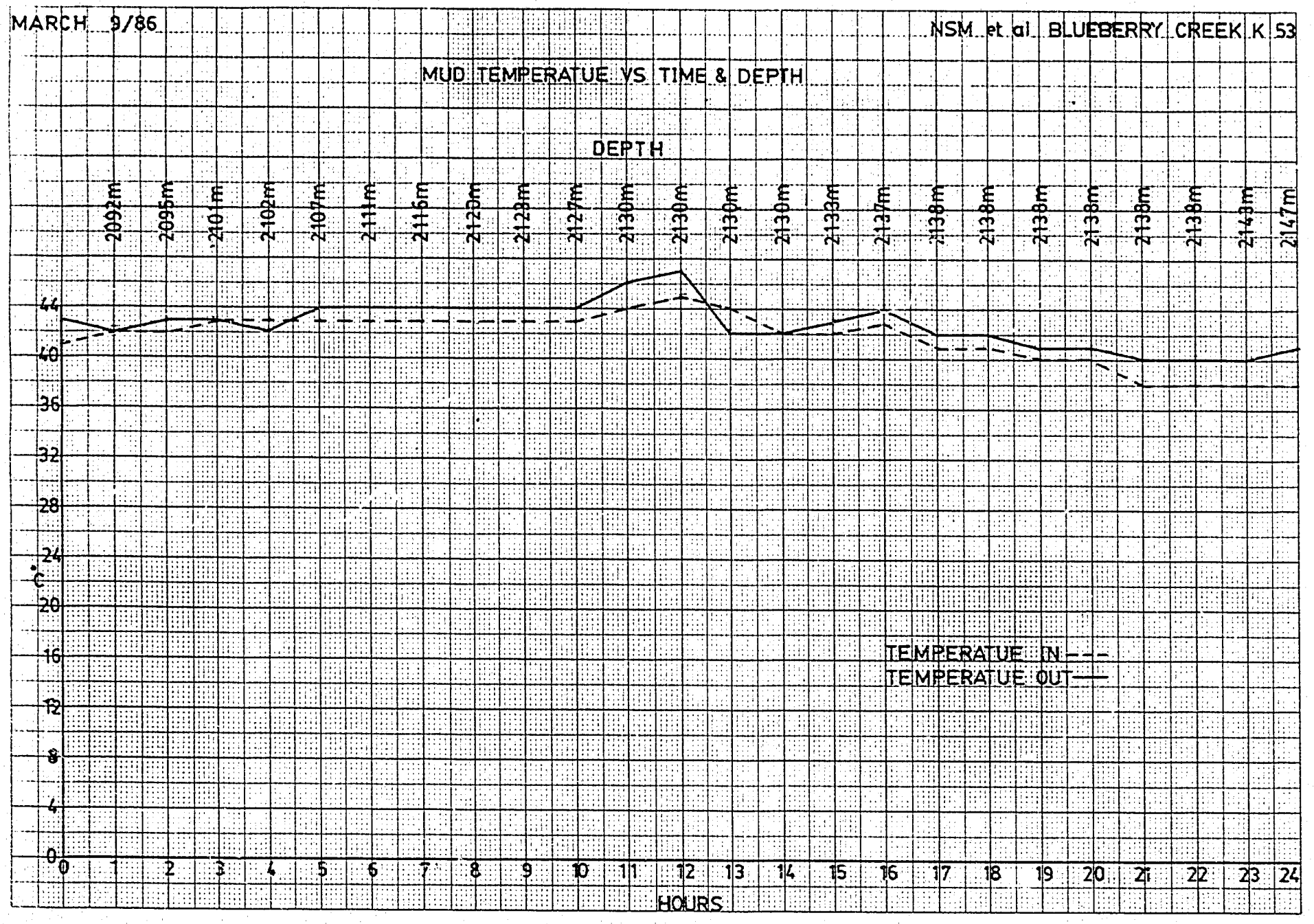
K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO.

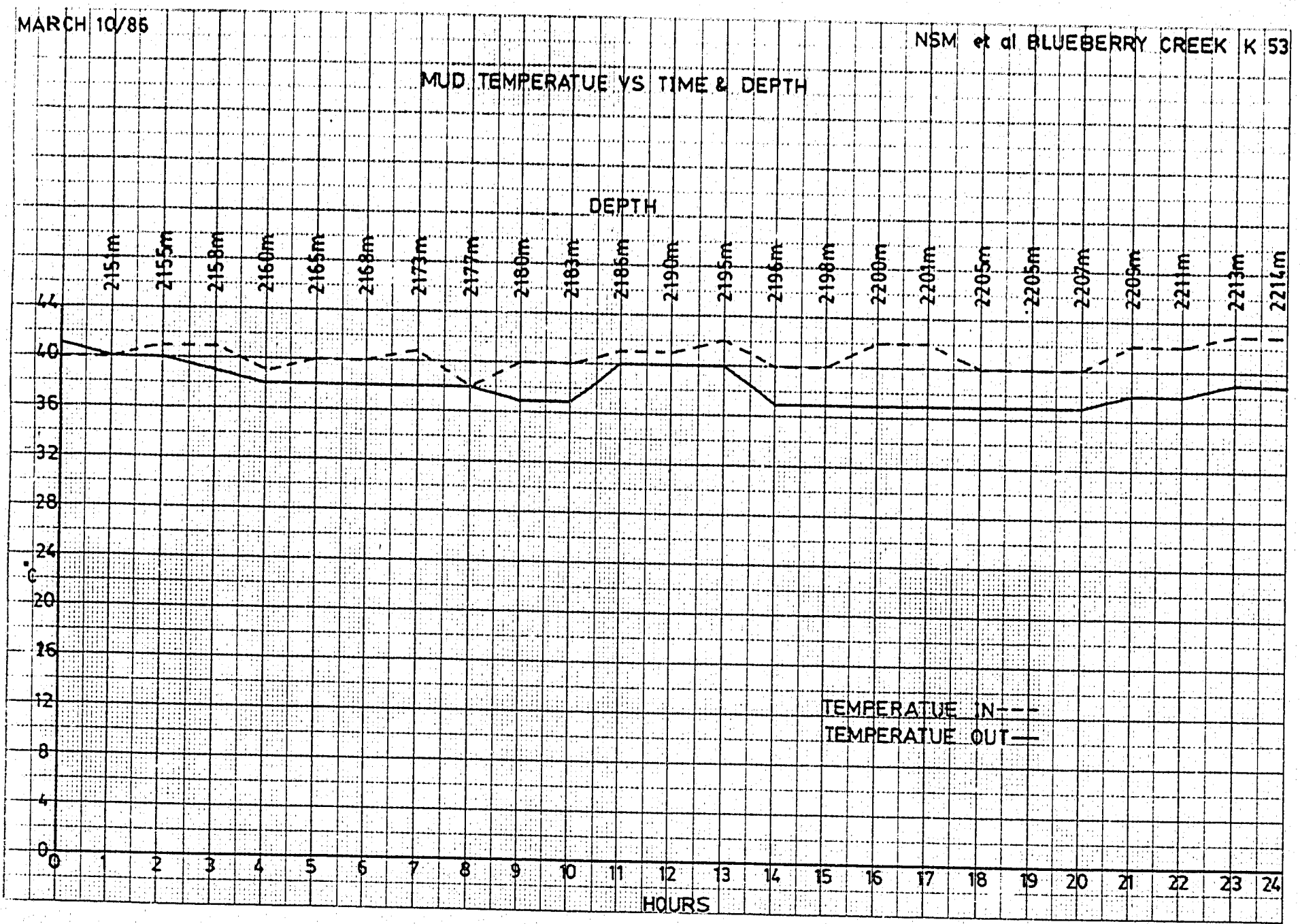


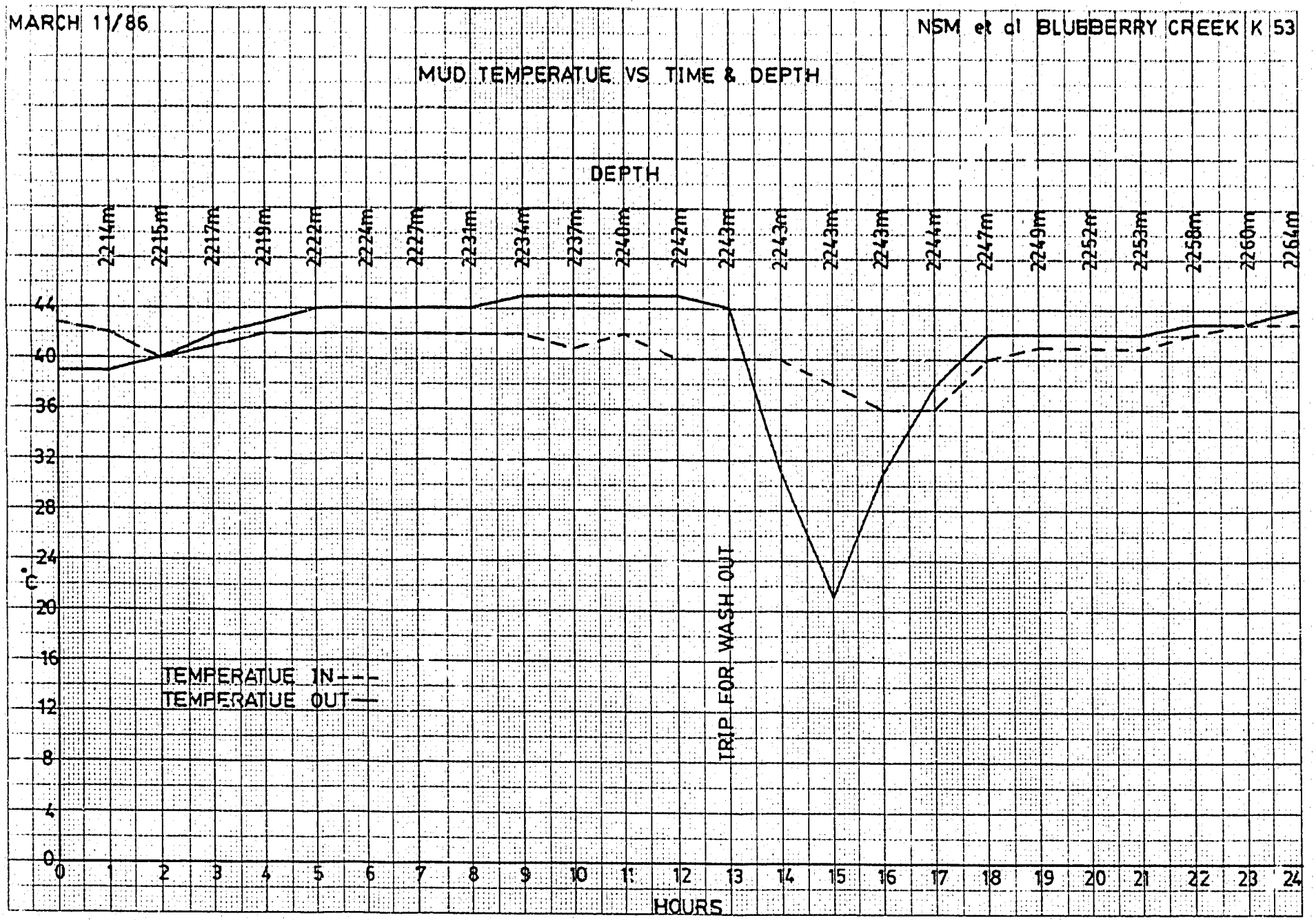
K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

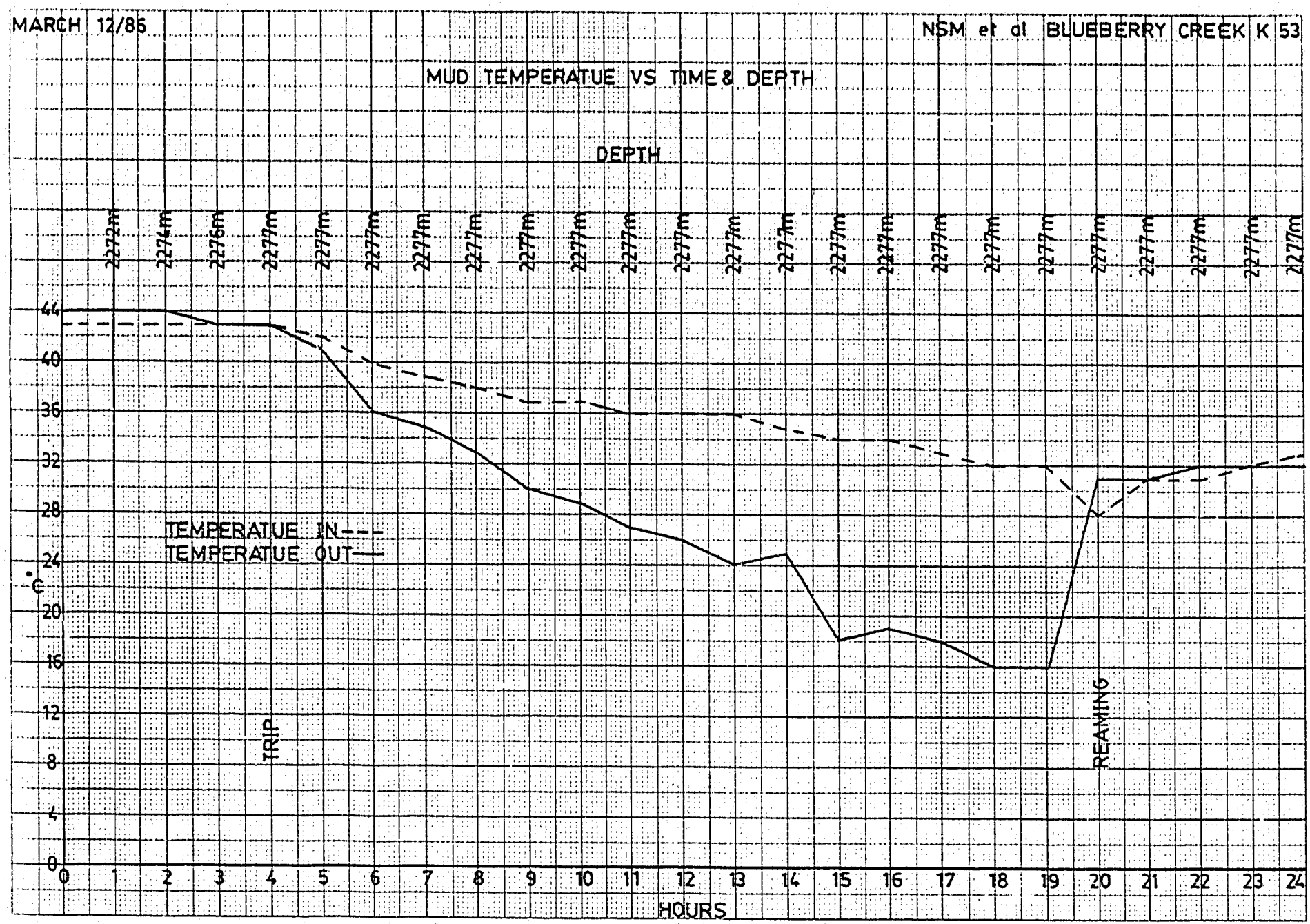


K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

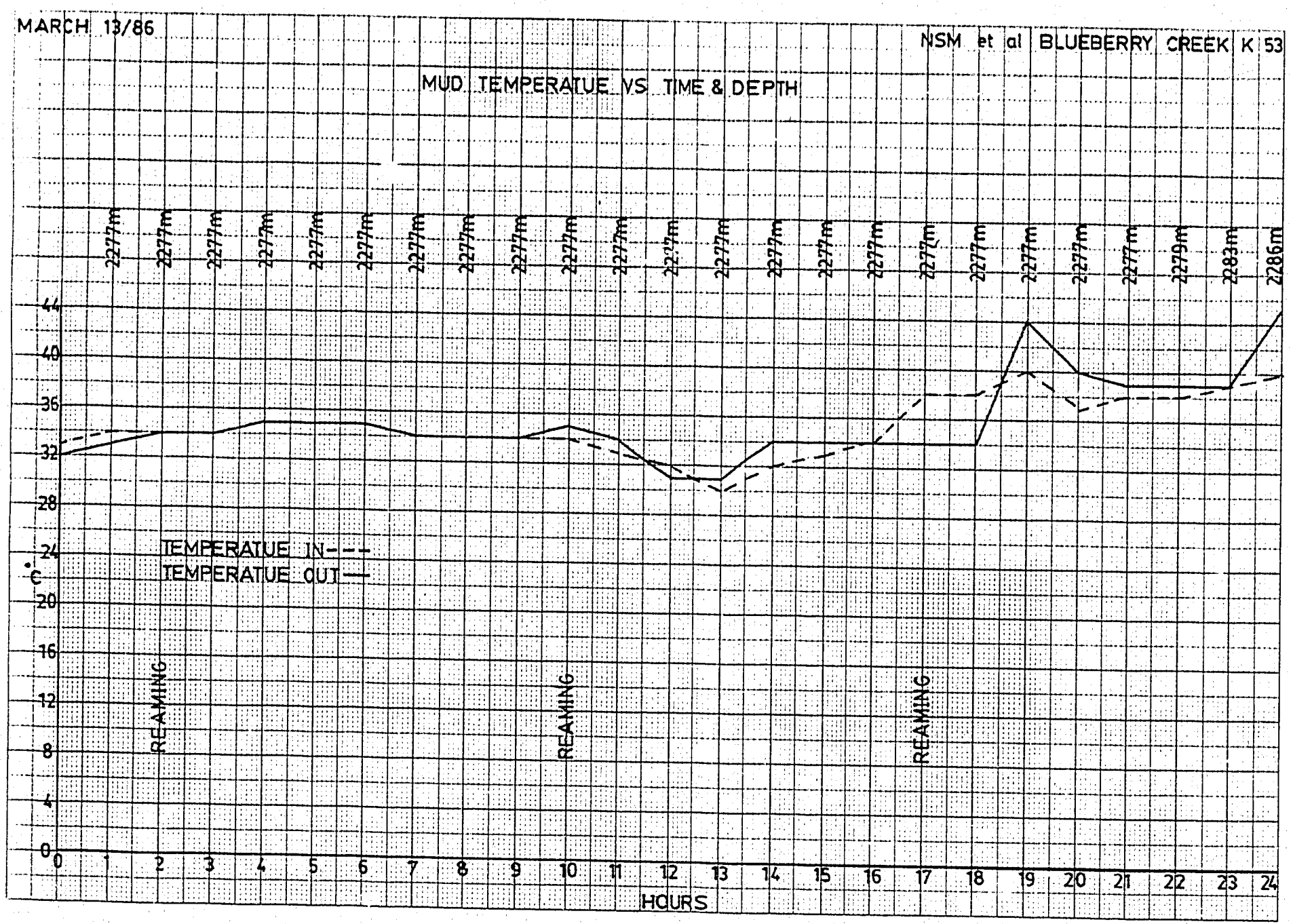



MARCH 10/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
DEPTH
2151m
2155m
2158m
2160m
2165m
2168m
2173m
2177m
2180m
2183m
2186m
2190m
2195m
2196m
2198m
2200m
2201m
2205m
2205m
2207m
2209m
2211m
2213m
2214m
°C
44
40
36
32
28
24
20
16
12
8
4
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS
TEMPERATUE IN---
TEMPERATUE OUT——

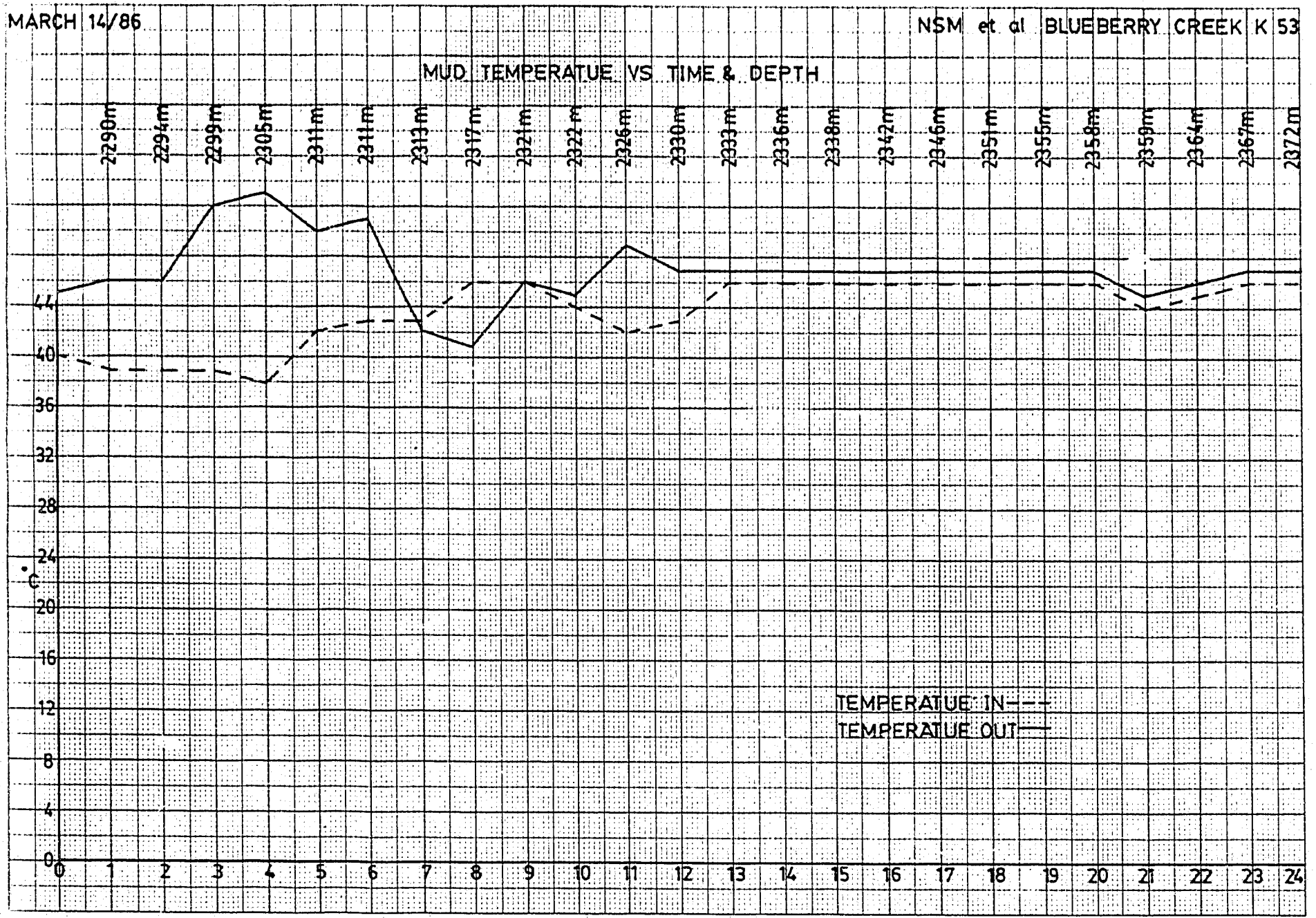

MARCH 11/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
DEPTH
2214m
2215m
2217m
2219m
2222m
2224m
2227m
2231m
2234m
2237m
2240m
2242m
2243m
2243m
2243m
2243m
2244m
2247m
2249m
2252m
2253m
2258m
2260m
2264m
°C
44
40
36
32
28
24
20
16
12
8
4
0
TEMPERATUE IN - - -
TEMPERATUE OUT ——
TRIP FOR WASH OUT
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS


MARCH 12/86
NSM et al BLUEBERRY CREEK K 53
MUD TEMPERATUE VS TIME & DEPTH
DEPTH
2272m
2274m
2276m
2277m
TEMPERATUE IN---
TEMPERATUE OUT——
°C
TRIP
REAMING
HOURS

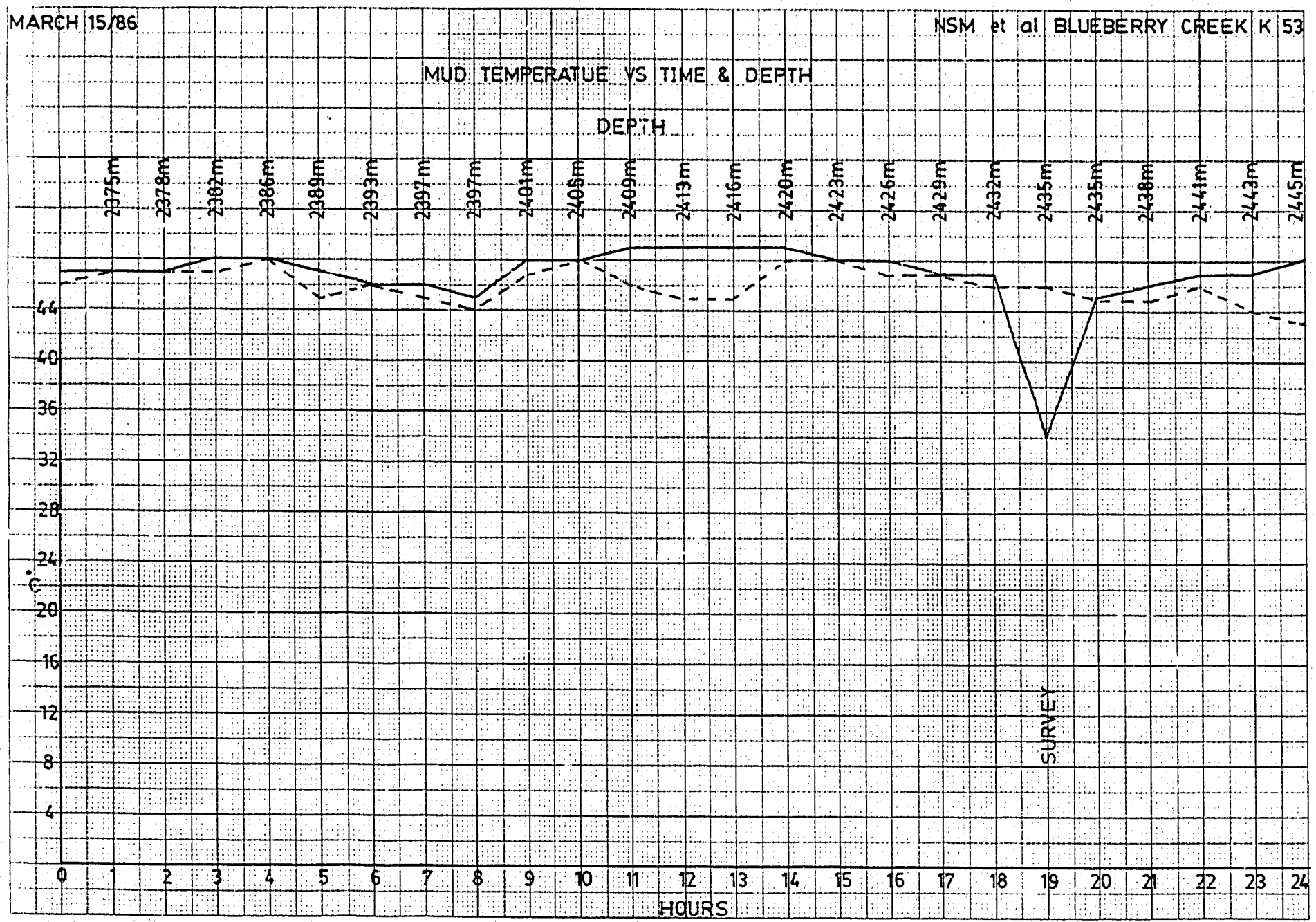
K+E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.



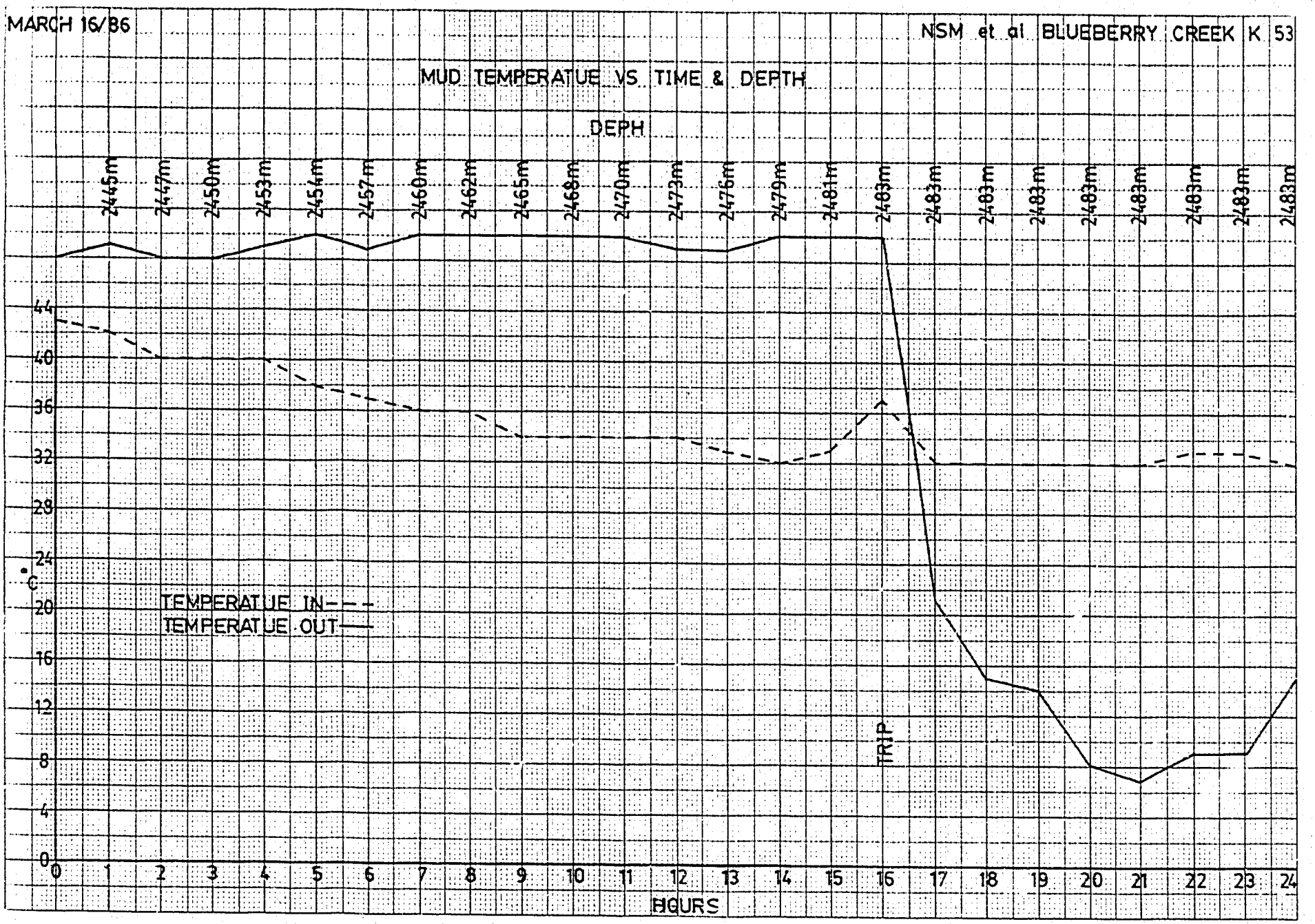
K+E 10 X 10 TO THE CENTIMETER



K•E 10 X 10 TO THE CENTIMETER KEUFFEL & ESSER CO

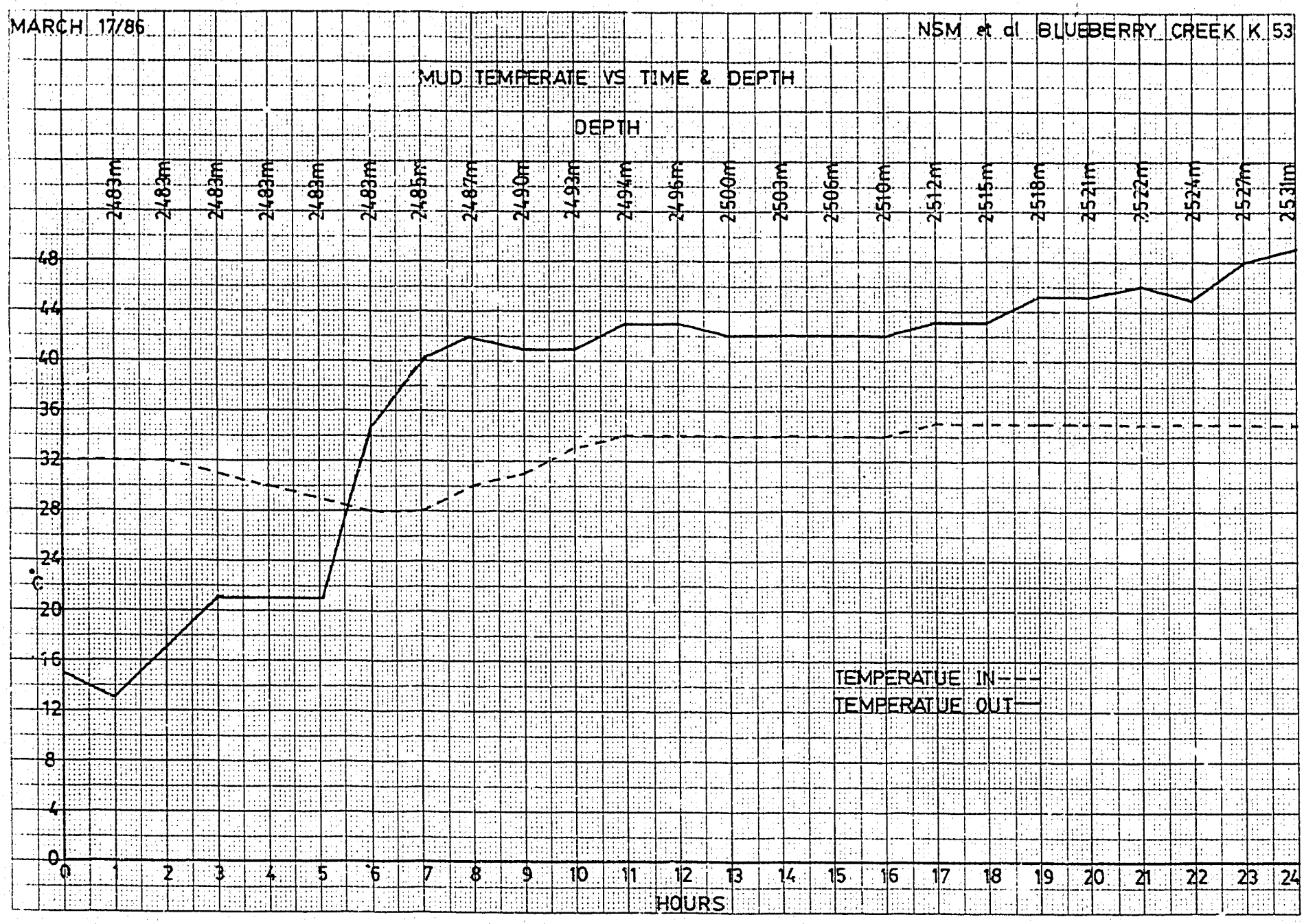


K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.



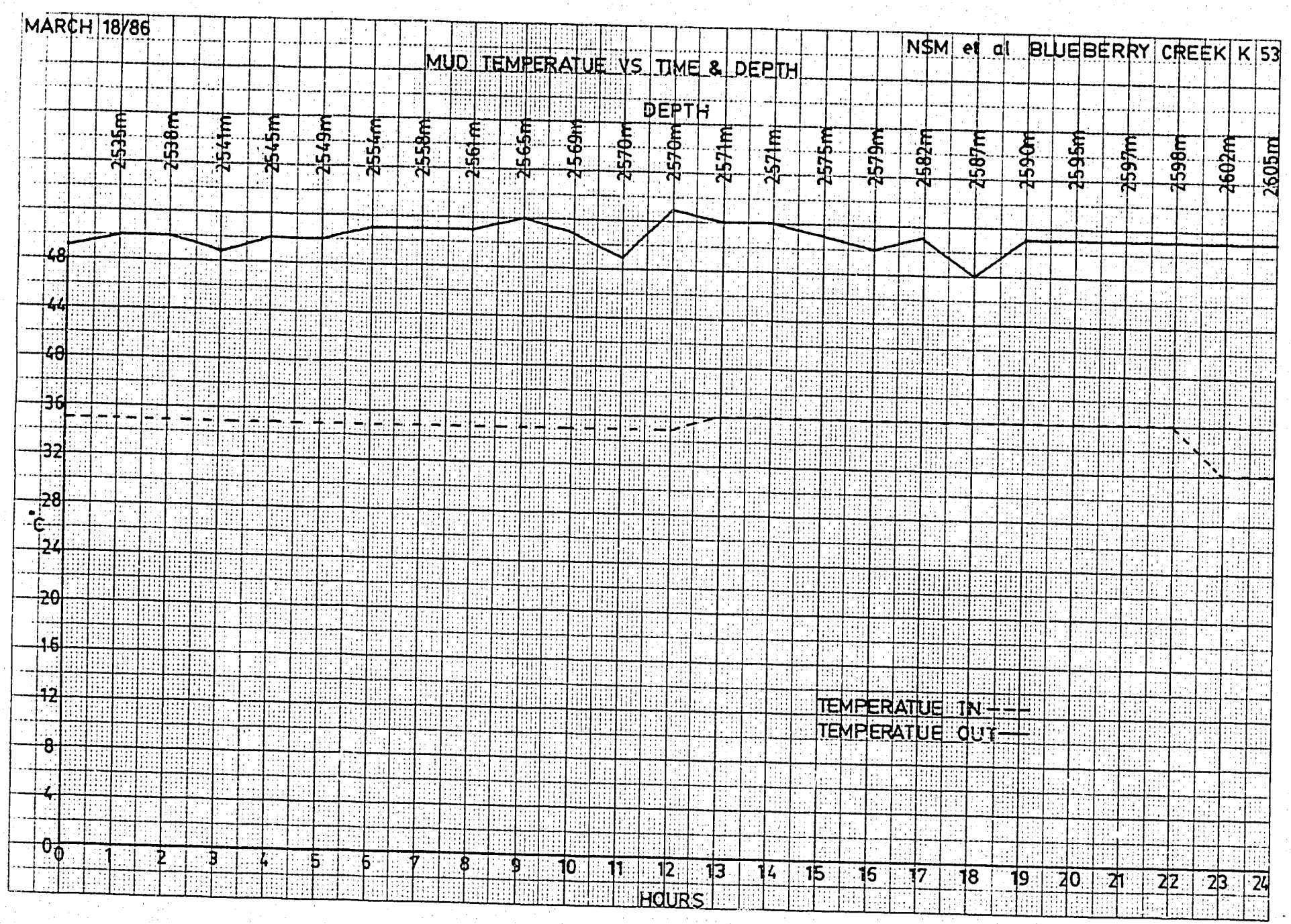
K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510

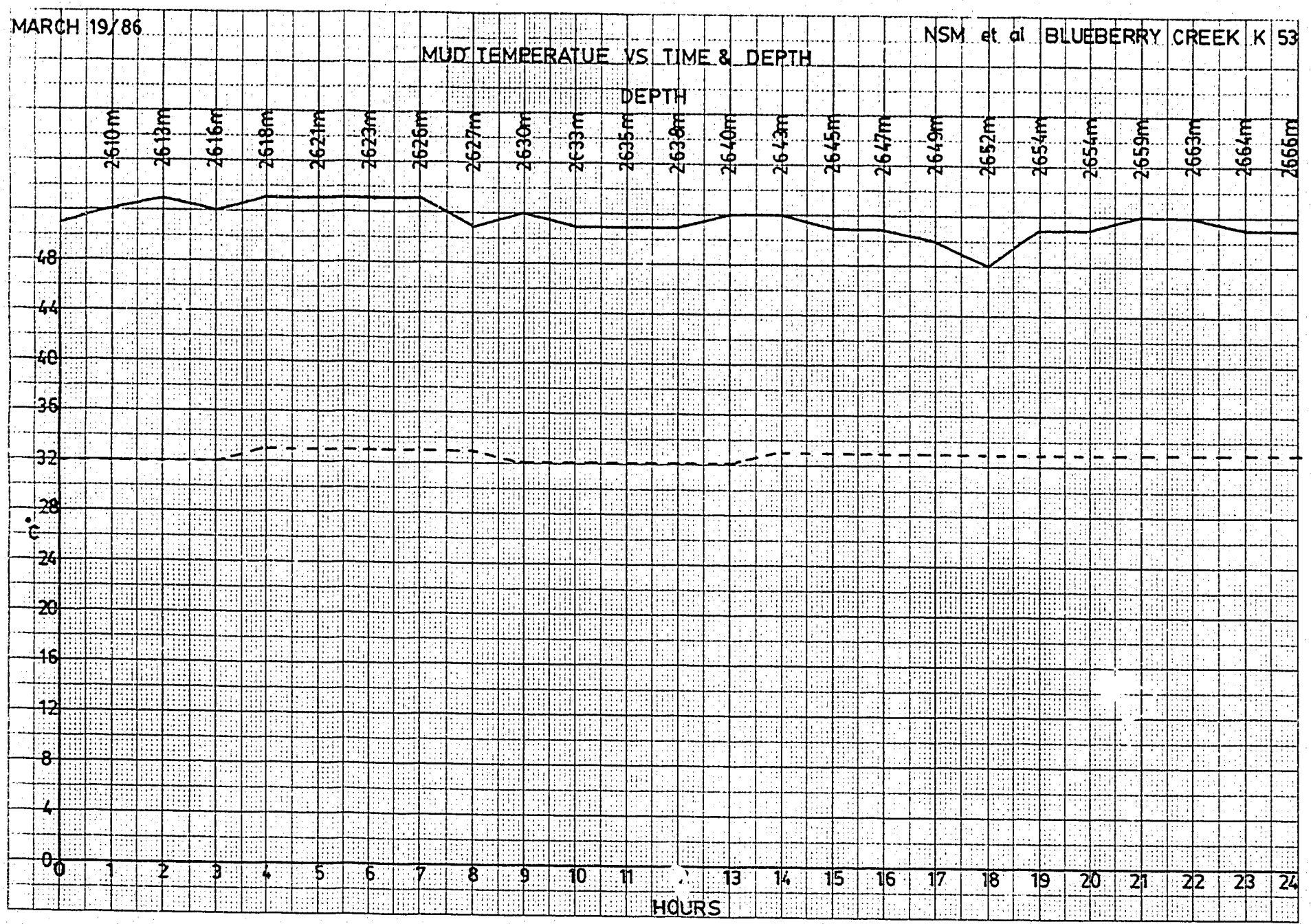


K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510

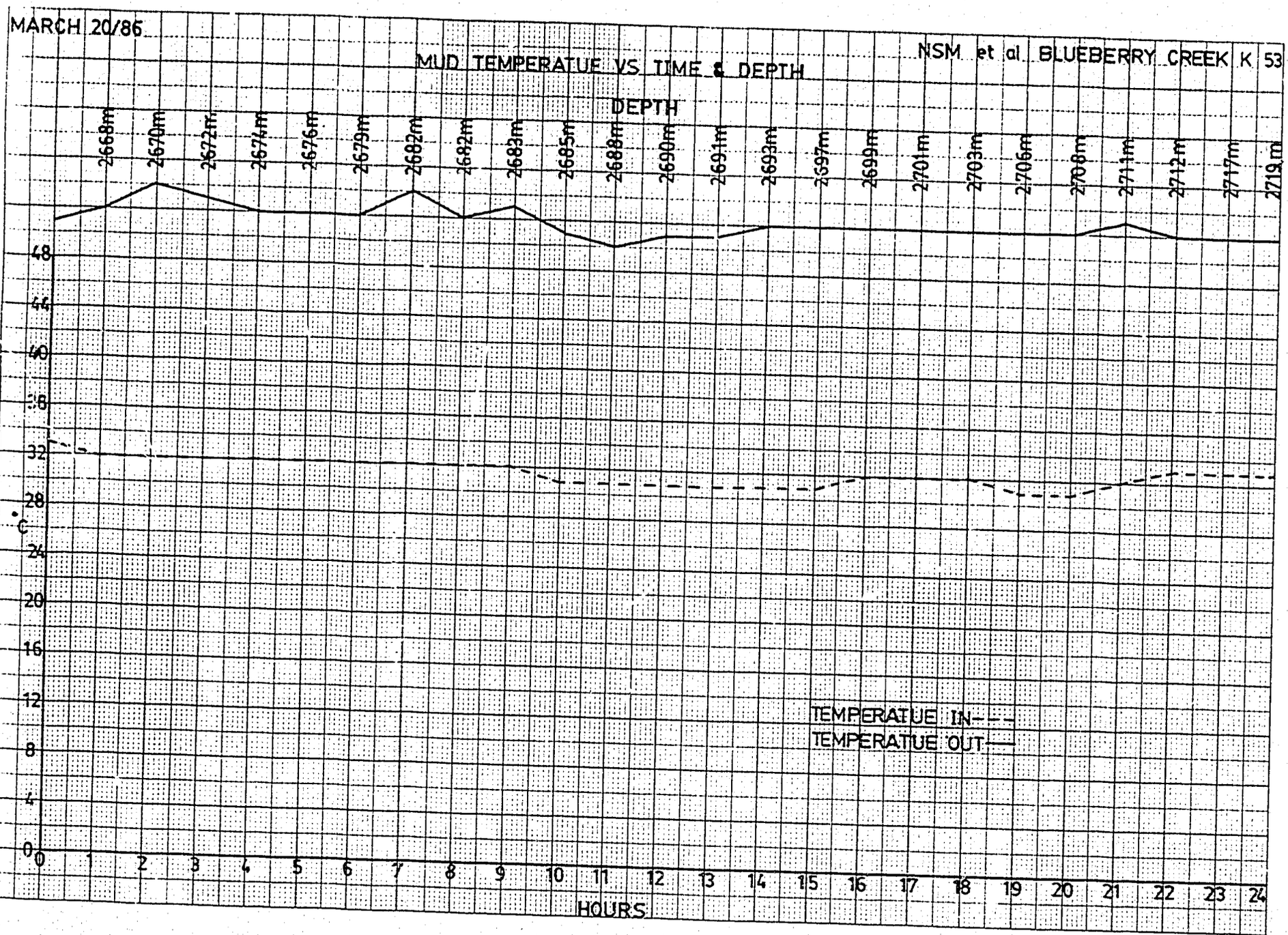


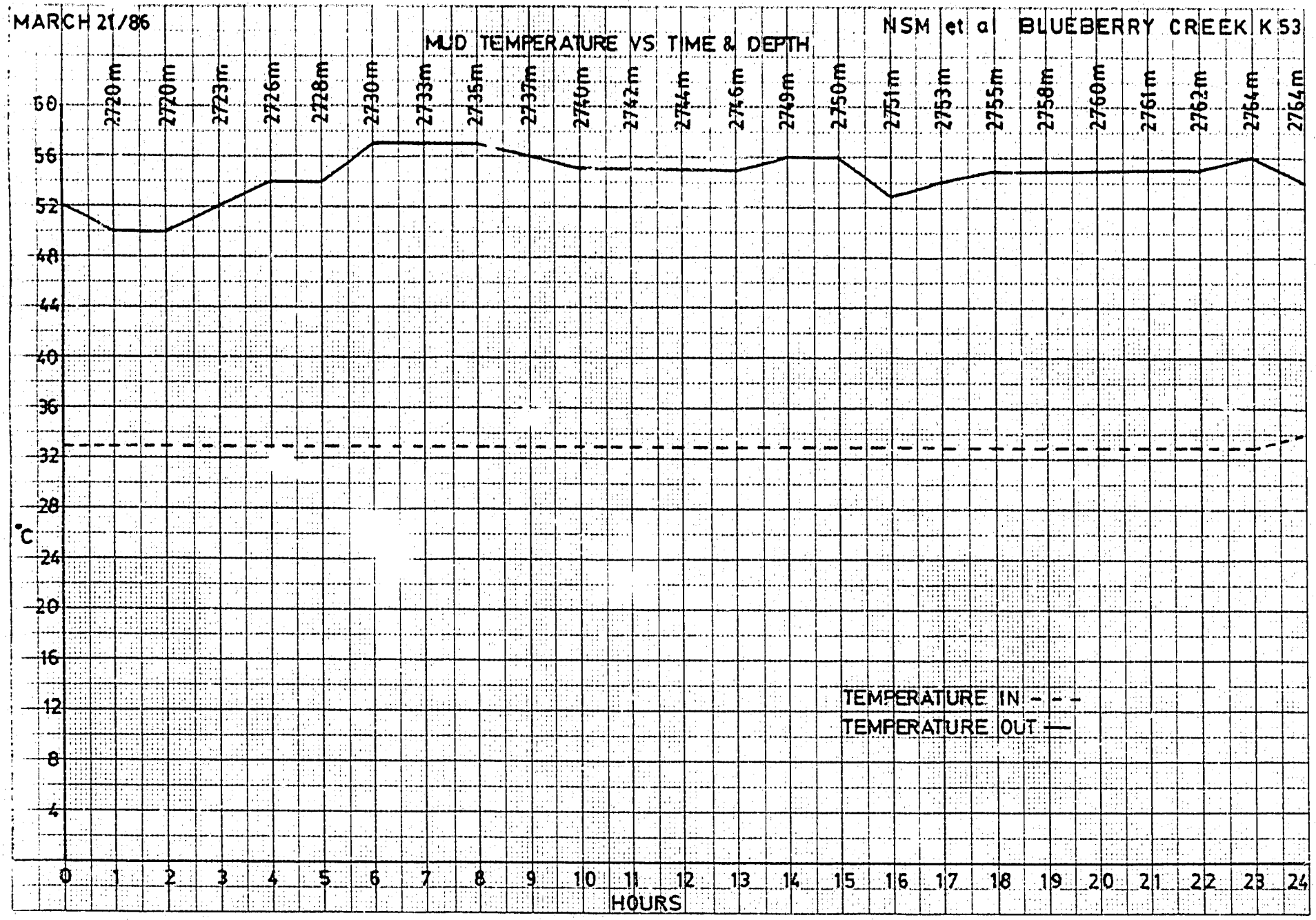
K+E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO.



K•E 10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510



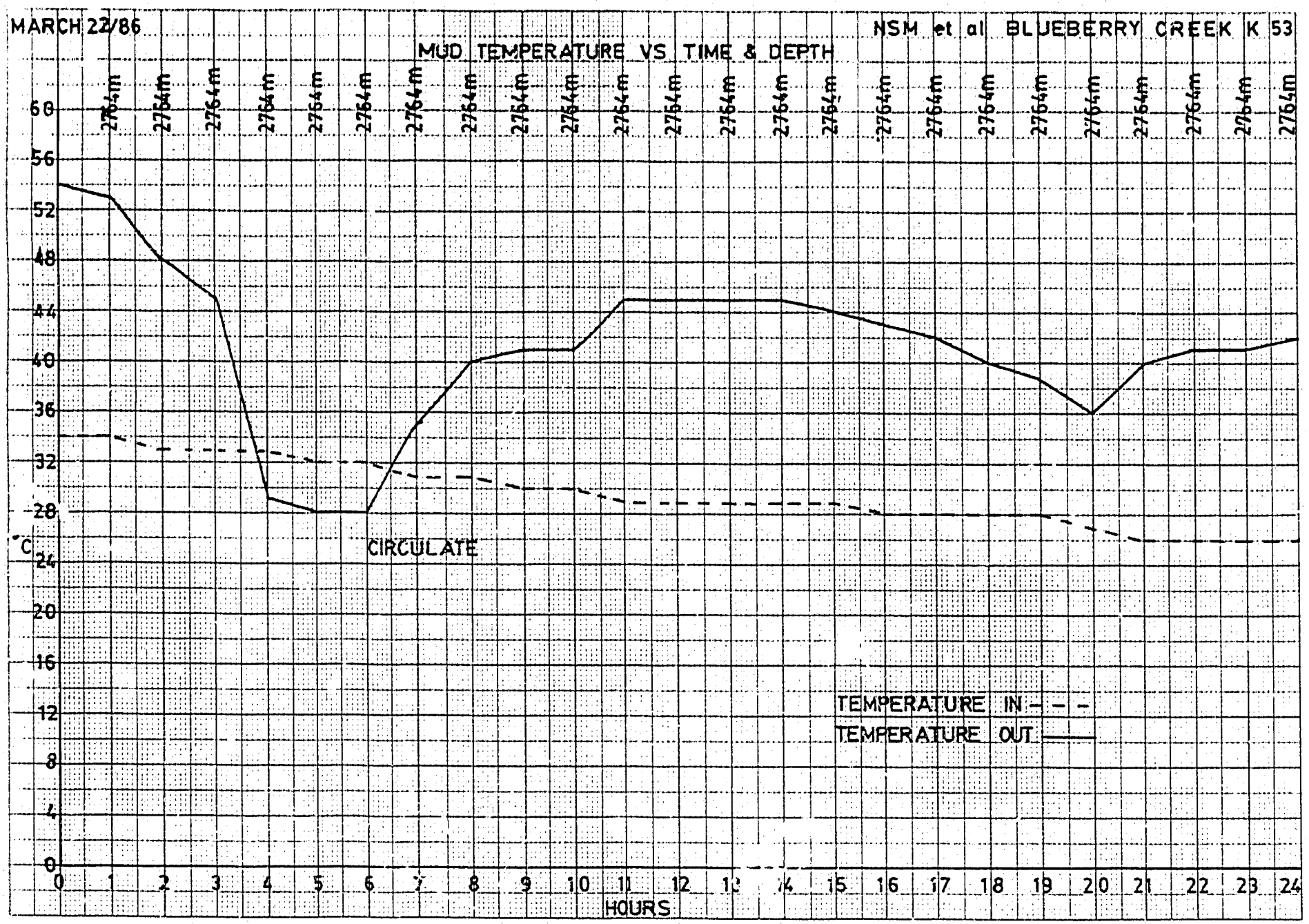

MARCH 21/86
MUD TEMPERATURE VS TIME & DEPTH
NSM et al BLUEBERRY CREEK K 53
2720m
2720m
2723m
2726m
2728m
2730m
2733m
2735m
2737m
2740m
2742m
2744m
2746m
2749m
2750m
2751m
2753m
2755m
2758m
2760m
2761m
2762m
2764m
2764m
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
°C
TEMPERATURE IN - - -
TEMPERATURE OUT ——
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS

K+E 10 X 10 TO THE CENTIMETER

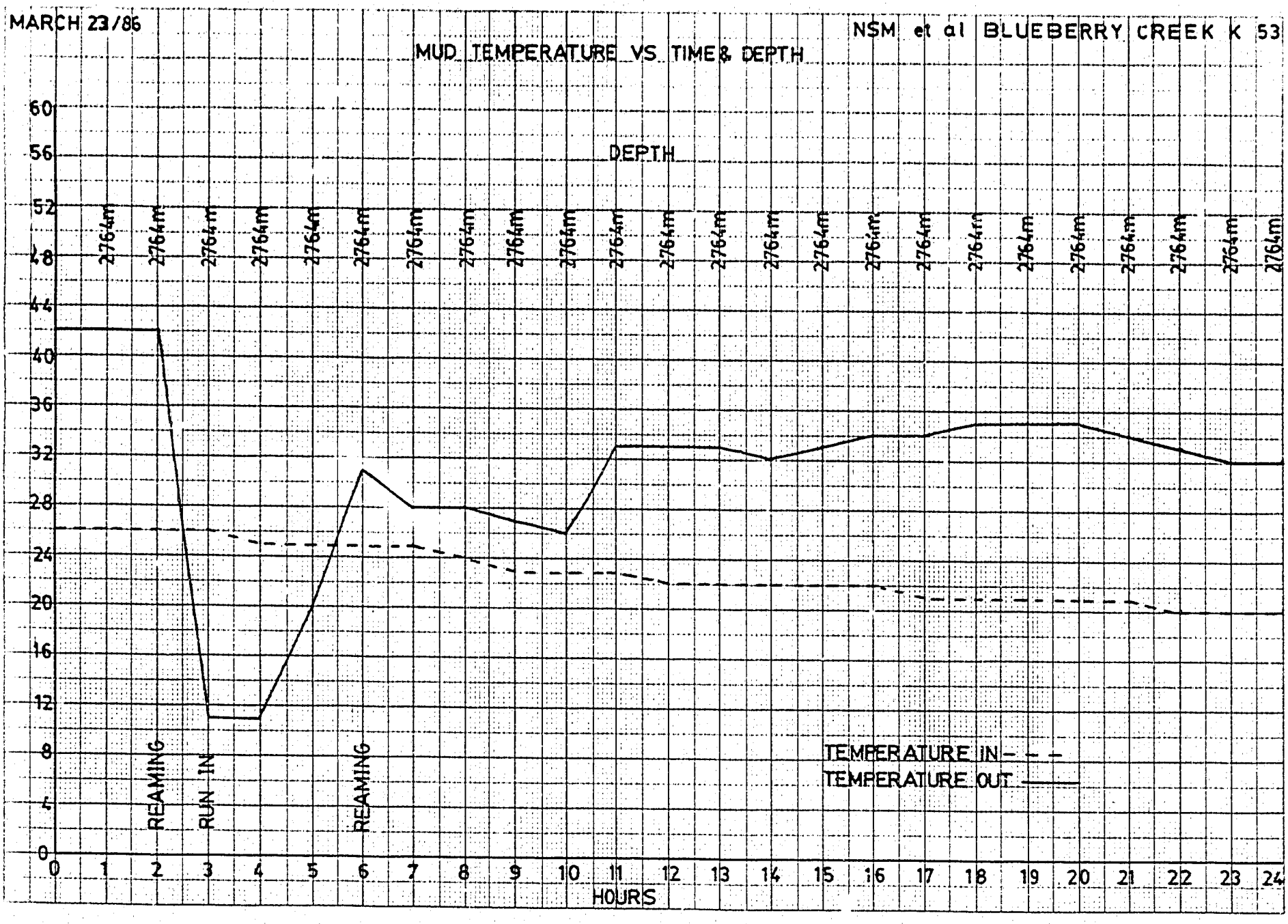
MARCH 22/86

NSM et al BLUEBERRY CREEK K 53

MUD TEMPERATURE VS TIME & DEPTH

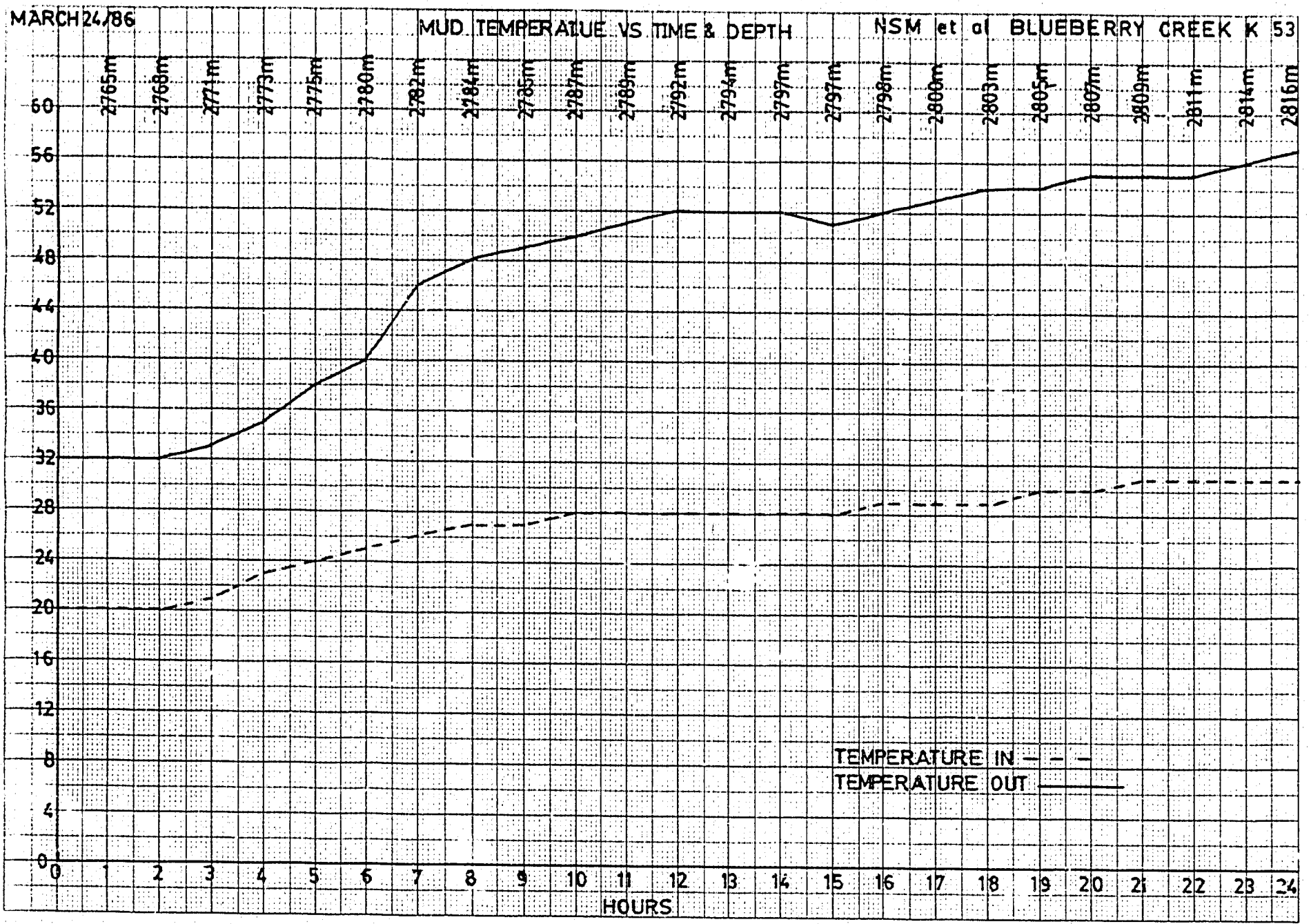


K+E 10 X 10 TO THE CENTIMETER

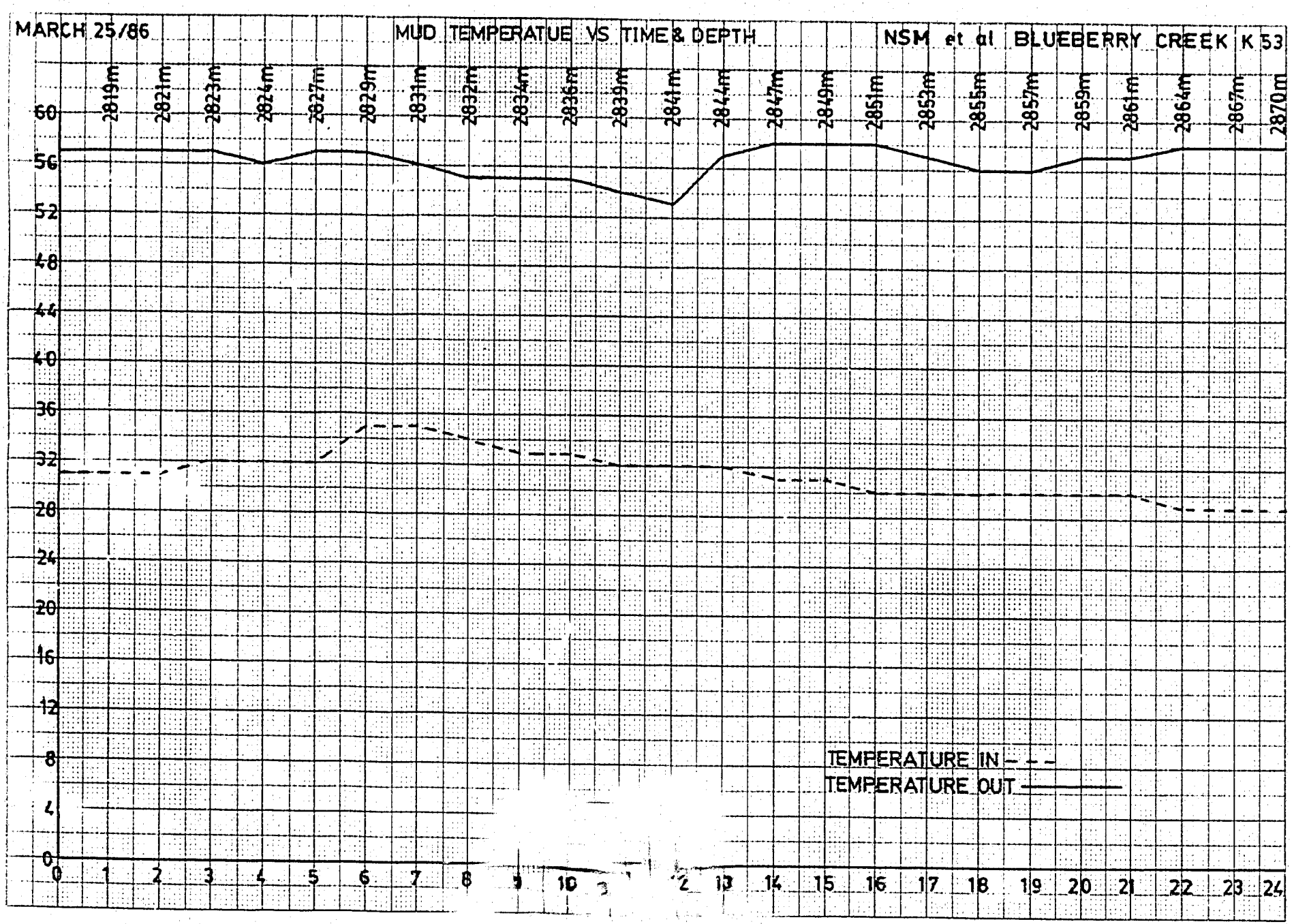


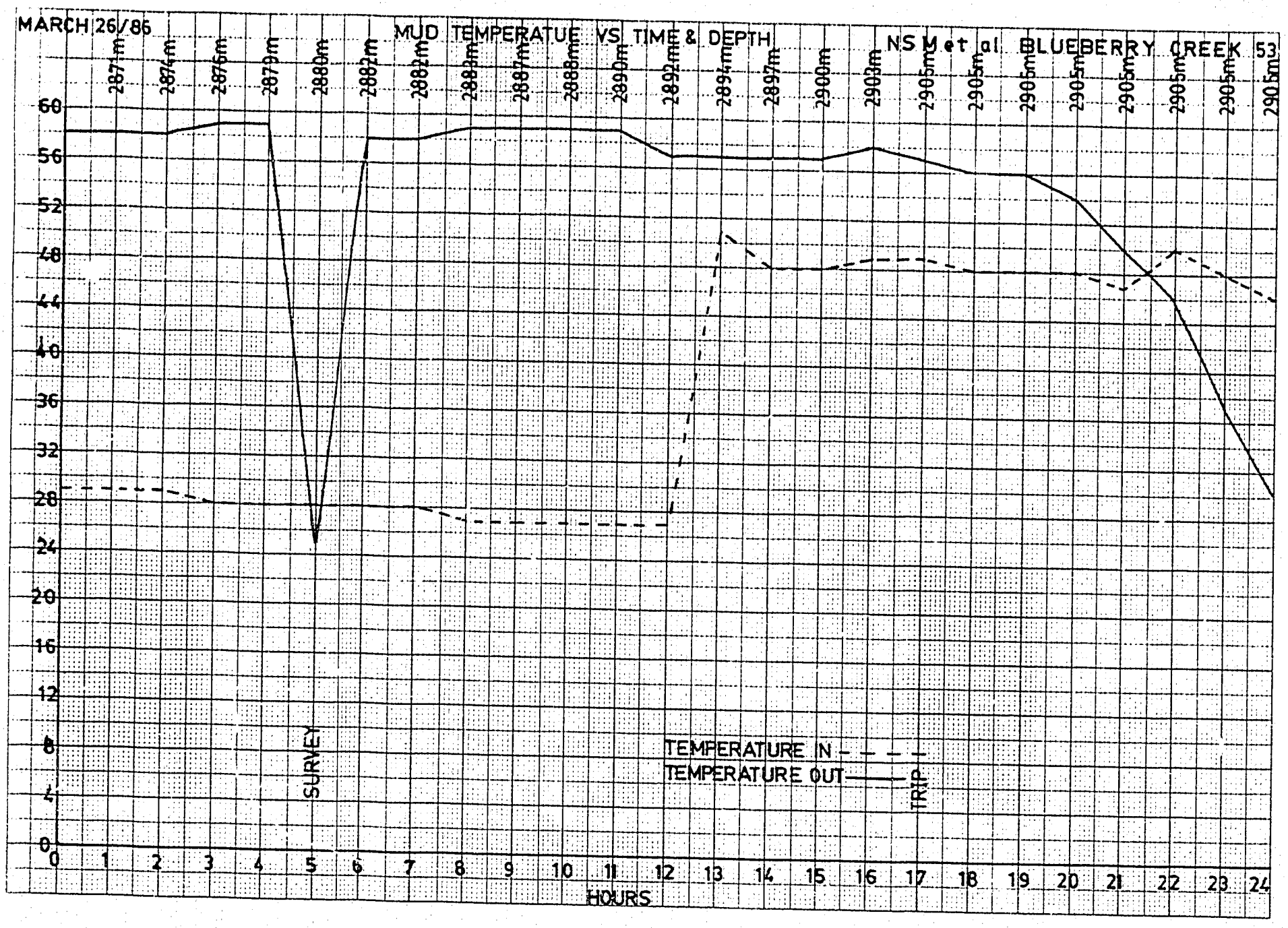
K•E 10 X 10 TO THE CENTIMETER

461510

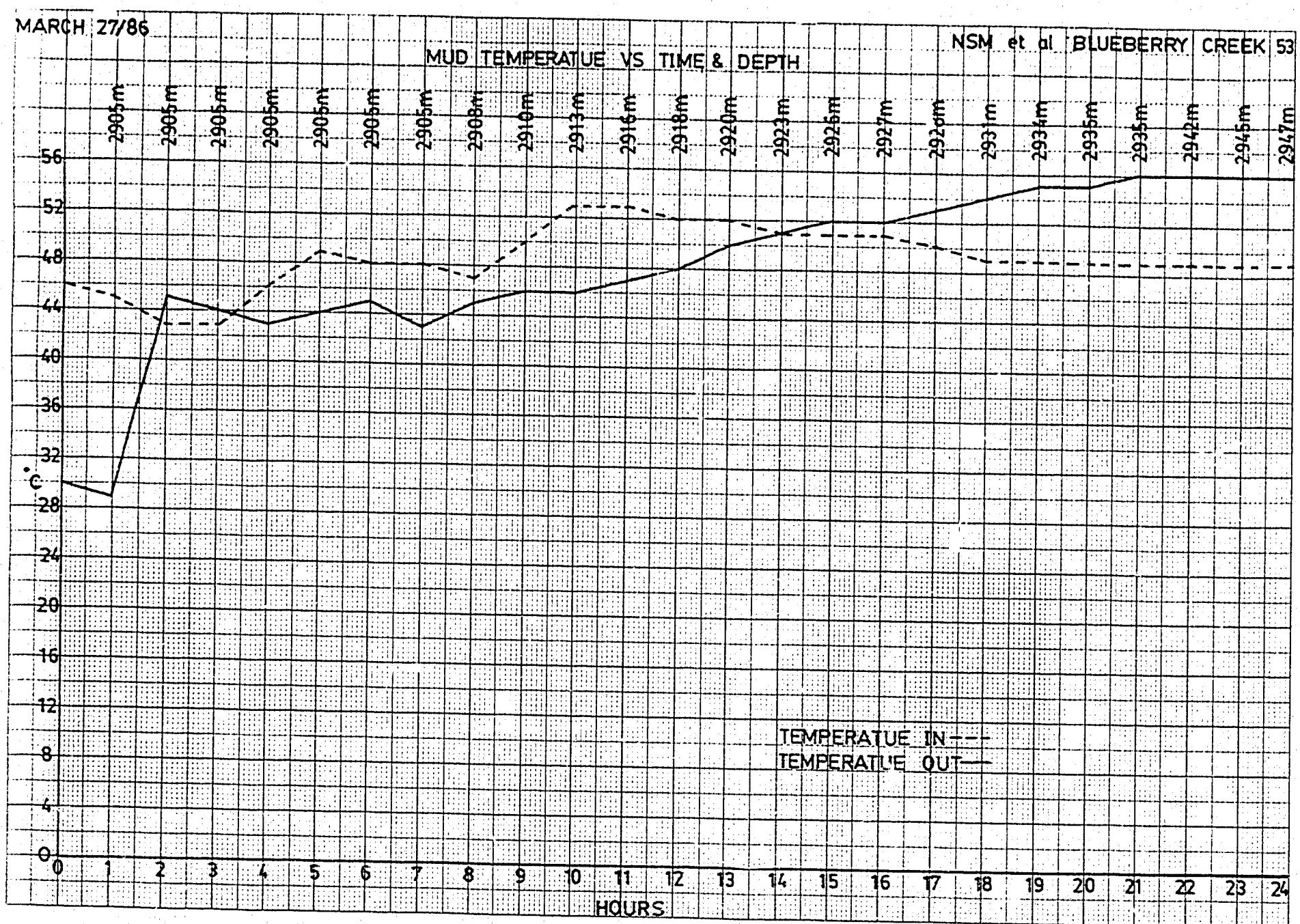


K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.



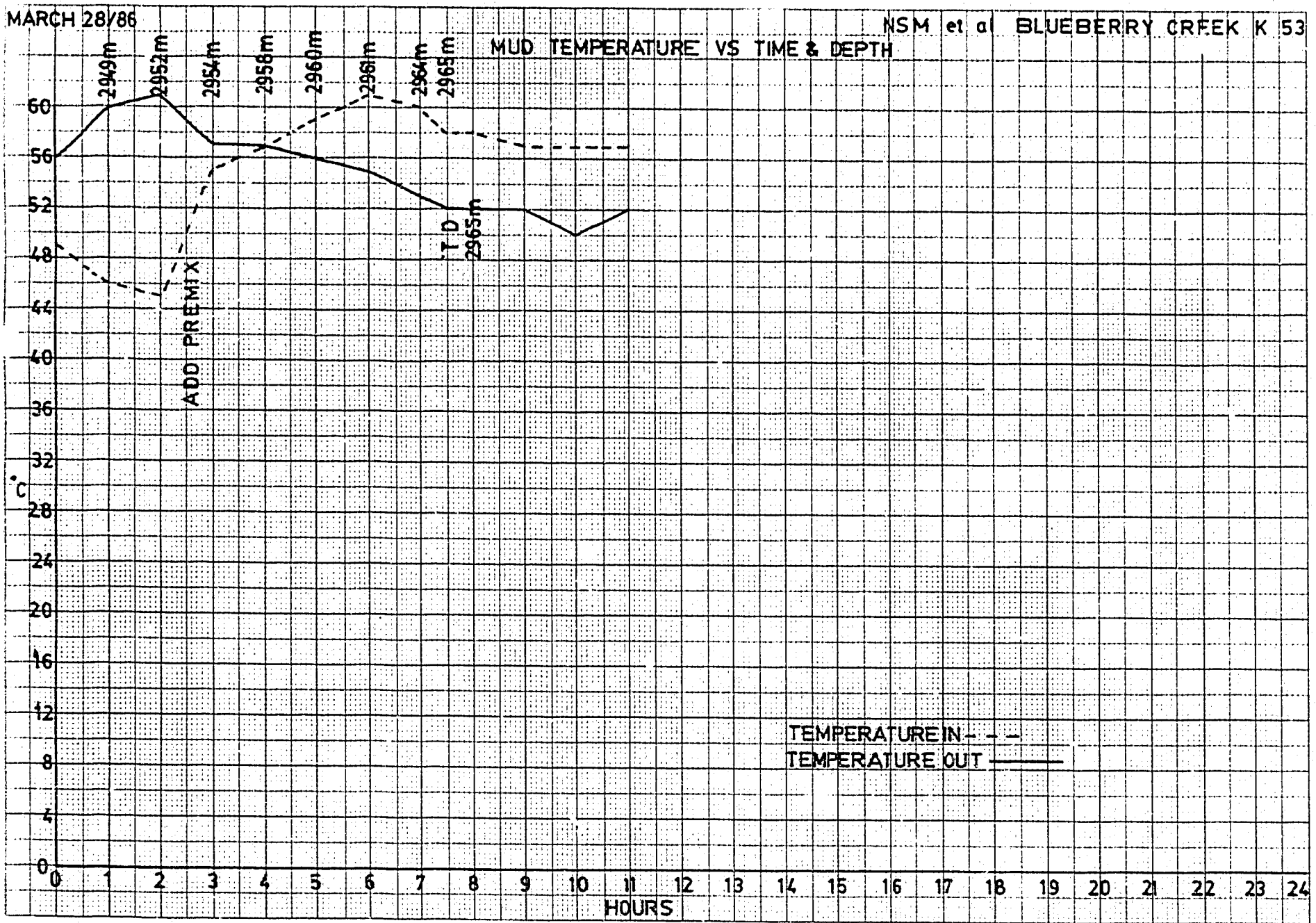

MARCH 26/86
MUD TEMPERATURE VS TIME & DEPTH
NS Metal BLUEBERRY CREEK 53
2871m
2874m
2876m
2879m
2880m
2882m
2882m
2883m
2887m
2888m
2890m
2892m
2894m
2897m
2900m
2903m
2905m
2905m
2905m
2905m
2905m
2905m
2905m
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS
SURVEY
TRIP
TEMPERATURE IN - - - -
TEMPERATURE OUT ——

K•E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.



K&E 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510



9211-N9-3-1

Survey Report for this plan is recorded as number F.B. 33493 C.L.S.R.

CANADA LANDS SURVEYS RECORDS
7 0 4 3 6
DATE 7 JULY 1986

PLAN AND FIELD NOTES OF SURVEY OF

EXPLORATORY WELL NSM ET AL BLUEBERRY CREEK K-53

IN UNIT K , SECTION 53
GRID AREA 64° 50' , 126° 15'

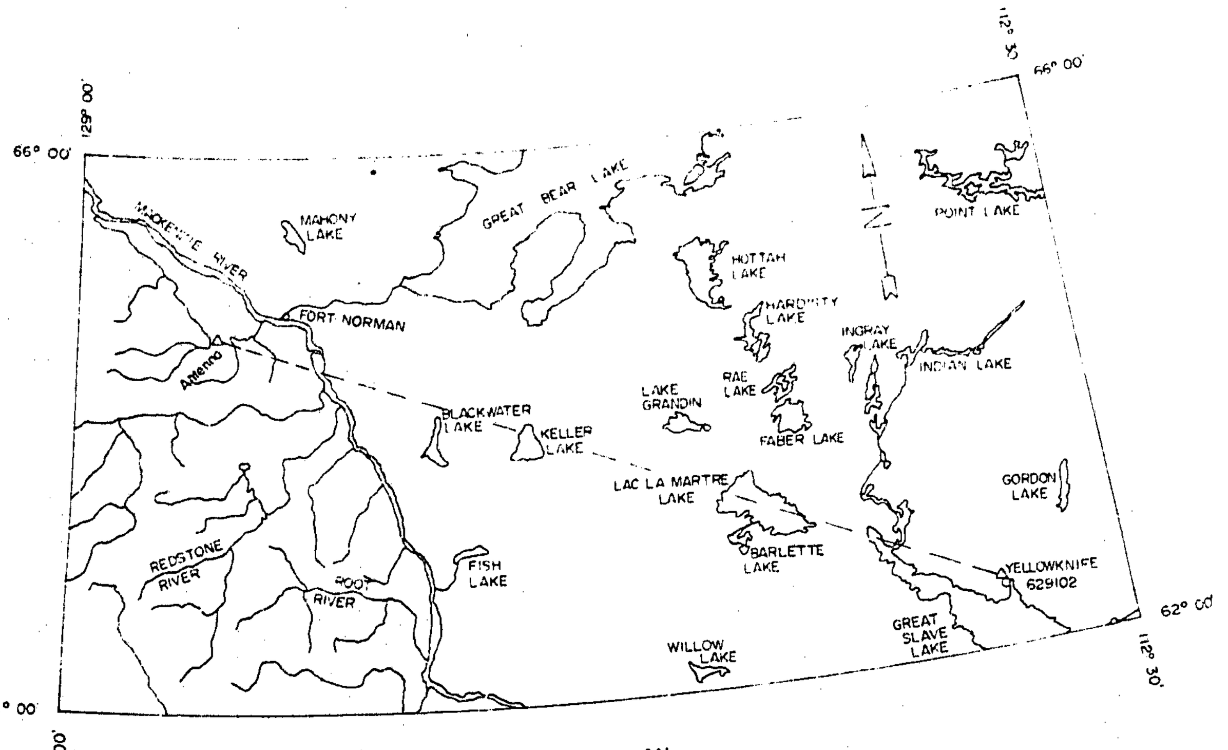
NORTHWEST TERRITORIES

CANADA OIL AND GAS LANDS REGULATIONS
EXPLORATION AGREEMENT NO. 215

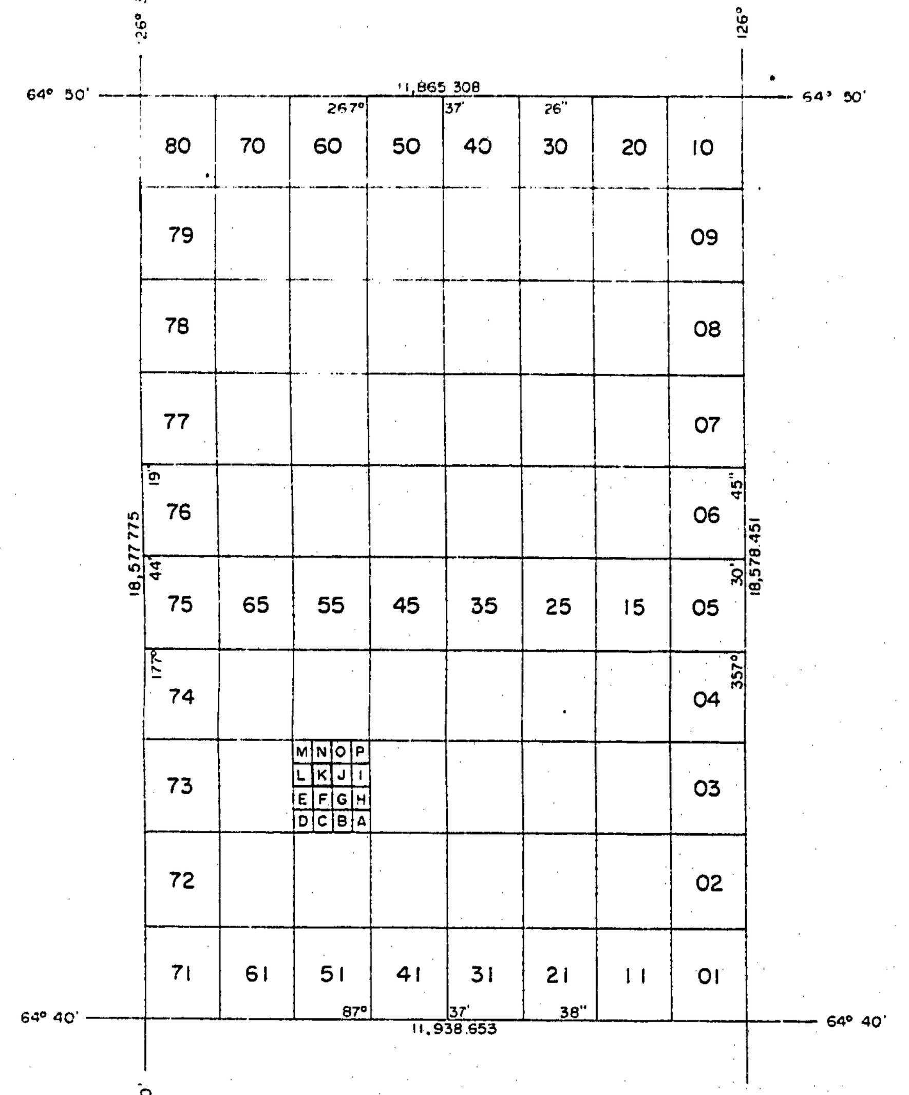
THIS SURVEY WAS EXECUTED DURING THE PERIOD FEB. 12 TO 14 , 1986
BY BRUCE HEWLKO C.L.S.
FOR N.S.M. RESOURCES LTD.

SCALE 1 : 1000

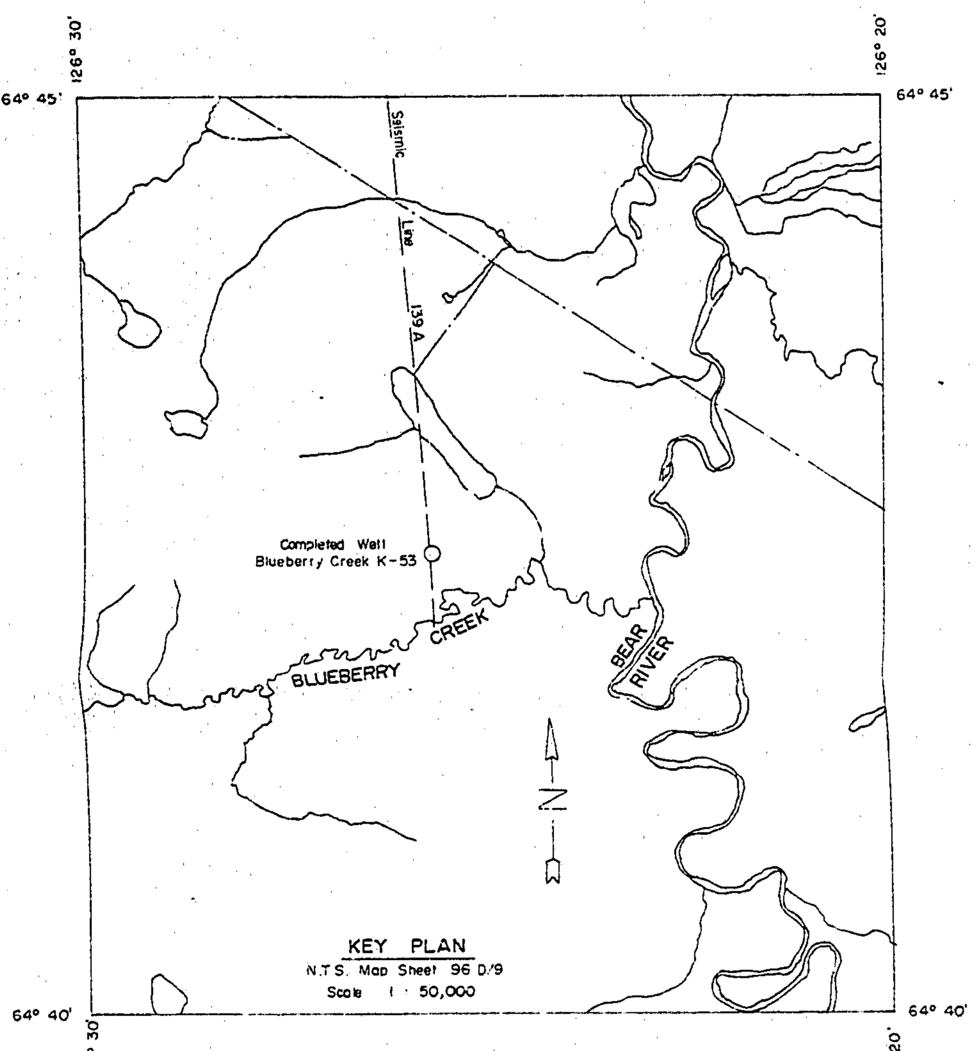
50 0 50 100 metres



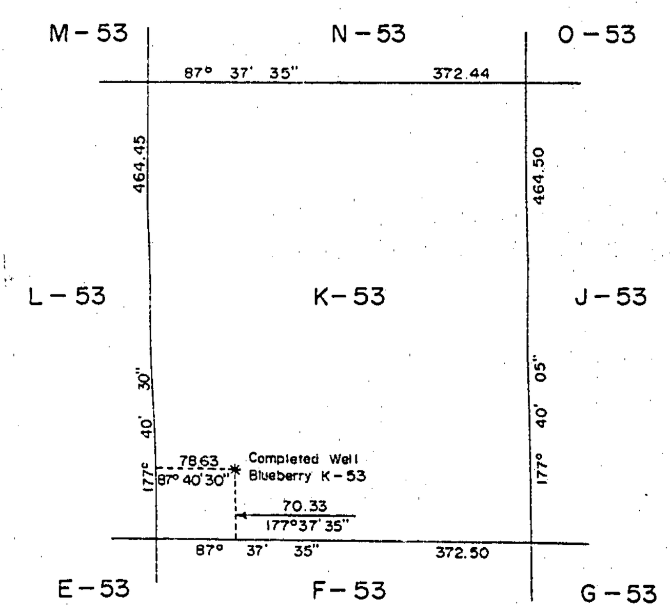
KEY PLAN
SCALE 1 : 4,000,000



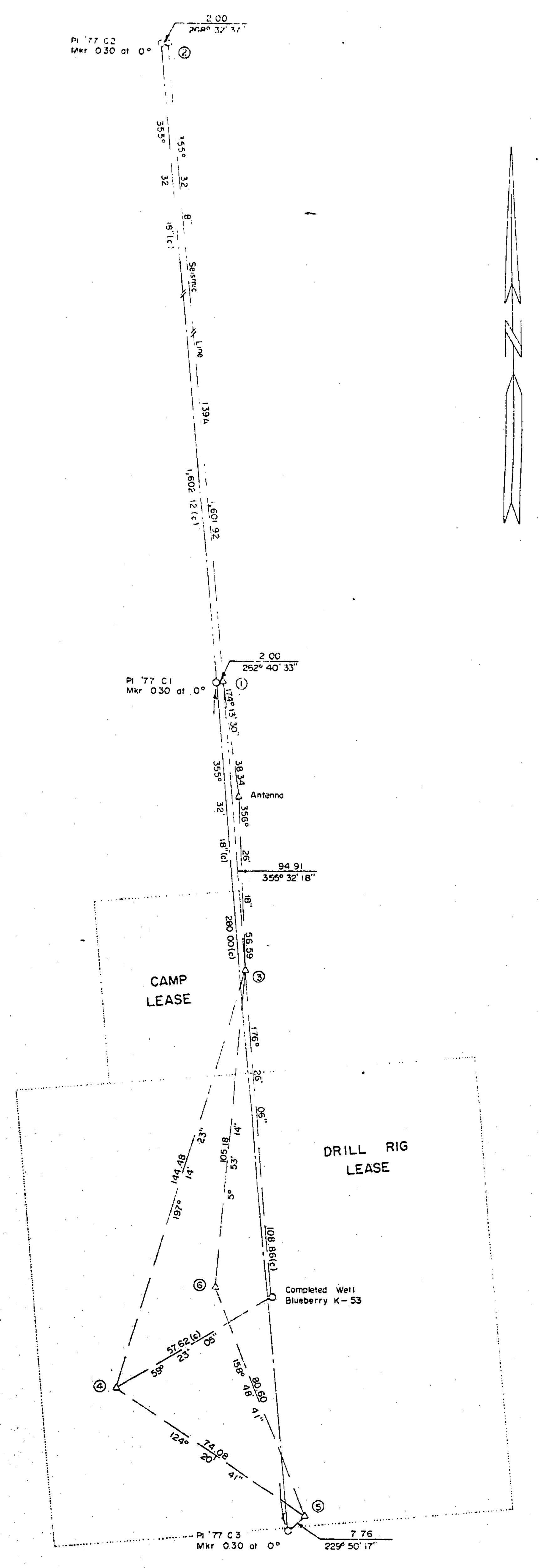
GRID AREA
64° 50' , 126° 15'
SCALE 1 : 100,000



KEY PLAN
N.T.S. Map Sheet 96 D/9
Scale 1 : 50,000



DETAIL
UNIT K , SECTION 53
SCALE 1 : 5000



GEOGRAPHIC AND U.T.M. COORDINATES (1927 N.A.D.)
U.T.M. ZONE 9 , CENTRAL MERIDIAN 129° WEST

STATION	LATITUDE	LONGITUDE	NORTHING	EASTING	ELEVATION
TRAVERSE					
Blueberry K-53	64° 42' 32.429"	126° 25' 40.942"	7,178,318.894	622,581.800	350.4
Antenna	64° 42' 37.769"	126° 25' 41.212"	7,178,483.971	622,571.512	350.25
C 1	64° 42' 38.999"	126° 25' 41.530"	7,178,521.852	622,565.665	350.5
C 2	64° 43' 30.692"	126° 25' 46.047"	7,180,118.687	622,441.066	337.2
C 3	64° 42' 29.965"	126° 25' 40.749"	7,178,242.773	622,587.442	
GRID AREA					
N.E.	64° 50'	126° 15'	7,192,520.912	630,461.682	
N.W.	64° 50'	126° 30'	7,192,028.985	618,606.576	
S.W.	64° 40'	126° 30'	7,173,465.678	619,339.629	
S.E.	64° 40'	126° 15'	7,173,959.969	631,268.045	
K-53 N.E.			7,178,724.859	622,859.368	
K-53 N.W.			7,178,709.434	622,487.278	
K-53 S.W.			7,178,245.366	622,506.089	
K-53 S.E.			7,178,260.793	622,878.266	

SUMMARY OF DOPPLER SATELLITE POSITION — DIFFERENCE SURVEY

		CONTROL STATION Yellowknife 629102 37 accepted passes between 7 hr. G.M.T., day 43 and 5 hr. G.M.T., day 45			DERIVED ANTENNA LOCATION 37 accepted passes between 7 hr. G.M.T., day 43 and 5 hr. G.M.T., day 45	
		1927 NAD F.B. 33135 CLSR.	Observed Geocentric Coordinates Broadcast Ephemeris W.G.S. 72	Derived Datum Shift Geocentric Minus NAD.	Observed Geocentric Coordinates Broadcast Ephemeris W.G.S. 72	Derived 1927 NAD Coordinates Geocentric Minus Datum Shift
Cartesian Coordinates	X	−1,222,816.806	−1,222,818.806	− 2.0	−1,622,564.69	−1,622,562.69
	Y	−2,690,779.497	−2,690,621.497	+ 158.0	−2,198,373.08	−2,198,531.07
	Z	+5,633,148.823	+5,633,328.823	+ 180.0	+5,744,307.18	+5,744,127.17
Latitude	Ø	62° 28' 28.863"				64° 42' 37.769"
Longitude	λ	114° 26' 21.415"				126° 25' 41.212"
Ht. above Sea Level	H	209.2				350.25
Geod. ht.	N	−0.6				5.6
Ht above Shperoid	h	208.6				355.85

LEGEND

Bearings are grid, derived from a solar observations at Station and are referred to the Central Meridian of U.T.M. Zone 9 (129° West).

Distances shown are expressed in metres and are horizontal at general ground level

Distances shown on grid area subdivisions are U.T.M. Plane.

To compute U.T.M. Coordinates distances have been reduced to sea level and the projection plane by applying a Combined Scale Factor of 0.9997292.

U.T.M. Coordinates were computed for Zone 9, Central Meridian 129° W.

Positioning was done by simultaneous Doppler satellite observations using Magnavox 1502 MX receivers. Positions were computed from the combined data from both stations using Magavox Software for which documentation is available from the Geodetic Survey of Canada. Average meteorological data were arbitrarily assumed. The derived position difference is between the identified monuments. Computer listings of the Doppler solution are included in the Surveyors Report of this survey (F.B. _____ C.L.S.R.)

C.L.S. '77 Posts Placed . . . . ○

Traverse Lines and Stations . . . . △———△

This survey was performed when drilling operations were in progress

I, Bruce Hewlko, of the City of Yellowknife, in the Northwest Territories, Canada Lands Surveyor, make oath and say that I have in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and field notes, and that the said plan and field notes are correct and true to the best of my knowledge and belief.

SO HELP ME GOD

Sworn before me at Yellowknife, N.W.T.
this 17 day of March, 1986

Canada Lands Surveyor

Bruce Hewlko C.L.S.

N.S.M. Resources Ltd.

WITNESS

Date: March 13, 1986

CANADA LANDS SURVEYS RECORDS 7 0 4 3 6

CANADA LANDS SURVEYS RECORDS 7 0 4 3 6

THOMSON UNDERWOOD McLELLAN SURVEYS LTD.
PROJECT NO. 8615 — 009