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GeothermEx, Inc. 901 MENDOCINO AVE.
BERKELEY, CA. 94707

JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

TEMPERATURE-GRADIENT

AND HEAT-FLOW DATA

GRASS VALLEY, NEVADA

for

SUNOCO ENERGY DEVELOPMENT CO.

Dallas, Texas

by

GeothermEx, Inc.
Berkeley, California

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JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

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JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

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INTRODUCTION

A series of 16 shallow and intermediate-depth temperature-gradient holes were drilled for Sunoco Energy Development Co. in Grass Valley, Pershing County, Nevada, on leases held by Aminoil USA, Inc., under the cost-sharing industry-linked program of the Department of Energy. Thirteen shallow (85-152 m) and 3 intermediate-depth (360-457 m) holes were completed and logged during the period June through September, 1979. The locations of these holes and of pre-existing temperature-gradient holes are shown on plate 1. This report constitutes a final data transmittal and disclosure of results.

The drilling subcontractor was Southwest Drilling and Exploration, Inc. of Central, Utah. They provided a Gardner-Denver 15W rig, a 3-man crew, and supporting equipment. All holes were drilled with mud as the circulating medium. Drilling histories for each hole are summarized in table 1.

GeothermEx, Inc. performed on-site geological descriptions of the cuttings; obtained several temperature profiles for each hole, including an equilibrium profile taken 23 days or more after cessation of drilling; selected samples for thermal conductivity measurements; integrated temperature, temperature-gradient, and heat-flow data obtained in this project with published values; and prepared this report.

GEOLOGY

Grass Valley is bounded on the east by the Sonoma and Tobin Ranges and on the west by the Goldbanks Hills and the East Range. The geology of the area has been summarized by Beyer *et al.* (1976). Exposed bedrock in the project area ranges from Lower Paleozoic sediments to Tertiary basaltic and rhyolitic volcanics. The center of Grass Valley contains a thick layer of unconsolidated Quaternary and Tertiary alluvium.

Noble (1975) performed photogeologic interpretation of Grass Valley and identified numerous faults and scarps within the project area.

Lithologic logs and descriptions for each hole drilled in this project are given in Appendixes A and B. Only hole S-GV-79-105

JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

Table 1

Drilling Histories of Temperature-Gradient
Holes, Grass Valley, Nevada
Sunoco Energy Development Co.

Shallow Holes

S-GV-79-2	Spud: 7/15/79 Complete: 7/16/79 TD: 500 feet	Some difficulty with caving by gravel was reported for upper 120 feet of hole.
S-GV-79-3	Spud: 6/15/79 Complete: 6/18/79 TD: 500 feet	
S-GV-79-4	Spud: 7/17/79 Complete: 7/18/79 TD: 500 feet	From 340-500 feet, hole was making its own mud. Insignificant amount of returns dropping out of mud.
S-GV-79-5	Spud: 6/19/79 Complete: 6/19/79 TD: 80 feet	Much caving from 20 to 80 feet. Lost circulation at 80 feet. Moved drill rig 80 yards west to site 5A.
S-GV-79-5A	Spud: 6/19/79 Complete: 6/21/79 TD: 500 feet	
S-GV-79-7	Spud: 6/21/79 Complete: 6/23/79 TD: 282 feet	Small lost circulation zone at 60 feet. Hole completed at 282 feet because of junk lost in hole.

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MURRAY C. GARDNER (503) 482-2605

S-GV-79-8 Spud: 6/28/79
Complete: 6/29/79
TD: 500 feet

S-GV-79-9 Spud: 6/30/79
Complete: 7/2/79
TD: 440 feet

Very hard drilling reported in zones 220-300 feet and also from 400 to 440 feet.

S-GV-79-10 Spud: 7/2/79
Complete: 7/5/79
TD: 500 feet

Very hard drilling reported in zones 343-420 feet. Note that hole was suspended for one day during drilling. (July 4 holiday).

S-GV-79-11 Spud: 7/7/79
Complete: 7/8/79
TD: 500 feet

Top 200 feet of hole tended to cave. Lost circulation zone at about 240 feet. In zone 260-320 feet, continued lost circulation and caving.

S-GV-79-12 Spud: 7/6/79
Complete: 7/7/79
TD: 500 feet

In zone 100-200 feet, there were almost no returns, but hole was making its own mud.

S-GV-79-13 Spud: 7/13/79
Complete: 7/14/79
TD: 480 feet

Much caving in zone 0-180 feet. No clay in returns in zone 400-480 feet, but mud was thick.

JAMES B. KOENIG (415) 524-9242
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S-GV-79-14 Spud: 7/19/79
Complete: 7/22/79
TD: 500 feet

Drilling equipment breakdown; hole suspended at 100 feet
for 48 hours. Much caving reported for zones 120-200
feet and 250-300 feet.

S-GV-79-15 Spud: 7/22/79
Complete: 7/23/79
TD: 500 feet

Intermediate-Depth Holes

S-GV-79-105 Spud: 8/12/79
Complete: 8/22/79
TD: 1,185 feet

S-GV-79-106 Spud: 8/28/79
Complete: 9/6/79
TD: 1,500 feet

S-GV-79-108 Spud: 7/28/79
Complete: 8/7/79
TD: 1,470 feet

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MURRAY C. GARDNER (503) 482-2605

penetrated consolidated rocks: light gray rhyolite in the interval 323-360 m. All other holes intersected unconsolidated sand, clay and gravel.

TEMPERATURE DATA

Preliminary and equilibrium temperature logs for each hole are given in Appendix C and D, and bottom-hole temperatures are summarized in table 2.

Temperatures observed at 30 and 50 m depths are shown on plate 1, and those observed at 100 m depth and greater are summarized on plate 2. Temperature gradients in the interval 30-50 m are shown on plate 3. Gradients computed for the interval 130-150 are shown on plate 4; and characteristic gradients for various depth intervals in holes deeper than 150 m are shown on plate 5.

HEAT FLOW

Heat flow computed for these holes are summarized in table 2 and are shown on plate 6, along with published values. Most values were computed using a thermal conductivity measured from the appropriate interval, but in some cases it was necessary to extrapolate values from zones of similar lithology.

All thermal conductivities were measured on unconsolidated materials. The calculations of heat-flow values were made using a range of likely porosities (20-40%) and assuming water-saturated conditions throughout. The resulting range of heat-flow values takes into account the fact that in situ porosities in poorly consolidated sedimentary rocks cannot be measured directly, and usually cannot be estimated closely from drill cuttings. Calculations that assume high porosities yield lower heat-flow values than do low porosities, because the thermal conductivity of water is 1.381 thermal conductivity units (TCU; 10^{-3} cal/cm-sec-°C), whereas the measured thermal conductivity of the rock material ranges from 4.4 to 9.1 TCU.

Terrain corrections were estimated from the topographic setting of each hole; they have relatively little effect on computed heat flows, as all holes were located on the valley floor.

Table 2

Bottomhole Temperatures, Temperature Gradients and Computed Heat Flow, Grass Valley, Nevada

Hole Number	Total Depth, meters	Bottom Hole Temperature, °C	Depth Interval, meters	Temperature Gradient, °C/km	Thermal Conduc- tivity TCU ¹	Terrain Correc- tion percent	Range of Heat Flow values, HFU ²	
							Maximum Porosity Conditions	Minimum Porosity Conditions
S-GV-79-2	150	24.1	30- 50	66.3	7.8 ³	0	2.59	3.66
			50- 80	73.7	7.57	0	3.21	4.51
			110-150	80.7	7.12	0	2.98	4.14
S-GV-79-3	150	21.9	20-150	56.2	6.4 ⁴	0	1.95	2.64
S-GV-79-4	150	20.8	30- 70	52.5	7.57	0	2.01	2.83
			70-150	66.2	7.47	0	2.52	3.53
S-GV-79-5A	150	33.9	30- 80	142.2	8.89	-5	5.71	8.29
			80-150	111.0	8.4 ⁴	0	4.53	6.50
S-GV-79-7	85	17.8	40- 70	3.6	9.97	-5	0.15	0.23
			70- 85	37.2	5.3 ³	0	1.15	1.51
S-GV-79-8	151	21.1	60-150	42.7	6.8 ⁴	0	1.53	2.11
S-GV-79-9	135	17.2	45- 70	31.2	7.70	-5	1.15	1.62
S-GV-79-10	152	20.1	35-150	53.2	8.4 ⁴	0	2.17	3.12
S-GV-79-11	152	17.4	30-105	29.0	9.07	0	1.24	1.80
			105-150	46.8	7.80	0	1.83	2.58
S-GV-79-12	152	27.8	45-100	102.3	6.34	0	3.52	4.78
			100-150	116.7	6.76	0	4.18	5.74
S-GV-79-13	146	22.1	10-100	61.8	7.82	0	2.41	3.42
			100-145	74.4	7.73	0	2.89	4.07

Hole Number	Total Depth, meters	Bottom Hole Temperature, °C	Depth Interval, meters	Temperature Gradient, °C/km	Thermal Conduc- tivity TCU ¹	Terrain Correc- tion percent	Range of Heat Flow values, HFU ²	
							Maximum Porosity Conditions	Minimum Porosity Conditions
S-GV-79-14	152	17.9	30- 60	25.7	8.10	0	1.03	1.46
			60-150	54.3	5.8 ⁴	0	1.77	2.36
S-GV-79-15	152	19.1	20-150	45.4	8.2 ⁴	0	1.83	2.61
S-GV-79-105	353	94.1	160-210	230	4.66	0	6.64	8.46
			230-270	158	5.4 ⁴	0	4.98	6.54
			290-310	290	5.90	0	9.6	12.9
S-GV-79-106	455	29.6	230-340	44.5	6.31	0	1.54	2.09
			370-450	60.0	6.0 ⁴	0	2.01	2.70
S-GV-79-108	440	62.3	230-340	104	9.41	0	4.57	6.71
			340-440	110	8.32	0	4.49	6.44

Notes:

¹TCU = thermal conductivity units, 10^{-3} cal/cm-sec-°C

²HFU = heat flow units, 10^{-6} cal/cm²-sec. Because all holes penetrated unconsolidated alluvium, water-saturated conditions were assumed throughout, and heat-flow values were calculated using 20% and 40% as the minimum and maximum porosities expected in this setting.

³No conductivity value measured in this depth interval. Conductivity given is average of values measured on similar lithology.

⁴Average of several conductivity values measured in this depth interval.

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REFERENCES

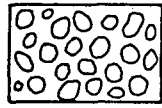
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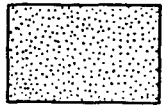
APPENDIX A.

Lithologic logs of shallow (85-152 m)
temperature-gradient holes.

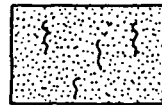
EXPLANATION OF SYMBOLS ON WELL LOGS



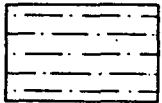
Gravel (conglomerate)



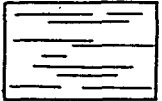
Sand (sandstone)



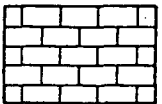
Quartzite



Silt (siltstone and mudstone)



Clay (shale, claystone, argillite)



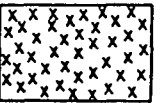
Limestone



Dolomite



Tuff (volcanic ash)



Lava flow

N.S. indicates that no sample is available

ABBREVIATIONS USED IN LITHOLOGIC DESCRIPTIONS

about	abt.	carbonaceous	carb.
above	abv.	cavernous	cav.
abundant	abnt.	caving	cvg.
accessory	acces.	cement, cemented	cmt.
acicular	acic.	center, centered	cntr.
agglomerate	aglm.	cephalopod	Ceph.
aggregate	agg.	chalcedony	chal.
algae, algal	Alg.	chalk, chalky	chk.
altered, altering	alt.	chert	cht.
amorphous	amor.	cherty	chty.
amount	amt.	chitin, chitinous	chit.
angular	ang.	clastic	clas.
anhedral	anhed.	clay, clayey	cly.
anhydrite, anhydritic	anhy.	claystone	clyst.
aphanitic	aphan.	clean	cln.
apparent	apr.	clear	clr.
appears	aprs.	clusters	clus.
approximate, approximately	approx.	coarse, coarsely	c.
aragonite	arag.	cobble	cbt.
arenaceous	aren.	color, colored	col.
argillaceous	arg.	common	com.
arkose, arkosic	ark.	compact	cpct.
asphalt, asphaltic	asph.	composition	comp.
assorted	asstd.	conchoidal	conch.
at	@	concretion, concretionary	conc.
average	av.	conodont	Cono.
band, banded	bnd.	concentric	cncn.
barite, baritic	bar.	conglomerate	cgl.
basalt	bas.	consolidated	cons.
bed	bd.	contact	ctc.
bedded	bdd.	contain	cont.
bedding	bdg.	contaminated	contam.
bentonite, bentonitic	bent.	contorted	cntrt.
biotite	biot.	coquina	coq.
bitumen, bituminous	bit.	covered	cov.
black	blk.	crenulated	cren.
block, blocky	blky.	crevice	crev.
blue, bluish	bl.	crinkled	crnk.
botryoidal	btry.	crinoid, crinoidal	Crin.
boulder	bldr.	cross-bedded, cross-bedding	xbdg., xbdg.
brachiopod	Brach.	cross-laminated	xlam.
breccia, brecciated	brec.	cross-stratified	xstrat.
brittle	brit.	cryptocrystalline	crpxl.
bright	bri.	cryptograined	crpgr.
brown	brn.	crystal, crystalline	xl., xln.
bryozoan	Bry.	cuttings	ctgs.
calcite, calcareous	calc.	dark	dk.
calichified	calich.	dead	dd.

debris	deb.	fragment, fragmental	frag.
decrease, decreasing	decr.	fresh	frs.
dendritic	dend.	friable	fri.
dense	dns.	frosted	fros.
determine	dtrm.	fusulinid	Fus.
detrital, detritus	dtrl.	gabbro	gab.
diameter	diam.	gastropod	Gast.
difference	dif.	glauconite, glauconitic	glau.
disaggregated	disagg.	glassy	gl.
disseminated	dissem.	gloss, glossy	glos.
dolocast, colocastic	dolc.	gneiss	gns.
dolomite, dolomitic	dol.	good	g.
dolomold, dolomoldic	dolmd.	grade, grades, graded	grd.
dominant	dom.	Grading	grdg.
druse, drusy	drsy.	grain, grained	g.
drilling	drlg.	granite	grnt.
earthy	rthy.	granodiorite	granod.
echinoid	Ech.	graptolite	Grap.
elliptical	elip.	granular	gran.
elevation	elev.	granule	grnl.
elongate	elg.	gravel	gvl.
embedded	embd.	gray	gy.
enlarged	enl.	graywacke	gywke.
equivalent	equiv.	greasy	gsy.
euهدral	euهد.	green	grn.
evaporitic	evap.	greenstone	grnst.
expose, exposed, exposure	exp.	gritty	grty.
extraneous	extran.	gypsum, gypsiferous	gyp.
extrusion, extrusive	extr.	hackly	hky.
faceted	fac.	hard	hd.
faint	fnt.	heavy	hvy.
fair	fr.	hematite, hematic	hem.
fault	flt.	heterogeneous	heterog.
fauna	fau.	hexagonal	hex.
feldspar, feldspathic	fld.	high	hi.
ferruginous	Fe	homogeneous	homog.
fibrous	fib.	horizontal	hztl.
figured	fig.	hornblende	hbl.
fine, finely	f.	hornfels	hfls.
fissile	fis.	hydrocarbon	hydc.
flaggy	flgy.	igneous	ig.
flake	flk(s).	imbedded	imbd.
flaky	flky.	impression	imp.
flat, flattened	flat.	included, inclusion	incl.
floating	fltg.	increase, increasing	incr.
fluorescence	flor.	indistinct	indst.
foliated	fol.	indurated	ind.
foraminiferan	Foram.	interbedded	intbdd.
formation	fm.	intercalated	intcl.
fossil, fossiliferous	fos.	intercrystalline	intxl.
fracture, fractured	frac.	interfingered	intfr.
		intergranular	intgran.

intergrown	intgwn.	middle	mid.
interlaminated	intlam.	mineral, mineralized	mnrl.
interstitial	intstl.	minimum	min
interval	intv.	minor	mnr.
intraformational	intfm.	minute	mnut
intrusion, intrusive	intr.	miscellaneous	misc.
invertebrate	invrtb.	moderate	mod.
iron	Fe	mollusc	Mol.
ironstone	Fe-st.	mottled, mottling	mot.
irregular	ireg.	mudstone	mdst.
irridescent	irid.	muscovite	musc.
jasper, jasperoid	jasp.	nacreous	nac.
jointed	jntd.	nepheline	neph.
joints	jnts.	no, non-	n.
kaolin	kao.	nodule	nod.
laminated	lam.	numerous	num.
large, larger	lrg.	object	obj.
lavender	lav.	occasional	occas.
leached	lchd.	ochre	och.
ledge	ldg.	odor	od.
lentil, lenticular	len.	oil	o.
lignite, lignitic	lig.	oil sand	o. sd.
light, lighter	lt.	oil stain	O. stn.
limonite, limonitic	lmn.	olive	olv.
limestone	ls.	oolicast, oolitic	ooc.
limy	lmy.	oolite, oolitic	ool.
lithic, lithology, lithographic	lith.	oomold, oomoldic	oom.
little	ltl.	opaque	op.
long	lg.	orange	orng.
loose	lse.	organic	org.
lower	low.	orthoclase	orth.
lumpy	lmpy.	ostracod	Ost.
lustre	lstr.	outcrop	otcp.
magnetic	mgn.	oxidized, oxide	ox.
marlstone	mrlst.	part, partly	pt.
maroon	mar.	parting	ptg.
massive	mas.	pearl, pearly	prly.
material, matter	mat.	pebble	pbl.
matrix	mtx.	pebbly	pbly.
maximum	max.	pelecypod	Plcy.
median	mdn.	pellet	pel.
medium	m.	peridotite	perid.
member	mbr.	permeability	perm.
metamorphic	meta.	petroleum, petroliferous	pet.
mica, micaceous	mica.	phenocryst	phen.
microcrystalline	micxln.	phosphate, phosphatic	phos.
microfossil,		pink	pk.
microfossiliferous	micfos.	pin-point	p-p.
micrograined	micgr.	pisolite, pisolitic	viso.
micro-micaceous	mic-mica.	pitted	pit.
		plagioclase	plag.

plant fossils	pl. fos.	sediment, sedimentary	sed.
plastic	plas.	selenite	sel.
platy	plty.	serpentine	sp.
point	pt.	several	sev.
polish, polished	pol.	shadow	shad.
poor, poorly	p.	shale	sh.
porcelaneous	porc.	shaly	shy.
porosity, porous	por.	siderite, sideritic	sid.
porphyritic	porph.	silica, siliceous	sil.
possible, possibility	pos.	silicified, silicification	silicif.
predominate, predominantly	pred.	silky	slky.
preserved, preservation	pres.	silt	slt.
primary	prim.	siltstone	sltst.
prism, prismatic	pris.	silty	slty.
probable, probably	prob.	size	sz.
prominent, prominently	prom.	slabby	slab.
pseudo	psdo.	slickensided	sks.
purple	purp.	slight, slightly	sl.
pyrite, pyritized	pyr.	small	s.
pyrobitumen	pyrbit.	smooth	smth.
pyroclastic	pyrclas.	soft	sft.
pyroxene	pyx.	solution	sol.
quartz	qtz.	sort	srt.
quartzite	qtzt.	sorted	srted.
quartzitic	qtzc.	sorting	srtg.
quartzose	qtzs.	speck, speckled	spec.
radiate, radiating	rad.	sphalerite	sphal.
range, ranging	rng.	spherules	sph.
rare	rr.	spicule, spicular	spic.
regular	reg.	splintery	splty.
remains, remnant	rmn.	sponge	Spg.
replaced, replacing		spore	Spr.
replacement	repl.	spot, spotted, spotty	sp.
residue, residual	resd.	stain, stained, staining	stn.
resinous	rsns.	station	sta.
rhomb, rhombic	rhmb.	stippled	stip.
rhyolite	rhy.	stone	st.
rock	rk.	strata, stratified,	
round, rounded	rd.	stratification	strat.
rubbly	rbly.	streak	str.
sample	spl.	striated	stri.
sand	sd.	stringer	strg.
sandstone	ss.	stromatoporoid	Strom.
sandy	sdy.	structure	struc.
saturated, saturation	sat.	stylotite	styl.
scales	sc.	subangular	sbang.
scarce	scs.	subhedral	sbhed.
scattered	scat.	subrounded	sbrd.
schist	sch.	sucrose	suc.
scolecodonts	Scol.	Sulphur	S
secondary	sec.	surface	surf.



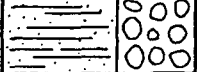
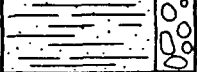

tabular	tab.
temperature	T.
texture	tex.
thick	thk.
thin	thn.
throughout	thru.
tight, tightly	tt.
trace	tr'
translucent	trnsl.
transparent	trnsp.
trilobite	Trilo.
tripoli, tripolitic	trip.
tubular	tub.
tuffaceous	tuf.
unconformity	unconf.
unconsolidated	uncons.
unidentified	unident.
upper	up.
variable	var.
varicolored	vcol.
varigated	vgt.
varved	vrvd.
vegetation	veg.
vein	vn.
vertebrate	vrtb.
very	v.
vesicular	ves.
vitreous	vit.
volcanics	volc.
vug, vuggy, vugular	vug.
water	wtr.
wavy	wvy.
waxy	wxy.
weather, weathered	wthr., wthrd.
well	w.
white	wh.
with	w/
xenolith	xen.
yellow	yel.
zone	zn.

Depth	Lithology	Description
		Slt., sdy.; & Gvl. (1-2cm), ang.-rd.; clasts = mixed aphan. rk. & cht.
		Gvl., as above; & Cly., sdy., calich.
50'		Gvl. (0.5-1.5cm), sbang.-sbrd.; clasts = aphan. rk., cht., & brn. f.g. silicif. ss.
		Gvl., cly.; clasts as above + wh. f.g. silicif. rk.
		Cly., sdy.; & Gvl.; clasts as above
100'		Gvl. (1cm), sdy.; clasts as above; & Clay, sdy.
		Cly., sdy.; & Gravel, as above
150'		Cly., as above; & Gvl. (~0.5cm); clasts as above
		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
200'		Cly., as above; & Gvl. (0.5-1cm); clasts = cht., yel. aphan. rk., & brn. f.g. silicif. ss.
		Sd., cly.; & Gvl. (0.2-1.5cm); clasts as above
250'		Slt., cly., pbly.
		Slt., cly.; & Gvl. (0.2-0.6cm), ang.-rd., sdy.; clasts as above
		Gvl., as above; & Sd., cly., slty.
300'		Gvl. (~0.5cm); & Sd., as above
		Slt., cly., sdy.; & Gvl., as above
350'		Slt., as above; & Gvl., as above
		Slt., as above; & Gvl., as above
		Slt., as above; & Gvl., as above
400'		Gvl. (1cm); clasts as above; & Slt., cly., sdy.
		Gvl., as above; & Silt, as above
450'		Slt., as above; & Gvl., as above
		Slt., as above; & Gvl., as above
500'		Slt., as above; & Gvl., as above

Depth	Lithology	Description
		Gvl., sbang.; clasts = bl.-grn. dns. rk.
		Gvl., sdy., cly.; clasts as above
50'		Gvl., sdy.; clasts as above; & Cly., bl. & tan
		Cly., as above; & Sd., sbang.; clasts = bl.-grn. rk.
		Cly., as above; & Sd., as above
100'		Sd., cly., c.g., sbang.; clasts = bl.-grn. rk., lt. aphan. rk. & tr. fib. calc.
		Sd., cly., pbly.; clasts as above
150'		Sd., as above
		Gvl.; clasts = bl.-grn. mot. rk. & lt. buff rk.; & Cly., bl., tan
		Gvl., sdy.; clasts = bl.-grn. rk. & bnd. purp. & blk. rk.; & Cly., bl.
200'		Gvl., as above; & Cly., as above
		Cly., bl. or tan, sdy.; & Gvl. (~0.5cm); clasts as above
250'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
		Gvl., as above; & Cly., sdy.
300'		Gvl., as above; & Cly., as above
		Sd., cly., c.g., ang.; clasts mostly sil. w/bl.-grn. rk. & lt. buff rk.; & Gvl. (0.5-1cm); clasts = sil. & bl.-grn. rk.
350'		Sd., as above; & Gvl., as above
		Sd., as above; & Cly.
		Sd.; clasts = bl.-grn. rk. & sil. in = amounts; & Cly.
400'		Sd., cly.; clasts mostly bl.-grn. rk. w/some sil.
		Sd. (1-4mm), cly., ang.; clasts = 45% bl.-grn. rk., 10% sil., & 45% dk. red-brn. volc. rk.
450'		Sd. (1-3mm); clasts = bl.-grn. rk., sil. & tr. volc. rk.; & Cly., sdy.
		Sd., as above; & Cly., as above
500'		Gvl. (~0.5cm), sdy.; clasts = bl.-grn. rk., sil. & yel. aphan. rk.; & Cly., as above

Depth	Lithology	Description
		Gvl. (0.3-1.5cm), sbrd.; clasts = silicif. rk., cht.; etc.
		Gvl. (0.3-1cm), as above; clasts, as above
50'		Gvl., as above; clasts incl. some clods of slt. & sd.
		Gvl., as above
		Gvl., as above
100'		Gvl. (0.4cm), sbang.-sbrd., cly., sdy.
		Gvl. (0.4cm), sbang.-sbrd., sdy.; & Clay, sdy.
150'		Gvl. (~1cm), sbang.-sbrd.; & Clay, as above
		Gvl. (~1cm); clasts = abnt. gry.-grn. rk., silicif. aphan. rks. & cht. & brn. f.g. silicif. ss.; & Cly., sdy.
		Gvl., cly., clasts, as above
200'		Gvl.; clasts, as above; & Clay, sdy.
		Gvl., cly.; clasts, as above
250'		Gvl.; clasts = silicif. ss., all col. cht., gry., blk., purp., brn. & yel. volc. rks. & tr. cons. slt.; & Cly., sdy.
		Gvl., as above; & Clay, as above
		Gvl., as above; clasts cont. tr. bl.-grn. mot. rk.; & Clay, as above
300'		Gvl., cly., sdy.; clasts, as above
		Gvl., as above
350'		Slt., pbly.
		Slt., as above
		Slt., as above
400'		Slt., as above
		Slt., as above
450'		Slt., as above
		Slt., as above
		Slt., as above
500'		Slt., as above

Note: 340-500' hole making own mud; insignificant amount of returns dropping out of mud.

Depth	Lithology	Description
		Gvl., sbang.-sbrd.; clasts (caliche coated) = 50% bl.-grn. mot. rk., 20% wh. fri. mat., 10% lt. gry. cht. & 20% mixed
		Gvl., as above; & Cly., sdy.
50'		Cly., sdy.; & Gvl.; clasts of bl.-grn. rk. & yel. silicif. rk.
		Cly., as above; & Gvl., as above
		N.S.

Note: Lost circulation at 80'. Moved drill rig 80 yards west to site 5A.

Depth	Lithology	Description
		Gvl., sband., sdy.; clasts mainly mat. of c. sd. in f.g. buff col. mtx., also some bl.-grn. mat.
		Gvl., as above; clasts coated w/caliche
50'		Gvl.; clasts = 50% wh. Fe ²⁺ stn. fri. rk. & 50% bl.-grn. rk. & cht.
		Gvl. cly.; clasts = 75% wh. fri. mat., 10% wh. cht., & 15% mixed comp.
		Gvl.; clasts as above w/some of wh. mat. silicif.; & Cly., wh.
100'		Gvl., as above; & Cly., as above
		Cly., sdy.; & Gvl., as above
150'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
200'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
250'		Gvl. (~0.4cm); clasts = mostly dk. gry. aphan. volc. rk. + some wh. fri. rk. & cht.; & Cly., as above
		Gvl., cly.; clasts as above
		Gvl., as above
300'		Gvl., cly.; clasts mostly silicif. volc. rk. + some clr. qtz.
		Gvl.; clasts as above; & Cly.
350'		Gvl., as above; & Cly.
		Gvl., as above; clasts = blk. aphan. rk., bl.-grn. rk., lt. grn. to brn. silicif. rk. & brn. f.g. silicif. ss.; & Cly., sdy.
		Gvl., as above; & Cly., as above
400'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
450'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
500'		Gvl., clasts = mixed comp. but w/abnt. brn. silicif. ss.; & Cly., bl., sdy.

Depth	Lithology	Description
		Gvl. & Sd., cly.
		Gvl., sdy.; clasts = off-wh. fri. rk., brn. f.g. silicif. ss.; & Cly., sdy., tr. pure wh. cly.
50'		Gvl. (~0.4cm); clasts = wh. fri. rk., wh. v.f.g. ss., brn. f.g. silicif. ss., asstd. cht.; & Cly., sdy. & pure wh.
		Gvl., red, sdy., cly.; clasts as above
		Gvl., sbang.-ang.; clasts as above; & Cly., sdy.
100'		Gvl., ang.; clasts = off-wh. sdy. fri. rk., v.f.g. silicif. ss. & blk. cht.; & Cly., sdy.
		Gvl., ang.; clasts as above; & Clay, sdy.
150'		Cly., sdy. & some pure; & Gvl., as above
		Gvl., as above; & Cly., as above
200'		Cly., sdy.; & Gvl.; clasts = v.f.g. silicif. ss.
		Cly., as above; & Gvl., as above
		Cly., sdy., tr. pure wh.; & Gvl.; clasts = v.f.g. silicif. ss. & yel silicif. volc. rk.
250'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
		Gvl., ang., sdy.; clasts = yel. silicif. volc. rk., v.f.g. gry. sil. ss. & blk. cht.

Note: Lost cones in hole at 282'. Move off hole.

Depth	Lithology	Description
		Gvl., sdy.; clasts = calich. soil & some blk. cht.; & Cly., sdy.
		Gvl., sdy.; clasts caliche coated w/abnt. cht. & silicif. grnst.
50'		Gvl., as above
		Gvl., sbang.-sbrd., sdy., cly.; clasts mostly silicif. rks.
		Gvl., as above
100'		Cly., wh., sdy.; & tr. Gvl.
		Cly., as above
150'		Gvl. (~0.4cm); clasts mostly silicif. rks.; & Sd., red, cly.
		Gvl., as above; & Sd., as above
		Gvl., as above; & Sd., as above
200'		Cly., sdy.; & Gvl. (~1cm); clasts as above
		Cly., as above; & Gvl., as above
250'		Gvl., ang., sdy.; clasts mostly cht.; & Cly., as above
		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
300'		Cly., bl., sdy.; & Gvl.; clasts cht.-rich
		Cly., wh., olv. grn. or deep red-brn., pure & sdy.; & Gvl., as above
350'		Cly., as above; & Gvl.; clasts = cht. & wh. fri. sdy. mat.
		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
400'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
450'		Gvl., sbang.-ang.; clasts = cht.; & Cly., sdy.
		Gvl.; clasts = cht. & wh. fri. rk.; & Cly., pure & sdy.
500'		Gvl., ang.-sbang.; clasts = cht.; & Cly., wh. or grn., pure & sdy.

Depth	Lithology	Description
		Gvl. (1-2cm), sbang.-sbrd.; clasts calice-coated of brn. to yel. silicif. aphan. rk. & gry. to wh. cht.
		Gvl., as above
50'		Gvl., as above
		Gvl., as above; clasts as above w/wh. fri. mat.
		Gvl., as above; & Sd., c., sbang.
100'		Sd., c.; clasts = cht. & volc. rk.; & Gvl., as above
		Sd., muddy, pbly.; clasts as above
150'		Sd., as above
		Sd., as above
		Sd., c., pbly.; clasts as above
200'		Gvl. (~1cm), ang.; clasts almost all gry. cht.
		Gvl., sdy.; clasts = cht. & volc. rk.; & Cly., sdy.
250'		Sd.; clasts = gry. & wh. cht. & red, brn. & gry. volc. rks.; & Cly., sdy.
		Sd., pbly.; clasts as above; & Cly., as above
		Sd., as above; & Cly., as above
300'		Sd., as above; & Cly., as above
		Gvl.; clasts = yel.-brn. & grn. volc. rk. & cht.; Sd., cly.; clasts = gry. & wh. cht., red, brn. & gry. volc. rks. & f. xln. calc.
350'		Gvl., as above; & Sd., as above
		Gvl., as above; & Sd., as above
		Gvl., sdy.; clasts = yel.-brn. volc. rk. & cht.; & Cly., sdy.
400'		Gvl., cly.; clasts as above
		Sd., c., ang.; clasts as above; & Cly.
450'		N.S.

Depth	Lithology	Description
		Gvl. (0.5-2cm), ang.-sbang.; clasts mostly cht. & cht. brec.
		Gvl., as above; & Cly., red, sdy.
50'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
100'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
150'		Gvl., as above; & Cly., as above
		Gvl. (0.3-2cm), sbang.-ang.; clasts = cht.; & Cly., as above
		Gvl., as above; & Cly., as above
200'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
250'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
300'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
		Gvl., sdy.; clasts = cht. & silicif. volc. rk.; & Cly., as above
350'		Gvl., as above; & Cly., as above
		Gvl., sdy., cly.
		Sd. (1-4mm), ang.; clasts = cht.; & Gvl., sdy.
400'		Sd., as above
		Sd., as above
		Sd., as above
450'		Sd., f.g.; clasts = cht.
		Sd., as above
		Sd., as above
500'		Sd., as above

Depth	Lithology	Description
		Gvl. (0.1-1cm), sbang.; clasts = blk., red, grn., bl. & gry. cht., & brn. & yel. volc. rk.
		Gvl. (0.4-2cm), sbang.-sbrd.; & Cly., brn., slty.
50'		Gvl.; clasts mostly cht. w/silicif. volc. rks. & brn. f.g. silicif. ss.; & Cly., as above
		Gvl., cly.; clasts as above
100'		Gvl., sbang.-ang.; clasts mostly cht.
		Gvl., slty.
		Gvl., cly.
150'		Gvl., sdy.; clasts mostly cht.
		Gvl., sdy., cly.
		Gvl., as above
200'		Gvl. (0.4-0.5cm), ang.; clasts = cht.
		Gvl., cly.
250'		Sd. (1-4mm), pbly., sbang.-ang.; clasts = cht.; & Gvl., sdy.
		Gvl., sdy., cly.; clasts = cht. & mot. brn. aphan. or f.g. rk.
		Gvl., sdy.; clasts as above
300'		Gvl., sdy.; clasts = cht. & asstd. types
		Gvl.; clasts = 25% cht. + yel., brn., gry. & blk. aphan. rk.
350'		Gvl., sdy.; clasts as above
		Gvl., sdy.; clasts = 20% fri. f.g. wh. rk. + cht. & volc. rks.
400'		Sd., c.; clasts = 50% fri. mat. & 50% cht.-rich rks.
		Sd., as above
		Gvl., cly.; clasts = cht. & volc. rk.
450'		Gvl., cly.; clasts = cht., volc. rks. & wh. fri. mat.
		Gvl., as above
500'		Gvl.; clasts as above

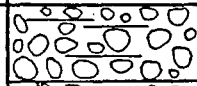


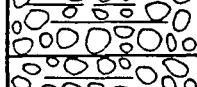
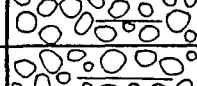
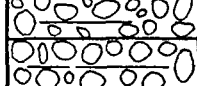
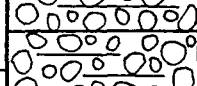
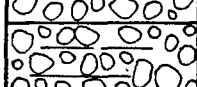
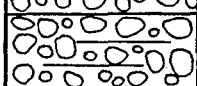
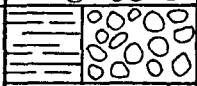
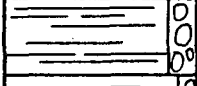
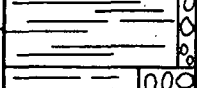





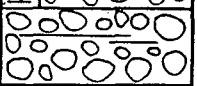

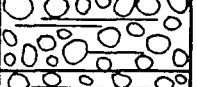
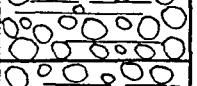
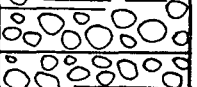
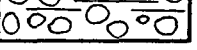

Depth	Lithology	Description
		Sd., c.g., cly., ang.; clasts = gry. cht. & yel. volc. rk.
		Gvl. (0.3-1.5cm), ang.-sbang.; clasts as above
50'		Gvl., as above
		Gvl., as above
100'		Gvl., as above
		Slt., gvly.
		Slt., as above
150'		Slt., as above
		Slt., as above
200'		Slt., as above
		Cly., sdy.; & Gvl. (~0.5cm); clasts = cht. & volc. rk.
		Cly., as above; & Gvl., as above
250'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
300'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
350'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
400'		Cly., as above; & Gvl., as above
		Gvl., sbrd.; clasts mostly cht. & volc. rk.
		Gvl., as above
450'		Gvl., as above; & Cly., sdy.
		Gvl., as above; & Cly., as above
500'		Gvl., as above; & Cly., as above

Note: 100-200' almost no returns, but hole making its own mud.

Depth	Lithology	Description
		Gvl., f., ang.; clasts of olv. grn., gry. & blk. cht., & of yel., brn. & gry. silicif. volc. rks.
		Gvl., cly.; clasts as above
50'		Gvl., as above
		Gvl. (1-1.5cm), cly.; clasts as above
100'		Gvl. (0.4-1.2cm), sdy.; clasts as above
		Gvl., as above
		Gvl. (0.3-0.5cm), sbang.-ang.; clasts are heterog. w/some f.g. silicif. ss. & grn. chal.
150'		Gvl., sdy.; clasts as above
		Cly., sdy.; & Gvl.; clasts as above
		Cly., as above; & Gvl. (~0.4cm); clasts as above
200'		Cly., as above; & Gvl. (0.4-1cm), sbang.-ang.; clasts as above
		Cly., as above; & Gvl., as above
250'		Gvl., as above; & Cly., sdy.
		Gvl. (~1cm); clasts as above; & Cly., sdy.
		Gvl., cly.; clasts as above
300'		Gvl.; clasts as above; Cly., sdy.
		Gvl. (0.5-1.5cm), cly.; clasts = cht., volc. rk. & brn. silicif. ss.
350'		Gvl. (~1cm), sdy., cly.; clasts as above
		Gvl., as above
		Gvl., as above
400'		Gvl. (1-1.5cm), ang-sbang.; clasts as above
		Gvl., sdy.; clasts as above
450'		Gvl. (1-1.5cm), sbang.-sbrd., cly., sdy.; clasts as above
		Gvl. (1cm); clasts as above

Note: 400-480' no clay in returns but mud thick

Depth	Lithology	Description
		Gvl. (1-3.5cm), sbang.-sbrd.; clasts = aphan. or v.f.g. rks. & cht.
		Gvl., as above; clasts coated w/orng. Fe-ox.
50'		Sd. (1-3mm); & Gvl., as above
		Gvl. cly. sdy.; clasts as above
100'		Gvl., cly.; clasts as above
		Gvl. (0.3-0.5cm), sdy., cly.; clasts mixed, incl. gry., red & blk. cht. & yel. & brn. aphan. rks.
		Gvl., as above
150'		Gvl., as above
		Gvl., sdy.; clasts as above
		Gvl., as above
200'		Gvl. (~1cm), sdy., cly.; clasts as above
		Gvl. (0.3-1.5cm); clasts as above; & Cly., sdy.
250'		Gvl. (0.8-1.5cm), ang.-sbang.; clasts as above; & Cly., as above
		Gvl. (1-2cm), ang.-sbrd.; clasts cht.-rich; & Cly., as above
		Gvl., as above; & Cly., as above
300'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
350'		Cly., sdy., pbly.
		Cly., as above
400'		Gvl. (~1cm); clasts = bl.-grn. mot. rk., blk. or red bas., milky qtz. & yel. & brn. aphan. rks.; & Cly., sdy.
		Gvl., cly.; clasts as above
		Gvl., sdy., cly.; clasts as above
450'		Gvl. (0.5-0.7cm), sdy.; clasts as above; & Cly., sdy.
		Gvl., as above; & Cly., as above
500'		Gvl., as above; & Cly., as above

Depth	Lithology	Description
		Gvl. (1-3cm), cly.; clasts = cht., silicif. volc. rk. & f.g. silicif. ss.
		Gvl.; clasts as above; & Cly., sdy.
50'		Gvl., as above; & Cly., as above
		Gvl., cly.; clasts as above
		Gvl., as above
100'		Gvl., as above
		Gvl., as above
150'		Gvl., as above
		Gvl., as above
200'		Gvl., as above
		Gvl.; clasts as above; & Cly., brn.
		Cly., as above; & Gvl., as above
250'		Cly., as above; & Gvl., as above
		Cly., as above; & Gvl., as above
300'		Gvl. (\approx1cm), sbang.; clasts mostly cht.
		Gvl. (0.5-2cm), cly., sbang.-ang.; clasts cht.-rich
		Gvl.; clasts as above; & Cly., sdy.
350'		Gvl., as above; & Cly., as above
		Gvl., as above; & Cly., as above
400'		Gvl. (0.5-2cm), cly.; clasts as above
		Gvl., as above
		Gvl., as above
450'		Gvl., as above
		Gvl., as above
500'		Gvl., as above

JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

APPENDIX B.

Lithologic logs of intermediate-depth (360-457. m)
temperature-gradient holes.

JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

APPENDIX C.

Temperature logs of shallow (85-152 m)
temperature-gradient holes.

TEMPERATURE LOG

S-GV-79-2

T. 32 N., R. 38 E., SE 1/4 of NE 1/4, Sec. 26

7/18/79 6:05 AM

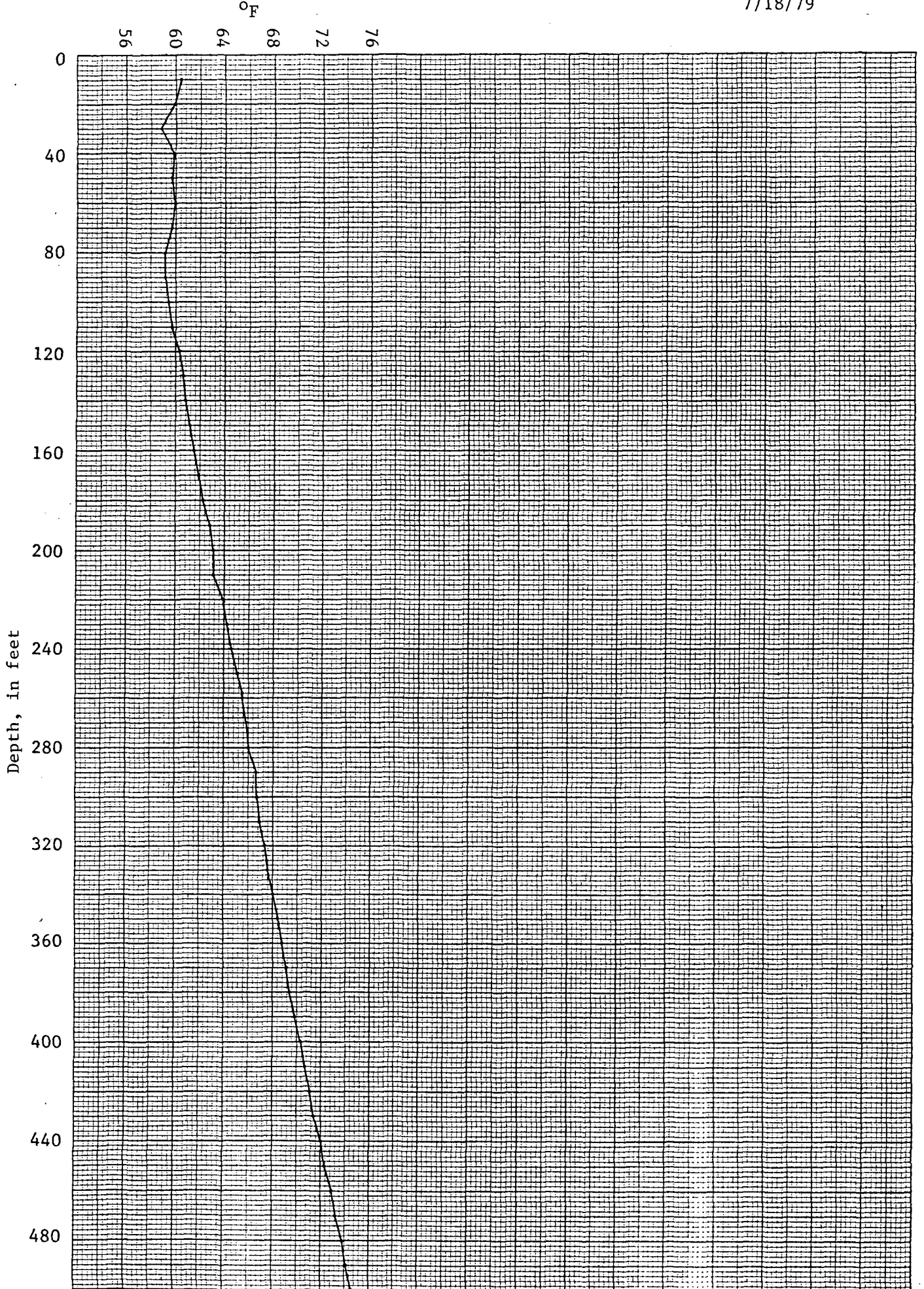
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	60.4	15.8	260	65.5	18.6
20	59.9	15.5	270	65.8	18.8
30	58.8	14.9	280	66.0	18.9
40	59.9	15.5	290	66.6	19.2
50	59.7	15.4	300	66.7	19.3
60	59.9	15.5	310	66.9	19.4
70	59.7	15.4	320	67.3	19.6
80	59.2	15.1	330	67.6	19.8
90	59.2	15.1	340	68.0	20.0
100	59.4	15.2	350	68.4	20.2
110	59.7	15.4	360	68.7	20.4
120	60.3	15.7	370	69.1	20.6
130	60.6	15.9	380	69.4	20.8
140	60.8	16.0	390	69.8	21.0
150	61.2	16.2	400	70.3	21.3
160	61.5	16.4	410	70.7	21.5
170	61.9	16.6	420	71.1	21.7
180	62.2	16.8	430	71.4	21.9
190	62.8	17.1	440	72.0	22.2
200	63.1	17.3	450	72.3	22.4
210	63.1	17.3	460	72.9	22.7
220	63.9	17.7	470	73.2	22.9
230	64.2	17.9	480	73.8	23.2
240	64.6	18.1	490	74.1	23.4
250	65.1	18.4	500	74.5	23.6

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-2

7/18/79



TEMPERATURE LOG

S-GV-79-2

T. 32 N., R. 38 E., SE 1/4 of NE 1/4, Sec. 26

8/4/79 4:45 PM

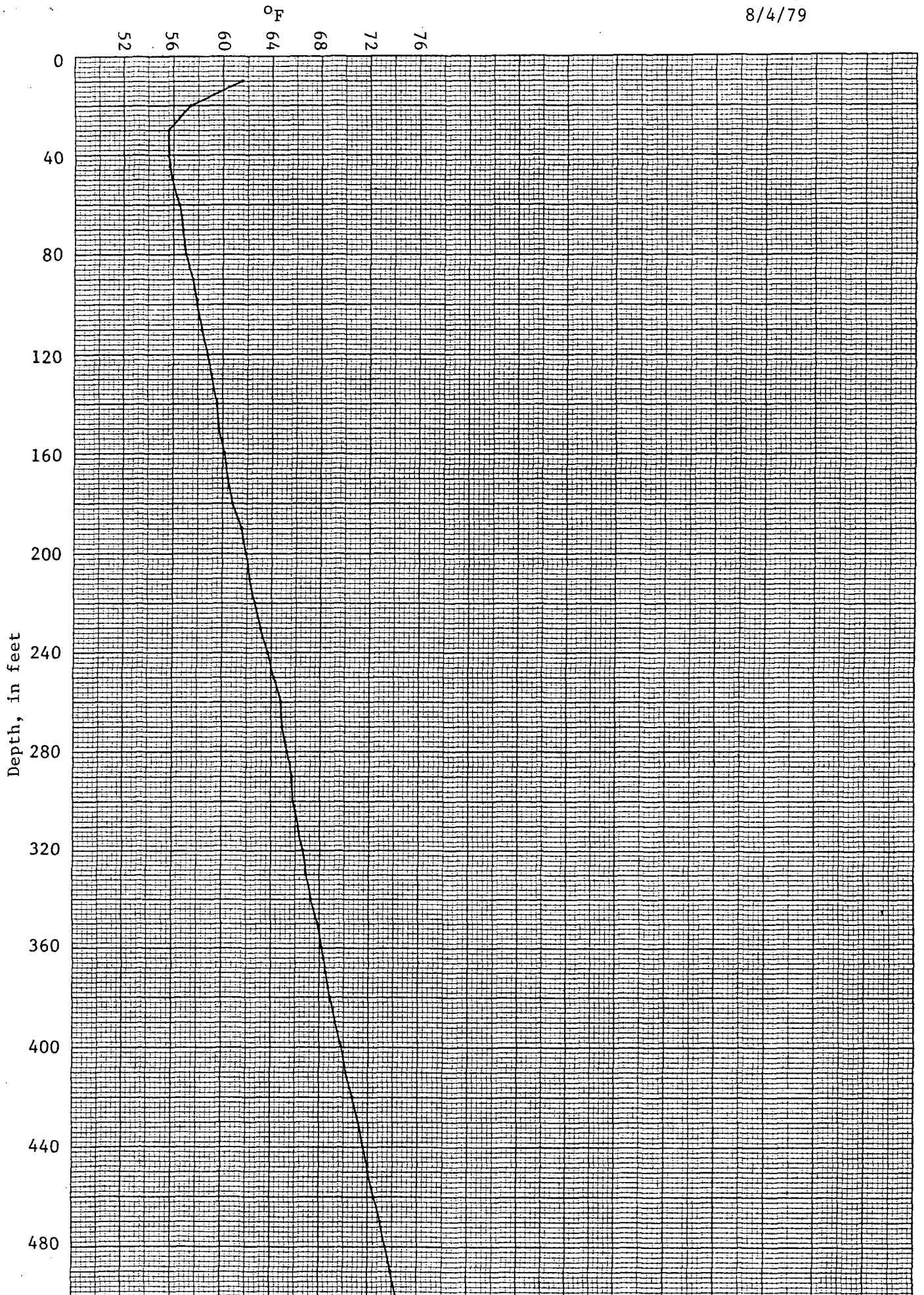
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	61.5	16.4	260	64.8	18.2
20	57.4	14.1	270	64.9	18.3
30	55.6	13.1	280	65.3	18.5
40	55.6	13.1	290	65.7	18.7
50	55.9	13.3	300	65.8	18.8
60	56.5	13.6	310	66.2	19.0
70	56.8	13.8	320	66.6	19.2
80	57.0	13.9	330	66.9	19.4
90	57.6	14.2	340	67.3	19.6
100	57.9	14.4	350	67.8	19.9
110	58.3	14.6	360	68.2	20.1
120	58.8	14.9	370	68.5	20.3
130	59.2	15.1	380	68.9	20.5
140	59.5	15.3	390	69.3	20.7
150	59.7	15.4	400	69.8	21.0
160	60.1	15.6	410	70.2	21.2
170	60.4	15.8	420	70.7	21.5
180	60.8	16.0	430	71.2	21.8
190	61.5	16.4	440	71.6	22.0
200	61.9	16.6	450	72.0	22.2
210	62.2	16.8	460	72.5	22.5
220	62.6	17.0	470	73.0	22.8
230	63.1	17.3	480	73.4	23.0
240	63.7	17.6	490	73.9	23.3
250	64.2	17.9	500	74.3	23.5

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-2

8/4/79



TEMPERATURE LOG

S-GV-79-2

T. 32 N., R. 38 E., SE 1/4 of NE 1/4, Sec. 26

9/30/79 2:30 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	61.7	16.5
98	59.5	15.3
131	60.8	16.0
164	61.9	16.6
197	63.3	17.4
230	64.8	18.2
246	65.7	18.7
262	66.4	19.1
279	66.7	19.3
295	67.3	19.6
312	67.8	19.9
328	68.0	20.0
344	69.1	20.6
361	69.6	20.9
377	70.3	21.3
394	71.1	21.7
410	71.8	22.1
427	72.5	22.5
443	73.2	22.9
459	73.9	23.3
475	74.7	23.7
492	75.4	24.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-2
9/30/79

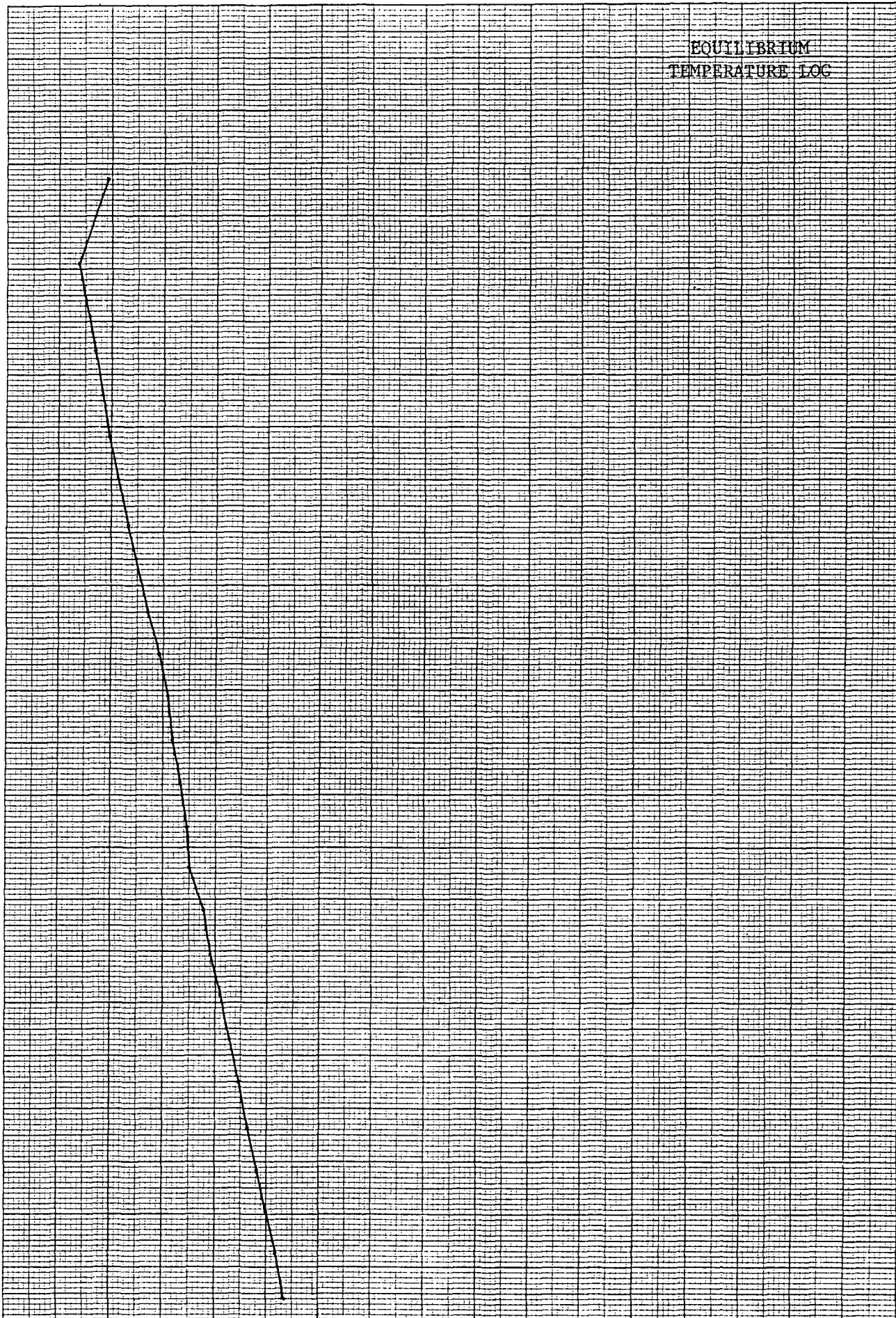
°F

58 62 66 70 74 78

EQUILIBRIUM
TEMPERATURE LOG

Depth, in feet

0
40
80
120
160
200
240
280
320
360
400
440
480



TEMPERATURE LOG

S-GV-79-3

T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 29

6/20/79 11:43 AM

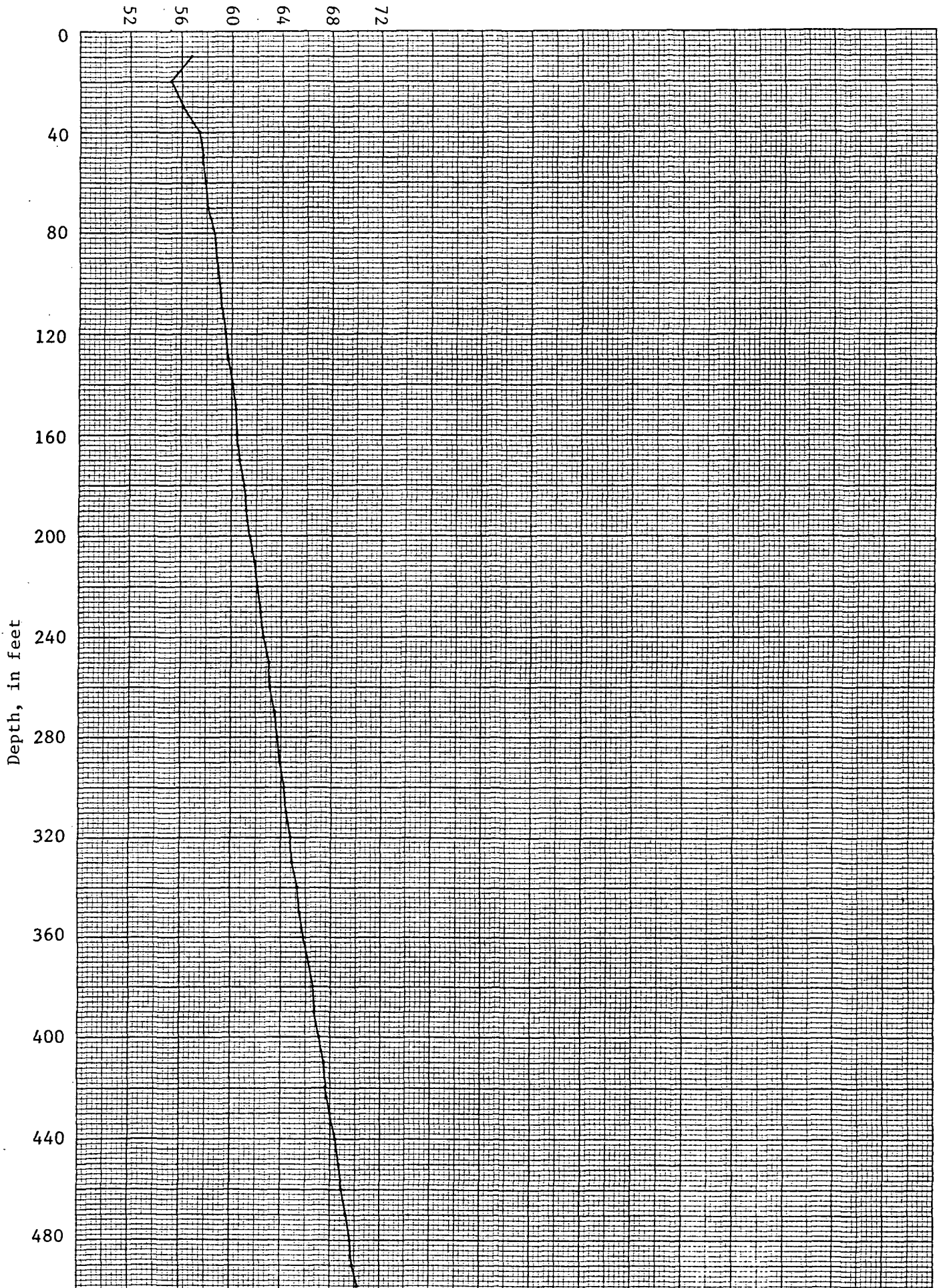
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	56.8	13.8	260	63.1	17.3
20	55.2	12.9	270	63.5	17.5
30	56.1	13.4	280	63.7	17.6
40	57.4	14.1	290	63.9	17.7
50	57.7	14.3	300	64.2	17.9
60	57.9	14.4	310	64.4	18.0
70	58.1	14.5	320	64.8	18.2
80	58.6	14.8	330	64.9	18.3
90	58.8	14.9	340	65.3	18.5
100	59.0	15.0	350	65.5	18.6
110	59.2	15.1	360	65.8	18.8
120	59.5	15.3	370	66.2	19.0
130	59.7	15.4	380	66.6	19.2
140	60.1	15.6	390	66.7	19.3
150	60.3	15.7	400	67.1	19.5
160	60.4	15.8	410	67.5	19.7
170	60.6	15.9	420	67.6	19.8
180	61.0	16.1	430	68.0	20.0
190	61.2	16.2	440	68.4	20.2
200	61.5	16.4	450	68.7	20.4
210	61.9	16.6	460	68.9	20.5
220	62.1	16.7	470	69.3	20.7
230	62.4	16.9	480	69.6	20.9
240	62.6	17.0	490	69.8	21.0
250	63.0	17.2	498	70.2	21.2

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-3
6/20/79

°F



TEMPERATURE LOG

S-GV-79-3

T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 29

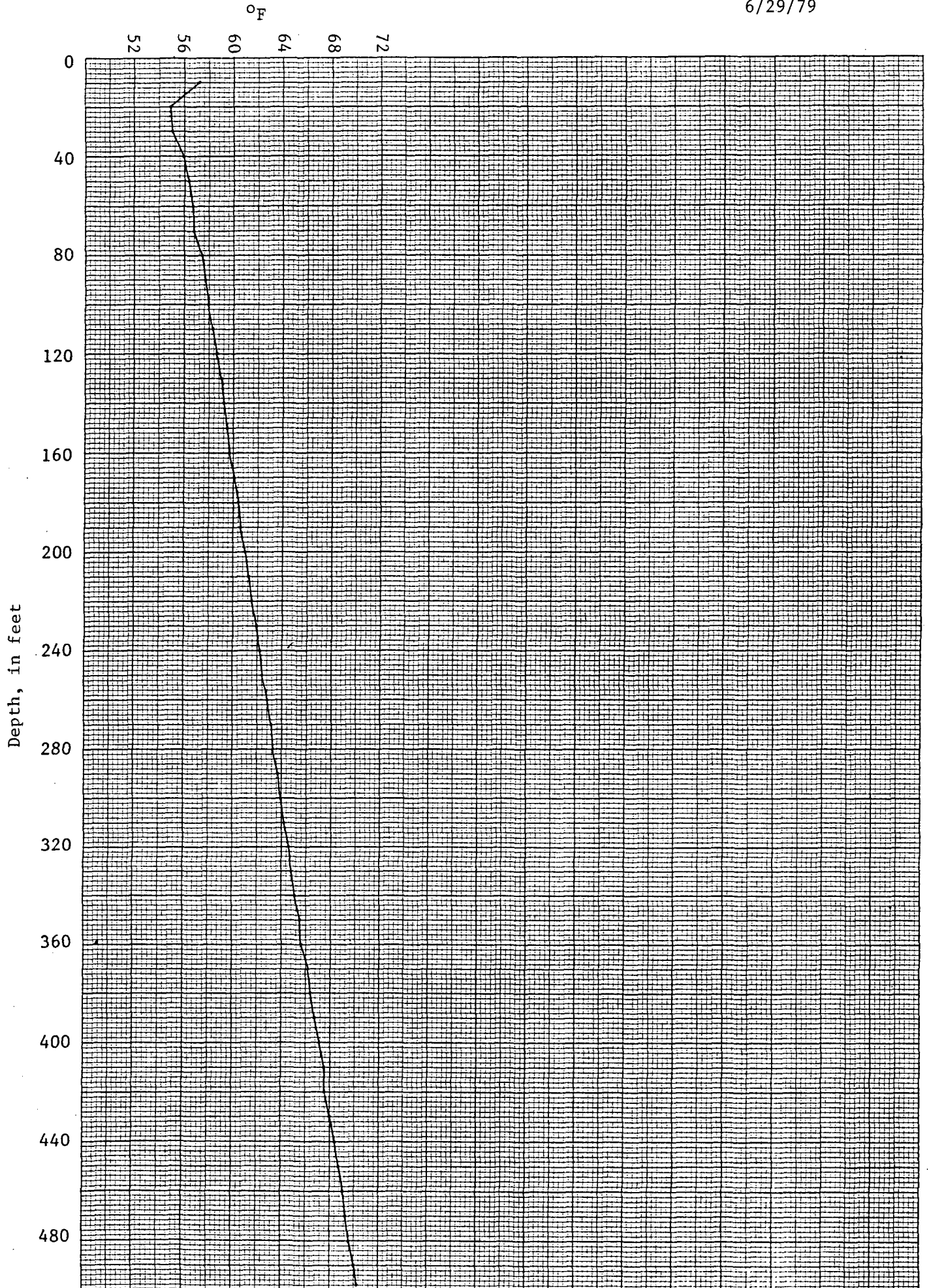
6/29/79 9:34 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	57.2	14.0	260	62.8	17.1
20	54.9	12.7	270	63.1	17.3
30	55.0	12.8	280	63.3	17.4
40	55.9	13.3	290	63.7	17.6
50	56.3	13.5	300	63.9	17.7
60	56.7	13.7	310	64.2	17.9
70	56.8	13.8	320	64.6	18.1
80	57.4	14.1	330	64.8	18.2
90	57.7	14.3	340	65.1	18.4
100	57.9	14.4	350	65.5	18.6
110	58.3	14.6	360	65.8	18.8
120	58.6	14.8	370	66.2	19.0
130	59.0	15.0	380	66.4	19.1
140	59.2	15.1	390	66.7	19.3
150	59.5	15.3	400	67.1	19.5
160	59.7	15.4	410	67.5	19.7
170	60.1	15.6	420	67.6	19.8
180	60.4	15.8	430	68.0	20.0
190	60.6	15.9	440	68.4	20.2
200	61.0	16.1	450	68.7	20.4
210	61.3	16.3	460	69.1	20.6
220	61.5	16.4	470	69.3	20.7
230	61.9	16.6	480	69.6	20.9
240	62.2	16.8	490	70.0	21.1
250	62.4	16.9	498	70.2	21.2

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-3
6/29/79



TEMPERATURE LOG

S-GV-79-3

T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 29

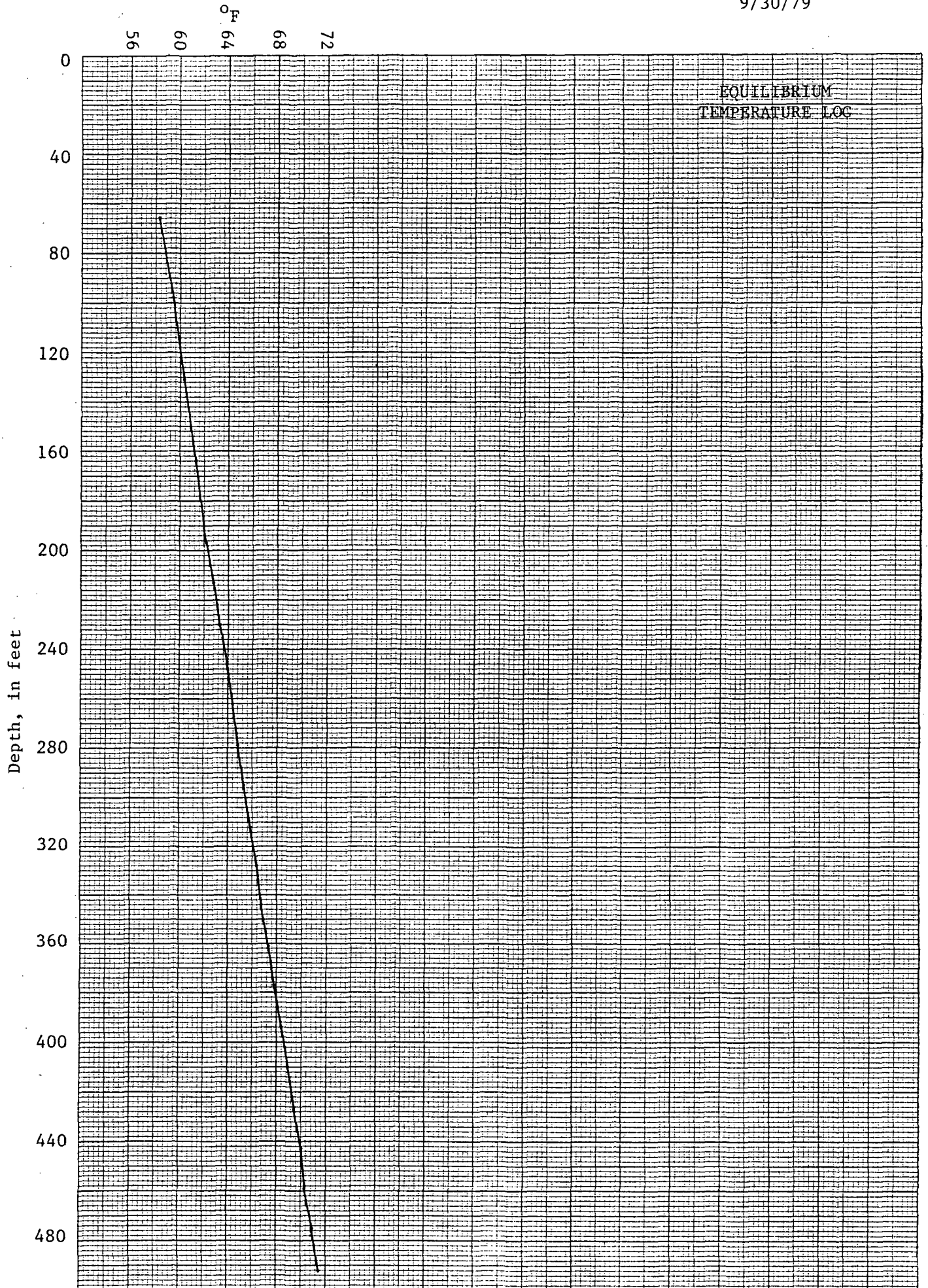
9/30/79 1:30 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	58.3	14.6
98	59.4	15.2
131	60.3	15.7
164	61.3	16.3
197	62.2	16.8
213	62.8	17.1
230	63.3	17.4
246	63.9	17.7
262	64.4	18.0
279	64.8	18.2
295	65.3	18.5
312	65.8	18.8
328	66.4	19.1
344	66.7	19.3
361	67.3	19.6
377	67.8	19.9
394	68.4	20.2
410	68.9	20.5
427	69.4	20.8
443	70.0	21.1
459	70.3	21.3
475	70.9	21.6
492	71.4	21.9

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-3
9/30/79



TEMPERATURE LOG

S-GV-79-4

T. 32 N., R. 38 E., SE 1/4 of SW 1/4. Sec. 35

7/20/79 6:24 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	56.3	13.5	260	59.9	15.5
20	54.5	12.5	270	60.1	15.6
30	54.1	12.3	280	60.4	15.8
40	55.0	12.8	290	60.6	15.9
50	55.2	12.9	300	60.8	16.0
60	55.6	13.1	310	61.2	16.2
70	55.6	13.1	320	61.5	16.4
80	55.6	13.1	330	61.9	16.6
90	55.6	13.1	340	62.1	16.7
100	55.9	13.3	350	62.6	17.0
110	56.1	13.4	360	63.0	17.2
120	56.3	13.5	370	63.1	17.3
130	56.8	13.8	380	63.5	17.5
140	56.8	13.8	390	64.0	17.8
150	57.2	14.0	400	64.4	18.0
160	57.2	14.0	410	64.8	18.2
170	57.6	14.2	420	65.1	18.4
180	57.7	14.3	430	65.5	18.6
190	58.1	14.5	440	65.8	18.8
200	58.3	14.6	450	66.2	19.0
210	58.6	14.8	460	66.7	19.3
220	58.8	14.9	470	67.1	19.5
230	59.0	15.0	480	67.5	19.7
240	59.4	15.2	490	67.8	19.9
250	59.5	15.3	500	68.2	20.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-4

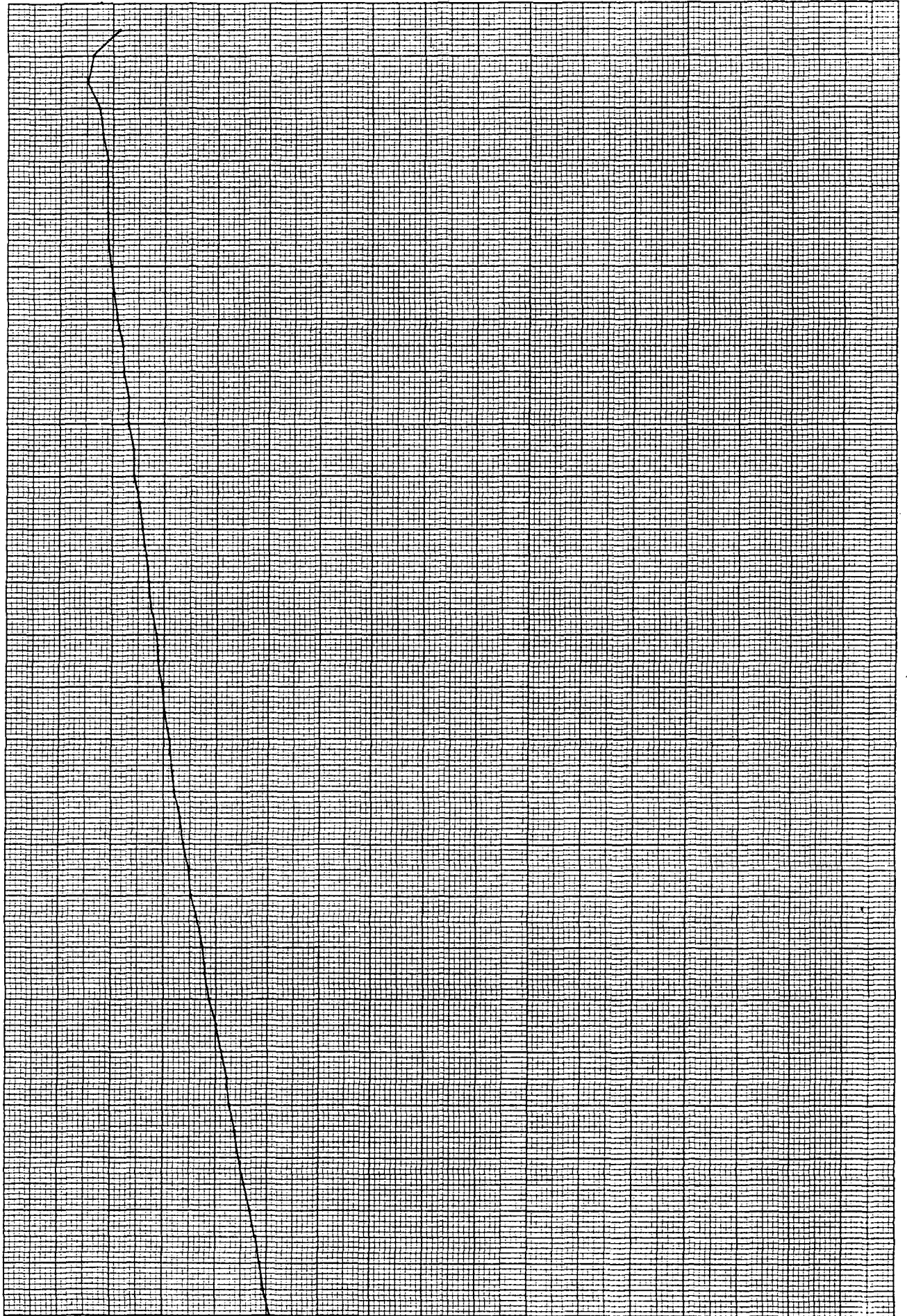
7/20/79

°F

52 56 60 64 68 72

Depth, in feet

0
40
80
120
160
200
240
280
320
360
400
440
480



TEMPERATURE LOG

S-GV-79-4

T. 32 N., R. 38 E., SE 1/4 of SW 1/4, Sec. 35

8/3/79 5:20 PM

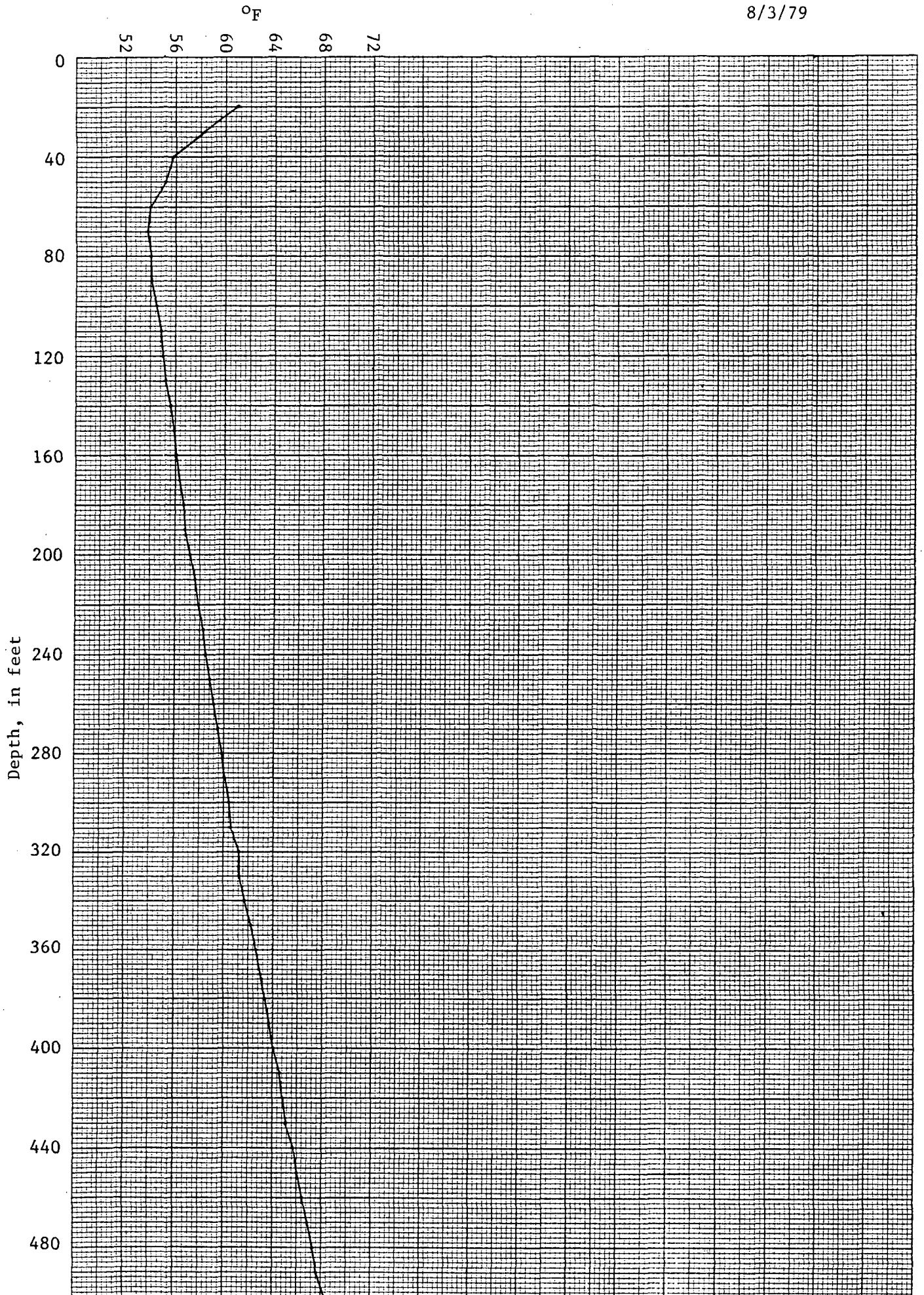
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	69.3	20.7	260	59.2	15.1
20	61.0	16.1	270	59.5	15.3
30	58.3	14.6	280	59.9	15.5
40	55.8	13.2	290	60.1	15.6
50	55.2	12.9	300	60.4	15.8
60	54.0	12.2	310	60.6	15.9
70	53.8	12.1	320	61.2	16.2
80	54.0	12.2	330	61.3	16.3
90	54.1	12.3	340	61.7	16.5
100	54.5	12.5	350	62.2	16.8
110	54.9	12.7	360	62.6	17.0
120	55.0	12.8	370	63.0	17.2
130	55.2	12.9	380	63.3	17.4
140	55.6	13.1	390	63.7	17.6
150	55.9	13.3	400	64.0	17.8
160	56.1	13.4	410	64.6	18.1
170	56.3	13.5	420	64.8	18.2
180	56.7	13.7	430	65.1	18.4
190	56.8	13.8	440	65.7	18.7
200	57.2	14.0	450	66.0	18.9
210	57.6	14.2	460	66.4	19.1
220	57.9	14.4	470	66.9	19.4
230	58.3	14.6	480	67.3	19.6
240	58.5	14.7	490	67.6	19.8
250	58.8	14.9	500	68.2	20.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-4

8/3/79



TEMPERATURE LOG

S-GV-79-4

T. 32 N., R. 38 E., SE 1/4 of SW 1/4, Sec. 35

9/30/79 3:30 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	60.1	15.6
98	56.1	13.4
131	57.0	13.9
164	57.9	14.4
197	58.8	14.9
230	59.9	15.5
262	61.0	16.1
295	62.1	16.7
328	63.0	17.2
344	63.7	17.6
361	64.2	17.9
377	64.9	18.3
394	65.5	18.6
410	66.0	18.9
427	66.7	19.3
443	67.5	19.7
459	68.0	20.0
475	68.7	20.4
492	69.4	20.8

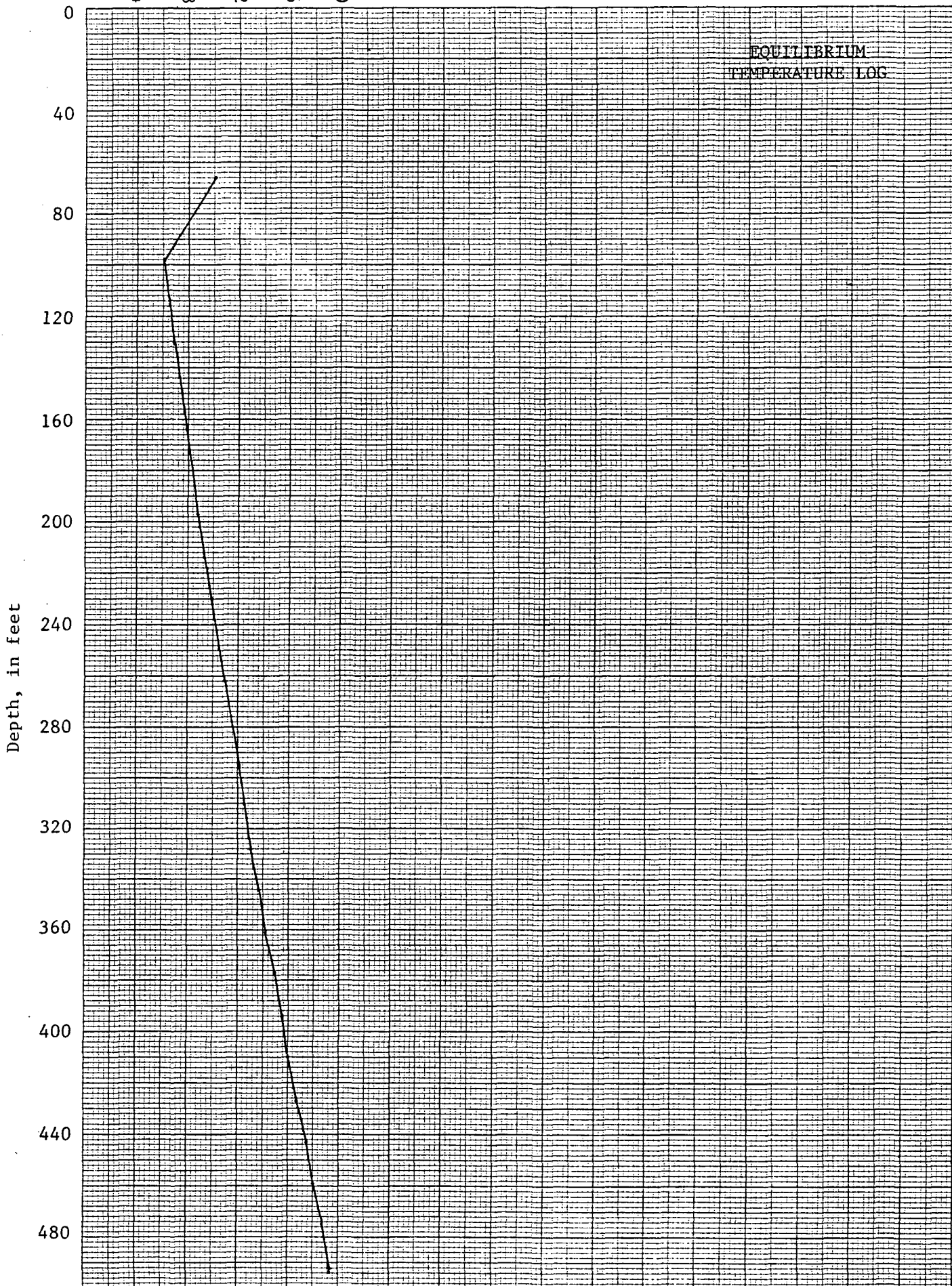
TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-4

9/30/79

°F

54 58 62 66 70



TEMPERATURE LOG

S-GV-79-5

T. 32 N., R. 39 E., SE 1/4 of NW 1/4, Sec. 32

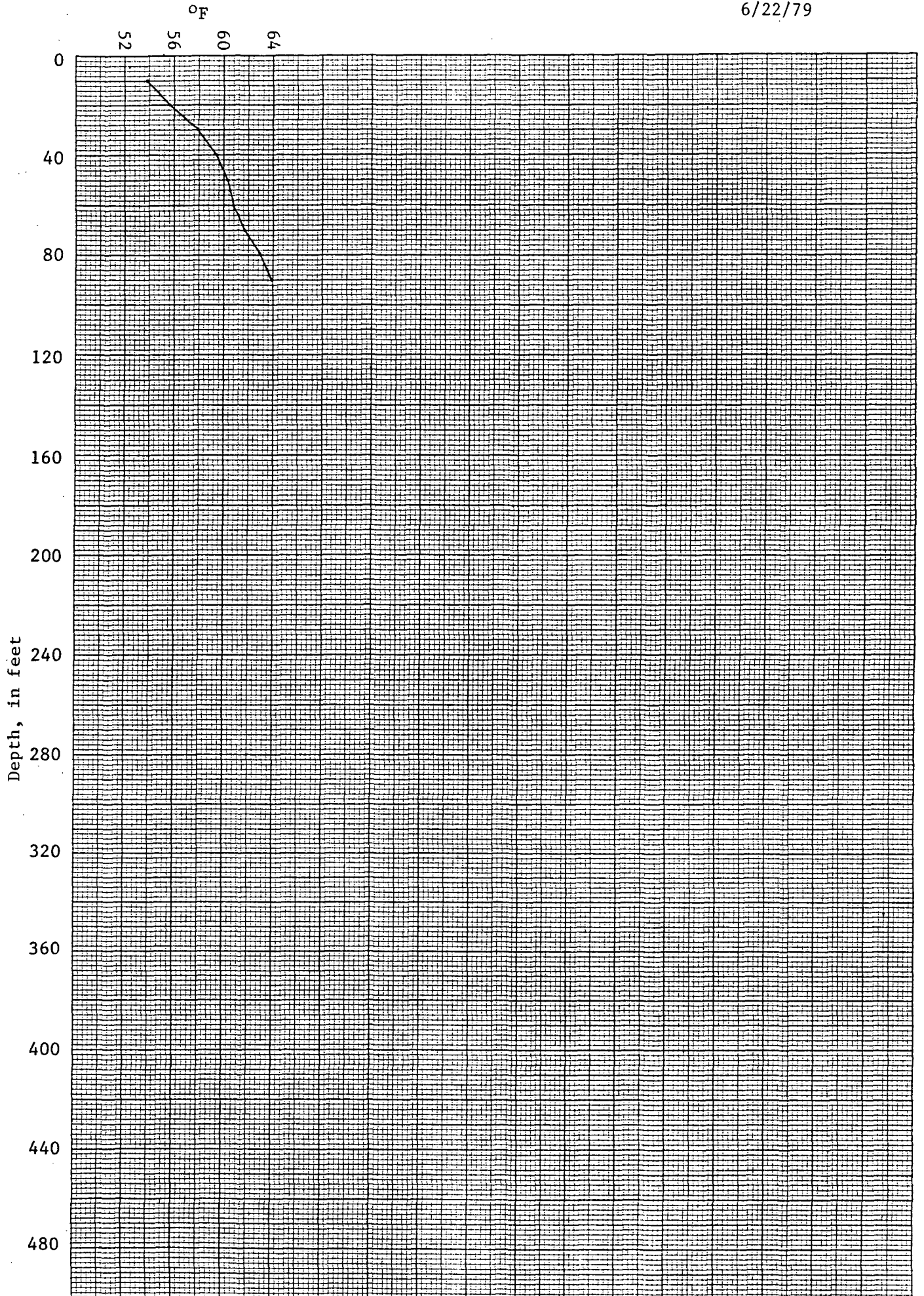
6/22/79 4:16 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	53.8	12.1
20	55.6	13.1
30	57.9	14.4
40	59.4	15.2
50	60.3	15.7
60	60.8	16.0
70	61.7	16.5
80	63.0	17.2
90	63.9	17.7

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-5
6/22/79



TEMPERATURE LOG

S-GV-79-5

T. 32 N., R. 39 E., SE 1/4 of NW 1/4, Sec. 32

6/30/79 2:03 PM

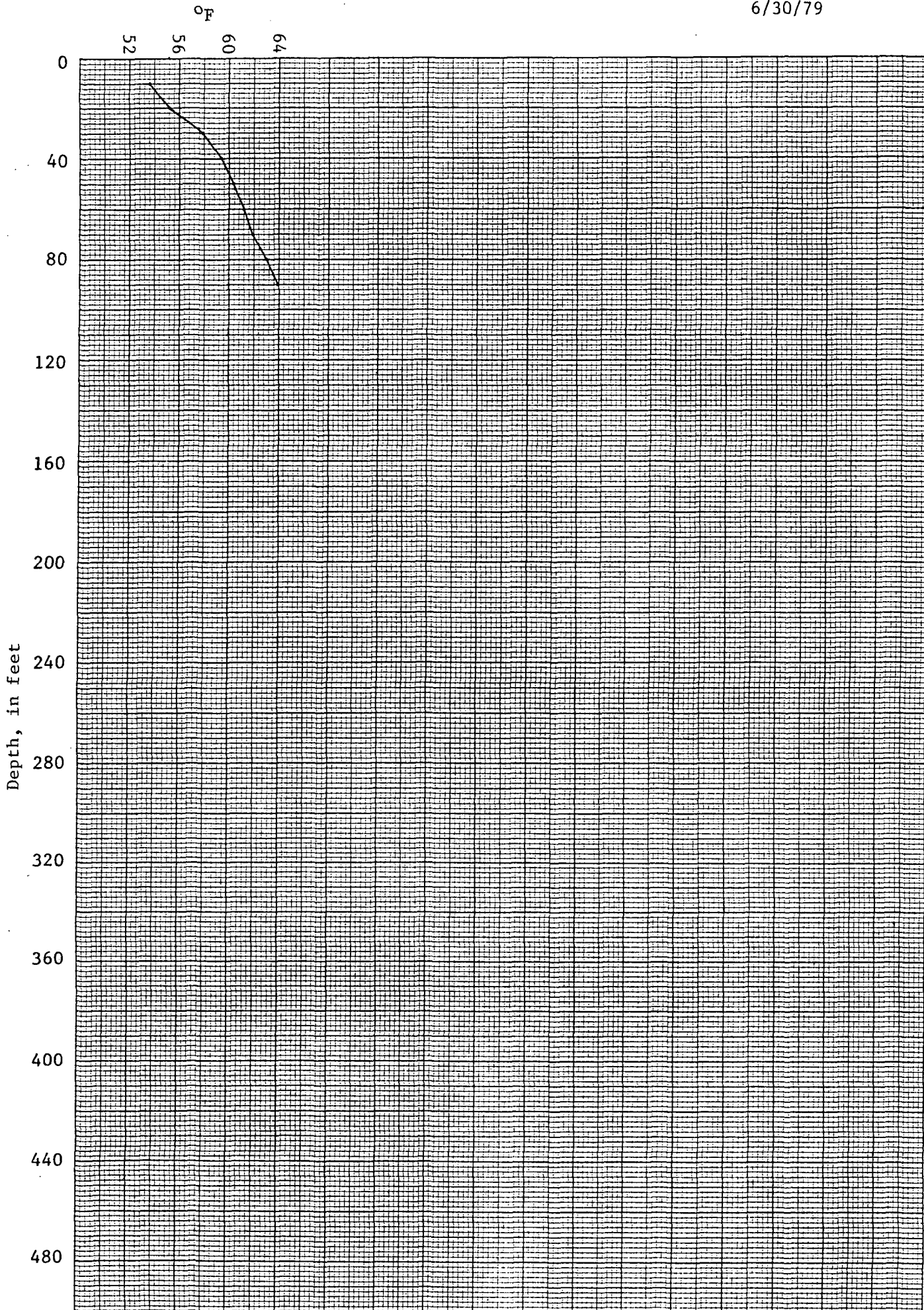
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	53.6	12.0
20	55.2	12.9
30	57.9	14.4
40	59.4	15.2
50	60.3	15.7
60	61.2	16.2
70	61.9	16.6
80	63.0	17.2
90	63.9	17.7

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-5

6/30/79



TEMPERATURE LOG

S-GV-79-5A

T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 32

6/22/79 2:30 PM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	64.8	18.2	260	78.1	25.6
20	63.1	17.3	270	78.6	25.9
30	63.3	17.4	280	79.2	26.2
40	64.8	18.2	290	79.5	26.4
50	64.8	18.2	300	80.2	26.8
60	65.8	18.8	310	80.8	27.1
70	66.6	19.2	320	81.5	27.5
80	66.7	19.3	330	82.0	27.8
90	66.7	19.3	340	82.6	28.1
100	68.0	20.0	350	82.9	28.3
110	68.4	20.2	360	83.7	28.7
120	69.3	20.7	370	84.2	29.0
130	69.9	20.9	380	84.7	29.3
140	70.5	21.4	390	85.3	29.6
150	71.1	21.7	400	85.8	29.9
160	71.8	22.1	410	86.4	30.2
170	72.3	22.4	420	87.1	30.6
180	72.9	22.7	430	87.6	30.9
190	73.6	23.1	440	88.3	31.3
200	74.3	23.5	450	88.9	31.6
210	74.8	23.8	460	89.6	32.0
220	75.6	24.2	470	90.1	32.3
230	76.1	24.5	480	90.9	32.7
240	76.8	24.9	490	91.6	33.1
250	77.5	25.3	498	92.1	33.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

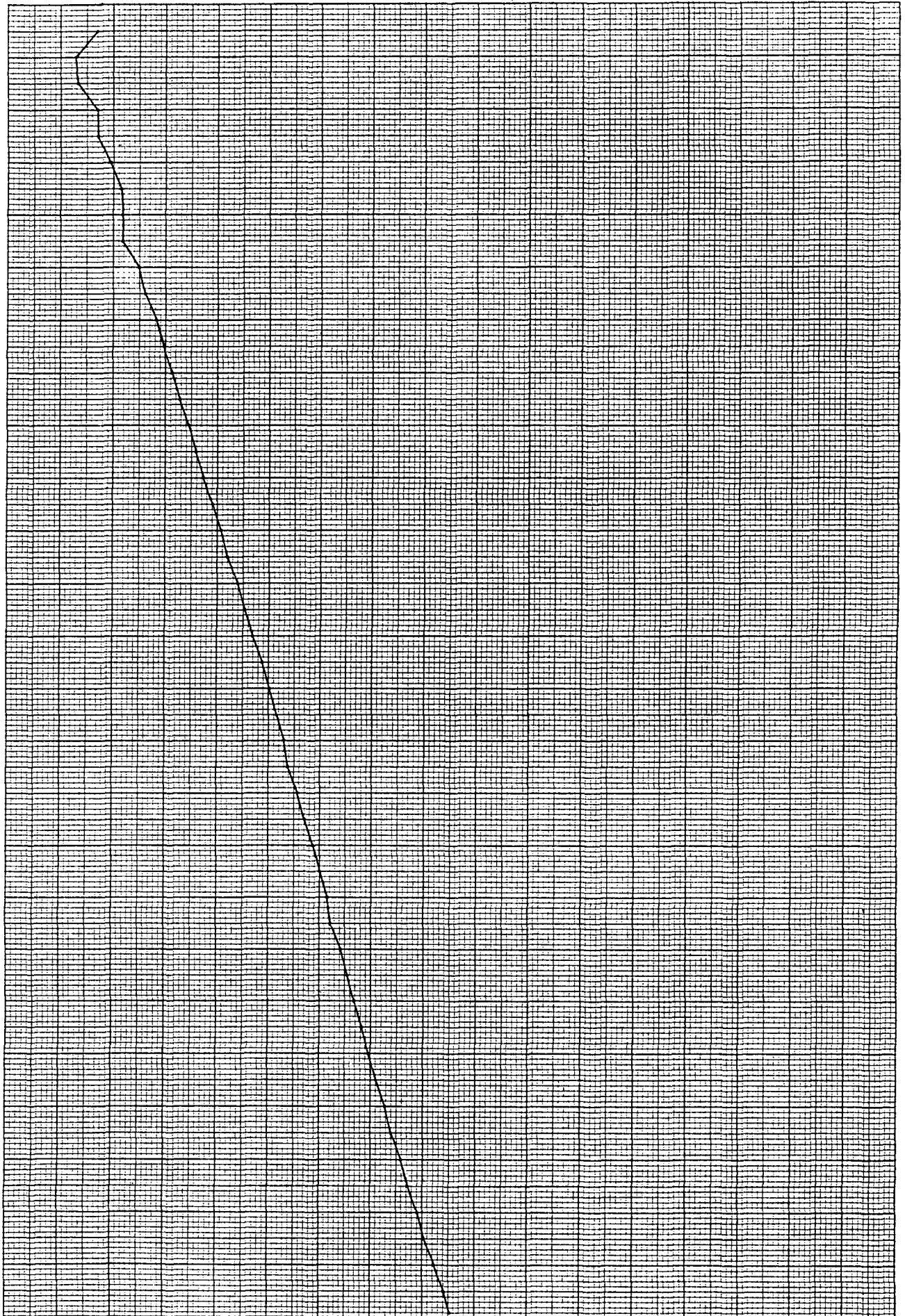
S-GV-79-5A
6/22/79

°F

62 66 70 74 78 82 86 90 94

Depth, in feet

0
40
80
120
160
200
240
280
320
360
400
440
480



TEMPERATURE LOG

S-GV-79-5A

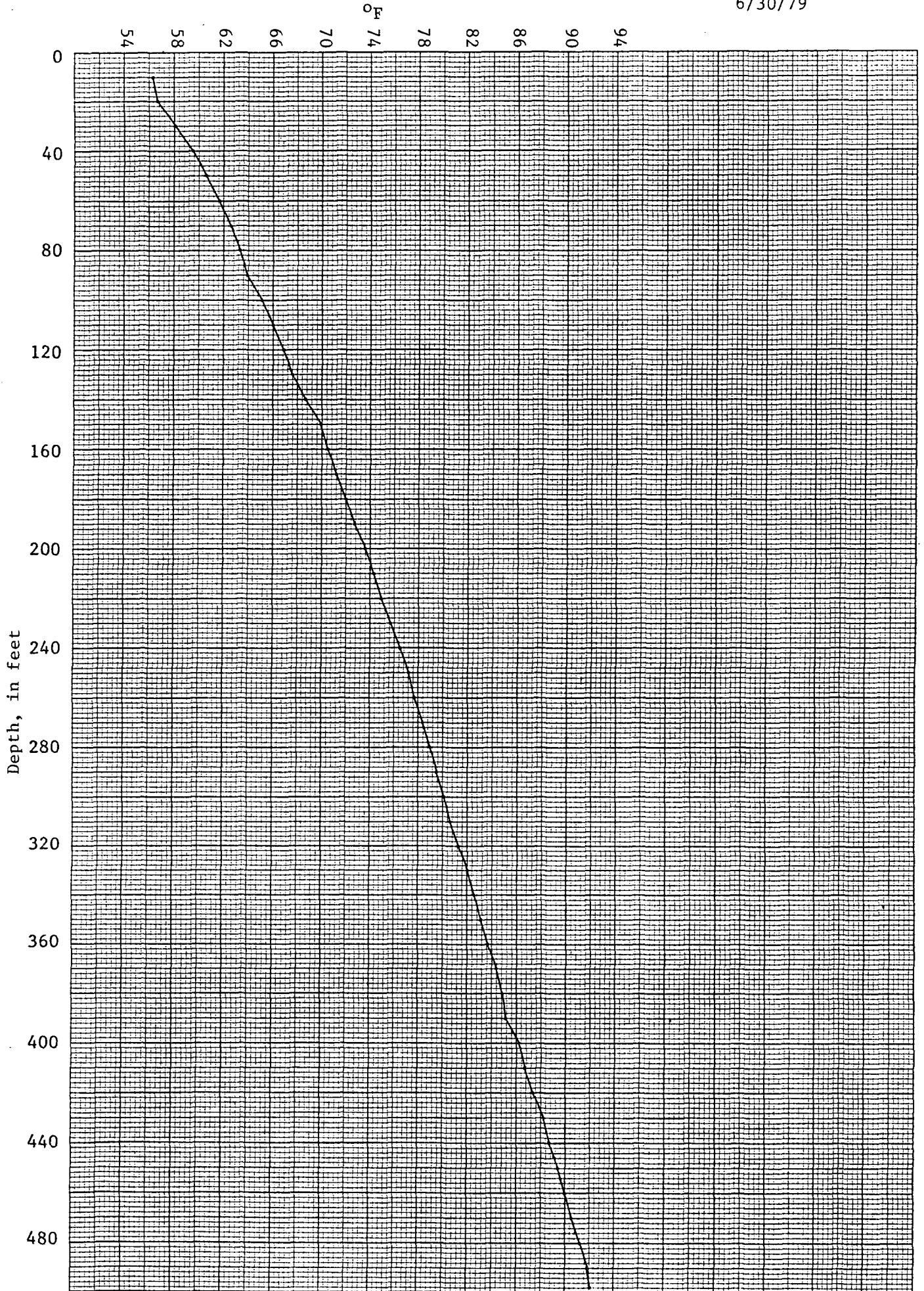
T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 32

6/30/79 12:28 PM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	56.3	13.5	260	77.7	25.4
20	56.7	13.7	270	78.4	25.8
30	58.1	14.5	280	79.0	26.1
40	59.5	15.3	290	79.5	26.4
50	60.6	15.9	300	80.1	26.7
60	61.7	16.5	310	80.6	27.0
70	62.6	17.0	320	81.3	27.4
80	63.3	17.4	330	82.0	27.8
90	63.9	17.7	340	82.6	28.1
100	65.1	18.4	350	83.1	28.4
110	66.0	18.9	360	83.7	28.7
120	66.9	19.4	370	84.4	29.1
130	67.6	19.8	380	84.9	29.4
140	68.7	20.4	390	85.5	29.7
150	69.9	20.9	400	86.2	30.1
160	70.5	21.4	410	86.7	30.4
170	71.2	21.8	420	87.4	30.8
180	72.0	22.2	430	88.2	31.2
190	72.7	22.6	440	88.7	31.5
200	73.6	23.1	450	89.4	31.9
210	74.3	23.5	460	90.0	32.2
220	75.0	23.9	470	90.5	32.5
230	75.7	24.3	480	91.2	32.9
240	76.5	24.7	490	91.8	33.2
250	77.2	25.1	498	92.1	33.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-5A
6/30/79



TEMPERATURE LOG

S-GV-79-5A

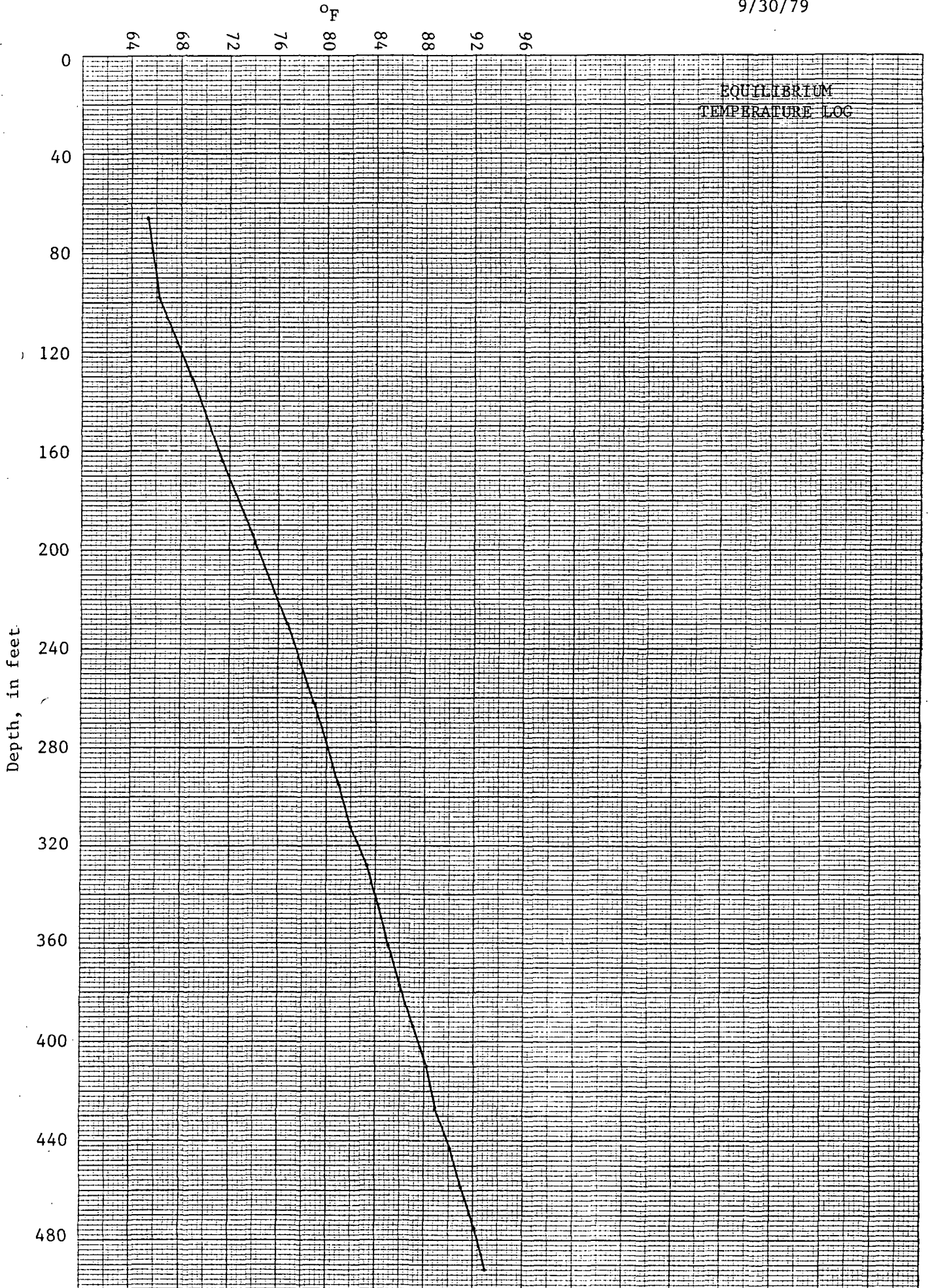
T. 32 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 32

9/30/79 11:45 AM
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	65.3	18.5
98	66.2	19.0
131	68.9	20.5
164	71.4	21.9
197	74.1	23.4
230	76.8	24.9
262	79.0	26.1
295	81.0	27.2
312	82.0	27.8
328	83.3	28.5
344	84.2	29.0
361	85.1	29.5
377	86.0	30.0
394	87.1	30.6
410	88.2	31.2
427	88.9	31.6
443	90.1	32.3
459	91.0	32.8
475	92.1	33.4
492	93.0	33.9

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-5A
9/30/79



TEMPERATURE LOG

S-GV-79-7

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 5 (unserv.)

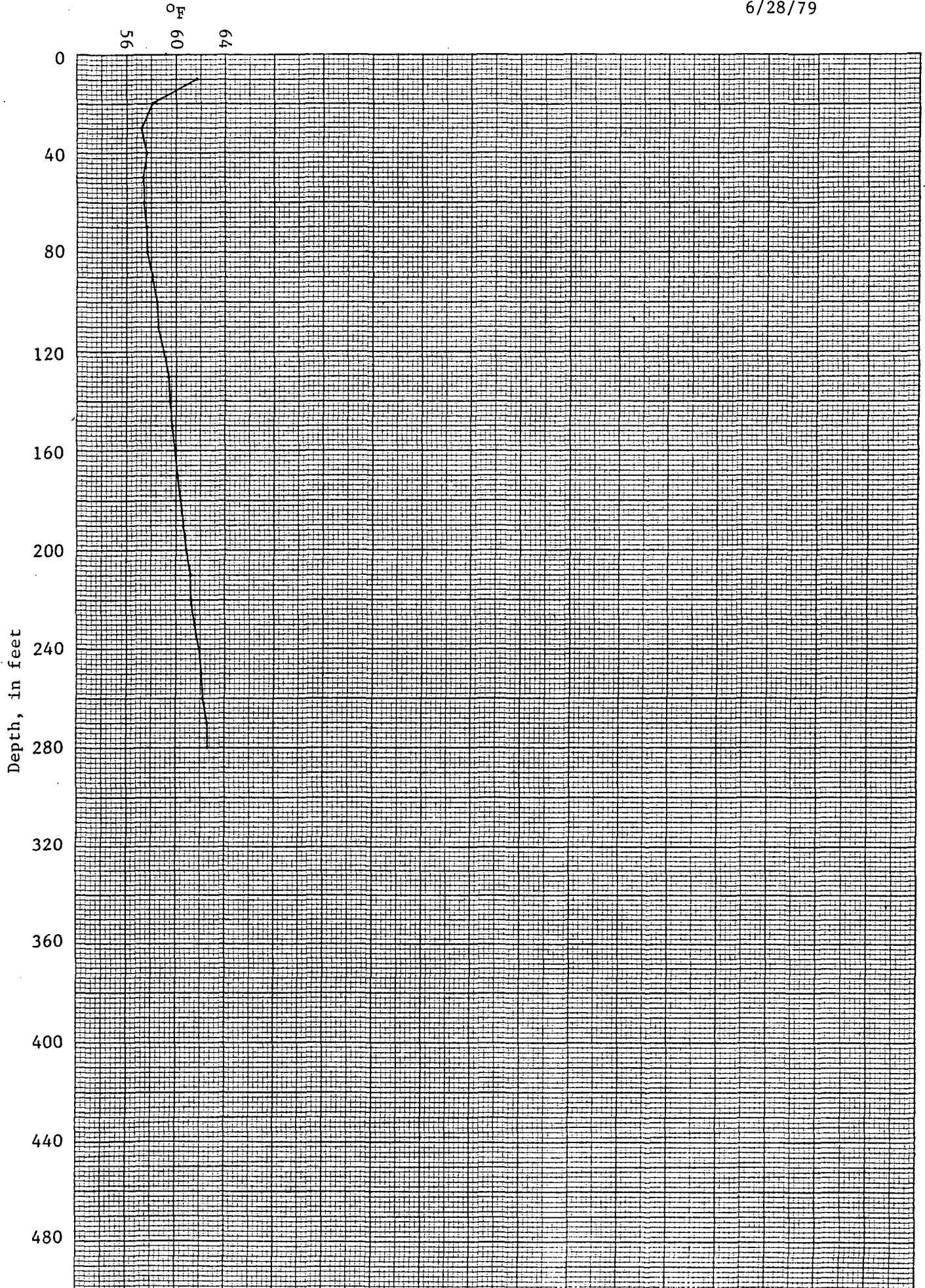
6/28/79 9:30 AM

Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
10	61.7	16.5
20	58.1	14.5
30	57.2	14.0
40	57.6	14.2
50	57.4	14.1
60	57.4	14.1
70	57.6	14.2
80	57.7	14.3
90	58.1	14.5
100	58.5	14.7
110	58.6	14.8
120	59.0	15.0
130	59.4	15.2
140	59.5	15.3
150	59.7	15.4
160	59.9	15.5
170	60.1	15.6
180	60.4	15.8
190	60.6	15.9
200	60.8	16.0
210	61.2	16.2
220	61.3	16.3
230	61.5	16.4
240	61.9	16.6
250	62.1	16.7
260	62.2	16.8
270	62.6	17.0
280	62.6	17.0

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-7
6/28/79



TEMPERATURE LOG

S-GV-79-7

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 5 (unserv.)

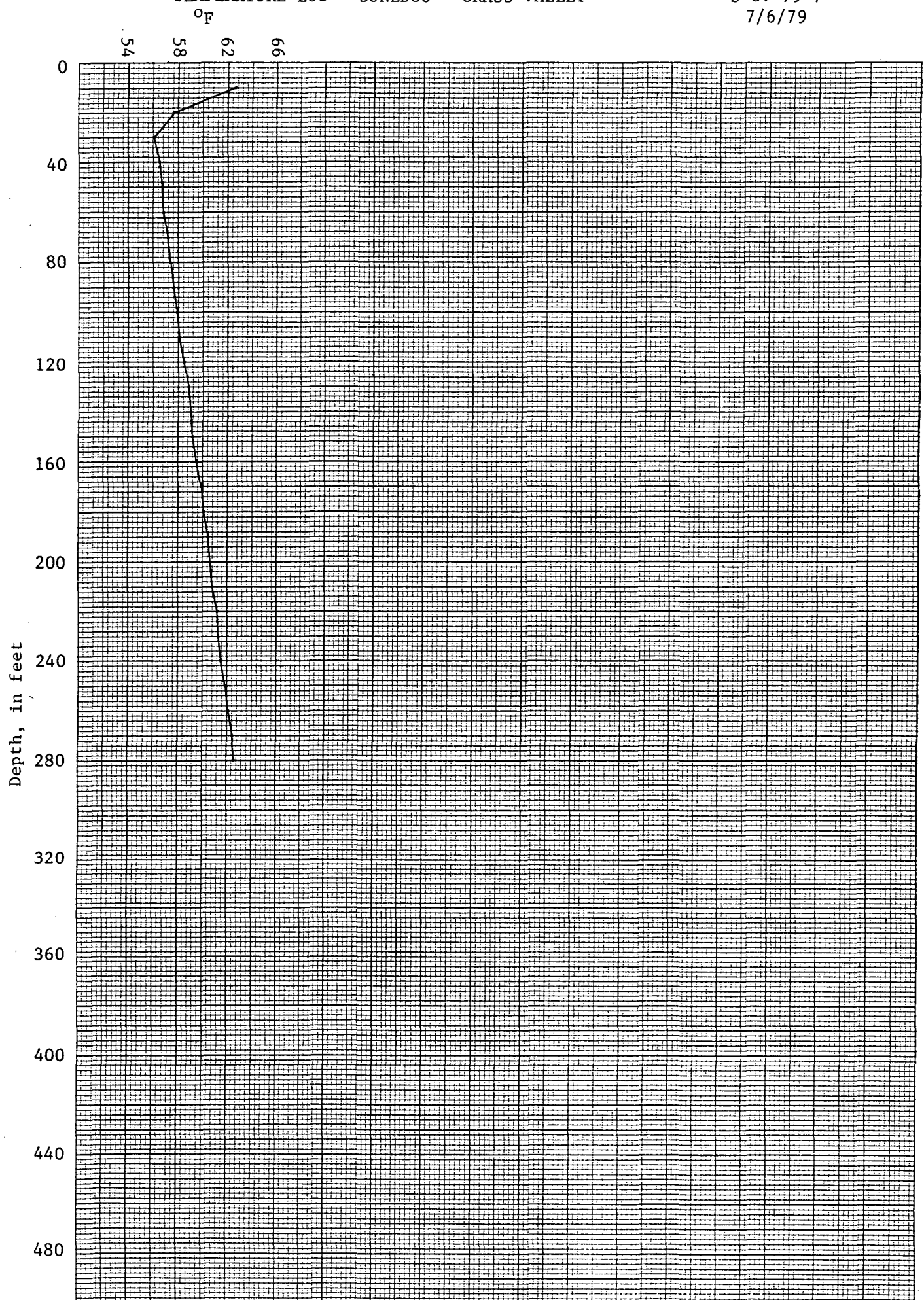
7/6/79 1:45 PM

Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
10	62.6	17.0
20	57.7	14.3
30	56.1	13.4
40	56.5	13.6
50	56.7	13.7
60	56.8	13.8
70	57.2	14.0
80	57.4	14.1
90	57.6	14.2
100	57.9	14.4
110	58.1	14.5
120	58.5	14.7
130	58.8	14.9
140	59.0	15.0
150	59.2	15.1
160	59.5	15.3
170	59.9	15.5
180	60.1	15.6
190	60.4	15.8
200	60.6	15.9
210	60.8	16.0
220	61.2	16.2
230	61.3	16.3
240	61.5	16.4
250	61.9	16.6
260	62.1	16.7
270	62.4	16.9
280	62.6	17.0

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-7
7/6/79



TEMPERATURE LOG

S-GV-79-7

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 5 (unserv.)

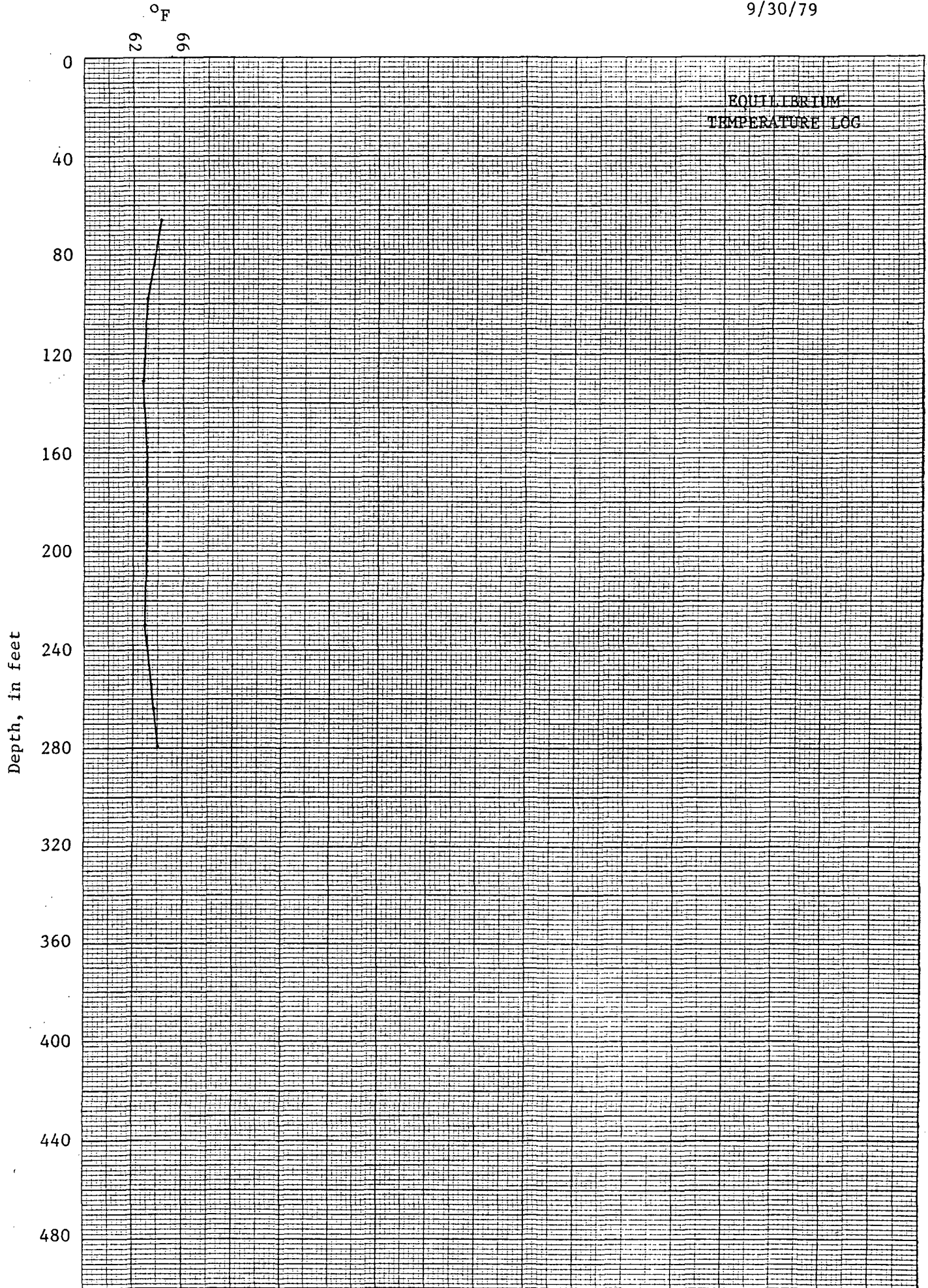
9/30/79 4:15 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	64.2	17.9
98	63.1	17.3
131	62.8	17.1
164	63.1	17.3
197	63.1	17.3
230	63.0	17.2
262	63.7	17.6
279	64.0	17.8

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-7
9/30/79



TEMPERATURE LOG

S-GV-79-8

T. 31 N., R. 39 E., NW 1/4 of NW 1/4, Sec. 8 (unserv.)

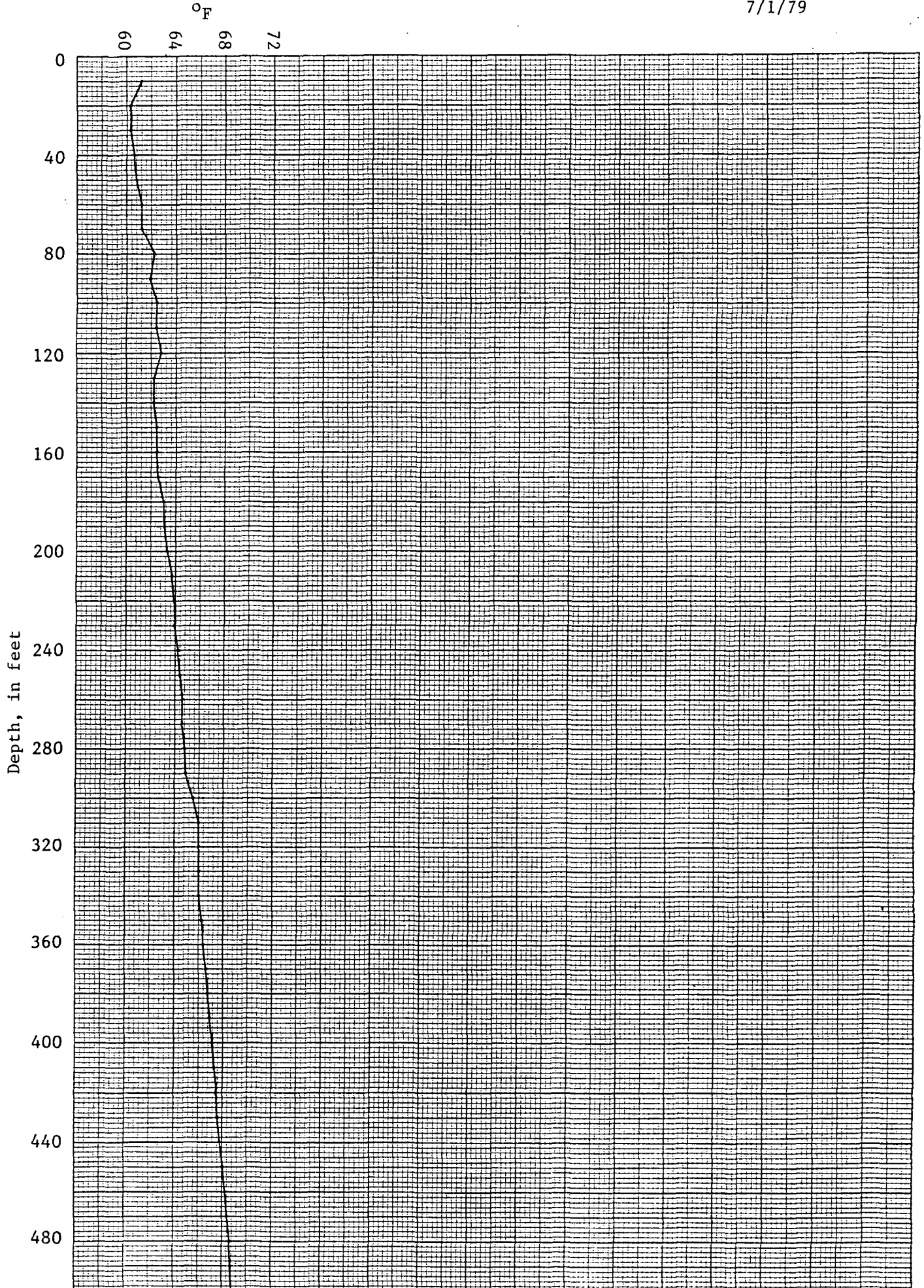
7/1/79 11:00 AM

Logged by GeothermEx. Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	61.2	16.2	260	64.6	18.1
20	60.3	15.7	270	64.6	18.1
30	60.3	15.7	280	64.8	18.2
40	60.6	15.9	290	64.9	18.3
50	60.8	16.0	300	65.5	18.6
60	61.2	16.2	310	66.0	18.9
70	61.2	16.2	320	66.0	18.9
80	62.2	16.8	330	66.0	18.9
90	61.9	16.6	340	66.0	18.9
100	62.4	16.9	350	66.2	19.0
110	62.4	16.9	360	66.4	19.1
120	62.8	17.1	370	66.6	19.2
130	62.2	16.8	380	66.7	19.3
140	62.2	16.8	390	66.9	19.4
150	62.4	16.9	400	67.1	19.5
160	62.4	16.9	410	67.3	19.6
170	62.6	17.0	420	67.5	19.7
180	63.0	17.2	430	67.6	19.8
190	63.1	17.3	440	67.8	19.9
200	63.3	17.4	450	68.0	20.0
210	63.7	17.6	460	68.2	20.1
220	63.9	17.7	470	68.4	20.2
230	63.9	17.7	480	68.5	20.3
240	64.2	17.9	490	68.7	20.4
250	64.4	18.0	500	68.7	20.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-8
7/1/79



TEMPERATURE LOG

S-GV-79-8

T. 31 N., R. 39 E., NW 1/4 of NW 1/4, Sec. 8 (unserv.)

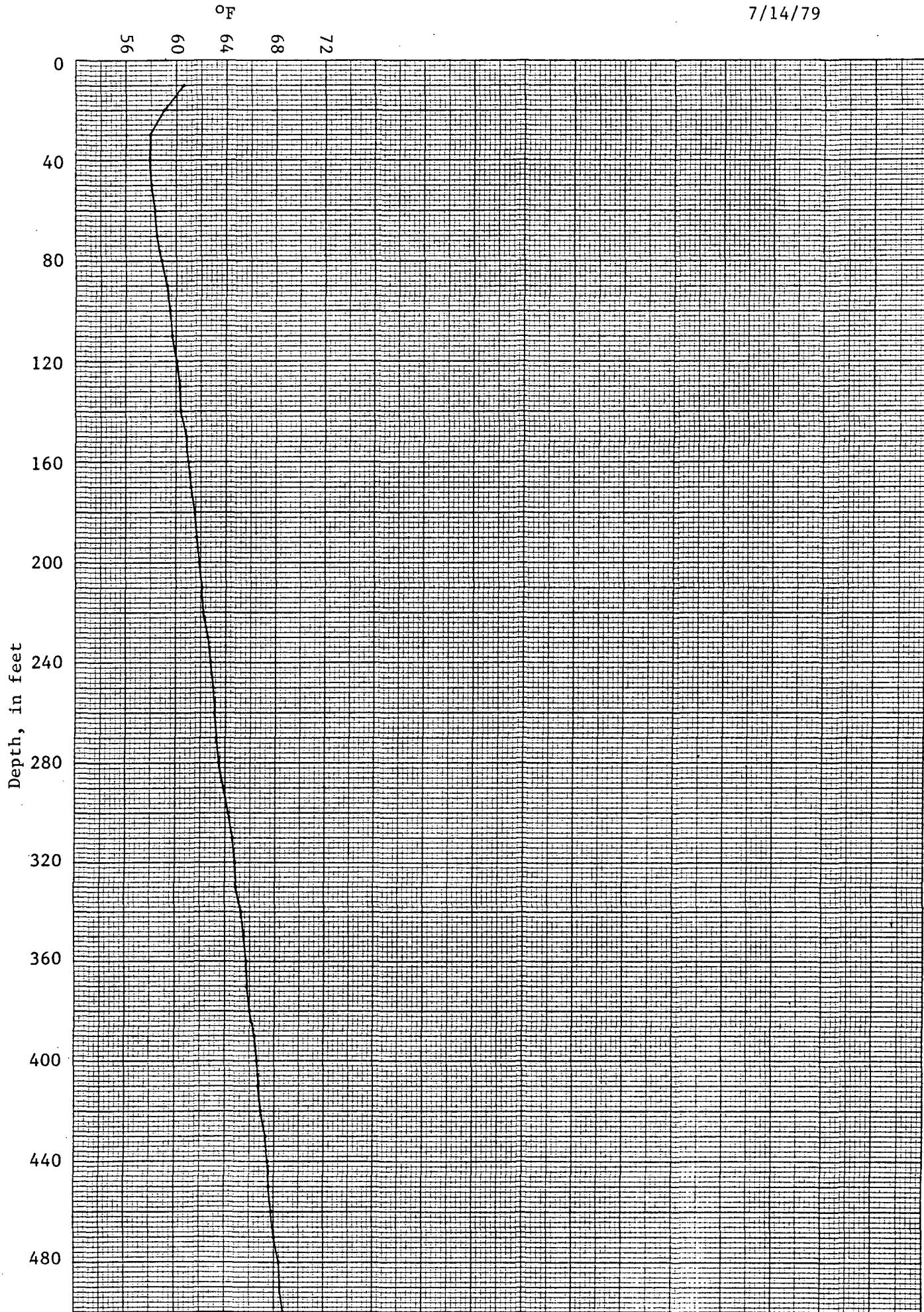
7/14/79 10:30 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	60.6	15.9	260	63.1	17.3
20	59.0	15.0	270	63.3	17.4
30	57.9	14.4	280	63.5	17.5
40	57.9	14.4	290	63.9	17.7
50	58.1	14.5	300	64.2	17.9
60	58.3	14.6	310	64.6	18.1
70	58.5	14.7	320	64.8	18.2
80	58.8	14.9	330	64.9	18.3
90	59.2	15.1	340	65.3	18.5
100	59.5	15.3	350	65.5	18.6
110	59.7	15.4	360	65.7	18.7
120	60.1	15.6	370	65.8	18.8
130	60.3	15.7	380	66.0	18.9
140	60.4	15.8	390	66.4	19.1
150	60.8	16.0	400	66.6	19.2
160	61.0	16.1	410	66.7	19.3
170	61.2	16.2	420	66.9	19.4
180	61.5	16.4	430	67.3	19.6
190	61.7	16.5	440	67.5	19.7
200	61.9	16.6	450	67.6	19.8
210	62.1	16.7	460	67.8	19.9
220	62.2	16.8	470	68.0	20.0
230	62.6	17.0	480	68.4	20.2
240	62.8	17.1	490	68.5	20.3
250	63.0	17.2	500	68.7	20.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-8
7/14/79



TEMPERATURE LOG

S-GV-79-8

T. 31 N., R. 39 E., NW 1/4 of NW 1/4, Sec. 8 (unserv.)

9/30/79 5:00 PM

Logged by GeothermEx, Inc.

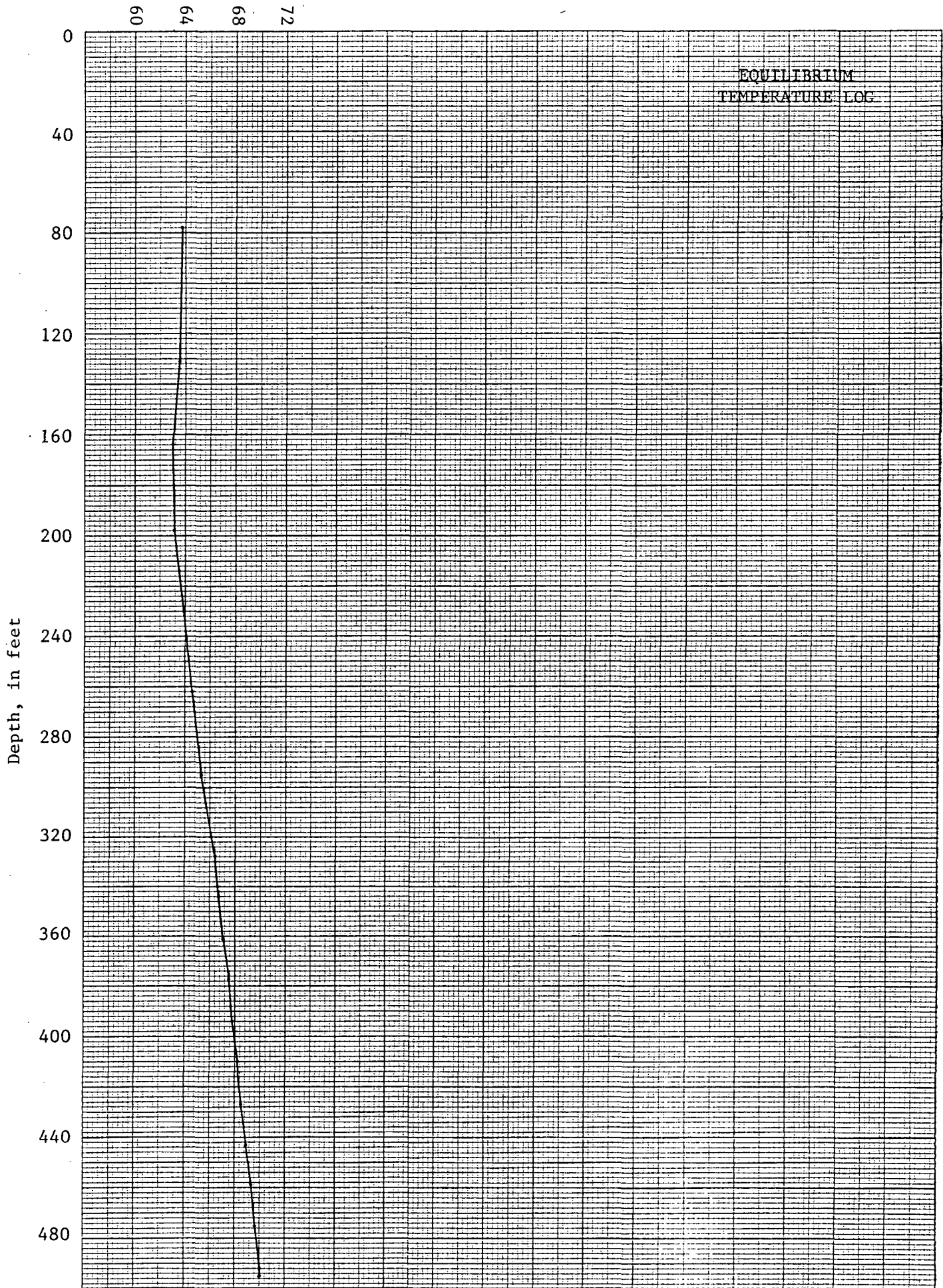
<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
98	63.7	17.6
131	63.5	17.5
164	63.0	17.2
197	63.1	17.3
230	63.9	17.7
262	64.6	18.1
295	65.3	18.5
328	66.4	19.1
344	66.7	19.3
361	67.1	19.5
377	67.5	19.7
394	67.8	19.9
410	68.2	20.1
427	68.5	20.3
443	68.9	20.5
459	69.3	20.7
475	69.6	20.9
492	70.0	21.1
495	70.0	21.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-8

9/30/79

°F



TEMPERATURE LOG

S-GV-79-9

T. 31 N., R. 39 E., NW 1/4 of SW 1/4, Sec. 14 (unserv.)

7/3/79 5:35 PM

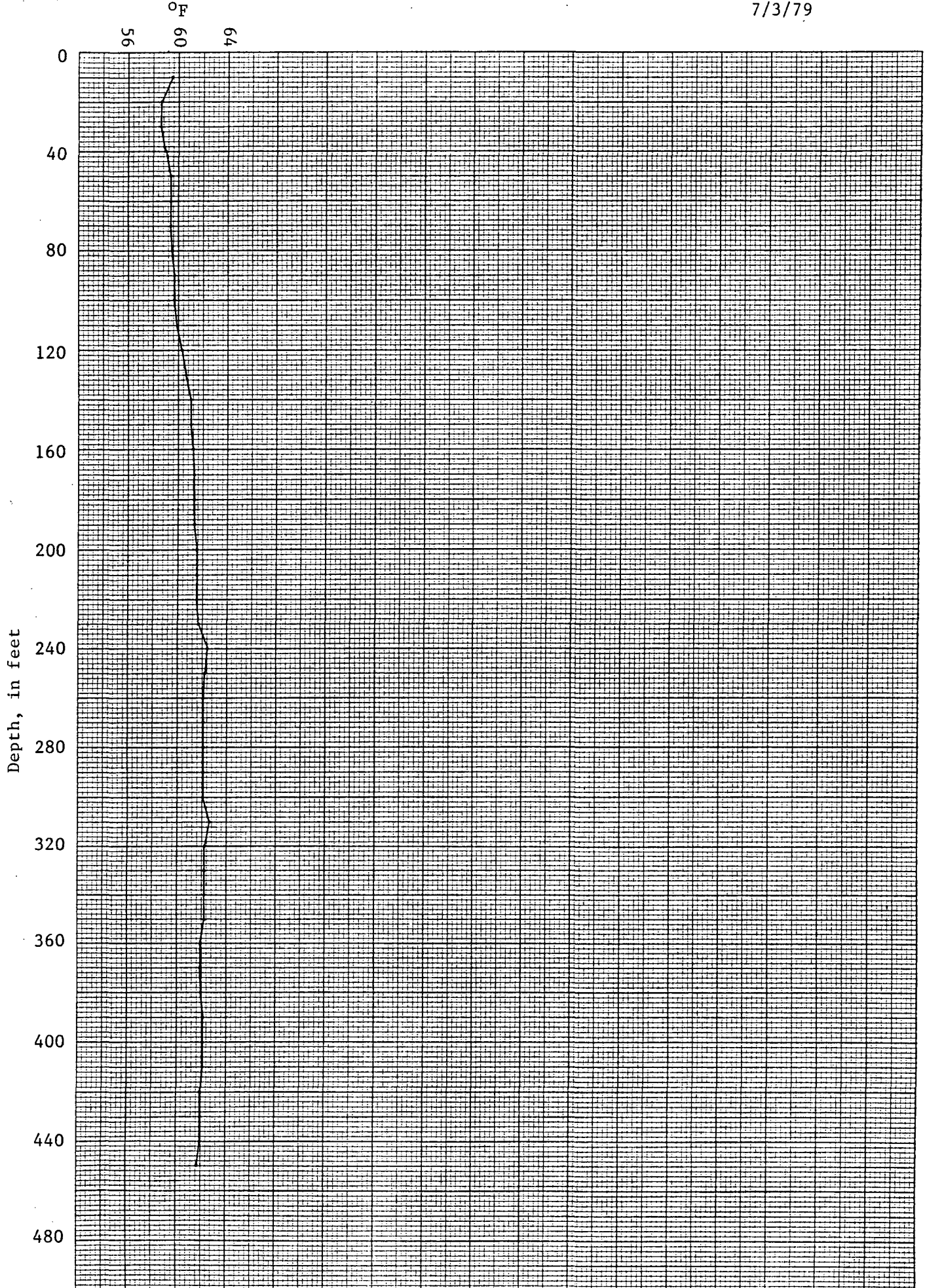
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	59.5	15.3	230	61.7	16.5
20	58.6	14.8	240	62.4	16.9
30	58.6	14.8	250	62.2	16.8
40	59.0	15.0	260	62.1	16.7
50	59.4	15.2	270	62.1	16.7
60	59.4	15.2	280	62.1	16.7
70	59.4	15.2	290	62.1	16.7
80	59.5	15.3	300	62.1	16.7
90	59.7	15.4	310	62.6	17.0
100	59.7	15.4	320	62.2	16.8
110	59.9	15.5	330	62.2	16.8
120	60.3	15.7	340	62.2	16.8
130	60.6	15.9	350	62.2	16.8
140	61.0	16.1	360	61.9	16.6
150	61.0	16.1	370	61.9	16.6
160	61.2	16.2	380	61.9	16.6
170	61.3	16.3	390	62.1	16.7
180	61.3	16.3	400	62.1	16.7
190	61.3	16.3	410	62.1	16.7
200	61.5	16.4	420	61.9	16.6
210	61.5	16.4	430	61.9	16.6
220	61.5	16.4	440	61.9	16.6
			450	61.7	16.5

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-9

7/3/79



TEMPERATURE LOG

S-GV-79-9

T. 31 N., R. 39 E., NW 1/4 of SW 1/4, Sec. 14 (unserv.)

7/14/79 12:09 PM

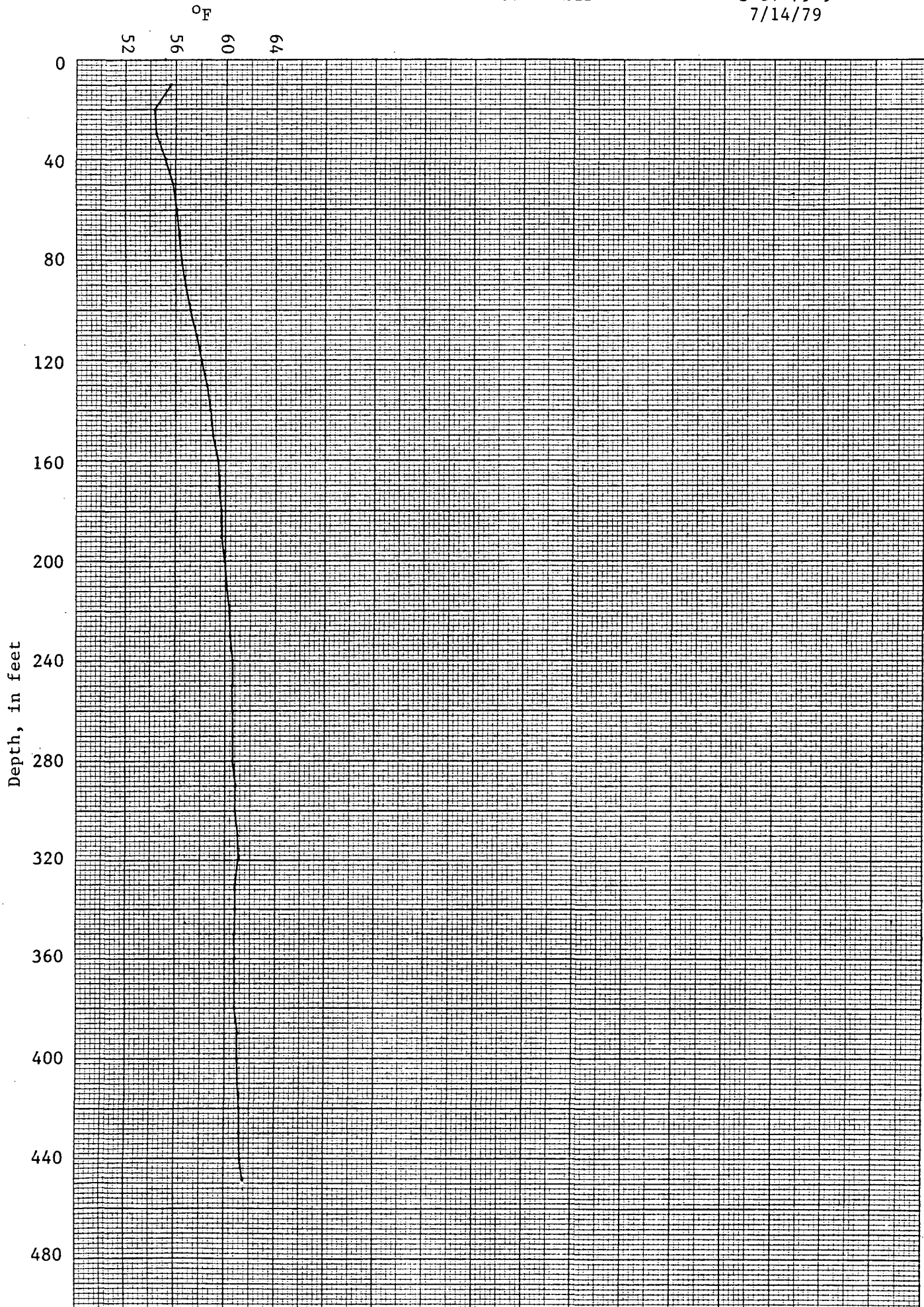
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	55.6	13.1	230	60.4	15.8
20	54.3	12.4	240	60.6	15.9
30	54.5	12.5	250	60.6	15.9
40	55.2	12.9	260	60.6	15.9
50	55.8	13.2	270	60.6	15.9
60	56.1	13.4	280	60.6	15.9
70	56.3	13.5	290	60.8	16.0
80	56.5	13.6	300	60.8	16.0
90	56.8	13.8	310	61.0	16.1
100	57.2	14.0	320	61.0	16.1
110	57.7	14.3	330	60.8	16.0
120	58.1	14.5	340	60.8	16.0
130	58.5	14.7	350	60.8	16.0
140	58.8	14.9	360	60.8	16.0
150	59.0	15.0	370	60.8	16.0
160	59.4	15.2	380	60.8	16.0
170	59.5	15.3	390	61.0	16.1
180	59.7	15.4	400	61.0	16.1
190	59.7	15.4	410	61.0	16.1
200	59.9	15.5	420	61.2	16.2
210	60.1	15.6	430	61.2	16.2
220	60.3	15.7	440	61.3	16.3
			449	61.5	16.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-9

7/14/79



TEMPERATURE LOG

S-GV-79-9

T. 31 N., R. 39 E., NW 1/4 of SW 1/4, Sec. 14 (unserv.)

9/24/79 2:00 PM

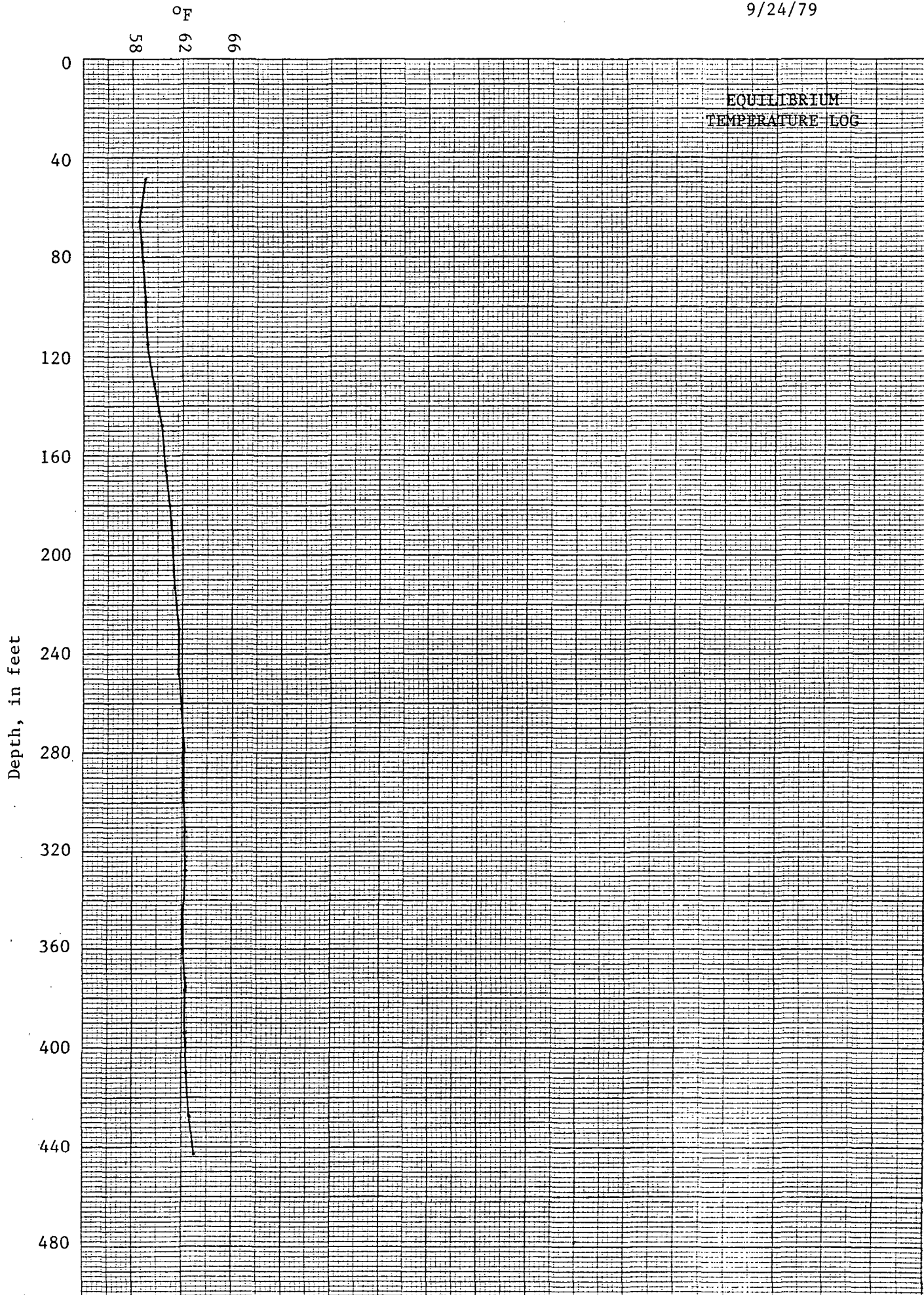
Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
49	59.0	15.0
66	58.6	14.8
82	58.8	14.9
98	59.0	15.0
115	59.2	15.1
131	59.7	15.4
148	60.3	15.7
164	60.6	15.9
180	61.0	16.1
197	61.2	16.2
213	61.3	16.3
230	61.7	16.5
246	61.7	16.5
262	61.9	16.6
279	62.1	16.7
295	62.1	16.7
312	62.2	16.8
328	62.2	16.8
344	62.1	16.7
361	62.1	16.7
377	62.2	16.8
394	62.2	16.8
410	62.4	16.9
427	62.6	17.0
443	63.0	17.2

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-9

9/24/79



TEMPERATURE LOG

S-GV-79-10

T. 31 N., R. 39 E., NE 1/4 of NE 1/4, Sec. 20

7/13/79 3:49 PM

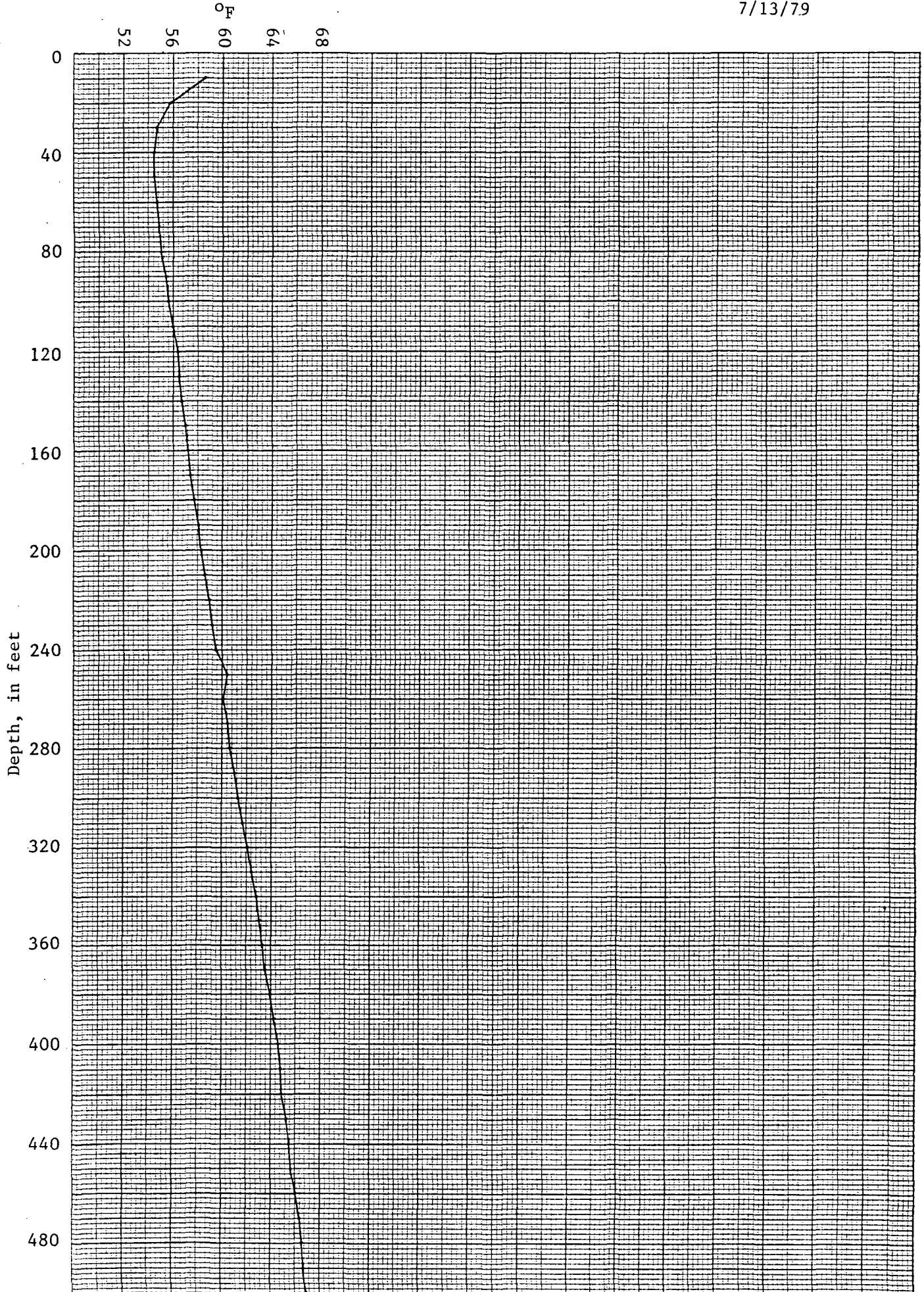
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	58.6	14.8	260	60.1	15.6
20	55.8	13.2	270	60.4	15.8
30	54.7	12.6	280	60.6	15.9
40	54.5	12.5	290	61.0	16.1
50	54.5	12.5	300	61.3	16.3
60	54.7	12.6	310	61.7	16.5
70	54.9	12.7	320	62.1	16.7
80	55.0	12.8	330	62.4	16.9
90	55.4	13.0	340	62.8	17.1
100	55.6	13.1	350	63.0	17.2
110	56.0	13.3	360	63.3	17.4
120	56.3	13.5	370	63.5	17.5
130	56.5	13.6	380	63.9	17.7
140	56.7	13.7	390	64.2	17.9
150	57.0	13.9	400	64.6	18.1
160	57.2	14.0	410	64.8	18.2
170	57.4	14.1	420	64.9	18.3
180	57.7	14.3	430	65.3	18.5
190	58.1	14.5	440	65.5	18.6
200	58.3	14.6	450	65.7	18.7
210	58.6	14.8	460	66.0	18.9
220	59.0	15.0	470	66.4	19.1
230	59.2	15.1	480	66.6	19.2
240	59.5	15.3	490	66.7	19.3
250	60.4	15.5	500	66.9	19.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-10

7/13/79



TEMPERATURE LOG

S-GV-79-10

T. 31 N., R. 39 E., NE 1/4 of NE 1/4, Sec. 20

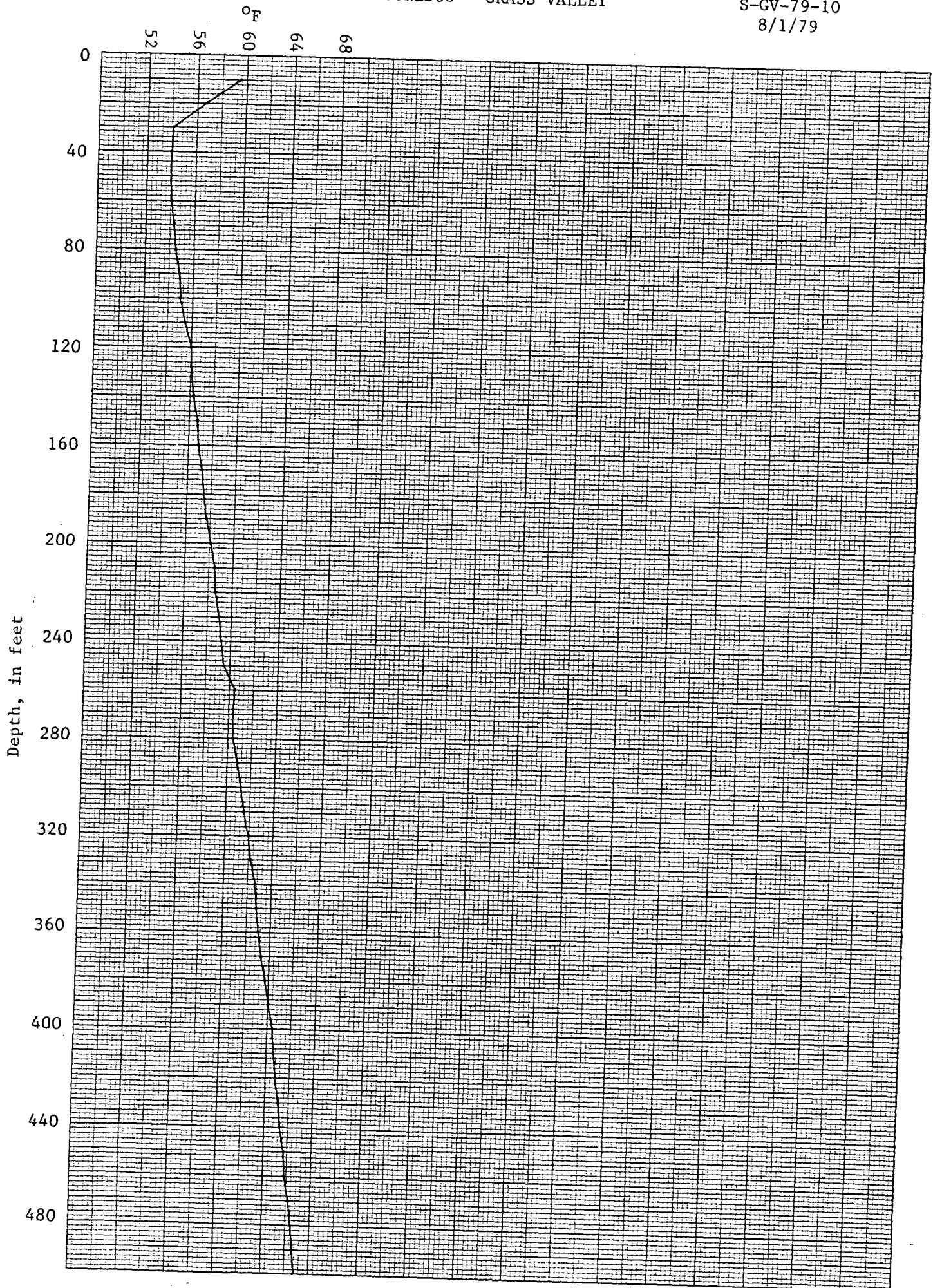
8/1/79 3:40 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	59.5	15.3	260	60.4	15.5
20	56.7	13.7	270	60.3	15.7
30	54.1	12.3	280	60.4	15.8
40	54.0	12.2	290	60.8	16.0
50	54.0	12.2	300	61.2	16.2
60	54.1	12.3	310	61.5	16.4
70	54.3	12.4	320	61.9	16.6
80	54.5	12.5	330	62.2	16.8
90	54.9	12.7	340	62.6	17.0
100	55.0	12.8	350	62.8	17.1
110	55.4	13.0	360	63.0	17.2
120	56.0	13.3	370	63.3	17.4
130	56.1	13.4	380	63.7	17.6
140	56.3	13.5	390	64.0	17.8
150	56.7	13.7	400	64.4	18.0
160	56.8	13.8	410	64.6	18.1
170	57.2	14.0	420	64.8	18.2
180	57.4	14.1	430	65.1	18.4
190	57.7	14.3	440	65.3	18.5
200	58.1	14.5	450	65.7	18.7
210	58.5	14.7	460	65.8	18.8
220	58.6	14.8	470	66.2	19.0
230	59.0	15.0	480	66.4	19.1
240	59.2	15.1	490	66.6	19.2
250	59.5	15.3	500	66.7	19.3

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-10
8/1/79



TEMPERATURE LOG

S-GV-79-10

T. 31 N., R. 39 E., NE 1/4 of NE 1/4, Sec. 20

9/24/79 1:30 PM

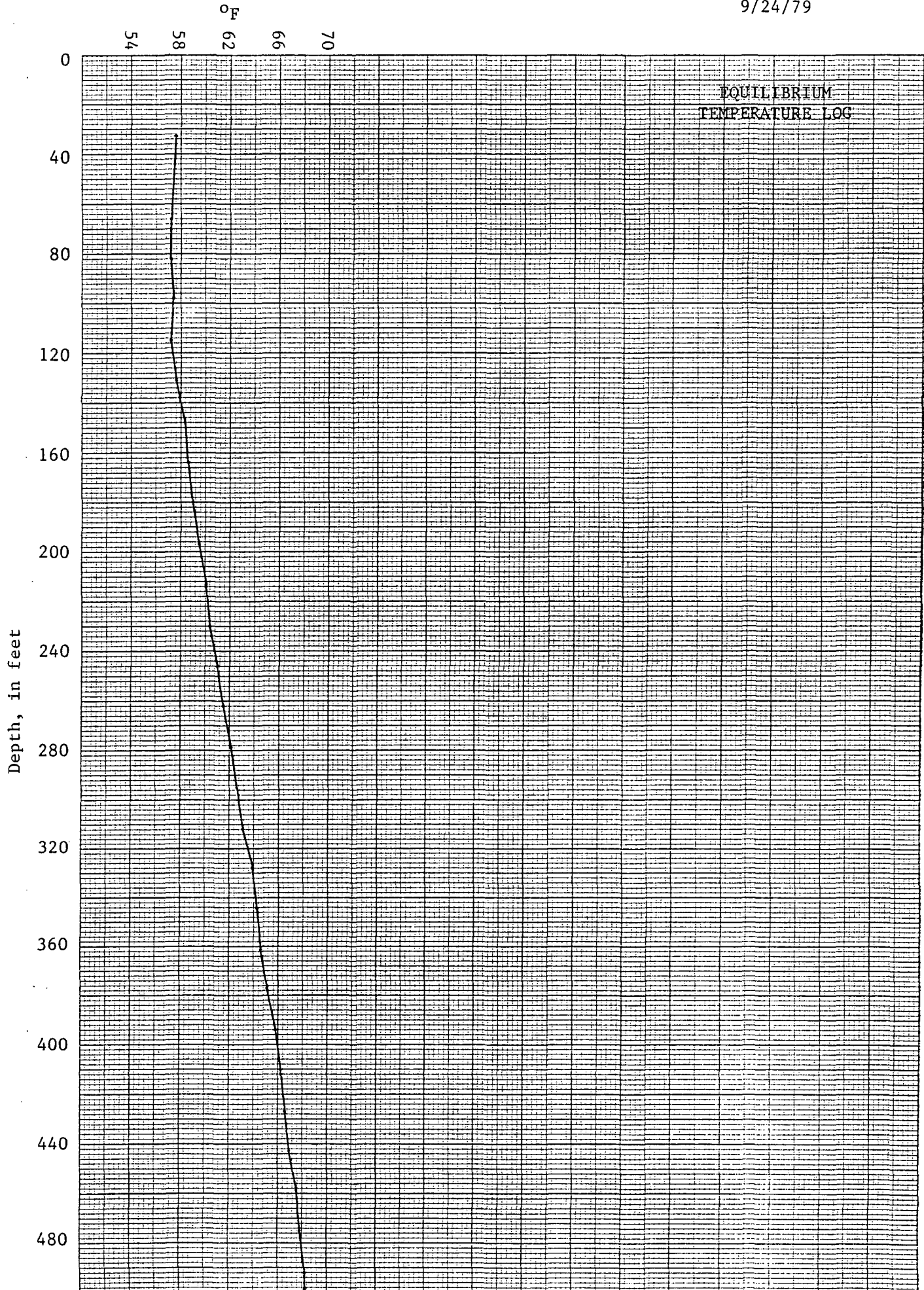
Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
33	57.6	14.2
66	57.2	14.0
82	57.2	14.0
98	57.4	14.1
115	57.2	14.0
131	57.6	14.2
148	58.3	14.6
164	58.6	14.8
180	59.0	15.0
197	59.5	15.3
213	60.1	15.6
230	60.4	15.8
246	61.0	16.1
262	61.5	16.4
279	62.1	16.7
295	62.6	17.0
312	63.1	17.3
328	63.9	17.7
344	64.2	17.9
361	64.6	18.1
377	65.1	18.4
394	65.8	18.8
410	66.2	19.0
427	66.6	19.2
443	66.9	19.4
459	67.5	19.7
475	67.8	19.9
492	68.2	20.1
499	68.2	20.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-10

9/24/79



TEMPERATURE LOG

S-GV-79-11

T. 31 N., R. 39 E., SW 1/4 of NE 1/4, Sec. 29

7/13/79 2:38 PM

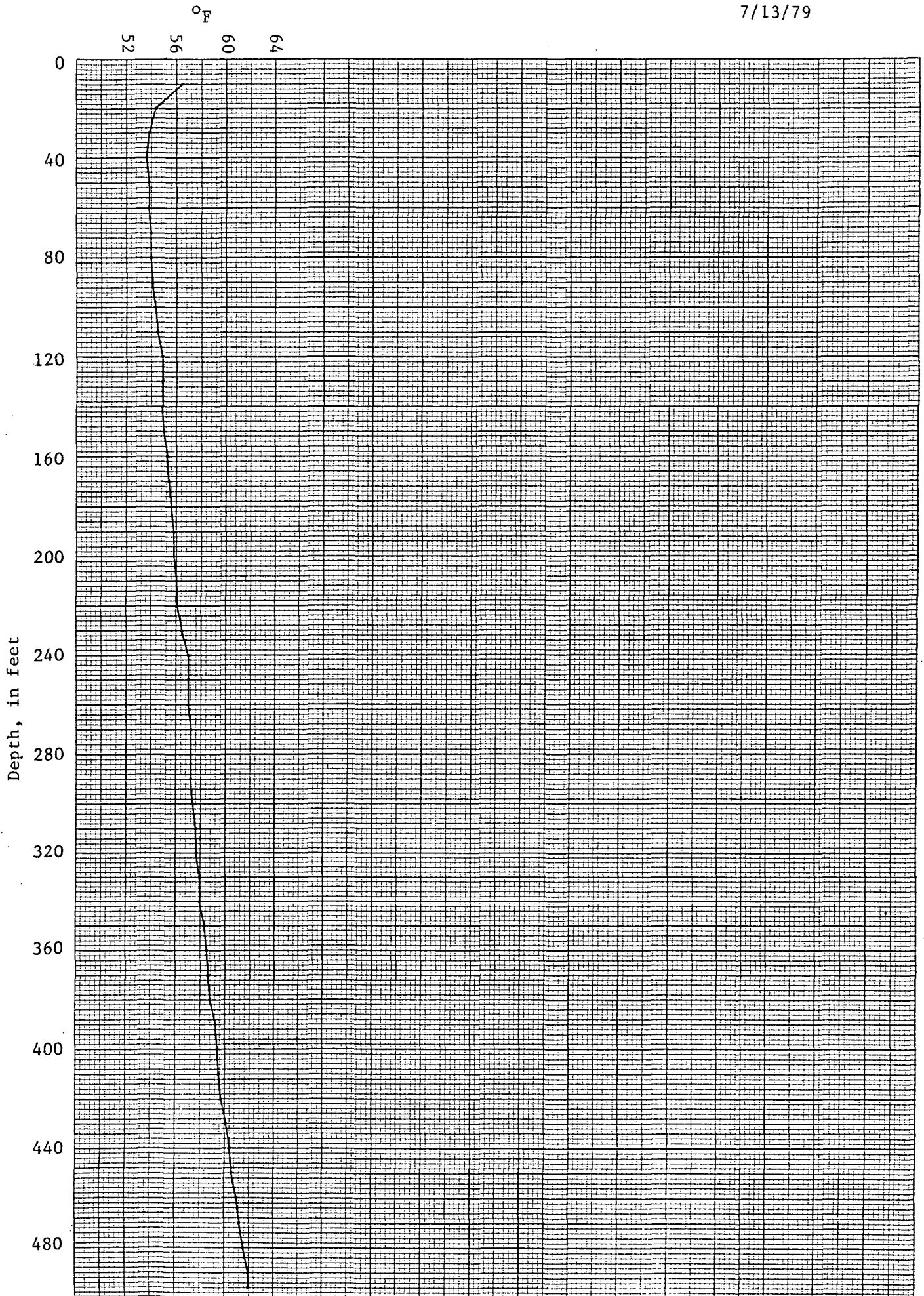
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	56.5	13.6	260	57.0	13.9
20	54.3	12.4	270	57.2	14.0
30	53.8	12.1	280	57.2	14.0
40	53.6	12.0	290	57.2	14.0
50	53.8	12.1	300	57.4	14.1
60	53.8	12.1	310	57.6	14.2
70	54.0	12.2	320	57.7	14.3
80	54.0	12.2	330	57.9	14.4
90	54.1	12.3	340	57.9	14.4
100	54.3	12.4	350	58.3	14.6
110	54.5	12.5	360	58.5	14.7
120	54.9	12.7	370	58.6	14.8
130	54.9	12.7	380	58.8	14.9
140	54.9	12.7	390	59.2	15.1
150	55.0	12.8	400	59.4	15.2
160	55.2	12.9	410	59.5	15.3
170	55.4	13.0	420	59.7	15.4
180	55.6	13.1	430	60.1	15.6
190	55.8	13.2	440	60.4	15.8
200	55.8	13.2	450	60.6	15.9
210	56.0	13.3	460	61.0	16.1
220	56.1	13.4	470	61.2	16.2
230	56.5	13.6	480	61.5	16.4
240	57.0	13.9	490	61.9	16.6
250	57.0	13.9	496	61.9	16.6

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-11

7/13/79



TEMPERATURE LOG

S-GV-79-11

T. 31 N., R. 39 E., SW 1/4 of NE 1/4, Sec. 29

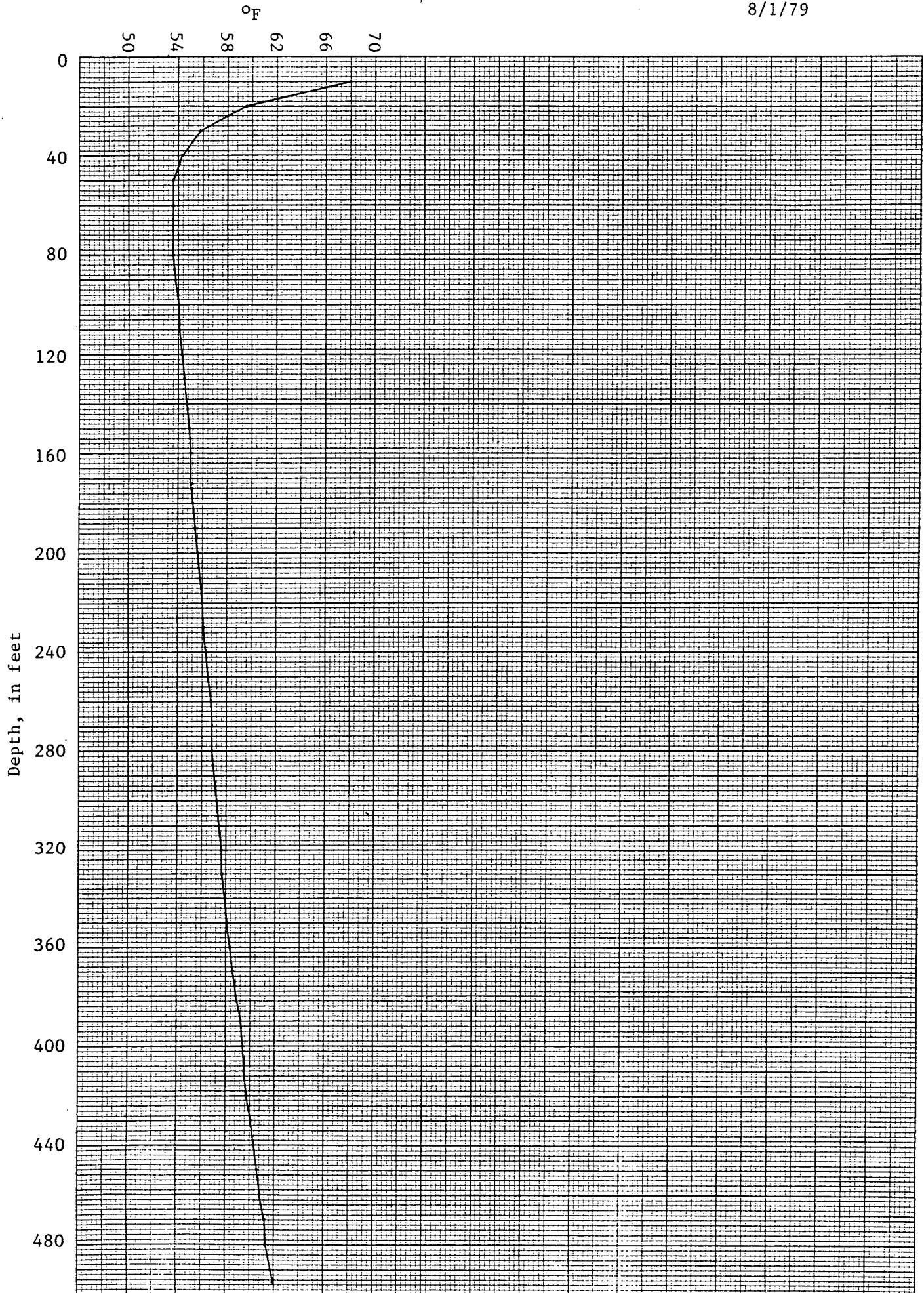
8/1/79 2:37 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	68.0	20.0	260	56.7	13.7
20	59.5	15.3	270	56.8	13.8
30	55.8	13.2	280	56.8	13.8
40	54.3	12.4	290	57.0	13.9
50	53.6	12.0	300	57.2	14.0
60	53.6	12.0	310	57.4	14.1
70	53.6	12.0	320	57.6	14.2
80	53.6	12.0	330	57.7	14.3
90	53.8	12.1	340	57.9	14.4
100	54.0	12.2	350	58.1	14.5
110	54.1	12.3	360	58.3	14.6
120	54.3	12.4	370	58.6	14.8
130	54.5	12.5	380	58.8	14.9
140	54.7	12.6	390	59.2	15.1
150	54.9	12.7	400	59.4	15.2
160	55.0	12.8	410	59.5	15.3
170	55.0	12.8	420	59.7	15.4
180	55.2	12.9	430	60.1	15.6
190	55.4	13.0	440	60.3	15.7
200	55.6	13.1	450	60.6	15.9
210	55.8	13.2	460	60.8	16.0
220	56.0	13.3	470	61.2	16.2
230	56.1	13.4	480	61.3	16.3
240	56.3	13.5	490	61.7	16.5
250	56.5	13.6	495	61.9	16.6

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-11
8/1/79



TEMPERATURE LOG

S-GV-79-11

T. 31 N., R. 39 E., SW 1/4 of NE 1/4, Sec. 29

9/24/79 11:00 AM

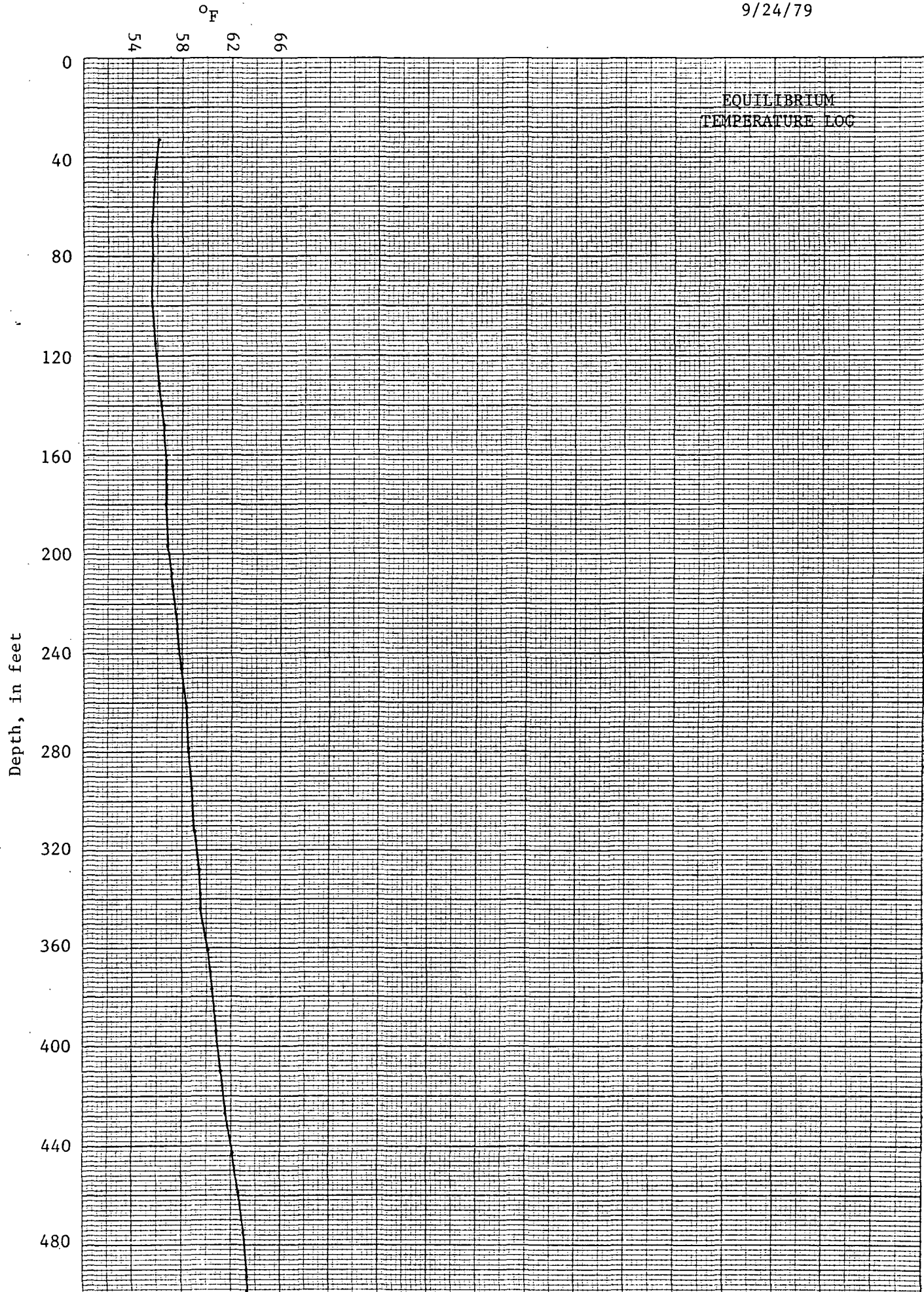
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	56.1	13.4
49	55.8	13.2
66	55.6	13.1
82	55.6	13.1
98	55.6	13.1
115	55.8	13.2
131	56.1	13.4
148	56.5	13.6
164	56.7	13.7
180	56.7	13.7
197	56.8	13.8
213	57.2	14.0
230	57.6	14.2
246	57.9	14.4
262	58.3	14.6
279	58.5	14.7
295	58.8	14.9
312	59.0	15.0
328	59.4	15.2
344	59.5	15.3
361	60.1	15.6
377	60.4	15.8
394	60.8	16.0
410	61.2	16.2
427	61.5	16.4
443	62.1	16.7
459	62.6	17.0
475	63.0	17.2
492	63.3	17.4
499	63.3	17.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-11

9/24/79



EQUILIBRIUM
TEMPERATURE LOG

TEMPERATURE LOG

S-GV-79-12

T. 31 N., R. 39 E., SW 1/4 of SE 1/4, Sec. 28

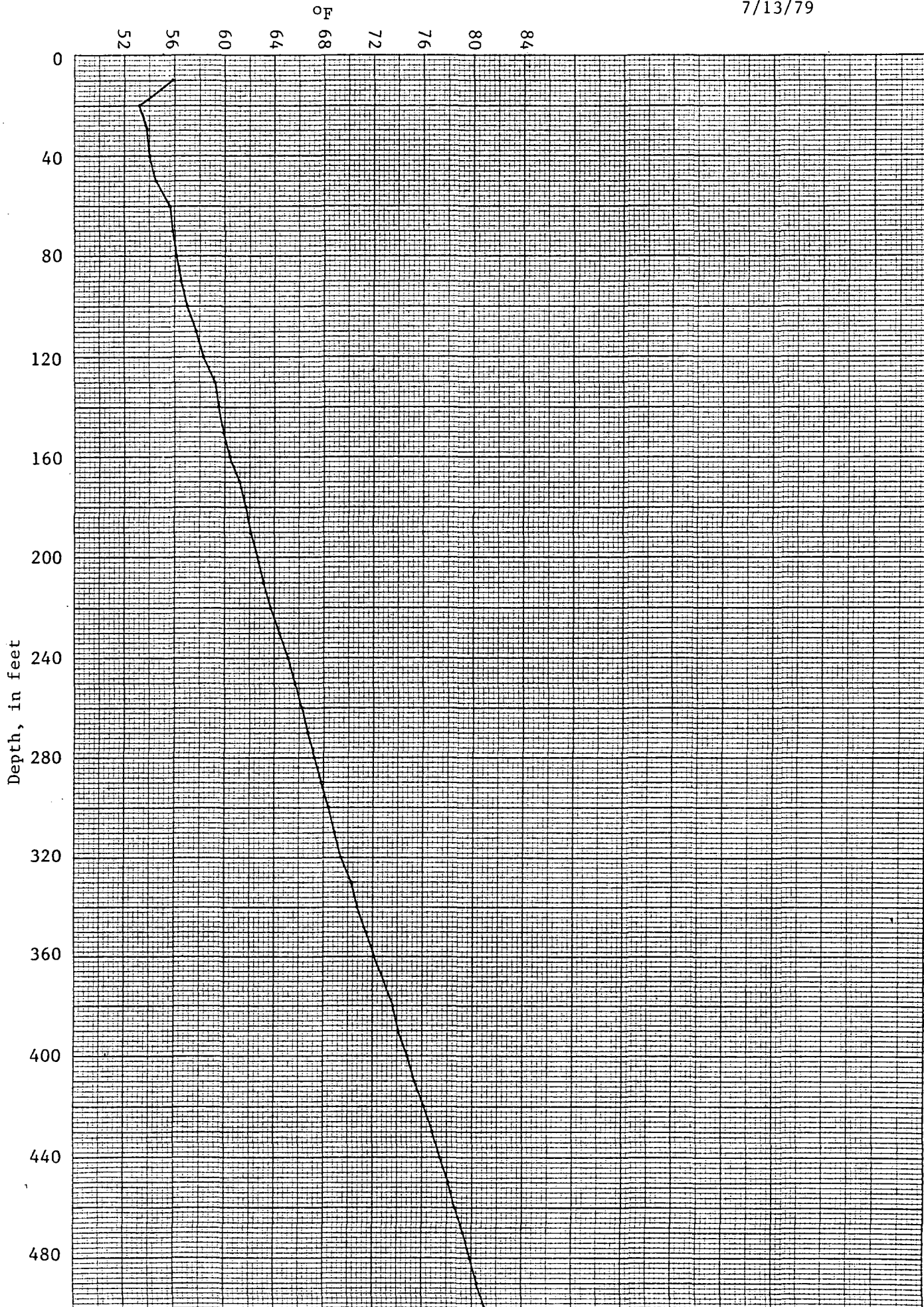
7/13/79 1:10 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	55.8	13.2	260	66.2	19.0
20	53.2	11.8	270	66.7	19.3
30	53.8	12.1	280	67.3	19.6
40	54.0	12.2	290	67.8	19.9
50	54.5	12.5	300	68.4	20.2
60	55.6	13.1	310	68.9	20.5
70	55.8	13.2	320	69.4	20.8
80	56.1	13.4	330	70.2	21.2
90	56.5	13.6	340	70.7	21.5
100	57.0	13.9	350	71.4	21.9
110	57.7	14.3	360	72.1	22.3
120	58.3	14.6	370	72.9	22.7
130	59.2	15.1	380	73.6	23.1
140	59.5	15.3	390	74.1	23.4
150	59.9	15.5	400	74.8	23.8
160	60.4	15.8	410	75.4	24.1
170	61.2	16.2	420	76.1	24.5
180	61.7	16.5	430	76.8	24.9
190	62.1	16.7	440	77.4	25.2
200	62.6	17.0	450	78.1	25.6
210	63.1	17.3	460	78.6	25.9
220	63.7	17.6	470	79.3	26.3
230	64.4	18.0	480	79.9	26.6
240	65.1	18.4	490	80.4	26.9
250	65.7	18.7	500	81.0	27.2

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-12
7/13/79



TEMPERATURE LOG

S-GV-79-12

T. 31 N., R. 39 E., SW 1/4 of SE 1/4, Sec. 28

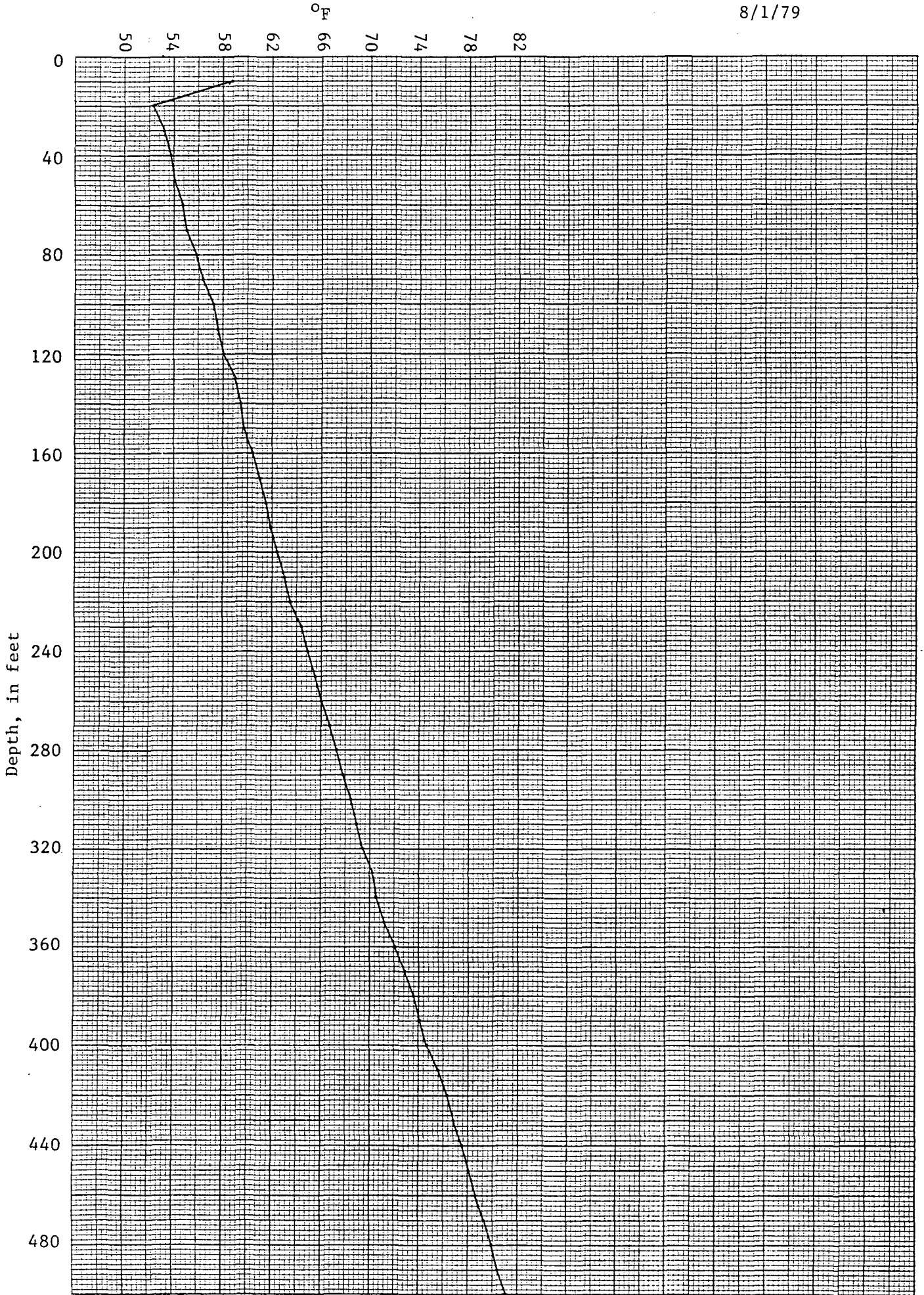
8/1/79 12:10 PM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	58.8	14.9	260	66.0	18.9
20	52.3	11.3	270	66.7	19.3
30	53.2	11.8	280	67.3	19.6
40	53.8	12.1	290	67.8	19.9
50	54.1	12.3	300	68.4	20.2
60	54.7	12.6	310	68.9	20.5
70	55.0	12.8	320	69.4	20.8
80	55.8	13.2	330	70.2	21.2
90	56.3	13.5	340	70.5	21.4
100	57.2	14.0	350	71.2	21.8
110	57.6	14.2	360	72.1	22.3
120	58.1	14.5	370	72.9	22.7
130	59.0	15.0	380	73.6	23.1
140	59.4	15.2	390	74.1	23.4
150	59.7	15.4	400	74.7	23.7
160	60.4	15.8	410	75.6	24.2
170	61.0	16.1	420	76.3	24.6
180	61.5	16.4	430	76.8	24.9
190	61.9	16.6	440	77.5	25.3
200	62.4	16.9	450	78.1	25.6
210	63.0	17.2	460	78.6	25.9
220	63.5	17.5	470	79.3	26.3
230	64.4	18.0	480	79.9	26.6
240	64.9	18.3	490	80.4	26.9
250	65.5	18.6	500	81.0	27.2

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-12

8/1/79



TEMPERATURE LOG

S-GV-79-12

T. 31 N., R. 39 E., SW 1/4 of SE 1/4, Sec. 28

9/24/79 12:00 PM

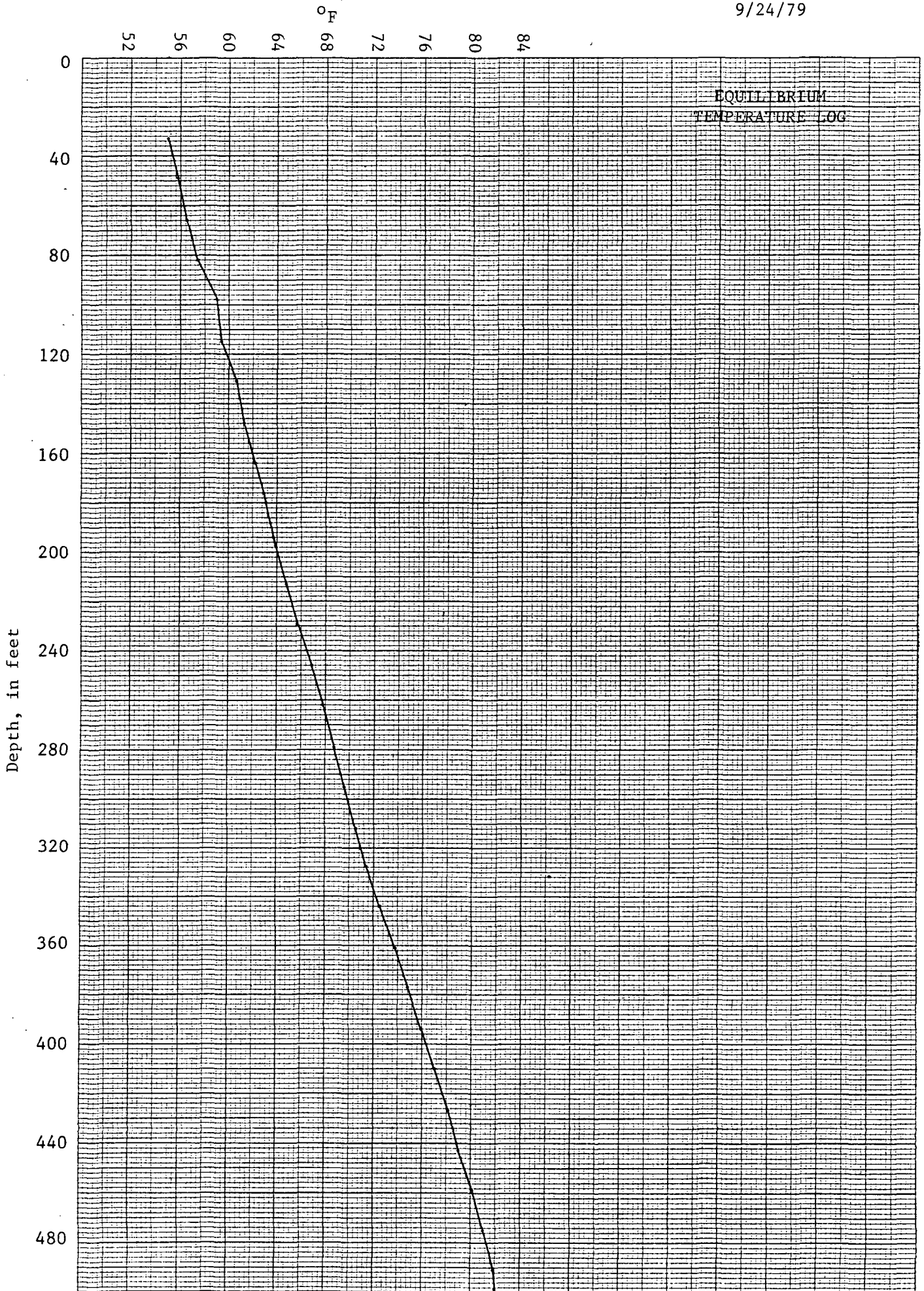
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	55.0	12.8
49	55.8	13.2
66	56.5	13.6
82	57.4	14.1
98	58.8	14.9
115	59.4	15.2
131	60.6	15.9
148	61.3	16.3
164	62.2	16.8
180	63.1	17.3
197	63.9	17.7
213	64.8	18.2
230	65.8	18.8
246	66.9	19.4
262	67.8	19.9
279	68.7	20.4
295	69.6	20.9
312	70.5	21.4
328	71.4	21.9
344	72.5	22.5
361	73.8	23.2
377	74.8	23.8
394	75.9	24.4
410	77.0	25.0
427	78.1	25.6
443	79.0	26.1
459	80.1	26.7
475	81.0	27.2
492	81.9	27.7
499	82.0	27.8

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-12

9/24/79



TEMPERATURE LOG

S-GV-79-13

T. 31 N., R. 39 E., NE 1/4 of SE 1/4, Sec. 33

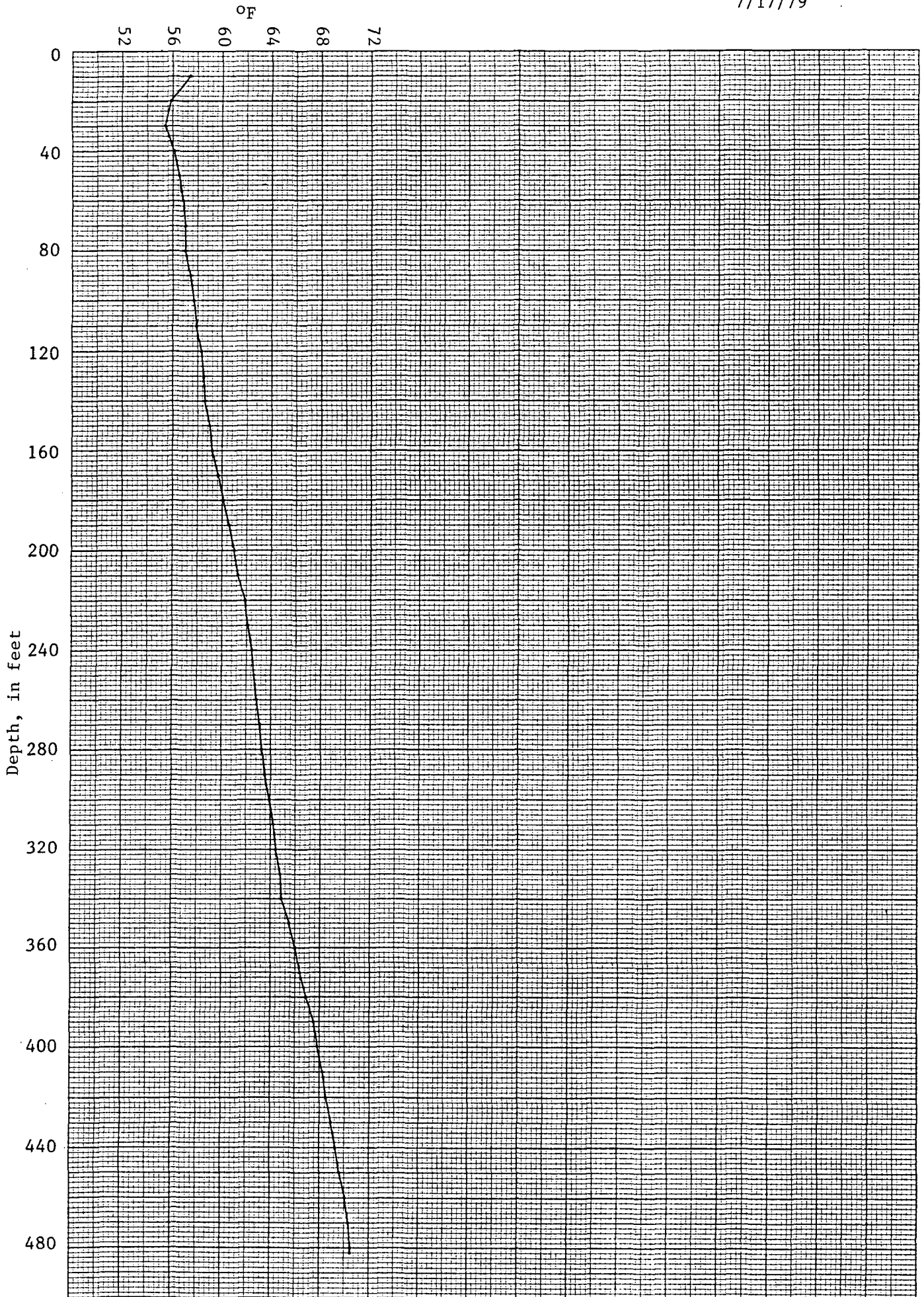
7/17/79 5:57 AM

Logged by GeothermEx, Inc.,

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	57.4	14.1	250	62.6	17.0
20	55.9	13.3	260	62.8	17.1
30	55.4	13.0	270	63.1	17.3
40	56.1	13.4	280	63.3	17.4
50	56.5	13.6	290	63.5	17.5
60	56.8	13.8	300	63.9	17.7
70	57.0	13.9	310	64.2	17.9
80	57.0	13.9	320	64.4	18.0
90	57.4	14.1	330	64.8	18.2
100	57.7	14.3	340	64.9	18.3
110	57.9	14.4	350	65.5	18.6
120	58.3	14.6	360	66.0	18.9
130	58.5	14.7	370	66.4	19.1
140	58.6	14.8	380	66.9	19.4
150	59.0	15.0	390	67.5	19.7
160	59.2	15.1	400	67.8	19.9
170	59.7	15.4	410	68.2	20.1
180	60.1	15.6	420	68.5	20.3
190	60.6	15.9	430	68.9	20.5
200	61.0	16.1	440	69.3	20.7
210	61.3	16.3	450	69.6	20.9
220	61.9	16.6	460	70.0	21.1
230	62.1	16.7	470	70.3	21.3
240	62.4	16.9	480	70.5	21.4
			482	70.5	21.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-13
7/17/79



TEMPERATURE LOG

S-GV-79-13

T. 31 N., R. 39 E., NE 1/4 of SE 1/4, Sec. 33

8/3/79 9:00 AM

Logged by GeothermEx, Inc.

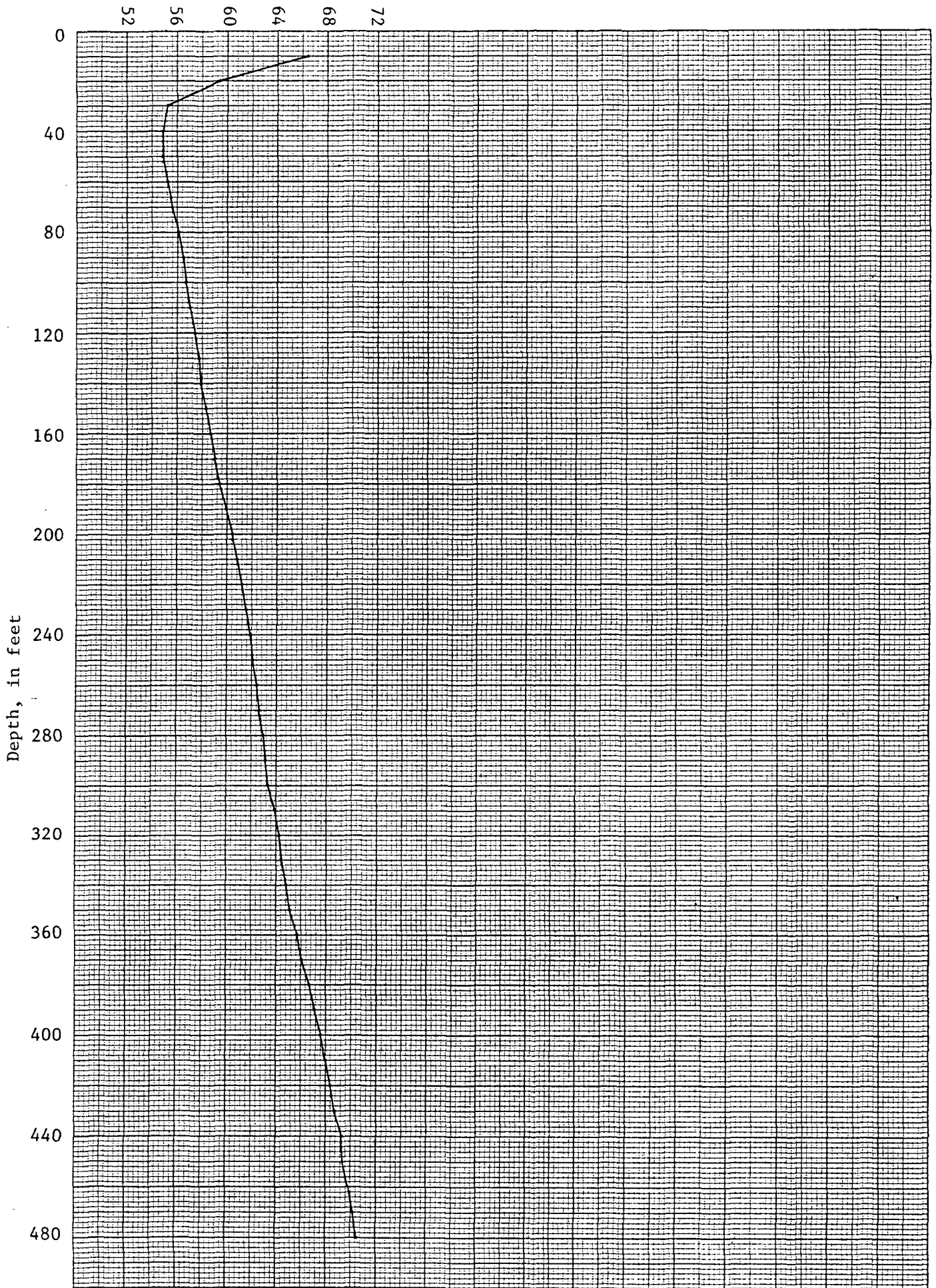
<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	66.4	19.1	250	62.1	16.7
20	59.4	15.2	260	62.4	16.9
30	55.2	12.9	270	62.6	17.0
40	54.9	12.7	280	63.0	17.2
50	54.9	12.7	290	63.1	17.3
60	55.2	12.9	300	63.5	17.5
70	55.6	13.1	310	63.9	17.7
80	56.1	13.4	320	64.2	17.9
90	56.5	13.6	330	64.4	18.0
100	56.7	13.7	340	64.8	18.2
110	57.0	13.9	350	65.1	18.4
120	57.4	14.1	360	65.7	18.7
130	57.7	14.3	370	66.0	18.9
140	57.9	14.4	380	66.7	19.3
150	58.3	14.6	390	67.1	19.5
160	58.6	14.8	400	67.6	19.8
170	59.0	15.0	410	68.0	20.0
180	59.4	15.2	420	68.4	20.2
190	59.9	15.5	430	68.7	20.4
200	60.4	15.8	440	69.3	20.7
210	60.8	16.0	450	69.4	20.8
220	61.2	16.2	460	69.8	21.0
230	61.5	16.4	470	70.2	21.2
240	61.9	16.6	480	70.5	21.4

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-13

8/3/79

°F



TEMPERATURE LOG

S-GV-79-13

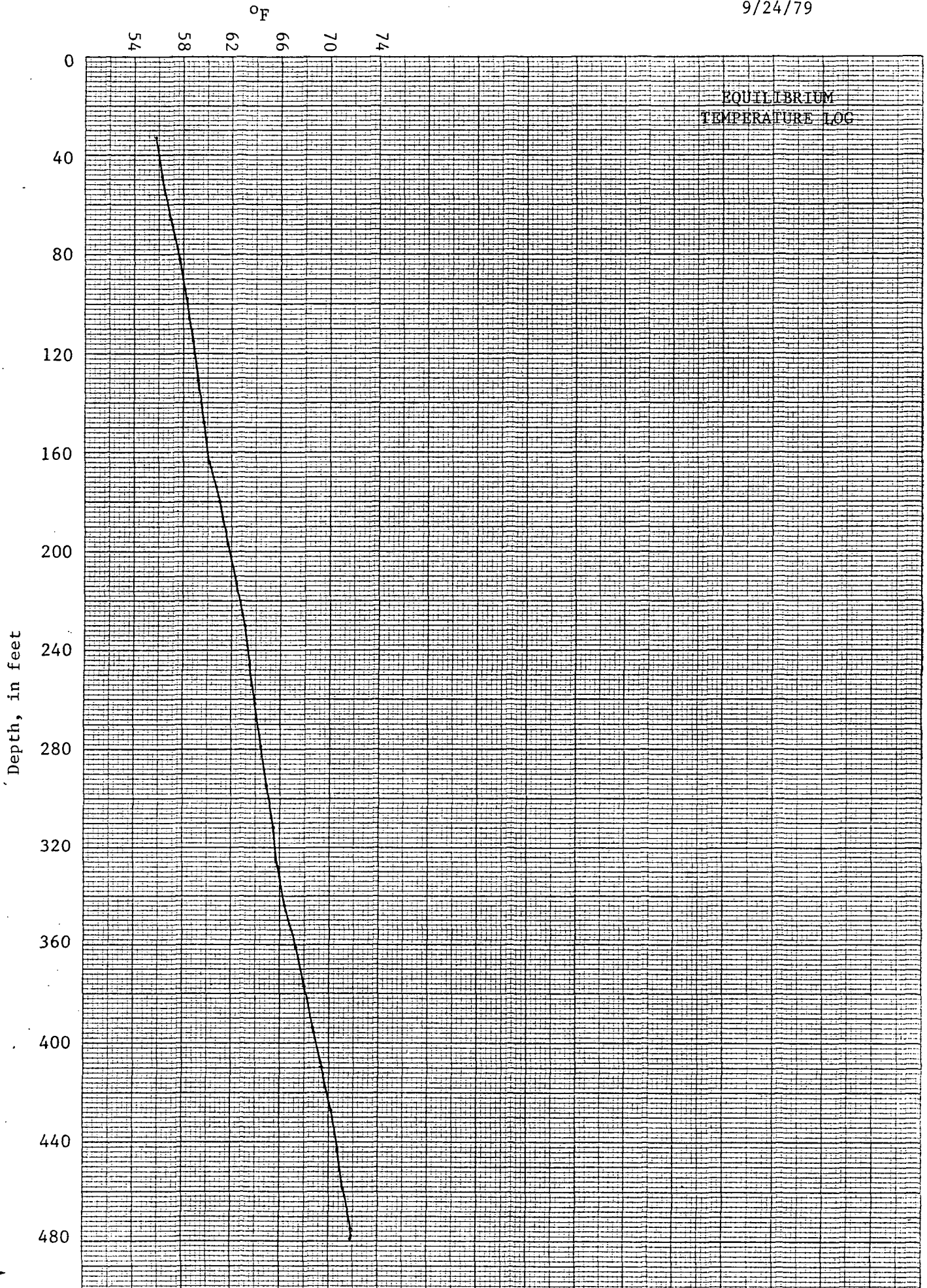
T. 31 N., R. 39 E., NE 1/4 of SE 1/4, Sec. 33

9/24/79 9:30 AM
Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
33	55.8	13.2
49	56.3	13.5
66	57.0	13.9
82	57.7	14.3
98	58.3	14.6
115	58.8	14.9
131	59.2	15.1
148	59.7	15.4
164	60.1	15.6
180	61.0	16.1
197	61.7	16.5
213	62.4	16.9
230	63.1	17.3
246	63.5	17.5
262	64.0	17.8
279	64.4	18.0
295	64.9	18.3
312	65.5	18.6
328	65.8	18.8
344	66.4	19.1
361	67.3	19.6
377	68.0	20.0
394	68.7	20.4
410	69.4	20.8
427	70.2	21.2
443	70.7	21.5
459	71.2	21.8
475	71.8	22.1
479	71.8	22.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-13
9/24/79



EQUILIBRIUM
TEMPERATURE LOG

TEMPERATURE LOG

S-GV-79-14

T. 30 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 4

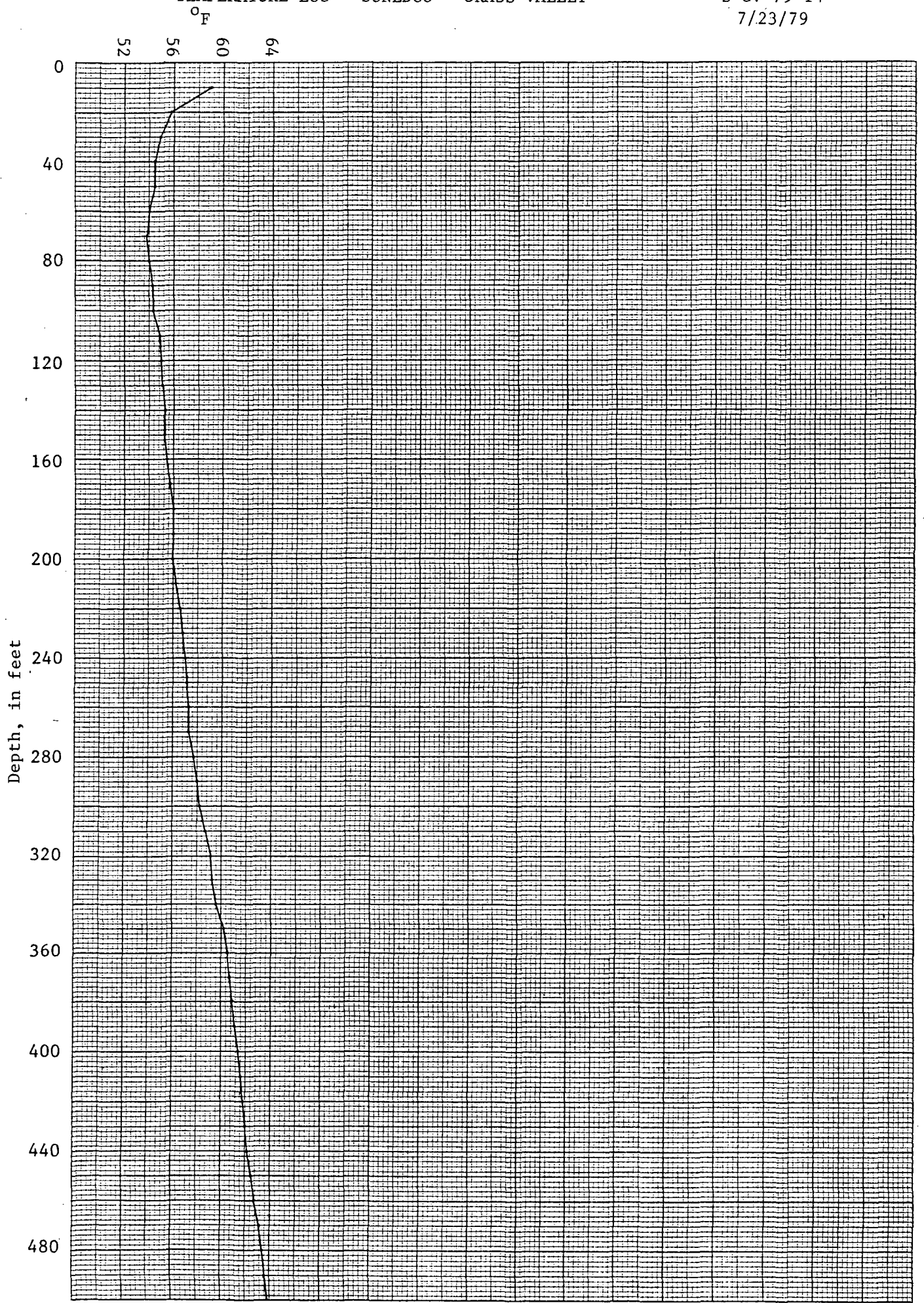
7/23/79 4:03 PM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	59.0	15.0	260	56.3	13.5
20	55.8	13.2	270	56.3	13.5
30	54.9	12.7	280	56.7	13.7
40	54.5	12.5	290	57.0	13.9
50	54.5	12.5	300	57.2	14.0
60	54.0	12.2	310	57.7	14.3
70	53.8	12.1	320	58.1	14.5
80	54.0	12.2	330	58.3	14.6
90	54.3	12.4	340	58.6	14.8
100	54.3	12.4	350	59.2	15.1
110	54.9	12.7	360	59.5	15.3
120	54.0	12.2	370	59.7	15.4
130	54.1	12.3	380	59.9	15.5
140	54.3	12.4	390	60.1	15.6
150	54.3	12.4	400	60.4	15.8
160	54.5	12.5	410	60.6	15.9
170	54.7	12.6	420	60.8	16.0
180	55.0	12.8	430	61.0	16.1
190	55.0	12.8	440	61.2	16.2
200	55.0	12.8	450	61.5	16.4
210	55.2	12.9	460	61.7	16.5
220	55.6	13.1	470	62.1	16.7
230	55.8	13.2	480	62.4	16.9
240	56.0	13.3	490	62.6	17.0
250	56.1	13.4	500	62.8	17.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-14

7/23/79



TEMPERATURE LOG

S-GV-79-14

T. 30 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 4

8/1/79 1:22 PM

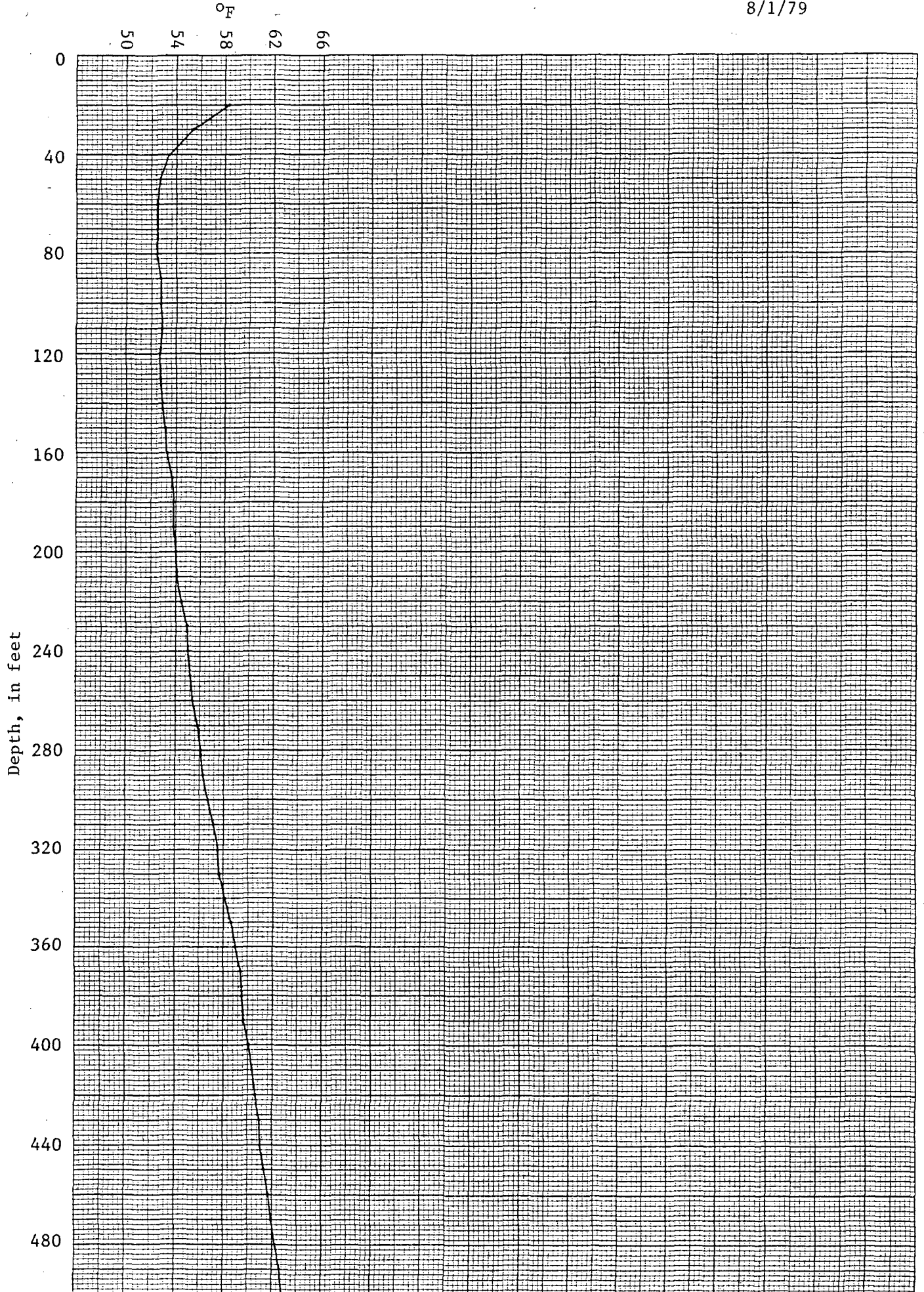
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	64.6	18.1	260	55.4	13.0
20	58.3	14.6	270	55.8	13.2
30	55.4	13.0	280	56.1	13.4
40	53.4	11.9	290	56.3	13.5
50	52.7	11.5	300	56.7	13.7
60	52.5	11.4	310	57.2	14.0
70	52.5	11.4	320	57.6	14.2
80	52.5	11.4	330	57.7	14.3
90	52.7	11.5	340	58.1	14.5
100	52.7	11.5	350	58.6	14.8
110	52.9	11.6	360	59.0	15.0
120	52.7	11.5	370	59.4	15.2
130	52.7	11.5	380	59.5	15.3
140	52.9	11.6	390	59.9	15.5
150	53.1	11.7	400	60.1	15.6
160	53.2	11.8	410	60.3	15.7
170	53.6	12.0	420	60.6	15.9
180	53.8	12.1	430	61.0	16.0
190	53.8	12.1	440	61.0	16.1
200	54.0	12.2	450	61.3	16.3
210	54.1	12.3	460	61.7	16.5
220	54.5	12.5	470	61.9	16.6
230	54.9	12.7	480	62.2	16.8
240	55.0	12.8	490	62.6	17.0
250	55.2	12.9	500	62.8	17.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-14

8/1/79



TEMPERATURE LOG

S-GV-79-14

T. 30 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 4

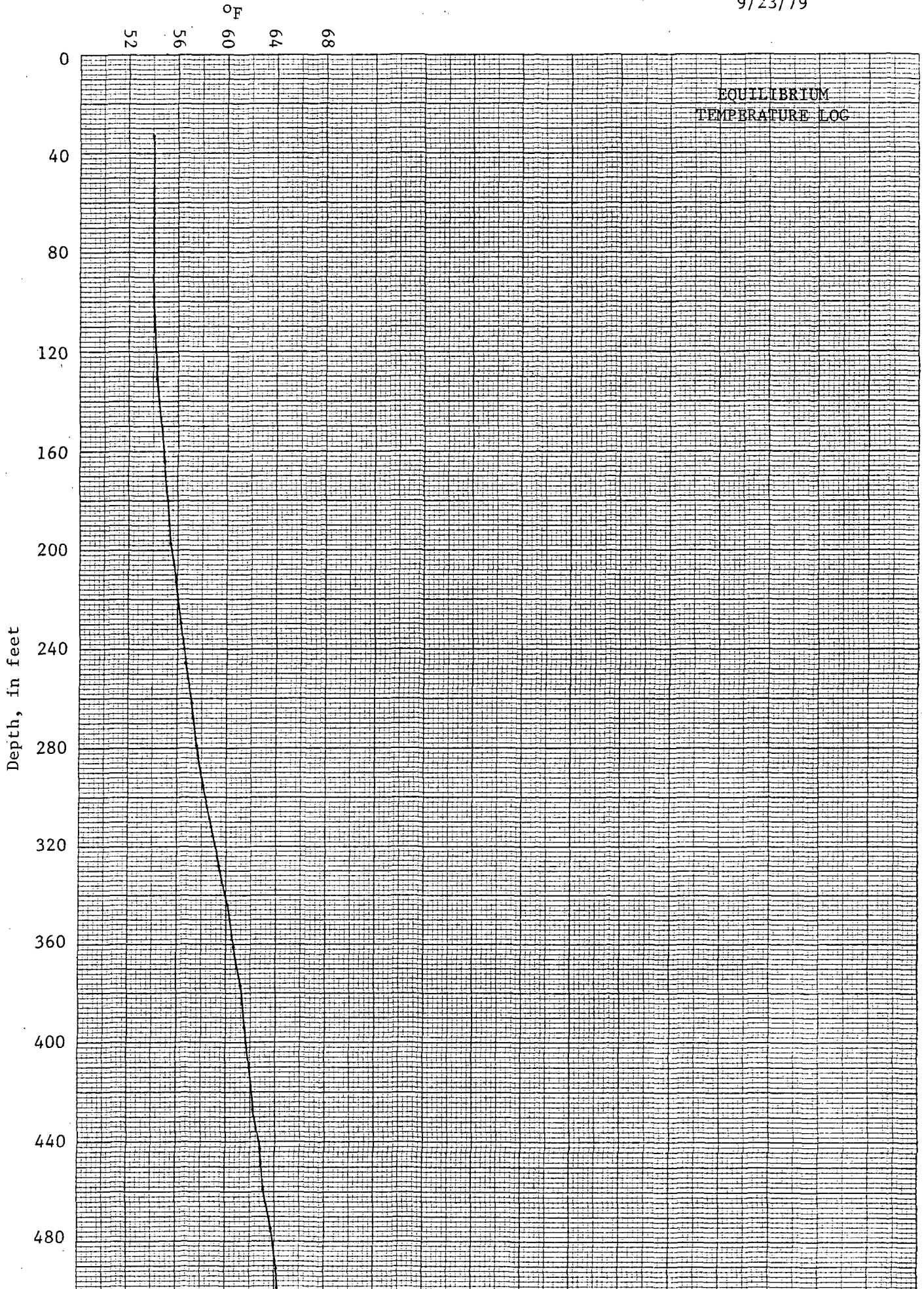
9/23/79 6:00 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	54.0	12.2
66	54.0	12.2
98	54.0	12.2
131	54.3	12.4
164	54.9	12.7
180	55.2	12.9
197	55.4	13.0
213	55.9	13.3
230	56.3	13.5
246	56.7	13.7
262	57.2	14.0
279	57.6	14.2
295	58.1	14.5
312	58.8	14.9
328	59.4	15.2
344	60.1	15.6
361	60.6	15.9
377	61.2	16.2
394	61.5	16.4
410	61.9	16.6
427	62.2	16.8
443	62.8	17.1
459	63.1	17.3
475	63.7	17.6
492	64.2	17.9
499	64.2	17.9

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-14
9/23/79



TEMPERATURE LOG

S-GV-79-15

T. 30 N., R. 39 E., NW 1/4 of SE 1/4, Sec. 3

7/28/79 5:23 PM

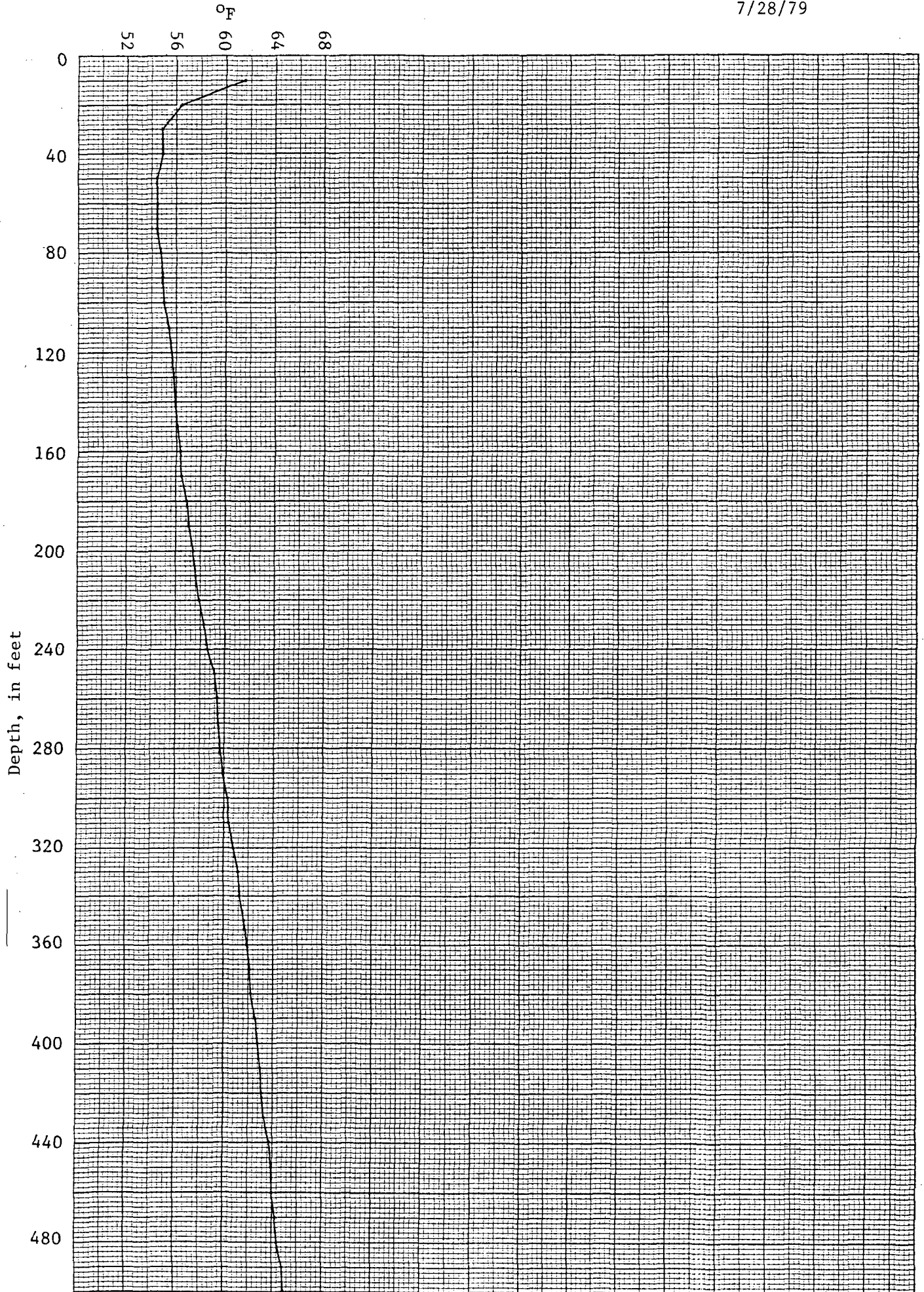
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	61.5	16.4	260	59.4	15.2
20	56.5	13.6	270	59.5	15.3
30	54.9	12.7	280	59.7	15.4
40	54.9	12.7	290	59.9	15.5
50	54.5	12.5	300	60.3	15.7
60	54.5	12.5	310	60.4	15.8
70	54.5	12.5	320	60.8	16.0
80	54.7	12.6	330	61.2	16.2
90	54.9	12.7	340	61.3	16.3
100	55.0	12.8	350	61.7	16.5
110	55.4	13.0	360	61.9	16.6
120	55.6	13.1	370	62.1	16.7
130	55.8	13.2	380	62.2	16.8
140	55.9	13.3	390	62.6	17.0
150	56.1	13.4	400	62.8	17.1
160	56.3	13.5	410	63.0	17.2
170	56.5	13.6	420	63.1	17.3
180	56.9	13.8	430	63.3	17.4
190	57.0	13.9	440	63.7	17.6
200	57.4	14.1	450	63.9	17.7
210	57.6	14.2	460	64.0	17.8
220	57.9	14.4	470	64.2	17.9
230	58.3	14.6	480	64.4	18.0
240	58.6	14.8	490	64.8	18.2
250	59.2	15.1	500	64.9	18.3

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-15

7/28/79



TEMPERATURE LOG

S-GV-79-15

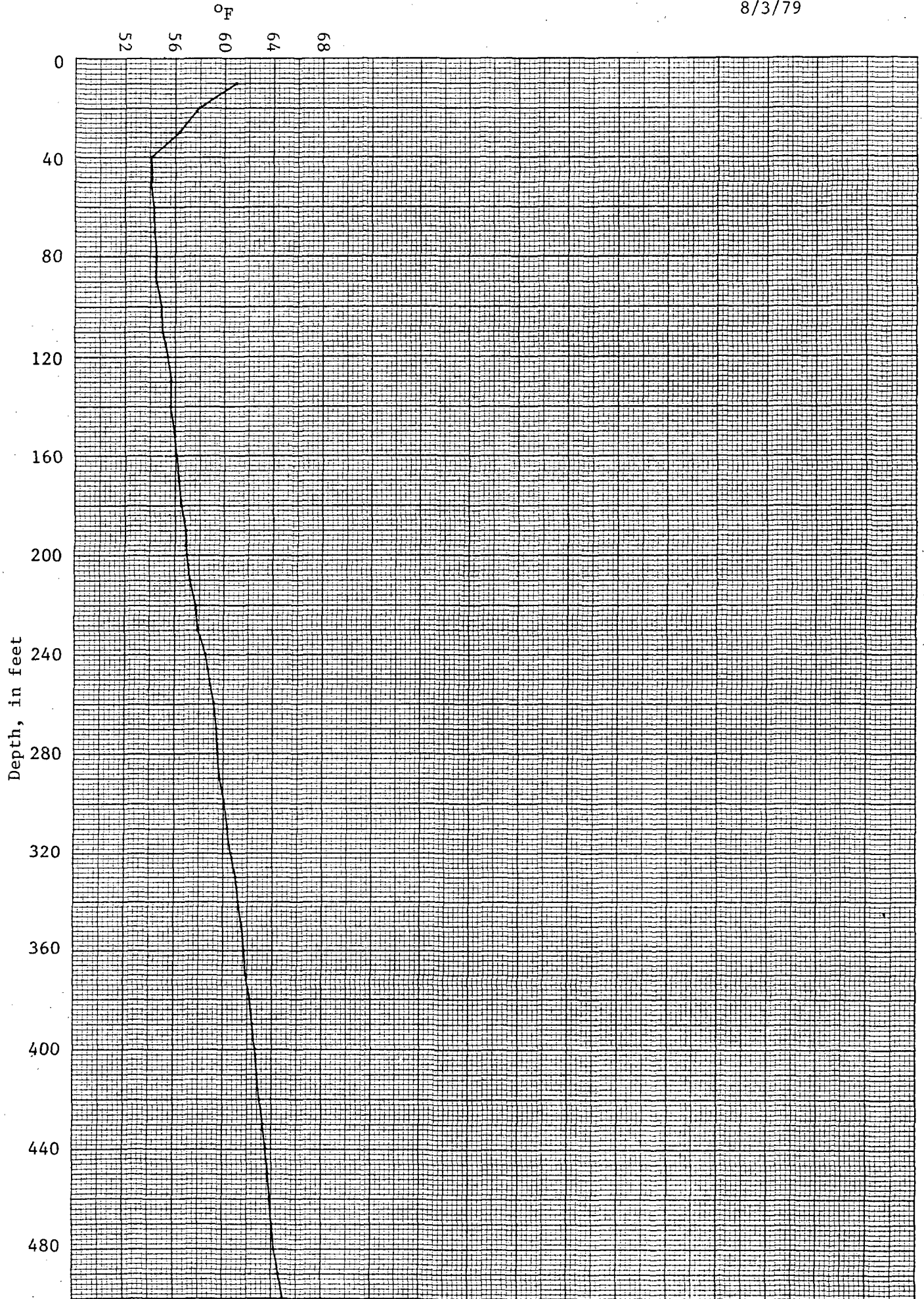
T. 30 N., R. 39 E., NW 1/4 of SE 1/4, Sec. 3

8/3/79 10:15 AM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
10	61.0	16.1	260	59.2	15.1
20	57.9	14.4	270	59.4	15.2
30	56.3	13.5	280	59.5	15.3
40	54.1	12.3	290	59.7	15.4
50	54.1	12.3	300	60.1	15.6
60	54.3	12.4	310	60.3	15.7
70	54.3	12.4	320	60.6	15.9
80	54.5	12.5	330	61.0	16.1
90	54.5	12.5	340	61.2	16.2
100	54.9	12.7	350	61.5	16.4
110	55.0	12.8	360	61.7	16.5
120	55.4	13.0	370	61.9	16.6
130	55.6	13.1	380	62.2	16.8
140	55.6	13.1	390	62.4	16.9
150	55.9	13.3	400	62.6	17.0
160	56.1	13.4	410	62.8	17.1
170	56.3	13.5	420	63.0	17.2
180	56.5	13.6	430	63.3	17.4
190	56.8	13.8	440	63.5	17.5
200	57.0	13.9	450	63.7	17.6
210	57.2	14.0	460	63.9	17.7
220	57.7	14.3	470	64.0	17.8
230	58.1	14.5	480	64.2	17.9
240	58.5	14.7	490	64.6	18.1
250	58.8	14.9	500	64.9	18.3

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-15
8/3/79



TEMPERATURE LOG

S-GV-79-15

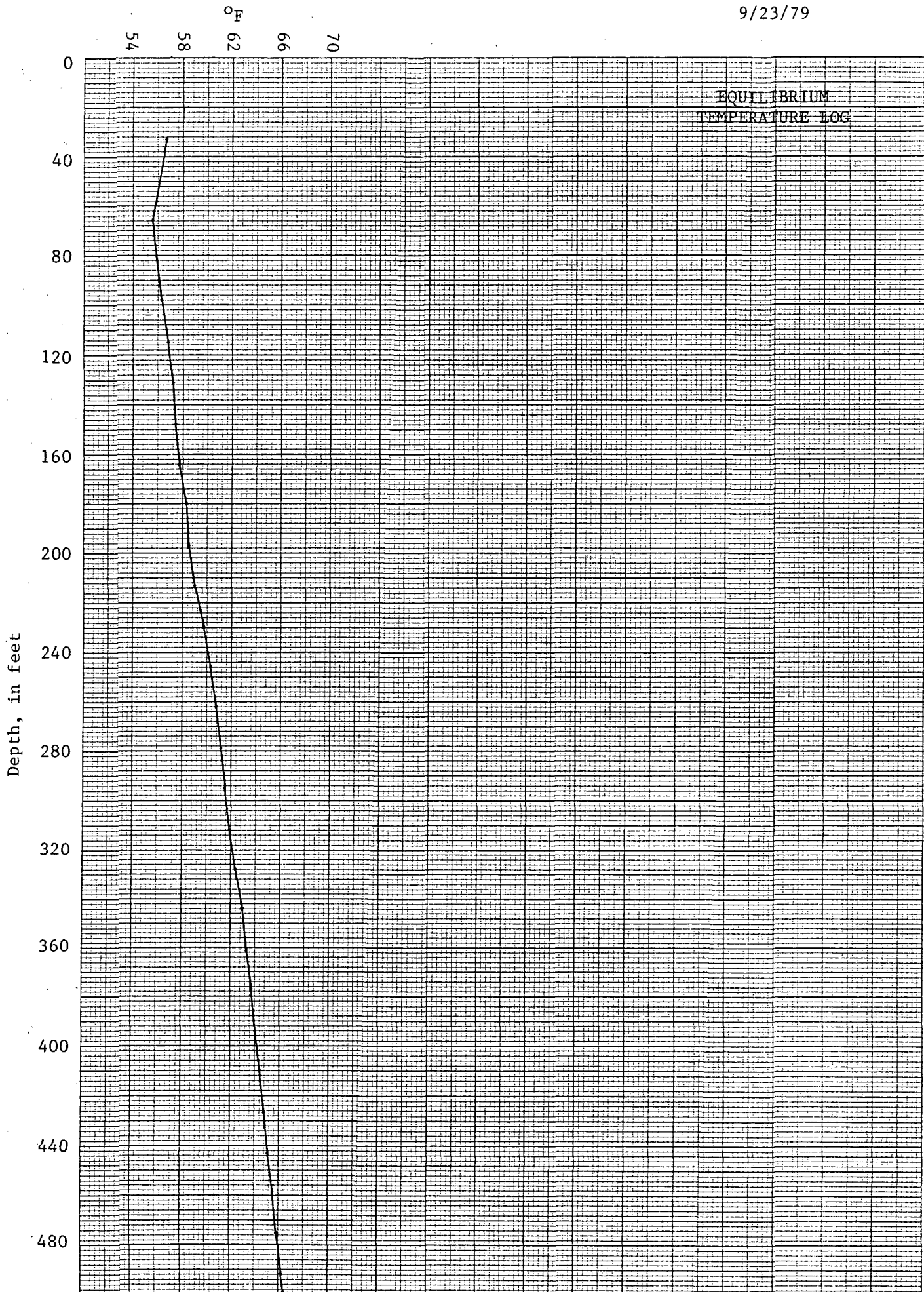
T. 30 N., R. 39 E., NW 1/4 of SE 1/4, Sec. 3

9/23/79 4:00 PM
Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	56.7	13.7
66	55.6	13.1
82	55.9	13.3
98	56.3	13.5
115	56.8	13.8
131	57.2	14.0
148	57.4	14.1
164	57.7	14.3
180	58.3	14.6
197	58.5	14.7
213	59.0	15.0
230	59.7	15.4
246	60.3	15.7
262	60.8	16.0
279	61.2	16.2
295	61.5	16.4
312	61.9	16.6
328	62.4	16.9
344	63.0	17.2
361	63.3	17.4
377	63.7	17.6
394	64.0	17.8
410	64.4	18.0
427	64.8	18.2
443	65.1	18.4
459	65.5	18.6
475	65.8	18.8
492	66.2	19.0
499	66.4	19.1

TEMPERATURE LOG - SUNEDCO - GRASS VALLEY

S-GV-79-15
9/23/79



EQUILIBRIUM
TEMPERATURE LOG

JAMES B. KOENIG (415) 524-9242
MURRAY C. GARDNER (503) 482-2605

APPENDIX D.

Temperature logs of intermediate-depth (360-457 m)
temperature-gradient holes.

TEMPERATURE LOG

S-GV-79-105

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 6

8/30/79 9:00 AM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
16	61.7	16.5	525	134.6	57.0
33	64.2	17.9	558	138.2	59.0
49	66.4	19.1	591	142.5	61.4
66	68.2	20.1	623	145.2	62.9
82	70.3	21.3	656	149.9	65.5
98	74.1	23.4	689	155.1	68.4
115	77.2	25.1	722	157.6	69.8
131	78.8	26.0	754	161.4	71.9
148	81.7	27.6	787	164.7	73.7
164	84.0	28.9	820	167.5	75.3
180	86.9	30.5	853	170.2	76.8
197	88.9	31.6	886	172.6	78.1
230	94.1	34.5	919	176.7	80.4
262	99.1	37.3	951	181.0	82.8
295	103.8	39.9	984	186.1	85.6
328	108.1	42.3	1,017	192.2	89.0
361	112.5	44.7	1,050	196.5	91.4
394	117.5	47.5	1,083	199.4	93.0
427	122.0	50.0	1,115	201.0	93.9
459	126.1	52.3	1,132	201.4	94.1
492	130.3	54.6	1,148	201.0	93.9

TEMPERATURE LOG

S-GV-79-105

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 6

9/6/79 11:30 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	63.1	17.3	754	162.4	72.5
66	67.5	19.7	787	165.6	74.2
82	69.4	20.8	820	168.5	75.8
98	72.7	22.6	853	171.1	77.3
131	78.0	25.6	869	172.5	78.1
164	83.0	28.3	886	173.9	78.8
197	88.5	31.4	902	176.0	80.0
230	93.5	34.1	919	178.2	81.2
262	98.7	37.1	935	180.5	82.5
295	103.6	39.8	951	182.8	83.8
328	108.2	42.4	968	185.2	85.1
361	113.1	45.0	984	187.7	86.5
394	117.8	47.7	1,001	190.3	87.9
427	122.5	50.3	1,017	193.1	89.5
459	126.8	52.7	1,033	195.3	90.7
492	131.3	55.1	1,050	197.5	92.0
525	135.6	57.5	1,066	199.0	92.8
558	139.0	59.4	1,083	200.2	93.5
591	143.0	61.7	1,099	201.3	94.1
623	146.3	63.5	1,115	201.6	94.2
656	151.1	66.2	1,132	201.7	94.3
689	156.0	68.9	1,148	201.6	94.2
722	158.6	70.4	1,158	201.6	94.2

TEMPERATURE LOG

S-GV-79-105

T. 31 N., R. 39 E., SW 1/4 of NW 1/4, Sec. 6

9/30/79 10:00 AM

Logged by GeothermEx, Inc.

<u>Depth, in feet</u>	<u>°F</u>	<u>°C</u>
66	66.2	19.0
98	71.1	21.7
131	77.0	25.0
164	81.9	27.7
197	87.6	30.9
230	93.0	33.9
262	98.2	36.8
295	103.3	39.6
328	108.0	42.2
361	112.8	44.9
394	117.9	47.7
427	122.5	50.3
459	127.0	52.8
492	131.5	55.3
525	136.0	57.8
558	139.5	59.7
591	143.1	61.7
623	147.0	63.9
656	151.9	66.6
689	156.7	69.3
722	159.4	70.8
755	163.6	73.1
787	166.5	74.7
820	169.3	76.3
853	171.9	77.7
886	174.9	79.4
919	178.9	81.6
951	183.9	84.4
984	189.1	87.3
1,017	194.4	90.2
1,050	198.7	92.6
1,066	200.1	93.4
1,083	201.0	93.9
1,099	202.1	94.5
1,115	202.5	94.7
1,132	202.1	94.5
1,145	201.4	94.1
1,158	201.4	94.1

TEMPERATURE LOG

S-GV-79-106

T. 31 N., R. 38 E., NW 1/4 of SE 1/4, Sec. 18

9/7/79 3:45 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	57.7	14.3	787	66.4	19.1
66	58.3	14.6	820	66.9	19.4
98	59.7	15.4	853	67.6	19.8
131	58.8	14.9	886	68.4	20.2
164	58.3	14.6	919	69.1	20.6
197	58.6	14.8	951	69.8	21.0
230	59.0	15.0	984	70.5	21.4
262	59.4	15.2	1,017	71.2	21.8
295	59.7	15.4	1,050	72.0	22.2
328	60.1	15.6	1,083	72.7	22.6
361	60.4	15.8	1,115	73.6	23.1
394	60.6	15.9	1,148	74.5	23.6
427	61.0	16.1	1,181	75.4	24.1
459	61.3	16.3	1,214	76.3	24.6
492	61.9	16.6	1,247	77.2	25.1
525	62.2	16.8	1,280	78.1	25.6
558	62.8	17.1	1,312	79.0	26.1
591	63.1	17.3	1,345	80.1	26.7
623	63.7	17.6	1,378	81.1	27.3
656	64.2	17.9	1,411	82.2	27.9
689	64.8	18.2	1,444	83.5	28.6
722	65.1	18.4	1,476	84.6	29.2
754	66.2	19.0	1,493	84.9	29.4

TEMPERATURE LOG

S-GV-79-106

T. 31 N., R. 38 E., NW 1/4 of SE 1/4, Sec. 18

9/13/79 1:15 PM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	55.0	12.8	787	66.0	18.9
66	55.8	13.2	820	66.6	19.2
98	56.5	13.6	853	67.5	19.7
131	57.6	14.2	886	68.4	20.2
164	56.7	13.7	919	69.3	20.7
197	57.0	13.9	951	69.8	21.0
230	57.6	14.2	984	70.5	21.4
262	57.9	14.4	1,017	71.4	21.9
295	58.3	14.6	1,050	72.1	22.3
328	58.8	14.9	1,083	73.0	22.8
361	59.4	15.2	1,115	73.9	23.3
394	59.5	15.3	1,181	74.8	23.8
427	60.1	15.6	1,214	75.0	23.9
459	60.4	15.8	1,247	76.6	24.8
492	61.0	16.1	1,280	77.5	25.3
525	61.3	16.3	1,312	79.5	26.4
558	61.9	16.6	1,345	80.6	27.0
591	62.4	16.9	1,378	81.7	27.6
623	63.1	17.3	1,411	82.8	28.2
656	63.5	17.5	1,444	83.8	28.8
689	64.2	17.9	1,476	85.1	29.5
722	64.8	18.2	1,493	85.1	29.5
755	65.3	18.5			

TEMPERATURE LOG

S-GV-79-106

T. 31 N., R. 38 E., NW 1/4 of SE 1/4, Sec. 18

9/30/79 7:45 AM
 Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	54.9	12.7	820	66.7	19.3
98	55.4	13.0	853	67.6	19.8
131	55.8	13.2	886	68.5	20.3
164	56.1	13.4	919	69.3	20.7
197	56.7	13.7	951	70.0	21.1
230	57.0	13.9	984	70.7	21.5
262	57.6	14.2	1,017	71.6	22.0
295	57.9	14.4	1,050	72.3	22.4
328	58.6	14.8	1,083	73.2	22.9
361	59.0	15.0	1,115	74.1	23.4
394	59.4	15.2	1,148	75.0	23.9
427	59.9	15.5	1,181	75.9	24.4
459	60.3	15.7	1,214	76.6	24.8
492	60.8	16.0	1,247	77.7	25.4
525	61.3	16.3	1,280	78.8	26.0
558	61.9	16.6	1,312	79.7	26.5
591	62.2	16.8	1,345	80.8	27.1
623	63.0	17.2	1,378	81.9	27.7
656	63.5	17.5	1,411	82.9	28.3
689	64.0	17.8	1,444	84.2	29.0
722	64.6	18.1	1,476	85.3	29.6
755	65.3	18.5	1,493	85.3	29.6

TEMPERATURE LOG

S-GV-79-108

T. 31 N., R. 39 E., NE 1/4 of SW 1/4, Sec. 27

8/12/79 8:45 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	61.5	16.4	754	104.9	40.5
66	64.8	18.2	787	106.9	41.6
131	70.2	21.2	820	108.7	42.6
164	71.6	22.0	853	110.5	43.6
197	73.8	23.2	886	112.5	44.7
213	74.7	23.7	919	114.3	45.7
230	75.6	24.2	951	116.1	46.7
246	76.6	24.8	984	117.9	47.7
262	77.4	25.2	1,017	119.7	48.7
279	78.6	25.9	1,050	121.5	49.7
295	79.3	26.3	1,083	123.3	50.7
312	80.4	26.9	1,115	125.2	51.8
328	81.5	27.5	1,148	127.0	52.8
427	84.9	29.4	1,181	128.8	53.8
459	86.9	30.5	1,214	130.8	54.9
492	90.1	32.3	1,247	132.6	55.9
525	92.1	33.4	1,280	134.4	56.0
558	93.9	34.4	1,312	136.4	58.0
591	95.7	35.4	1,345	138.4	59.1
623	97.3	36.3	1,378	140.2	60.1
656	99.3	37.4	1,411	142.2	61.2
689	101.1	38.4	1,444	144.0	62.2
722	103.1	39.5	1,460	144.0	62.2

TEMPERATURE LOG

S-GV-79-108

T. 31 N., R. 39 E., NE 1/4 of SW 1/4, Sec. 27

8/18/79 4:00 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
66	62.8	17.1	591	95.7	35.4
82	65.1	18.4	623	97.7	36.5
98	66.0	18.9	656	99.5	37.5
115	67.8	19.9	689	101.5	38.6
131	69.1	20.6	722	103.3	39.6
148	69.8	21.0	754	105.3	40.7
164	70.9	21.6	787	107.1	41.7
180	71.8	22.1	820	109.0	42.8
197	72.7	22.6	853	110.8	43.8
213	73.8	23.2	886	112.6	44.8
230	74.7	23.7	919	114.6	45.9
262	76.8	24.9	951	116.4	46.9
279	77.9	25.5	984	118.2	47.9
295	78.8	26.0	1,017	120.0	48.9
312	79.9	26.6	1,050	121.8	49.9
328	81.0	27.2	1,083	123.8	51.0
344	81.7	27.6	1,115	125.6	52.0
361	82.8	28.2	1,148	127.4	53.0
377	84.0	28.9	1,181	129.2	54.0
394	84.9	29.4	1,214	131.2	55.1
410	85.5	29.7	1,247	133.0	56.1
427	86.4	30.2	1,280	134.8	57.1
459	88.3	31.3	1,312	136.8	58.2
492	90.1	32.3	1,345	138.6	59.2
509	91.0	32.8	1,378	140.5	60.3
525	91.8	33.2	1,411	142.3	61.3
558	93.9	34.4	1,444	144.1	62.3

TEMPERATURE LOG

S-GV-79-108

T. 31 N., R. 39 E., NE 1/4 of SW 1/4, Sec. 27

9/3/79 9:30 AM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	60.3	15.7	754	105.3	40.7
66	62.6	17.0	787	107.2	41.8
98	65.1	18.4	820	109.0	42.8
131	67.6	19.8	853	111.2	44.0
164	70.2	21.2	886	113.0	45.0
197	72.1	22.3	919	114.8	46.0
230	74.3	23.5	951	116.6	47.0
262	76.3	24.6	984	118.6	48.1
295	78.4	25.8	1,017	120.4	49.1
328	80.8	27.1	1,050	122.2	50.1
361	82.4	28.0	1,083	124.0	51.1
394	84.7	29.3	1,115	125.8	52.1
427	86.2	30.1	1,148	127.6	53.1
459	88.3	31.3	1,181	129.4	54.1
492	90.1	32.3	1,214	131.4	55.2
525	91.9	33.3	1,247	133.2	56.2
558	93.9	34.4	1,280	135.0	57.2
591	95.7	35.4	1,312	136.9	58.3
623	97.8	36.6	1,345	138.7	59.3
656	99.7	37.6	1,378	140.5	60.3
689	101.5	38.6	1,411	142.3	61.3
722	103.5	39.7	1,444	144.1	62.3

TEMPERATURE LOG

S-GV-79-108

T. 31 N., R. 39 E., NE 1/4 of SW 1/4, Sec. 27

9/20/79 2:30 PM

Logged by GeothermEx, Inc.

<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>	<u>Depth,</u> <u>in feet</u>	<u>°F</u>	<u>°C</u>
33	59.9	15.5	755	105.4	40.8
66	62.2	16.8	787	107.4	41.9
98	64.6	18.1	820	109.2	42.9
131	67.6	19.8	853	111.2	44.0
164	69.8	21.0	886	113.0	45.0
197	72.0	22.2	919	114.8	46.0
230	74.1	23.4	951	116.8	47.1
262	76.3	24.6	984	118.6	48.1
295	78.3	25.7	1,017	120.6	49.2
328	80.6	27.0	1,050	122.4	50.2
361	82.4	28.0	1,083	124.2	51.2
394	84.7	29.3	1,115	126.0	52.2
427	86.2	30.1	1,148	127.8	53.2
459	88.2	31.2	1,181	129.6	54.2
492	90.0	32.2	1,214	131.4	55.2
525	91.9	33.3	1,247	133.3	56.3
558	93.9	34.4	1,280	135.1	57.3
591	95.9	35.5	1,312	137.1	58.4
623	97.9	36.6	1,345	138.9	59.4
656	99.7	37.6	1,375	140.7	60.4
689	101.7	38.7	1,411	142.5	61.4
722	103.5	39.7	1,444	144.1	62.3