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Technical Report
for
Aquifer Testing
at the
Old Rifle Range and Demolition Range

Naval Surface Warfare Center
Crane Division
Crane, Indiana

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888

Contract Task Order 0038

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TECHNICAL REPORT
FOR
AQUIFER TESTING
AT THE
OLD RIFLE RANGE AND DEMOLITION RANGE

NAVAL SURFACE WARFARE CENTER, CRANE DIVISION
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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1.0 SCOPE AND PURPOSE

This report presents the results of the aquifer testing at the Demolition Range (DR) and Old Rifle Range (ORR) at the Naval Surface Warfare Center (NSWC), Crane, Indiana (Figures 1 and 2). The purpose of the testing was to provide estimates of hydraulic conductivity for the bedrock aquifers underlying the sites. The hydraulic conductivities will be used to estimate groundwater flow rates across the sites.

The aquifer testing involved conducting slug tests in 41 monitoring wells. The monitoring wells were screened in four bedrock aquifers, which were identified during the RCRA facility investigation (RFI) and previous studies (Murphy and Wade, 1998; Dunbar, 1982 and 1984) a the Mansfield Formation, the Haney Limestone, the Upper Big Clifty Formation, and the Big Clifty and Beech Creek Formations. The following monitoring wells were tested for each aquifer:

- Mansfield Formation: 06-01A, 06-07, and 06C01P3
- Haney Limetsone: 06-21, 06C03P2, 06C04P2, and 06C16P3
- Big Clifty (Upper): 06-15, 06-16, 06-17, 06-18, 06-20, 06-22, 06-23, 06C06P2, 06C10P2, 06C11P2, 06C12P2, 06C13P2, 06C14P2, 06C15P2, 06C16P2, and 06C18P2
- Big Clifty/Beech Creek: 06C01, 06C02, 06C03, 06C04, 06C05, 06C06, 06C07, 06C09, 06C10, 06C11, 06C12, 06C13, 06C14, 06C15, 06C16, and 06C18

The locations of the monitoring wells are illustrated in Figure 3.

Wells 06-01B and 06C01P2, screened in the Mansfield Formation, were proposed for testing but had insufficient water levels to conduct tests. Well 06C01 was added to replace 06C01P2; however, well 06C01 is screened in the Big Clifty/Beech Creek aquifer. Well 06C06 is screened across both the Mansfield and the Beech Creek Formations. Wells 06C07 and 06C09 are screened in the Beech Creek Formation only.

Wells tested previously by Fisher (1996) (06-06, 06-12, 06C06, 06C06P2, and 06C08P2) were not re-tested for this scope of work, except 06C06. The results from the previous tests were incorporated into the statistical estimate of hydraulic conductivity for the Mansfield Formation (Section 4.0).

2.0 BACKGROUND

NSWC Crane is located in the southern portion of Indiana, approximately 75 miles southwest of Indianapolis, 60 miles northwest of Louisville, Kentucky, and immediately east of Burns City and Crane Village, Indiana. NSWC Crane encompasses approximately 62,463 acres or approximately 98 square miles of the northern portion of Martin County and smaller portions of Greene, Davies, and Lawrence Counties. A location map of the NSWC Crane facility is shown on Figure 1.

The geology at NSWC Crane is generally characterized by thin overburden deposits overlying bedrock. The overburden deposits generally range in depth from the surface to 0 to 65 feet below ground surface (Nohrstedt, et al., 1998). The bedrock underlying the Crane facility consists of sedimentary rocks from the Lower Pennsylvanian-age Raccoon Creek Group and the Upper Mississippian-age Stephensport and West Baden Groups. A generalized stratigraphic column of rock units at NSWC Crane is illustrated in Figure 4. A brief description of the geologic units underlying the DR and ORR follows [from Palmer (1969), Murphy and Wade (1998), and Kvale (1992)].

Structurally, NSWC Crane is located on the eastern flank of the Illinois Basin. The sedimentary sequence underlying the facility slopes gently to the southwest, dipping 30 to 50 feet per mile and striking north-northwest (Murphy and Wade, 1998). Locally, however, Mississippian rocks may dip from 0 to 15 feet per mile to as much as 100 feet per mile (Sulphur Creek; Kvale, 1992). Local structural features include small-scale flexures and folds. Two faults exist in the area: the Mt. Carmel Fault, located 20 miles east of NSWC Crane, and a possible fault 2-½ miles east of DR and ORR.

The bedrock underlying the DR and ORR includes the Pennsylvanian Mansfield Formation of the Raccoon Creek Group and three Mississippian units: the Haney Limestone (also known as the Galconda Limestone), the Big Clifty Formation, and the Beech Creek Limestone. The Mansfield Formation consists of alternating beds of shales, sandstone, mudstone, siltstone, and thin discontinuous coal units. Only wells in the DR were screened in the Mansfield Formation. An unconformity separates the Pennsylvanian units from the underlying Mississippian units. The Haney Limestone of the Mississippian Stephensport Group consists of shaly limestone and limey shales. Two wells in the DR (06C03P2 and 06C04P2) and two wells in the ORR (06-21 and 06C16P3) are screened across the Haney Limestone. The Indian Springs Member of the Big Clifty Formation is a dark gray fissile shale to massive claystone that acts as an aquitard, separating the Haney Limestone from the underlying sandstone of the Big Clifty Formation (Murphy and Wade, 1998). The Sandstone Member of the Big Clifty Formation (hereafter referred to as the Big Clifty Formation) is a tan to green-gray, massive to thick-bedded, rippled, fine- to very fine-grained, well-sorted, rounded, friable sandstone with occasional shaly partings. Thickness of this unit ranges from 30 to 40 feet. The Beech Creek Limestone consists of fossiliferous, hard, dense limestone

with sparse to numerous joints. The Big Clifty/Beech Creek Formations were considered as one aquifer system during previous investigations (Dunbar, 1982 and 1984, and Murphy and Wade, 1998). Numerous wells were installed in the upper Big Clifty Formation and across the lower Big Clifty/Beech Creek contact to evaluate the shallow versus deeper groundwater quality. The Elwren Formation of the West Baden Group consists of mudstone and acts as the basal aquitard in the area of DR and ORR.

The DR occupies the crest of a north-south trending ridge, bounded by Turkey Creek to the east and Boggs Creek to the west (Figure 3). The ridge has a total topographic relief of 210 feet. The DR has 0 to 9 feet of soil cover overlying sandstone and shale of the Pennsylvanian Mansfield Formation. The Mansfield Formation at the DR is approximately 220 feet thick with an unconformity at its base, separating the Pennsylvanian and Mississippian units. The Haney Limestone and Big Clifty Formation are present in the southeastern half of the DR beneath the Mansfield Formation; however, they have been eroded by the unconformity of the northwestern portion of the DR, in the vicinity of wells 06C06 and 06C07 (Murphy and Wade, 1998).

The ORR extends from the eastern slope of the DR eastward approximately 1,200 to 1,500 feet to NSWC Crane Road 8 (Figure 3). The total relief of the ORR is approximately 30 feet. The ORR has a variable thickness of colluvium, alluvium, and residual soils, ranging from 3 to 28 feet in thickness from the northwest to east. The rock underlying the ORR soil is the Big Clifty Formation with the Beech Creek Limestone lying unconformably below it (Murphy and Wade, 1998).

Regionally, the overall ground water flow direction is expected to conform to the dip bedrock (southwestward) with a gradient approaching the dip, less than 1/2 degree (Murphy and Wade, 1998; Carpenter and Cazee, 1981). Locally, groundwater is likely to flow toward surface drainages. Seasonal fluctuations in the water table are expected to be slight since precipitation is well distributed throughout the year (Murphy and Wade, 1998). Aquifers are generally isolated from one another vertically by less permeable shale units. Ground water enters the aquifers through outcrops and infiltration and flows by gravity down the dip of the strata or locally in directions controlled by the potentiometric gradient.

3.0 METHODOLOGY

A total of 15 wells at the DR and 26 wells at the ORR were selected for aquifer testing for this study. These wells, listed in Table 1 and illustrated in Figure 3, were selected to calculate statistical estimates of the mean of hydraulic conductivity for each aquifer. All wells were tested, except 06-01B and 0601P2, with a total of 74 tests completed. Thirty-five falling head tests and 39 rising head tests were conducted. Wells 0601B and 06C01P2 were not tested due to insufficient water levels in the wells.

The slug tests were conducted by displacing a volume of water with a polyvinyl chloride (PVC) cylinder and recording the head change with a pressure transducer and electronic datalogger. Falling head tests were initiated by inserting the slug rapidly into the water column, causing a positive head change. When the water level had recovered to within 0.10 feet of the static water level, the falling head test was terminated. A rising head test was initiated by withdrawing the PVC slug and causing a negative head change and run until the same criteria were met as for the falling head test. If the static water level was below the top of the well screen, only the rising head test was conducted by inserting the slug into the water column and allowing the water level to recover to within 0.10 feet of static before initiation of the rising head test. The PVC slug was decontaminated between wells according to Crane Standard Operating Procedure (SOP) 8 (Tetra Tech NUS, 1998). In wells with dedicated pumps , the pumps were withdrawn in order to conduct slug tests and then re-installed according to Crane SOP 3 (TtNUS, 1998).

The head changes induced during the falling and rising head tests were measured using pressure transducers and recorded using electronic dataloggers. A pressure transducer was installed in each well prior to testing and allowed to thermally equilibrate with the formation water. A datalogger recorded the head changes during each test at a logarithmic rate, recording head changes rapidly at the beginning of the test and at longer intervals as the test progressed. All field data sheets and datalogger records from each test are provided in the appendix.

The test data were evaluated to determine the time of maximum displacement. The noisy early-time data of each test was ignored, and the time records were reinitialized by subtraction of the start time from each time response. This pre-analysis processing is after Butler (1998).

The slug tests were analyzed using the Hvorslev (1951) method. The head change for each timed reading was normalized by division by the initial head change. The normalized head was plotted versus time on semi-logarithmic graph paper, and a straight line was fitted to the plot. For plots in which the best-fit line did not pass through the 1.0 intercept along the time axis, the line was translated to pass the 1.0 intercept. The time lag (T_0) of 0.37 was determined from the fitted line, and the hydraulic conductivity (K) was calculated using the formula

$$K = [r^2 \ln (L/R)] / (2 L T_o)$$

where r_c = the well casing radius

L = the length of the saturated well screen

R = the effective well screen radius, assumed the borehole radius

The well casing radius, r_c, for wells in which the static water level was below the top of the well screen, was calculated using the following formula after Dawson and Istok (1991)

$$r_c = [r^2 (1-n) + n r_o^2]^{1/2}$$

where n = porosity, assumed 0.25 for the medium- to coarse-grained filter pack (Fetter,1988)

r = the well casing radius

r_o = R

All plots and calculations are provided in the appendix.

4.0 RESULTS

The calculated hydraulic conductivity values for the DR and ORR are summarized in Table 1. Tables 2 through 6 subdivide the wells by aquifer and present the calculated statistical mean values for each aquifer at each site. Figure 5 illustrates graphically the ranges of hydraulic conductivity values for each aquifer, and Figures 6 through 9 illustrate the frequency distribution for each aquifer.

Hydraulic conductivity values for the Mansfield Formation ranged from 1.15E-06 to 4.34E-04 cm/sec, with a geometric mean of 2.67E-05 cm/sec. (The Mansfield Formation was only screened in wells in the DR.) This range included four values from Fisher (1996). The Fisher values were similar to the values from this study.

Hydraulic conductivity values from the Haney Limestone ranged from 1.39E-05 to 2.65E-04 cm/sec (geometric mean 6.07E-05) at the DR and from 3.28E-05 to 2.29E-04 cm/sec (geometric mean 8.66E-05) at the ORR. The geometric mean for the formation was 7.25E-05 cm/sec.

Only one well (06C02P2) was screened in the upper Big Clifty Formation at the DR. It had a hydraulic conductivity value of 1.80E-03 cm/sec. Values for the upper Big Clifty at the ORR ranged from 8.44E-05 to 1.661E-03 cm/sec, with a geometric mean of 3.96E-04 cm/sec. For the Big Clifty/Beech Creek aquifer, hydraulic conductivity values at the DR ranged from 6.14E-05 to 7.48E-03 cm/sec (geometric mean 1.20E-03 cm/sec); values ranged from 2.14E-05 to 1.43E-02 cm/sec (geometric mean 7.88E-04 cm/sec) at the ORR. The formation geometric means for the upper Big Clifty Formation and the Big Clifty/Beech Creek were similar, with values of 4.32E-04 cm/sec and 9.40E-04 cm/sec, respectively. Only two wells (06C07 and 06C09) were screened in the Beech Creek Formation only. The values for the Beech Creek Formation ranged from 1.36E-04 to 1.05E-03 cm/sec (geometric mean was 4.13E-04 cm/sec). Table 7 summarizes the geometric means of hydraulic conductivity for each aquifer.

Hydraulic conductivity values were similar within each aquifer but varied between aquifers. The Mansfield Formation and Haney Limestone conductivities were within an order of magnitude, but both were approximately an order of magnitude lower than the upper Big Clifty and Big Clifty/Beech Creek units. These values may be related to the depth of the formations. Based on the RFI rock coring program (Murphy and Wade, 1998), the Mansfield Formation and the Haney Limestone are shallow units with a higher shale content, limiting transmissivity of the units. In contrast, the Big Clifty and Beech Creek Formations are more fractured and at greater depths, increasing the transmissivity. In addition, primary porosity in the Big Clifty Formation and the discontinuity between the Big Clifty Formation and Beech Creek may also increase the hydraulic conductivity.

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TABLE 1

SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS
OLD RIFLE RANGE AND DEMOLITION RANGE
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	SCREENED INTERVAL		DTW	K (FALLING HEAD)		K (RISING HEAD)	
		TOS (ft TOC)	BOS (ft TOC)	(ft TOC)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
Demolition Range								
06-01A	Mansfield	8.04	17.69	5.49	3.84E-02	1.35E-05	6.92E-02	2.44E-05
06-01B*	Mansfield	38.87	48.04	Dry	--	--	--	--
06-07	Mansfield	17.42	26.66	16.10	1.17E+00	4.11E-04	1.30E+00	4.57E-04
06C01	BC/BC	188.90	228.90	179.43	1.72E-01	6.05E-05	1.76E-01	6.22E-05
06C01P2*	Mansfield	109.55	119.55	117.39	--	--	--	--
06C01P3	Mansfield	47.02	57.02	44.18	3.49E-03	1.23E-06	3.02E-03	1.06E-06
06C02	BC/BC	49.10	69.10	15.65	4.66E+00	1.64E-03	4.54E+00	1.60E-03
06C02P2	BCU	31.79	41.79	14.40	5.54E+00	1.96E-03	4.66E+00	1.64E-03
06C03	BC/BC	69.15	89.15	12.65	7.48E+00	2.64E-03	7.04E+00	2.48E-03
06C03P2	Haney	12.79	22.79	3.81	4.83E-02	1.70E-05	3.08E-02	1.08E-05
06C04	BC/BC	79.93	99.93	27.34	2.33E+01	8.20E-03	1.92E+01	6.76E-03
06C04P2	Haney	18.71	28.71	19.39	--	--	7.51E-01	2.65E-04
06C05	BC/BC	63.24	83.24	15.53	7.17E+00	2.53E-03	3.74E-01	1.32E-04
06C06	Mansfield/Beech Creek	52.75	72.75	19.12	3.07E+00	1.08E-03	3.07E+00	1.08E-03
06C07	Beech Creek	64.61	84.61	18.97	3.86E-01	1.36E-04	5.54E-01	1.96E-04
Old Rifle Range								
06-15	BCU	5.40	14.51	10.48	--	--	1.14E+01	4.02E-03
06-16	BCU	32.91	47.53	9.06	5.18E-01	1.83E-04	6.35E-01	2.24E-04
06-17	BCU	10.75	20.09	10.92	--	--	3.15E+00	1.11E-03
06-18	BCU	14.75	24.02	10.05	2.80E-01	9.88E-05	2.12E-01	7.48E-05
06-20	BCU	13.49	22.63	16.20	--	--	1.72E+00	6.10E-04
06-21	Haney	43.84	52.94	42.04	7.96E-02	2.81E-05	1.06E-01	3.74E-05
06-22	BCU	19.73	28.86	8.78	7.86E-01	2.77E-04	9.13E-01	3.22E-04
06-23 (1)	BCU	6.05	14.91	24.01	8.79E-01	3.10E-04	7.98E-01	2.82E-04
(2)					1.17E+00	4.14E-04	7.67E-01	2.71E-04
06C09	Beech Creek	52.26	62.26	12.91	2.86E+00	1.01E-03	2.98E+00	1.05E-03

TABLE 1

SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS
OLD RIFLE RANGE AND DEMOLITION RANGE
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	SCREENED INTERVAL		DTW	K (FALLING HEAD)		K (RISING HEAD)	
		TOS (ft TOC)	BOS (ft TOC)	(ft TOC)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
06C10	BC/BC	47.74	67.74	13.19	2.18E-01	7.70E-05	1.96E-01	6.92E-05
06C10P2	BCU	24.54	34.54	12.32	1.81E+00	6.39E-04	1.97E+00	6.95E-04
06C11	BC/BC	38.40	58.40	3.75	5.61E-02	1.98E-05	6.49E-02	2.29E-05
06C11P2	BCU	22.24	33.24	3.73	4.05E+00	1.43E-03	3.90E+00	1.38E-03
06C12	BC/BC	58.78	78.78	21.84	2.27E+00	7.99E-04	2.51E+00	8.84E-04
06C12P2	BCU	30.79	40.79	21.48	3.28E-01	1.16E-04	3.57E-01	1.26E-04
06C13**	BC/BC	37.19	57.19	8.69	--	--	--	--
06C13P2	BCU	21.75	31.75	8.42	4.51E+00	1.60E-03	4.84E+00	1.71E-03
06C14	BC/BC	30.28	50.28	11.15	1.09E+01	3.85E-03	1.74E+01	6.14E-03
06C14P2	BCU	16.63	26.63	10.13	3.61E-01	1.27E-04	3.76E-01	1.33E-04
06C15	BC/BC	37.60	57.60	14.51	4.44E+01	1.57E-02	3.63E+01	1.28E-02
06C15P2	BCU	22.58	32.58	13.20	7.52E-01	2.65E-04	7.46E-01	2.63E-04
06C16	BC/BC	65.14	85.14	33.56	2.00E+01	7.04E-03	2.03E+01	7.16E-03
06C16P2	BCU	32.88	42.88	30.35	2.31E-01	8.14E-05	2.48E-01	8.74E-05
06C16P3	Haney	12.46	22.46	13.95	--	--	6.49E-01	2.29E-04
06C18	BC/BC	41.65	61.65	8.95	7.88E-01	2.78E-04	8.26E-01	2.91E-04
06C18P2	BCU	24.87	34.87	9.02	1.07E+00	3.77E-04	1.50E+00	5.29E-04

NOTES:
* Insufficient water column height to conduct tests.
** Test response oscillatory.

BCU = Big Clifty (Upper)
BC/BC = Big Clifty and Beech Creek Formations
Haney = Haney Limestone
Beech Creek = Beech Creek Limestone

TOS = Top of Screen
BOS = Bottom of Screen
TOC = Top of Casing
DTW = Depth to Water

TABLE 2

HYDRAULIC CONDUCTIVITY VALUES OF MANSFIELD FORMATION
OLD RIFLE RANGE AND DEMOLITION RANGE
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	K (FALLING HEAD)		K (RISING HEAD)		ARTHMETIC MEAN		COMMENTS
		(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	
Demolition Range								
06-01A	Mansfield	3.84E-02	1.35E-05	6.92E-02	2.44E-05	5.38E-02	1.90E-05	
06-06	Mansfield	--	--	--	--	8.14E-02	2.87E-05	Fisher, 1996.
06-07	Mansfield	1.17E+00	4.11E-04	1.30E+00	4.57E-04	1.24E+00	4.34E-04	
06-12	Mansfield	--	--	--	--	1.00E-02	3.54E-06	Fisher, 1996.
06C01P3	Mansfield	3.49E-03	1.23E-06	3.02E-03	1.06E-06	3.26E-03	1.15E-06	
06C06P2	Mansfield	--	--	--	--	1.45E-01	5.10E-05	Fisher, 1996.
06C08P2	Mansfield	--	--	--	--	5.58E-01	1.97E-04	Fisher, 1996.
					Arithmetic Mean=	2.98E-01	1.05E-04	
					Standard Deviation=	4.56E-01	1.60E-04	
					Geometric Mean=	7.57E-02	2.67E-05	
06C06	Mansfield/Beech Creek	3.07E+00	1.08E-03	3.07E+00	1.08E-03	3.07E+00	1.08E-03	
06C06 (1)	Mansfield/Beech Creek	--	--	--	--	1.18E+01	4.17E-03	Fisher, 1996.
06C06 (2)	Mansfield/Beech Creek	--	--	--	--	1.18E+01	4.15E-03	Fisher, 1996.
					Arithmetic Mean=	8.88E+00	3.13E-03	
					Standard Deviation=	5.04E+00	1.78E-03	
					Geometric Mean=	7.53E+00	2.65E-03	

Old Rifle Range
No wells screened within Pennsylvanian units.

NOTES:
K = hydraulic conductivity
Beech Creek = Beech Creek Limestone
ft/day = feet per day
cm/sec = centimeters per second

TABLE 3

HYDRAULIC CONDUCTIVITY VALUES OF THE HANEY LIMESTONE
OLD RIFLE RANGE AND DEMOLITION RANGE
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	K (FALLING HEAD)		K (RISING HEAD)		ARTHMETIC MEAN	
		(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
Demolition Range							
06C03P2	Haney Ls	4.83E-02	1.70E-05	3.08E-02	1.08E-05	3.96E-02	1.39E-05
06C04P2	Haney Ls	--	--	7.51E-01	2.65E-04	7.51E-01	2.65E-04
					Arithmetic Mean=	3.95E-01	1.39E-04
					Standard Deviation=	5.03E-01	1.78E-04
					Geometric Mean=	1.72E-01	6.07E-05
Old Rifle Range							
06-21	Haney Ls	7.96E-02	2.81E-05	1.06E-01	3.74E-05	9.28E-02	3.28E-05
06C16P3	Haney Ls	--	--	6.49E-01	2.29E-04	6.49E-01	2.29E-04
					Arithmetic Mean=	3.71E-01	1.31E-04
					Standard Deviation=	3.93E-01	1.39E-04
					Geometric Mean=	2.45E-01	8.66E-05
					Haney Limestone Geometric Mean=	2.06E-01	7.25E-05

NOTES:
K = hydraulic conductivity
Haney Ls = Haney Limestone
ft/day = feet per day
cm/sec = centimeters per second

TABLE 4

HYDRAULIC CONDUCTIVITY VALUES OF UPPER BIG CLIFTY FORMATION
OLD RIFLE RANGE AND DEMOLITION RANGE
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	K (FALLING HEAD)		K (RISING HEAD)		ARITHMETIC MEAN	
		(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
Demolition Range							
06C02P2	BCU	5.54E+00	1.96E-03	4.66E+00	1.64E-03	5.10E+00	1.80E-03
Old Rifle Range							
06-15	BCU	--	--	1.14E+01	4.02E-03	1.14E+01	4.02E-03
06-16	BCU	5.18E-01	1.83E-04	6.35E-01	2.24E-04	5.77E-01	2.04E-04
06-17	BCU	--	--	3.15E+00	1.11E-03	3.15E+00	1.11E-03
06-18	BCU	2.80E-01	9.88E-05	2.12E-01	7.48E-05	2.46E-01	8.68E-05
06-20	BCU	--	--	1.72E+00	6.10E-04	1.72E+00	6.10E-04
06-22	BCU	7.86E-01	2.77E-04	9.13E-01	3.22E-04	8.50E-01	3.00E-04
06-23 (1)	BCU	8.79E-01	3.10E-04	7.98E-01	2.82E-04	8.39E-01	2.96E-04
(2)		1.17E+00	4.14E-04	7.67E-01	2.71E-04	9.69E-01	3.43E-04
06C10P2	BCU	1.81E+00	6.39E-04	1.97E+00	6.95E-04	1.89E+00	6.67E-04
06C11P2	BCU	4.05E+00	1.43E-03	3.90E+00	1.38E-03	3.98E+00	1.41E-03
06C12P2	BCU	3.28E-01	1.16E-04	3.57E-01	1.26E-04	3.43E-01	1.21E-04
06C13P2	BCU	4.51E+00	1.60E-03	4.84E+00	1.71E-03	4.68E+00	1.66E-03
06C14P2	BCU	3.61E-01	1.27E-04	3.76E-01	1.33E-04	3.69E-01	1.30E-04
06C15P2	BCU	7.52E-01	2.65E-04	7.46E-01	2.63E-04	7.49E-01	2.64E-04
06C16P2	BCU	2.31E-01	8.14E-05	2.48E-01	8.74E-05	2.40E-01	8.44E-05
06C18P2	BCU	1.07E+00	3.77E-04	1.50E+00	5.29E-04	1.29E+00	4.53E-04
					Arithmetic Mean=	2.08E+00	7.34E-04
					Standard Deviation=	2.83E+00	9.98E-04
					Geometric Mean=	1.12E+00	3.96E-04
					Big Clifty (Upper) Geometric Mean=	1.23E+00	4.32E-04

NOTES:
K = hydraulic conductivity
BCU = Big Clifty (Upper) Formation
ft/day = feet per day
cm/sec = centimeters per second

TABLE 5

HYDRAULIC CONDUCTIVITY OF BIG CLIFTY/BEECH CREEK AQUIFER
OLD RIFLE RANGE AND DEMOLITION
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	K (FALLING HEAD)		K (RISING HEAD)		MEAN K	
		(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
Demolition Range							
06C01	BC/BC	1.72E-01	6.05E-05	1.76E-01	6.22E-05	1.74E-01	6.14E-05
06C02	BC/BC	4.66E+00	1.64E-03	4.54E+00	1.60E-03	4.60E+00	1.62E-03
06C03	BC/BC	7.48E+00	2.64E-03	7.04E+00	2.48E-03	7.26E+00	2.56E-03
06C04	BC/BC	2.33E+01	8.20E-03	1.92E+01	6.76E-03	2.13E+01	7.48E-03
06C05	BC/BC	7.17E+00	2.53E-03	3.74E-01	1.32E-04	3.77E+00	1.33E-03
					Arithmetic Mean=	7.41E+00	2.61E-03
					Standard Deveiation=	8.14E+00	2.86E-03
					Geometric Mean=	3.42E+00	1.20E-03
Old Rifle Range							
06C10	BC/BC	2.18E-01	7.70E-05	1.96E-01	6.92E-05	2.07E-01	7.31E-05
06C11	BC/BC	5.61E-02	1.98E-05	6.49E-02	2.29E-05	6.05E-02	2.14E-05
06C12	BC/BC	2.27E+00	7.99E-04	2.51E+00	8.84E-04	2.39E+00	8.42E-04
06C14	BC/BC	1.09E+01	3.85E-03	1.74E+01	6.14E-03	1.42E+01	5.00E-03
06C15	BC/BC	4.44E+01	1.57E-02	3.63E+01	1.28E-02	4.04E+01	1.43E-02
06C16	BC/BC	2.00E+01	7.04E-03	2.03E+01	7.16E-03	2.02E+01	7.10E-03
06C18	BC/BC	7.88E-01	2.78E-04	8.26E-01	2.91E-04	8.07E-01	2.85E-04
					Arithmetic Mean=	1.12E+01	3.94E-03
					Standard Deveiation=	1.51E+01	5.33E-03
					Geometric Mean=	2.23E+00	7.88E-04
					Big Clift/Beech Creek aquifer Geometric Mean=	2.67E+00	9.40E-04

NOTES:
K = hydraulic conductivity
BC/BC = Big Clifty/Beech Creek aquifer
ft/day = feet per day
cm/sec = centimeters per second

TABLE 6

HYDRAULIC CONDUCTIVITY OF BEECH CREEK FORMATION
OLD RIFLE RANGE AND DEMOLITION
NSWC CRANE, CRANE, INDIANA

WELL ID	SCREENED FORMATION	K (FALLING HEAD)		K (RISING HEAD)		MEAN K	
		(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
Demolition Range							
06C07	Beech Creek	3.86E-01	1.36E-04	5.54E-01	1.96E-04	4.70E-01	1.66E-04
Old Rifle Range							
06C09	Beech Creek	2.86E+00	1.01E-03	2.98E+00	1.05E-03	2.92E+00	1.03E-03
					Arithmetic Mean=	1.70E+00	5.98E-04
					Standard Deveiation=	1.73E+00	6.11E-04
					Geometric Mean=	1.17E+00	4.13E-04

NOTES:
K = hydraulic conductivity
ft/day = feet per day
cm/sec = centimeters per second

TABLE 7

GEOMETRIC MEANS OF HYDRAULIC CONDUCTIVITY FOR PENSYLVANIAN AND MISSISSIPPIAN FORMATIONS OLD RIFLE RANGE AND DEMOLITION RANGE NSWC, CRANE, INDIANA

Aquifer	K (geometric mean)	
	ft/day	cm/sec
Mansfield Formation	7.57E-02	2.67E-05
Haney Limestone	2.06E-01	7.25E-05
Big Clifty (Upper) Formation	1.23	4.32E-04
Big Clifty/Beech Creek Formations	2.67	9.40E-04
Beech Creek Formation	1.17	4.13E-04

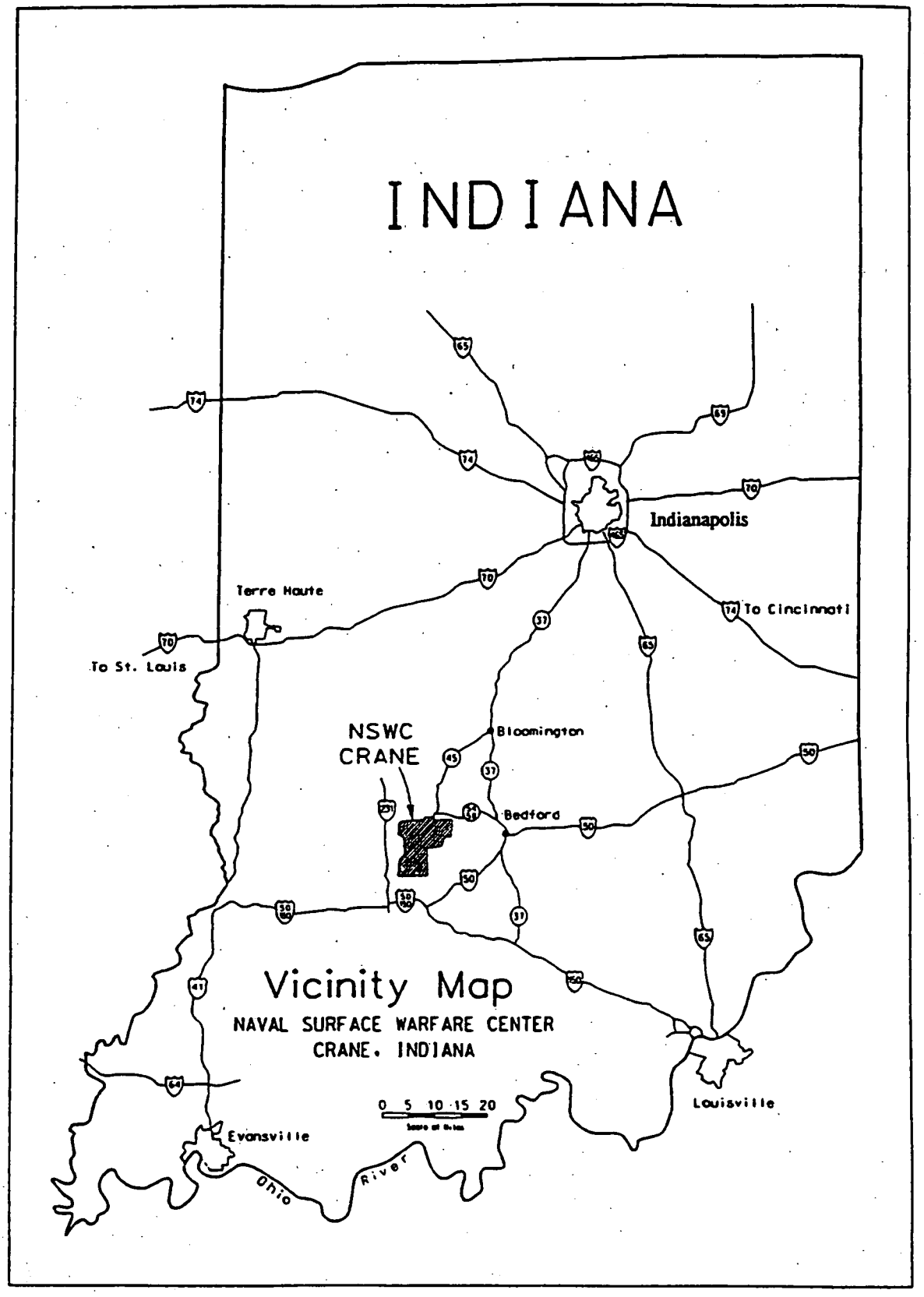
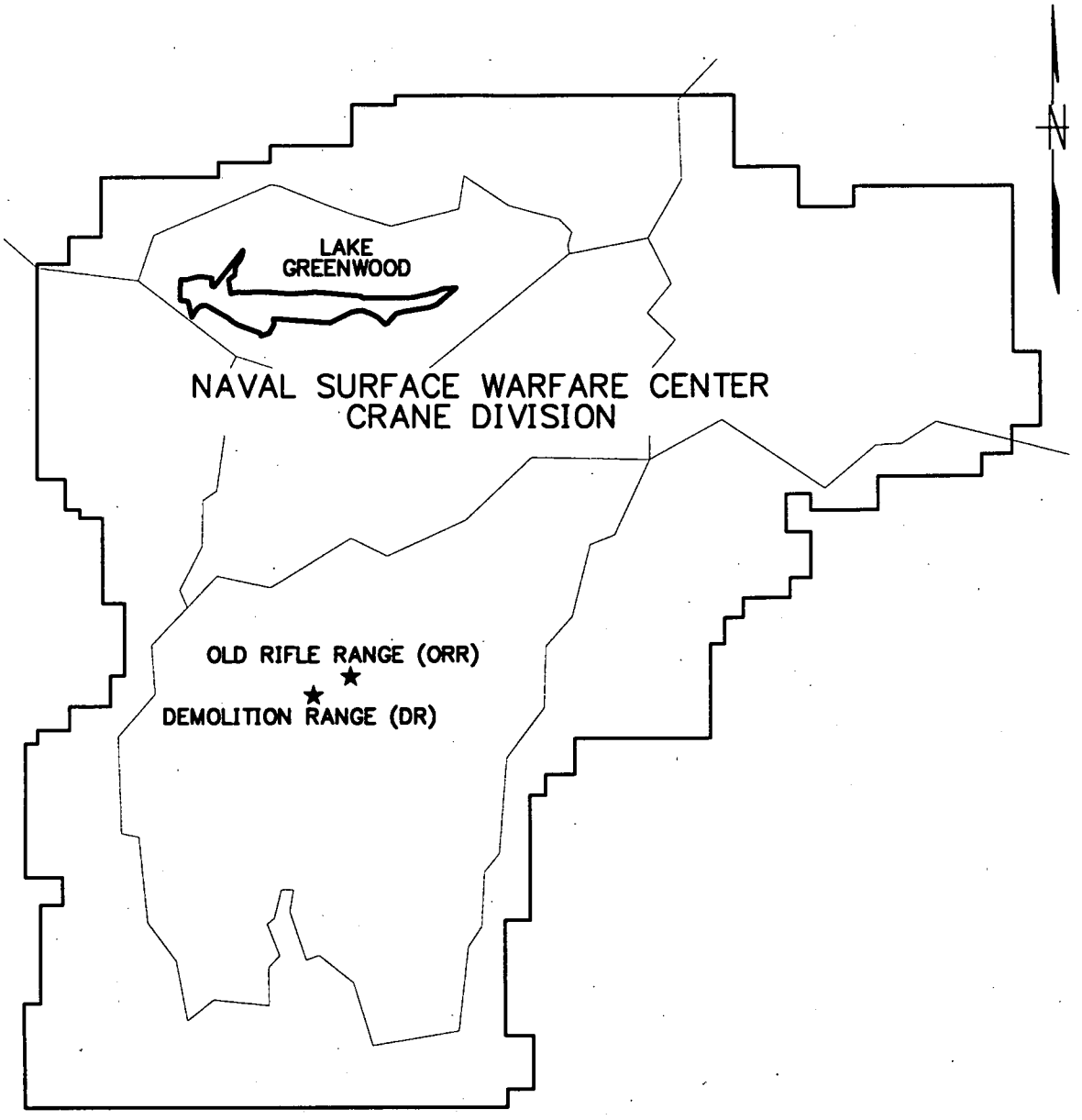


Figure 1
General Location Map
Naval Surface Warfare Center
Crane, Indiana

Draft Report, RCRA Facility Investigation Phase II Groundwater Release Assessment,
SWMU 06/09 Demolition Area and Phase III Release Characterization SWMU 07/09 Old Rifle Range
Naval Surface Warfare Center, Crane, Indiana, William L. Murphy and Roy Wade, November 1995 - Figure 1

ACAD: 7651CM04.dwg 03/30/99 MF



LEGEND

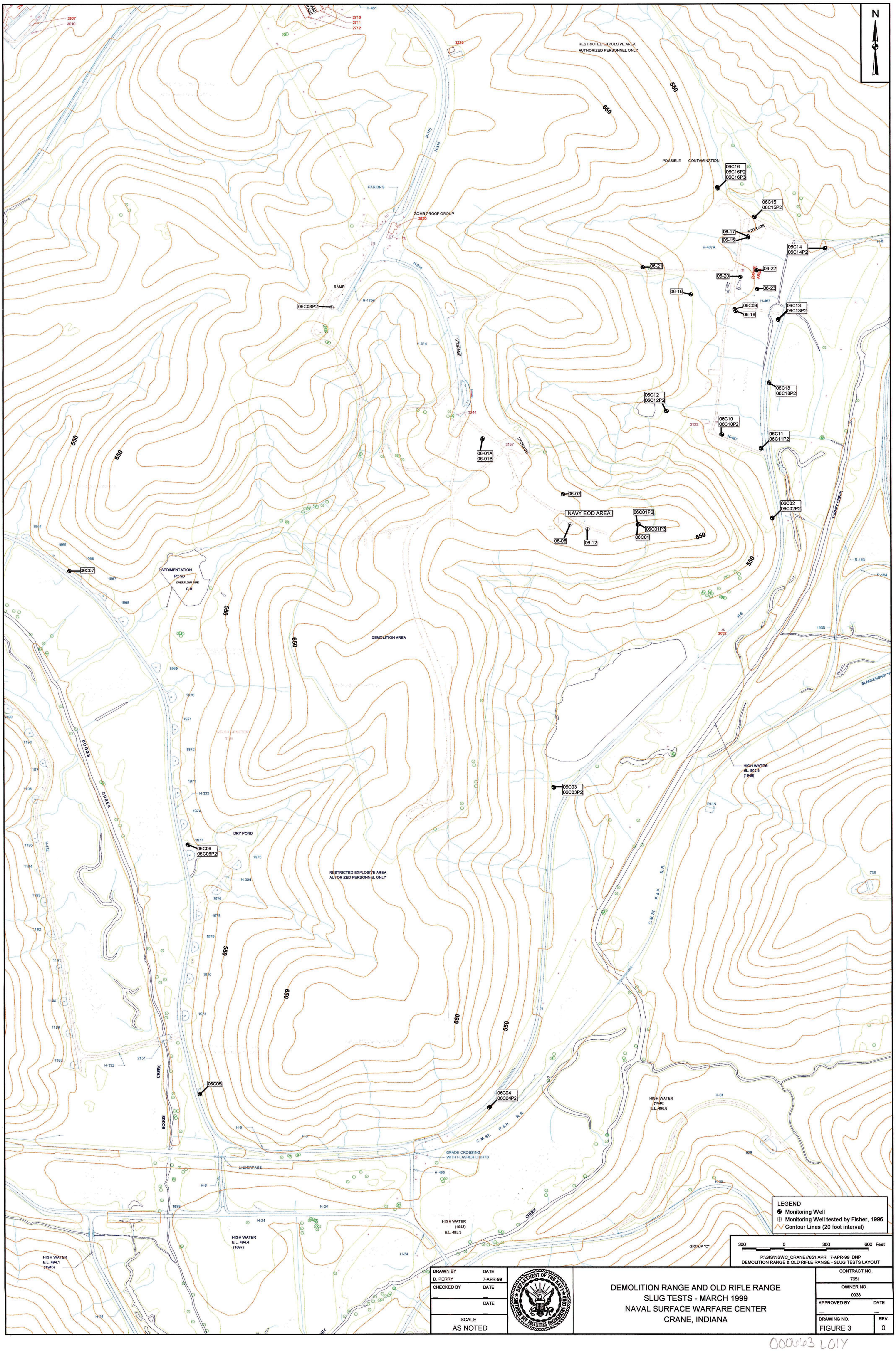
★ SITE LOCATIONS

0 12000 24000

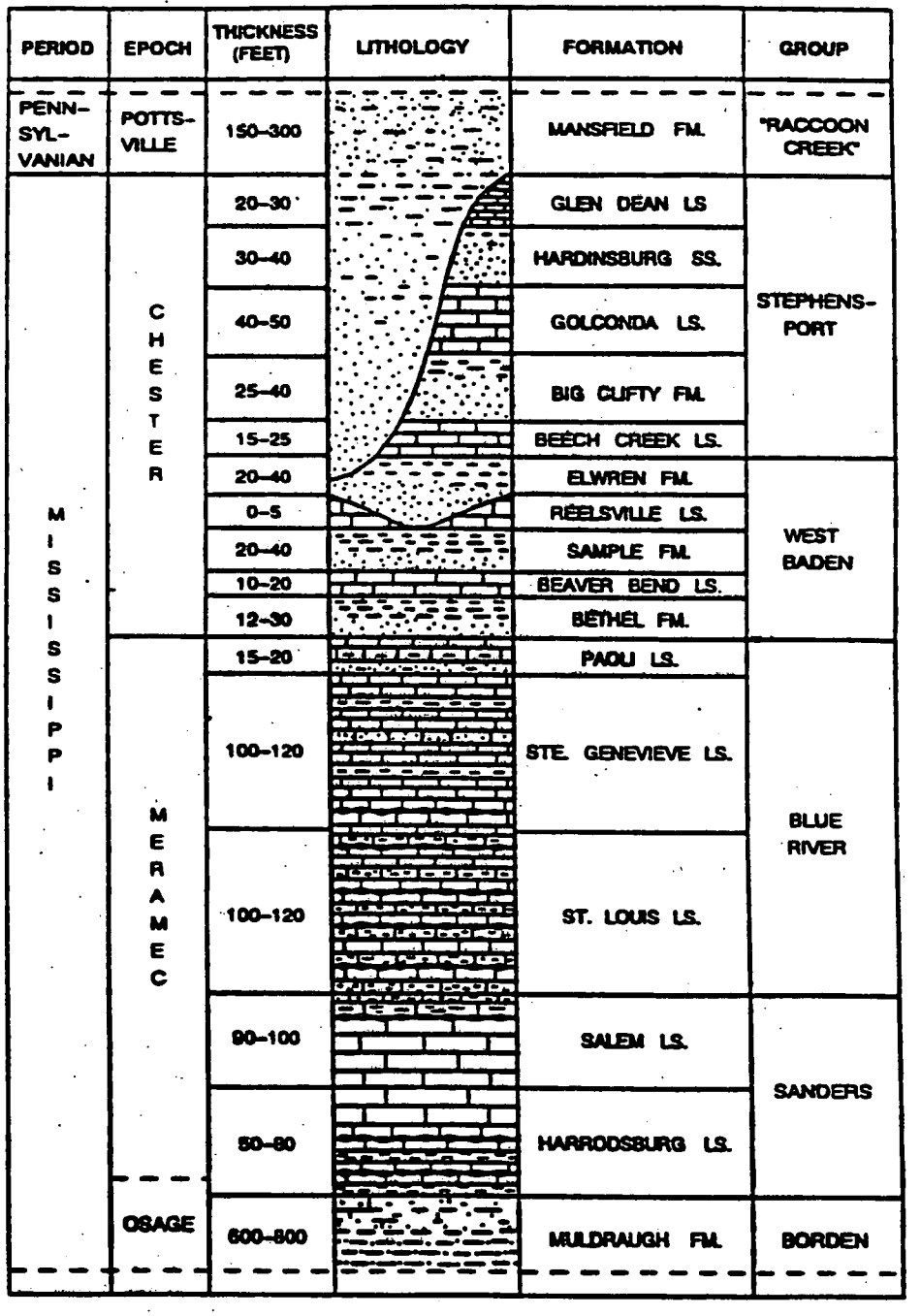
SCALE IN FEET

DRAWN BY MF DATE 3/30/99	Tetra Tech NUS, Inc.	CONTRACT NO. 7651	OWNER NO. 0038
CHECKED BY DATE	OLD RIFLE RANGE AND DEMOLITION RANGE LOCATIONS NAVAL SURFACE WARFARE CENTER CRANE, INDIANA	APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE 1" = 12000'		DRAWING NO. FIGURE 2	REV. 0

FORM CADD NO. SOUTH_AV.DWG - REV 0 - 02/07/97


N
RESTRICTED EXPOLSIVE AREA
AUTHORIZED PERSONNEL ONLY
POSSIBLE CONTAMINATION
06C16
06C16P2
06C16P3
06C15
06C15P2
06-17
06-15
STORAGE
06C14
06C14P2
06-21
06-22
06-20
06-23
06-16
06C09
06-18
06C13
06C13P2
06C08P2
RAMP
PARKING
BOMB PROOF GROUP
06C18
06C18P2
06C12
06C12P2
06C10
06C10P2
06C11
06C11P2
06-01A
06-01B
06-07
NAVY EOD AREA
06C01P2
06C01P3
06C01
06-06
06-12
06C02
06C02P2
TURKEY CREEK
06C07
SEDIMENTATION POND
OVERFLOW PIPE
DEMOLITION AREA
BOGGS CREEK
HIGH WATER
EL. 501.5
(1948)
06C03
06C03P2
RUIN
DRY POND
06C06
06C06P2
RESTRICTED EXPLOSIVE AREA
AUTORIZED PERSONNEL ONLY
C.M.ST. P.&P. R.R.
06C05
06C04
06C04P2
HIGH WATER
(1948)
E.L. 496.8
GRADE CROSSING
WITH FLASHER LIGHTS
UNDERPASS
HIGH WATER
(1943)
E.L. 495.3
HIGH WATER
E.L. 494.4
(1897)
HIGH WATER
E.L. 494.1
(1943)
GROUP "C"
LEGEND
Monitoring Well
Monitoring Well tested by Fisher, 1996
Contour Lines (20 foot interval)
300 0 300 600 Feet
P:\GIS\NSWC_CRANE\7651.APR 7-APR-99 DNP
DEMOLITION RANGE & OLD RIFLE RANGE - SLUG TESTS LAYOUT
DRAWN BY D. PERRY
DATE 7-APR-99
CHECKED BY
DATE
SCALE AS NOTED
DEPARTMENT OF THE NAVY NAVAL AIR ENGINEERING CMD
DEMOLITION RANGE AND OLD RIFLE RANGE
SLUG TESTS - MARCH 1999
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA
CONTRACT NO. 7651
OWNER NO. 0038
APPROVED BY
DATE
DRAWING NO. FIGURE 3
REV. 0

000663 L01Y



Source: Draft Report, RCRA Facility Investigation
Phase II Groundwater Release Assessment, SWMU 06/09
Demolition Area and Phase III Release
Characterization SWMU 07/09 Old Rifle Range
November 1995 - Figure 13
by William L. Murphy and Roy Wade

Figure 4
Stratigraphic Column for Rock Units Encountered at the Naval Surface Warfare Center (Source: Palmer, 1969; Cited in Murphy and Wade, 1995)
Naval Surface Warfare Center
Crane, Indiana

Figure 5
Box Plot of Hydraulic Conductivity
Old Rifle Range and Demolition Range
NSWC, Crane, Indiana

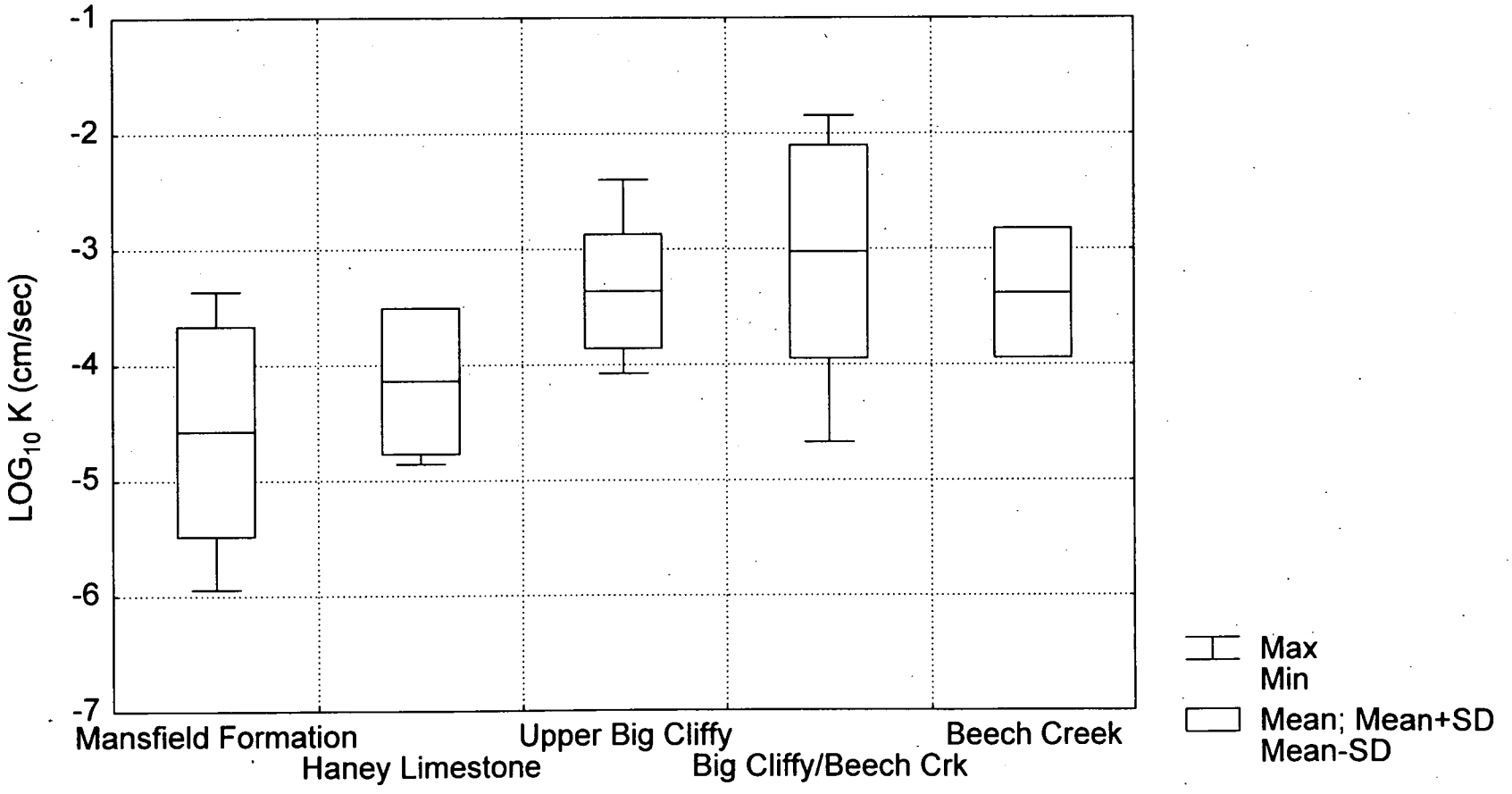


Figure 6
Frequency Distribution of Hydraulic Conductivity
for Mansfield Formation
Old Rifle Range and Demolition Range
NSWC, Crane, Indiana

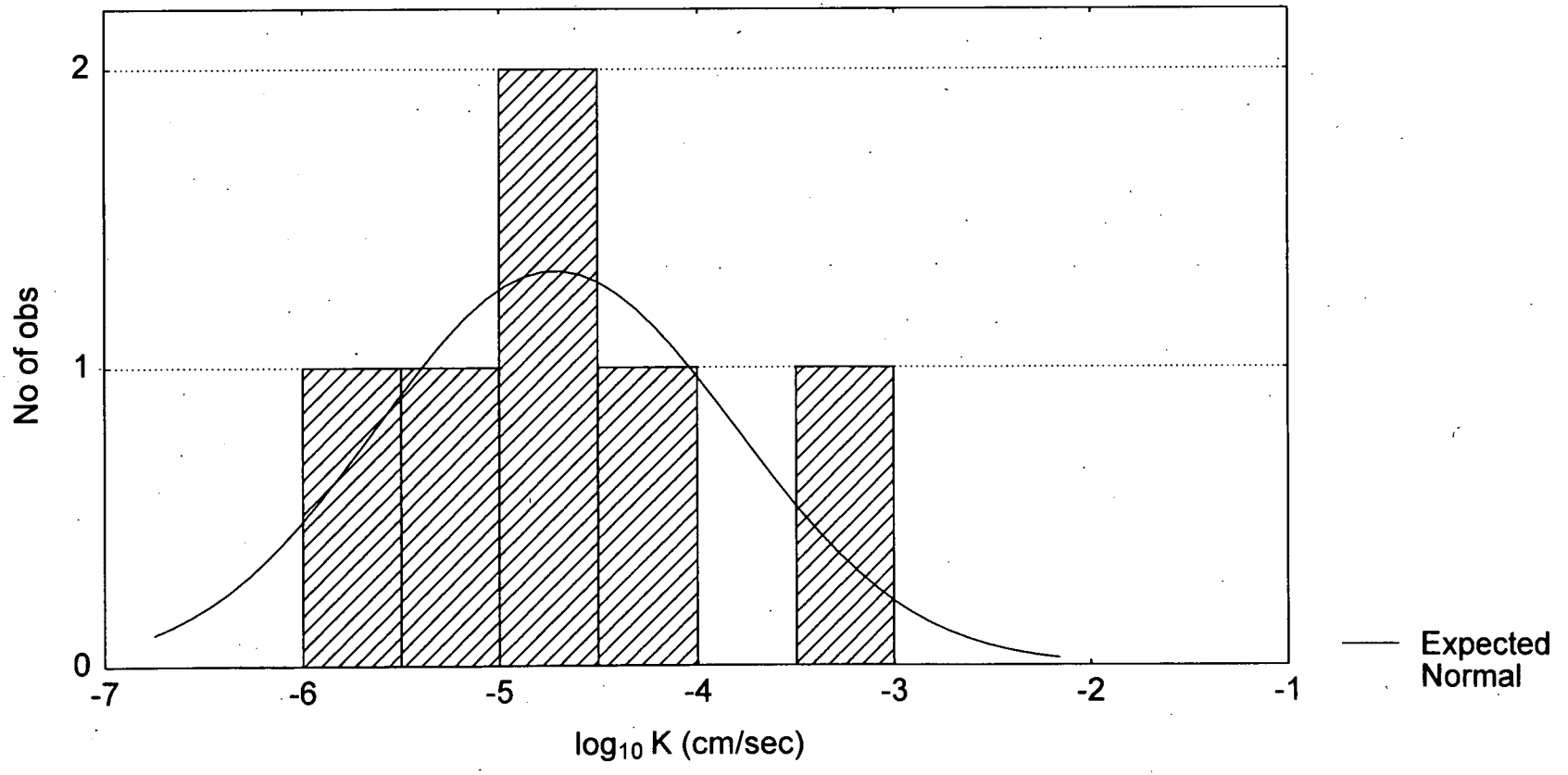


Figure 7
Frequency Distribution of Hydraulic Conductivity
for Haney Limestone
Old Rifle Range and Demolition Range
NSWC, Crane, Indiana

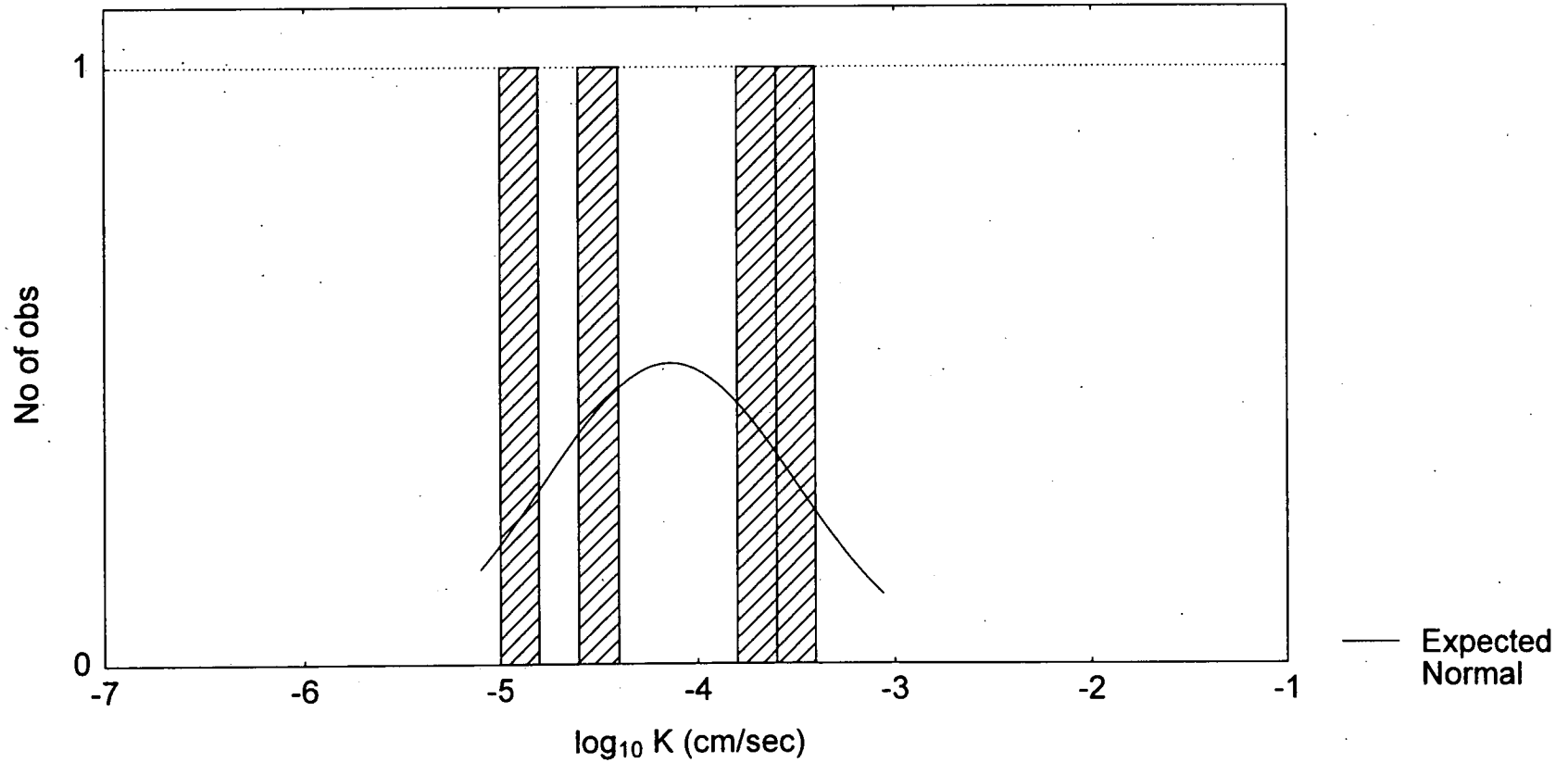


Figure 8
Frequency Distribution of Hydraulic Conductivity
for Big Cliffy (Upper) Formation
Old Rifle Range and Demolition Range

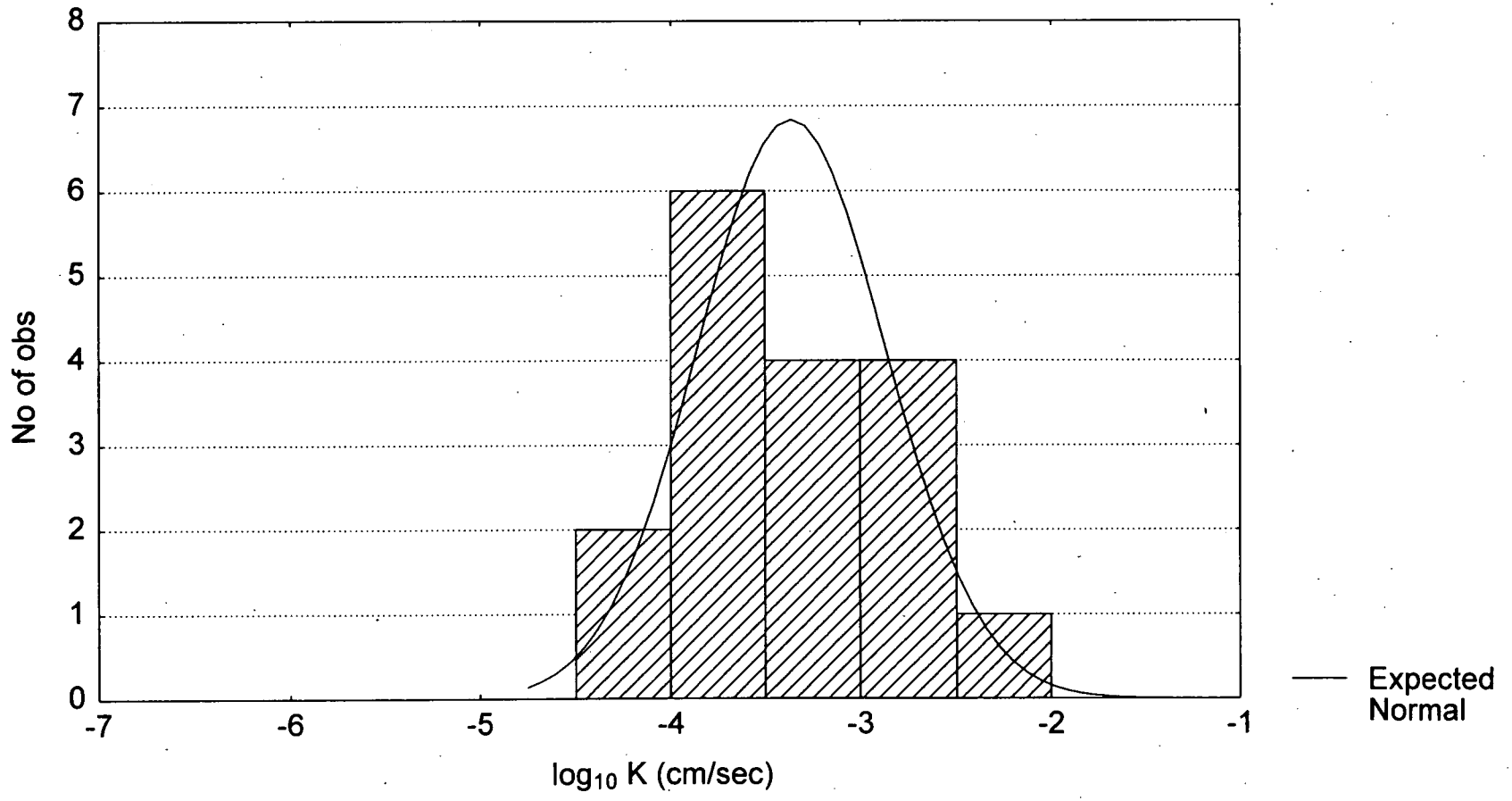
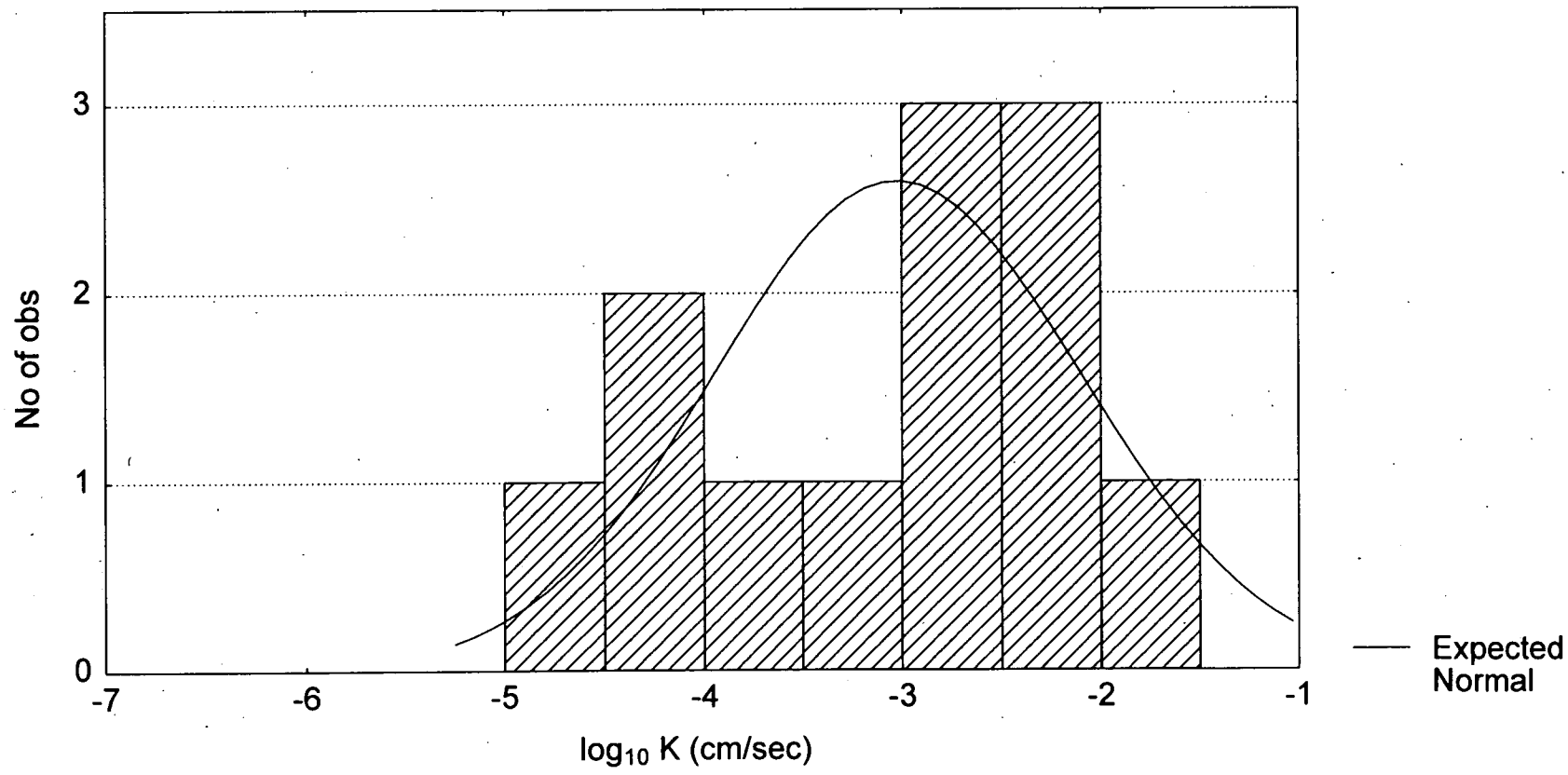


Figure 9
Frequency Distribution of Hydraulic Conductivity
for Big Bliffy / Beech Creek
Old Rifle Range
NSWC, Crane, Indiana



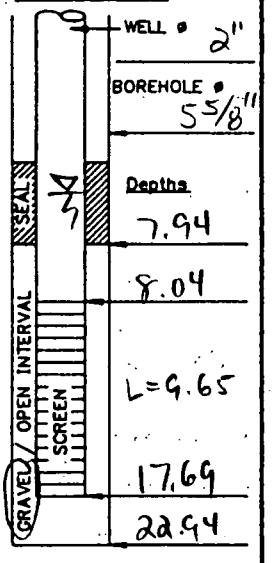
SLUG TEST DATA SHEETS, RECOVERY DATA, AND HVORSLEV (1951) CALCULATIONS

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

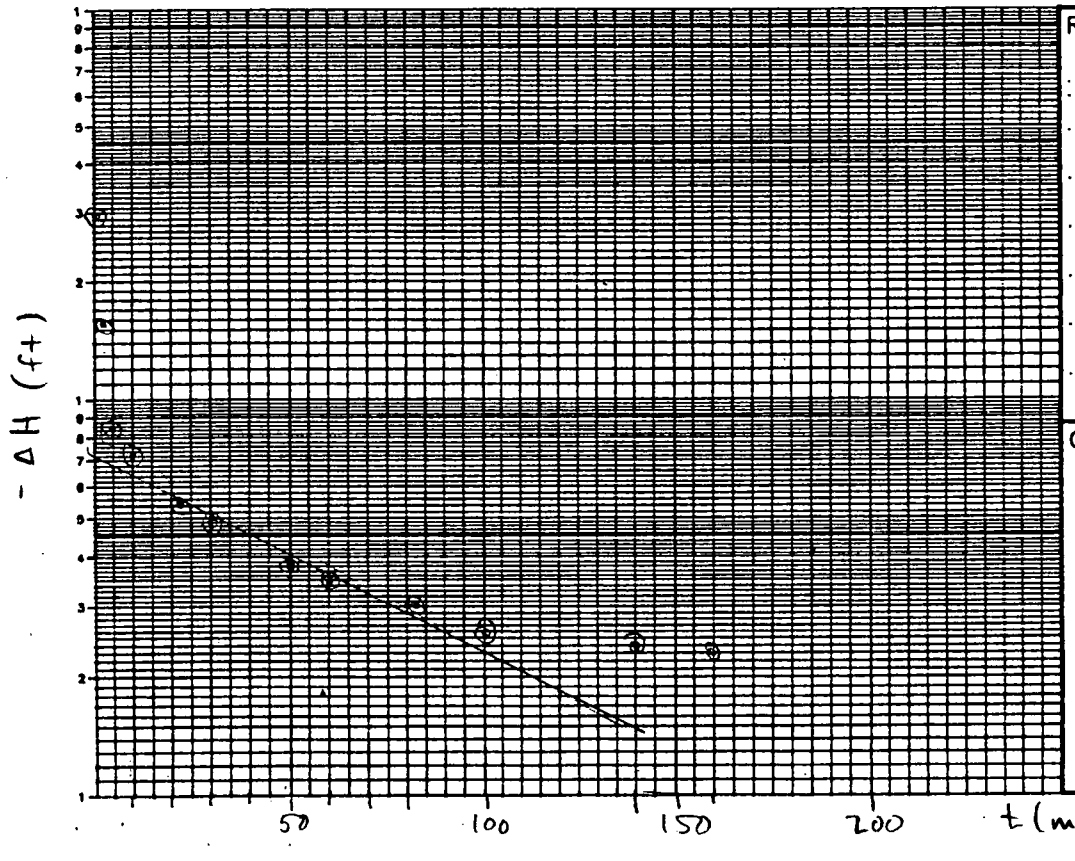
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-01A
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.65' TEST NO.: T175Ø
STATIC WATER LEVEL (Depth/Elevation): 5.49 ft TPVC DATE: 3-11-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE 1 OF 1
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.09		-2.94			
1.00		-1.54			
5.00		-0.84			
10.00		-0.72			
24.00		-0.54	30.0		-0.49
50.00		-0.38			
74.00		-0.30	60.0		-0.35
100.0		-0.26			
120.0		-0.25			
140.0		-0.24			
160.0		-0.23			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hemit 143
XD 201804 20psi
H_2O above XD = 16.05'
Start @ 0846
Stop @ 1130

CALCS, SKETCH MAPS, ETC.:
file: Ø6Ø1A Fall.txt

00001

SE1000C
Environmental Logger
03/11 15:10

Unit# 00143 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60001
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06-01A
Falling Head Test
0601AFALL.TXT

Step 0 03/11 08:46:35

Elapsed Time	INPUT 1
0.0000	0.006
0.0033	-0.019
0.0066	-3.291
0.0100	-7.038
0.0133	-5.990
0.0166	-2.557
0.0200	-1.938
0.0233	-3.322
0.0266	-4.841
0.0300	-5.122
0.0333	-4.069
0.0366	-3.265
0.0400	-3.361
0.0433	-2.876
0.0466	-1.836
0.0500	-2.002
0.0533	-2.117
0.0566	-2.448
0.0600	-2.544
0.0633	-2.786
0.0666	-2.614
0.0700	-2.480
0.0733	-2.378
0.0766	-2.531
0.0800	-2.633
0.0833	-2.570
0.0866	-2.378
0.0900	-2.455
0.0933	-2.793
0.0966	-2.940
0.1000	-2.608
0.1033	-2.499
0.1066	-2.557
0.1100	-2.429
0.1133	-2.321
0.1166	-2.302
0.1200	-2.385

			H/H_0	t
0.1233	-2.493			
0.1266	-2.544	← H_0	1.00	0.0
0.1300	-2.538			
0.1333	-2.493			
0.1366	-2.442			
0.1400	-2.410		0.95	0.0134
0.1433	-2.404			
0.1466	-2.416			
0.1500	-2.429			
0.1533	-2.436			
0.1566	-2.429			
0.1600	-2.423			
0.1633	-2.404			
0.1666	-2.397			
0.1700	-2.397			
0.1733	-2.385			
0.1766	-2.385			
0.1800	-2.391			
0.1833	-2.385			
0.1866	-2.378			
0.1900	-2.372			
0.1933	-2.365			
0.1966	-2.365			
0.2000	-2.353		0.92	0.0734
0.2033	-2.353			
0.2066	-2.353			
0.2100	-2.346			
0.2133	-2.334			
0.2166	-2.334			
0.2200	-2.334			
0.2233	-2.327			
0.2266	-2.321			
0.2300	-2.314			
0.2333	-2.314			
0.2366	-2.302		0.90	0.1100
0.2400	-2.302			
0.2433	-2.295			
0.2466	-2.289			
0.2500	-2.289			
0.2533	-2.282			
0.2566	-2.276			
0.2600	-2.276			
0.2633	-2.270			
0.2666	-2.263			
0.2700	-2.263			
0.2733	-2.257			
0.2766	-2.251			
0.2800	-2.244			
0.2833	-2.244			
0.2866	-2.238			
0.2900	-2.231			
0.2933	-2.231			
0.2966	-2.225			
0.3000	-2.225			
0.3033	-2.219			
0.3066	-2.212			
0.3100	-2.206			
0.3133	-2.206			
0.3166	-2.200			
0.3200	-2.193			

0.3233	-2.193		
0.3266	-2.187		
0.3300	-2.180		
0.3333	-2.180		
0.3500	-2.155	0.85	0.2234
0.3666	-2.136		
0.3833	-2.110		
0.4000	-2.091		
0.4166	-2.072		
0.4333	-2.053		
0.4500	-2.027	0.80	0.3234
0.4666	-2.015		
0.4833	-1.989		
0.5000	-1.970		
0.5166	-1.957		
0.5333	-1.938		
0.5500	-1.919		
0.5666	-1.900		
0.5833	-1.887		
0.6000	-1.868		
0.6166	-1.855		
0.6333	-1.836		
0.6500	-1.823		
0.6666	-1.804		
0.6833	-1.798		
0.7000	-1.772	0.70	0.5734
0.7166	-1.766		
0.7333	-1.747		
0.7500	-1.728		
0.7666	-1.715		
0.7833	-1.702		
0.8000	-1.689		
0.8166	-1.677		
0.8333	-1.664		
0.8500	-1.651		
0.8666	-1.632	0.64	0.7400
0.8833	-1.619		
0.9000	-1.613		
0.9166	-1.594		
0.9333	-1.587		
0.9500	-1.575		
0.9666	-1.562		
0.9833	-1.549		
1.0000	-1.543		
1.2000	-1.390	0.55	1.0734
1.4000	-1.300		
1.6000	-1.243		
1.8000	-1.186		
2.0000	-1.141	0.45	1.8734
2.2000	-1.096		
2.4000	-1.064		
2.6000	-1.026	0.40	2.4734
2.8000	-0.988		
3.0000	-0.962		
3.2000	-0.943		
3.4000	-0.924		
3.6000	-0.905		
3.8000	-0.892		
4.0000	-0.879	0.35	3.8734
4.2000	-0.867		

4.4000	-0.860		
4.6000	-0.854		
4.8000	-0.847		
5.0000	-0.841	0.33	4.8734
5.2000	-0.835		
5.4000	-0.835		
5.6000	-0.822		
5.8000	-0.822		
6.0000	-0.816		
6.2000	-0.809		
6.4000	-0.809		
6.6000	-0.803		
6.8000	-0.796		
7.0000	-0.790		
7.2000	-0.784		
7.4000	-0.784		
7.6000	-0.777		
7.8000	-0.771	0.30	7.6734
8.0000	-0.765		
8.2000	-0.758		
8.4000	-0.765		
8.6000	-0.752		
8.8000	-0.752		
9.0000	-0.752		
9.2000	-0.745		
9.4000	-0.739		
9.6000	-0.739		
9.8000	-0.733		
10.0000	-0.726	0.29	9.8734
12.0000	-0.694		
14.0000	-0.663		
16.0000	-0.631	0.25	15.8734
18.0000	-0.612		
20.0000	-0.586	0.23	19.8734
22.0000	-0.567		
24.0000	-0.548		
26.0000	-0.529		
28.0000	-0.510	0.20	27.8734
30.0000	-0.497		
32.0000	-0.478		
34.0000	-0.465		
36.0000	-0.452	0.18	35.8734
38.0000	-0.439		
40.0000	-0.433		
42.0000	-0.427		
44.0000	-0.414		
46.0000	-0.401		
48.0000	-0.388	0.15	47.8734
50.0000	-0.382	0.15	49.8734
52.0000	-0.376		
54.0000	-0.369		
56.0000	-0.363	0.14	
58.0000	-0.350		
60.0000	-0.350		
62.0000	-0.344		
64.0000	-0.337		
66.0000	-0.337		
68.0000	-0.331		
70.0000	-0.318		
72.0000	-0.312		

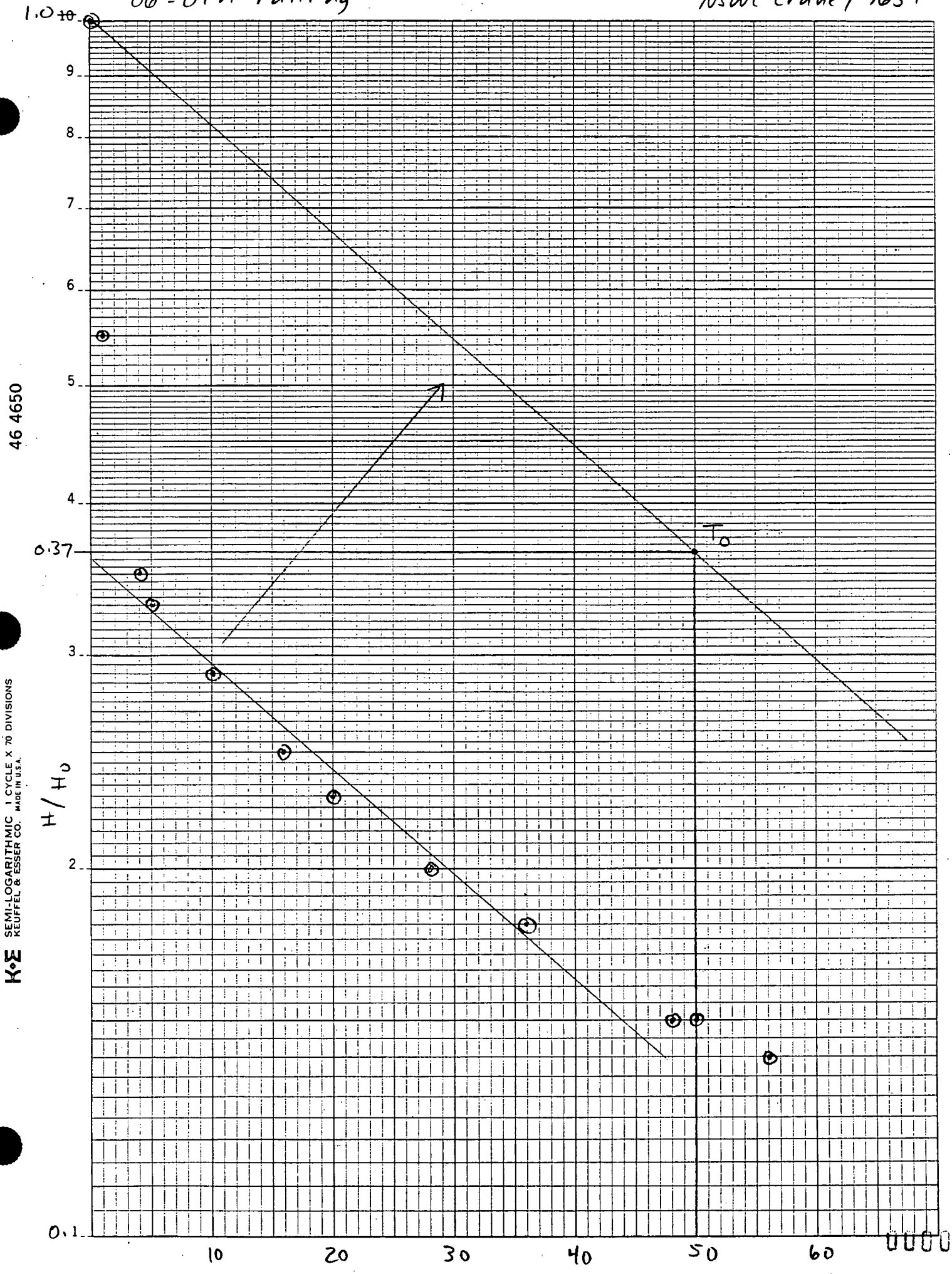
74.0000	-0.305
76.0000	-0.305
78.0000	-0.299
80.0000	-0.293
82.0000	-0.293
84.0000	-0.293
86.0000	-0.280
88.0000	-0.286
90.0000	-0.280
92.0000	-0.274
94.0000	-0.274
96.0000	-0.274
98.0000	-0.267
100.000	-0.267
120.000	-0.254
140.000	-0.242
160.000	-0.235

END

0.10 97.8734

06-01A Falling

NSWC Crane / 7651



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TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC Crane		JOB NUMBER 7651	
SUBJECT 06-D1A Falling Head Test			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.23$ ft
$L = 9.65$ ft

$T_0 = 50.0$ min

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(9.65 \text{ ft}/0.23 \text{ ft})}{2(9.65 \text{ ft})(50.0 \text{ min})}$$

$$K = 2.67 \times 10^{-5} \text{ ft/min} \times 1440 \text{ min/day}$$

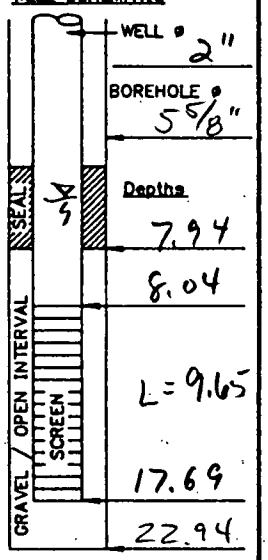
$$K = 3.84 \times 10^{-2} \text{ ft/day}$$
$$= 1.35 \times 10^{-5} \text{ cm/s}$$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

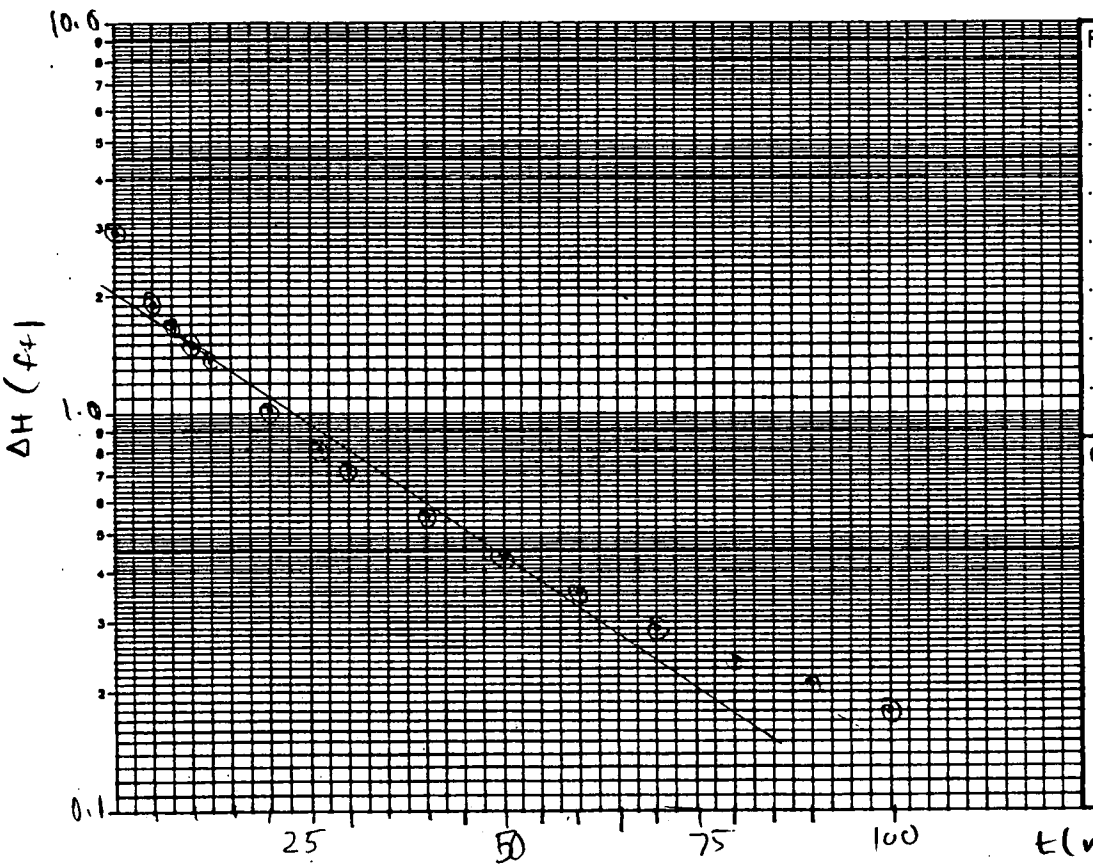
PROJECT NAME: NSWC Crane WELL/BORING NO.: 06-01A
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.65' TEST NO.: T18S0
STATIC WATER LEVEL (Depth/Elevation): 5.24' TPVC DATE: 3/11/99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		2.91	70.00		0.29
1.00		2.49	80.00		0.24
5.00		1.91	90.00		0.21
7.60		1.68	100.00		0.18
10.00		1.50			
12.00		1.38			
20.00		1.01			
26.00		0.82			
30.00		0.73			
40.00		0.56			
50.00		0.44			
60.00		0.36			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD 201804 20psi
H_2O above XD = 16.29'
Start @ 1131
Stop @ 1340

CALCS, SKETCH MAPS, ETC.:
file: 06-01A Rise.txt

SE1000C
Environmental Logger
03/11 15:16

Unit# 00143 Test 18

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60001
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well #06-01A
Rising Head Test
Ø6Ø1A RISE.Txt

Step 0 03/11 11:31:19

Elapsed Time	INPUT 1	
0.0000	-0.006	
0.0033	0.133	
0.0066	3.467	
0.0100	5.575	
0.0133	4.957	
0.0166	-0.082	
0.0200	4.378	
0.0233	2.090	
0.0266	3.498	
0.0300	2.702	
0.0333	2.963	← H_0
0.0366	2.887	
0.0400	2.887	
0.0433	2.938	
0.0466	2.810	
0.0500	2.919	
0.0533	2.855	
0.0566	2.880	
0.0600	2.874	
0.0633	2.861	
0.0666	2.849	
0.0700	2.849	
0.0733	2.849	
0.0766	2.842	
0.0800	2.829	
0.0833	2.829	
0.0866	2.829	
0.0900	2.823	
0.0933	2.823	
0.0966	2.817	
0.1000	2.817	
0.1033	2.810	
0.1066	2.810	
0.1100	2.810	
0.1133	2.804	
0.1166	2.804	
0.1200	2.798	

H/H_0
1.00

0.1233	2.798
0.1266	2.791
0.1300	2.791
0.1333	2.791
0.1366	2.791
0.1400	2.785
0.1433	2.785
0.1466	2.785
0.1500	2.785
0.1533	2.772
0.1566	2.779
0.1600	2.772
0.1633	2.766
0.1666	2.766
0.1700	2.766
0.1733	2.766
0.1766	2.759
0.1800	2.759
0.1833	2.759
0.1866	2.759
0.1900	2.759
0.1933	2.753
0.1966	2.753
0.2000	2.753
0.2033	2.753
0.2066	2.747
0.2100	2.747
0.2133	2.740
0.2166	2.747
0.2200	2.740
0.2233	2.734
0.2266	2.734
0.2300	2.740
0.2333	2.728
0.2366	2.728
0.2400	2.728
0.2433	2.734
0.2466	2.728
0.2500	2.728
0.2533	2.728
0.2566	2.721
0.2600	2.721
0.2633	2.721
0.2666	2.715
0.2700	2.715
0.2733	2.715
0.2766	2.708
0.2800	2.715
0.2833	2.708
0.2866	2.708
0.2900	2.708
0.2933	2.702
0.2966	2.708
0.3000	2.702
0.3033	2.702
0.3066	2.702
0.3100	2.702
0.3133	2.696
0.3166	2.696
0.3200	2.689

0.3233	2.696	
0.3266	2.689	
0.3300	2.696	
0.3333	2.689	
0.3500	2.689	
0.3666	2.677	
0.3833	2.670	
0.4000	2.664	
0.4166	2.657	
0.4333	2.651	
0.4500	2.651	
0.4666	2.638	
0.4833	2.632	
0.5000	2.626	
0.5166	2.619	
0.5333	2.613	
0.5500	2.606	0.90
0.5666	2.600	
0.5833	2.600	
0.6000	2.594	
0.6166	2.587	
0.6333	2.587	
0.6500	2.575	
0.6666	2.575	
0.6833	2.568	
0.7000	2.568	
0.7166	2.562	
0.7333	2.556	
0.7500	2.549	
0.7666	2.549	
0.7833	2.543	
0.8000	2.536	
0.8166	2.536	
0.8333	2.524	
0.8500	2.524	
0.8666	2.524	
0.8833	2.524	
0.9000	2.511	
0.9166	2.511	
0.9333	2.505	
0.9500	2.505	
0.9666	2.498	
0.9833	2.492	
1.0000	2.492	
1.2000	2.441	
1.4000	2.396	
1.6000	2.358	
1.8000	2.320	0.80
2.0000	2.288	
2.2000	2.256	
2.4000	2.224	
2.6000	2.199	
2.8000	2.167	
3.0000	2.141	
3.2000	2.116	
3.4000	2.090	
3.6000	2.071	
3.8000	2.046	
4.0000	2.020	0.70
4.2000	1.995	

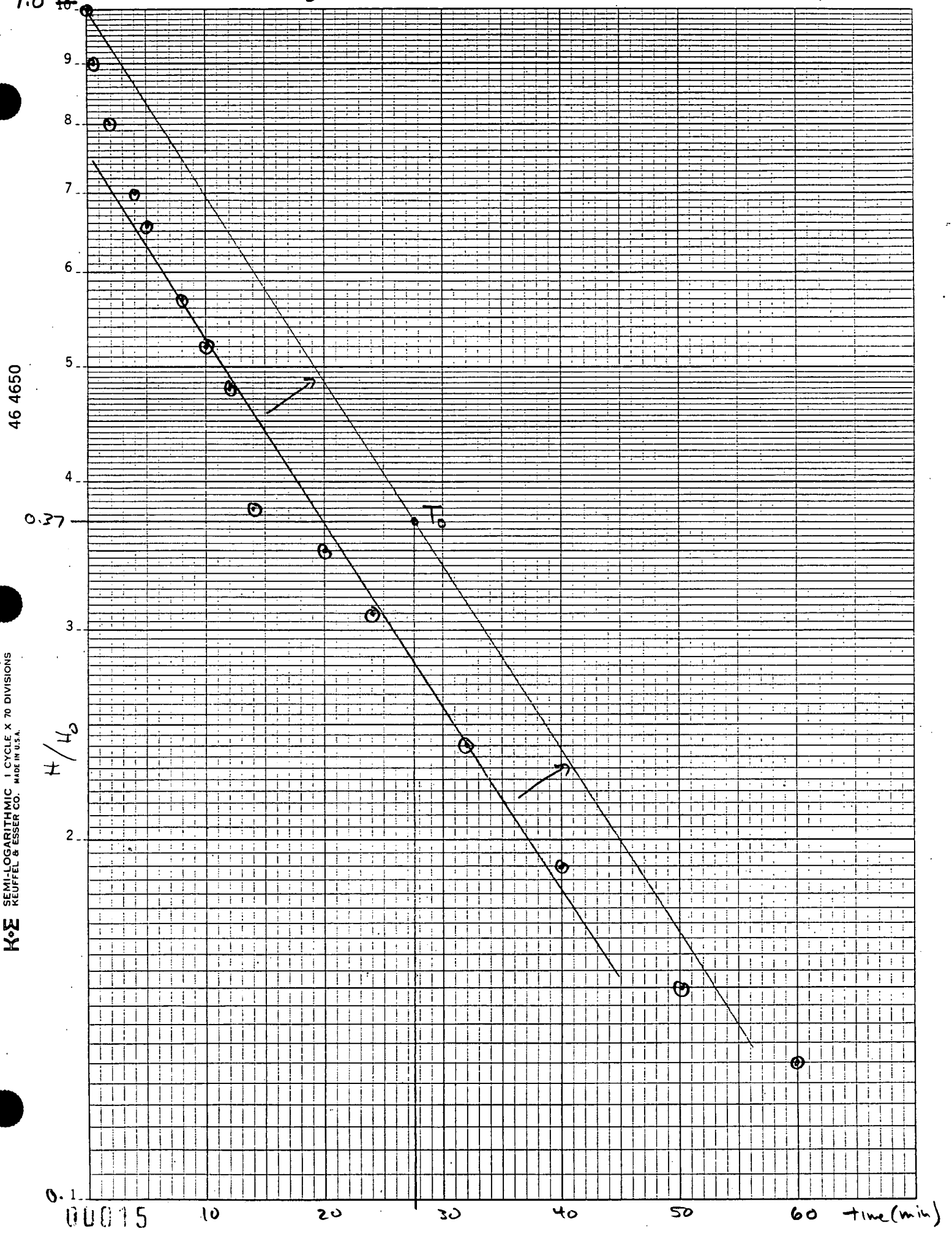
4.4000	1.976	
4.6000	1.950	
4.8000	1.925	
5.0000	1.912	0.66
5.2000	1.893	
5.4000	1.874	
5.6000	1.855	
5.8000	1.835	
6.0000	1.823	
6.2000	1.797	
6.4000	1.784	
6.6000	1.765	
6.8000	1.753	
7.0000	1.733	0.60
7.2000	1.721	
7.4000	1.702	
7.6000	1.682	
7.8000	1.670	
8.0000	1.651	0.57
8.2000	1.638	
8.4000	1.612	
8.6000	1.606	
8.8000	1.587	
9.0000	1.574	
9.2000	1.561	
9.4000	1.542	
9.6000	1.529	
9.8000	1.517	
10.0000	1.504	0.52
12.0000	1.383	0.48
14.0000	1.275	0.38
16.0000	1.179	
18.0000	1.090	
20.0000	1.013	0.35
22.0000	0.949	
24.0000	0.886	0.31
26.0000	0.828	
28.0000	0.784	
30.0000	0.739	
32.0000	0.694	0.24
34.0000	0.656	
36.0000	0.624	
38.0000	0.586	
40.0000	0.561	0.19
42.0000	0.535	
44.0000	0.510	
46.0000	0.484	
48.0000	0.465	
50.0000	0.446	0.15
52.0000	0.427	
54.0000	0.414	
56.0000	0.395	
58.0000	0.376	
60.0000	0.363	0.13
62.0000	0.344	
64.0000	0.331	
66.0000	0.318	
68.0000	0.306	
70.0000	0.299	
72.0000	0.293	

74.0000	0.280
76.0000	0.274
78.0000	0.261
80.0000	0.248
82.0000	0.248
84.0000	0.235
86.0000	0.235
88.0000	0.229
90.0000	0.216
92.0000	0.210
94.0000	0.204
96.0000	0.191
98.0000	0.191
100.000	0.184
120.000	0.133

END

06-01A Rising

NSWC Crane / 7651



0015

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC Crane		JOB NUMBER 7651	
SUBJECT 06-01A Rising Head Test			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.23$ ft
$L = 9.65$ ft

$T_0 = 27.6$ min

$$K = \frac{r^2 \ln(L/R)}{2LT}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.65\ ft / 0.23\ ft)}{2(9.65\ ft)(27.6\ min)}$$

$$K = 4.81 \times 10^{-5}\ ft/min \times 1440\ min/day$$

$$K = 6.92 \times 10^{-2}\ ft/day \times 1\ cm/s / 2835\ ft/day$$

$$K = 2.44 \times 10^{-5}\ cm/s$$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC Crane WELL/BORING NO.: 06-07

PROJECT NO.: 7651 GEOLOGIST: T. Evans

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.24 ft / 26.66 TEST NO.: T1550

STATIC WATER LEVEL (Depth/Elevation): 16.11 ft TPVC DATE: 3-11-99

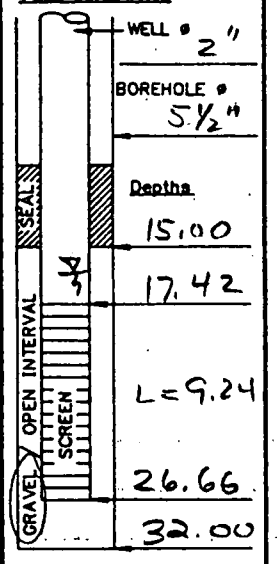
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 4.7') PAGE ___ OF ___

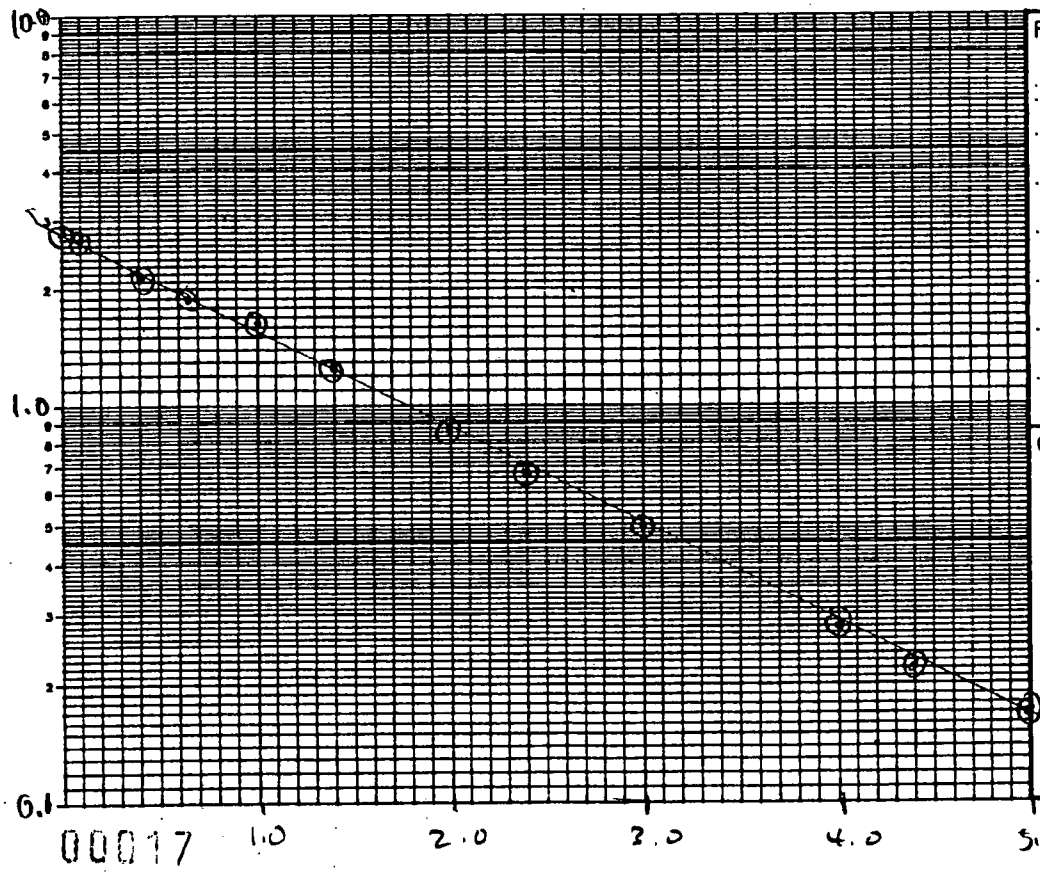
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.07		-2.79	5.00		-0.17
0.10		-2.74	6.00		-0.11
0.25		-2.52	7.00		-0.07
0.50		-2.14			
0.75		-1.88			
1.00		-1.63			
1.40		-1.25			
2.00		-0.87			
2.40		-0.68			
3.00		-0.49			
4.00		-0.28			
4.40		-0.22			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit 143

XO 1670 50psi

H_2O above XO = 14.57

Start @ 0804

Stop @ 0816

CALCS, SKETCH MAPS, ETC.:

File: 0607Fall.txt

00017

0.0433

SE1000C
Environmental Logger
03/11 10:03

Unit# 00143 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60700
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06-07
Falling Head Test
file: Ø6Ø7 FALL.TXT

Step 0 03/11 08:04:21

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	-0.491
0.0066	-3.856
0.0100	-4.110
0.0133	-4.633
0.0166	-4.411
0.0200	-4.411
0.0233	-4.348
0.0266	-4.379
0.0300	-4.237
0.0333	-4.316
0.0366	-4.221
0.0400	-4.014
0.0433	-3.269
0.0466	-2.507
0.0500	-1.824
0.0533	-2.697
0.0566	-2.856
0.0600	-3.015
0.0633	-2.951
0.0666	-2.618
0.0700	-2.618
0.0733	-2.792 ← H_0
0.0766	-2.792
0.0800	-2.777
0.0833	-2.777
0.0866	-2.777
0.0900	-2.761
0.0933	-2.761
0.0966	-2.761
0.1000	-2.745
0.1033	-2.745
0.1066	-2.729
0.1100	-2.729
0.1133	-2.729
0.1166	-2.729
0.1200	-2.713

H/H_0	t
1.00	0.0

0.1233	-2.713		
0.1266	-2.713		
0.1300	-2.697		
0.1333	-2.697		
0.1366	-2.697		
0.1400	-2.681		
0.1433	-2.681		
0.1466	-2.665	0.95	0.0733
0.1500	-2.665		
0.1533	-2.665		
0.1566	-2.665		
0.1600	-2.650		
0.1633	-2.650		
0.1666	-2.650		
0.1700	-2.634		
0.1733	-2.634		
0.1766	-2.634		
0.1800	-2.618		
0.1833	-2.618		
0.1866	-2.618		
0.1900	-2.602		
0.1933	-2.602		
0.1966	-2.586		
0.2000	-2.586		
0.2033	-2.586		
0.2066	-2.586		
0.2100	-2.570		
0.2133	-2.570		
0.2166	-2.570		
0.2200	-2.554		
0.2233	-2.554		
0.2266	-2.554		
0.2300	-2.554		
0.2333	-2.539		
0.2366	-2.539		
0.2400	-2.523	0.90	0.1667
0.2433	-2.523		
0.2466	-2.523		
0.2500	-2.523		
0.2533	-2.507		
0.2566	-2.507		
0.2600	-2.507		
0.2633	-2.491		
0.2666	-2.491		
0.2700	-2.491		
0.2733	-2.491		
0.2766	-2.475		
0.2800	-2.475		
0.2833	-2.475		
0.2866	-2.459		
0.2900	-2.459		
0.2933	-2.459		
0.2966	-2.443		
0.3000	-2.443		
0.3033	-2.443		
0.3066	-2.443		
0.3100	-2.428		
0.3133	-2.428		
0.3166	-2.428		
0.3200	-2.412		

0.3233	-2.412		
0.3266	-2.412		
0.3300	-2.396		
0.3333	-2.396		
0.3500	-2.380		
0.3666	-2.364		
0.3833	-2.348		
0.4000	-2.332		
0.4166	-2.316		
0.4333	-2.301		
0.4500	-2.269		
0.4666	-2.237	0.80	0.3933
0.4833	-2.221		
0.5000	-2.205	0.79	0.4267
0.5166	-2.174		
0.5333	-2.158		
0.5500	-2.142		
0.5666	-2.110		
0.5833	-2.094		
0.6000	-2.078		
0.6166	-2.047		
0.6333	-2.031		
0.6500	-2.015		
0.6666	-1.999		
0.6833	-1.967		
0.7000	-1.951		
0.7166	-1.935		
0.7333	-1.920		
0.7500	-1.888	0.68	0.6767
0.7666	-1.872		
0.7833	-1.856		
0.8000	-1.840		
0.8166	-1.824		
0.8333	-1.824		
0.8500	-1.777		
0.8666	-1.761		
0.8833	-1.745		
0.9000	-1.729		
0.9166	-1.713		
0.9333	-1.697		
0.9500	-1.682		
0.9666	-1.666		
0.9833	-1.650		
1.0000	-1.634	0.59	0.9267
1.2000	-1.412		
1.4000	-1.253		
1.6000	-1.110	0.45	1.5267
1.8000	-0.983		
2.0000	-0.872	0.31	1.9267
2.2000	-0.777		
2.4000	-0.682		
2.6000	-0.603	0.22	2.5667
2.8000	-0.539		
3.0000	-0.491	0.18	2.9267
3.2000	-0.428		
3.4000	-0.380	0.14	3.3267
3.6000	-0.349		
3.8000	-0.317		
4.0000	-0.285	0.10	3.9267
4.2000	-0.253		

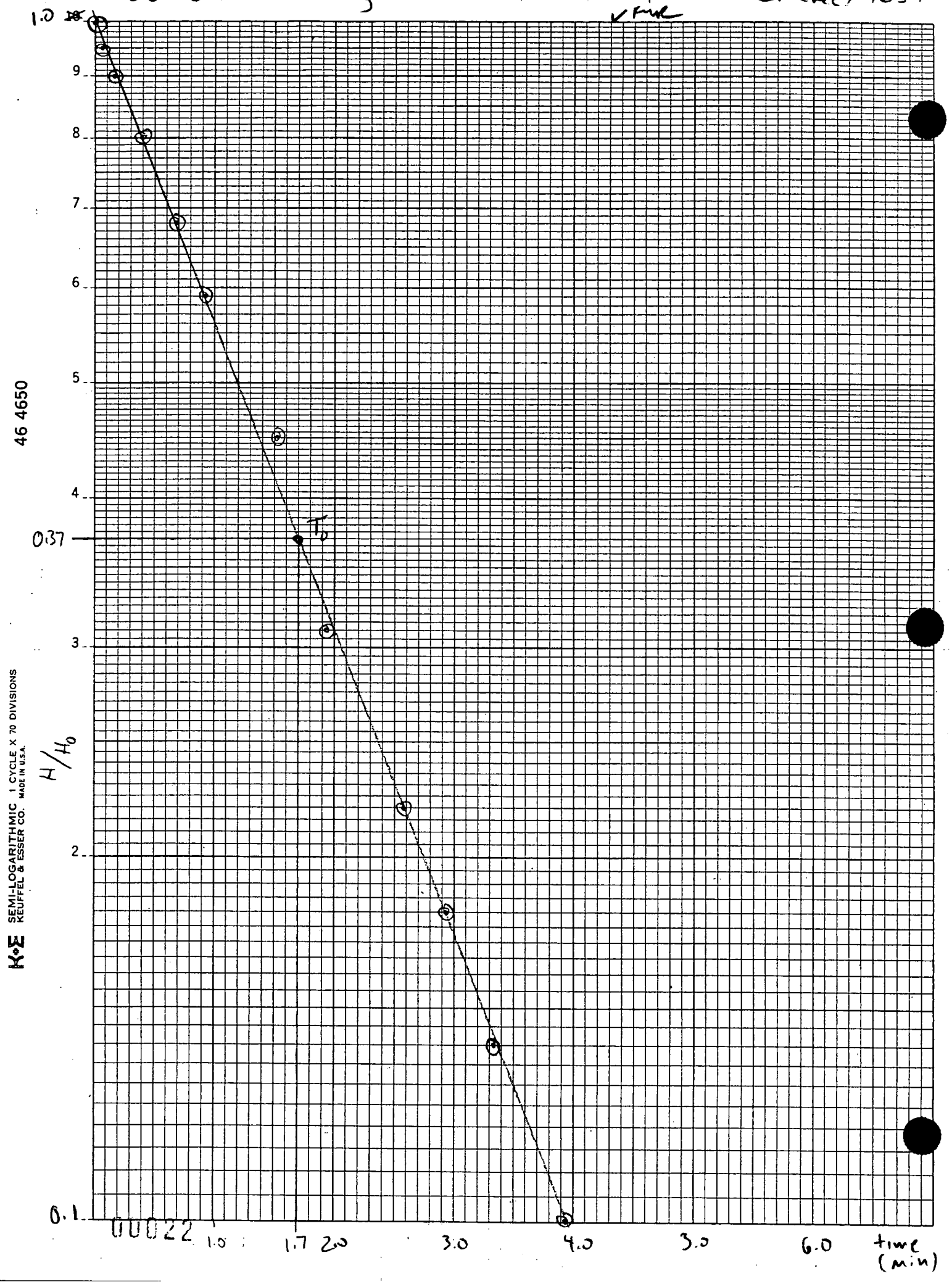
4.4000	-0.222
4.6000	-0.206
4.8000	-0.190
5.0000	-0.174
5.2000	-0.158
5.4000	-0.142
5.6000	-0.126
5.8000	-0.126
6.0000	-0.111
6.2000	-0.111
6.4000	-0.095
6.6000	-0.095
6.8000	-0.079
7.0000	-0.079
7.2000	-0.079
7.4000	-0.063
7.6000	-0.063
7.8000	-0.063
8.0000	-0.063
8.2000	-0.047
8.4000	-0.047
8.6000	-0.047
8.8000	-0.047
9.0000	-0.047
9.2000	-0.031
9.4000	-0.031
9.6000	-0.031
9.8000	-0.031
10.0000	-0.031
12.0000	0.000

END

0.06

06-07 Falling

NSWC Crane/7651



00022

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT NSWC Crane		JOB NUMBER 7651	
SUBJECT 06-07 Falling Head Test			
BASED ON Hvorslev (1951		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.23$ ft
$L = 9.24$ ft

$T_0 = 1.7$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(9.24\ \text{ft}/0.03\ \text{ft})}{2(9.24\ \text{ft})(1.7\ \text{min})}$$

$K = 8.10 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 1.17$ ft/day $\times$ 1 cm/s / 2835 ft/day

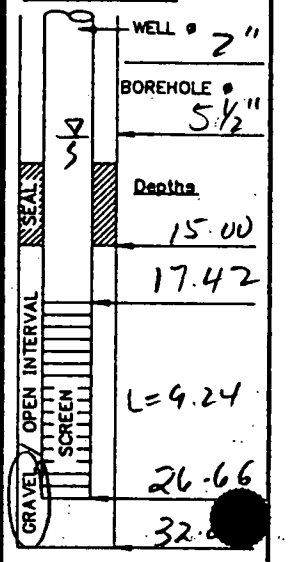
$= 4.11 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

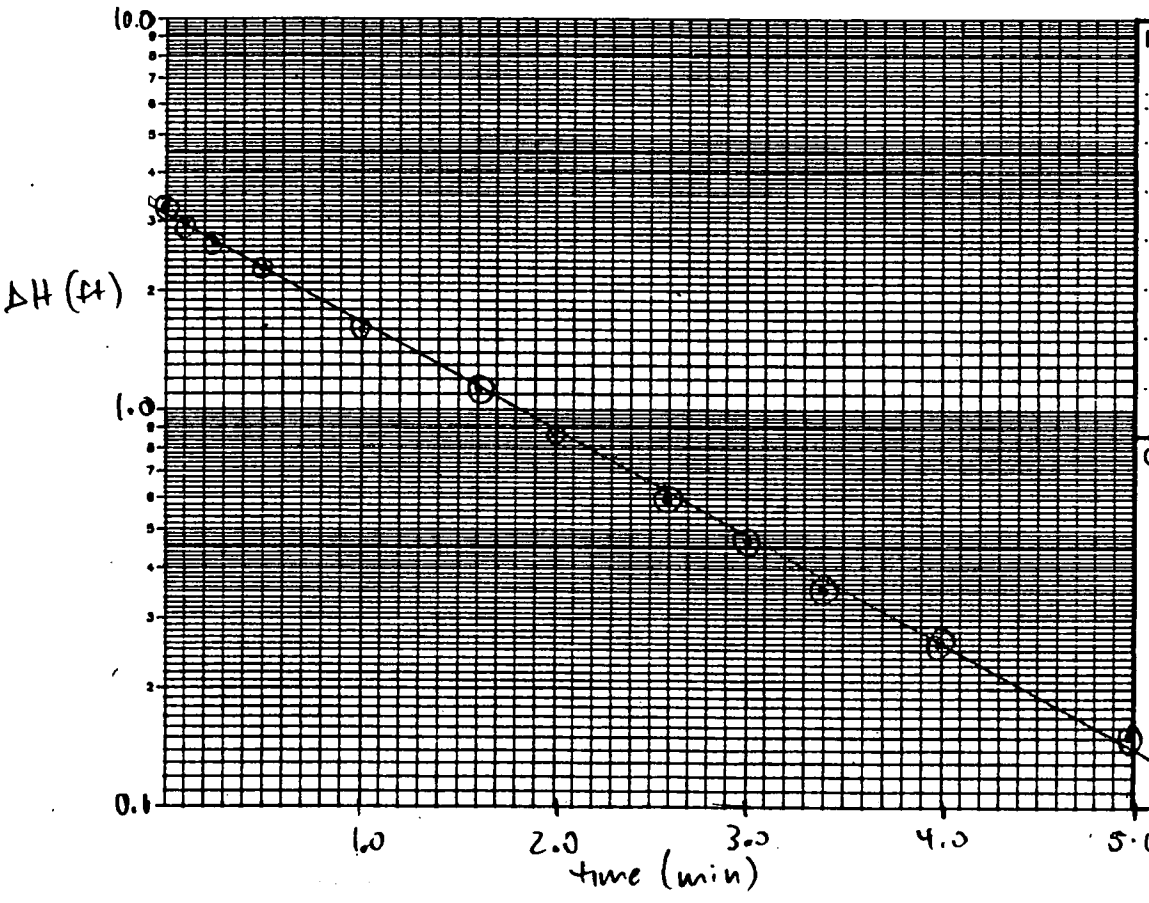
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-07
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.24 ft TEST NO.: T1550
STATIC WATER LEVEL (Depth/Elevation): 16.10' TOVC DATE: 3/11/99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.26	5.00		0.15
0.05		3.07	6.00		0.09
0.10		2.96	7.00		0.06
0.25		2.69	8.00		0.04
0.50		2.28			
1.00		1.66			
1.60		1.12			
2.00		0.87			
2.60		0.60			
3.00		0.47			
3.40		0.36			
4.00		0.26			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
HERMIT #143
XD #1670 50 psi
H2O above XD = 14.58
Start @ 0819
Stop @ 0834

CALCS, SKETCH MAPS, ETC.:
file: 0607RISE.txt

0.0366
SE1000C
Environmental Logger
03/11 10:12

Unit# 00143 Test 16

Setups: INPUT 1

Type	Level (F)
Mode	TOC
I.D.	60700
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06-07
Rising Head Test
file: 0607RISE.TXT

Step 0 03/11 08:19:37

Elapsed Time	INPUT 1		H/H_0
0.0000	0.063		
0.0033	8.298		
0.0066	4.268		
0.0100	3.491		
0.0133	3.268	← H_0	1.00
0.0166	3.253		
0.0200	3.205		
0.0233	3.205		
0.0266	3.189		
0.0300	3.157		
0.0333	3.142		
0.0366	3.126		
0.0400	3.126		0.95
0.0433	3.110		
0.0466	3.078		
0.0500	3.078		
0.0533	3.078		
0.0566	3.078		
0.0600	3.062		
0.0633	3.062		
0.0666	3.046		
0.0700	3.046		
0.0733	3.030		
0.0766	3.015		
0.0800	3.015		
0.0833	3.030		
0.0866	2.983		
0.0900	2.999		
0.0933	2.983		
0.0966	2.983		
0.1000	2.967		
0.1033	2.951		0.90
0.1066	2.951		
0.1100	2.951		
0.1133	2.935		
0.1166	2.935		
0.1200	2.919		

0.1233	2.919
0.1266	2.903
0.1300	2.903
0.1333	2.903
0.1366	2.888
0.1400	2.888
0.1433	2.872
0.1466	2.888
0.1500	2.856
0.1533	2.856
0.1566	2.856
0.1600	2.856
0.1633	2.840
0.1666	2.824
0.1700	2.824
0.1733	2.824
0.1766	2.808
0.1800	2.808
0.1833	2.808
0.1866	2.808
0.1900	2.792
0.1933	2.777
0.1966	2.777
0.2000	2.777
0.2033	2.777
0.2066	2.777
0.2100	2.761
0.2133	2.777
0.2166	2.777
0.2200	2.745
0.2233	2.729
0.2266	2.729
0.2300	2.729
0.2333	2.729
0.2366	2.713
0.2400	2.713
0.2433	2.697
0.2466	2.697
0.2500	2.697
0.2533	2.697
0.2566	2.697
0.2600	2.681
0.2633	2.681
0.2666	2.681
0.2700	2.745
0.2733	2.665
0.2766	2.665
0.2800	2.650
0.2833	2.634
0.2866	2.650
0.2900	2.634
0.2933	2.634
0.2966	2.634
0.3000	2.618
0.3033	2.618
0.3066	2.602
0.3100	2.602
0.3133	2.602
0.3166	2.602
0.3200	2.586

0.85

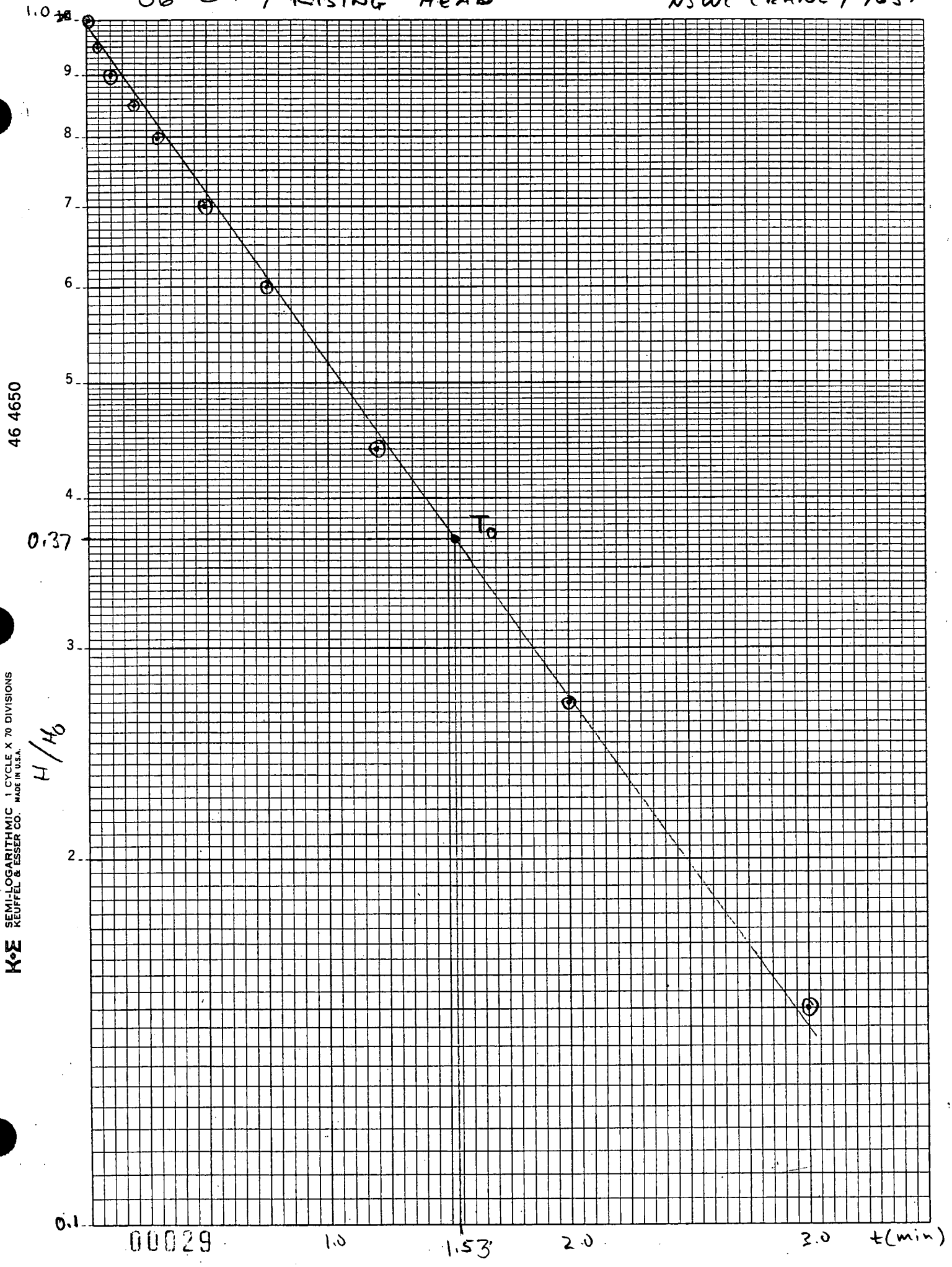
0.80

0.3233	2.586	
0.3266	2.586	
0.3300	2.570	
0.3333	2.570	
0.3500	2.523	
0.3666	2.507	
0.3833	2.459	
0.4000	2.427	
0.4166	2.396	
0.4333	2.380	
0.4500	2.348	
0.4666	2.332	
0.4833	2.300	0.70
0.5000	2.285	
0.5166	2.253	
0.5333	2.237	
0.5500	2.205	
0.5666	2.189	
0.5833	2.158	
0.6000	2.142	
0.6166	2.126	
0.6333	2.094	
0.6500	2.078	
0.6666	2.062	
0.6833	2.031	
0.7000	2.015	
0.7166	1.999	
0.7333	1.983	
0.7500	1.951	0.60
0.7666	1.935	
0.7833	1.904	
0.8000	1.888	
0.8166	1.872	
0.8333	1.856	
0.8500	1.840	
0.8666	1.824	
0.8833	1.793	
0.9000	1.777	
0.9166	1.761	
0.9333	1.745	
0.9500	1.729	
0.9666	1.713	
0.9833	1.698	
1.0000	1.666	
1.2000	1.444	0.44
1.4000	1.269	
1.6000	1.126	
1.8000	0.999	
2.0000	0.872	0.27
2.2000	0.777	
2.4000	0.682	
2.6000	0.603	
2.8000	0.539	
3.0000	0.476	0.15
3.2000	0.428	
3.4000	0.365	
3.6000	0.333	
3.8000	0.301	
4.0000	0.269	
4.2000	0.238	0.07

4.4000	0.206	
4.6000	0.190	
4.8000	0.174	
5.0000	0.158	
5.2000	0.142	
5.4000	0.127	
5.6000	0.111	0.03
5.8000	0.111	
6.0000	0.095	
6.2000	0.095	
6.4000	0.079	
6.6000	0.079	
6.8000	0.079	
7.0000	0.063	
7.2000	0.063	
7.4000	0.063	
7.6000	0.063	
7.8000	0.047	
8.0000	0.047	0.01
8.2000	0.047	
8.4000	0.047	
8.6000	0.047	
8.8000	0.031	
9.0000	0.031	
9.2000	0.031	
9.4000	0.031	
9.6000	0.031	
9.8000	0.031	
10.0000	0.031	
12.0000	0.031	
14.0000	0.015	

END

06-07 / RISING HEAD NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC Crane	JOB NUMBER	7651
SUBJECT	06-07 Rising Head Test		
BASED ON	Hvorslev	DRAWING NUMBER	
BY	TSE	CHECKED BY	
APPROVED BY		DATE	

$r = 0.083\ ft$

$R = 0.23\ ft$

$L = 9.24\ ft$

$T_0 = 1.53\ min$

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.24\ ft / 0.23\ ft)}{2(9.24\ ft)(1.53\ min)}$$

$K = 9.00 \times 10^{-4}\ ft/min \times 1{,}440\ min / 1\ day$

$K = 1.30\ ft/day \times 1\ cm/s / 2835\ ft/day$

$= 4.57 \times 10^{-4}\ cm/s$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC Crane WELL/BORING NO.: 06-15

PROJECT NO.: 7651 GEOLOGIST: T. Evans

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.11 ft / ~~14.67~~ 14.51 ft TOC TEST NO.: 06015

STATIC WATER LEVEL (Depth/Elevation): 10.48' TOC DATE: 3-10-99

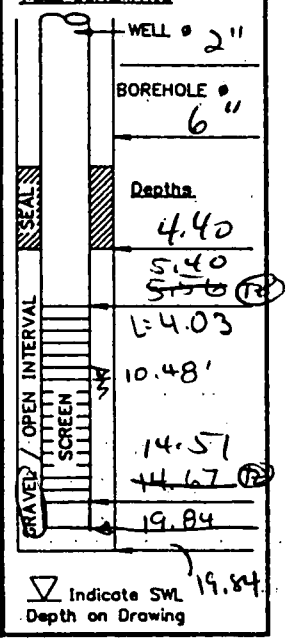
TEST TYPE (Rising/Falling/Constant Head): ~~Falling~~ Rising CHECKED:

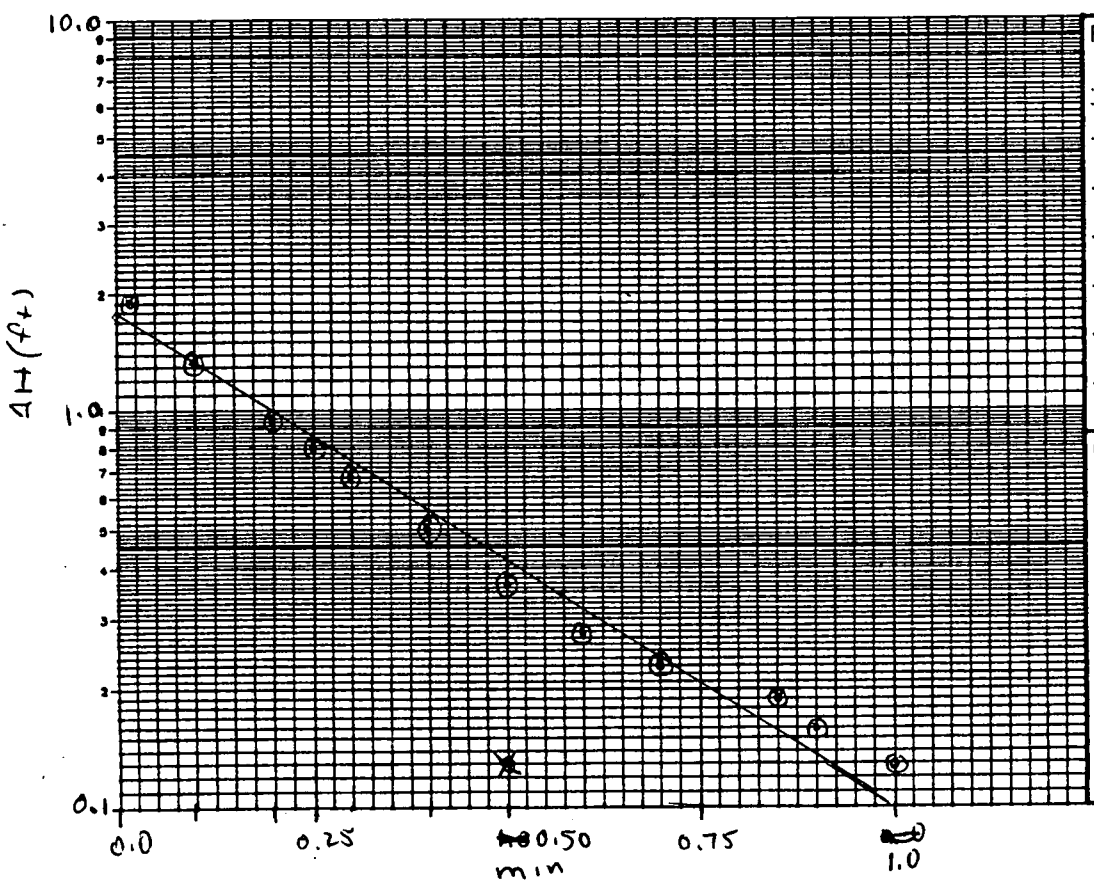
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 5.12') PAGE ... OF ...

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC (XD + WLS)

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		1.93	0.50		0.37
0.04		1.65	0.55		0.33
0.05		1.54	0.60		0.29
0.08		1.42	0.70		0.23
0.10		1.34	0.80		0.19
0.15		1.13	0.90		0.16
0.20		0.94	1.00		0.13
0.25		0.80	1.40		0.07
0.30		0.69	2.00		0.03
0.35		0.59	2.40		0.01
0.40		0.50			
0.45		0.43			

WELL SCHEMATIC





REMARKS:

Hermit S/N 143

XD S/N 203210

H_2O above XD = 8.15 ft

Level / Log / TOC

Start @ 0918

Stop @ 0932

CALCS, SKETCH MAPS, ETC.:

file: 0615 Rise.txt

00031

✓ FWK

0.0166
SE1000C
Environmental Logger
03/10 18:48

Unit# 00143 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06015
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06-15
Rising Head Test
06 15 RISE, TXT

Step 0 03/10 09:18:00

Elapsed Time	INPUT 1
0.0000	-0.043
0.0033	0.768
0.0066	2.042
0.0100	0.734
0.0133	0.446
0.0166	1.215
0.0200	1.930
0.0233	1.755
0.0266	1.739
0.0300	1.705
0.0333	1.702
0.0366	1.655
0.0400	1.655
0.0433	1.621
0.0466	1.618
0.0500	1.596
0.0533	1.574
0.0566	1.558
0.0600	1.530
0.0633	1.518
0.0666	1.499
0.0700	1.477
0.0733	1.468
0.0766	1.440
0.0800	1.421
0.0833	1.421
0.0866	1.396
0.0900	1.380
0.0933	1.365
0.0966	1.346
0.1000	1.340
0.1033	1.321
0.1066	1.305
0.1100	1.293
0.1133	1.277
0.1166	1.265
0.1200	1.249

Ho	H/Ho	T
	1.00	0
	.95	.0133
	.90	.0300
	.85	.0433
	.80	.0633

00032

.0233

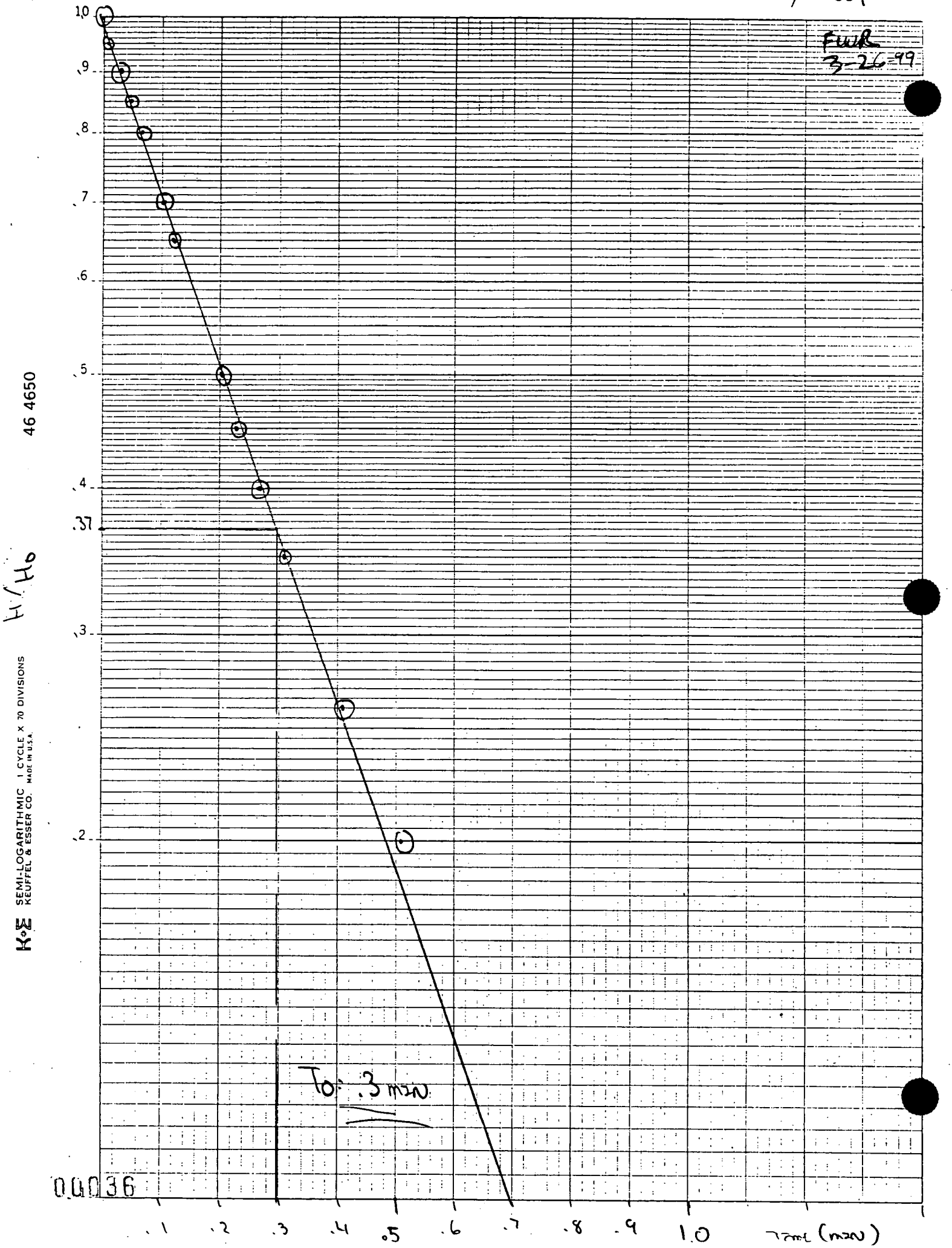
0.1233	1.234		
0.1266	1.221	.70	.1033
0.1300	1.208		
0.1333	1.196		
0.1366	1.180		
0.1400	1.168		
0.1433	1.155		
0.1466	1.146	.65	.1233
0.1500	1.130		
0.1533	1.118		
0.1566	1.105		
0.1600	1.093		
0.1633	1.084		
0.1666	1.068		
0.1700	1.055		
0.1733	1.046		
0.1766	1.034		
0.1800	1.024		
0.1833	1.012		
0.1866	1.002		
0.1900	0.990		
0.1933	0.977		
0.1966	0.968		
0.2000	0.959		
0.2033	0.949		
0.2066	0.937		
0.2100	0.927		
0.2133	0.918		
0.2166	0.909		
0.2200	0.896		
0.2233	0.887		
0.2266	0.877	.50	.2033
0.2300	0.868		
0.2333	0.859		
0.2366	0.846		
0.2400	0.840		
0.2433	0.831		
0.2466	0.821		
0.2500	0.815		
0.2533	0.806		
0.2566	0.796		
0.2600	0.787	.45	.2366
0.2633	0.781		
0.2666	0.771		
0.2700	0.765		
0.2733	0.756		
0.2766	0.749		
0.2800	0.740		
0.2833	0.734		
0.2866	0.724		
0.2900	0.718		
0.2933	0.712		
0.2966	0.699	.40	.2733
0.3000	0.693		
0.3033	0.687		
0.3066	0.678		
0.3100	0.671		
0.3133	0.665		
0.3166	0.659		00033
0.3200	0.649		

0.3233	0.643		
0.3266	0.640		
0.3300	0.634		
0.3333	0.624	.35	.3100
0.3500	0.590		
0.3666	0.562		
0.3833	0.531		
0.4000	0.506		
0.4166	0.481		
0.4333	0.456	.26	.4100
0.4500	0.434		
0.4666	0.415		
0.4833	0.393		
0.5000	0.378		
0.5166	0.362		
0.5333	0.346	.20	.5100
0.5500	0.331		
0.5666	0.318		
0.5833	0.306		
0.6000	0.293		
0.6166	0.284		
0.6333	0.271		
0.6500	0.262		
0.6666	0.253		
0.6833	0.243		
0.7000	0.234		
0.7166	0.228		
0.7333	0.218		
0.7500	0.212		
0.7666	0.206		
0.7833	0.196		
0.8000	0.193		
0.8166	0.187		
0.8333	0.181		
0.8500	0.174		
0.8666	0.168		
0.8833	0.165		
0.9000	0.162		
0.9166	0.156		
0.9333	0.153		
0.9500	0.149		
0.9666	0.143		
0.9833	0.140		
1.0000	0.137		
1.2000	0.093		
1.4000	0.071		
1.6000	0.056		
1.8000	0.040		
2.0000	0.031		
2.2000	0.024		
2.4000	0.015		
2.6000	0.009		
2.8000	0.000		
3.0000	-0.009		
3.2000	-0.012		
3.4000	-0.015		
3.6000	-0.015		
3.8000	-0.021		
4.0000	-0.021		
4.2000	-0.021		

4.4000	-0.028
4.6000	-0.028
4.8000	-0.028
5.0000	-0.028
5.2000	-0.031
5.4000	-0.031
5.6000	-0.034
5.8000	-0.034
6.0000	-0.034
6.2000	-0.034
6.4000	-0.037
6.6000	-0.034
6.8000	-0.037
7.0000	-0.037
7.2000	-0.040
7.4000	-0.037
7.6000	-0.037
7.8000	-0.037
8.0000	-0.037
8.2000	-0.037
8.4000	-0.034
8.6000	-0.037
8.8000	-0.040
9.0000	-0.040
9.2000	-0.040
9.4000	-0.040
9.6000	-0.040
9.8000	-0.040
10.0000	-0.040
12.0000	-0.040
14.0000	-0.037

END

06-15 RISING NSWC CRANE / 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: OG-15 RISING HEAD TEST			
BASED ON: HORSLEV (1951)		DRAWING NUMBER:	
BY: RMB	CHECKED BY: 3-26-99	APPROVED BY:	DATE:

$r = .083$ FT
$R = .250$ FT
$L = 4.03$ FT

$T_0 = 0.30$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ FT})^2 \ln(4.03 \text{ FT} / .250 \text{ FT})}{2(4.03 \text{ FT})(0.30 \text{ MIN})}$$

$K = 7.92 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 11.41$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K = 4.02 \times 10^{-3}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-16

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.06' TEST NO.: TSS 0

STATIC WATER LEVEL (Depth/Elevation): 27.09' TPVC DATE: 3/12/99

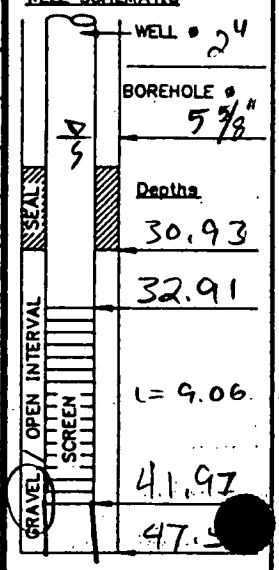
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

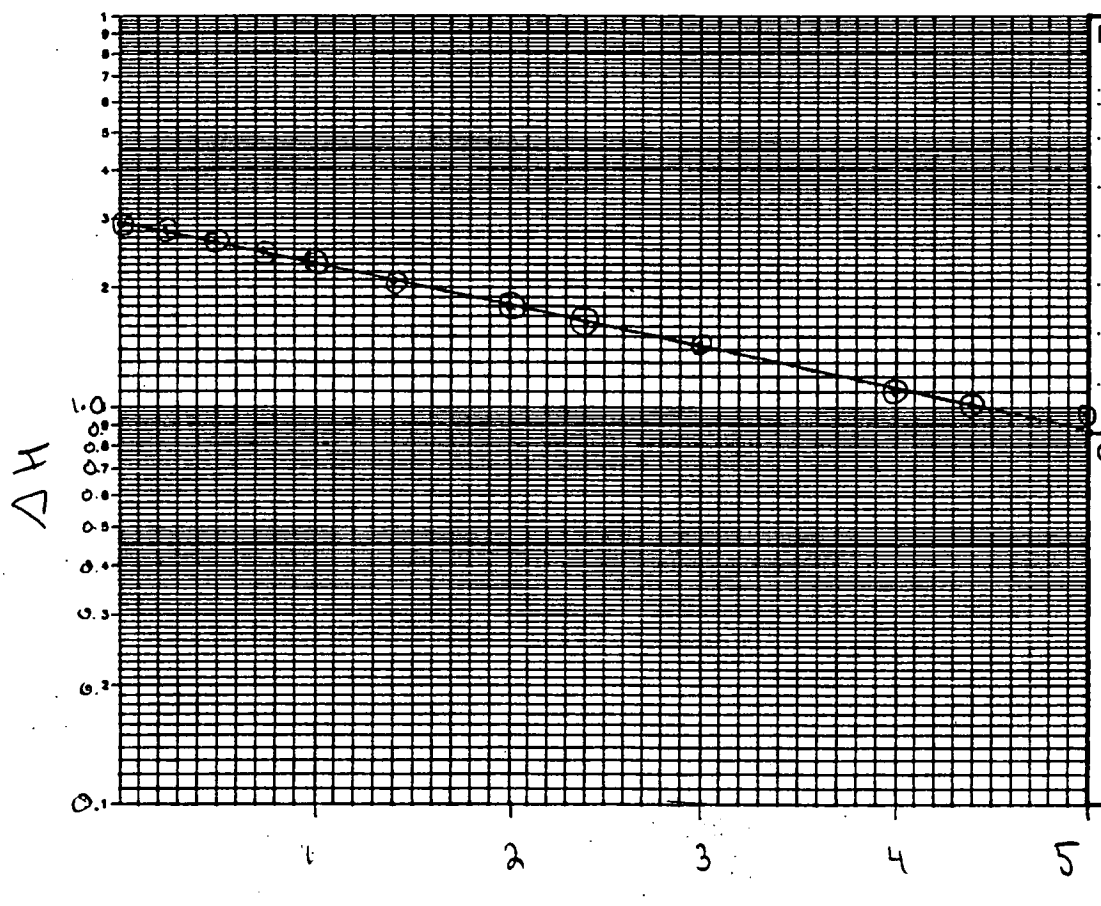
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 4.7') PAGE ... OF ...

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.10		-2.967	6.00		-0.765
0.25		-2.840	7.00		-0.625
0.50		-2.655			
0.75		-2.489			
1.00		-2.335			
1.40		-2.086			
2.00		-1.806			
2.40		-1.652			
3.00		-1.448			
4.00		-1.161			
4.40		-1.072			
5.00		-0.944			

WELL SCHEMATIC





REMARKS:
Hermit # 143
XD #201804 20psi
H_2O above XD = 19.12'

Start @ 1009
Stop @ 1100

CALCS, SKETCH MAPS, ETC.:
File: 0616fall.txt

00038

Fwr 3-26

SE1000C
Environmental Logger
03/13 08:19

Unit# 00143 Test 5

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06016
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well 06-16
Falling Head Test
Ø6 16 Fall.txt

Step 0 03/12 10:09:08

Elapsed Time	INPUT 1
0.0000	-0.855
0.0033	-3.389
0.0066	-3.440
0.0100	-4.385
0.0133	-3.970
0.0166	-4.308
0.0200	-4.411
0.0233	-4.404
0.0266	-4.417
0.0300	-4.443
0.0333	-4.398
0.0366	-4.423
0.0400	-4.379
0.0433	-4.353
0.0466	-4.161
0.0500	-2.942
0.0533	-1.225
0.0566	-2.316
0.0600	-3.216
0.0633	-3.944
0.0666	-3.548
0.0700	-2.999
0.0733	-2.374
0.0766	-2.495
0.0800	-3.229
0.0833	-3.127
0.0866	-2.859
0.0900	-2.993
0.0933	-2.967
0.0966	-2.948
0.1000	-2.967 ← H_0
0.1033	-2.948
0.1066	-2.955
0.1100	-2.948
0.1133	-2.942
0.1166	-2.942
0.1200	-2.942

H/H_0	t
1.00	0.0

00039

0.1233	-2.916
0.1266	-2.916
0.1300	-2.948
0.1333	-2.923
0.1366	-2.923
0.1400	-2.916
0.1433	-2.923
0.1466	-2.916
0.1500	-2.916
0.1533	-2.916
0.1566	-2.910
0.1600	-2.904
0.1633	-2.904
0.1666	-2.904
0.1700	-2.897
0.1733	-2.897
0.1766	-2.891
0.1800	-2.891
0.1833	-2.884
0.1866	-2.878
0.1900	-2.891
0.1933	-2.891
0.1966	-2.878
0.2000	-2.878
0.2033	-2.878
0.2066	-2.872
0.2100	-2.872
0.2133	-2.865
0.2166	-2.865
0.2200	-2.859
0.2233	-2.859
0.2266	-2.852
0.2300	-2.852
0.2333	-2.852
0.2366	-2.846
0.2400	-2.846
0.2433	-2.846
0.2466	-2.840
0.2500	-2.840
0.2533	-2.833
0.2566	-2.833
0.2600	-2.833
0.2633	-2.827
0.2666	-2.827
0.2700	-2.827
0.2733	-2.814
0.2766	-2.821
0.2800	-2.821
0.2833	-2.814
0.2866	-2.814
0.2900	-2.808
0.2933	-2.801
0.2966	-2.808
0.3000	-2.795
0.3033	-2.801
0.3066	-2.801
0.3100	-2.795
0.3133	-2.795
0.3166	-2.789
0.3200	-2.789

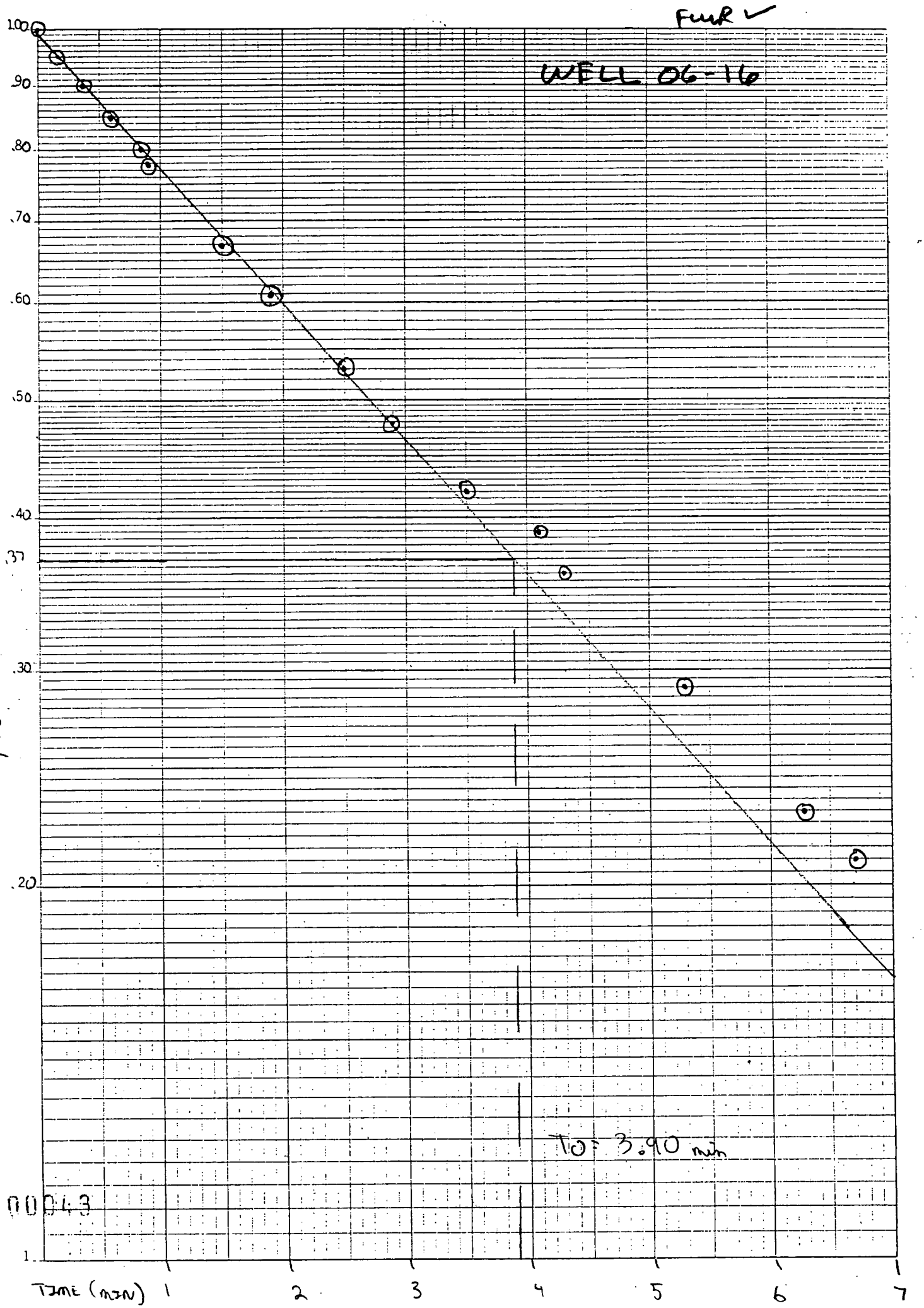
.95 .1766

00040

0.3233	-2.789		
0.3266	-2.782		
0.3300	-2.782		
0.3333	-2.776		
0.3500	-2.763		
0.3666	-2.750		
0.3833	-2.744		
0.4000	-2.731		
0.4166	-2.718		
0.4333	-2.706		
0.4500	-2.693		
0.4666	-2.680		
0.4833	-2.667	.90	.3833
0.5000	-2.655		
0.5166	-2.642		
0.5333	-2.629		
0.5500	-2.623		
0.5666	-2.610		
0.5833	-2.597		
0.6000	-2.584		
0.6166	-2.572		
0.6333	-2.565		
0.6500	-2.552		
0.6666	-2.540		
0.6833	-2.533		
0.7000	-2.520	.85	.6000
0.7166	-2.508		
0.7333	-2.501		
0.7500	-2.489		
0.7666	-2.476		
0.7833	-2.469		
0.8000	-2.457		
0.8166	-2.444		
0.8333	-2.437		
0.8500	-2.425		
0.8666	-2.418		
0.8833	-2.406		
0.9000	-2.393		
0.9166	-2.386		
0.9333	-2.374		
0.9500	-2.367	.80	.8500
0.9666	-2.354		
0.9833	-2.348		
1.0000	-2.335	.78	.9000
1.2000	-2.189		
1.4000	-2.086		
1.6000	-1.991	.67	1.500
1.8000	-1.895		
2.0000	-1.806	.61	1.900
2.2000	-1.729		
2.4000	-1.652		
2.6000	-1.582	.53	2.500
2.8000	-1.512		
3.0000	-1.448	.48	2.900
3.2000	-1.384		
3.4000	-1.327		
3.6000	-1.269	.42	3.500
3.8000	-1.218		
4.0000	-1.161	.39	4.100
4.2000	-1.116		

		H/Ho	t
4.4000	-1.072	.36	4.300
4.6000	-1.027		
4.8000	-0.982		
5.0000	-0.944		
5.2000	-0.906		
5.4000	-0.867	.29	5.300
5.6000	-0.829		
5.8000	-0.797		
6.0000	-0.765		
6.2000	-0.733		
6.4000	-0.701	.23	6.300
6.6000	-0.676		
6.8000	-0.644	.21	6.700
7.0000	-0.625		
7.2000	-0.593	.20	7.100
7.4000	-0.574		
7.6000	-0.548		
7.8000	-0.529		
8.0000	-0.504		
8.2000	-0.485		
8.4000	-0.465	.15	8.300
8.6000	-0.446		
8.8000	-0.427		
9.0000	-0.408		
9.2000	-0.395		
9.4000	-0.382		
9.6000	-0.363		
9.8000	-0.351		
10.0000	-0.338		
12.0000	-0.223		
14.0000	-0.146		
16.0000	-0.102		
18.0000	-0.070		
20.0000	-0.051		
22.0000	-0.044		
24.0000	-0.038		
26.0000	-0.032		
28.0000	-0.032		
30.0000	-0.025		
32.0000	-0.032		
34.0000	-0.025		
36.0000	-0.025		
38.0000	-0.019		
40.0000	-0.006		
42.0000	0.000		
44.0000	0.012		
46.0000	0.012		
48.0000	0.019		
50.0000	0.025		

END


FILE
WELL 06-16
1.00
.90
.80
.70
.60
.50
.40
.37
.30
.20
1
H/Ho
TO = 3.90 min
TIME (MIN)
1
2
3
4
5
6
7
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
00043

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06-16 FALLING HEAD TEST			
BASED ON: HORSLEV (1951)		DRAWING NUMBER:	
BY: RMB	CHECKED BY: FWRamsey 3-26-99	APPROVED BY:	DATE:

r = .083 FT FWR 3-26-99

R = ~~.250 FT~~ 0.234

L = 9.06 FT

T_0 = 3.90 MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(.083\ \text{FT})^2 \ln\left(9.06\ \text{FT} / \cancel{.250}\ .234\ \text{FT}\right)}{2(9.06\ \text{FT})(3.90\ \text{MIN})}$$

FWR 3/26

K = ~~3.5~~ 3.6 $\times 10^{-4}$ FT/MIN × 1440 MIN/DAY

K = ~~50~~ FWR ~~.52~~ .518 TE 3/31/99 FT/DAY × 1 cm/SEC / 2835 FT/DAY

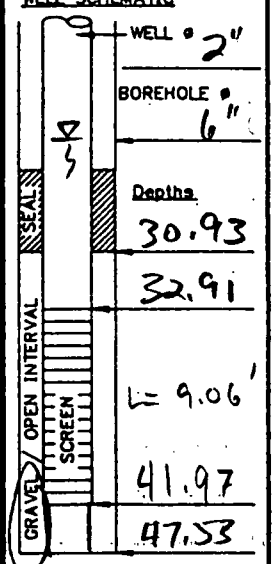
K = 1.83×10^{-4} cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

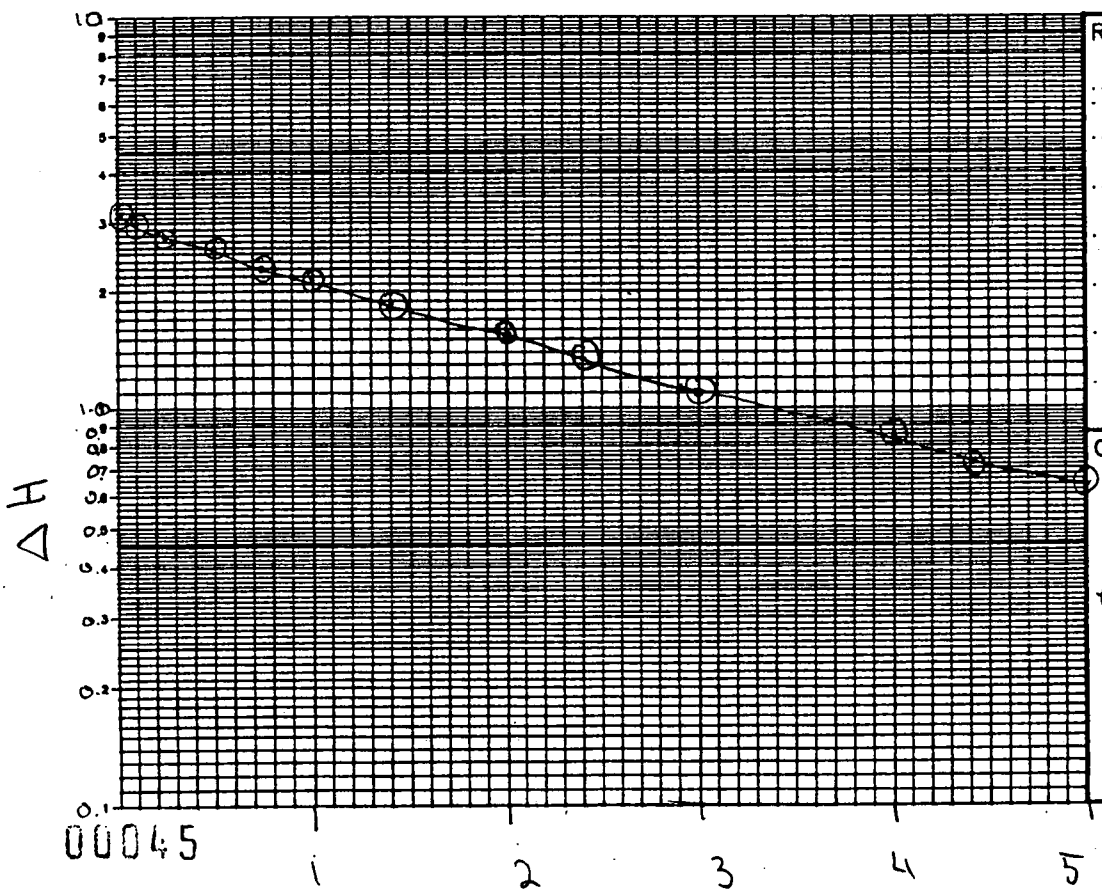
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-16
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.06' TEST NO.: T6S0
STATIC WATER LEVEL (Depth/Elevation): 27.06' TPVC DATE: 3/12/99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
.02		3.208	5.00		-0.657
0.10		2.984	6.00		0.504
0.25		2.857	7.00		0.394
0.50		2.595			
0.75		2.379			
1.00		2.181			
1.40		1.875			
2.00		1.543			
2.40		1.352			
3.00		1.135			
4.00		0.854			
4.40		0.765			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit #143
XD S/N 201804 200psi
H_2O above XD = 19.09'

Start @ 1101
Stop @ 1124

CALCS, SKETCH MAPS, ETC.:

File : Ø6 16 Rise.txt

00045

SE1000C
Environmental Logger
03/13 08:22

Unit# 00143 Test 6

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06016
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well ~~06016~~ 06-16
Rising Head Test
06 16 Rise. txt

Step 0 03/12 11:01:28

Elapsed Time	INPUT 1	
0.0000	6.324	
0.0033	4.476	
0.0066	1.958	
0.0100	3.080	
0.0133	3.290	
0.0166	3.214	
0.0200	3.208	← Ho
0.0233	3.182	
0.0266	3.163	
0.0300	3.157	
0.0333	3.137	
0.0366	3.125	
0.0400	3.125	
0.0433	3.112	
0.0466	3.112	
0.0500	3.099	
0.0533	3.105	
0.0566	3.093	
0.0600	3.086	
0.0633	3.074	
0.0666	3.074	
0.0700	3.067	
0.0733	3.067	
0.0766	3.061	
0.0800	3.067	
0.0833	3.042	
0.0866	3.042	
0.0900	3.042	
0.0933	3.029	
0.0966	3.029	
0.1000	2.984	
0.1033	3.016	
0.1066	3.010	
0.1100	3.004	
0.1133	2.997	
0.1166	3.010	
0.1200	2.997	

H/Ho	t
1.00	0
.95	.0633

00046

H/Ho	t
0.1233	2.991
0.1266	2.997
0.1300	2.984
0.1333	2.984
0.1366	2.978
0.1400	2.953
0.1433	2.965
0.1466	2.972
0.1500	2.959
0.1533	2.959
0.1566	2.946
0.1600	2.946
0.1633	2.946
0.1666	2.908
0.1700	2.940
0.1733	2.927
0.1766	2.927
0.1800	2.927
0.1833	2.914
0.1866	2.895
0.1900	2.902
0.1933	2.908
0.1966	2.902
0.2000	2.895
0.2033	2.895
0.2066	2.902
0.2100	2.889
0.2133	2.902
0.2166	2.895
0.2200	2.882
0.2233	2.876
0.2266	2.876
0.2300	2.876
0.2333	2.876
0.2366	2.870
0.2400	2.863
0.2433	2.863
0.2466	2.863
0.2500	2.857
0.2533	2.850
0.2566	2.831
0.2600	2.838
0.2633	2.838
0.2666	2.844
0.2700	2.831
0.2733	2.831
0.2766	2.825
0.2800	2.825
0.2833	2.825
0.2866	2.780
0.2900	2.812
0.2933	2.812
0.2966	2.812
0.3000	2.812
0.3033	2.780
0.3066	2.793
0.3100	2.793
0.3133	2.793
0.3166	2.787
0.3200	2.787

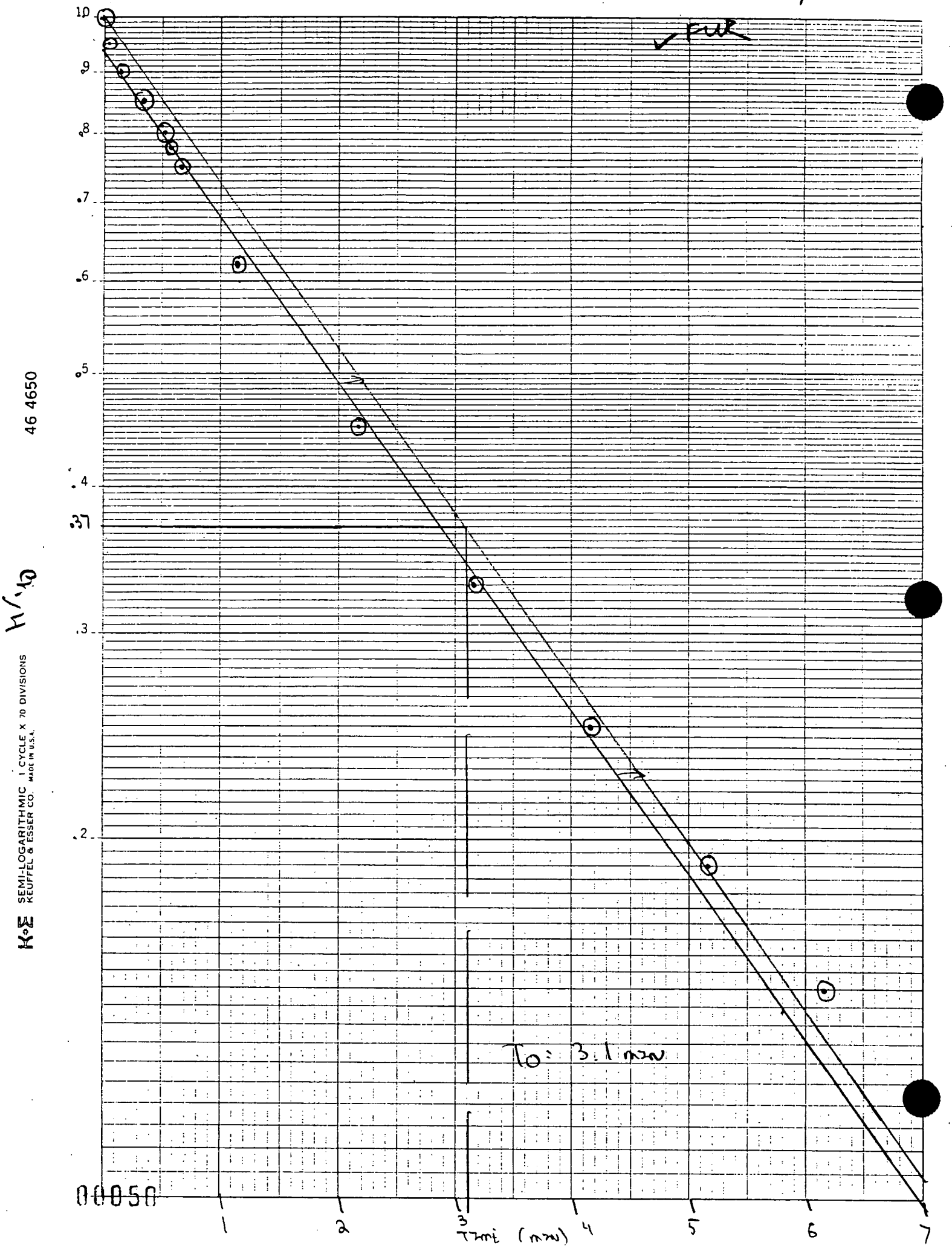
.90 .180

0.3233	2.787		
0.3266	2.780		
0.3300	2.774		
0.3333	2.774		
0.3500	2.748		
0.3666	2.729	.85	.3466
0.3833	2.710		
0.4000	2.691		
0.4166	2.678		
0.4333	2.659		
0.4500	2.646		
0.4666	2.627		
0.4833	2.615		
0.5000	2.595		
0.5166	2.583		
0.5333	2.564	.80	.5133
0.5500	2.551		
0.5666	2.538		
0.5833	2.519		
0.6000	2.506	.78	.5800
0.6166	2.493		
0.6333	2.474		
0.6500	2.462		
0.6666	2.449		
0.6833	2.430		
0.7000	2.417	.75	.6800
0.7166	2.404		
0.7333	2.391		
0.7500	2.379		
0.7666	2.366		
0.7833	2.353		
0.8000	2.334		
0.8166	2.321		
0.8333	2.308		
0.8500	2.296		
0.8666	2.283		
0.8833	2.270		
0.9000	2.257		
0.9166	2.245		
0.9333	2.232		
0.9500	2.219		
0.9666	2.207		
0.9833	2.194		
1.0000	2.181		
1.2000	2.009	.62	1.18
1.4000	1.875		
1.6000	1.754		
1.8000	1.671		
2.0000	1.543		
2.2000	1.448	.45	2.18
2.4000	1.352		
2.6000	1.282		
2.8000	1.205		
3.0000	1.135		
3.2000	1.071	.33	3.18
3.4000	1.007		
3.6000	0.950		
3.8000	0.899		
4.0000	0.854		
4.2000	0.810	.25	4.18

		h/ho	t
4.4000	0.765		
4.6000	0.727		
4.8000	0.689		
5.0000	0.657		
5.2000	0.618	.19	5.18
5.4000	0.586		
5.6000	0.561		
5.8000	0.529		
6.0000	0.504		
6.2000	0.484	.15	6.18
6.4000	0.459		
6.6000	0.440		
6.8000	0.414		
7.0000	0.395		
7.2000	0.376		
7.4000	0.363		
7.6000	0.338		
7.8000	0.325	.10	7.780
8.0000	0.306		
8.2000	0.293		
8.4000	0.274		
8.6000	0.261		
8.8000	0.248		
9.0000	0.236		
9.2000	0.223		
9.4000	0.210		
9.6000	0.197		
9.8000	0.191		
10.0000	0.185		
12.0000	0.102		
14.0000	0.057		
16.0000	0.031		
18.0000	0.000		
20.0000	0.025		
22.0000	0.031		
24.0000	0.019		
26.0000	0.012		

END

06-16 RISING NSWC CRANE / 7651



00050

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT OG-1b RISING HEAD TEST			
BASED ON HORSLEV (1951)		DRAWING NUMBER	
BY RMB	CHECKED BY Fidel Ramos 3-26-99	APPROVED BY	DATE

$r = .083$ FT
$R = .250$ FT
$L = 9.03$ FT

$T_0 = 3.1$ MIN

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

$$K = \frac{(0.083\ \text{FT})^2 \ln(9.03\ \text{FT}/.250\ \text{FT})}{2(9.03\ \text{FT})(3.10\ \text{MIN})}$$

$K = 4.41 \times 10^{-4}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 0.635$ FT/DAY $\times$ 1 CM/SEC / 2835 FT/DAY

$K = 2.24 \times 10^{-4}$ CM/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-17

PROJECT NO.: 7651 GEOLOGIST: T. EVANS

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.34' TEST NO.: T1150

STATIC WATER LEVEL (Depth/Elevation): 10.92' TPVC DATE: 3/10/95

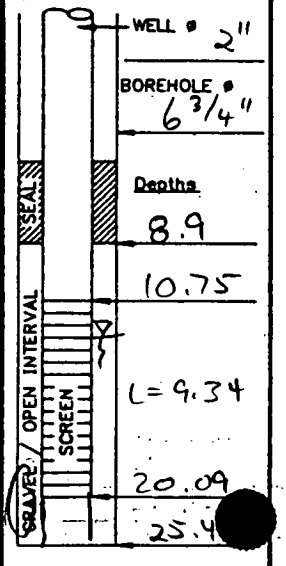
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 5.12') PAGE ___ OF ___

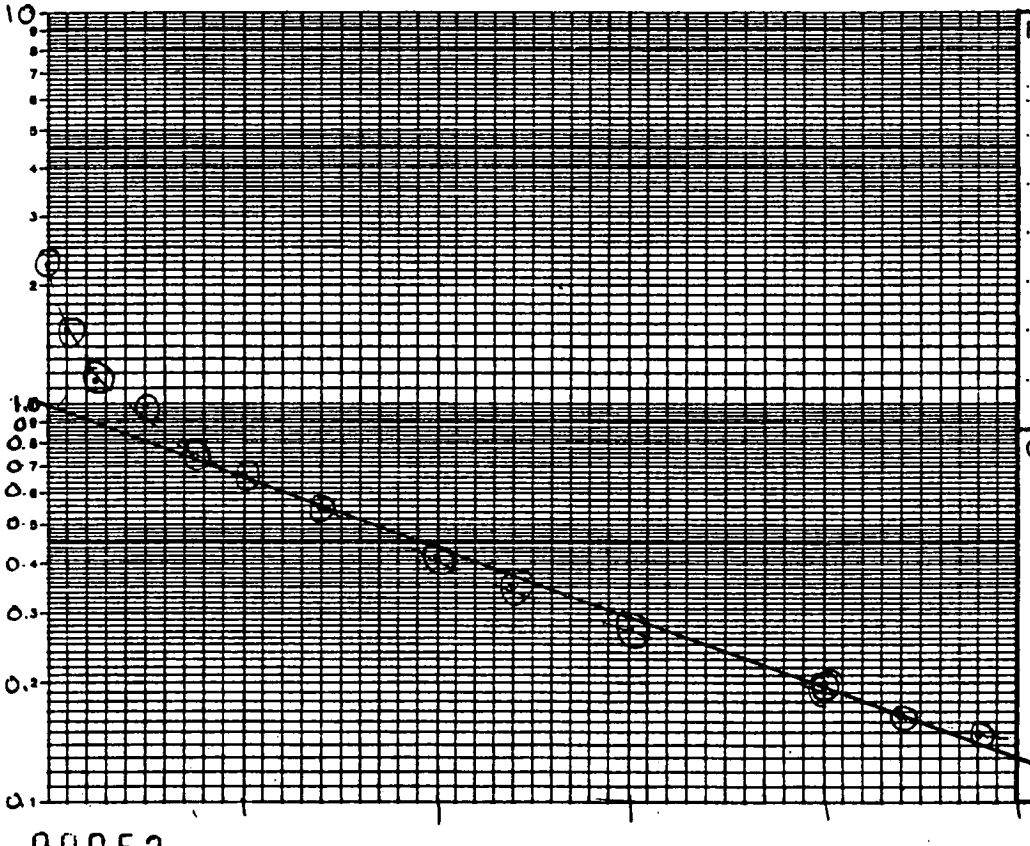
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.020		2.283	4.80		0.152
0.10		1.513	6.00		0.114
0.25		1.164	7.00		0.108
0.50		0.909			
0.75		0.776			
1.00		0.680			
1.40		0.547			
2.00		0.426			
2.40		0.356			
3.00		0.286			
4.00		0.197			
4.40		0.165			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

KD S/N 201604 20psi

H_2O above KD = 13.36'

Start @ 0940

Stop @ 0955

CALCS, SKETCH MAPS, ETC.:

File = 0617rise.txt

00052

FWR
3/26/99

SE1000C
Environmental Logger
03/12 13:39

Unit# 00145 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06017
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well #06-17
Rising Head Test
Ø617Rise.txt

Step 0 03/10 09:40:00

Elapsed Time	INPUT 1	H/H_0	t
0.0000	-0.006		
0.0033	0.000		
0.0066	0.858		
0.0100	2.690		
0.0133	1.463		
0.0166	0.369		
0.0200	2.283 ← H_0	1.00	0
0.0233	2.003		
0.0266	1.927		
0.0300	1.876		
0.0333	1.857		
0.0366	1.838		
0.0400	1.812	.79	.0200
0.0433	1.793		
0.0466	1.768		
0.0500	1.761		
0.0533	1.749		
0.0566	1.717	.75	.0366
0.0600	1.704		
0.0633	1.692		
0.0666	1.666		
0.0700	1.660		
0.0733	1.647		
0.0766	1.634		
0.0800	1.609		
0.0833	1.603		
0.0866	1.590	.70	.0666
0.0900	1.571		
0.0933	1.564		
0.0966	1.545		
0.1000	1.533		
0.1033	1.520		
0.1066	1.513		
0.1100	1.501		
0.1133	1.488	.65	.0933
0.1166	1.469		
0.1200	1.463		

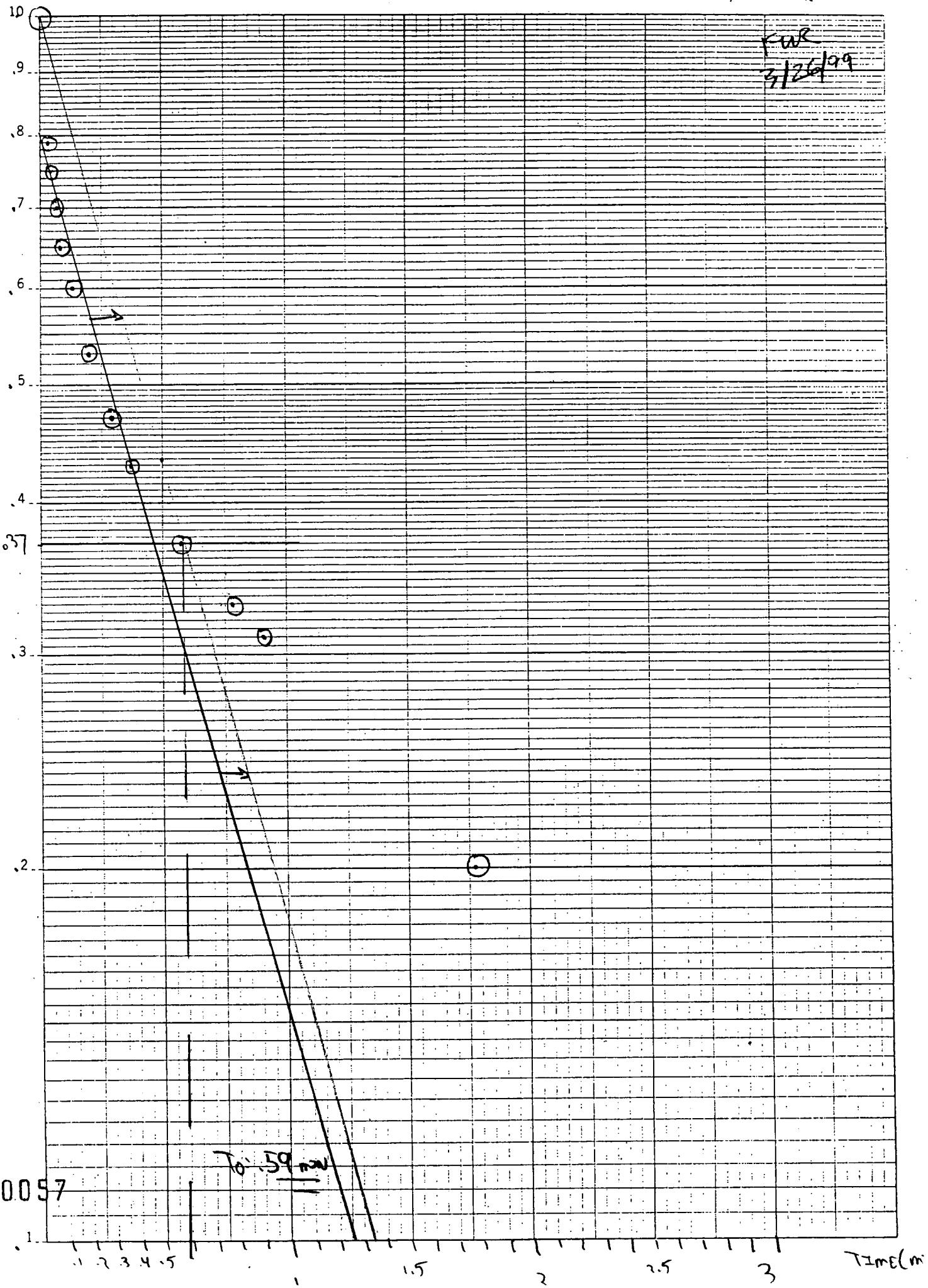
0.1233	1.450		
0.1266	1.444		
0.1300	1.424		
0.1333	1.418		
0.1366	1.405		
0.1400	1.399		
0.1433	1.386		
0.1466	1.386		
0.1500	1.367	.60	.1300
0.1533	1.361		
0.1566	1.361		
0.1600	1.342		
0.1633	1.329		
0.1666	1.323		
0.1700	1.310		
0.1733	1.310		
0.1766	1.297		
0.1800	1.291		
0.1833	1.284		
0.1866	1.272		
0.1900	1.272		
0.1933	1.259		
0.1966	1.253		
0.2000	1.240		
0.2033	1.253		
0.2066	1.234		
0.2100	1.227		
0.2133	1.221		
0.2166	1.221		
0.2200	1.208	.53	.200
0.2233	1.202		
0.2266	1.195		
0.2300	1.183		
0.2333	1.189		
0.2366	1.183		
0.2400	1.170		
0.2433	1.164		
0.2466	1.170		
0.2500	1.164		
0.2533	1.151		
0.2566	1.151		
0.2600	1.138		
0.2633	1.138		
0.2666	1.132		
0.2700	1.132		
0.2733	1.126		
0.2766	1.119		
0.2800	1.113		
0.2833	1.119		
0.2866	1.100		
0.2900	1.106		
0.2933	1.094		
0.2966	1.100		
0.3000	1.087		
0.3033	1.087		
0.3066	1.081		
0.3100	1.081		
0.3133	1.075		
0.3166	1.075		
0.3200	1.062	.47	.300

0.3233	1.068		
0.3266	1.062		
0.3300	1.049		
0.3333	1.056		
0.3500	1.030		
0.3666	1.011		
0.3833	0.998		
0.4000	0.979	.43	.3800
0.4166	0.967		
0.4333	0.954		
0.4500	0.935		
0.4666	0.928		
0.4833	0.922		
0.5000	0.909		
0.5166	0.897		
0.5333	0.884		
0.5500	0.877		
0.5666	0.871		
0.5833	0.858		
0.6000	0.852	.37	.5800
0.6166	0.833		
0.6333	0.827		
0.6500	0.827		
0.6666	0.808		
0.6833	0.808		
0.7000	0.795		
0.7166	0.795		
0.7333	0.782		
0.7500	0.776		
0.7666	0.769		
0.7833	0.757		
0.8000	0.763	.33	.7800
0.8166	0.750		
0.8333	0.737		
0.8500	0.731		
0.8666	0.731		
0.8833	0.725		
0.9000	0.706	.31	.8800
0.9166	0.712		
0.9333	0.706		
0.9500	0.699		
0.9666	0.687		
0.9833	0.680		
1.0000	0.680		
1.2000	0.604		
1.4000	0.547		
1.6000	0.496		
1.8000	0.458	.20	1.780
2.0000	0.426		
2.2000	0.388		
2.4000	0.356		
2.6000	0.337		
2.8000	0.318	.14	2.7800
3.0000	0.286		
3.2000	0.254	.11	3.1800
3.4000	0.248		
3.6000	0.222	.09	3.580
3.8000	0.210		
4.0000	0.197		
4.2000	0.184		

4.4000	0.165
4.6000	0.152
4.8000	0.152
5.0000	0.171
5.2000	0.152
5.4000	0.133
5.6000	0.140
5.8000	0.127
6.0000	0.114
6.2000	0.120
6.4000	0.114
6.6000	0.127
6.8000	0.114
7.0000	0.108
7.2000	0.101
7.4000	0.095
7.6000	0.089
7.8000	0.082
8.0000	0.076
8.2000	0.101
8.4000	0.108
8.6000	0.089
8.8000	0.082
9.0000	0.082
9.2000	0.076
9.4000	0.076
9.6000	0.076
9.8000	0.076
10.0000	0.063
12.0000	0.050
14.0000	0.031
16.0000	0.038
18.0000	0.025

END

06-17 RISING NSWC CRANE / 7651



00057

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OG-17 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB / CHECKED BY: FWRamsey 3-26-99	APPROVED BY: / DATE:

$r = 0.083$ FT

$R = 0.281$ FT

$L = 9.34$ FT

$T_o = .59$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(9.34\,FT / 0.281\,FT)}{2(9.34\,FT)(.59\,MIN)}$$

$K = 2.19 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 3.15$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

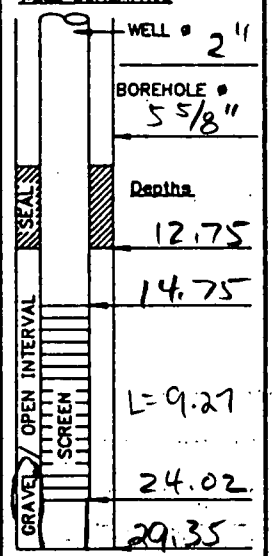
$K = 1.11 \times 10^{-3}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

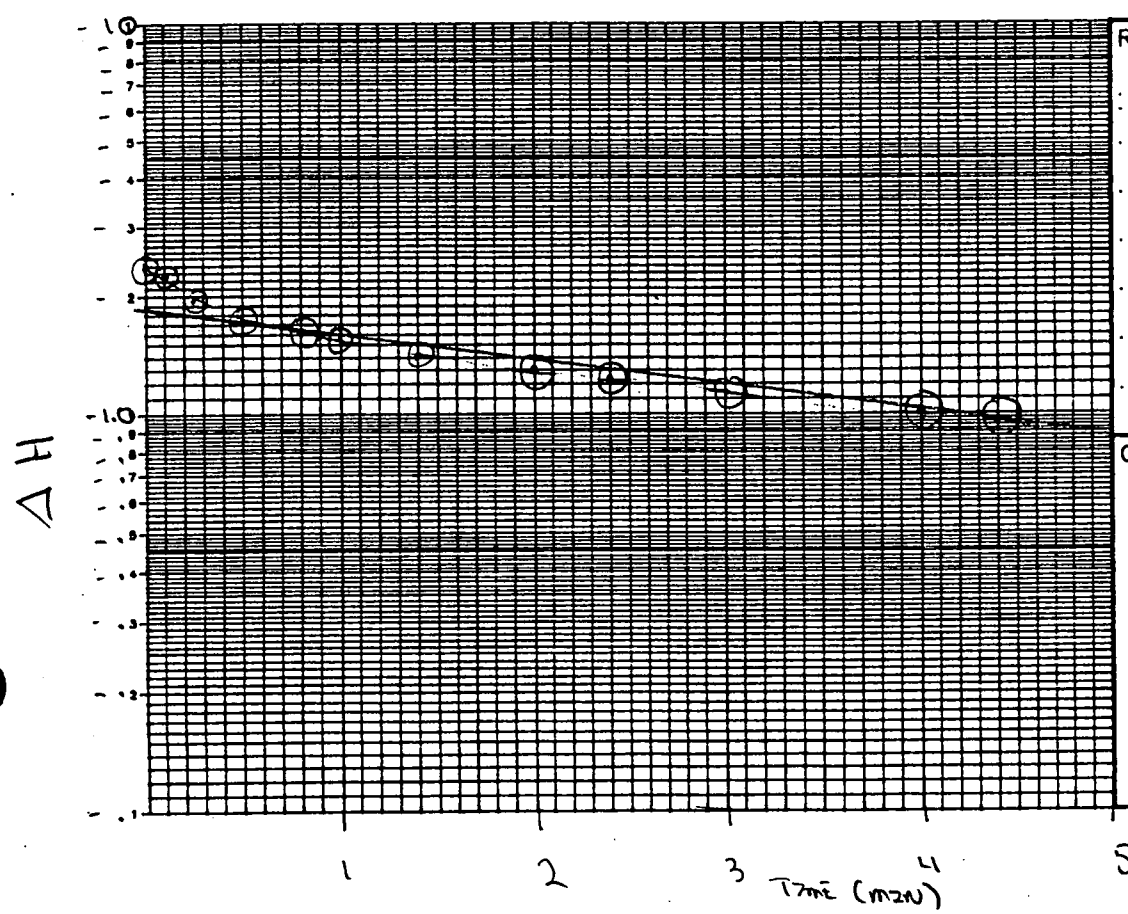
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-18
PROJECT NO.: 7651 GEOLOGIST: TIM EVANS
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.27' TEST NO.: T185Ø
STATIC WATER LEVEL (Depth/Elevation): 10.05' TOVC DATE: 3/12/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø X 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-2.386	5.00		-0.908
0.10		-2.283	6.00		-0.814
0.25		-1.973	7.00		-0.726
0.50		-1.750			
0.75		-1.631			
1.00		-1.547			
1.40		-1.437			
2.00		-1.321			
2.40		-1.249			
3.00		-1.158			
4.00		-1.020			
4.40		-0.977			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
ID S/N 203210 10psi
H_2O above XD = 17.91
Start @ 1030
Stop @ 1103

CALCS, SKETCH MAPS, ETC.:
file: 0618Fall.txt

FWR 3/26

SE1000C
Environmental Logger
03/12 14:23

Unit# 00145 Test 18

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06018
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06-18
Falling Head Test
Ø618 FALL.txt

Step 0 03/12 10:30:03

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	-1.030
0.0066	-2.825
0.0100	-3.740
0.0133	-3.628
0.0166	-3.446
0.0200	-2.214
0.0233	-3.060
0.0266	-3.176
0.0300	-1.650
0.0333	-1.663
0.0366	-2.458
0.0400	-2.690
0.0433	-2.371
0.0466	-2.302
0.0500	-2.321
0.0533	-2.424
0.0566	-2.436
0.0600	-2.386
0.0633	-2.386
0.0666	-2.405
0.0700	-2.361
0.0733	-2.339
0.0766	-2.367
0.0800	-2.333
0.0833	-2.314
0.0866	-2.302
0.0900	-2.321
0.0933	-2.292
0.0966	-2.280
0.1000	-2.283
0.1033	-2.264
0.1066	-2.273
0.1100	-2.261
0.1133	-2.233
0.1166	-2.233
0.1200	-2.220

	H/Ho	t
Ho	1.00	0
	.95	.0433

00060

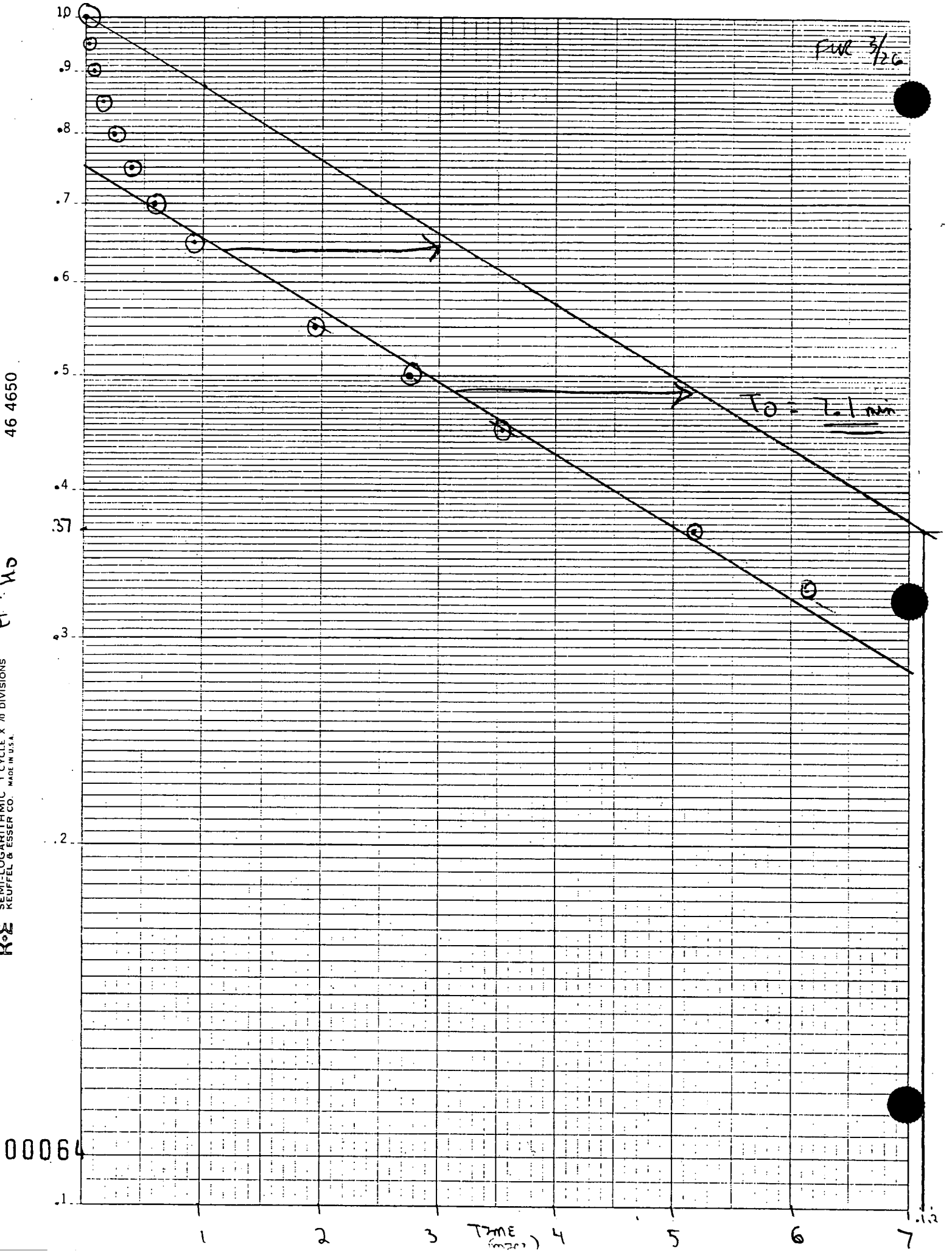
0.1233	-2.220		
0.1266	-2.211		
0.1300	-2.198		
0.1333	-2.189		
0.1366	-2.186		
0.1400	-2.161		
0.1433	-2.164		
0.1466	-2.158		
0.1500	-2.151	.90	.0900
0.1533	-2.136		
0.1566	-2.129		
0.1600	-2.120		
0.1633	-2.120		
0.1666	-2.104		
0.1700	-2.101		
0.1733	-2.095		
0.1766	-2.086		
0.1800	-2.079		
0.1833	-2.076		
0.1866	-2.067		
0.1900	-2.061		
0.1933	-2.054		
0.1966	-2.045		
0.2000	-2.045		
0.2033	-2.039		
0.2066	-2.032		
0.2100	-2.029		
0.2133	-2.020	.85	.1533
0.2166	-2.014		
0.2200	-2.007		
0.2233	-2.001		
0.2266	-1.998		
0.2300	-1.995		
0.2333	-1.992		
0.2366	-1.985		
0.2400	-1.979		
0.2433	-1.976		
0.2466	-1.973		
0.2500	-1.973		
0.2533	-1.960		
0.2566	-1.960		
0.2600	-1.954		
0.2633	-1.957		
0.2666	-1.951		
0.2700	-1.945		
0.2733	-1.945		
0.2766	-1.938		
0.2800	-1.935		
0.2833	-1.932		
0.2866	-1.926		
0.2900	-1.926		
0.2933	-1.923		
0.2966	-1.916		
0.3000	-1.913		
0.3033	-1.907		
0.3066	-1.904		
0.3100	-1.904	.80	.2500
0.3133	-1.898		
0.3166	-1.894		
0.3200	-1.891		

0.3233	-1.888		
0.3266	-1.885		
0.3300	-1.882		
0.3333	-1.882		
0.3500	-1.863		
0.3666	-1.851		
0.3833	-1.835		
0.4000	-1.819		
0.4166	-1.810		
0.4333	-1.794		
0.4500	-1.782	.75	.3900
0.4666	-1.769		
0.4833	-1.760		
0.5000	-1.750		
0.5166	-1.738		
0.5333	-1.728		
0.5500	-1.719		
0.5666	-1.710		
0.5833	-1.697		
0.6000	-1.697		
0.6166	-1.688		
0.6333	-1.681		
0.6500	-1.672	.70	.5900
0.6666	-1.666		
0.6833	-1.656		
0.7000	-1.650		
0.7166	-1.644		
0.7333	-1.638		
0.7500	-1.631		
0.7666	-1.625		
0.7833	-1.619		
0.8000	-1.612		
0.8166	-1.606		
0.8333	-1.600		
0.8500	-1.594		
0.8666	-1.587		
0.8833	-1.584		
0.9000	-1.578		
0.9166	-1.575		
0.9333	-1.569		
0.9500	-1.562		
0.9666	-1.559		
0.9833	-1.553	.65	.9233
1.0000	-1.547		
1.2000	-1.484		
1.4000	-1.437		
1.6000	-1.396		
1.8000	-1.356		
2.0000	-1.321	.55	1.940
2.2000	-1.280		
2.4000	-1.249		
2.6000	-1.221		
2.8000	-1.190	.50	2.740
3.0000	-1.158		
3.2000	-1.130		
3.4000	-1.099		
3.6000	-1.074	.45	3.540
3.8000	-1.046		
4.0000	-1.020		
4.2000	-0.999		

4.4000	-0.977		
4.6000	-0.961		
4.8000	-0.930		
5.0000	-0.908		
5.2000	-0.889	.37	5.1400
5.4000	-0.867		
5.6000	-0.851		
5.8000	-0.833		
6.0000	-0.814		
6.2000	-0.795	.33	6.140
6.4000	-0.776		
6.6000	-0.757		
6.8000	-0.745		
7.0000	-0.726		
7.2000	-0.710	.30	7.140
7.4000	-0.695		
7.6000	-0.682		
7.8000	-0.667		
8.0000	-0.651		
8.2000	-0.638		
8.4000	-0.623		
8.6000	-0.613		
8.8000	-0.601		
9.0000	-0.585		
9.2000	-0.573		
9.4000	-0.560		
9.6000	-0.548		
9.8000	-0.538		
10.0000	-0.526		
12.0000	-0.432		
14.0000	-0.350		
16.0000	-0.288		
18.0000	-0.234		
20.0000	-0.187		
22.0000	-0.150		
24.0000	-0.112		
26.0000	-0.087		
28.0000	-0.062		
30.0000	-0.040		
32.0000	-0.022		

END

NCWS CRANE 06-18 FALLING



00064

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-18 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB / CHECKED BY: FWRamser 3/26/89	APPROVED BY: / DATE:

$r = 0.083$ FT

$R = 0.234$ FT

$L = 9.27$ FT

$T_o = 7.1$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(9.27\,FT / 0.234\,FT)}{2(9.27\,FT)(7.1\,MIN)}$$

$K = 1.93 \times 10^{-4}$ FT/MIN $\times$ 1440 MIN/DAY

$K =$ ~~0.27~~ 0.28 FWR 3/26 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K =$ ~~9.78~~ 9.88 FWR 3/26 $\times 10^{-5}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-18

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.27' TEST NO.: T1950

STATIC WATER LEVEL (Depth/Elevation): 10.05' TOVC DATE:

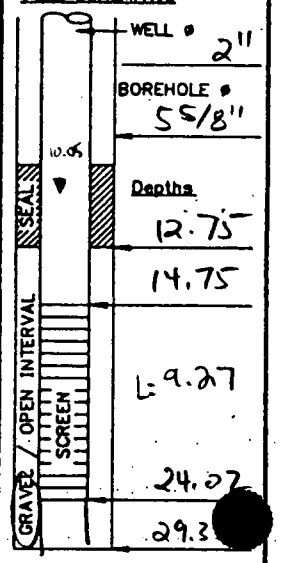
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 7.68') PAGE ... OF ...

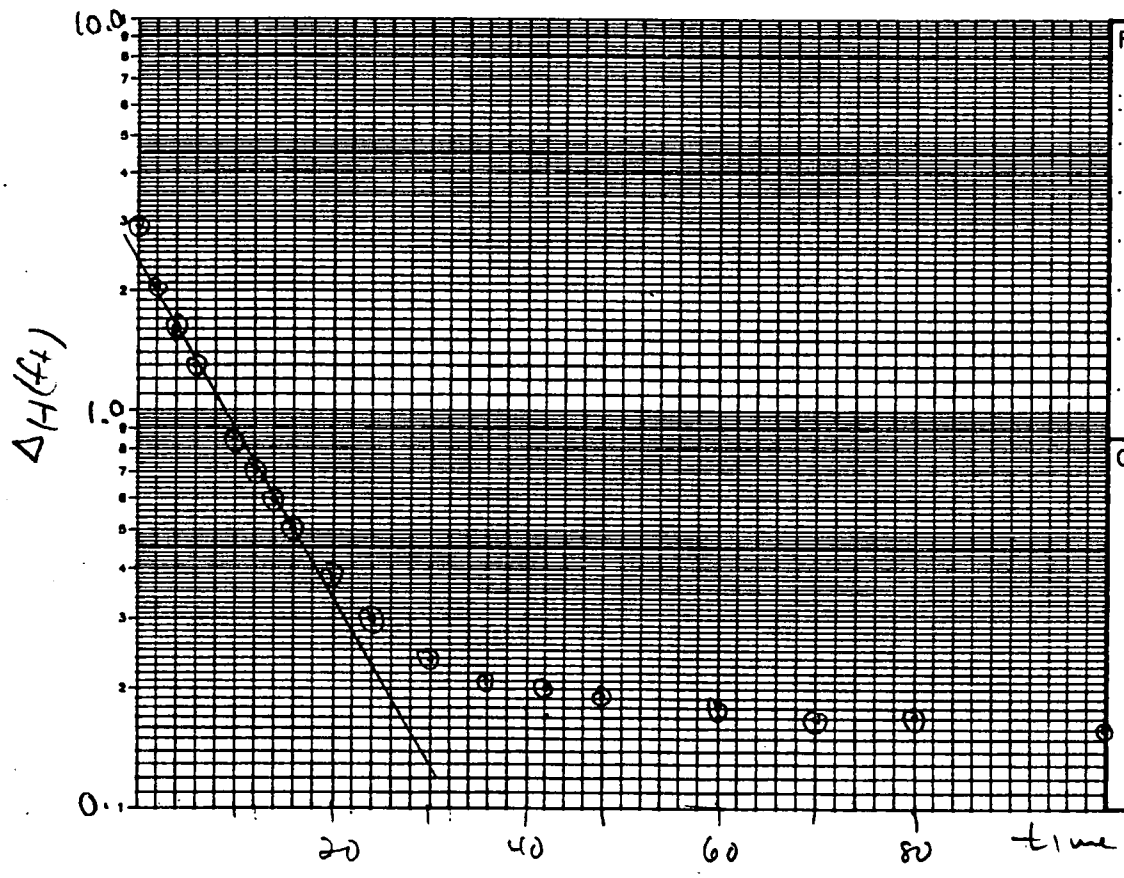
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		2.91	20.00		0.38
0.50		2.56	24.00		0.30
0.75		2.45	30.00		0.24
1.00		2.36	36.00		0.21
2.00		2.05	42.00		0.20
4.00		1.60	50.00		0.19
6.00		1.28	60.00		0.18
8.00		1.03	70.00		0.17
10.00		0.84	80.00		0.17
12.00		0.70	100.00		0.16
14.00		0.54	120.00		0.15
16.00		0.50			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

XD SN 203210 10psi

H_2O above XD = 17.91

Start @ 1030

Stop @ 1103

CALCS, SKETCH MAPS, ETC.:

file: 0618 Rise.txt

FWR 3/26

SE1000C
Environmental Logger
03/12 15:18

Unit# 00145 Test 19

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06018
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06-18
Rising Head Test
06 18 RISE.TXT

Step 0 03/12 11:05:24

Elapsed Time	INPUT 1
0.0000	-0.012
0.0033	4.120
0.0066	2.822
0.0100	-0.779
0.0133	3.745
0.0166	0.967
0.0200	2.112
0.0233	2.969
0.0266	3.420
0.0300	2.828
0.0333	2.875
0.0366	2.913 ← Ho
0.0400	2.900
0.0433	2.897
0.0466	2.882
0.0500	2.879
0.0533	2.869
0.0566	2.866
0.0600	2.850
0.0633	2.850
0.0666	2.841
0.0700	2.838
0.0733	2.828
0.0766	2.863
0.0800	2.807
0.0833	2.822
0.0866	2.813
0.0900	2.807
0.0933	2.803
0.0966	2.794
0.1000	2.794
0.1033	2.794
0.1066	2.788
0.1100	2.788
0.1133	2.782
0.1166	2.782
0.1200	2.778

H/Ho	T
1.00	0

0.1233	2.775
0.1266	2.772
0.1300	2.766
0.1333	2.763
0.1366	2.766
0.1400	2.760
0.1433	2.760
0.1466	2.757
0.1500	2.753
0.1533	2.750
0.1566	2.750
0.1600	2.744
0.1633	2.744
0.1666	2.741
0.1700	2.738
0.1733	2.738
0.1766	2.735
0.1800	2.731
0.1833	2.728
0.1866	2.728
0.1900	2.725
0.1933	2.722
0.1966	2.722
0.2000	2.719
0.2033	2.716
0.2066	2.716
0.2100	2.713
0.2133	2.710
0.2166	2.710
0.2200	2.706
0.2233	2.703
0.2266	2.703
0.2300	2.703
0.2333	2.700
0.2366	2.697
0.2400	2.694
0.2433	2.694
0.2466	2.694
0.2500	2.691
0.2533	2.688
0.2566	2.688
0.2600	2.685
0.2633	2.681
0.2666	2.681
0.2700	2.678
0.2733	2.678
0.2766	2.678
0.2800	2.675
0.2833	2.672
0.2866	2.672
0.2900	2.669
0.2933	2.669
0.2966	2.666
0.3000	2.663
0.3033	2.663
0.3066	2.660
0.3100	2.660
0.3133	2.656
0.3166	2.653
0.3200	2.653

.95 .1000

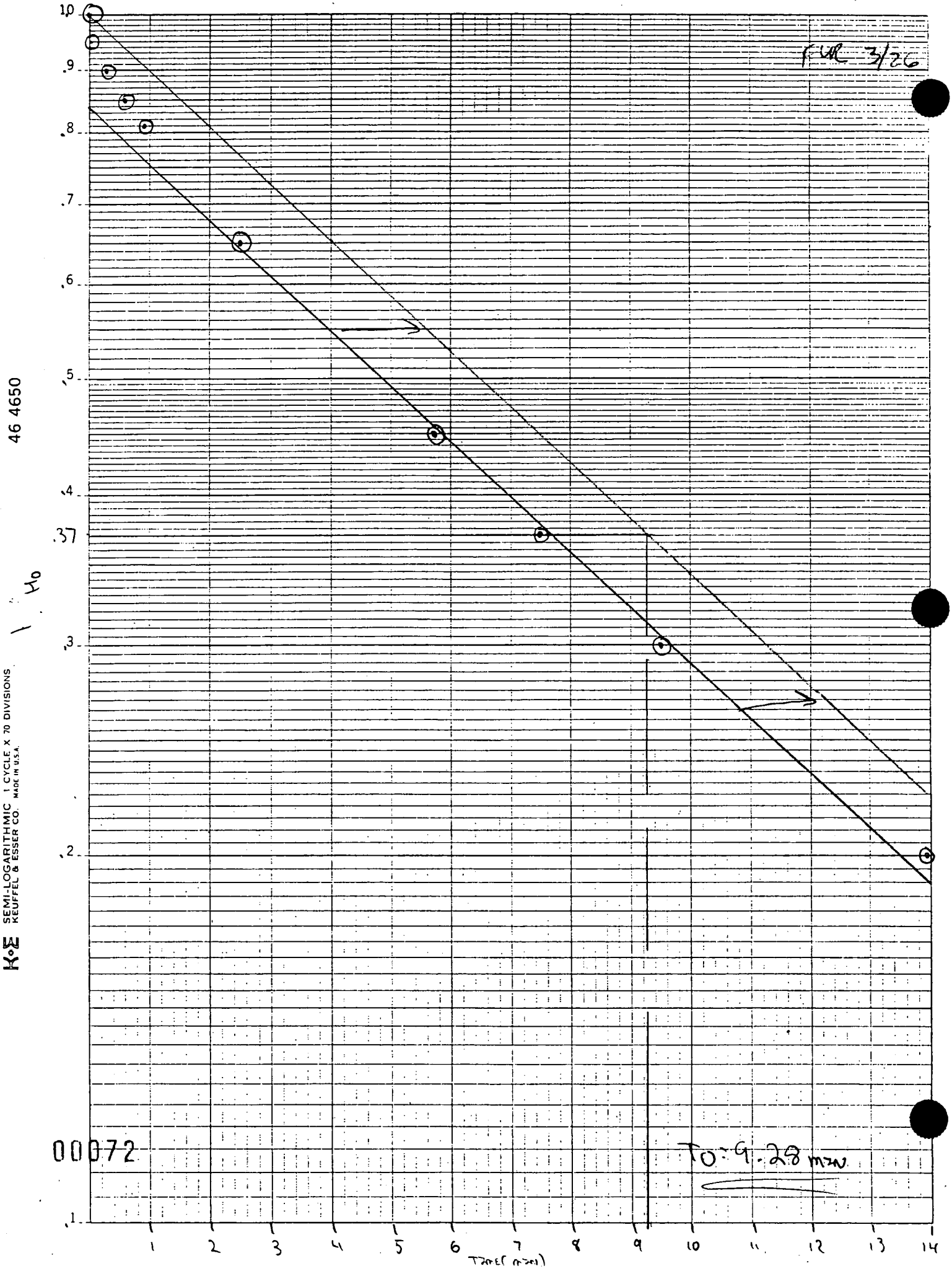
0.3233	2.653		
0.3266	2.650		
0.3300	2.647		
0.3333	2.647		
0.3500	2.641		
0.3666	2.628		
0.3833	2.619	.90	.3467
0.4000	2.610		
0.4166	2.600		
0.4333	2.594		
0.4500	2.585		
0.4666	2.578		
0.4833	2.569		
0.5000	2.563		
0.5166	2.553		
0.5333	2.547		
0.5500	2.538		
0.5666	2.531		
0.5833	2.525		
0.6000	2.516		
0.6166	2.513		
0.6333	2.503		
0.6500	2.497		
0.6666	2.491		
0.6833	2.484		
0.7000	2.475	.85	.6633
0.7166	2.469		
0.7333	2.466		
0.7500	2.459		
0.7666	2.450		
0.7833	2.447		
0.8000	2.437		
0.8166	2.431		
0.8333	2.425		
0.8500	2.419		
0.8666	2.412		
0.8833	2.409		
0.9000	2.400		
0.9166	2.394		
0.9333	2.391		
0.9500	2.384		
0.9666	2.378	.81	.9300
0.9833	2.372		
1.0000	2.365		
1.2000	2.284		
1.4000	2.222		
1.6000	2.162		
1.8000	2.103		
2.0000	2.053		
2.2000	1.996		
2.4000	1.949		
2.6000	1.902	.65	2.5633
2.8000	1.856		
3.0000	1.809		
3.2000	1.768		
3.4000	1.724		
3.6000	1.684		
3.8000	1.643		
4.0000	1.605		
4.2000	1.568		

4.4000	1.533		
4.6000	1.499		
4.8000	1.464		
5.0000	1.430		
5.2000	1.396		
5.4000	1.368		
5.6000	1.339		
5.8000	1.308	.45	5.7633
6.0000	1.280		
6.2000	1.252		
6.4000	1.224		
6.6000	1.198		
6.8000	1.177	.40	6.7633
7.0000	1.148		
7.2000	1.123		
7.4000	1.098		
7.6000	1.080	.37	7.5633
7.8000	1.054		
8.0000	1.036		
8.2000	1.014		
8.4000	0.995		
8.6000	0.973		
8.8000	0.951		
9.0000	0.932		
9.2000	0.914		
9.4000	0.898		
9.6000	0.879	.30	9.5633
9.8000	0.864		
10.0000	0.845		
12.0000	0.701		
14.0000	0.591	.20	13.9633
16.0000	0.500		
18.0000	0.435		
20.0000	0.385		
22.0000	0.338		
24.0000	0.306		
26.0000	0.285		
28.0000	0.266		
30.0000	0.244		
32.0000	0.234		
34.0000	0.219		
36.0000	0.213		
38.0000	0.203		
40.0000	0.203		
42.0000	0.200		
44.0000	0.203		
46.0000	0.197		
48.0000	0.194		
50.0000	0.191		
52.0000	0.187		
54.0000	0.191		
56.0000	0.191		
58.0000	0.187		
60.0000	0.184		
62.0000	0.181		
64.0000	0.181		
66.0000	0.181		
68.0000	0.181		
70.0000	0.178		
72.0000	0.175		

74.0000	0.172
76.0000	0.172
78.0000	0.172
80.0000	0.172
82.0000	0.172
84.0000	0.162
86.0000	0.169
88.0000	0.162
90.0000	0.166
92.0000	0.166
94.0000	0.162
96.0000	0.162
98.0000	0.162
100.000	0.162
120.000	0.150
140.000	0.134
160.000	0.137
180.000	0.122
200.000	0.122
220.000	0.112
240.000	0.115

END

06-18 R25706 NSWC CRANE / 7651



00072

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06-18 RISING HEAD TEST			
BASED ON HORSLEV 1951		DRAWING NUMBER	
BY RMB	CHECKED BY SWRamser 3/26/99	APPROVED BY	DATE

$r = 0.083$ FT

$R = 0.234$ FT

$L = 9.27$ FT

$T_o = 9.28$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(9.27\,FT / 0.234\,FT)}{2(9.27\,FT)(9.28\,MIN)}$$

$K = 1.42 \times 10^{-4}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 0.212$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K = 7.48 \times 10^{-5}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC Crane WELL/BORING NO.: 06-20

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.14 TEST NO.: T250

STATIC WATER LEVEL (Depth/Elevation): 16.20' DATE:

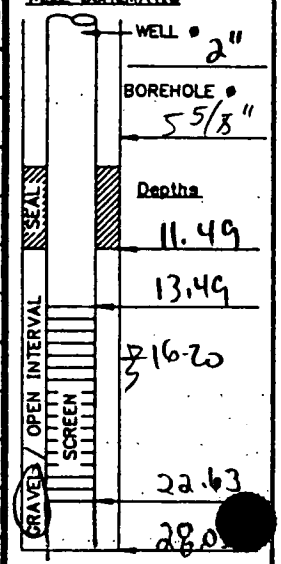
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF

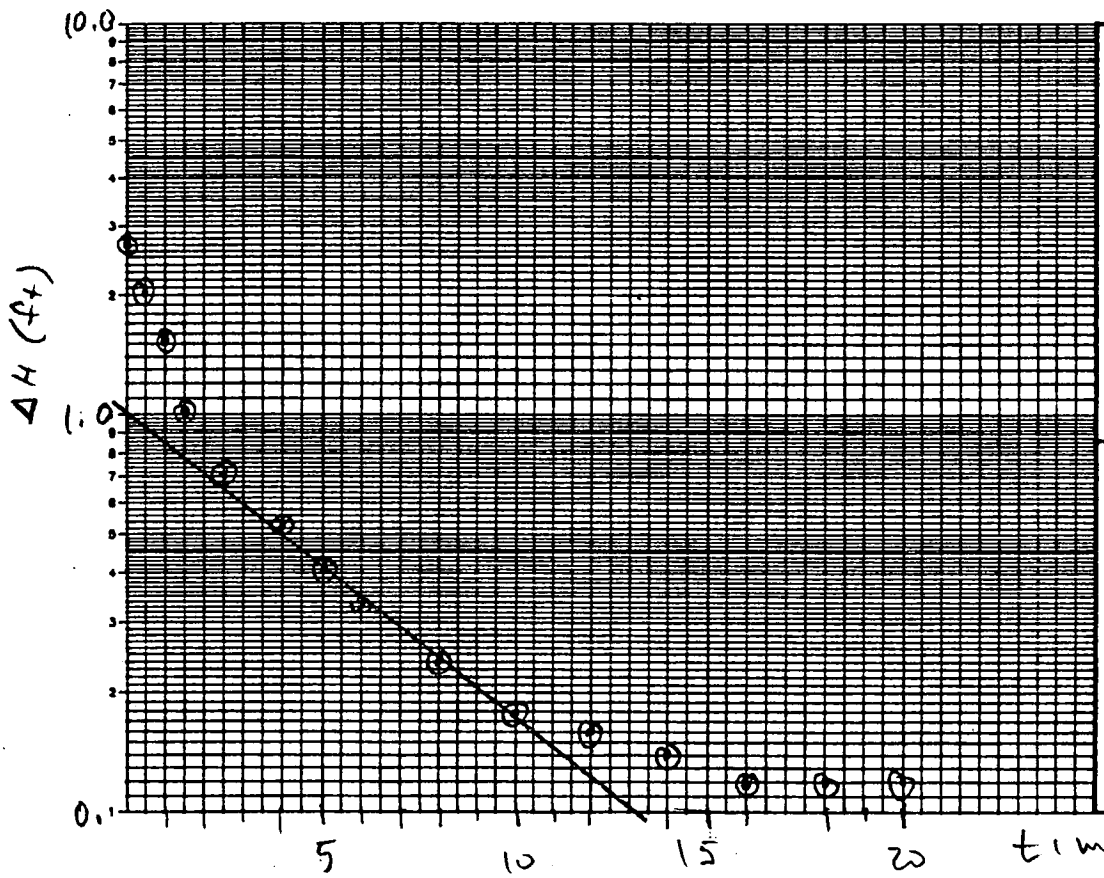
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		0.84	14.00		0.14
0.25		2.36	16.00		0.11
0.50		2.01	18.00		0.11
1.00		1.55	20.00		0.11
2.00		1.00			
3.00		0.70			
4.00		0.52			
5.00		0.41			
6.00		0.33			
8.00		0.24			
10.00		0.17			
12.00		0.16			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 143

XD S/N 203120 50psi

H_2O above XD = 10.84'

Start @ 1643

Stop @ 1709

CALCS, SKETCH MAPS, ETC.:

file: 0620Rise.txt

SE1000C
Environmental Logger
03/13 08:01

Unit# 00143 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06020
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well 06-20
Rising Head Test
file: 06020RISE.txt

Step 0 03/11 16:43:05

Elapsed Time	INPUT 1
0.0000	0.096
0.0033	3.377
0.0066	4.033
0.0100	3.825
0.0133	2.081
0.0166	3.233
0.0200	2.865
0.0233	2.865
0.0266	2.913
0.0300	2.849
0.0333	2.849
0.0366	2.801
0.0400	2.801
0.0433	2.785
0.0466	2.785
0.0500	2.769
0.0533	2.753
0.0566	2.753
0.0600	2.737
0.0633	2.737
0.0666	2.721
0.0700	2.705
0.0733	2.689
0.0766	2.705
0.0800	2.689
0.0833	2.673
0.0866	2.673
0.0900	2.673
0.0933	2.657
0.0966	2.641
0.1000	2.641
0.1033	2.641
0.1066	2.609
0.1100	2.625
0.1133	2.609
0.1166	2.609
0.1200	2.593

Ho

H/Ho	T
1.00	0
.95	.040

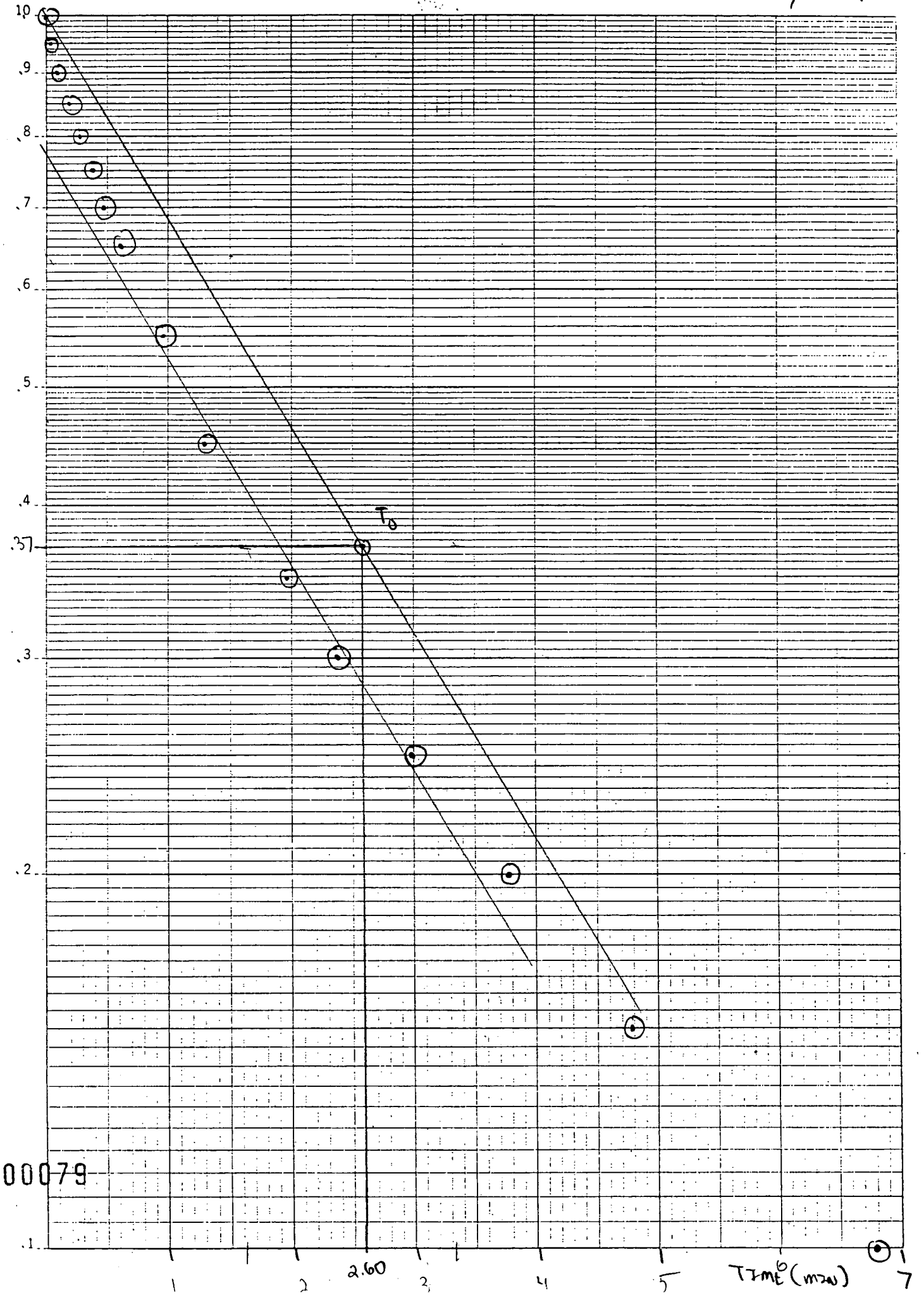
0.1233	2.593		
0.1266	2.593		
0.1300	2.593		
0.1333	2.577		
0.1366	2.561	.90	0.1066
0.1400	2.545		
0.1433	2.577		
0.1466	2.545		
0.1500	2.545		
0.1533	2.545		
0.1566	2.529		
0.1600	2.529		
0.1633	2.513		
0.1666	2.513		
0.1700	2.497		
0.1733	2.497		
0.1766	2.481		
0.1800	2.481		
0.1833	2.465		
0.1866	2.465		
0.1900	2.465		
0.1933	2.449		
0.1966	2.449		
0.2000	2.449		
0.2033	2.433		
0.2066	2.433		
0.2100	2.433		
0.2133	2.417	.85	.1833
0.2166	2.417		
0.2200	2.401		
0.2233	2.401		
0.2266	2.401		
0.2300	2.401		
0.2333	2.385		
0.2366	2.385		
0.2400	2.385		
0.2433	2.369		
0.2466	2.369		
0.2500	2.369		
0.2533	2.353		
0.2566	2.353		
0.2600	2.337		
0.2633	2.337		
0.2666	2.337		
0.2700	2.337		
0.2733	2.321		
0.2766	2.321		
0.2800	2.321		
0.2833	2.305		
0.2866	2.305		
0.2900	2.305		
0.2933	2.289		
0.2966	2.289		
0.3000	2.289		
0.3033	2.273		
0.3066	2.273		
0.3100	2.273	.80	.2800
0.3133	2.273		
0.3166	2.257		
0.3200	2.257		

0.3233	2.257		
0.3266	2.241		
0.3300	2.241		
0.3333	2.241		
0.3500	2.209		
0.3666	2.193		
0.3833	2.177		
0.4000	2.145	.75	.3700
0.4166	2.112		
0.4333	2.097		
0.4500	2.081		
0.4666	2.065		
0.4833	2.048		
0.5000	2.017		
0.5166	2.000	.70	.4866
0.5333	1.984		
0.5500	1.952		
0.5666	1.936		
0.5833	1.920		
0.6000	1.904		
0.6166	1.888		
0.6333	1.872		
0.6500	1.856	.65	.6200
0.6666	1.840		
0.6833	1.824		
0.7000	1.808		
0.7166	1.792		
0.7333	1.776		
0.7500	1.760		
0.7666	1.744		
0.7833	1.728		
0.8000	1.712		
0.8166	1.696		
0.8333	1.696		
0.8500	1.664		
0.8666	1.664		
0.8833	1.648		
0.9000	1.632		
0.9166	1.616		
0.9333	1.600		
0.9500	1.600		
0.9666	1.584		
0.9833	1.568	.55	.9533
1.0000	1.552		
1.2000	1.392		
1.4000	1.264	.45	1.370
1.6000	1.168		
1.8000	1.088		
2.0000	1.008	.35	1.970
2.2000	0.928		
2.4000	0.864	.30	2.370
2.6000	0.816		
2.8000	0.752		
3.0000	0.704	.25	2.970
3.2000	0.672		
3.4000	0.624		
3.6000	0.592		
3.8000	0.560	.20	3.770
4.0000	0.528		
4.2000	0.512		

4.4000	0.480		
4.6000	0.448		
4.8000	0.432	.15	4.770
5.0000	0.416		
5.2000	0.400		
5.4000	0.368		
5.6000	0.368		
5.8000	0.352		
6.0000	0.336		
6.2000	0.320		
6.4000	0.304		
6.6000	0.304		
6.8000	0.288	.10	6.770
7.0000	0.272		
7.2000	0.272		
7.4000	0.256		
7.6000	0.256		
7.8000	0.240		
8.0000	0.240		
8.2000	0.224		
8.4000	0.224		
8.6000	0.224		
8.8000	0.208		
9.0000	0.208		
9.2000	0.208		
9.4000	0.192		
9.6000	0.192		
9.8000	0.192		
10.0000	0.176		
12.0000	0.160		
14.0000	0.144		
16.0000	0.112		
18.0000	0.112		
20.0000	0.112		
22.0000	0.112		
24.0000	0.112		
26.0000	0.096		

END

06-20 RISING NSWC CRANE / 7651



46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

00079

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06-20 RISING HEAD TEST			
BASED ON HVORSLEV (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY MLM 4/1/99	APPROVED BY /	DATE

$r = \sqrt{r_i^2(1-n) + n r_o^2}$ (Dawson & Istok, 1991)

where r_i = well screen I.D.
n = porosity of filter pack assumed 0.25
r_o = filter pack or borehole O.D.

$r = \sqrt{(0.083\ ft)^2(1-0.25) + (0.25)(0.167\ ft)^2}$

$= 0.110\ ft$

$R = 0.234\ ft$
$L = 6.43\ ft$

$T_o = 2.60\ min$

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.110\ ft)^2 \ln(6.43\ ft / 0.234\ ft)}{2(6.43\ ft)(2.60\ min)}$$

$K = 1.20 \times 10^{-3}\ ft/min \times 1440\ min/day$

$= \cancel{1.73}\ 1.72\ ft/day \times 1\ cm/s / 2835\ ft/day$

$= 6.10 \times 10^{-4}\ cm/s$

00080

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-21

PROJECT NO.: 7651 GEOLOGIST: T. Evans

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10 ft TEST NO.: T1950

STATIC WATER LEVEL (Depth/Elevation): 42.07' TPVC DATE: 3-11-99

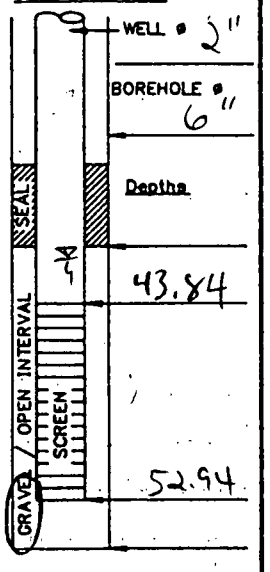
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

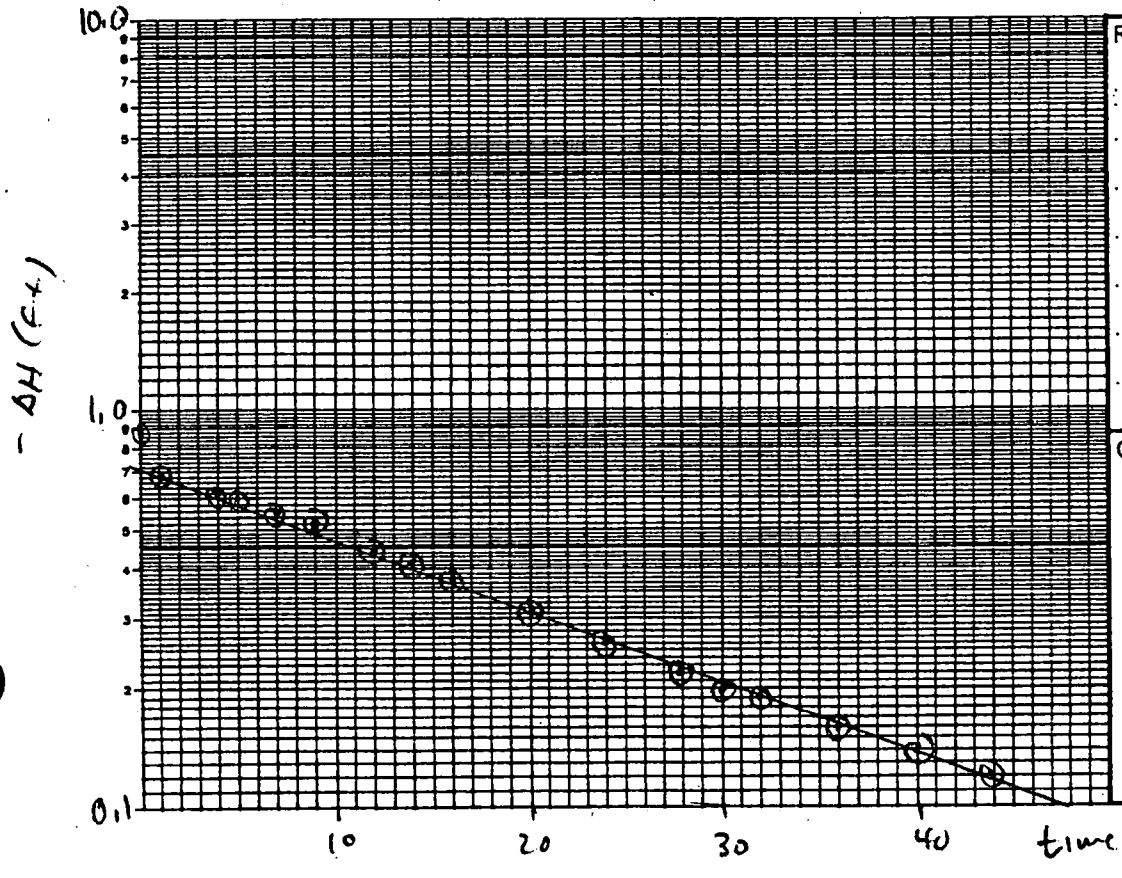
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 4.7') PAGE ... OF ...

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		-0.88	28.00		-0.22
1.00		-0.69	30.00		-0.20
2.00		-0.68	32.00		-0.19
4.00		-0.61	36.00		-0.15
5.00		-0.60	40.00		-0.14
7.00		-0.55	44.00		-0.12
9.00		-0.52	50.00		-0.09
12.00		-0.44			
14.00		-0.41			
16.00		-0.38			
20.00		-0.31			
24.00		-0.26			

WELL SCHEMATIC





REMARKS:

Hermit # 143
XD S/N 1670
50 psi
H_2O above XD 8.03

Start @ 1400
Stop @ 1458

CALCS, SKETCH MAPS, ETC.:

file:
0621 Fall. txt

FWR
3-30-99

SE1000C
Environmental Logger
03/11 15:20

Unit# 00143 Test 19

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06021
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06-21
Falling Head Test
Ø621 FALL.txt

Step 0 03/11 14:06:20

Elapsed Time	INPUT 1
0.0000	-1.078
0.0033	-3.760
0.0066	-4.204
0.0100	-3.395
0.0133	-2.919
0.0166	-2.348
0.0200	-1.697
0.0233	-0.904
0.0266	-0.206
0.0300	-0.015
0.0333	-0.888
0.0366	-0.650
0.0400	-0.650
0.0433	-0.682
0.0466	-0.682
0.0500	-0.682
0.0533	-0.714 ← H_0
0.0566	-0.682
0.0600	-0.698
0.0633	-0.682
0.0666	-0.698
0.0700	-0.698
0.0733	-0.698
0.0766	-0.698
0.0800	-0.682
0.0833	-0.698
0.0866	-0.698
0.0900	-0.698
0.0933	-0.698
0.0966	-0.698
0.1000	-0.698
0.1033	-0.698
0.1066	-0.698
0.1100	-0.698
0.1133	-0.698
0.1166	-0.698
0.1200	-0.698

H/H_0	t
1.00	0.0000

0.1233	-0.698
0.1266	-0.698
0.1300	-0.698
0.1333	-0.698
0.1366	-0.698
0.1400	-0.698
0.1433	-0.698
0.1466	-0.698
0.1500	-0.698
0.1533	-0.714
0.1566	-0.698
0.1600	-0.698
0.1633	-0.698
0.1666	-0.698
0.1700	-0.698
0.1733	-0.698
0.1766	-0.698
0.1800	-0.698
0.1833	-0.698
0.1866	-0.714
0.1900	-0.698
0.1933	-0.714
0.1966	-0.714
0.2000	-0.698
0.2033	-0.698
0.2066	-0.714
0.2100	-0.698
0.2133	-0.714
0.2166	-0.714
0.2200	-0.714
0.2233	-0.714
0.2266	-0.714
0.2300	-0.714
0.2333	-0.714
0.2366	-0.698
0.2400	-0.698
0.2433	-0.698
0.2466	-0.714
0.2500	-0.714
0.2533	-0.714
0.2566	-0.714
0.2600	-0.714
0.2633	-0.714
0.2666	-0.714
0.2700	-0.698
0.2733	-0.698
0.2766	-0.698
0.2800	-0.698
0.2833	-0.698
0.2866	-0.714
0.2900	-0.698
0.2933	-0.729
0.2966	-0.714
0.3000	-0.714
0.3033	-0.714
0.3066	-0.714
0.3100	-0.698
0.3133	-0.714
0.3166	-0.714
0.3200	-0.698

0.3233	-0.698		
0.3266	-0.698		
0.3300	-0.714		
0.3333	-0.698		
0.3500	-0.714		
0.3666	-0.714		
0.3833	-0.714		
0.4000	-0.714		
0.4166	-0.714		
0.4333	-0.714		
0.4500	-0.714		
0.4666	-0.714		
0.4833	-0.714		
0.5000	-0.714		
0.5166	-0.714		
0.5333	-0.714		
0.5500	-0.714		
0.5666	-0.714		
0.5833	-0.729		
0.6000	-0.698		
0.6166	-0.714		
0.6333	-0.714		
0.6500	-0.714		
0.6666	-0.714		
0.6833	-0.714		
0.7000	-0.714		
0.7166	-0.714		
0.7333	-0.714		
0.7500	-0.698		
0.7666	-0.698		
0.7833	-0.698		
0.8000	-0.698		
0.8166	-0.698		
0.8333	-0.698		
0.8500	-0.698		
0.8666	-0.698		
0.8833	-0.698		
0.9000	-0.698		
0.9166	-0.698		
0.9333	-0.698		
0.9500	-0.698		
0.9666	-0.698		
0.9833	-0.698		
1.0000	-0.698		
1.2000	-0.698	0.98	1.1467
1.4000	-0.698		
1.6000	-0.682		
1.8000	-0.682		
2.0000	-0.682		
2.2000	-0.666		
2.4000	-0.666		
2.6000	-0.666		
2.8000	-0.650		
3.0000	-0.650		
3.2000	-0.650	0.91	3.1467
3.4000	-0.634		
3.6000	-0.634		
3.8000	-0.634		
4.0000	-0.618		
4.2000	-0.618		

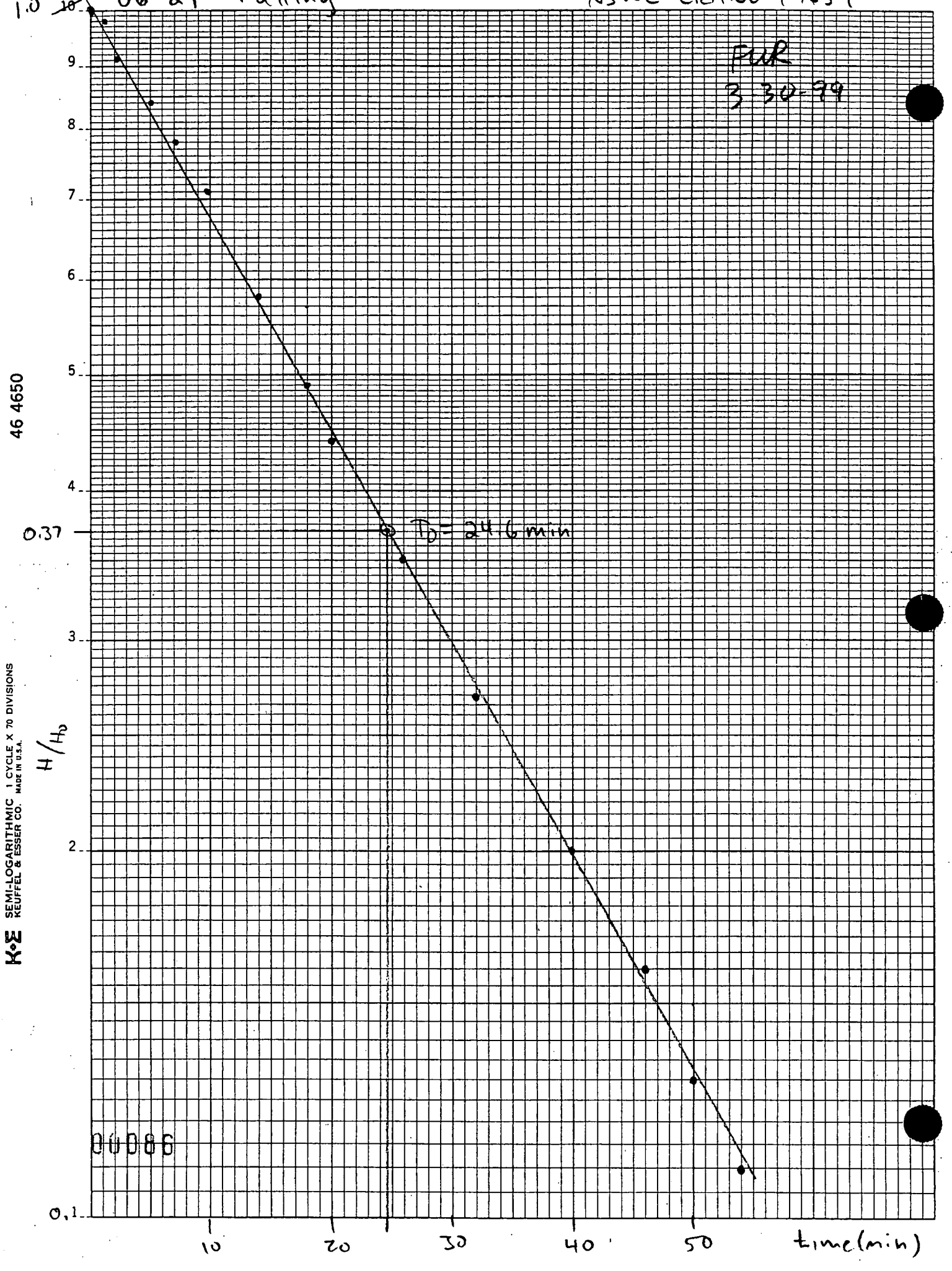
4.4000	-0.618		
4.6000	-0.618		
4.8000	-0.618		
5.0000	-0.602		
5.2000	-0.602	0.84	5.1467
5.4000	-0.602		
5.6000	-0.587		
5.8000	-0.587		
6.0000	-0.587		
6.2000	-0.571		
6.4000	-0.571		
6.6000	-0.571		
6.8000	-0.571		
7.0000	-0.555		
7.2000	-0.555	0.78	7.1467
7.4000	-0.555		
7.6000	-0.555		
7.8000	-0.539		
8.0000	-0.539		
8.2000	-0.539		
8.4000	-0.539		
8.6000	-0.523		
8.8000	-0.523		
9.0000	-0.523		
9.2000	-0.507		
9.4000	-0.507		
9.6000	-0.507		
9.8000	-0.507		
10.0000	-0.507	0.71	9.9467
12.0000	-0.444		
14.0000	-0.412	0.58	13.9467
16.0000	-0.380		
18.0000	-0.349	0.49	17.9467
20.0000	-0.317	0.44	19.9467
22.0000	-0.285		
24.0000	-0.269		
26.0000	-0.253	0.35	25.9467
28.0000	-0.222		
30.0000	-0.206		
32.0000	-0.190	0.27	31.9467
34.0000	-0.190		
36.0000	-0.158		
38.0000	-0.158		
40.0000	-0.142	0.20	39.9467
42.0000	-0.126		
44.0000	-0.126		
46.0000	-0.111	0.16	45.9467
48.0000	-0.095		
50.0000	-0.095	0.13	49.9467
52.0000	-0.079	0.11	51.9467

END

06-21 Falling

NSWC CRANE 17651

FWR
3-30-99



00086

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-21 FALLING HEAD	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE / CHECKED BY: [illegible]	APPROVED BY: / DATE:

$r = 0.083\ ft$

$R = 0.25\ ft$

$L = 9.10\ ft$

$T_0 = 24.6\ min$

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.10\ ft / 0.25\ ft)}{2\,(9.10\ ft)\,(24.6\ min)}$$

$K = 5.53 \times 10^{-5}\ ft/min \times 1440\ min/day$

$K = 7.96 \times 10^{-2}\ ft/day \times 1\ cm/s / 2835\ ft/day$

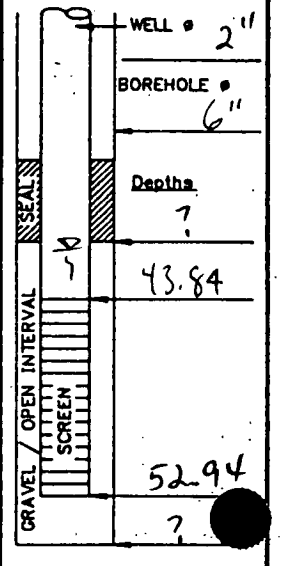
$= 2.81 \times 10^{-5}\ cm/s$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

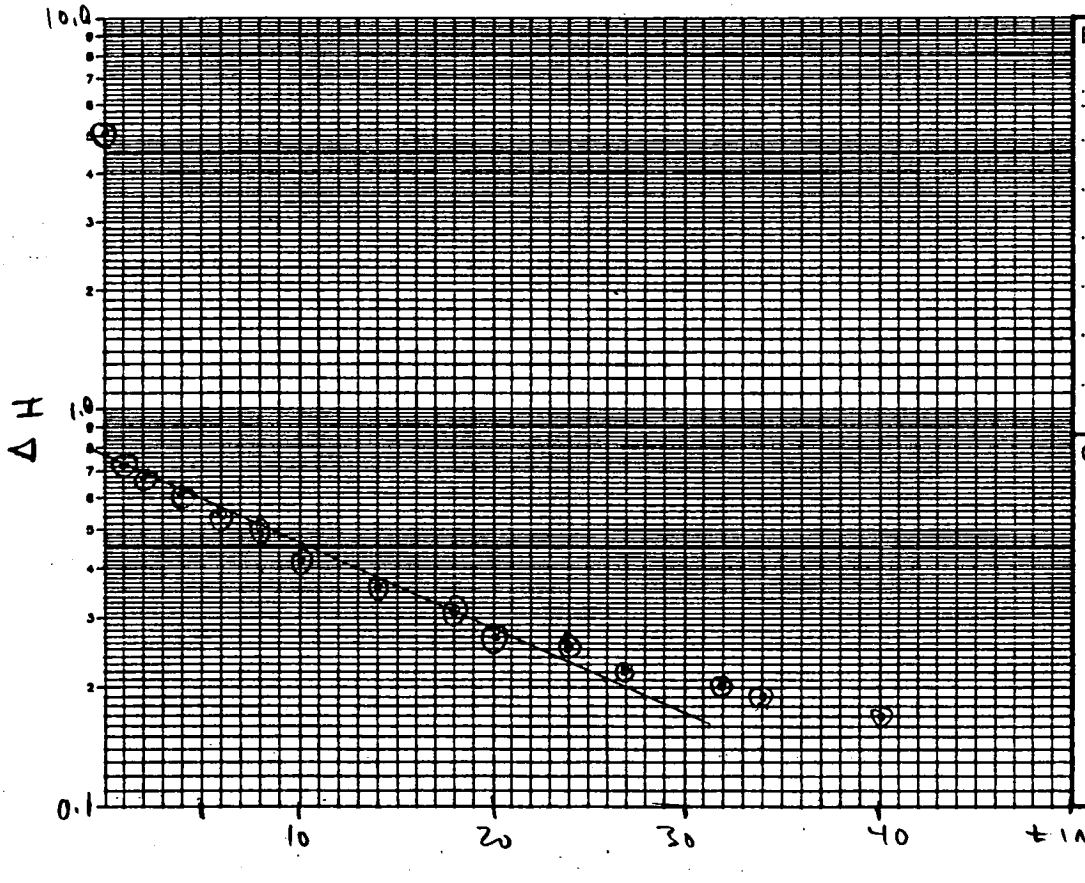
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-21
PROJECT NO.: 7651 GEOLOGIST: T. Evans
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10 ft TEST NO.: TØSØ
STATIC WATER LEVEL (Depth/Elevation): 42.04' TPVC DATE: 3-11-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø X 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.00		5.01	34.00		0.19
2.00		0.68	40.00		0.17
4.00		0.61			
6.00		0.53	0.10		0.87
8.00		0.49	0.30		0.79
10.00		0.42	0.70		0.74
14.00		0.36	1.00		0.72
18.00		0.31	1.20		0.71
20.00		0.28	1.40		0.71
24.00		0.25			
28.00		0.22			
32.00		0.20			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD s/N 1670
50 psi !
Start @ 1532
Stop @ 1613

CALCS, SKETCH MAPS, ETC.:
file:
0621 Rise.txt

FWR
3-30-99

SE1000C
Environmental Logger
03/13 07:52

Unit# 00143 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06021
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well Ø6-21
Rising Head Test
file: Ø621 RISE.txt

Step 0 03/11 15:32:51

Elapsed Time	INPUT 1	H_0/H	t
0.0000	0.158		
0.0033	5.013		
0.0066	3.601		
0.0100	2.586 ← H_0	1.00	0.0000
0.0133	2.554		
0.0166	2.332		
0.0200	2.141	0.83	0.0100
0.0233	1.919		
0.0266	1.729		
0.0300	1.570	0.61	0.0200
0.0333	1.427		
0.0366	1.300		
0.0400	1.189	0.46	0.0300
0.0433	1.126		
0.0466	1.078		
0.0500	1.047	0.40	0.0400
0.0533	1.015		
0.0566	0.983		
0.0600	0.967	0.37	0.0500
0.0633	0.951		
0.0666	0.936		
0.0700	0.920		
0.0733	0.920		
0.0766	0.904		
0.0800	0.904		
0.0833	0.888		
0.0866	0.888		
0.0900	0.872	0.34	0.0800
0.0933	0.872		
0.0966	0.856		
0.1000	0.872	0.34	0.0900
0.1033	0.872		
0.1066	0.856		
0.1100	0.856	0.33	0.1000
0.1133	0.856		
0.1166	0.856		
0.1200	0.840		

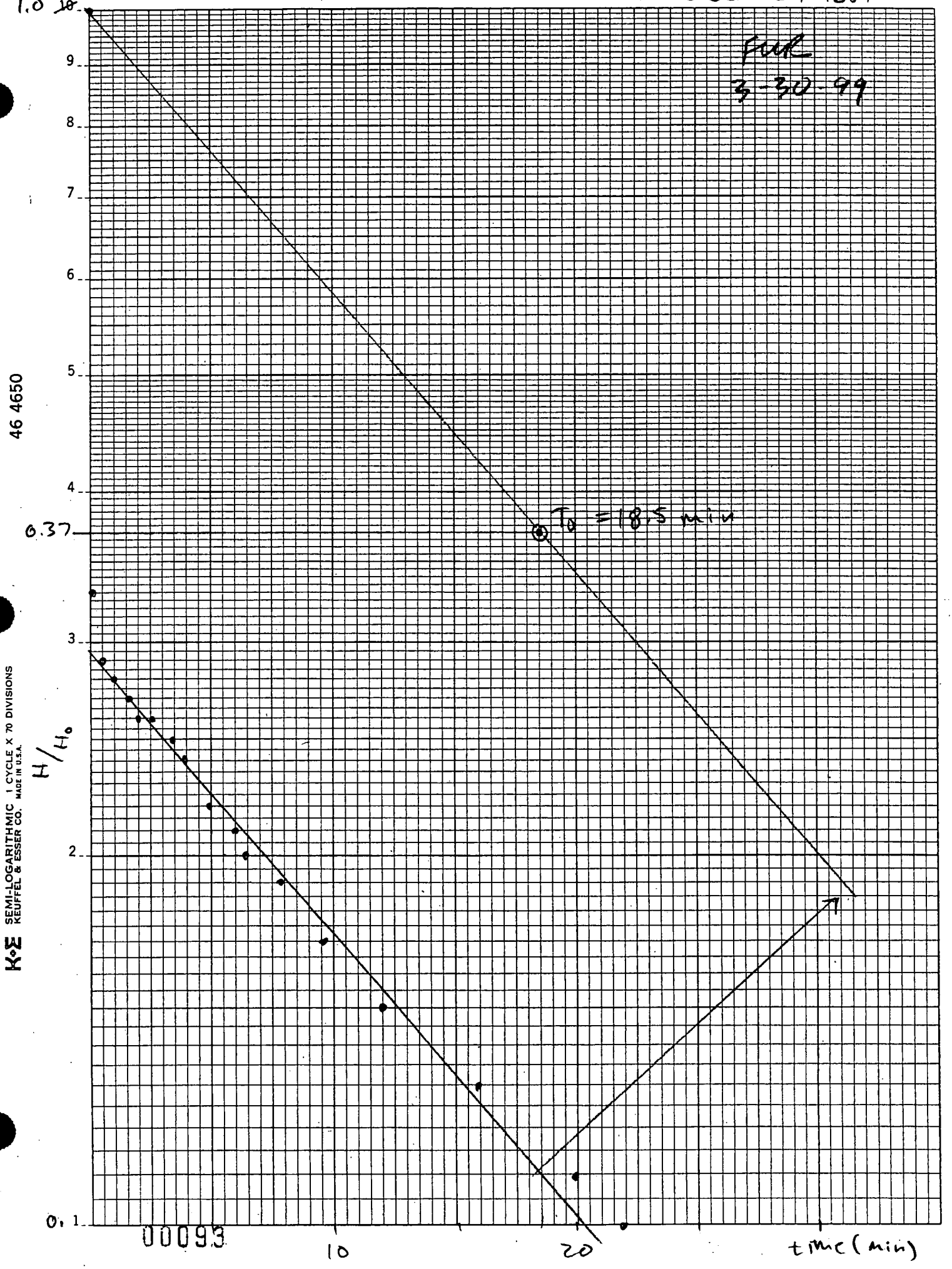
0.1233	0.856		
0.1266	0.840		
0.1300	0.840		
0.1333	0.840		
0.1366	0.840		
0.1400	0.840		
0.1433	0.840		
0.1466	0.840		
0.1500	0.840		
0.1533	0.825		
0.1566	0.840		
0.1600	0.825	0.32	0.1500
0.1633	0.840		
0.1666	0.825		
0.1700	0.825		
0.1733	0.825		
0.1766	0.825		
0.1800	0.825		
0.1833	0.825		
0.1866	0.825		
0.1900	0.825		
0.1933	0.825		
0.1966	0.825		
0.2000	0.809		
0.2033	0.809		
0.2066	0.809		
0.2100	0.825	0.32	0.2000
0.2133	0.825		
0.2166	0.825		
0.2200	0.809		
0.2233	0.809		
0.2266	0.809		
0.2300	0.809		
0.2333	0.809		
0.2366	0.809		
0.2400	0.809		
0.2433	0.809		
0.2466	0.809		
0.2500	0.793		
0.2533	0.809		
0.2566	0.809		
0.2600	0.809	0.31	0.2500
0.2633	0.809		
0.2666	0.809		
0.2700	0.793		
0.2733	0.809		
0.2766	0.809		
0.2800	0.793		
0.2833	0.809		
0.2866	0.793		
0.2900	0.793		
0.2933	0.793		
0.2966	0.793		
0.3000	0.793		
0.3033	0.793		
0.3066	0.793		
0.3100	0.809		
0.3133	0.793		
0.3166	0.793		
0.3200	0.793		

0.3233	0.793		
0.3266	0.777		
0.3300	0.777		
0.3333	0.793		
0.3500	0.793		
0.3666	0.777		
0.3833	0.793		
0.4000	0.777		
0.4166	0.777		
0.4333	0.761		
0.4500	0.777		
0.4666	0.761		
0.4833	0.761		
0.5000	0.761	0.29	0.4900
0.5166	0.761		
0.5333	0.761		
0.5500	0.761		
0.5666	0.761		
0.5833	0.761		
0.6000	0.761		
0.6166	0.761		
0.6333	0.761		
0.6500	0.745		
0.6666	0.745		
0.6833	0.745		
0.7000	0.745		
0.7166	0.745		
0.7333	0.745		
0.7500	0.745	0.29	0.7400
0.7666	0.745		
0.7833	0.745		
0.8000	0.745		
0.8166	0.745		
0.8333	0.745		
0.8500	0.745		
0.8666	0.745		
0.8833	0.745		
0.9000	0.745		
0.9166	0.745		
0.9333	0.745		
0.9500	0.729		
0.9666	0.745		
0.9833	0.729		
1.0000	0.729	0.28	0.9900
1.2000	0.713		
1.4000	0.713		
1.6000	0.698	0.27	1.5900
1.8000	0.698		
2.0000	0.682	0.26	1.9900
2.2000	0.682		
2.4000	0.666		
2.6000	0.666	0.26	2.5900
2.8000	0.650		
3.0000	0.650		
3.2000	0.634		
3.4000	0.634	0.25	3.3900
3.6000	0.634		
3.8000	0.618		
4.0000	0.618	0.24	3.9900
4.2000	0.602		

4.4000	0.602		
4.6000	0.587		
4.8000	0.587		
5.0000	0.571	0.22	4.9900
5.2000	0.571		
5.4000	0.571		
5.6000	0.555	0.21	5.5900
5.8000	0.555		
6.0000	0.539		
6.2000	0.539		
6.4000	0.523	0.20	6.3900
6.6000	0.523		
6.8000	0.523		
7.0000	0.507		
7.2000	0.507		
7.4000	0.507		
7.6000	0.491		
7.8000	0.491		
8.0000	0.491	0.19	7.9900
8.2000	0.475		
8.4000	0.475		
8.6000	0.475	0.18	8.5900
8.8000	0.460		
9.0000	0.460		
9.2000	0.444		
9.4000	0.444		
9.6000	0.444	0.17	9.5900
9.8000	0.428		
10.0000	0.428		
12.0000	0.396	0.15	11.9900
14.0000	0.364		
16.0000	0.333	0.13	15.9900
18.0000	0.317		
20.0000	0.285	0.11	19.9900
22.0000	0.253	0.10	21.9900
24.0000	0.253		
26.0000	0.238		
28.0000	0.222		
30.0000	0.206		
32.0000	0.206		
34.0000	0.190		
36.0000	0.190		
38.0000	0.174		
40.0000	0.174		

END

06-21 RISING HEAD TEST NSWC CRANE / 7651



FWR
3-30-99

00093

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-21 RISING HEAD	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: 3-30-99 JMRamsey
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.25$ ft

$L = 9.10$ ft

$T_0 = 18.5$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(9.10 \text{ ft}/0.25 \text{ ft})}{2 (9.10 \text{ ft})(18.5 \text{ min})}$$

$K = 7.35 \times 10^{-5}$ ft/min $\times$ 1440 min/day

$K = 1.06 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

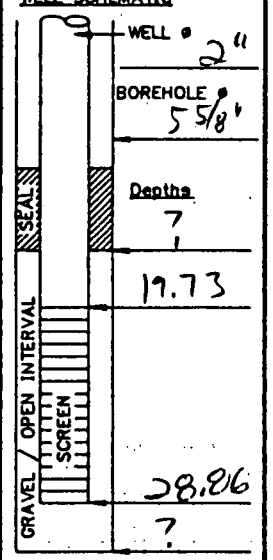
$= 3.74 \times 10^{-5}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

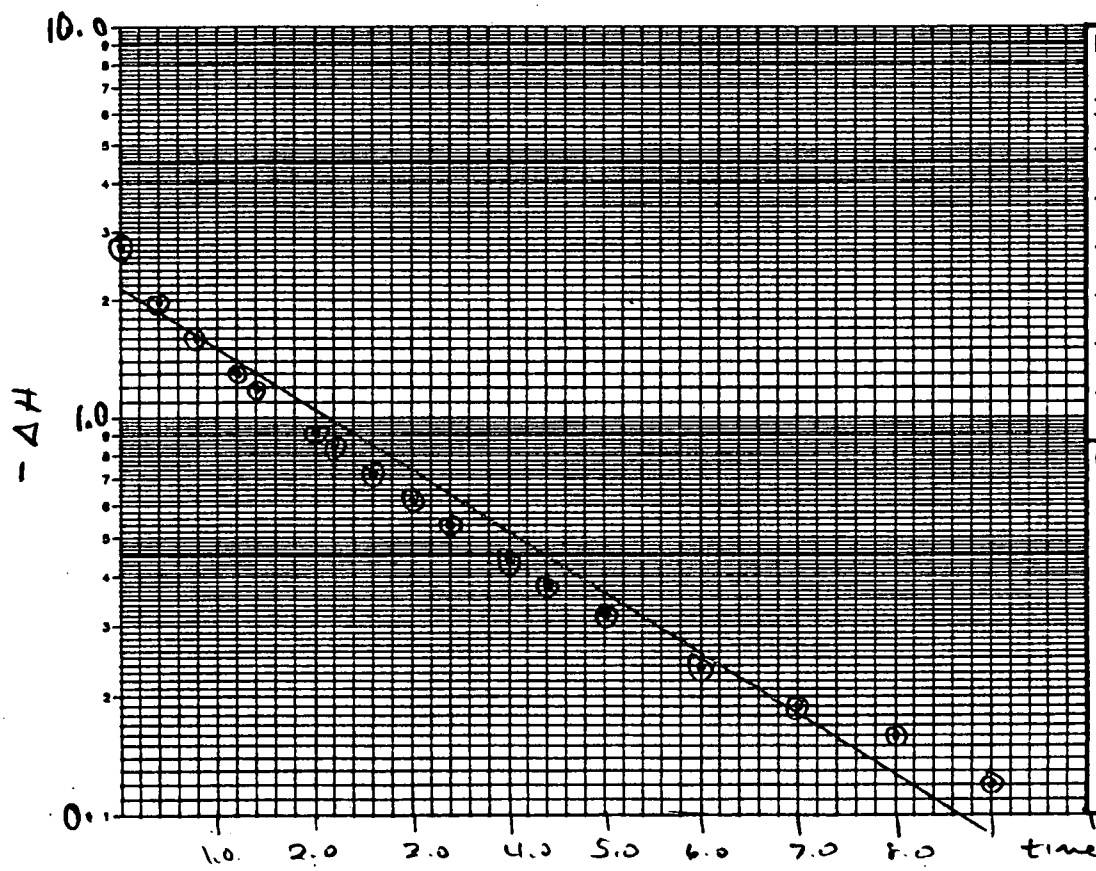
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-22
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.13' TEST NO.: T1150
STATIC WATER LEVEL (Depth/Elevation): 8.78' DATE: 3-10-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-2.78	5.00		-0.32
0.40		-1.96	5.60		-0.27
0.80		-1.60	6.00		-0.24
1.20		-1.29	7.00		-0.19
1.40		-1.18	8.00		-0.16
2.00		-0.91	9.00		-0.12
2.20		-0.84	10.00		-0.11
2.60		-0.72			
3.00		-0.62			
3.40		-0.54			
4.00		-0.44			
4.40		-0.38			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
H_2O above XD = 19.07
Start @ 1031
Stop @ 1044

CALCS, SKETCH MAPS, ETC.:
file:
0622 Fall.txt

FWR
3-30-99

0.7666
SE1000C
Environmental Logger
03/10 18:56

Unit# 00143 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06022
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

well # 06-22
Falling Head Test
Ø622 FALL. TXT

Step 0 03/10 10:31:25

Elapsed Time	INPUT 1
0.0000	-0.096
0.0033	-0.768
0.0066	-1.969
0.0100	-2.594
0.0133	-2.370
0.0166	-1.873
0.0200	-1.921
0.0233	-2.514
0.0266	-3.122
0.0300	-3.459
0.0333	-3.315
0.0366	-3.234
0.0400	-2.930
0.0433	-2.049
0.0466	-1.521
0.0500	-1.761
0.0533	-2.033
0.0566	-2.514
0.0600	-2.738
0.0633	-2.786
0.0666	-2.514
0.0700	-2.306
0.0733	-2.209
0.0766	-2.226
0.0800	-2.354
0.0833	-2.482
0.0866	-2.514
0.0900	-2.482
0.0933	-2.386
0.0966	-2.306
0.1000	-2.290
0.1033	-2.322
0.1066	-2.370
0.1100	-2.386
0.1133	-2.386
0.1166	-2.370
0.1200	-2.322

			H/H_o	t
0.1233	-2.290			
0.1266	-2.290			
0.1300	-2.306			
0.1333	-2.322			
0.1366	-2.322	← H_o	1.00	0.0000
0.1400	-2.306			
0.1433	-2.290			
0.1466	-2.274			
0.1500	-2.274			
0.1533	-2.274			
0.1566	-2.274		0.98	0.0200
0.1600	-2.274			
0.1633	-2.274			
0.1666	-2.257			
0.1700	-2.241			
0.1733	-2.241			
0.1766	-2.241			
0.1800	-2.241			
0.1833	-2.241			
0.1866	-2.226			
0.1900	-2.226			
0.1933	-2.226			
0.1966	-2.209			
0.2000	-2.209			
0.2033	-2.193			
0.2066	-2.209			
0.2100	-2.193			
0.2133	-2.193			
0.2166	-2.193		0.94	0.0800
0.2200	-2.193			
0.2233	-2.177			
0.2266	-2.177			
0.2300	-2.177			
0.2333	-2.162			
0.2366	-2.162			
0.2400	-2.162			
0.2433	-2.162			
0.2466	-2.145			
0.2500	-2.145			
0.2533	-2.145			
0.2566	-2.145			
0.2600	-2.129			
0.2633	-2.129			
0.2666	-2.113			
0.2700	-2.113			
0.2733	-2.113			
0.2766	-2.113		0.91	0.1400
0.2800	-2.097			
0.2833	-2.097			
0.2866	-2.097			
0.2900	-2.097			
0.2933	-2.097			
0.2966	-2.081			
0.3000	-2.081			
0.3033	-2.081			
0.3066	-2.081			
0.3100	-2.065			
0.3133	-2.065			
0.3166	-2.065			
0.3200	-2.065			

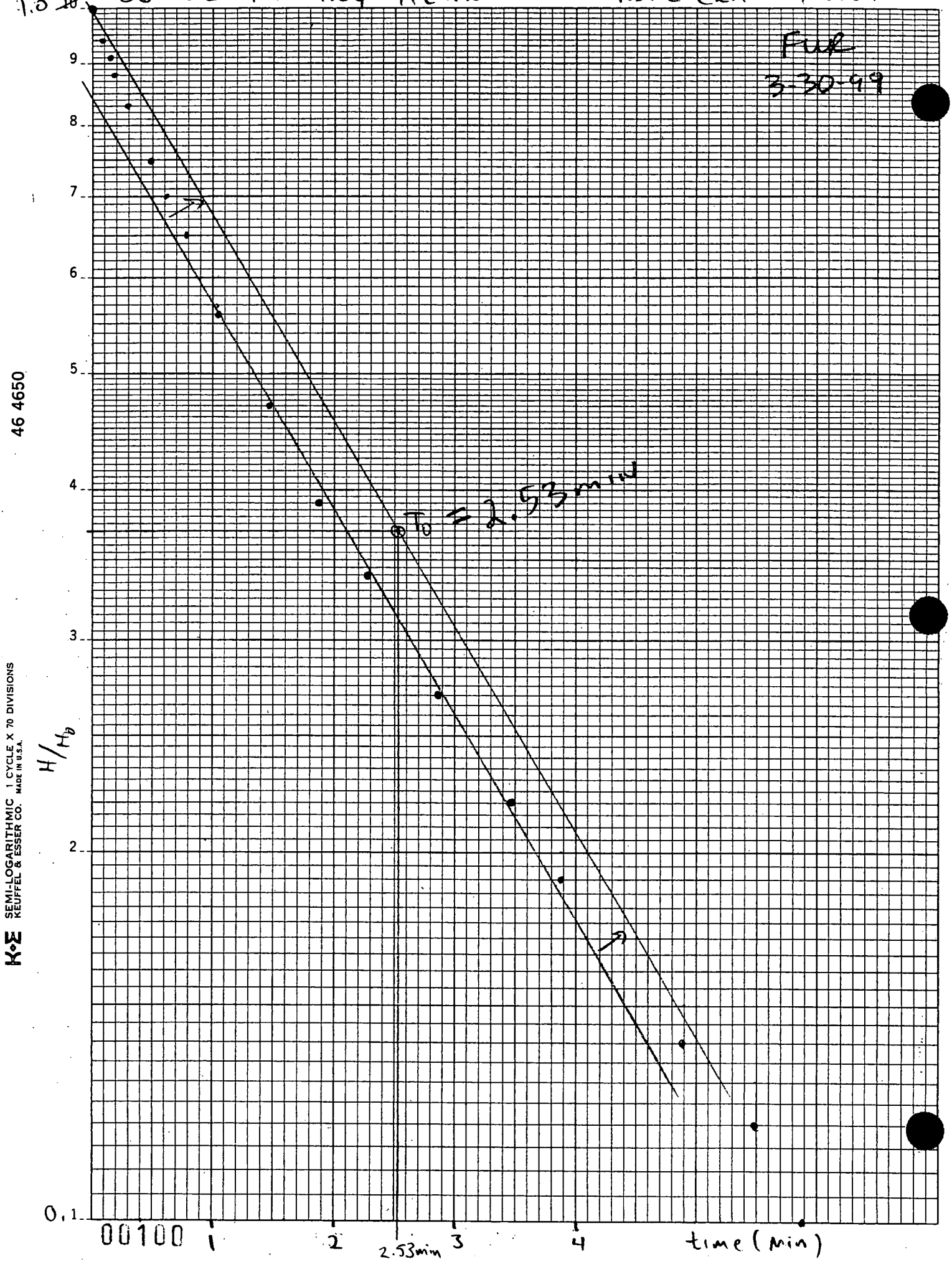
0.3233	-2.065		
0.3266	-2.049		
0.3300	-2.049		
0.3333	-2.049	0.88	0.1967
0.3500	-2.017		
0.3666	-2.001		
0.3833	-1.985		
0.4000	-1.969		
0.4166	-1.953		
0.4333	-1.937	0.83	0.2967
0.4500	-1.921		
0.4666	-1.905		
0.4833	-1.889		
0.5000	-1.857		
0.5166	-1.841		
0.5333	-1.825		
0.5500	-1.809		
0.5666	-1.809		
0.5833	-1.777		
0.6000	-1.761		
0.6166	-1.761		
0.6333	-1.745	0.75	0.4967
0.6500	-1.713		
0.6666	-1.713		
0.6833	-1.697		
0.7000	-1.681		
0.7166	-1.665		
0.7333	-1.649		
0.7500	-1.633	0.70	0.6134
0.7666	-1.617		
0.7833	-1.617		
0.8000	-1.601		
0.8166	-1.585		
0.8333	-1.569		
0.8500	-1.553		
0.8666	-1.553		
0.8833	-1.537		
0.9000	-1.521		
0.9166	-1.505	0.65	0.7800
0.9333	-1.505		
0.9500	-1.489		
0.9666	-1.473		
0.9833	-1.457		
1.0000	-1.457		
1.2000	-1.297	0.56	1.0634
1.4000	-1.185		
1.6000	-1.088	0.47	1.4634
1.8000	-1.008		
2.0000	-0.912	0.39	1.8634
2.2000	-0.848		
2.4000	-0.784	0.34	2.2634
2.6000	-0.720		
2.8000	-0.672		
3.0000	-0.624	0.27	2.8634
3.2000	-0.576		
3.4000	-0.544		
3.6000	-0.512	0.22	3.4634
3.8000	-0.480		
4.0000	-0.448	0.19	3.8634
4.2000	-0.416		

4.4000	-0.384		
4.6000	-0.368		
4.8000	-0.336		
5.0000	-0.320	0.14	4.8634
5.2000	-0.304		
5.4000	-0.288		
5.6000	-0.272	0.12	5.4634
5.8000	-0.256		
6.0000	-0.240	0.10	5.8634
6.2000	-0.240		
6.4000	-0.224		
6.6000	-0.208		
6.8000	-0.192		
7.0000	-0.192		
7.2000	-0.192		
7.4000	-0.176		
7.6000	-0.160		
7.8000	-0.160		
8.0000	-0.160		
8.2000	-0.144		
8.4000	-0.144		
8.6000	-0.144		
8.8000	-0.144		
9.0000	-0.128		
9.2000	-0.128		
9.4000	-0.112		
9.6000	-0.112		
9.8000	-0.112		
10.0000	-0.112		
12.0000	-0.080		

END

06-22 FALLING HEMP NSWC CRANE / 7651

FWR
3-30-99



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06-22 FALLING HEAD		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-30-99
APPROVED BY		DATE	

$r = 0.083$ ft
$R = 0.234$ ft
$L = 9.13$ ft

$T_0 = 2.53$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(9.13 \text{ ft} / 0.234 \text{ ft})}{2 (9.13 \text{ ft})(2.53 \text{ min})}$$

$K = 5.46 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.86 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

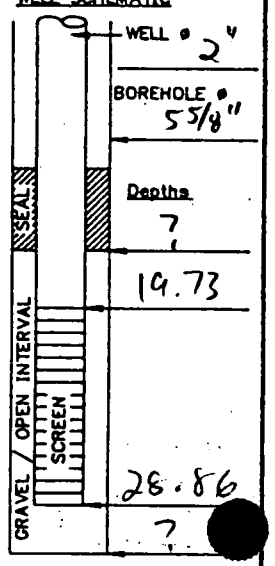
$= 2.77 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

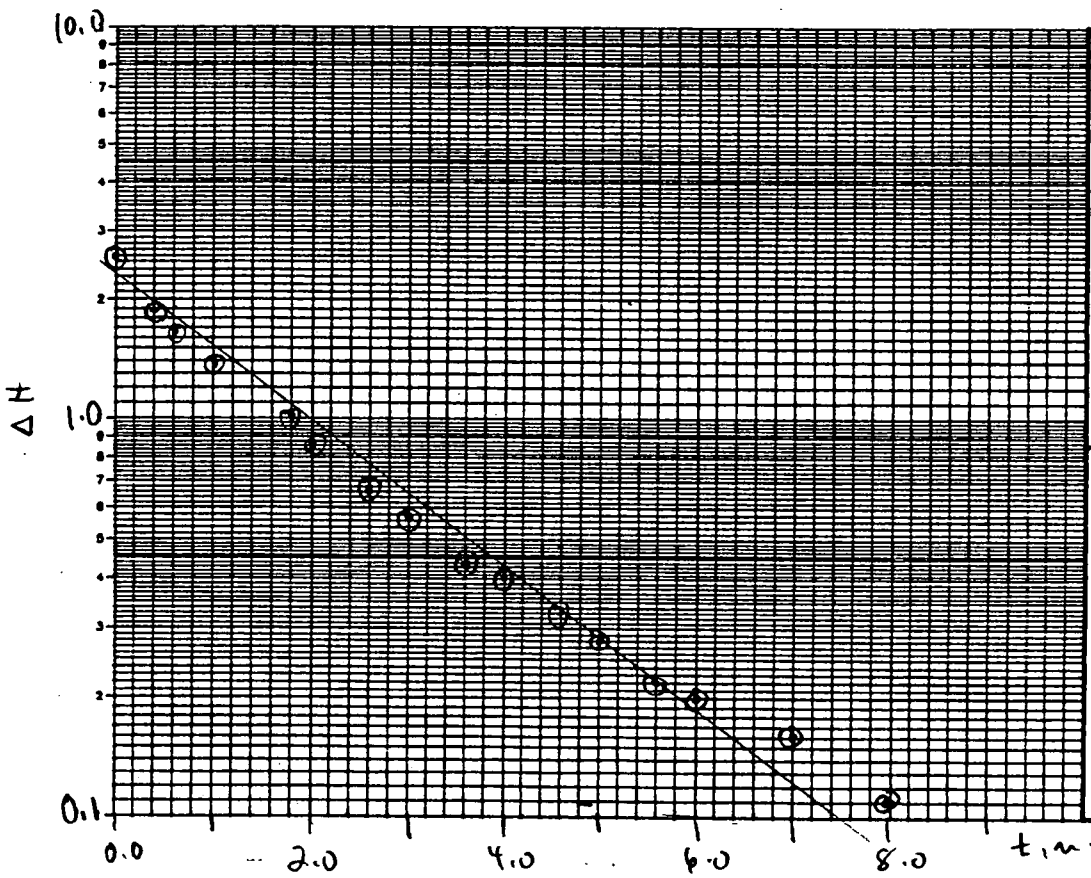
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-22
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.13 ft TEST NO.: T1234
STATIC WATER LEVEL (Depth/Elevation): 8.71' TPVC DATE: 3-10-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø X 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		2.59	5.60		0.22
0.40		1.88	6.00		0.20
0.60		1.68	6.60		0.17
1.00		1.36	7.00		0.16
1.60		1.00	8.00		0.11
2.00		0.86	9.00		0.08
2.60		0.67	10.00		0.06
3.00		0.57			
3.60		0.44			
4.00		0.40			
4.60		0.33			
5.00		0.28			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hemit # 143
XO s/N 203120
50psi
H_2O above XO ___
Start @ 1046
Stop @ 1100

CALCS, SKETCH MAPS, ETC.:
File:
0622rise.txt

FLR
3-30-99

0.0033
SE1000C
Environmental Logger
03/10 19:01

Unit# 00143 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06022
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06-22
Rising Head Test
Ø622 RISE . TXT

Step 0 03/10 10:45:59

Elapsed Time	INPUT 1
0.0000	1.441
0.0033	2.017
0.0066	1.697
0.0100	0.848
0.0133	0.896
0.0166	1.617
0.0200	2.113
0.0233	2.417
0.0266	2.594
0.0300	2.626
0.0333	2.513
0.0366	2.417
0.0400	2.594 ←
0.0433	2.513
0.0466	2.481
0.0500	2.433
0.0533	2.433
0.0566	2.433
0.0600	2.433
0.0633	2.401
0.0666	2.385
0.0700	2.369
0.0733	2.385
0.0766	2.385
0.0800	2.369
0.0833	2.369
0.0866	2.369
0.0900	2.353
0.0933	2.353
0.0966	2.337
0.1000	2.321
0.1033	2.305
0.1066	2.305
0.1100	2.305
0.1133	2.305

H/H_0	t
1.00	0.0000
0.94	0.0200

0.1166	2.289		
0.1200	2.289	0.88	0.0800
0.1233	2.273		
0.1266	2.273		
0.1300	2.273		
0.1333	2.273		
0.1366	2.241		
0.1400	2.225		
0.1433	2.225		
0.1466	2.225		
0.1500	2.193		
0.1533	2.209		
0.1566	2.209		
0.1600	2.193		
0.1633	2.193		
0.1666	2.209		
0.1700	2.177		
0.1733	2.177		
0.1766	2.177		
0.1800	2.161		
0.1833	2.161		
0.1866	2.161		
0.1900	2.145	0.83	0.1500
0.1933	2.161		
0.1966	2.129		
0.2000	2.145		
0.2033	2.145		
0.2066	2.129		
0.2100	2.113		
0.2133	2.129		
0.2166	2.113		
0.2200	2.113		
0.2233	2.113		
0.2266	2.097		
0.2300	2.097		
0.2333	2.065		
0.2366	2.065		
0.2400	2.065	0.80	0.2000
0.2433	2.065		
0.2466	2.065		
0.2500	2.065		
0.2533	2.049		
0.2566	2.065		
0.2600	2.049		
0.2633	2.049		
0.2666	2.049		
0.2700	2.033		
0.2733	2.033		
0.2766	2.033		
0.2800	2.017		
0.2833	2.017		
0.2866	2.017		
0.2900	2.017	0.78	0.2500
0.2933	2.001		
0.2966	2.001		
0.3000	2.001		
0.3033	2.001		
0.3066	1.985		
0.3100	1.985		
0.3133	1.985		

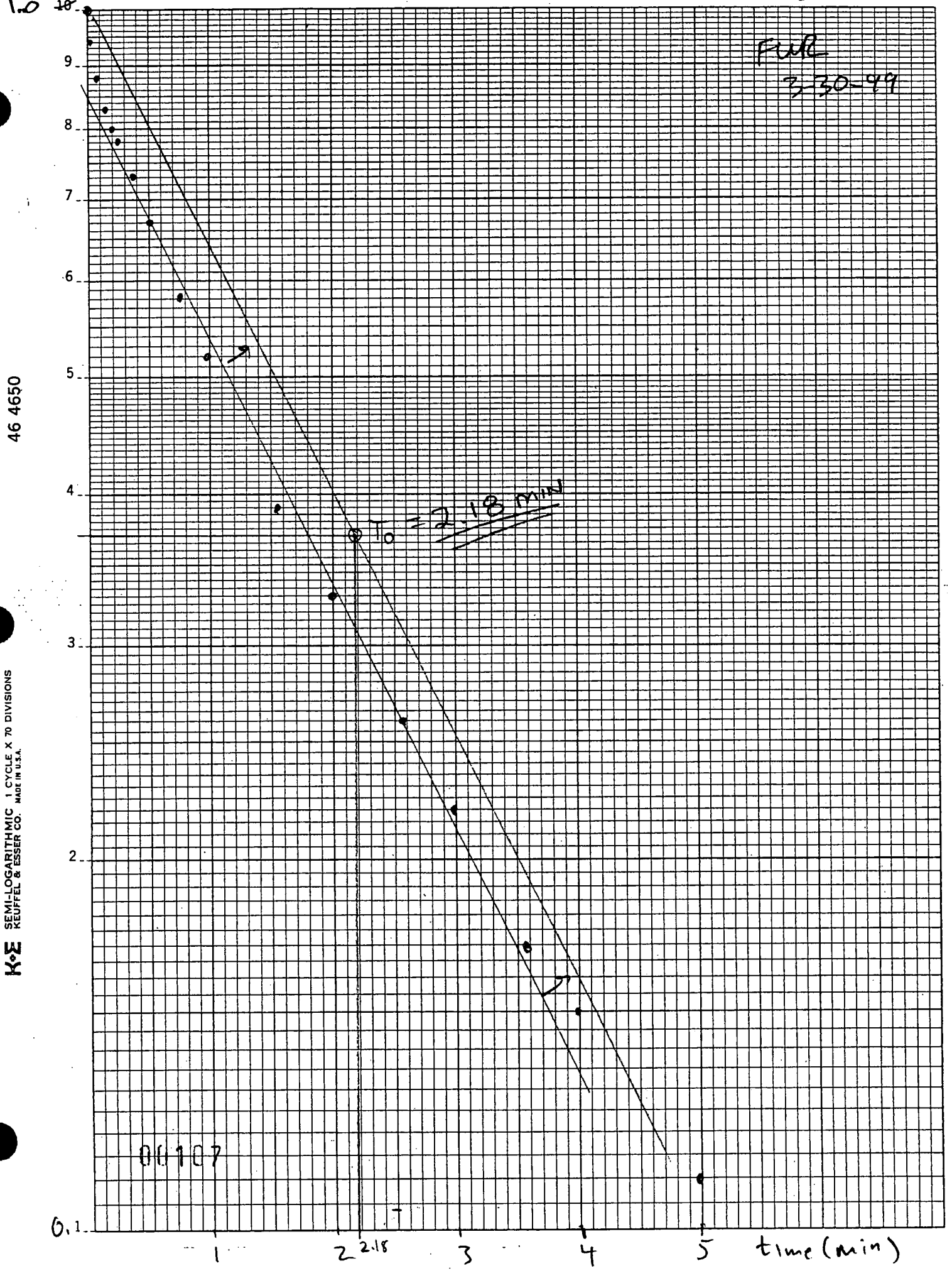
0.3166	1.969		
0.3200	1.969		
0.3233	1.969		
0.3266	1.969		
0.3300	1.969		
0.3333	1.953		
0.3500	1.937		
0.3666	1.921		
0.3833	1.905		
0.4000	1.889	0.73	0.3600
0.4166	1.857		
0.4333	1.841		
0.4500	1.825		
0.4666	1.809		
0.4833	1.793		
0.5000	1.777		
0.5166	1.761		
0.5333	1.745		
0.5500	1.729	0.67	0.5100
0.5666	1.713		
0.5833	1.697		
0.6000	1.681		
0.6166	1.665		
0.6333	1.649		
0.6500	1.633		
0.6666	1.617		
0.6833	1.601		
0.7000	1.585		
0.7166	1.569		
0.7333	1.553		
0.7500	1.537		
0.7666	1.537		
0.7833	1.521		
0.8000	1.505	0.58	0.7600
0.8166	1.489		
0.8333	1.489		
0.8500	1.473		
0.8666	1.457		
0.8833	1.457		
0.9000	1.425		
0.9166	1.425		
0.9333	1.409		
0.9500	1.393		
0.9666	1.393		
0.9833	1.377		
1.0000	1.361	0.52	0.9600
1.2000	1.217		
1.4000	1.104		
1.6000	1.008	0.39	1.5600
1.8000	0.928		
2.0000	0.864	0.33	1.9600
2.2000	0.784		
2.4000	0.720		
2.6000	0.672	0.26	2.5600
2.8000	0.624		
3.0000	0.576	0.22	2.9600
3.2000	0.544		
3.4000	0.496		
3.6000	0.448	0.17	3.5600
3.8000	0.432		

4.0000	0.400	0.15	3.9600
4.2000	0.368		
4.4000	0.352		
4.6000	0.336		
4.8000	0.304		
5.0000	0.288	0.11	4.9600
5.2000	0.256		
5.4000	0.256		
5.6000	0.224		
5.8000	0.224		
6.0000	0.208		
6.2000	0.192		
6.4000	0.176		
6.6000	0.176		
6.8000	0.160		
7.0000	0.160		
7.2000	0.144		
7.4000	0.144		
7.6000	0.128		
7.8000	0.128		
8.0000	0.112		
8.2000	0.112		
8.4000	0.112		
8.6000	0.096		
8.8000	0.096		
9.0000	0.080		
9.2000	0.080		
9.4000	0.080		
9.6000	0.080		
9.8000	0.080		
10.0000	0.064		
12.0000	0.048		
14.0000	0.032		

END

06-22 RISING HEAD

NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06-22 RISING Head			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: 3-30-99 EWRamser	APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.234$ ft

$L = 9.13$ ft

$T_0 = 2.18$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.13\ ft / 0.234\ ft)}{2\,(9.13\ ft)\,(2.18\ min)}$$

$K = 6.34 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 9.13 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 3.22 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-23

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10 TEST NO.: TR3Ø

STATIC WATER LEVEL (Depth/Elevation): 6.05' DATE: 3-10-99

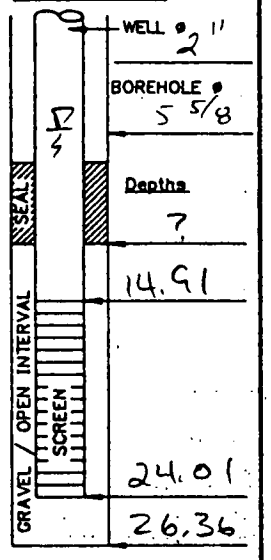
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' x 7.68') PAGE ... OF ...

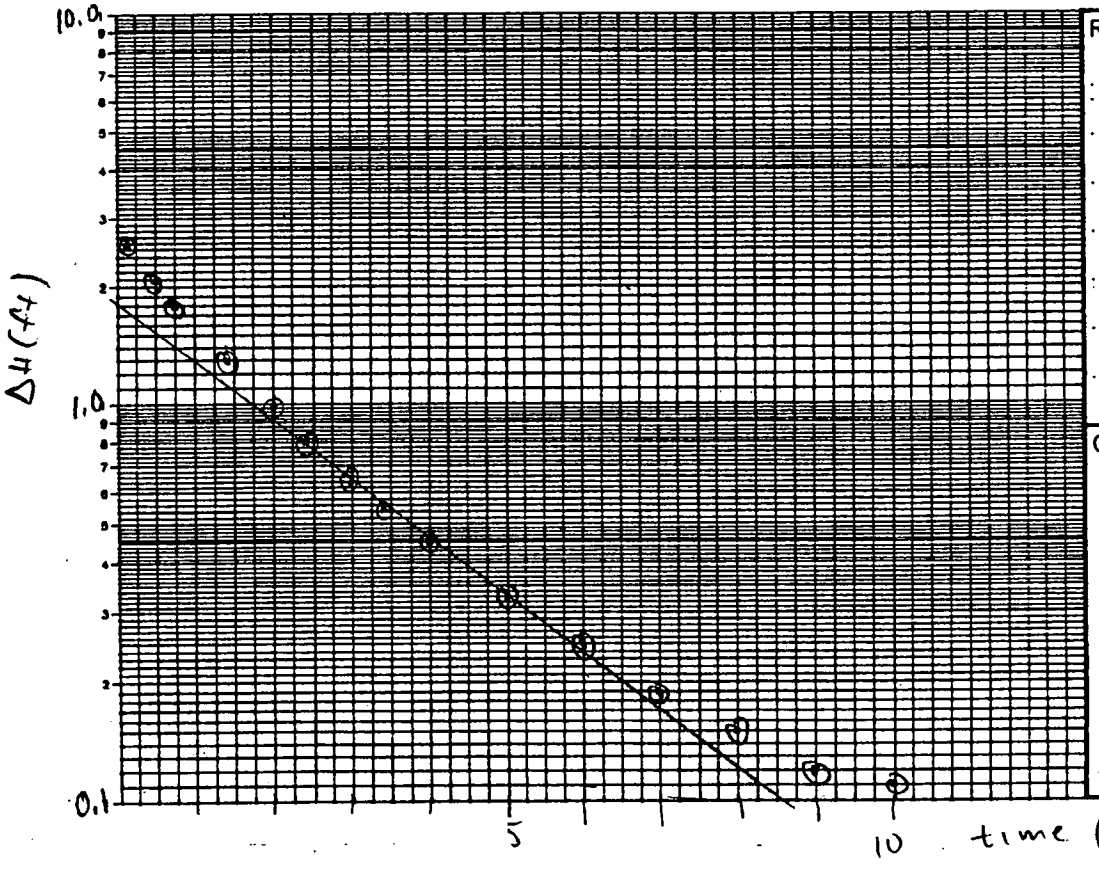
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.15		-2.58	5.40		-0.28
0.50		-2.06	6.00		-0.25
0.75		-1.82	7.00		-0.19
1.00		-1.60	8.00		-0.15
1.40		-1.29	9.00		-0.12
2.00		-0.98	10.00		-0.11
2.40		-0.82			
3.00		-0.64			
3.40		-0.55			
4.00		-0.44			
4.40		-0.39			
5.00		-0.33			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

XD S/N 1670

50 psi

Start @ 1112

Stop @ 1125

CALCS, SKETCH MAPS, ETC.:

file:

0623 Fall.txt

1st Run

00109

0.1166 -2.53

SE1000C
Environmental Logger
03/12 13:43

Unit# 00145 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06023
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Step 0 03/10 11:12:00

Elapsed Time	INPUT 1
0.0000	-0.015
0.0033	-0.221
0.0066	-0.618
0.0100	-0.586
0.0133	-0.253
0.0166	-1.140
0.0200	-2.107
0.0233	-1.441
0.0266	-1.964
0.0300	-3.644
0.0333	-4.310
0.0366	-3.311
0.0400	-1.679
0.0433	-1.552
0.0466	-2.899
0.0500	-3.787
0.0533	-3.105
0.0566	-2.408
0.0600	-2.313
0.0633	-2.202
0.0666	-2.139
0.0700	-2.583
0.0733	-3.010
0.0766	-3.090
0.0800	-2.598
0.0833	-1.901
0.0866	-2.012
0.0900	-2.725
0.0933	-3.185
0.0966	-2.868
0.1000	-2.297
0.1033	-2.107
0.1066	-2.424
0.1100	-2.820
0.1133	-2.852
0.1166	-2.535
0.1200	-2.266

Well # 06-23 (1st Test)
Falling Head test
Ø623 FALL. txt

0.1233	-2.313			
0.1266	-2.583			
0.1300	-2.725			
0.1333	-2.614			
0.1366	-2.408			
0.1400	-2.329			
0.1433	-2.440			
0.1466	-2.583			
0.1500	-2.583			
0.1533	-2.472			
0.1566	-2.376			
0.1600	-2.392			
0.1633	-2.487			
0.1666	-2.519			
0.1700	-2.472			
0.1733	-2.408			
0.1766	-2.376			
0.1800	-2.424			
0.1833	-2.456			
0.1866	-2.456			
0.1900	-2.424		H/H_0	t
0.1933	-2.376			
0.1966	-2.392			
0.2000	-2.424	← H_0	1.00	0.0000
0.2033	-2.424			
0.2066	-2.408			
0.2100	-2.376			
0.2133	-2.376			
0.2166	-2.376			
0.2200	-2.392		0.99	0.0200
0.2233	-2.392			
0.2266	-2.376			
0.2300	-2.361			
0.2333	-2.361			
0.2366	-2.361			
0.2400	-2.345			
0.2433	-2.345			
0.2466	-2.345			
0.2500	-2.345		0.97	0.0500
0.2533	-2.329			
0.2566	-2.329			
0.2600	-2.329			
0.2633	-2.329			
0.2666	-2.329			
0.2700	-2.313			
0.2733	-2.313			
0.2766	-2.297			
0.2800	-2.297			
0.2833	-2.297			
0.2866	-2.297			
0.2900	-2.281			
0.2933	-2.281			
0.2966	-2.281			
0.3000	-2.281		0.94	0.1000
0.3033	-2.266			
0.3066	-2.266			
0.3100	-2.266			
0.3133	-2.266		-	
0.3166	-2.266			00111
0.3200	-2.250			

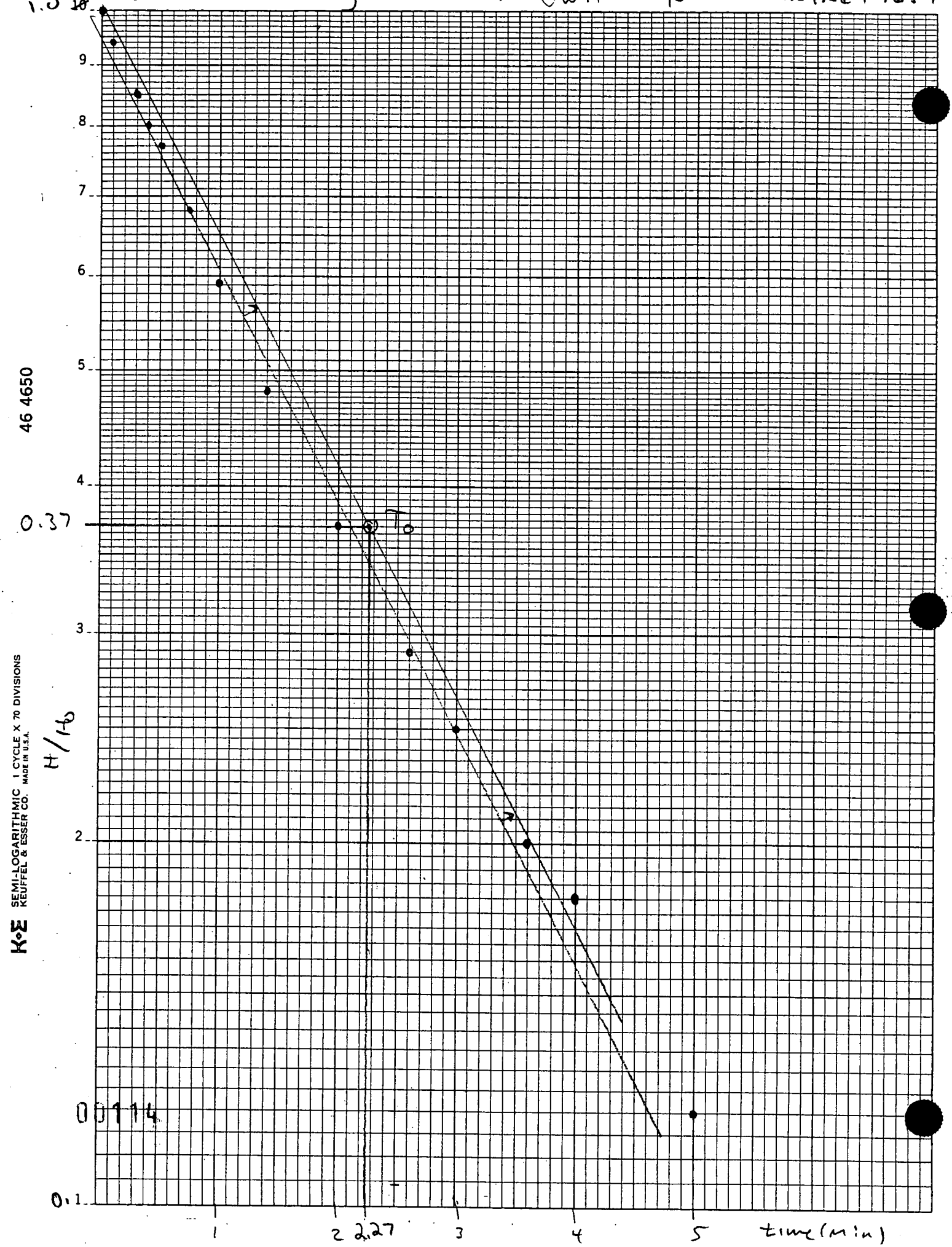
0.3233	-2.250		
0.3266	-2.250		
0.3300	-2.234		
0.3333	-2.234		
0.3500	-2.218		
0.3666	-2.202		
0.3833	-2.202		
0.4000	-2.171		
0.4166	-2.155		
0.4333	-2.139		
0.4500	-2.123		
0.4666	-2.107		
0.4833	-2.091		
0.5000	-2.060	0.85	0.3000
0.5166	-2.044		
0.5333	-2.028		
0.5500	-2.012		
0.5666	-1.996		
0.5833	-1.980		
0.6000	-1.964	0.81	0.4000
0.6166	-1.949		
0.6333	-1.933		
0.6500	-1.917		
0.6666	-1.901		
0.6833	-1.885		
0.7000	-1.869	0.77	0.5000
0.7166	-1.838		
0.7333	-1.838		
0.7500	-1.822		
0.7666	-1.806		
0.7833	-1.790		
0.8000	-1.774		
0.8166	-1.758		
0.8333	-1.743		
0.8500	-1.727		
0.8666	-1.711		
0.8833	-1.695		
0.9000	-1.679		
0.9166	-1.663		
0.9333	-1.663		
0.9500	-1.648	0.68	0.7500
0.9666	-1.632		
0.9833	-1.616		
1.0000	-1.600		
1.2000	-1.426	0.59	1.0000
1.4000	-1.299		
1.6000	-1.172	0.48	1.4000
1.8000	-1.077		
2.0000	-0.982		
2.2000	-0.903	0.37	2.0000
2.4000	-0.824		
2.6000	-0.760		
2.8000	-0.697	0.29	2.6000
3.0000	-0.649		
3.2000	-0.602	0.25	3.0000
3.4000	-0.554		
3.6000	-0.522		
3.8000	-0.491	0.22	3.6000
4.0000	-0.443		
4.2000	-0.427	0.18	4.0000

4.4000	-0.396
4.6000	-0.364
4.8000	-0.348
5.0000	-0.332
5.2000	-0.301
5.4000	-0.285
5.6000	-0.269
5.8000	-0.253
6.0000	-0.253
6.2000	-0.237
6.4000	-0.221
6.6000	-0.206
6.8000	-0.206
7.0000	-0.190
7.2000	-0.190
7.4000	-0.174
7.6000	-0.174
7.8000	-0.158
8.0000	-0.158
8.2000	-0.158
8.4000	-0.142
8.6000	-0.142
8.8000	-0.126
9.0000	-0.126
9.2000	-0.126
9.4000	-0.126
9.6000	-0.126
9.8000	-0.110
10.0000	-0.110
12.0000	-0.079
14.0000	-0.079

END

0.12 5.0000

06-23 Falling Head (1) CWA NSWC CRANE 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06-23 Falling Head Test (1)			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: CWA	APPROVED BY:	DATE:

$r = 0.083$ ft
$R = 0.234$ ft
$L = 9.10$ ft

$T_0 = 2.27$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.10\ ft / 0.234\ ft)}{2\ (9.10\ ft)\ (2.27\ min)}$$

$K = 6.10 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 8.79 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

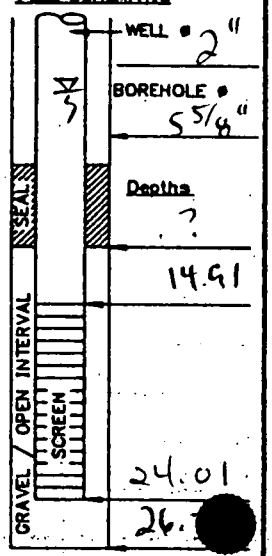
$= 3.10 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

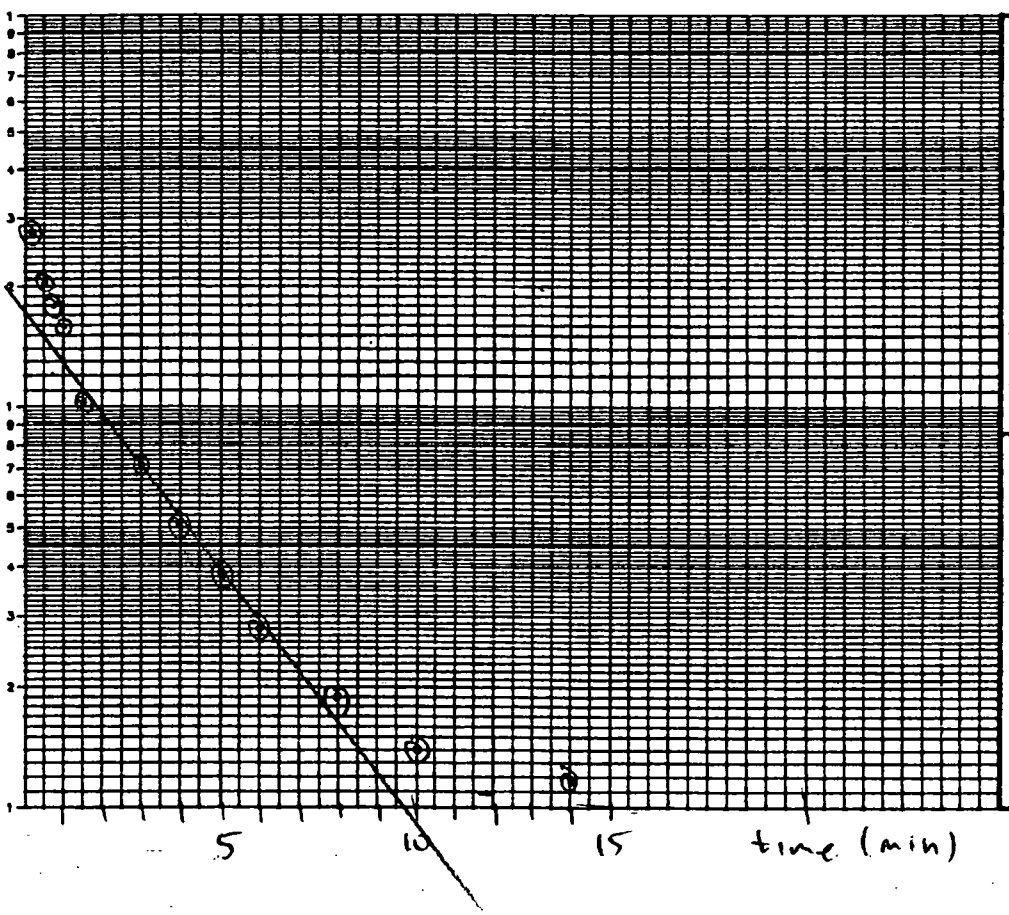
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-23
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10 TEST NO.: T1350
STATIC WATER LEVEL (Depth/Elevation): 6.00' DATE: 3-10-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.08		2.77	14.00		0.11
0.50		2.02	16.00		0.11
0.75		1.79			
1.00		1.58			
2.00		1.03			
3.00		0.71			
4.00		0.50			
5.00		0.38			
6.00		0.28			
8.00		0.19			
10.00		0.14			
12.00		0.12			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50 psi
Start @ 1126
Stop @ 1145

CALCS, SKETCH MAPS, ETC.:
file: 0623 rise.txt
1st Run

SE1000C
Environmental Logger
03/12 13:47

Unit# 00145 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06023
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06-23 (1st Test)
Rising Head Test
06023 RISE.txt

Step 0 03/10 11:26:34

Elapsed Time	INPUT 1
0.0000	0.079
0.0033	2.693
0.0066	4.436
0.0100	1.505
0.0133	-1.695
0.0166	2.170
0.0200	4.864
0.0233	2.503
0.0266	0.998
0.0300	3.485
0.0333	3.929
0.0366	1.996
0.0400	1.964
0.0433	3.549
0.0466	3.153
0.0500	1.948
0.0533	2.519
0.0566	3.311
0.0600	2.677
0.0633	2.139
0.0666	2.772
0.0700	3.026
0.0733	2.456
0.0766	2.360
0.0800	2.820
0.0833	2.772
0.0866	2.392
0.0900	2.503
0.0933	2.788
0.0966	2.614
0.1000	2.424
0.1033	2.582
0.1066	2.693
0.1100	2.535
0.1133	2.456
0.1166	2.598
0.1200	2.614

		H/H_0	t
0.1233	2.487		
0.1266	2.487		
0.1300	2.582		
0.1333	2.535		
0.1366	2.456		
0.1400	2.487		
0.1433	2.535 F	1.00	0.0000
0.1466	2.487		
0.1500	2.456		
0.1533	2.487		
0.1566	2.503		
0.1600	2.456		
0.1633	2.440	0.96	0.0200
0.1666	2.471		
0.1700	2.471		
0.1733	2.440		
0.1766	2.440		
0.1800	2.456		
0.1833	2.440		
0.1866	2.424		
0.1900	2.424		
0.1933	2.424	0.96	0.0500
0.1966	2.408		
0.2000	2.408		
0.2033	2.408		
0.2066	2.408		
0.2100	2.392		
0.2133	2.392		
0.2166	2.392		
0.2200	2.376		
0.2233	2.376		
0.2266	2.360		
0.2300	2.376		
0.2333	2.360		
0.2366	2.360		
0.2400	2.360		
0.2433	2.345	0.93	0.1000
0.2466	2.345		
0.2500	2.329		
0.2533	2.329		
0.2566	2.329		
0.2600	2.329		
0.2633	2.313		
0.2666	2.313		
0.2700	2.313		
0.2733	2.313		
0.2766	2.297		
0.2800	2.297		
0.2833	2.297		
0.2866	2.297		
0.2900	2.281		
0.2933	2.281	0.90	0.1500
0.2966	2.281		
0.3000	2.281		
0.3033	2.265		
0.3066	2.265		
0.3100	2.265		
0.3133	2.265		
0.3166	2.250		
0.3200	2.250		

0.3233	2.250		
0.3266	2.234		
0.3300	2.234		
0.3333	2.234		
0.3500	2.202		
0.3666	2.186		
0.3833	2.155	0.85	0.2400
0.4000	2.139		
0.4166	2.107		
0.4333	2.091		
0.4500	2.075		
0.4666	2.059		
0.4833	2.044	0.81	0.3400
0.5000	2.028		
0.5166	1.996		
0.5333	1.980		
0.5500	1.964		
0.5666	1.948		
0.5833	1.933		
0.6000	1.917		
0.6166	1.901		
0.6333	1.885		
0.6500	1.869	0.74	0.5067
0.6666	1.853		
0.6833	1.838		
0.7000	1.822		
0.7166	1.806		
0.7333	1.790		
0.7500	1.790		
0.7666	1.774		
0.7833	1.758	0.69	0.6400
0.8000	1.743		
0.8166	1.727		
0.8333	1.711		
0.8500	1.711	0.67	0.7067
0.8666	1.695		
0.8833	1.679		
0.9000	1.663		
0.9166	1.647		
0.9333	1.632		
0.9500	1.632		
0.9666	1.616		
0.9833	1.600	0.63	0.8400
1.0000	1.584		
1.2000	1.426		
1.4000	1.315	0.52	1.2567
1.6000	1.204		
1.8000	1.109	0.44	1.6567
2.0000	1.030		
2.2000	0.950	0.37	2.0567
2.4000	0.887		
2.6000	0.808		
2.8000	0.760		
3.0000	0.713	0.28	2.8567
3.2000	0.665		
3.4000	0.618		
3.6000	0.570	0.22	3.4567
3.8000	0.538		
4.0000	0.507		
4.2000	0.475	0.19	4.0567

4.4000	0.443
4.6000	0.427
4.8000	0.396
5.0000	0.380
5.2000	0.364
5.4000	0.332
5.6000	0.317
5.8000	0.301
6.0000	0.285
6.2000	0.285
6.4000	0.269
6.6000	0.253
6.8000	0.237
7.0000	0.237
7.2000	0.221
7.4000	0.221
7.6000	0.206
7.8000	0.206
8.0000	0.190
8.2000	0.190
8.4000	0.190
8.6000	0.174
8.8000	0.174
9.0000	0.174
9.2000	0.158
9.4000	0.158
9.6000	0.158
9.8000	0.142
10.0000	0.142
12.0000	0.126
14.0000	0.110
16.0000	0.110
18.0000	0.095

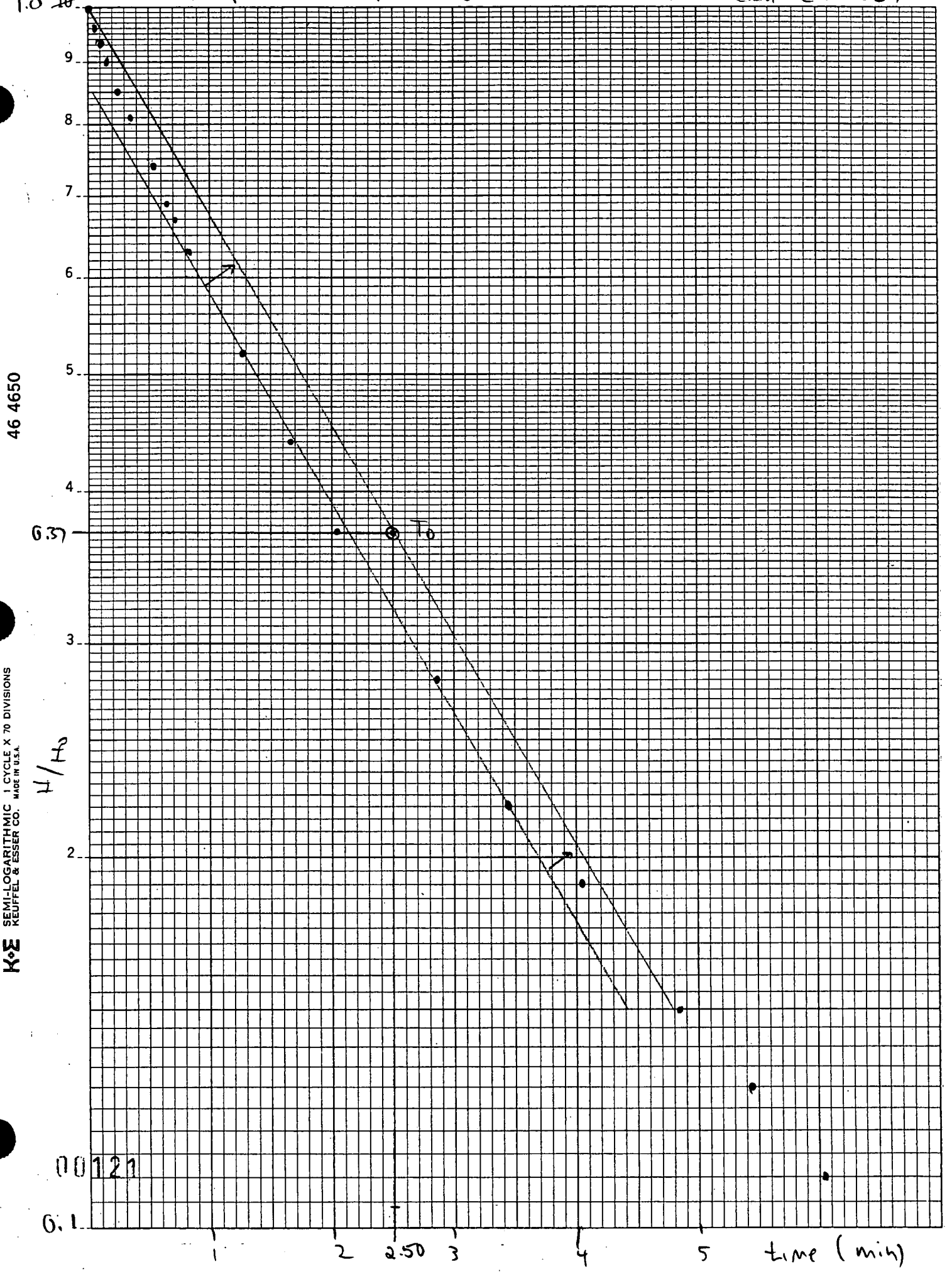
END

0.15 4.8567

0.13 5.4567

0.11 6.0567

06-23 RISING HEAD (1) CWA NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-23 RISING HEAD (1)	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE / CHECKED BY: CWA	APPROVED BY: / DATE:

$r = 0.083$ ft

$R = 0.234$ ft

$L = 9.10$ ft

$T_0 = 2.50$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(9.10 \text{ ft}/0.234 \text{ ft})}{2(9.10 \text{ ft})(2.50 \text{ min})}$$

$K = 5.54 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.98 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

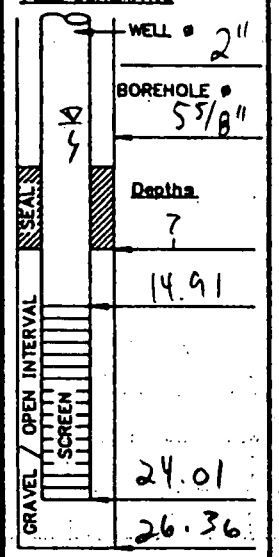
$= 2.82 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

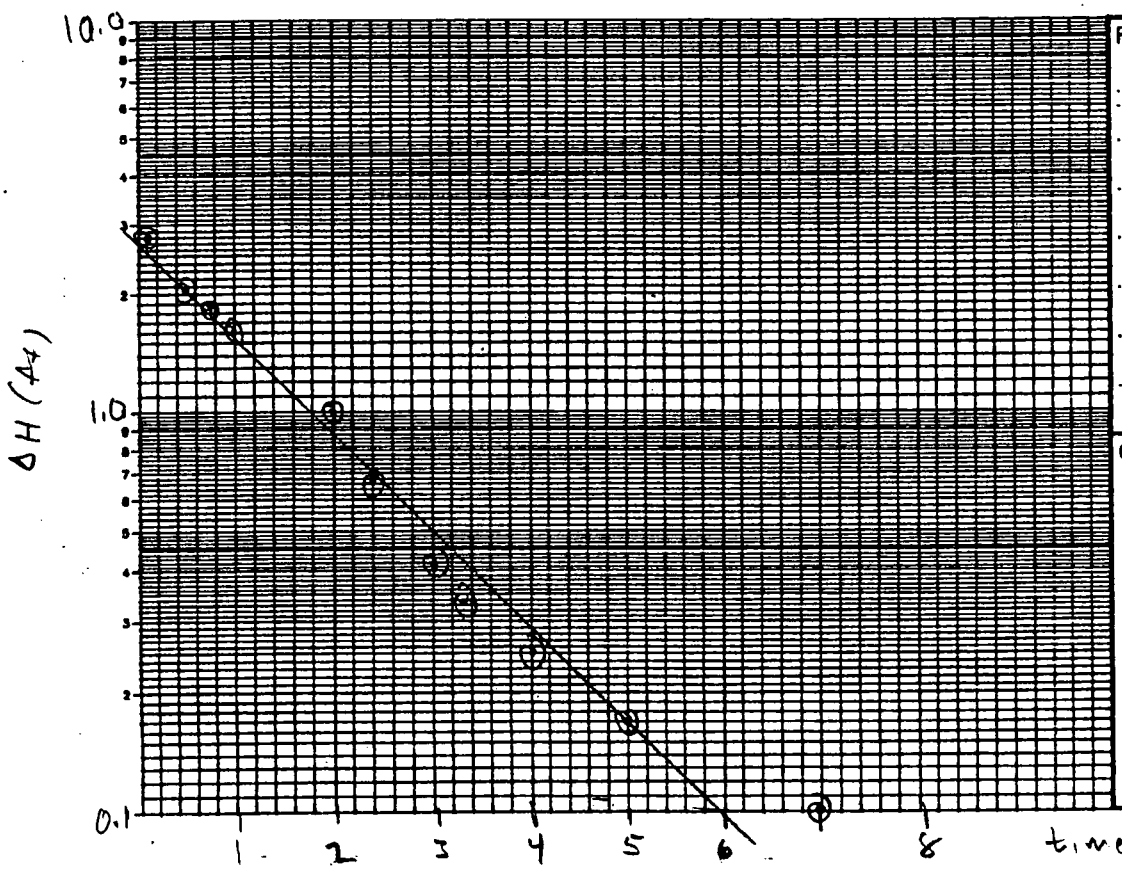
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-23
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10' TPVC TEST NO.: TP S8
STATIC WATER LEVEL (Depth/Elevation): 6.41' TPVC DATE: 3-14-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.10		-2.78			
0.50		-2.12			
0.75		-1.85			
1.00		-1.63			
2.00		-0.97			
3.00		-0.42	2.40		-0.67
4.00		-0.25	3.40		-0.33
5.00		-0.17			
7.00		-0.10			
9.00		-0.07			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Heavit # 145
XD SIN 203210
10 psi
H_2O above KD = 16.30'
Start @ 1409
Stop @ 1422

CALCS, SKETCH MAPS, ETC.:
File: 0623Fall2.txt
* 2nd RUN

SE1000C
Environmental Logger
03/14 15:18

Unit# 00145 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06023
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Step 0 03/14 14:09:25

Elapsed Time	INPUT 1
0.0000	-0.040
0.0033	-0.607
0.0066	-1.925
0.0100	-3.250
0.0133	-3.628
0.0166	-3.447
0.0200	-3.845
0.0233	-4.293
0.0266	-4.152
0.0300	-3.575
0.0333	-3.196
0.0366	-3.184
0.0400	-2.902
0.0433	-2.297
0.0466	-1.993
0.0500	-2.166
0.0533	-2.764
0.0566	-3.224
0.0600	-3.206
0.0633	-2.839
0.0666	-2.495
0.0700	-2.407
0.0733	-2.601
0.0766	-2.867
0.0800	-2.955
0.0833	-2.823
0.0866	-2.611
0.0900	-2.510
0.0933	-2.576
0.0966	-2.708
0.1000	-2.783
0.1033	-2.745
0.1066	-2.639
0.1100	-2.564
0.1133	-2.570
0.1166	-2.626
0.1200	-2.673

Well # 06-23 (2nd Test)
Falling Head Test
Ø623 FALL2.txt

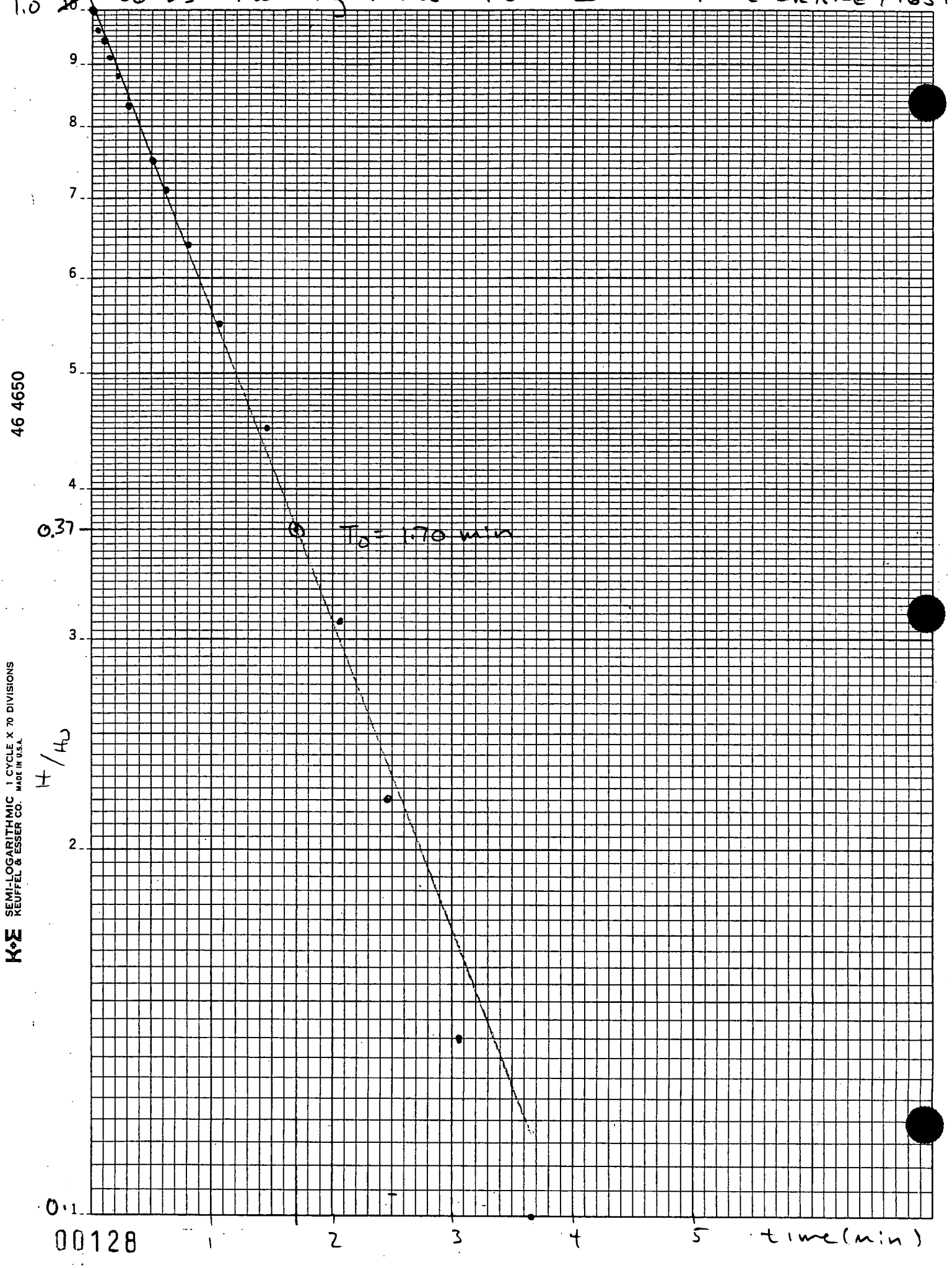
			H/H_0	τ
0.1233	-2.664			
0.1266	-2.617			
0.1300	-2.573			
0.1333	-2.570			
0.1366	-2.598			
0.1400	-2.620	← H_0	1.00	0.0000
0.1433	-2.611			
0.1466	-2.582			
0.1500	-2.557			
0.1533	-2.551			
0.1566	-2.560			
0.1600	-2.573			
0.1633	-2.573			
0.1666	-2.557			
0.1700	-2.535			
0.1733	-2.526			
0.1766	-2.526			
0.1800	-2.532			
0.1833	-2.532			
0.1866	-2.526			
0.1900	-2.517		0.96	0.0500
0.1933	-2.507			
0.1966	-2.504			
0.2000	-2.504			
0.2033	-2.504			
0.2066	-2.498			
0.2100	-2.491			
0.2133	-2.485			
0.2166	-2.482			
0.2200	-2.479			
0.2233	-2.476			
0.2266	-2.473			
0.2300	-2.466			
0.2333	-2.460			
0.2366	-2.454			
0.2400	-2.451		0.94	0.1000
0.2433	-2.451			
0.2466	-2.445			
0.2500	-2.441			
0.2533	-2.432			
0.2566	-2.426			
0.2600	-2.423			
0.2633	-2.419			
0.2666	-2.416			
0.2700	-2.410			
0.2733	-2.407			
0.2766	-2.401			
0.2800	-2.394			
0.2833	-2.394			
0.2866	-2.391			
0.2900	-2.385		0.91	0.1500
0.2933	-2.382			
0.2966	-2.379			
0.3000	-2.372			
0.3033	-2.366			
0.3066	-2.363			
0.3100	-2.363			
0.3133	-2.357			
0.3166	-2.351			
0.3200	-2.347			

0.3233	-2.341		
0.3266	-2.341		
0.3300	-2.335		
0.3333	-2.332		
0.3500	-2.313	0.88	0.2100
0.3666	-2.285		
0.3833	-2.260		
0.4000	-2.238		
0.4166	-2.222		
0.4333	-2.200		
0.4500	-2.181	0.83	0.3100
0.4666	-2.159		
0.4833	-2.141		
0.5000	-2.125		
0.5166	-2.103		
0.5333	-2.087		
0.5500	-2.069		
0.5666	-2.047		
0.5833	-2.025		
0.6000	-2.009		
0.6166	-1.990		
0.6333	-1.978		
0.6500	-1.959	0.75	0.5100
0.6666	-1.937		
0.6833	-1.925		
0.7000	-1.909		
0.7166	-1.887		
0.7333	-1.856		
0.7500	-1.853	0.71	0.6100
0.7666	-1.831		
0.7833	-1.831		
0.8000	-1.809		
0.8166	-1.796		
0.8333	-1.781		
0.8500	-1.768		
0.8666	-1.752		
0.8833	-1.740		
0.9000	-1.724		
0.9166	-1.709		
0.9333	-1.690		
0.9500	-1.677	0.64	0.8100
0.9666	-1.665		
0.9833	-1.649		
1.0000	-1.637		
1.2000	-1.449	0.55	1.0600
1.4000	-1.311		
1.6000	-1.192	0.45	1.4600
1.8000	-1.079		
2.0000	-0.979		
2.2000	-0.819	0.31	2.0600
2.4000	-0.676		
2.6000	-0.569	0.22	2.4600
2.8000	-0.491		
3.0000	-0.428		
3.2000	-0.375	0.14	3.0800
3.4000	-0.334		
3.6000	-0.303		
3.8000	-0.272	0.10	3.6600
4.0000	-0.253		
4.2000	-0.234		

4.4000	-0.216
4.6000	-0.203
4.8000	-0.187
5.0000	-0.175
5.2000	-0.165
5.4000	-0.150
5.6000	-0.153
5.8000	-0.134
6.0000	-0.134
6.2000	-0.131
6.4000	-0.125
6.6000	-0.119
6.8000	-0.115
7.0000	-0.109
7.2000	-0.103
7.4000	-0.103
7.6000	-0.097
7.8000	-0.090
8.0000	-0.087
8.2000	-0.084
8.4000	-0.084
8.6000	-0.084
8.8000	-0.078
9.0000	-0.072
9.2000	-0.075
9.4000	-0.065
9.6000	-0.072
9.8000	-0.068
10.0000	-0.062
12.0000	-0.047

END

06-23 Falling Head Test #2 NSWC CRANE/7651



00128

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-23 FALLING HEAD TEST #2	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE / CHECKED BY: CWA	APPROVED BY: / DATE:

$r = 0.083$ ft
$R = 0.234$ ft
$L = 9.10$ ft

$T_0 = 1.70$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(9.10\ ft / 0.234\ ft)}{2\,(9.10\ ft)\,(1.70\ min)}$$

$K = 8.15 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 1.17 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

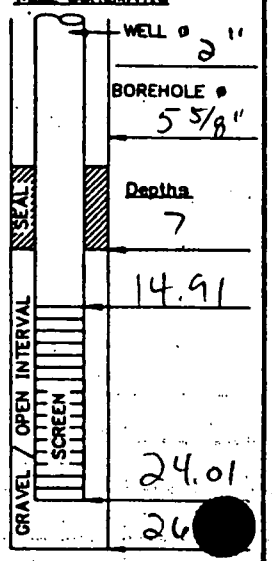
$= 4.14 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

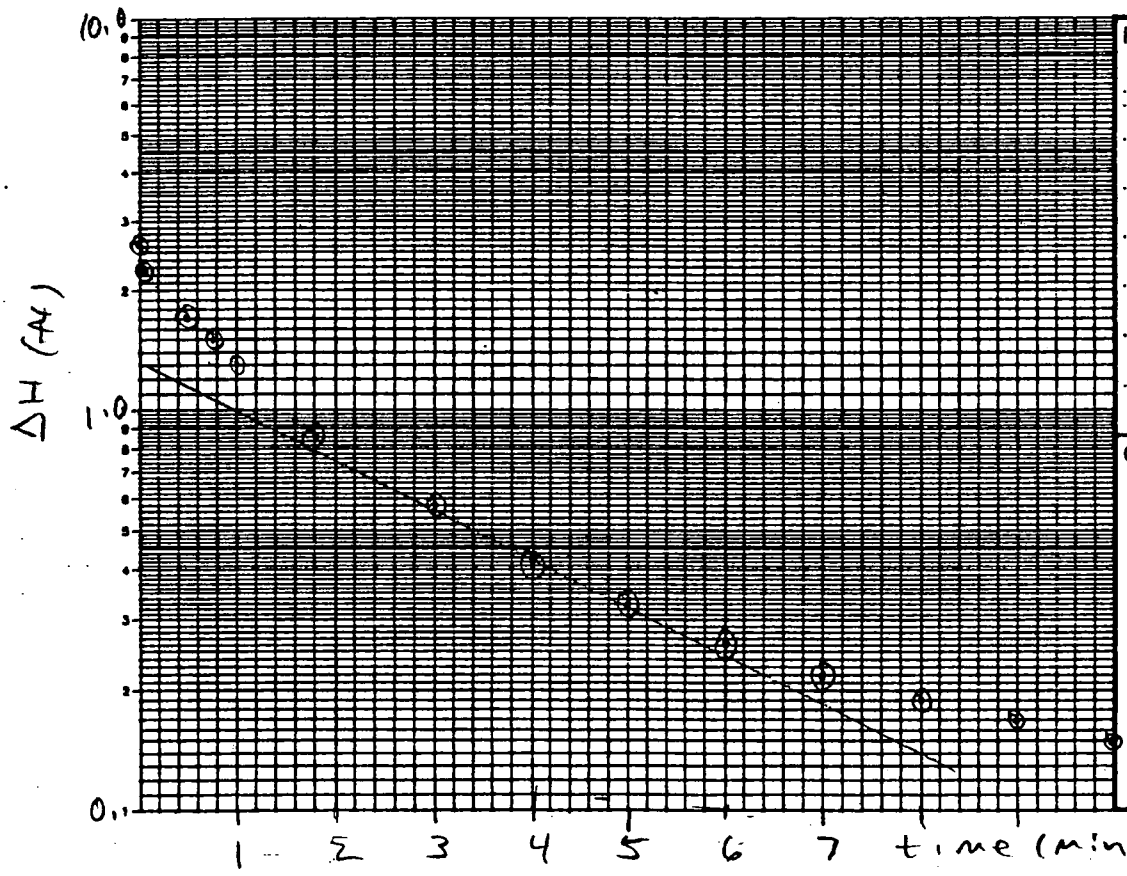
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06-23
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 9.10' TEST NO.: T150
STATIC WATER LEVEL (Depth/Elevation): 6.37' TOVL DATE: 3-14-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		2.63	9.00		0.17
0.10		2.25	10.00		0.15
0.50		1.69	12.00		0.13
0.75		1.49	14.00		0.11
1.00		1.32	16.00		0.11
2.00		0.85			
3.00		0.58			
4.00		0.42			
5.00		0.33			
6.00		0.26			
7.00		0.22			
8.00		0.19			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203210
10 ps.
H_2O above XD 16.34
Start @ 1424
Stop @ 1444

CALCS, SKETCH MAPS, ETC.:
file:
0623Rise2.txt
* 2nd RUN

SE1000C
Environmental Logger
03/14 15:29

Unit# 00145 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	06023
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well #06-23 (2nd test)
Rising Head Test
0623 Rise 2.txt

Step 0 03/14 14:23:49

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	0.478
0.0066	2.621
0.0100	3.061
0.0133	1.573
0.0166	1.686
0.0200	3.052
0.0233	2.833
0.0266	1.726
0.0300	1.973
0.0333	2.805
0.0366	2.530
0.0400	1.864
0.0433	2.120
0.0466	2.633
0.0500	2.367
0.0533	1.958
0.0566	2.198
0.0600	2.492
0.0633	2.274
0.0666	2.033
0.0700	2.220
0.0733	2.389
0.0766	2.214
0.0800	2.070
0.0833	2.214
0.0866	2.308
0.0900	2.177
0.0933	2.098
0.0966	2.198
0.1000	2.252
0.1033	2.152
0.1066	2.101
0.1100	2.170
0.1133	2.189
0.1166	2.123
0.1200	2.101

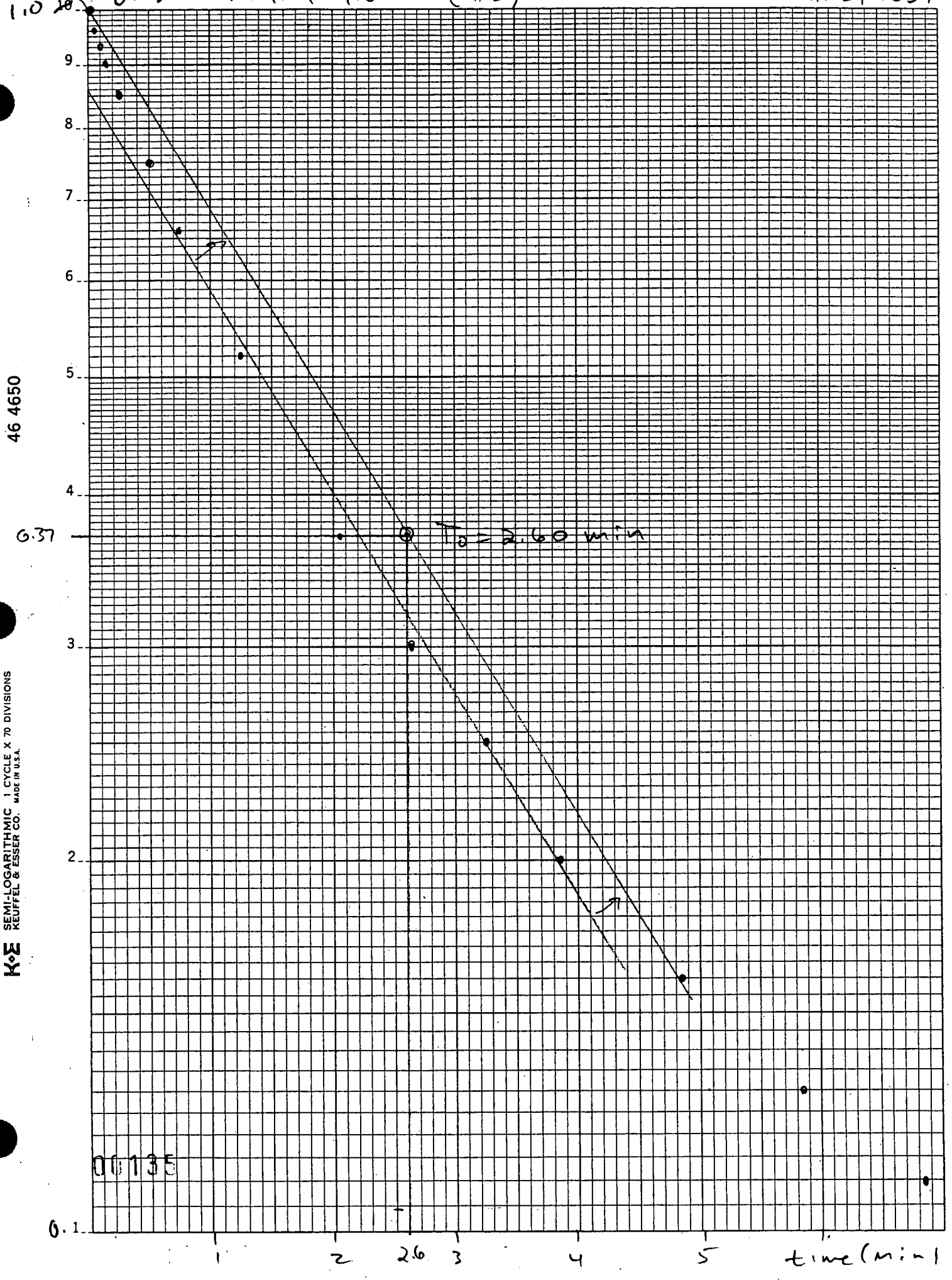
			H/H_o	t
0.1233	2.148			
0.1266	2.152			
0.1300	2.105			
0.1333	2.095			
0.1366	2.123			
0.1400	2.120			
0.1433	2.086			
0.1466	2.080			
0.1500	2.105	← H_o	1.00	0.0000
0.1533	2.101			
0.1566	2.083			
0.1600	2.067			
0.1633	2.080			
0.1666	2.073			
0.1700	2.055			
0.1733	2.055			
0.1766	2.058			
0.1800	2.045			
0.1833	2.030			
0.1866	2.033			
0.1900	2.039			
0.1933	2.033			
0.1966	2.017			
0.2000	2.014		0.96	0.0500
0.2033	2.017			
0.2066	2.008			
0.2100	2.001			
0.2133	2.001			
0.2166	2.001			
0.2200	1.995			
0.2233	1.986			
0.2266	1.986			
0.2300	1.983			
0.2333	1.976			
0.2366	1.973			
0.2400	1.973			
0.2433	1.967			
0.2466	1.964			
0.2500	1.955		0.93	0.1000
0.2533	1.955			
0.2566	1.951			
0.2600	1.945			
0.2633	1.942			
0.2666	1.942			
0.2700	1.936			
0.2733	1.930			
0.2766	1.930			
0.2800	1.926			
0.2833	1.920			
0.2866	1.917			
0.2900	1.914			
0.2933	1.911			
0.2966	1.905			
0.3000	1.901		0.90	0.1500
0.3033	1.901			
0.3066	1.898			
0.3100	1.889			
0.3133	1.886			
0.3166	1.866			
0.3200	1.880			

0.3233	1.876		
0.3266	1.873		
0.3300	1.873		
0.3333	1.867		
0.3500	1.848		
0.3666	1.833		
0.3833	1.811		
0.4000	1.795	0.85	0.2500
0.4166	1.779		
0.4333	1.761		
0.4500	1.745		
0.4666	1.729		
0.4833	1.714		
0.5000	1.698		
0.5166	1.682		
0.5333	1.667		
0.5500	1.654		
0.5666	1.639		
0.5833	1.626		
0.6000	1.614		
0.6166	1.598		
0.6333	1.589		
0.6500	1.573	0.75	0.5000
0.6666	1.564		
0.6833	1.548		
0.7000	1.542		
0.7166	1.520		
0.7333	1.507		
0.7500	1.498		
0.7666	1.485		
0.7833	1.470		
0.8000	1.467		
0.8166	1.451		
0.8333	1.435		
0.8500	1.423		
0.8666	1.420		
0.8833	1.398		
0.9000	1.382	0.66	0.7500
0.9166	1.379		
0.9333	1.367		
0.9500	1.360		
0.9666	1.342		
0.9833	1.335		
1.0000	1.329		
1.2000	1.188		
1.4000	1.086	0.52	1.2500
1.6000	1.001		
1.8000	0.922		
2.0000	0.851		
2.2000	0.785	0.37	2.0500
2.4000	0.725		
2.6000	0.675		
2.8000	0.628	0.30	2.6500
3.0000	0.585		
3.2000	0.563		
3.4000	0.516	0.25	3.2500
3.6000	0.484		
3.8000	0.456		
4.0000	0.428	0.20	3.8500
4.2000	0.403		

4.4000	0.394		
4.6000	0.362		
4.8000	0.347		
5.0000	0.331	0.16	4.8500
5.2000	0.312		
5.4000	0.300		
5.6000	0.287		
5.8000	0.275		
6.0000	0.269	0.13	5.8500
6.2000	0.253		
6.4000	0.244		
6.6000	0.237		
6.8000	0.231		
7.0000	0.225	0.11	6.8500
7.2000	0.215		
7.4000	0.206		
7.6000	0.203		
7.8000	0.197		
8.0000	0.193		
8.2000	0.184		
8.4000	0.181		
8.6000	0.178		
8.8000	0.178		
9.0000	0.172		
9.2000	0.165		
9.4000	0.162		
9.6000	0.162		
9.8000	0.162		
10.0000	0.159		
12.0000	0.134		
14.0000	0.118		
16.0000	0.112		
18.0000	0.106		
20.0000	0.100		

END

D6-23 RISING HEAD (#2) CWA NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06-23 RISING HEAD TEST (#2)	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: CWA
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.234$ ft

$L = 9.10$ ft

$T_0 = 2.60$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(9.10 \text{ ft}/0.234 \text{ ft})}{2(9.10 \text{ ft})(2.60 \text{ min})}$$

$K = 5.33 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.67 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

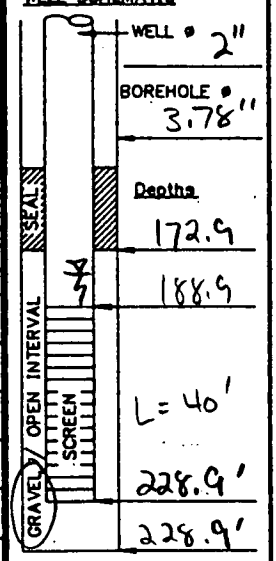
$= 2.71 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

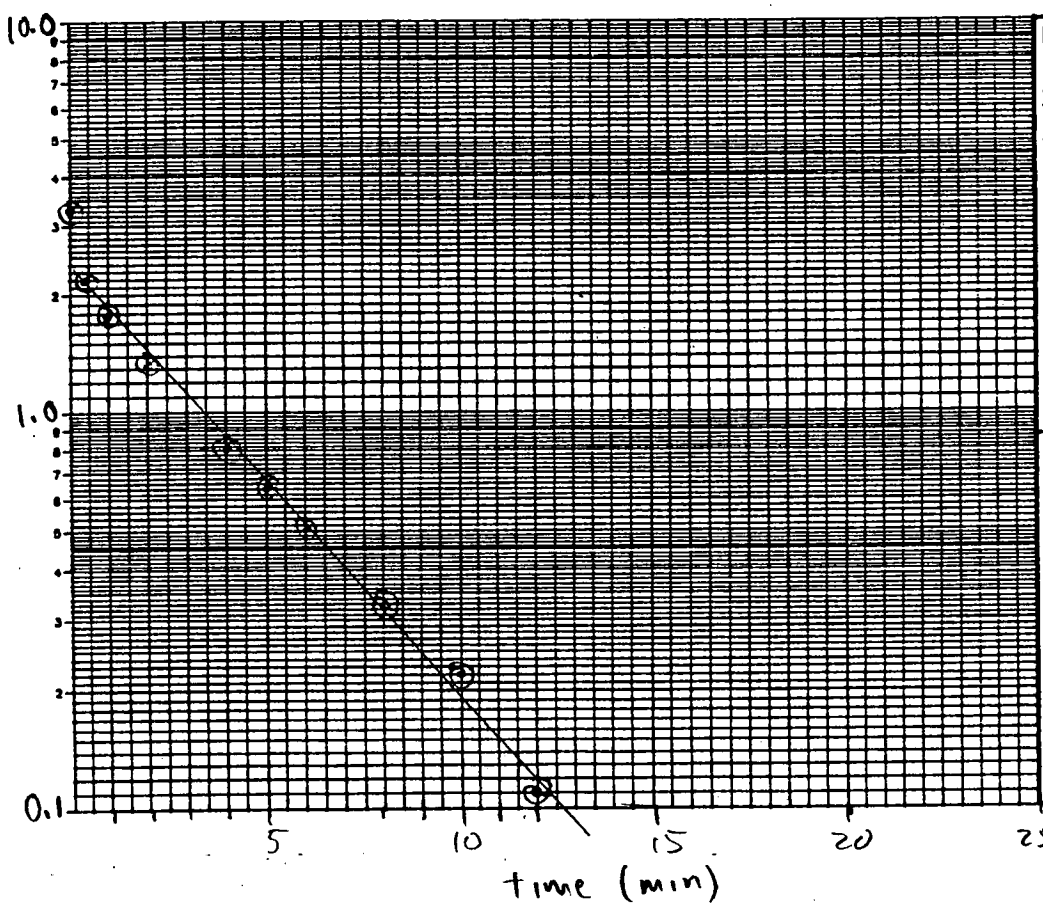
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C01
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 40' TEST NO.: T1350
STATIC WATER LEVEL (Depth/Elevation): 179.43' TPVC DATE: 3/10/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-3.33			
0.10		-2.66			
0.20		-2.45			
0.80		-1.90	0.40		-2.19
1.00		-1.79			
2.00		-1.34			
4.00		-0.81			
5.00		-0.65			
6.00		-0.51			
10.00		-0.22	8.00		-0.33
12.00		-0.11			
14.00		-0.06			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
H_2O above XD 48.17'
Start @ 1522
Stop @ 1606

CALCS, SKETCH MAPS, ETC.:
File: 06C01 Fall.txt

SE1000C
Environmental Logger
03/10 19:04

Unit# 00143 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60100
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C01
Falling Head Test
file: 06C01FALL.TXT

Step 0 03/10 15:22:23

Elapsed Time	INPUT 1	
0.0000	0.032	
0.0033	0.016	
0.0066	-5.290	
0.0100	-6.701	
0.0133	-5.675	
0.0166	-4.504	
0.0200	-4.007	
0.0233	-4.633	
0.0266	-4.489	
0.0300	-4.360	
0.0333	-4.312	
0.0366	-2.837	
0.0400	-1.474	
0.0433	-1.683	
0.0466	-2.677	
0.0500	-3.334 ←	H/H_o
0.0533	-3.093	
0.0566	-2.580	
0.0600	-2.773 ← H_o	1.00
0.0633	-2.757	
0.0666	-2.757	
0.0700	-2.741	
0.0733	-2.725	
0.0766	-2.725	
0.0800	-2.725	
0.0833	-2.709	
0.0866	-2.693	
0.0900	-2.677	
0.0933	-2.677	
0.0966	-2.661	
0.1000	-2.661	
0.1033	-2.661	
0.1066	-2.645	0.95
0.1100	-2.628	
0.1133	-2.626	
0.1166	-2.628	
0.1200	-2.613	

0.1233	-2.597
0.1266	-2.597
0.1300	-2.580
0.1333	-2.597
0.1366	-2.580
0.1400	-2.565
0.1433	-2.565
0.1466	-2.565
0.1500	-2.549
0.1533	-2.549
0.1566	-2.532
0.1600	-2.532
0.1633	-2.532
0.1666	-2.516
0.1700	-2.516
0.1733	-2.500
0.1766	-2.500
0.1800	-2.484
0.1833	-2.484
0.1866	-2.468
0.1900	-2.468
0.1933	-2.468
0.1966	-2.468
0.2000	-2.452
0.2033	-2.452
0.2066	-2.452
0.2100	-2.436
0.2133	-2.420
0.2166	-2.436
0.2200	-2.420
0.2233	-2.404
0.2266	-2.404
0.2300	-2.404
0.2333	-2.404
0.2366	-2.388
0.2400	-2.388
0.2433	-2.388
0.2466	-2.388
0.2500	-2.372
0.2533	-2.372
0.2566	-2.372
0.2600	-2.356
0.2633	-2.356
0.2666	-2.356
0.2700	-2.340
0.2733	-2.340
0.2766	-2.340
0.2800	-2.324
0.2833	-2.324
0.2866	-2.324
0.2900	-2.324
0.2933	-2.308
0.2966	-2.308
0.3000	-2.308
0.3033	-2.308
0.3066	-2.292
0.3100	-2.292
0.3133	-2.292
0.3166	-2.292
0.3200	-2.276

0.90

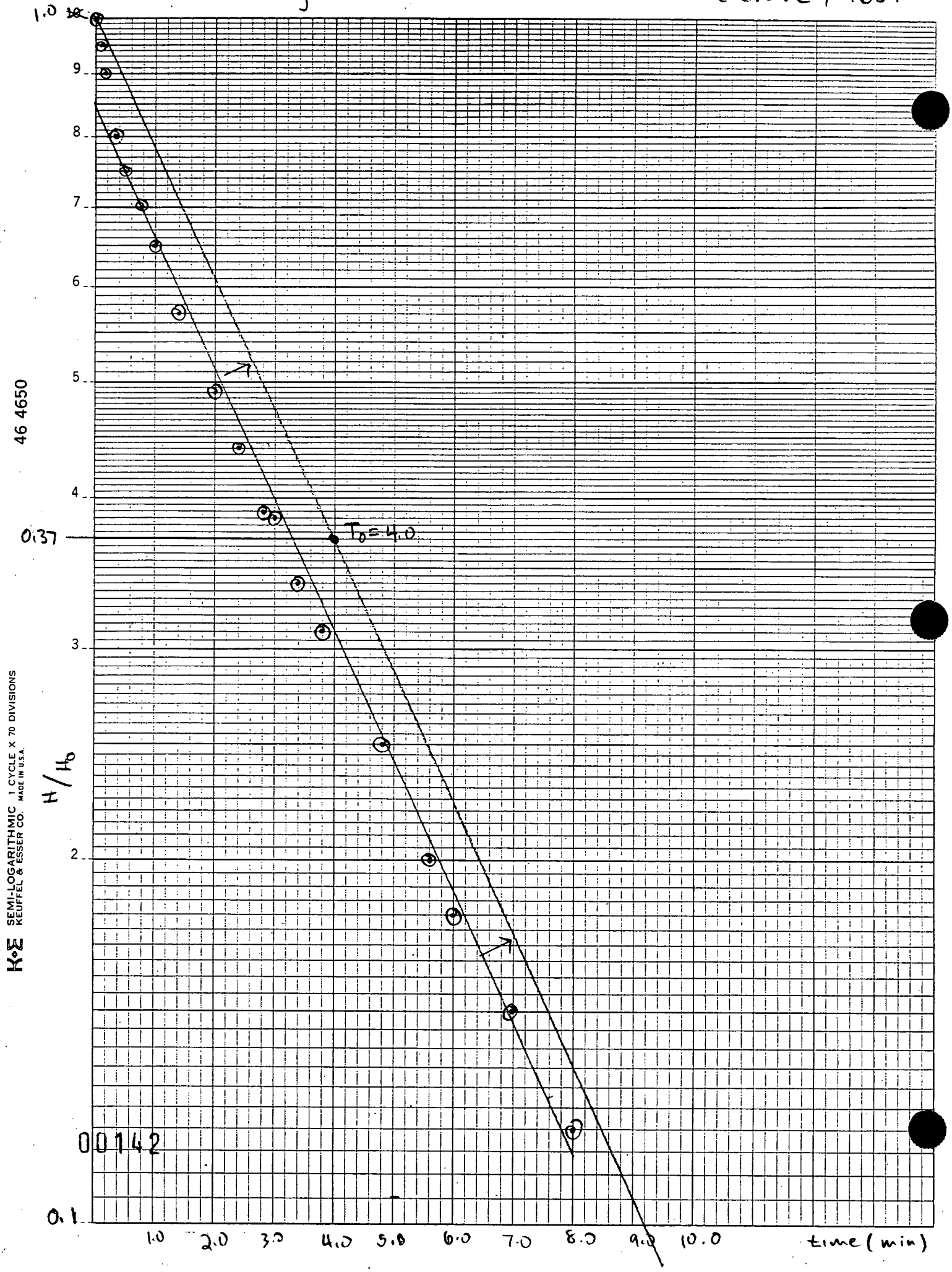
0.3233	-2.276	
0.3266	-2.276	
0.3300	-2.260	
0.3333	-2.260	
0.3500	-2.244	
0.3666	-2.228	0.80
0.3833	-2.212	
0.4000	-2.196	
0.4166	-2.180	
0.4333	-2.164	
0.4500	-2.148	
0.4666	-2.132	
0.4833	-2.115	
0.5000	-2.100	
0.5166	-2.100	
0.5333	-2.083	0.75
0.5500	-2.068	
0.5666	-2.051	
0.5833	-2.051	
0.6000	-2.035	
0.6166	-2.019	
0.6333	-2.003	
0.6500	-2.003	
0.6666	-1.987	
0.6833	-1.987	
0.7000	-1.971	
0.7166	-1.955	
0.7333	-1.955	
0.7500	-1.939	0.70
0.7666	-1.923	
0.7833	-1.923	
0.8000	-1.907	
0.8166	-1.907	
0.8333	-1.891	
0.8500	-1.875	
0.8666	-1.875	
0.8833	-1.859	
0.9000	-1.843	
0.9166	-1.843	
0.9333	-1.827	
0.9500	-1.827	
0.9666	-1.811	0.65
0.9833	-1.811	
1.0000	-1.795	0.65
1.2000	-1.683	
1.4000	-1.587	0.57
1.6000	-1.507	
1.8000	-1.426	
2.0000	-1.346	0.49
2.2000	-1.282	
2.4000	-1.218	0.44
2.6000	-1.154	
2.8000	-1.089	0.39
3.0000	-1.041	0.34
3.2000	-0.993	
3.4000	-0.945	0.34
3.6000	-0.897	
3.8000	-0.865	0.31
4.0000	-0.817	
4.2000	-0.785	

4.4000	-0.753	
4.6000	-0.705	0.25
4.8000	-0.689	
5.0000	-0.656	
5.2000	-0.625	
5.4000	-0.593	
5.6000	-0.561	0.20
5.8000	-0.544	
6.0000	-0.512	0.18
6.2000	-0.496	
6.4000	-0.480	
6.6000	-0.448	
6.8000	-0.433	
7.0000	-0.416	0.15
7.2000	-0.400	
7.4000	-0.384	
7.6000	-0.368	
7.8000	-0.352	
8.0000	-0.336	0.12
8.2000	-0.320	
8.4000	-0.304	
8.6000	-0.288	0.10
8.8000	-0.288	
9.0000	-0.272	
9.2000	-0.256	
9.4000	-0.240	
9.6000	-0.240	
9.8000	-0.240	
10.0000	-0.224	0.08
12.0000	-0.112	
14.0000	-0.064	
16.0000	-0.031	
18.0000	-0.015	
20.0000	-0.015	
22.0000	-0.015	
24.0000	-0.015	
26.0000	0.000	
28.0000	0.000	
30.0000	0.000	
32.0000	0.000	
34.0000	0.000	
36.0000	0.000	
38.0000	0.000	
40.0000	0.000	
42.0000	0.000	
44.0000	0.000	

END

06C01 Falling Head

NSWC Crane / 7651



00142

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C01 FALLING HEAD TEST			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 40.0$ ft

$T_0 = 4.0$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(40.0\ \text{ft} / 0.16\ \text{ft})}{2(40.0\ \text{ft})(4.0\ \text{min})}$$

$K = 1.19 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 1.72 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 6.05 \times 10^{-5}$ cm/sec

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: D6C01

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 40.0' TEST NO.: T1450

STATIC WATER LEVEL (Depth/Elevation): 179.40' TPVC DATE:

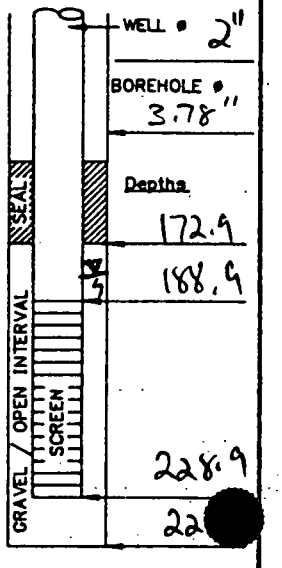
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ___ OF ___

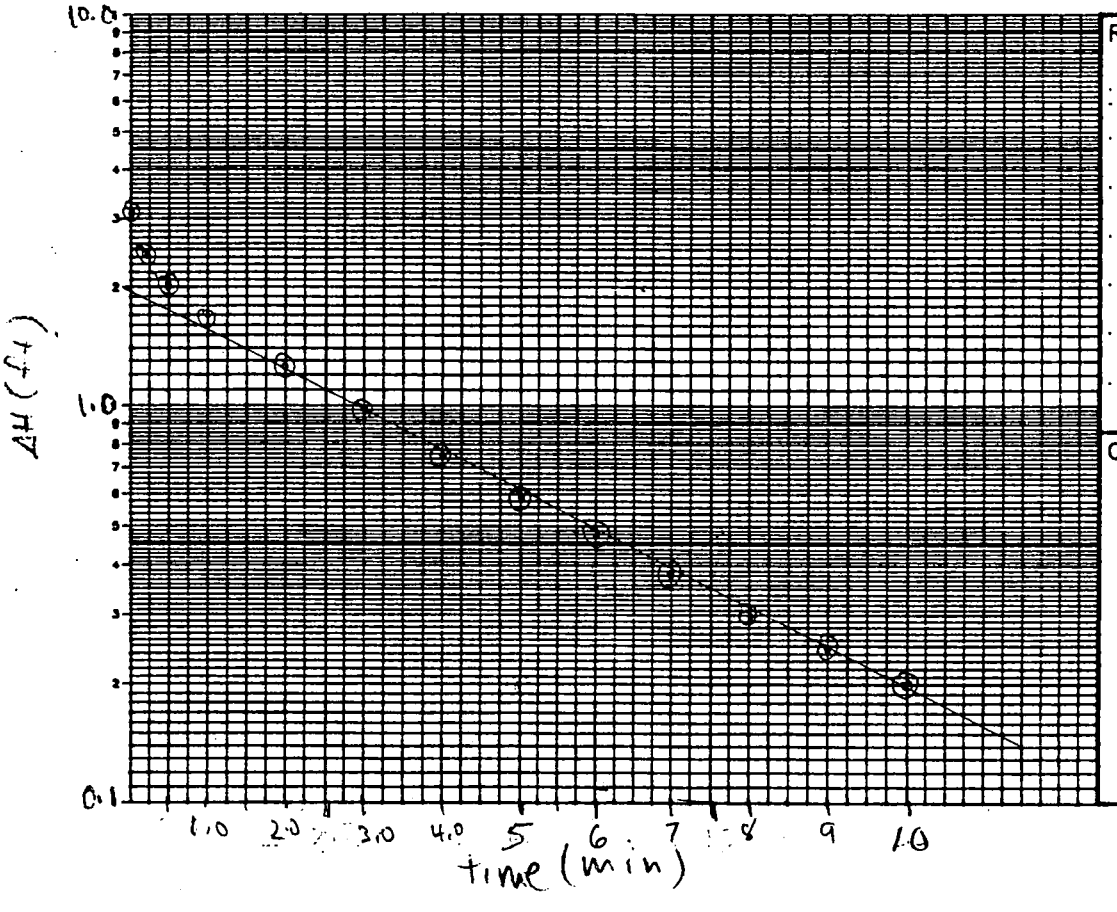
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.10			
0.05		2.82			
0.10		2.64			
0.20		2.42			
0.30		2.24			
0.50		2.03			
1.00		1.71			
3.00		0.97	2.00		1.26
5.00		0.54	4.00		0.75
7.00		0.38	6.00		0.48
10.00		0.20	8.00		0.30
14.00		0.11	9.00		0.25

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 143

XD S/N 203120 50 psi

H_2O above XD = 48.20

Start @ 1612

Stop @ 1627

CALCS, SKETCH MAPS, ETC.:

file: 06C01rise.txt

SE1000C
Environmental Logger
03/10 19:06

Unit# 00143 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60100
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well #06C01
Rising Head Test
File: Ø6CØ1RSE.TXT

Step 0 03/10 16:12:13

Elapsed Time	INPUT 1	H/H₀
0.0000	0.000	
0.0033	2.837	
0.0066	5.930	
0.0100	1.490	
0.0133	3.109 ←	1.00
0.0166	3.013	
0.0200	2.949	
0.0233	2.997	
0.0266	2.965	
0.0300	2.869	
0.0333	2.949	
0.0366	2.865	
0.0400	2.901	
0.0433	2.853	
0.0466	2.805	0.90
0.0500	2.821	
0.0533	2.821	
0.0566	2.789	
0.0600	2.789	
0.0633	2.773	
0.0666	2.757	
0.0700	2.741	
0.0733	2.741	
0.0766	2.725	
0.0800	2.708	
0.0833	2.708	
0.0866	2.693	
0.0900	2.693	
0.0933	2.676	
0.0966	2.661	
0.1000	2.645	0.85
0.1033	2.645	
0.1066	2.629	
0.1100	2.629	
0.1133	2.613	
0.1166	2.613	
0.1200	2.597	

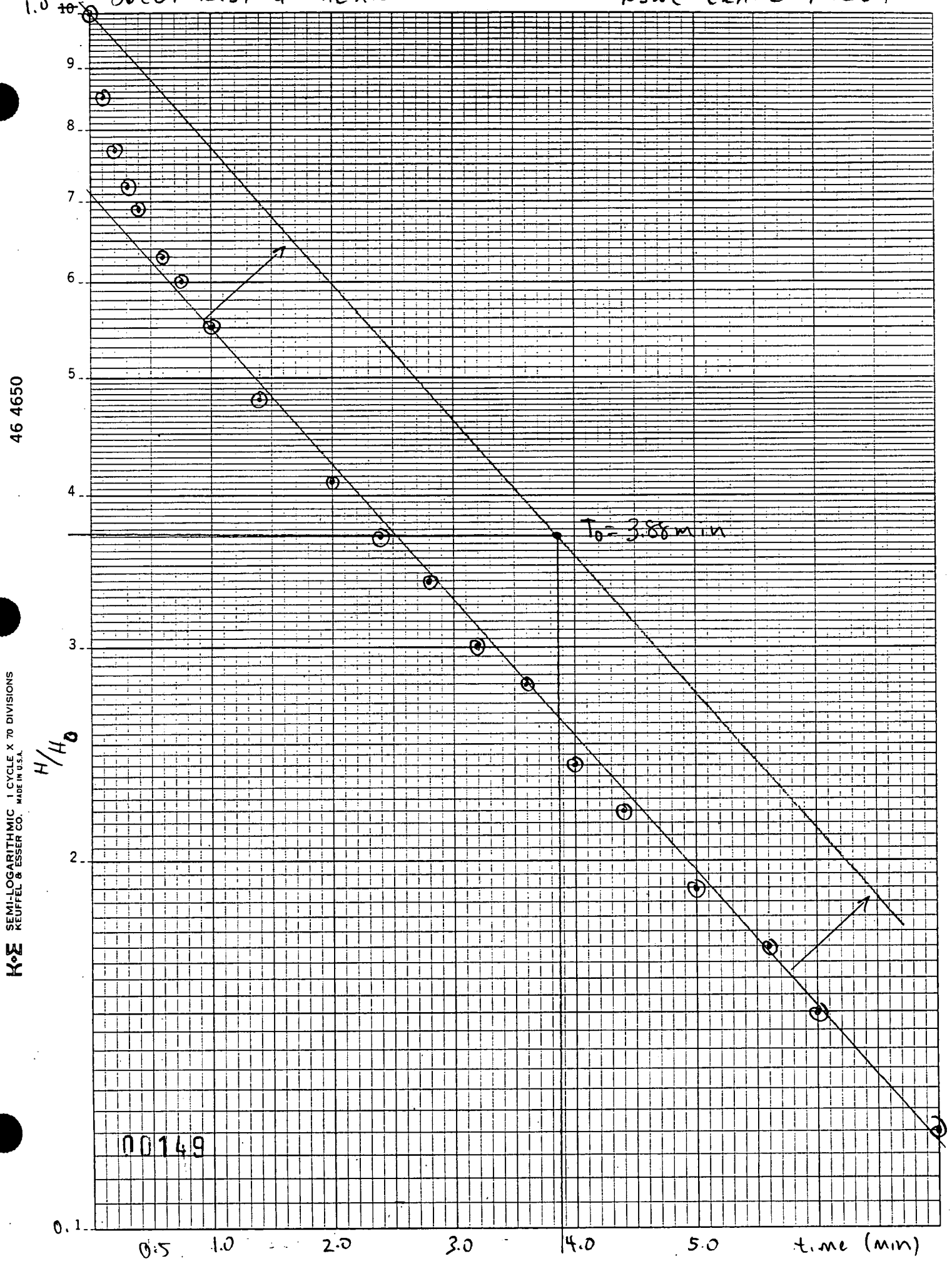
0.1233	2.597	
0.1266	2.580	
0.1300	2.564	
0.1333	2.564	
0.1366	2.564	
0.1400	2.548	
0.1433	2.548	
0.1466	2.532	
0.1500	2.532	
0.1533	2.516	
0.1566	2.500	0.80
0.1600	2.500	
0.1633	2.484	
0.1666	2.484	
0.1700	2.484	
0.1733	2.468	
0.1766	2.468	
0.1800	2.452	
0.1833	2.452	
0.1866	2.436	
0.1900	2.436	
0.1933	2.420	
0.1966	2.420	
0.2000	2.420	0.78
0.2033	2.404	
0.2066	2.388	
0.2100	2.388	
0.2133	2.388	
0.2166	2.388	
0.2200	2.372	
0.2233	2.372	
0.2266	2.356	
0.2300	2.356	
0.2333	2.356	
0.2366	2.356	
0.2400	2.340	0.75
0.2433	2.340	
0.2466	2.324	
0.2500	2.324	
0.2533	2.324	
0.2566	2.324	
0.2600	2.308	
0.2633	2.308	
0.2666	2.292	
0.2700	2.292	
0.2733	2.292	
0.2766	2.292	
0.2800	2.292	
0.2833	2.276	
0.2866	2.276	
0.2900	2.276	
0.2933	2.260	
0.2966	2.260	
0.3000	2.244	0.72
0.3033	2.244	
0.3066	2.244	
0.3100	2.244	
0.3133	2.228	
0.3166	2.228	
0.3200	2.228	

0.3233	2.228	
0.3266	2.212	
0.3300	2.212	
0.3333	2.212	
0.3500	2.196	
0.3666	2.180	
0.3833	2.148	
0.4000	2.132	0.69
0.4166	2.115	
0.4333	2.100	
0.4500	2.084	
0.4666	2.068	
0.4833	2.051	
0.5000	2.035	
0.5166	2.019	
0.5333	2.003	
0.5500	2.003	
0.5666	1.987	
0.5833	1.971	
0.6000	1.955	0.63
0.6166	1.955	
0.6333	1.939	
0.6500	1.924	
0.6666	1.907	
0.6833	1.907	
0.7000	1.891	
0.7166	1.875	
0.7333	1.875	
0.7500	1.859	0.60
0.7666	1.843	
0.7833	1.843	
0.8000	1.827	0.59
0.8166	1.811	
0.8333	1.811	
0.8500	1.811	
0.8666	1.795	
0.8833	1.779	
0.9000	1.779	0.57
0.9166	1.763	
0.9333	1.763	
0.9500	1.747	
0.9666	1.747	
0.9833	1.731	
1.0000	1.715	0.55
1.2000	1.603	
1.4000	1.506	0.48
1.6000	1.426	
1.8000	1.346	
2.0000	1.266	0.41
2.2000	1.202	
2.4000	1.154	0.37
2.6000	1.090	
2.8000	1.042	0.34
3.0000	0.977	
3.2000	0.929	0.30
3.4000	0.881	
3.6000	0.849	0.27
3.8000	0.801	
4.0000	0.753	0.24
4.2000	0.721	

4.4000	0.689	0.22
4.6000	0.657	
4.8000	0.625	
5.0000	0.593	0.19
5.2000	0.577	
5.4000	0.545	
5.6000	0.529	0.17
5.8000	0.497	
6.0000	0.481	0.15
6.2000	0.448	
6.4000	0.432	
6.6000	0.416	
6.8000	0.400	
7.0000	0.384	0.12
7.2000	0.368	
7.4000	0.352	
7.6000	0.336	
7.8000	0.320	0.10
8.0000	0.304	
8.2000	0.288	
8.4000	0.288	
8.6000	0.272	
8.8000	0.272	
9.0000	0.256	0.08
9.2000	0.240	
9.4000	0.240	
9.6000	0.224	
9.8000	0.224	
10.0000	0.208	0.07
12.0000	0.144	
14.0000	0.112	

END

06C01 RISING HEAD NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC Crane	JOB NUMBER	7651
SUBJECT	06 C01 Rising Head Test		
BASED ON	Hvorslev (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	RMB
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 40.0$ ft

$T_0 = 3.88$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(40.0 \text{ ft} / 0.16 \text{ ft})}{2(40.0 \text{ ft})(3.88 \text{ min})}$$

$K = 1.23 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 1.76 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

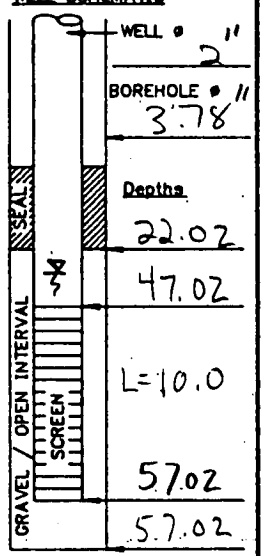
$= 6.22 \times 10^{-5}$ cm/sec

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

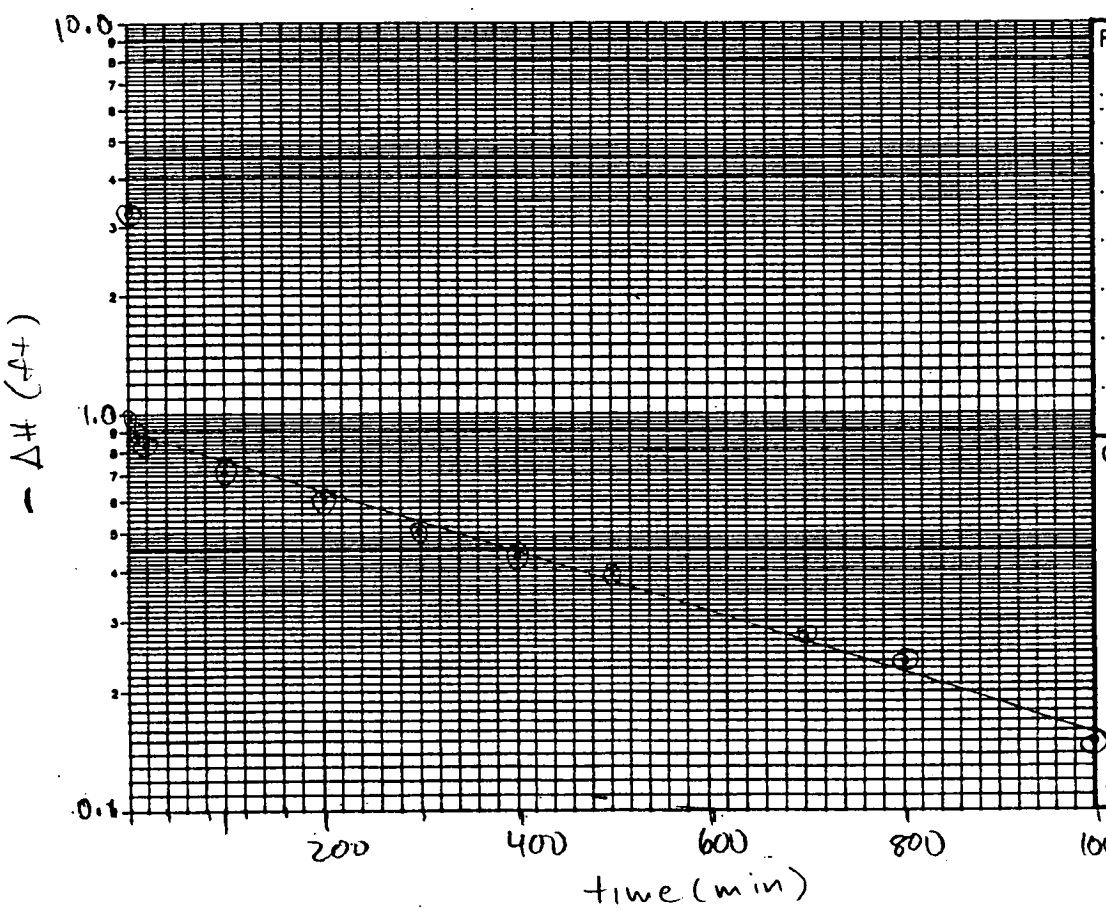
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C01P3
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0 TEST NO.: T1450
STATIC WATER LEVEL (Depth/Elevation): 44.18' TPVC DATE: 3/10/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		-3.33	10.0		-0.89
0.10		-1.89	20.0		-0.84
0.20		-1.50	40.0		-0.79
0.40		-1.33	60.0		-0.76
0.60		-1.29	100.0		-0.71
0.80		-1.26	200.0		-0.60
1.00		-1.23	300.0		-0.50
1.60		-1.16	400.0 500.0		-0.43 -0.37
2.00		-1.12	700.0		-0.27
2.60		-1.07	800.0		-0.24
3.00		-1.05	1000.0		-0.15
5.00		-0.97			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD # 203210 10psi
H_2O above XD = 11.76
Start @ 1417
Stop @ 1042 (3/11)

CALCS, SKETCH MAPS, ETC.:
File: 06C01P3fall.txt

00151

SE1000C
Environmental Logger
03/12 13:50

Unit# 00145 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60103
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06C01P3
Falling Head test
Ø6CØ1P3FALL.TXT

Step 0 03/10 14:17:02

Elapsed Time	INPUT 1		H/H₀
0.0000	-0.068		
0.0033	-0.365		
0.0066	-1.403		
0.0100	-2.487		
0.0133	-3.016		
0.0166	-2.975		
0.0200	-3.335		
0.0233	-2.641		
0.0266	-3.282		
0.0300	-3.332	←	
0.0333	-2.803		
0.0366	-2.300		
0.0400	-2.331		
0.0433	-2.268		
0.0466	-2.175		
0.0500	-1.368		
0.0533	-2.287		
0.0566	-2.586		
0.0600	-2.284		
0.0633	-2.159	← H_0	1.00
0.0666	-2.150		
0.0700	-2.125		
0.0733	-2.097		
0.0766	-2.065		
0.0800	-2.040		
0.0833	-2.015		
0.0866	-1.990		
0.0900	-1.965		
0.0933	-1.940		
0.0966	-1.918		
0.1000	-1.893		0.88
0.1033	-1.872		
0.1066	-1.853		
0.1100	-1.834		
0.1133	-1.815		
0.1166	-1.796		
0.1200	-1.778		

00152

0.1233	-1.787	
0.1266	-1.943	
0.1300	-1.646	
0.1333	-1.831	
0.1366	-1.596	
0.1400	-1.696	
0.1433	-1.668	
0.1466	-1.675	
0.1500	-1.650	0.74
0.1533	-1.584	
0.1566	-1.593	
0.1600	-1.662	
0.1633	-1.599	
0.1666	-1.590	
0.1700	-1.578	
0.1733	-1.568	
0.1766	-1.559	
0.1800	-1.499	
0.1833	-1.543	
0.1866	-1.537	
0.1900	-1.534	
0.1933	-1.518	
0.1966	-1.512	
0.2000	-1.506	0.70
0.2033	-1.499	
0.2066	-1.490	
0.2100	-1.487	
0.2133	-1.481	
0.2166	-1.474	
0.2200	-1.468	
0.2233	-1.462	
0.2266	-1.462	
0.2300	-1.443	
0.2333	-1.446	
0.2366	-1.443	
0.2400	-1.440	
0.2433	-1.440	
0.2466	-1.434	
0.2500	-1.428	
0.2533	-1.424	
0.2566	-1.421	
0.2600	-1.418	
0.2633	-1.415	
0.2666	-1.409	0.65
0.2700	-1.412	
0.2733	-1.387	
0.2766	-1.399	
0.2800	-1.396	
0.2833	-1.403	
0.2866	-1.381	
0.2900	-1.390	
0.2933	-1.384	
0.2966	-1.384	
0.3000	-1.378	
0.3033	-1.378	
0.3066	-1.378	
0.3100	-1.374	
0.3133	-1.374	
0.3166	-1.371	
0.3200	-1.368	

0.3233	-1.368	
0.3266	-1.368	
0.3300	-1.365	
0.3333	-1.362	
0.3500	-1.356	
0.3666	-1.346	
0.3833	-1.343	
0.4000	-1.337	
0.4166	-1.331	
0.4333	-1.328	
0.4500	-1.324	
0.4666	-1.318	
0.4833	-1.312	
0.5000	-1.312	
0.5166	-1.309	
0.5333	-1.306	
0.5500	-1.300	
0.5666	-1.300	
0.5833	-1.296	
0.6000	-1.293	
0.6166	-1.290	
0.6333	-1.287	
0.6500	-1.287	
0.6666	-1.281	
0.6833	-1.281	
0.7000	-1.281	
0.7166	-1.275	
0.7333	-1.271	
0.7500	-1.271	
0.7666	-1.268	
0.7833	-1.265	
0.8000	-1.262	
0.8166	-1.259	
0.8333	-1.259	
0.8500	-1.256	
0.8666	-1.253	
0.8833	-1.253	
0.9000	-1.253	
0.9166	-1.246	
0.9333	-1.246	
0.9500	-1.243	
0.9666	-1.240	
0.9833	-1.240	
1.0000	-1.237	
1.2000	-1.203	
1.4000	-1.184	0.55
1.6000	-1.162	
1.8000	-1.140	
2.0000	-1.124	
2.2000	-1.106	
2.4000	-1.093	
2.6000	-1.078	0.50
2.8000	-1.062	
3.0000	-1.053	
3.2000	-1.037	
3.4000	-1.031	
3.6000	-1.018	
3.8000	-1.012	
4.0000	-1.003	
4.2000	-0.993	

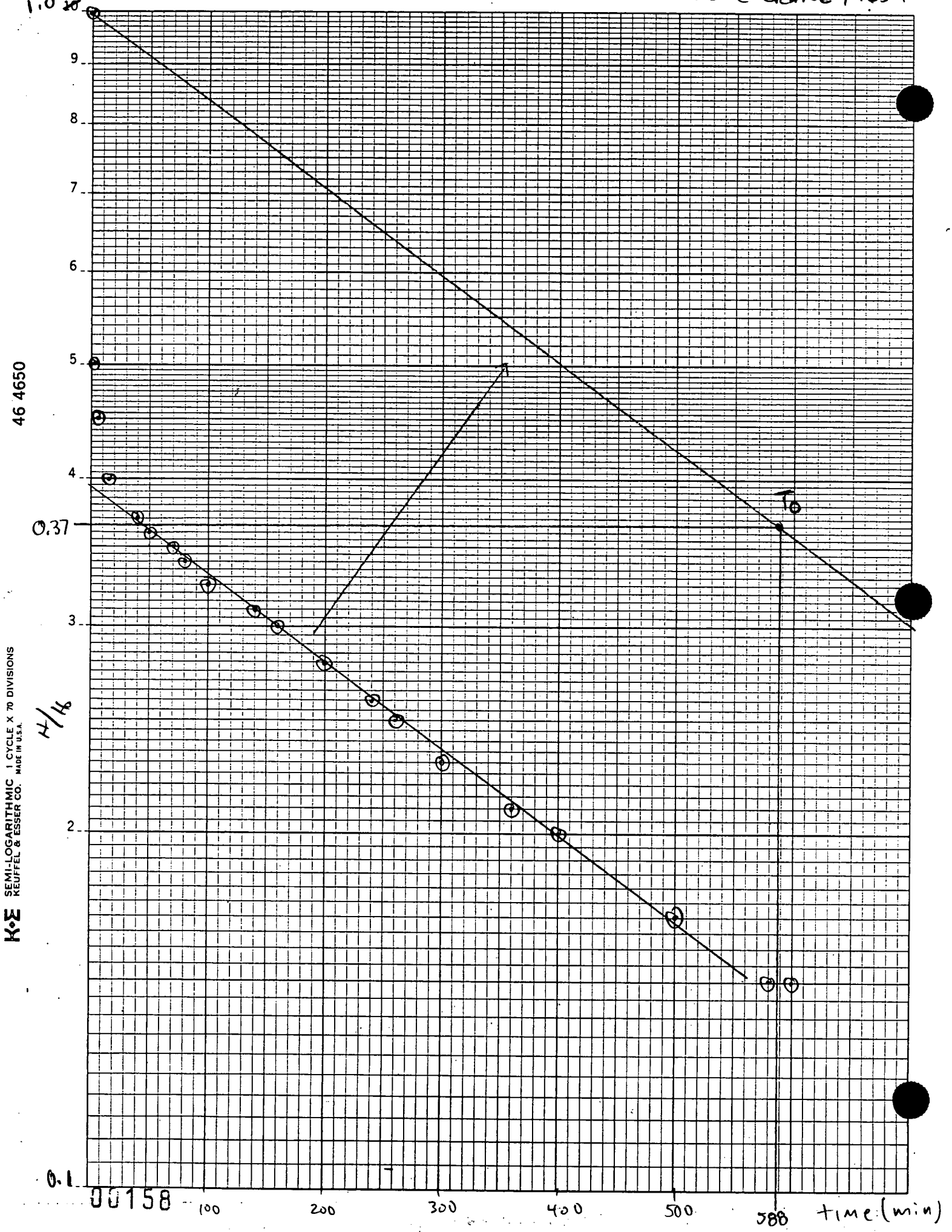
4.4000	-0.987	
4.6000	-0.981	0.45
4.8000	-0.976	
5.0000	-0.971	
5.2000	-0.965	
5.4000	-0.959	
5.6000	-0.953	
5.8000	-0.949	
6.0000	-0.943	
6.2000	-0.940	
6.4000	-0.937	
6.6000	-0.931	
6.8000	-0.931	
7.0000	-0.928	
7.2000	-0.921	
7.4000	-0.921	
7.6000	-0.918	
7.8000	-0.915	
8.0000	-0.915	
8.2000	-0.912	
8.4000	-0.912	
8.6000	-0.909	
8.8000	-0.903	
9.0000	-0.903	
9.2000	-0.899	
9.4000	-0.899	
9.6000	-0.896	
9.8000	-0.896	
10.0000	-0.893	
12.0000	-0.878	
14.0000	-0.868	0.40
16.0000	-0.859	
18.0000	-0.853	
20.0000	-0.846	
22.0000	-0.843	
24.0000	-0.837	
26.0000	-0.824	
28.0000	-0.821	
30.0000	-0.821	
32.0000	-0.821	
34.0000	-0.812	
36.0000	-0.806	
38.0000	-0.799	
40.0000	-0.796	0.37
42.0000	-0.793	
44.0000	-0.793	
46.0000	-0.787	
48.0000	-0.793	
50.0000	-0.781	0.36
52.0000	-0.781	
54.0000	-0.774	
56.0000	-0.771	
58.0000	-0.771	
60.0000	-0.768	
62.0000	-0.765	
64.0000	-0.765	
66.0000	-0.765	
68.0000	-0.762	
70.0000	-0.756	0.35
72.0000	-0.753	

74.0000	-0.749	
76.0000	-0.746	
78.0000	-0.740	
80.0000	-0.737	0.34
82.0000	-0.737	
84.0000	-0.734	
86.0000	-0.731	
88.0000	-0.728	
90.0000	-0.724	
92.0000	-0.724	
94.0000	-0.721	
96.0000	-0.721	
98.0000	-0.715	
100.000	-0.715	0.33
120.000	-0.693	
140.000	-0.668	0.31
160.000	-0.643	0.30
180.000	-0.621	
200.000	-0.603	0.28
220.000	-0.578	
240.000	-0.562	0.26
260.000	-0.543	0.25
280.000	-0.521	
300.000	-0.503	0.23
320.000	-0.490	
340.000	-0.474	
360.000	-0.453	0.21
380.000	-0.443	
400.000	-0.437	0.20
420.000	-0.424	
440.000	-0.409	
460.000	-0.403	
480.000	-0.387	
500.000	-0.371	0.17
520.000	-0.359	
540.000	-0.353	
560.000	-0.337	
580.000	-0.334	0.15
600.000	-0.324	0.15
620.000	-0.312	
640.000	-0.306	
660.000	-0.293	
680.000	-0.287	
700.000	-0.274	
720.000	-0.265	
740.000	-0.262	
760.000	-0.256	
780.000	-0.256	
800.000	-0.249	
820.000	-0.234	
840.000	-0.228	
860.000	-0.231	
880.000	-0.212	
900.000	-0.199	
920.000	-0.193	
940.000	-0.187	
960.000	-0.178	
980.000	-0.165	
1000.00	-0.159	
1200.00	-0.078	

END

06C01P3 / FALLING HEAD

NSWC CRANE / 7651



00158

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C01P3 FALLING HEAD TEST			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 10.0$ ft

$T_0 = 588$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft} / 0.16 \text{ ft})}{2(10.0 \text{ ft})(588 \text{ min})}$$

$K = 2.42 \times 10^{-6}$ ft/min $\times$ 1440 min/day

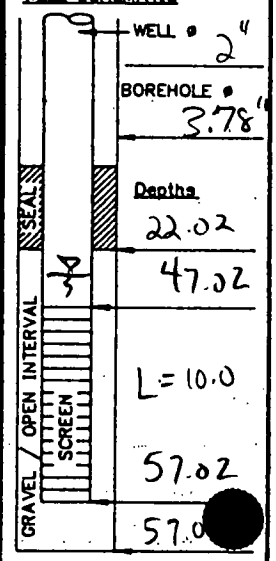
$K = 3.49 \times 10^{-3}$ ft/day $\times$ 1 cm/s / 2835 ft/day
$= 1.23 \times 10^{-6}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

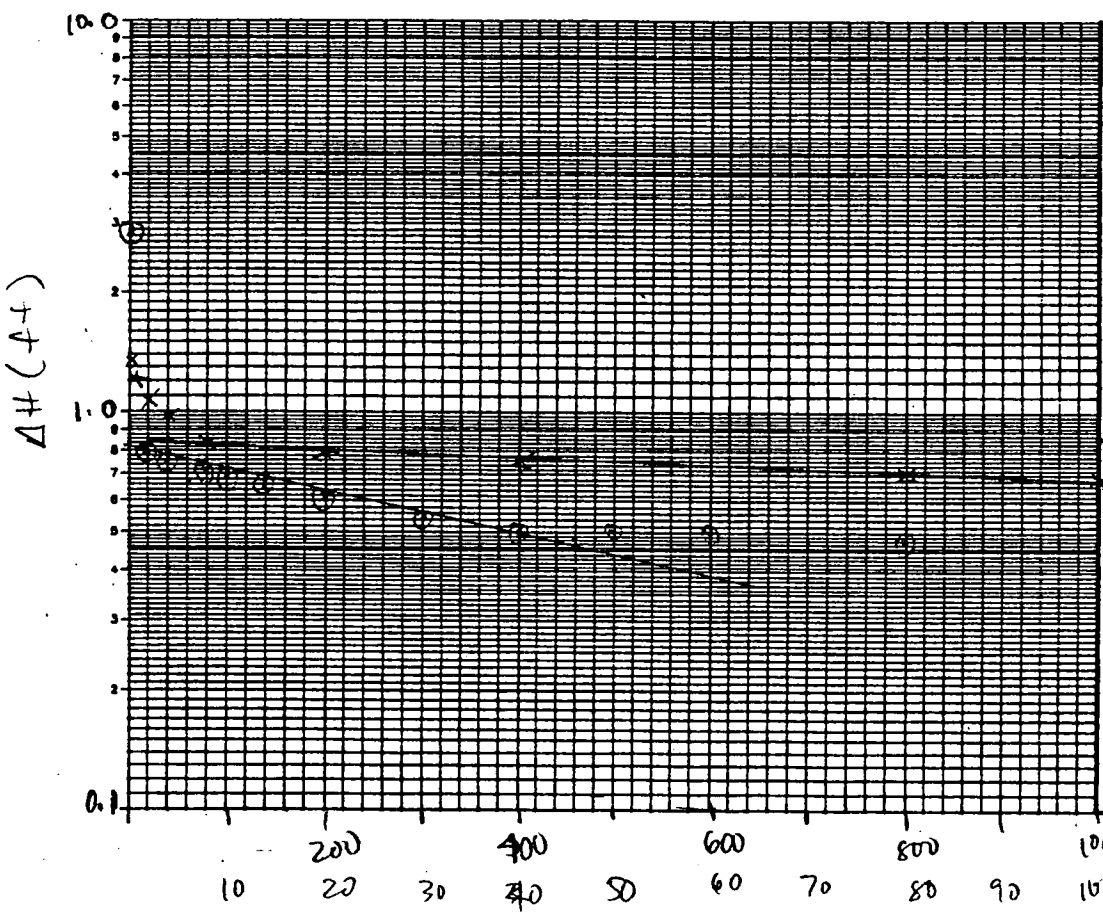
PROJECT NAME: NSWC Crane WELL/BORING NO.: 06C01P3
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1550
STATIC WATER LEVEL (Depth/Elevation): 44.01' TPVC DATE: 3/11/99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.88	40.00		0.76
0.20		1.50	80.00		0.71
0.40		1.35	100.00		0.69
0.60		1.29	140.00		0.66
0.80		1.24	200.00		0.61
1.00		1.21	300.00		0.55
2.00		1.09	400.00		0.52
4.00		0.96	500.00		0.51
6.00		0.89	600.00		0.50
8.00		0.85	800.00		0.48
10.00		0.84	1000.00		0.44
20.00		0.79	1200.00		0.45

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD # 203210 10psi
H_2O above XD = 11.83'

Start @ 1044
Stop @ 0852 (3/12)

CALCS, SKETCH MAPS, ETC.:
file: 06C01P3Rise.txt

0.1333
SE1000C
Environmental Logger
03/12 13:58

Unit# 00145 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60103
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well #06C01P3
Rising Head Test
Ø6CØ1P3RISE.TXT

Step 0 03/11 10:44:21

Elapsed Time	INPUT 1		H/H_0
0.0000	0.003		
0.0033	2.189		
0.0066	5.340		
0.0100	1.115		
0.0133	1.580		
0.0166	2.051		
0.0200	2.504		
0.0233	2.888	← H_0	1.00
0.0266	2.757		
0.0300	2.716		
0.0333	2.654		
0.0366	2.595		0.90
0.0400	2.541		
0.0433	2.495		
0.0466	2.451		
0.0500	2.401		
0.0533	2.357		
0.0566	2.317		0.80
0.0600	2.276		
0.0633	2.236		
0.0666	2.195		
0.0700	2.167		0.75
0.0733	2.129		
0.0766	2.095		
0.0800	2.067		
0.0833	2.033		
0.0866	2.008		
0.0900	1.973		
0.0933	1.951		
0.0966	1.926		
0.1000	1.698		
0.1033	1.873		
0.1066	1.855		
0.1100	1.827		
0.1133	1.805		
0.1166	1.783		
0.1200	1.770		

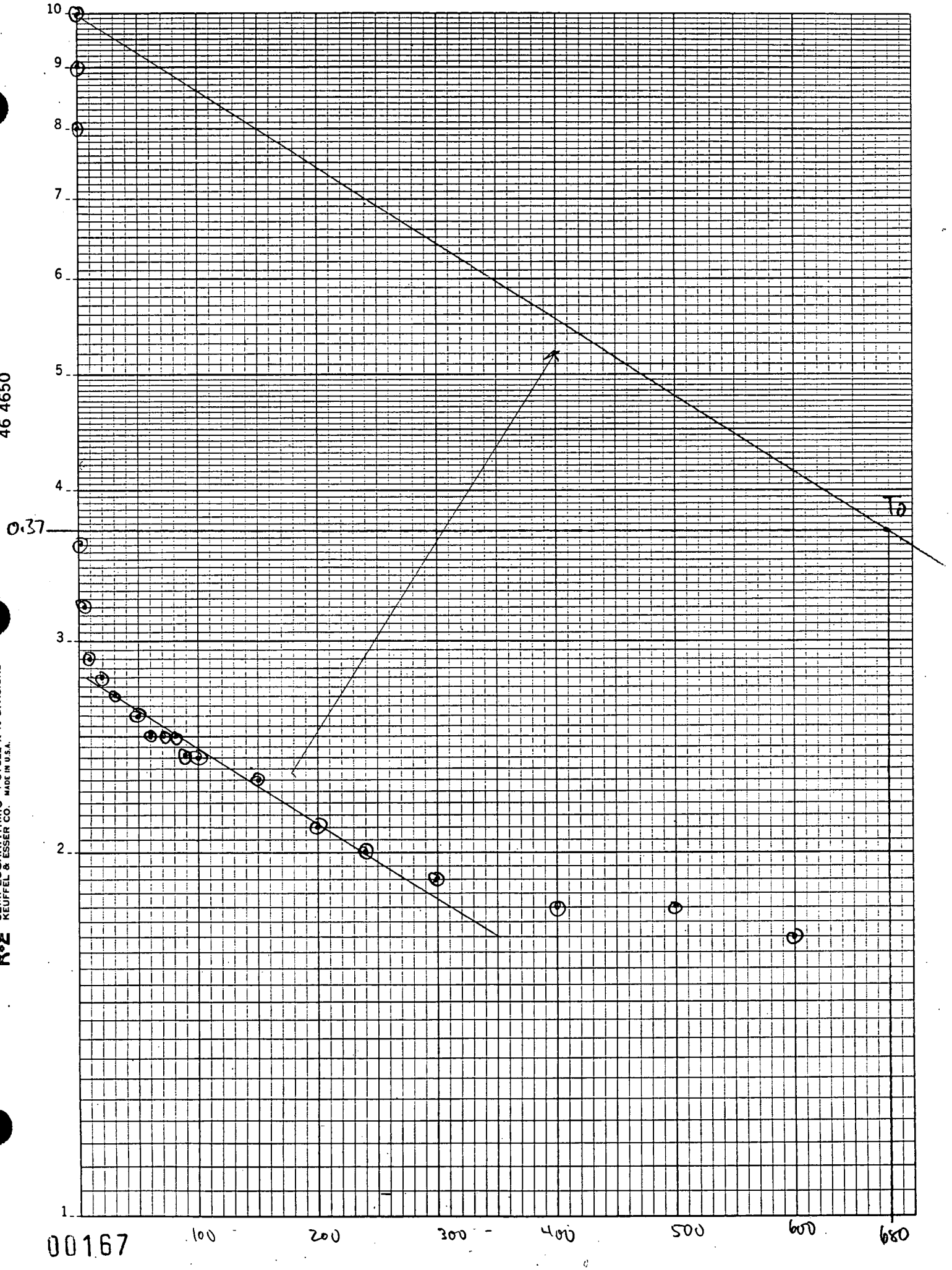
0.1233	1.752	
0.1266	1.736	0.60
0.1300	1.714	
0.1333	1.702	
0.1366	1.686	
0.1400	1.671	
0.1433	1.655	
0.1466	1.646	
0.1500	1.633	
0.1533	1.621	
0.1566	1.611	
0.1600	1.596	
0.1633	1.589	
0.1666	1.830	
0.1700	1.614	
0.1733	1.567	
0.1766	1.542	
0.1800	1.546	
0.1833	1.539	
0.1866	1.533	
0.1900	1.517	
0.1933	1.514	
0.1966	1.508	
0.2000	1.502	
0.2033	1.499	
0.2066	1.496	
0.2100	1.486	
0.2133	1.480	
0.2166	1.474	
0.2200	1.474	
0.2233	1.474	
0.2266	1.464	
0.2300	1.458	0.50
0.2333	1.458	
0.2366	1.449	
0.2400	1.449	
0.2433	1.443	
0.2466	1.443	
0.2500	1.436	
0.2533	1.436	
0.2566	1.433	
0.2600	1.427	
0.2633	1.427	
0.2666	1.424	
0.2700	1.421	
0.2733	1.418	
0.2766	1.418	
0.2800	1.414	
0.2833	1.411	
0.2866	1.411	
0.2900	1.411	
0.2933	1.408	
0.2966	1.408	
0.3000	1.402	
0.3033	1.402	
0.3066	1.399	
0.3100	1.396	
0.3133	1.393	
0.3166	1.389	
0.3200	1.389	

0.3233	1.389	
0.3266	1.383	
0.3300	1.383	
0.3333	1.383	
0.3500	1.374	
0.3666	1.368	
0.3833	1.358	
0.4000	1.355	
0.4166	1.336	
0.4333	1.346	
0.4500	1.340	
0.4666	1.330	
0.4833	1.324	
0.5000	1.324	
0.5166	1.315	
0.5333	1.308	
0.5500	1.302	
0.5666	1.296	
0.5833	1.296	
0.6000	1.293	
0.6166	1.290	
0.6333	1.286	
0.6500	1.283	
0.6666	1.274	
0.6833	1.271	
0.7000	1.268	
0.7166	1.261	
0.7333	1.258	
0.7500	1.255	
0.7666	1.255	
0.7833	1.249	
0.8000	1.243	
0.8166	1.246	
0.8333	1.243	
0.8500	1.243	
0.8666	1.240	
0.8833	1.227	
0.9000	1.230	
0.9166	1.227	
0.9333	1.227	
0.9500	1.221	
0.9666	1.218	
0.9833	1.215	
1.0000	1.211	0.42
1.2000	1.177	
1.4000	1.155	
1.6000	1.133	
1.8000	1.112	
2.0000	1.093	
2.2000	1.074	
2.4000	1.055	
2.6000	1.046	0.36
2.8000	1.027	
3.0000	1.015	0.35
3.2000	1.002	
3.4000	0.990	
3.6000	0.984	
3.8000	0.968	
4.0000	0.962	
4.2000	0.952	

4.4000	0.943	
4.6000	0.937	
4.8000	0.934	
5.0000	0.927	0.32
5.2000	0.918	
5.4000	0.915	
5.6000	0.905	
5.8000	0.899	
6.0000	0.893	
6.2000	0.887	
6.4000	0.884	
6.6000	0.880	
6.8000	0.877	
7.0000	0.874	0.30
7.2000	0.868	
7.4000	0.868	
7.6000	0.865	
7.8000	0.865	
8.0000	0.859	
8.2000	0.855	
8.4000	0.852	
8.6000	0.852	
8.8000	0.849	
9.0000	0.849	
9.2000	0.843	
9.4000	0.843	
9.6000	0.843	
9.8000	0.840	
10.0000	0.840	0.24
12.0000	0.827	
14.0000	0.818	
16.0000	0.809	
18.0000	0.802	
20.0000	0.799	0.28
22.0000	0.796	
24.0000	0.793	
26.0000	0.787	
28.0000	0.787	
30.0000	0.780	0.27
32.0000	0.780	
34.0000	0.771	
36.0000	0.768	
38.0000	0.762	
40.0000	0.762	0.26
42.0000	0.759	
44.0000	0.755	
46.0000	0.752	
48.0000	0.749	
50.0000	0.743	0.26
52.0000	0.746	
54.0000	0.737	
56.0000	0.737	
58.0000	0.737	
60.0000	0.734	0.25
62.0000	0.727	
64.0000	0.727	
66.0000	0.724	
68.0000	0.721	
70.0000	0.718	0.25-
72.0000	0.721	

74.0000	0.718	
76.0000	0.721	
78.0000	0.721	
80.0000	0.718	0.25
82.0000	0.715	
84.0000	0.712	
86.0000	0.712	
88.0000	0.706	
90.0000	0.706	0.24
92.0000	0.706	
94.0000	0.706	
96.0000	0.696	
98.0000	0.696	
100.000	0.699	0.24
120.000	0.681	
140.000	0.662	
160.000	0.643	
180.000	0.621	
200.000	0.612	
220.000	0.596	
240.000	0.587	0.20
260.000	0.574	
280.000	0.562	
300.000	0.552	0.19
320.000	0.552	
340.000	0.543	
360.000	0.537	
380.000	0.531	
400.000	0.527	0.18
420.000	0.521	
440.000	0.521	
460.000	0.518	
480.000	0.515	
500.000	0.515	0.18
520.000	0.512	
540.000	0.509	
560.000	0.506	
580.000	0.502	
600.000	0.502	0.17
620.000	0.499	
640.000	0.496	
660.000	0.496	
680.000	0.496	
700.000	0.496	
720.000	0.493	
740.000	0.490	
760.000	0.487	
780.000	0.484	
800.000	0.481	
820.000	0.471	
840.000	0.465	
860.000	0.462	
880.000	0.456	
900.000	0.456	
920.000	0.462	
940.000	0.462	
960.000	0.453	
980.000	0.446	0.15
1000.00	0.443	
1200.00	0.459	

END


10
9
8
7
6
5
4
0.37
3
2
1
100
200
300
400
500
600
680
To
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

00167

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C01P3 RISING HEAD TEST			
BASED ON HVORSLEV (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 10.0$ ft

$T_0 = 680$ min

$$k = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$k = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.16 \text{ ft})}{2(10.0 \text{ ft})(680 \text{ min})}$$

$k = 2.09 \times 10^{-6}$ ft/min $\times$ 1440 min/day

$k = 3.02 \times 10^{-3}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 1.06 \times 10^{-6}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C02

PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T450

STATIC WATER LEVEL (Depth/Elevation): 15.65' TOC DATE: 3/13/99

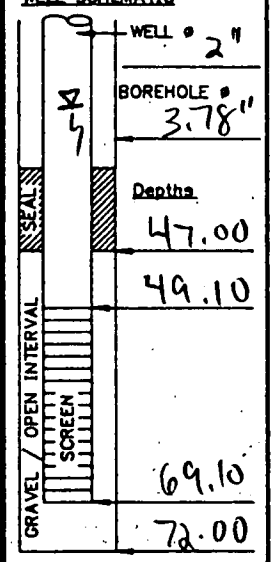
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF ...

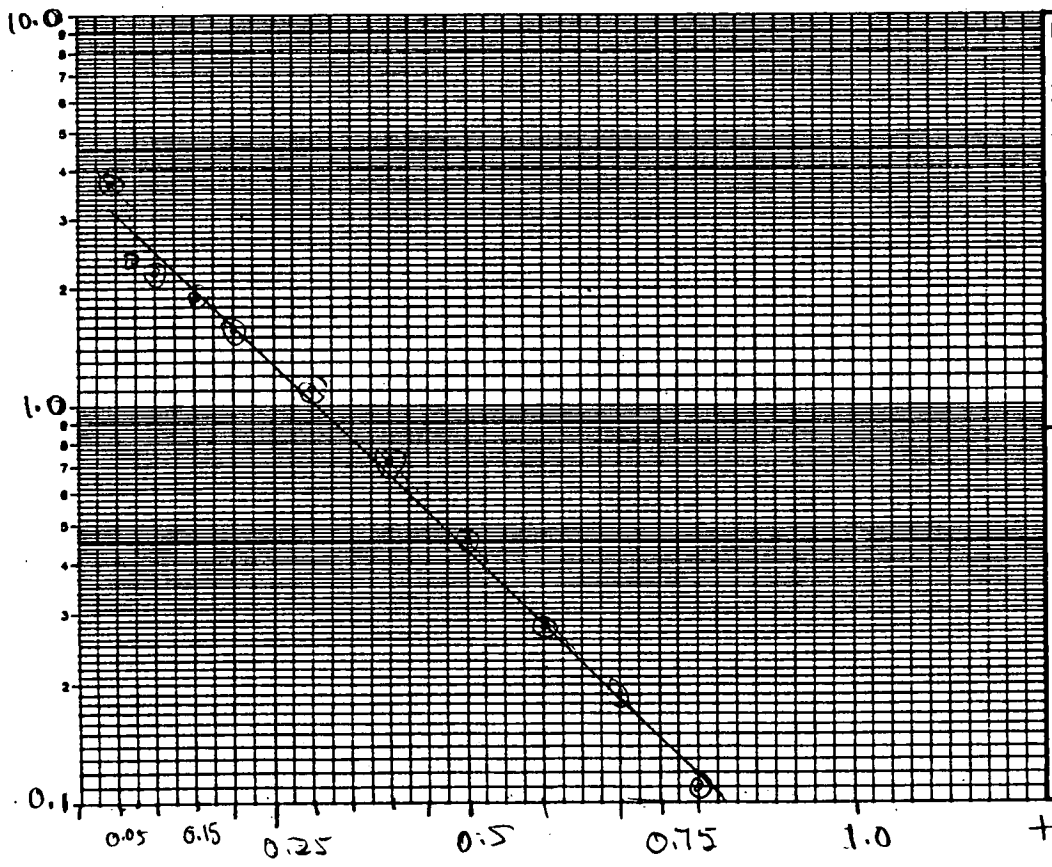
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		-3.82			
0.10		-2.20	0.07		-2.33
0.20		-1.56	0.15		-1.88
0.30		-1.10			
0.40		-0.72			
0.60		-0.28	0.50		-0.46
0.80		-0.11	0.70		-0.19

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

XD S/N 203120 50psi

H_2O above XD = 51.92

Start @ 0951

Stop @ 1003

CALCS, SKETCH MAPS, ETC.:

file: 06C02fall.txt

SE1000C
Environmental Logger
03/13 12:26

Unit# 00145 Test 4

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60020
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/13 09:50:37

Elapsed Time	INPUT 1
0.0000	-0.048
0.0033	-0.208
0.0066	-0.432
0.0100	-0.880
0.0133	-1.264
0.0166	-1.664
0.0200	-2.225
0.0233	-2.609
0.0266	-3.073
0.0300	-3.377
0.0333	-3.474
0.0366	-3.570
0.0400	-3.762
0.0433	-3.778
0.0466	-3.826 ←
0.0500	-3.634
0.0533	-3.442
0.0566	-3.233
0.0600	-3.073
0.0633	-2.833
0.0666	-2.609
0.0700	-2.337
0.0733	-2.145
0.0766	-2.016
0.0800	-2.129
0.0833	-2.305
0.0866	-2.305
0.0900	-2.305
0.0933	-2.273
0.0966	-2.225
0.1000	-2.209
0.1033	-2.209
0.1066	-2.193
0.1100	-2.145
0.1133	-2.129
0.1166	-2.097
0.1200	-2.081

Well # 06C02
Falling Head Test
file: 06C02FALL.Txt

H/H_0	t
1.00	0.000
0.96	0.0200

00170

0.1233	-2.033	0.88	0.0400
0.1266	-2.049		
0.1300	-2.016		
0.1333	-1.985		
0.1366	-1.969		
0.1400	-1.937		
0.1433	-1.937		
0.1466	-1.904		
0.1500	-1.888		
0.1533	-1.857		
0.1566	-1.841		
0.1600	-1.809		
0.1633	-1.809	0.78	0.0800
0.1666	-1.776		
0.1700	-1.760		
0.1733	-1.729		
0.1766	-1.713		
0.1800	-1.697		
0.1833	-1.681	0.73	0.1000
0.1866	-1.648		
0.1900	-1.632		
0.1933	-1.600		
0.1966	-1.600		
0.2000	-1.569		
0.2033	-1.552	0.67	0.1200
0.2066	-1.552		
0.2100	-1.520		
0.2133	-1.504		
0.2166	-1.488		
0.2200	-1.456		
0.2233	-1.456	0.63	0.1400
0.2266	-1.424		
0.2300	-1.424		
0.2333	-1.408	0.61	0.1500
0.2366	-1.376		
0.2400	-1.376		
0.2433	-1.344	0.58	0.1600
0.2466	-1.328		
0.2500	-1.328		
0.2533	-1.296		
0.2566	-1.280		
0.2600	-1.264		
0.2633	-1.264	0.55	0.1800
0.2666	-1.232		
0.2700	-1.216		
0.2733	-1.200		
0.2766	-1.184		
0.2800	-1.168		
0.2833	-1.184	0.51	0.2000
0.2866	-1.152		
0.2900	-1.136		
0.2933	-1.120		
0.2966	-1.088		
0.3000	-1.104		
0.3033	-1.056		
0.3066	-1.072		
0.3100	-1.040		
0.3133	-1.040		
0.3166	-1.024		
0.3200	-1.008		

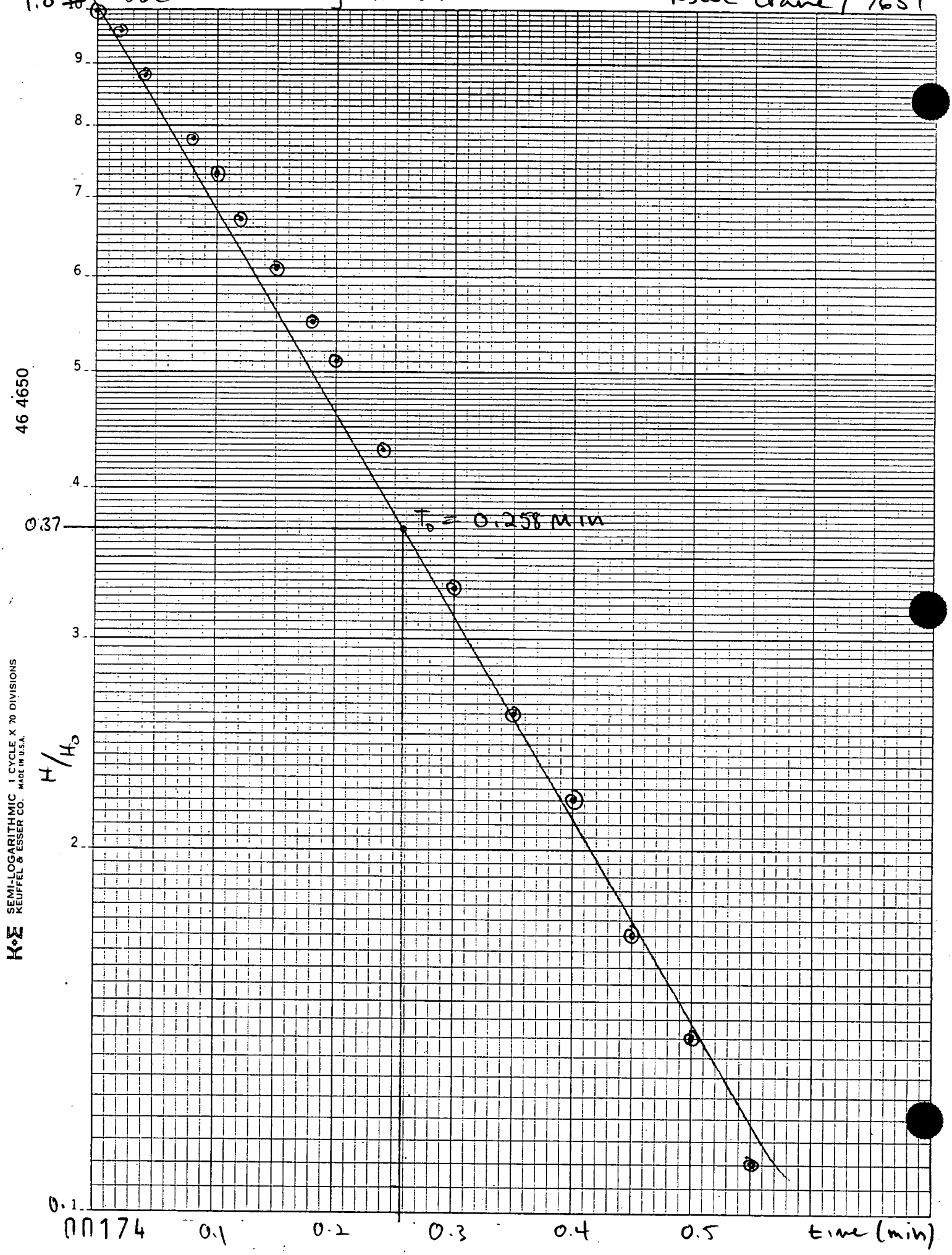
0.3233	-0.992	0.43	0.2400
0.3266	-0.976		
0.3300	-0.960		
0.3333	-0.960		
0.3500	-0.896		
0.3666	-0.832		
0.3833	-0.768	0.33	0.3000
0.4000	-0.720		
0.4166	-0.656		
0.4333	-0.608	0.26	0.3500
0.4500	-0.576		
0.4666	-0.528		
0.4833	-0.496	0.22	0.4000
0.5000	-0.464		
0.5166	-0.432		
0.5333	-0.400	0.17	0.4500
0.5500	-0.352		
0.5666	-0.336		
0.5833	-0.320	0.14	0.5000
0.6000	-0.288		
0.6166	-0.271		
0.6333	-0.256	0.11	0.5500
0.6500	-0.224		
0.6666	-0.224		
0.6833	-0.192		
0.7000	-0.192		
0.7166	-0.192		
0.7333	-0.143		
0.7500	-0.160		
0.7666	-0.128		
0.7833	-0.112		
0.8000	-0.112		
0.8166	-0.112		
0.8333	-0.095		
0.8500	-0.080		
0.8666	-0.080		
0.8833	-0.080		
0.9000	-0.064		
0.9166	-0.064		
0.9333	-0.064		
0.9500	-0.064		
0.9666	-0.048		
0.9833	-0.064		
1.0000	-0.048		
1.2000	-0.015		
1.4000	-0.015		
1.6000	-0.015		
1.8000	-0.015		
2.0000	-0.031		
2.2000	0.000		
2.4000	-0.015		
2.6000	-0.015		
2.8000	-0.031		
3.0000	-0.015		
3.2000	-0.015		
3.4000	-0.015		
3.6000	-0.015		
3.8000	-0.015		
4.0000	-0.015		
4.2000	-0.015		

4.4000	-0.015
4.6000	-0.015
4.8000	-0.015
5.0000	-0.015
5.2000	-0.015
5.4000	-0.015
5.6000	-0.015
5.8000	-0.015
6.0000	-0.015
6.2000	-0.015
6.4000	0.000
6.6000	-0.015
6.8000	-0.015
7.0000	0.000
7.2000	-0.015
7.4000	-0.015
7.6000	-0.015
7.8000	-0.015
8.0000	-0.015
8.2000	-0.015
8.4000	-0.015
8.6000	0.000
8.8000	-0.015
9.0000	-0.015
9.2000	-0.015
9.4000	0.000
9.6000	0.000
9.8000	-0.015
10.0000	0.000
12.0000	-0.015

END

06C02 Falling Head

NSWC Crane / 7651



ΠΠ174

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C02 Falling Head Test			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_o = 0.258$ min

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

$$K = \frac{(0.083\text{ ft})^2 \ln(20.0\text{ ft}/0.16\text{ ft})}{2(20.0\text{ ft})(0.258\text{ min})}$$

$K = 3.23 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 4.66 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

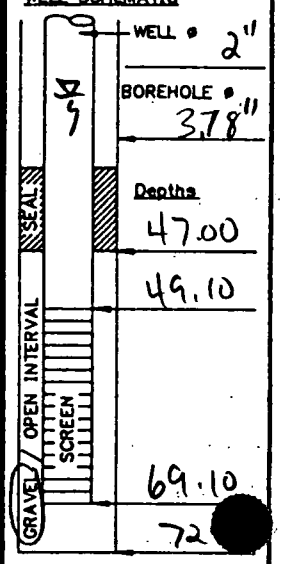
$= 1.64 \times 10^{-3}$ cm/sec

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

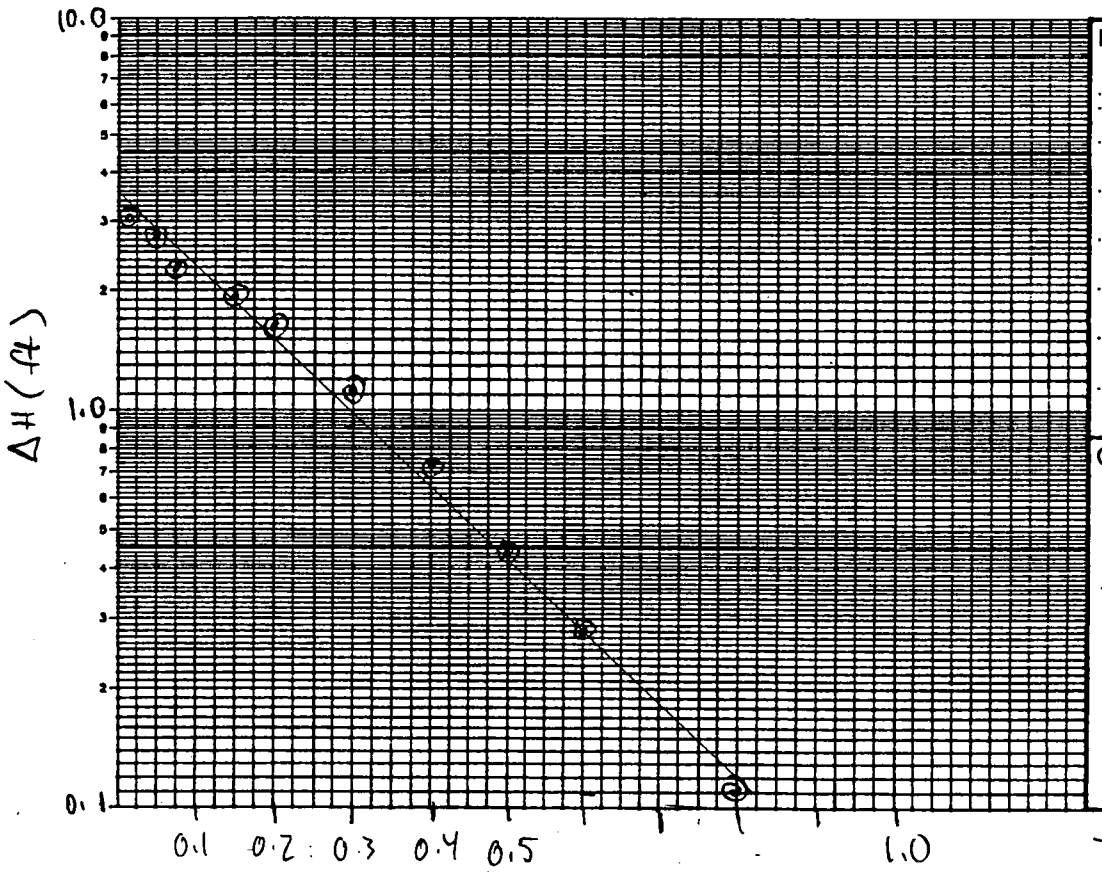
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C02
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: TSSØ
STATIC WATER LEVEL (Depth/Elevation): 15.65' TPVC DATE: 3/13/99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		3.07	0.60		0.28
0.05		2.75	0.70		0.17
0.10		2.30	0.80		0.11
0.15		1.93	1.00		0.04
0.20		1.61			
0.25		1.34			
0.30		1.12			
0.35		0.91			
0.40		0.73			
0.45		0.57			
0.50		0.44			
0.55		0.35			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD = 51.92'
Start @ 1005
Stop @ 1016

CALCS, SKETCH MAPS, ETC.:
File: 06C02Rise.txt

SE1000C
Environmental Logger
03/13 12:29

Unit# 00145 Test 5

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60020
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/13 10:05:02

Well # 06C02
Rising Head test
file: Ø6CØ2RISE.TXT

Elapsed Time	INPUT 1		H/H_0	t
0.0000	0.000			
0.0033	1.120			
0.0066	1.296			
0.0100	1.616			
0.0133	1.616			
0.0166	2.241			
0.0200	2.673			
0.0233	3.073	← H_0	1.00	0.0000
0.0266	3.025			
0.0300	2.961			
0.0333	2.913			
0.0366	2.881			
0.0400	2.929			
0.0433	2.833		0.92	0.0200
0.0466	2.817			
0.0500	2.753			
0.0533	2.705			
0.0566	2.641			
0.0600	2.689			
0.0633	2.625		0.85	0.0400
0.0666	2.577			
0.0700	2.545			
0.0733	2.529			
0.0766	2.497			
0.0800	2.465			
0.0833	2.449		0.80	0.0600
0.0866	2.433			
0.0900	2.385			
0.0933	2.353			
0.0966	2.337			
0.1000	2.305			
0.1033	2.305		0.75	0.0800
0.1066	2.289			
0.1100	2.241			
0.1133	2.209			
0.1166	2.193			
0.1200	2.145			

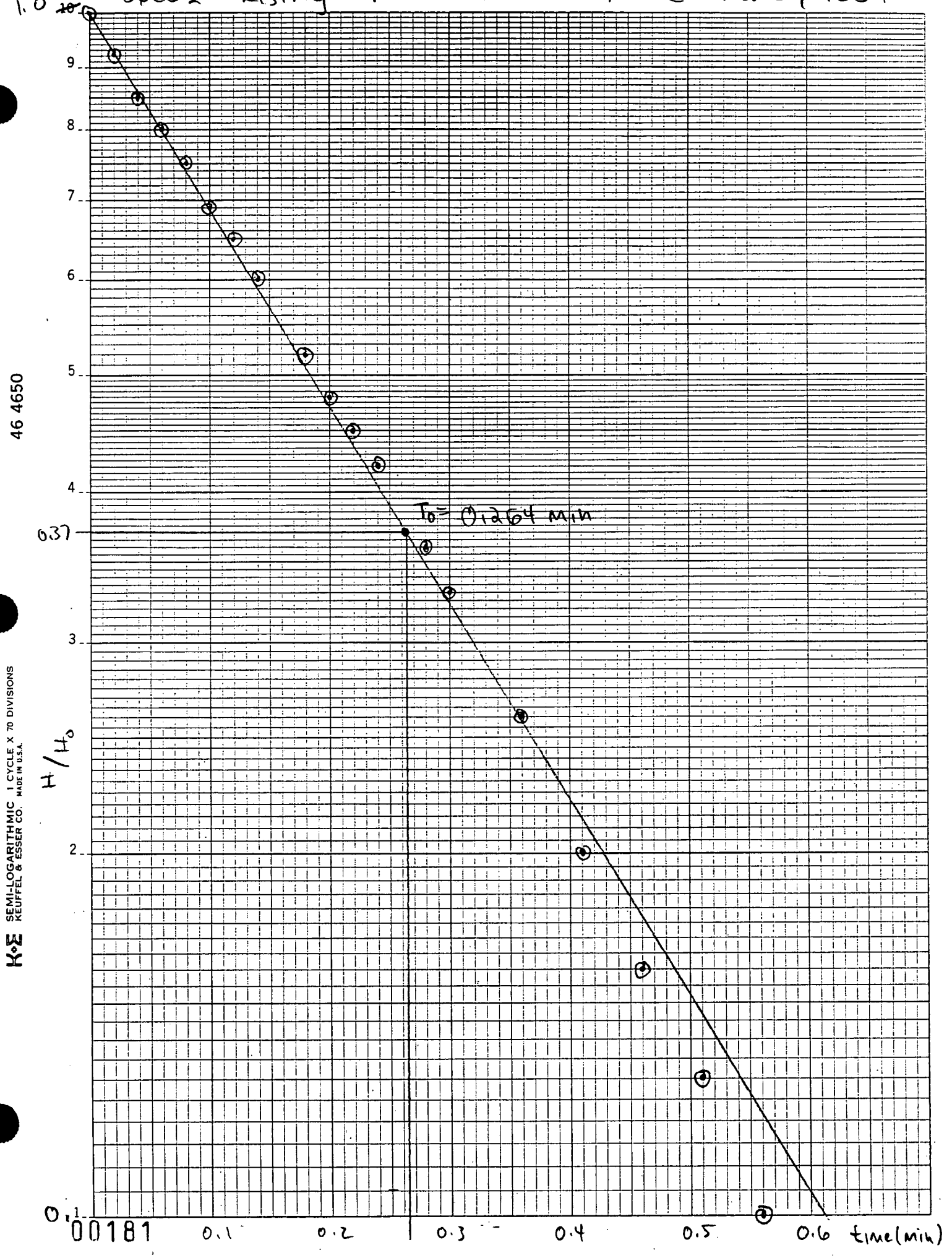
0.1233	2.112	0.69	0.1000
0.1266	2.112		
0.1300	2.081		
0.1333	2.049		
0.1366	2.081		
0.1400	2.001		
0.1433	1.984	0.65	0.1200
0.1466	1.953		
0.1500	1.936		
0.1533	1.904		
0.1566	1.889		
0.1600	1.889		
0.1633	1.841	0.60	0.1400
0.1666	1.825		
0.1700	1.793		
0.1733	1.793		
0.1766	1.760		
0.1800	1.728		
0.1833	1.728		
0.1866	1.697		
0.1900	1.697		
0.1933	1.632		
0.1966	1.632		
0.2000	1.616		
0.2033	1.600	0.52	0.1800
0.2066	1.569		
0.2100	1.552		
0.2133	1.520		
0.2166	1.520		
0.2200	1.488		
0.2233	1.488	0.48	0.2000
0.2266	1.472		
0.2300	1.456		
0.2333	1.424		
0.2366	1.408		
0.2400	1.392		
0.2433	1.376	0.45	0.2200
0.2466	1.344		
0.2500	1.344		
0.2533	1.328		
0.2566	1.296		
0.2600	1.296		
0.2633	1.280	0.42	0.2400
0.2666	1.264		
0.2700	1.280		
0.2733	1.232		
0.2766	1.216		
0.2800	1.232		
0.2833	1.184		
0.2866	1.168		
0.2900	1.152		
0.2933	1.152		
0.2966	1.136		
0.3000	1.120		
0.3033	1.104	0.36	0.2800
0.3066	1.088		
0.3100	1.072		
0.3133	1.056		
0.3166	1.040		
0.3200	1.024		

0.3233	1.008	0.33	0.3000
0.3266	0.992		
0.3300	0.992		
0.3333	0.976		
0.3500	0.912		
0.3666	0.848		
0.3833	0.800	0.26	0.3600
0.4000	0.736		
0.4166	0.672		
0.4333	0.624	0.20	0.4100
0.4500	0.576		
0.4666	0.544		
0.4833	0.496	0.16	0.4600
0.5000	0.448		
0.5166	0.416		
0.5333	0.400	0.13	0.5100
0.5500	0.352		
0.5666	0.336		
0.5833	0.320	0.10	0.5600
0.6000	0.288		
0.6166	0.256		
0.6333	0.240		
0.6500	0.224		
0.6666	0.208		
0.6833	0.191		
0.7000	0.176		
0.7166	0.160		
0.7333	0.144		
0.7500	0.128		
0.7666	0.128		
0.7833	0.112		
0.8000	0.112		
0.8166	0.096		
0.8333	0.096		
0.8500	0.080		
0.8666	0.080		
0.8833	0.063		
0.9000	0.080		
0.9166	0.063		
0.9333	0.063		
0.9500	0.063		
0.9666	0.048		
0.9833	0.063		
1.0000	0.048		
1.2000	0.015		
1.4000	0.015		
1.6000	0.015		
1.8000	0.000		
2.0000	0.032		
2.2000	0.000		
2.4000	0.000		
2.6000	0.015		
2.8000	0.000		
3.0000	0.000		
3.2000	0.000		
3.4000	0.000		
3.6000	0.015		
3.8000	0.015		
4.0000	0.000		
4.2000	0.015		

4.4000	0.015
4.6000	0.015
4.8000	0.015
5.0000	0.015
5.2000	0.000
5.4000	0.015
5.6000	-0.015
5.8000	0.000
6.0000	0.015
6.2000	0.000
6.4000	0.015
6.6000	0.015
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.015
7.8000	0.015
8.0000	0.015
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.015
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.015
9.8000	0.015
10.0000	0.000
12.0000	0.000

END

06C02 Rising Head NSWC Crane / 7651



00181

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT D6C02 RISING HEAD TEST			
BASED ON HVORSLEV (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.264$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(20.0\ \text{ft} / 0.16\ \text{ft})}{2(20.0\ \text{ft})(0.264\ \text{min})}$$

$K = 3.15 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 4.54 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

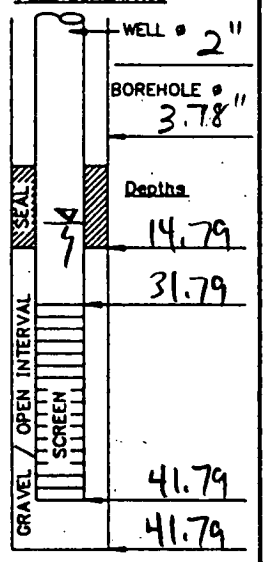
$= 1.60 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

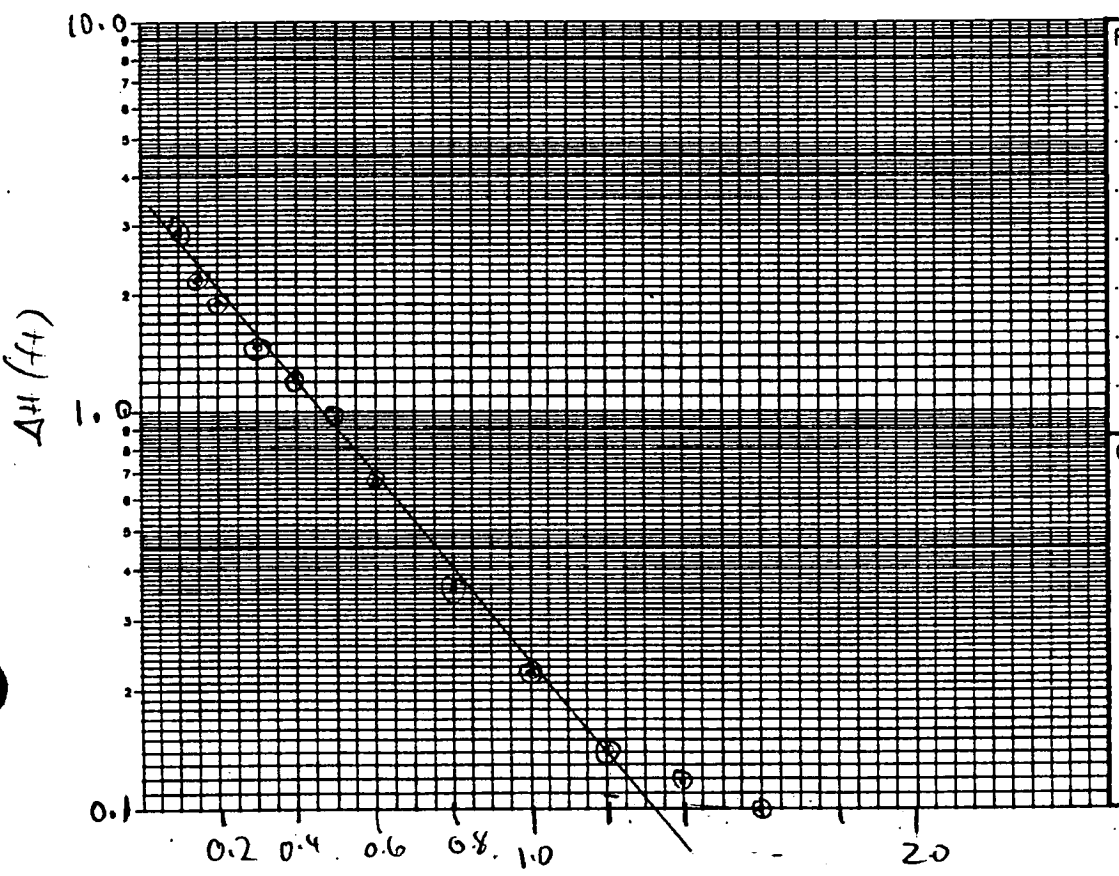
PROJECT NAME: NSWC Crane WELL/BORING NO.: 06C02P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.:
STATIC WATER LEVEL (Depth/Elevation): 14.40' TPVC DATE: 3/13/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 7.68') PAGE ... OF
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.09		-2.90	0.70		-0.48
0.15		-2.18	0.80		-0.36
0.20		-1.93	1.00		-0.22
0.25		-1.72	1.20		-0.14
0.30		-1.48	1.40		-0.12
0.35		-1.38	1.60		-0.10
0.40		-1.22	1.80		-0.09
0.45		-1.08	2.00		-0.08
0.50		-0.95			
0.55		-0.79			
0.60		-0.67			
0.65		-0.56			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit 143
XD S/N 201804
20 psi
H_2O above XD 26.14'
Start 0958
Stop 1010

CALCS, SKETCH MAPS, ETC.:
File:
06C02P2 Fall.txt

SE1000C
Environmental Logger
03/13 18:22

Unit# 00143 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60022
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Step 0 03/13 09:58:40

Elapsed Time	INPUT 1
0.0000	-0.006
0.0033	-0.006
0.0066	0.000
0.0100	-0.006
0.0133	-0.006
0.0166	-0.006
0.0200	-0.300
0.0233	-0.511
0.0266	-0.639
0.0300	-0.747
0.0333	-0.811
0.0366	-0.926
0.0400	-1.323
0.0433	-1.502
0.0466	-1.508
0.0500	-1.463
0.0533	-1.597
0.0566	-1.623
0.0600	-2.071
0.0633	-2.160
0.0666	-2.314
0.0700	-2.326
0.0733	-2.435
0.0766	-2.365
0.0800	-2.486
0.0833	-2.748
0.0866	-2.761
0.0900	-2.902
0.0933	-2.844
0.0966	-2.576
0.1000	-2.294
0.1033	-2.237
0.1066	-2.326
0.1100	-2.173
0.1133	-2.045
0.1166	-2.403 ←
0.1200	-2.339

well #06C02P2
Falling Head Test
Ø6CØ2P2 FALL.TXT

H/H_0	t
1.00	0.00

0.1233	-2.358		
0.1266	-2.320		
0.1300	-2.301		
0.1333	-2.282		
0.1366	-2.269	0.94	0.02
0.1400	-2.243		
0.1433	-2.224		
0.1466	-2.198		
0.1500	-2.186		
0.1533	-2.167		
0.1566	-2.154	0.90	0.04
0.1600	-2.135		
0.1633	-2.115		
0.1666	-2.103		
0.1700	-2.083		
0.1733	-2.064		
0.1766	-2.045	0.85	0.06
0.1800	-2.032		
0.1833	-2.013		
0.1866	-1.994		
0.1900	-1.981		
0.1933	-1.968		
0.1966	-1.949	0.81	0.08
0.2000	-1.936		
0.2033	-1.924		
0.2066	-1.904		
0.2100	-1.892		
0.2133	-1.872		
0.2166	-1.859	0.77	0.10
0.2200	-1.847		
0.2233	-1.828		
0.2266	-1.815		
0.2300	-1.802		
0.2333	-1.789		
0.2366	-1.776	0.74	0.12
0.2400	-1.764		
0.2433	-1.751		
0.2466	-1.738		
0.2500	-1.725		
0.2533	-1.719		
0.2566	-1.700	0.71	0.14
0.2600	-1.693		
0.2633	-1.681		
0.2666	-1.649		
0.2700	-1.649		
0.2733	-1.623		
0.2766	-1.623	0.68	0.16
0.2800	-1.597		
0.2833	-1.597		
0.2866	-1.565		
0.2900	-1.629		
0.2933	-1.559		
0.2966	-1.553	0.65	0.18
0.3000	-1.482		
0.3033	-1.540		
0.3066	-1.546		
0.3100	-1.502		
0.3133	-1.476		
0.3166	-1.502	0.63	0.20
0.3200	-1.470		

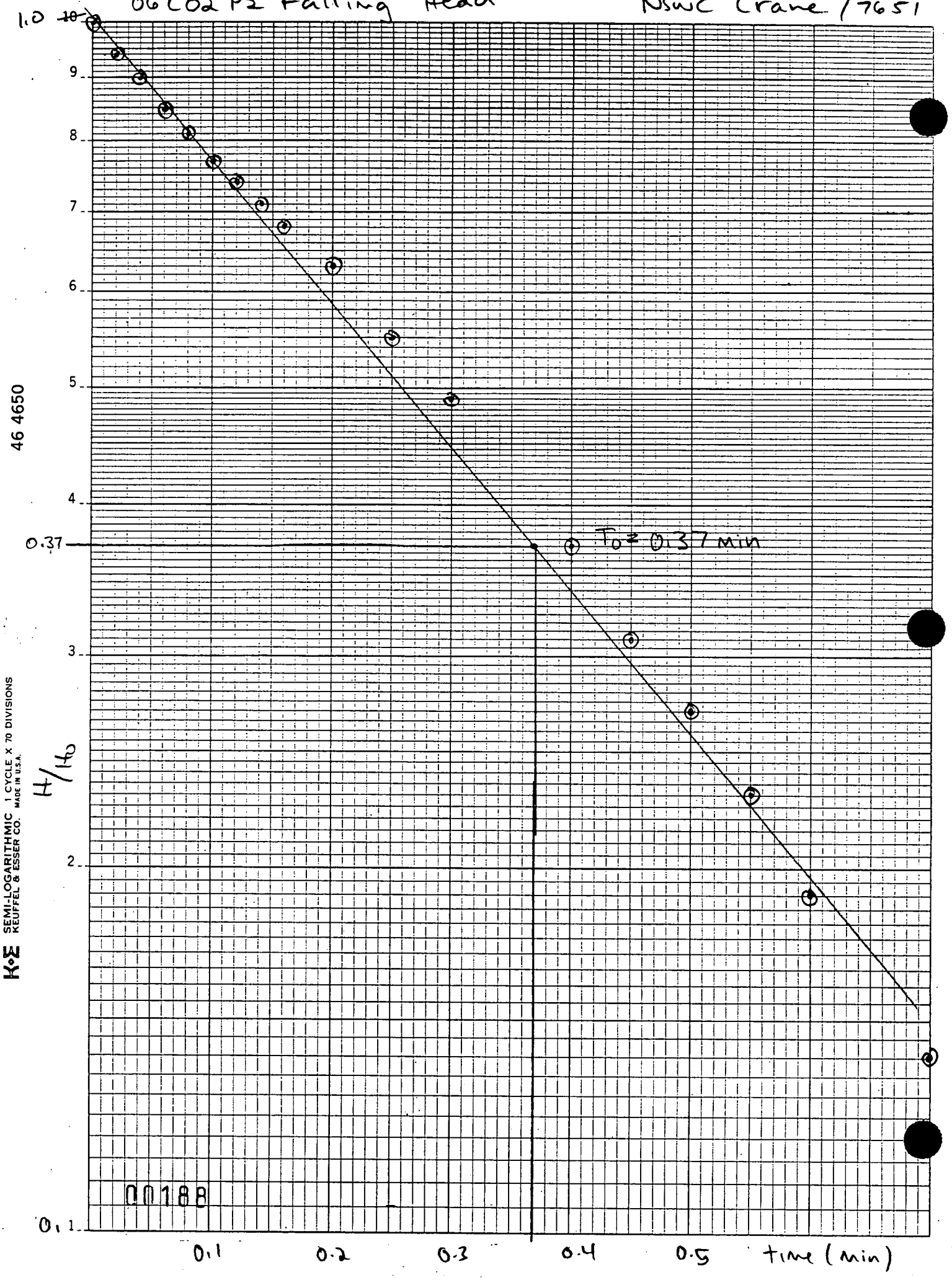
0.3233	-1.470		
0.3266	-1.470		
0.3300	-1.470		
0.3333	-1.431		
0.3500	-1.380		
0.3666	-1.323	0.55	0.25
0.3833	-1.271		
0.4000	-1.227		
0.4166	-1.176	0.49	0.30
0.4333	-1.131		
0.4500	-1.086		
0.4666	-1.048		
0.4833	-1.009		
0.5000	-0.958		
0.5166	-0.901	0.37	0.40
0.5333	-0.850		
0.5500	-0.799		
0.5666	-0.754	0.31	0.45
0.5833	-0.715		
0.6000	-0.677		
0.6166	-0.639	0.27	0.50
0.6333	-0.600		
0.6500	-0.568		
0.6666	-0.543	0.23	0.55
0.6833	-0.517		
0.7000	-0.485		
0.7166	-0.466	0.19	0.60
0.7333	-0.440		
0.7500	-0.421		
0.7666	-0.402		
0.7833	-0.376		
0.8000	-0.364		
0.8166	-0.345	0.14	0.70
0.8333	-0.332		
0.8500	-0.313		
0.8666	-0.300		
0.8833	-0.287		
0.9000	-0.281		
0.9166	-0.268	0.11	0.80
0.9333	-0.255		
0.9500	-0.249		
0.9666	-0.236		
0.9833	-0.230		
1.0000	-0.223		
1.2000	-0.146		
1.4000	-0.121		
1.6000	-0.108		
1.8000	-0.095		
2.0000	-0.089		
2.2000	-0.076		
2.4000	-0.076		
2.6000	-0.070		
2.8000	-0.070		
3.0000	-0.063		
3.2000	-0.063		
3.4000	-0.057		
3.6000	-0.057		
3.8000	-0.057		
4.0000	-0.044		
4.2000	-0.057		

4.4000	-0.051
4.6000	-0.051
4.8000	-0.044
5.0000	-0.044
5.2000	-0.044
5.4000	-0.044
5.6000	-0.044
5.8000	-0.038
6.0000	-0.044
6.2000	-0.038
6.4000	-0.038
6.6000	-0.038
6.8000	-0.038
7.0000	-0.038
7.2000	-0.038
7.4000	-0.038
7.6000	-0.038
7.8000	-0.032
8.0000	-0.032
8.2000	-0.032
8.4000	-0.032
8.6000	-0.032
8.8000	-0.032
9.0000	-0.032
9.2000	-0.032
9.4000	-0.032
9.6000	-0.025
9.8000	-0.032
10.0000	-0.025

END

06 C02 P2 Falling Head

NSWC Crane / 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER	
SUBJECT 06C02P2 Falling Head Test			
BASED ON Hvorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY RMB	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 10.0$ ft

$T_0 = 0.37$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft} / 0.16 \text{ ft})}{2(10.0 \text{ ft})(0.37 \text{ min})}$$

$K = 3.85 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 5.54 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

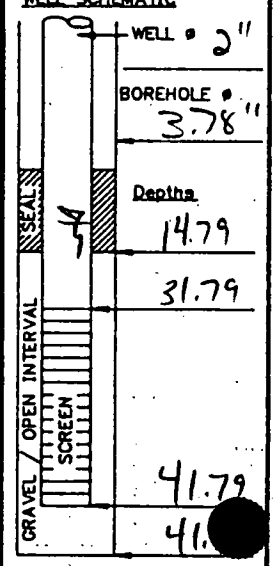
$= 1.96 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

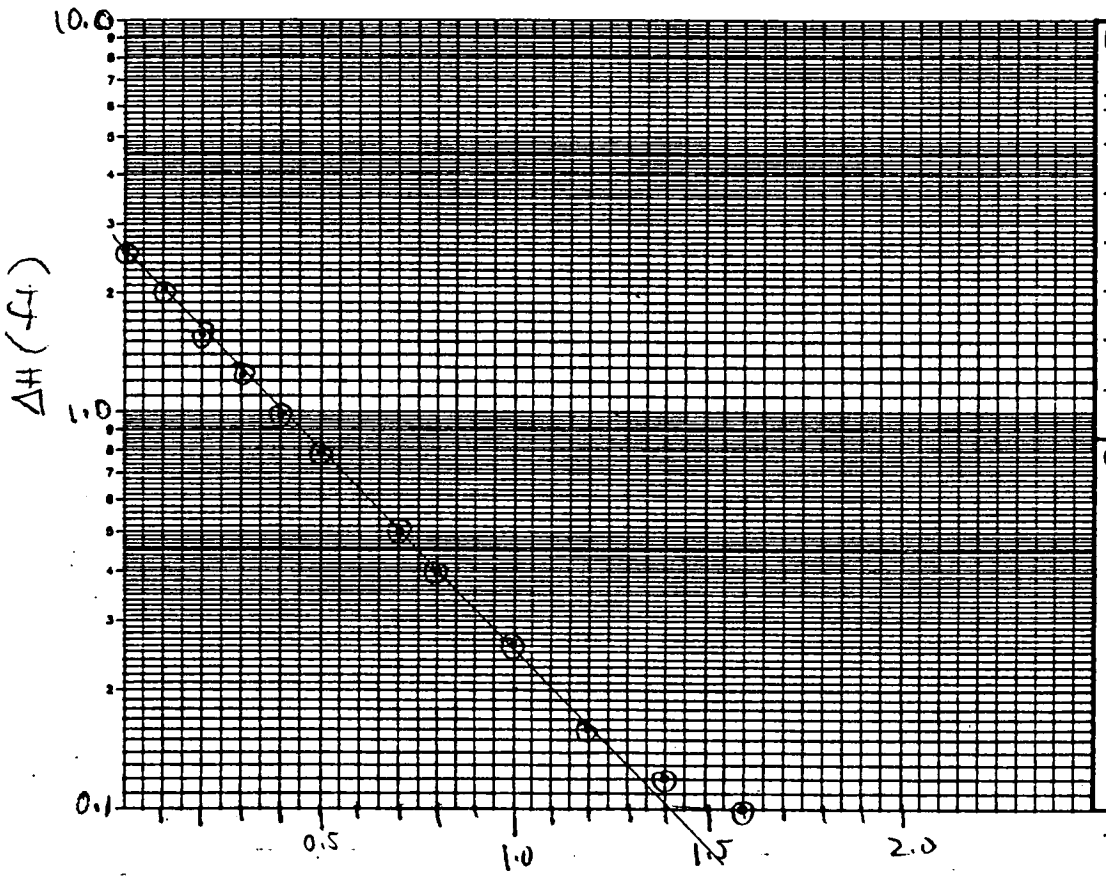
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C02P2
PROJECT NO.: 7651 GEOLOGIST: J. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: TEST NO.: T1450
STATIC WATER LEVEL (Depth/Elevation): 14.38' TPVC DATE: 3/13/99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		2.53	1.20		0.16
0.10		2.03	1.40		0.12
0.15		1.76	1.60		0.10
0.20		1.55	1.80		0.08
0.30		1.24	2.00		0.07
0.40		0.99	2.20		0.06
0.50		0.79			
0.60		0.63			
0.70		0.50			
0.80		0.40			
1.00		0.26			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 201804
20 psi
H_2O above XD 26.16
Start @ 1011
Stop @ 1024

CALCS, SKETCH MAPS, ETC.:
file:
06C02P2Rise.txt

SE1000C
Environmental Logger
03/13 18:25

Unit# 00143 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60022
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C02P2
Rising Head Test
06C02P2Rise.txt

Step 0 03/13 10:11:26

Elapsed Time	INPUT 1
0.0000	-0.006
0.0033	2.210
0.0066	1.476
0.0100	0.217
0.0133	1.380
0.0166	1.456
0.0200	1.763
0.0233	2.108
0.0266	2.319
0.0300	2.530 ←
0.0333	2.459
0.0366	2.421
0.0400	2.395
0.0433	2.370
0.0466	2.357
0.0500	2.319
0.0533	2.287
0.0566	2.274
0.0600	2.248
0.0633	2.223
0.0666	2.191
0.0700	2.172
0.0733	2.165
0.0766	2.133
0.0800	2.121
0.0833	2.102
0.0866	2.076
0.0900	2.057
0.0933	2.057
0.0966	2.019
0.1000	2.038
0.1033	2.006
0.1066	1.954
0.1100	1.948
0.1133	1.923
0.1166	1.910
0.1200	1.897

H/H_0	t
1.00	0.00
0.92	0.02
0.86	0.04
0.81	0.06
0.77	0.08

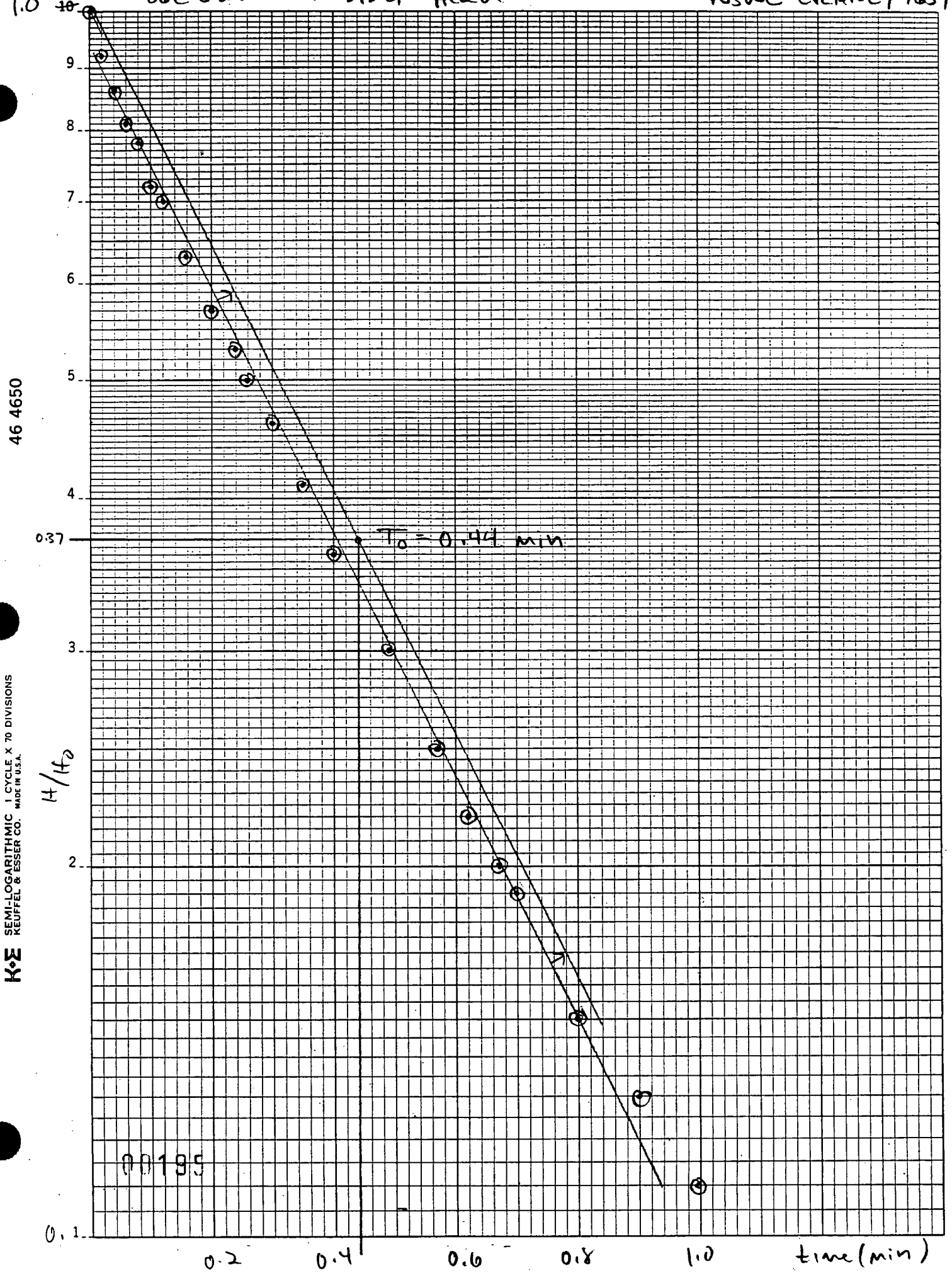
0.1233	1.910		
0.1266	1.859		
0.1300	1.827	0.72	0.10
0.1333	1.840		
0.1366	1.814		
0.1400	1.795		
0.1433	1.789		
0.1466	1.769		
0.1500	1.763	0.70	0.12
0.1533	1.750		
0.1566	1.718		
0.1600	1.712		
0.1633	1.699		
0.1666	1.680		
0.1700	1.674	0.66	0.14
0.1733	1.654		
0.1766	1.648		
0.1800	1.629		
0.1833	1.616		
0.1866	1.603		
0.1900	1.590	0.63	0.16
0.1933	1.584		
0.1966	1.571		
0.2000	1.558		
0.2033	1.571		
0.2066	1.527		
0.2100	1.540	0.61	0.18
0.2133	1.507		
0.2166	1.495		
0.2200	1.488		
0.2233	1.476		
0.2266	1.463		
0.2300	1.450	0.57	0.20
0.2333	1.431		
0.2366	1.424		
0.2400	1.418		
0.2433	1.412		
0.2466	1.399		
0.2500	1.399	0.55	0.22
0.2533	1.380		
0.2566	1.367		
0.2600	1.354		
0.2633	1.348		
0.2666	1.335		
0.2700	1.329	0.53	0.24
0.2733	1.316		
0.2766	1.309		
0.2800	1.303		
0.2833	1.290		
0.2866	1.284		
0.2900	1.271	0.50	0.26
0.2933	1.265		
0.2966	1.252		
0.3000	1.246		
0.3033	1.239		
0.3066	1.227		
0.3100	1.220	0.48	0.28
0.3133	1.207		
0.3166	1.201		
0.3200	1.194		

0.3233	1.188		
0.3266	1.175		
0.3300	1.169	0.46	0.30
0.3333	1.162		
0.3500	1.118		
0.3666	1.073		
0.3833	1.035	0.41	0.3533
0.4000	0.996		
0.4166	0.958		
0.4333	0.920	0.36	0.4033
0.4500	0.888		
0.4666	0.856		
0.4833	0.824		
0.5000	0.792		
0.5166	0.760	0.30	0.4866
0.5333	0.734		
0.5500	0.709		
0.5666	0.683		
0.5833	0.658		
0.6000	0.632	0.25	0.5700
0.6166	0.613		
0.6333	0.588		
0.6500	0.568	0.22	0.6200
0.6666	0.543		
0.6833	0.524		
0.7000	0.505	0.20	0.6700
0.7166	0.492		
0.7333	0.472	0.19	0.7033
0.7500	0.453		
0.7666	0.441		
0.7833	0.421		
0.8000	0.409		
0.8166	0.396		
0.8333	0.376	0.15	0.8033
0.8500	0.364		
0.8666	0.351		
0.8833	0.338	0.13	0.8533
0.9000	0.332		
0.9166	0.319		
0.9333	0.306	0.12	0.9033
0.9500	0.293		
0.9666	0.287		
0.9833	0.275		
1.0000	0.268	0.11	0.9700
1.2000	0.166	0.07	1.17
1.4000	0.127	0.05	1.37
1.6000	0.102		
1.8000	0.083		
2.0000	0.076		
2.2000	0.063		
2.4000	0.057		
2.6000	0.057		
2.8000	0.051		
3.0000	0.051		
3.2000	0.044		
3.4000	0.044		
3.6000	0.044		
3.8000	0.038		
4.0000	0.038		
4.2000	0.038		

4.4000	0.031
4.6000	0.031
4.8000	0.031
5.0000	0.031
5.2000	0.025
5.4000	0.025
5.6000	0.025
5.8000	0.025
6.0000	0.025
6.2000	0.025
6.4000	0.025
6.6000	0.025
6.8000	0.019
7.0000	0.019
7.2000	0.019
7.4000	0.019
7.6000	0.019
7.8000	0.019
8.0000	0.019
8.2000	0.019
8.4000	0.019
8.6000	0.019
8.8000	0.019
9.0000	0.019
9.2000	0.019
9.4000	0.013
9.6000	0.019
9.8000	0.013
10.0000	0.019
12.0000	0.013

END

06C02P2 RISING Head NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C02P2 RISING HEAD TEST			
BASED ON HVORSLEV (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 10.0$ ft

$T_0 = 0.44$ min

$$K = \frac{r^2 \ln (L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln (10.0 \text{ ft} / 0.16 \text{ ft})}{2 (10.0 \text{ ft}) (0.44 \text{ min})}$$

$K = 3.24 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 4.66 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

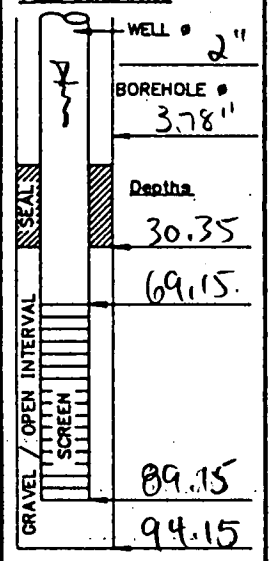
$= 1.64 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

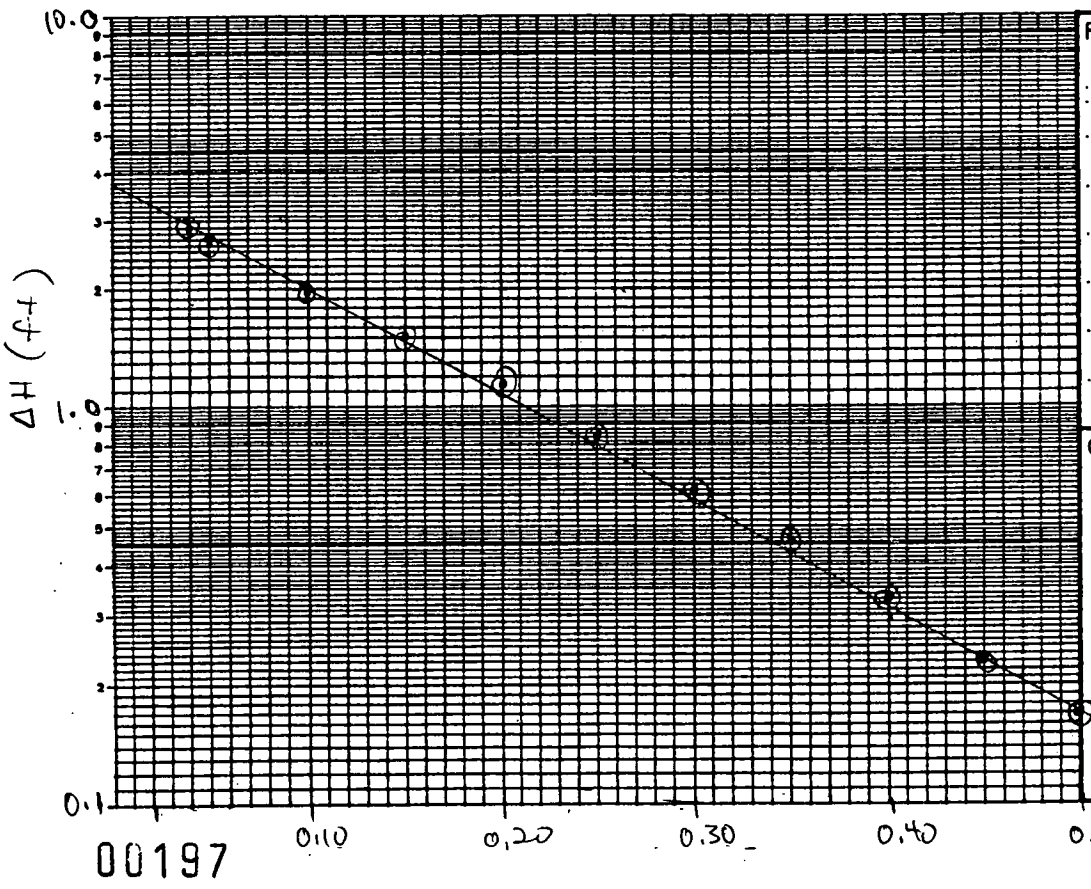
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C03
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T650
STATIC WATER LEVEL (Depth/Elevation): 12.65' TOVC DATE: 3/13/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ϕ x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		-2.90	0.60		-0.09
0.05		-2.65			
0.10		-1.96			
0.15		-1.50			
0.20		-1.14			
0.25		-0.84			
0.30		-0.61			
0.35		-0.46			
0.40		-0.33			
0.45		-0.23			
0.50		-0.17			
0.55		-0.12			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD s/o 1670
50 psi
H_2O above XO 74.94'

Start @ 1056
Stop @ 1124

CALCS, SKETCH MAPS, ETC.:
file
06C03Fall.txt

00197

FWR
3-29-99

SE1000C
Environmental Logger
03/13 12:33

Unit# 00145 Test 6

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60030
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C03
FALLING HEAD TEST
file: 06C03FALL.TXT

Step 0 03/13 10:55:40

Elapsed Time	INPUT 1	
0.0000	-0.016	
0.0033	-0.016	
0.0066	-0.159	
0.0100	-0.301	
0.0133	-0.524	
0.0166	-0.984	
0.0200	-1.095	
0.0233	-1.714	
0.0266	-1.936	
0.0300	-1.222	
0.0333	-1.825	
0.0366	-2.285	
0.0400	-2.777	
0.0433	-2.904 ←	
0.0466	-2.713	
0.0500	-2.650	
0.0533	-2.586	
0.0566	-2.602	
0.0600	-2.570	
0.0633	-2.650	
0.0666	-2.586	
0.0700	-2.174	
0.0733	-1.952	
0.0766	-1.730	
0.0800	-1.952	
0.0833	-2.094	
0.0866	-2.079	
0.0900	-2.110	H_0
0.0933	-1.968	
0.0966	-1.999	
0.1000	-1.968	
0.1033	-1.936	
0.1066	-1.920	
0.1100	-1.872	
0.1133	-1.809	
0.1166	-1.825	

H/H_0	t
1.00	0.0000
0.95	0.0066
0.89	0.02

0.1200	-1.761		
0.1233	-1.730		
0.1266	-1.714		
0.1300	-1.682	0.80	0.0400
0.1333	-1.650		
0.1366	-1.619		
0.1400	-1.587	0.75	0.0500
0.1433	-1.571		
0.1466	-1.523		
0.1500	-1.507		
0.1533	-1.476	0.70	0.0633
0.1566	-1.460		
0.1600	-1.428		
0.1633	-1.396		
0.1666	-1.381		
0.1700	-1.349	0.64	0.0800
0.1733	-1.317		
0.1766	-1.301		
0.1800	-1.270		
0.1833	-1.253		
0.1866	-1.222		
0.1900	-1.206	0.57	0.1000
0.1933	-1.190		
0.1966	-1.158		
0.2000	-1.143		
0.2033	-1.110		
0.2066	-1.095		
0.2100	-1.079	0.51	0.1200
0.2133	-1.047		
0.2166	-1.032		
0.2200	-1.016		
0.2233	-1.000		
0.2266	-0.968		
0.2300	-0.952	0.45	0.1400
0.2333	-0.936		
0.2366	-0.920		
0.2400	-0.904		
0.2433	-0.872		
0.2466	-0.857		
0.2500	-0.841	0.40	0.1600
0.2533	-0.825		
0.2566	-0.809		
0.2600	-0.794		
0.2633	-0.778		
0.2666	-0.762		
0.2700	-0.745	0.35	0.1800
0.2733	-0.730		
0.2766	-0.714		
0.2800	-0.698		
0.2833	-0.682		
0.2866	-0.666		
0.2900	-0.666		
0.2933	-0.651		
0.2966	-0.635	0.30	0.2066
0.3000	-0.618		
0.3033	-0.603		
0.3066	-0.587		
0.3100	-0.587		
0.3133	-0.571		
0.3166	-0.555		

0.3200	-0.540		
0.3233	-0.540		
0.3266	-0.524	0.25	0.2366
0.3300	-0.508		
0.3333	-0.508		
0.3500	-0.460		
0.3666	-0.412	0.20	0.2766
0.3833	-0.365		
0.4000	-0.333		
0.4166	-0.286	0.14	0.3266
0.4333	-0.254		
0.4500	-0.237		
0.4666	-0.206	0.10	0.3766
0.4833	-0.190		
0.5000	-0.174		
0.5166	-0.142		
0.5333	-0.127		
0.5500	-0.127		
0.5666	-0.110		
0.5833	-0.095		
0.6000	-0.095		
0.6166	-0.079		
0.6333	-0.079		
0.6500	-0.063		
0.6666	-0.063		
0.6833	-0.063		
0.7000	-0.063		
0.7166	-0.047		
0.7333	-0.047		
0.7500	-0.047		
0.7666	-0.047		
0.7833	-0.047		
0.8000	-0.047		
0.8166	-0.031		
0.8333	-0.047		
0.8500	-0.031		
0.8666	-0.031		
0.8833	-0.031		
0.9000	-0.031		
0.9166	-0.031		
0.9333	-0.031		
0.9500	-0.031		
0.9666	-0.031		
0.9833	-0.031		
1.0000	-0.031		
1.2000	-0.031		
1.4000	-0.031		
1.6000	-0.031		
1.8000	-0.031		
2.0000	-0.031		
2.2000	-0.016		
2.4000	-0.016		
2.6000	-0.016		
2.8000	-0.016		
3.0000	-0.016		
3.2000	-0.016		
3.4000	-0.031		
3.6000	-0.016		
3.8000	-0.016		
4.0000	-0.016		

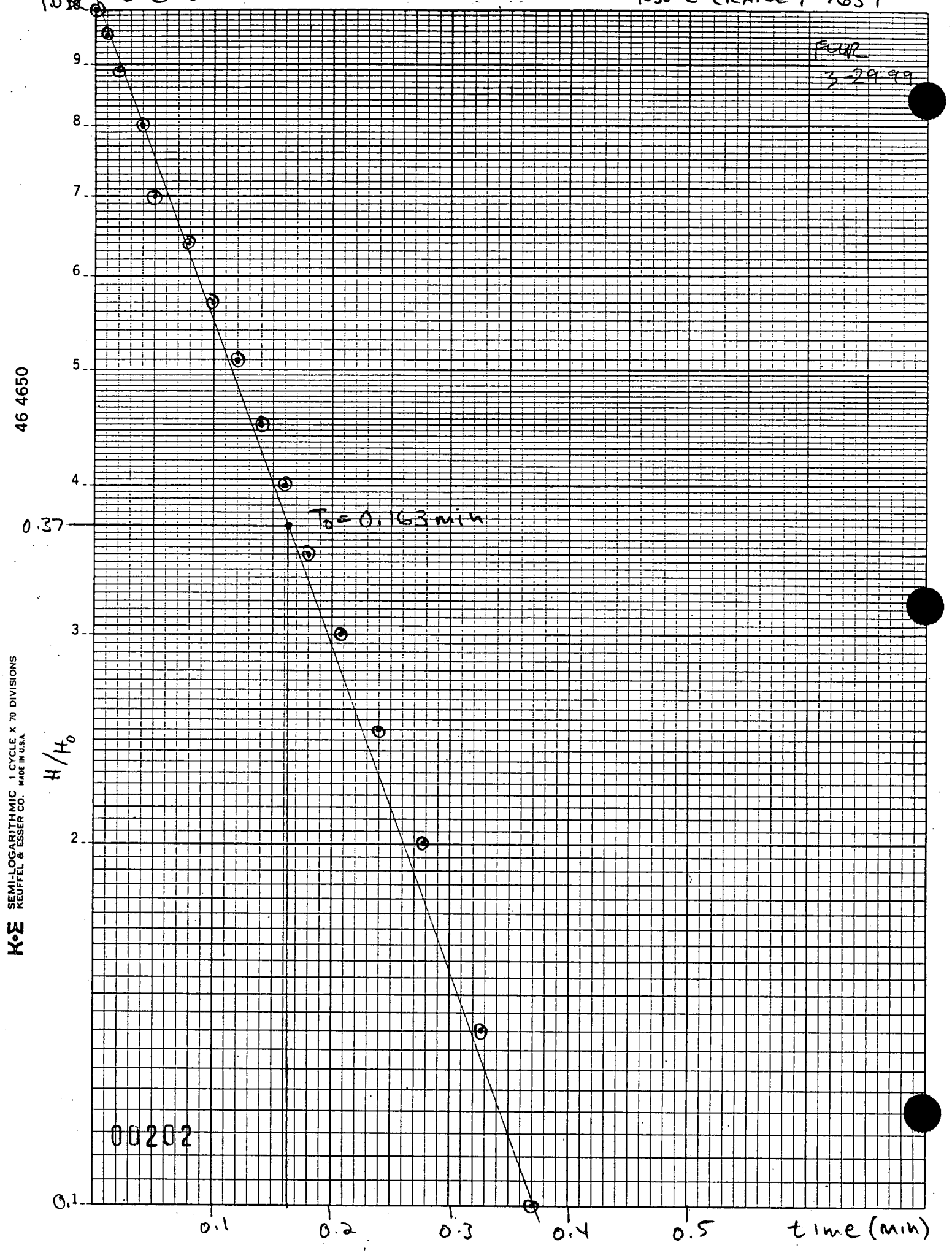
4.2000	-0.016
4.4000	-0.016
4.6000	-0.016
4.8000	-0.016
5.0000	-0.016
5.2000	-0.016
5.4000	-0.016
5.6000	-0.016
5.8000	-0.016
6.0000	-0.016
6.2000	-0.016
6.4000	-0.016
6.6000	-0.016
6.8000	-0.016
7.0000	-0.016
7.2000	-0.016
7.4000	-0.016
7.6000	-0.016
7.8000	-0.016
8.0000	-0.016
8.2000	-0.016
8.4000	-0.016
8.6000	-0.016
8.8000	-0.016
9.0000	-0.016
9.2000	-0.016
9.4000	-0.016
9.6000	-0.016
9.8000	-0.016
10.0000	-0.016
12.0000	-0.016
14.0000	-0.016
16.0000	-0.016
18.0000	-0.016
20.0000	-0.016
22.0000	-0.016
24.0000	-0.016
26.0000	-0.016
28.0000	-0.016

END

D6C03 FALLING HEAD

NSWC CRANE / 7651

FLWR
3-29-99



00202

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C03 FALLING HEAD TEST			
BASED ON HVORSLEV (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY SURamsey 3-29-99	APPROVED BY	DATE

$r = 0.083\ ft$

$R = 0.16\ ft$

$L = 20.0\ ft$

$T_0 = 0.163\ min$

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(20.0\ ft / 0.16\ ft)}{2(20.0\ ft)(0.16\ min)}$$

$K = 5.20 \times 10^{-3}\ ft/min \times 1440\ min/day$

$K = 7.48 \times 10^{0}\ ft/day \times 1\ cm/s / 2835\ ft/day$

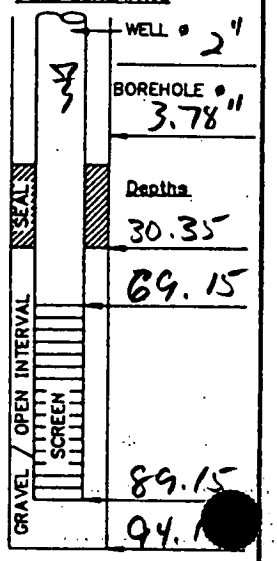
$= 2.64 \times 10^{-3}\ cm/s$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

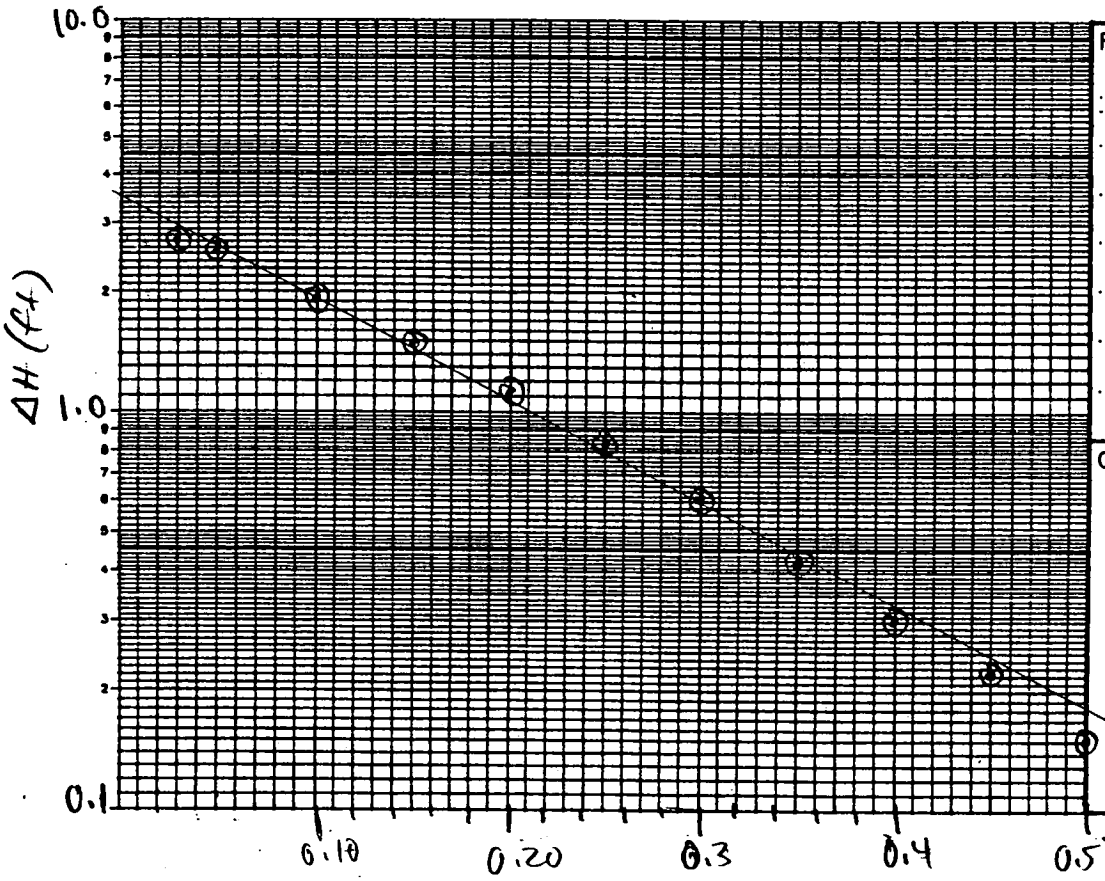
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C03
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T7S0
STATIC WATER LEVEL (Depth/Elevation): 12.62' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		2.72	0.05		2.53
0.10		1.95			
0.15		1.49			
0.20		1.12			
0.25		0.84			
0.30		0.61			
0.35		0.42			
0.40		0.30			
0.45		0.22			
0.50		0.15			
0.55		0.11			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670, 50psi
H_2O above XD = 74.97
Start @ 1135
Stop @ 1147

CALCS, SKETCH MAPS, ETC.:
file:
06C03rise.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/13 12:39

Unit# 00145 Test 7

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60030
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C03
Rising Head Test
File: 06C03 Rise.txt

Step 0 03/13 11:35:43

Elapsed Time	INPUT 1		H/H_0	t
0.0000	0.476			
0.0033	1.491			
0.0066	1.459			
0.0100	0.920			
0.0133	0.857			
0.0166	1.666			
0.0200	1.888			
0.0233	2.126			
0.0266	2.475			
0.0300	2.728			
0.0333	2.744	← H_0	1.00	0.000
0.0366	2.713			
0.0400	2.665			
0.0433	2.617		0.95	0.0100
0.0466	2.570			
0.0500	2.538			
0.0533	2.490		0.91	0.0200
0.0566	2.443			
0.0600	2.411			
0.0633	2.364			
0.0666	2.316			
0.0700	2.284			
0.0733	2.237			
0.0766	2.205		0.80	0.0433
0.0800	2.157			
0.0833	2.126			
0.0866	2.094			
0.0900	2.062		0.75	0.0567
0.0933	2.030			
0.0966	1.983			
0.1000	1.951			
0.1033	1.919		0.70	0.0700
0.1066	1.888			
0.1100	1.856			
0.1133	1.824			
0.1166	1.792		0.65	0.0833
0.1200	1.745			

00205

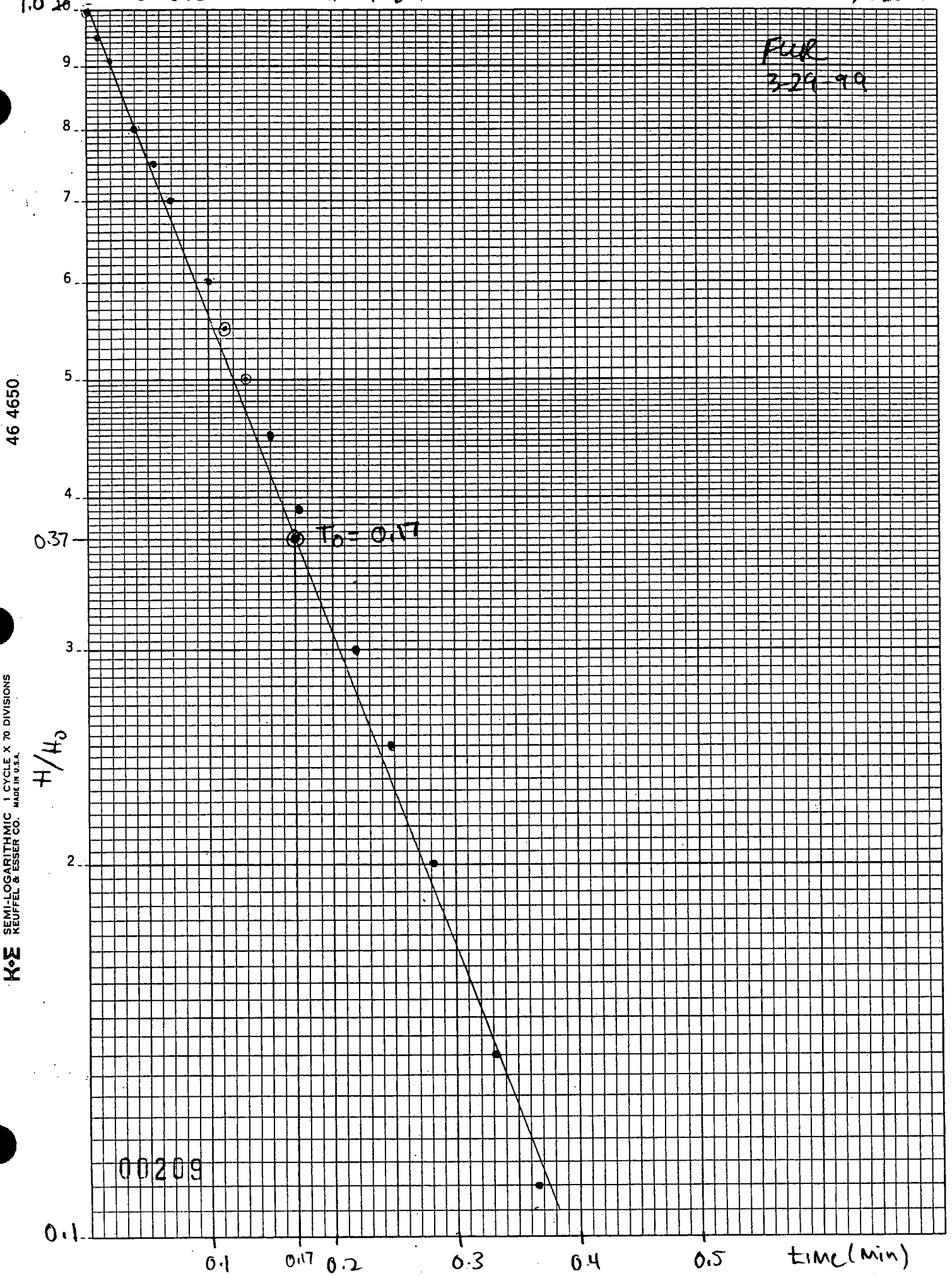
0.1233	1.713		
0.1266	1.681		
0.1300	1.666		
0.1333	1.634	0.60	0.1000
0.1366	1.602		
0.1400	1.570		
0.1433	1.539		
0.1466	1.507	0.55	0.1133
0.1500	1.491		
0.1533	1.459		
0.1566	1.428		
0.1600	1.412		
0.1633	1.380	0.50	0.1300
0.1666	1.348		
0.1700	1.332		
0.1733	1.301		
0.1766	1.285		
0.1800	1.253		
0.1833	1.237	0.45	0.1500
0.1866	1.206		
0.1900	1.190		
0.1933	1.174		
0.1966	1.142		
0.2000	1.126		
0.2033	1.126		
0.2066	1.079	0.39	0.1733
0.2100	1.063		
0.2133	1.047		
0.2166	0.983		
0.2200	0.999		
0.2233	0.983		
0.2266	0.968		
0.2300	0.952		
0.2333	0.920		
0.2366	0.904		
0.2400	0.888		
0.2433	0.872		
0.2466	0.857		
0.2500	0.841		
0.2533	0.825	0.30	0.2200
0.2566	0.809		
0.2600	0.793		
0.2633	0.777		
0.2666	0.761		
0.2700	0.745		
0.2733	0.730		
0.2766	0.714		
0.2800	0.698	0.25	0.2467
0.2833	0.682		
0.2866	0.666		
0.2900	0.666		
0.2933	0.650		
0.2966	0.634		
0.3000	0.619		
0.3033	0.603		
0.3066	0.603		
0.3100	0.587		
0.3133	0.571		
0.3166	0.555	0.20	0.2833
0.3200	0.555		

0.3233	0.539		
0.3266	0.523		
0.3300	0.523		
0.3333	0.507		
0.3500	0.428		
0.3666	0.381	0.14	0.3333
0.3833	0.349		
0.4000	0.301	0.11	0.3667
0.4166	0.269		
0.4333	0.238		
0.4500	0.222		
0.4666	0.190		
0.4833	0.174		
0.5000	0.158		
0.5166	0.143		
0.5333	0.127		
0.5500	0.111		
0.5666	0.095		
0.5833	0.095		
0.6000	0.079		
0.6166	0.079		
0.6333	0.063		
0.6500	0.063		
0.6666	0.063		
0.6833	0.063		
0.7000	0.047		
0.7166	0.047		
0.7333	0.047		
0.7500	0.047		
0.7666	0.047		
0.7833	0.031		
0.8000	0.031		
0.8166	0.031		
0.8333	0.031		
0.8500	0.031		
0.8666	0.031		
0.8833	0.031		
0.9000	0.031		
0.9166	0.031		
0.9333	0.031		
0.9500	0.031		
0.9666	0.031		
0.9833	0.031		
1.0000	0.031		
1.2000	0.015		
1.4000	0.015		
1.6000	0.015		
1.8000	0.015		
2.0000	0.015		
2.2000	0.015		
2.4000	0.015		
2.6000	0.015		
2.8000	0.015		
3.0000	0.015		
3.2000	0.015		
3.4000	0.015		
3.6000	0.015		
3.8000	0.015		
4.0000	0.015		
4.2000	0.015		

4.4000	0.015
4.6000	0.015
4.8000	0.015
5.0000	0.015
5.2000	0.015
5.4000	0.015
5.6000	0.015
5.8000	0.015
6.0000	0.015
6.2000	0.015
6.4000	0.015
6.6000	0.015
6.8000	0.000
7.0000	0.015
7.2000	0.015
7.4000	0.000
7.6000	0.015
7.8000	0.015
8.0000	0.015
8.2000	0.015
8.4000	0.015
8.6000	0.015
8.8000	0.015
9.0000	0.015
9.2000	0.015
9.4000	0.015
9.6000	0.000
9.8000	0.015
10.0000	0.015

END

06C03 RISING HEAD NSWC CRANE /7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C03 RISING HEAD TEST			
BASED ON HVORSLEV (1951).		DRAWING NUMBER	
BY TSE	CHECKED BY Fred Warner 3-29-99	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.17$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft} / 0.16 \text{ ft})}{2(20.0 \text{ ft})(0.17 \text{ min})}$$

$K = 4.89 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 7.04 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

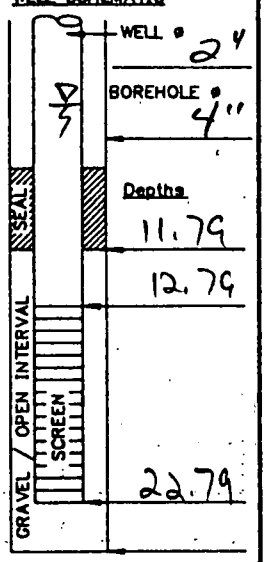
$\approx 2.48 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

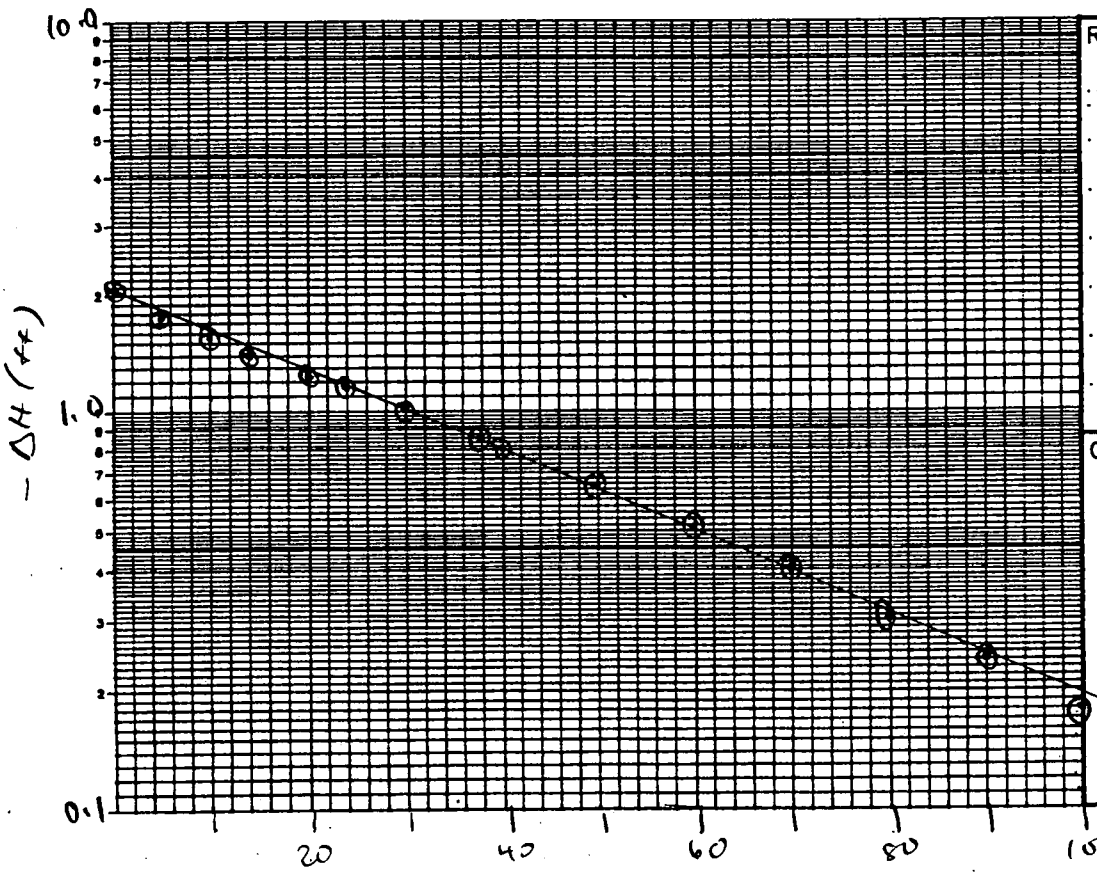
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C03P2
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1550
STATIC WATER LEVEL (Depth/Elevation): 3.81' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 3.20') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.09		-2.04	70.00		-0.40
1.00		-1.96	80.00		-0.31
5.00		-1.76	90.00		-0.24
10.00		-1.55	100.00		-0.18
14.00		-1.41	120.00		-0.08
20.00		-1.25	140.00		-0.02
24.00		-1.17			
30.00		-1.02			
38.00		-0.85			
40.00		-0.81			
50.00		-0.65			
60.00		-0.51			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi
H_2O above XD 19.63
Start @ 1051
Stop @ 1311

CALCS, SKETCH MAPS, ETC.:
file
06C03P2 Fall.txt

00211

PLL
3-29-99

SE1000C
Environmental Logger
03/13 18:28

Unit# 00143 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60032
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06C03P2
Falling Head Test
06C03P2 FALL.txt

Step 0 03/13 10:51:07

Elapsed Time	INPUT 1
0.0000	-0.947
0.0033	-2.432
0.0066	-2.781
0.0100	-2.696
0.0133	-3.032
0.0166	-3.067
0.0200	-3.057
0.0233	-3.016
0.0266	-2.884
0.0300	-2.448
0.0333	-0.602
0.0366	-1.996
0.0400	-2.426
0.0433	-2.065
0.0466	-2.015
0.0500	-2.162
0.0533	-1.993
0.0566	-2.005
0.0600	-1.999
0.0633	-2.030
0.0666	-2.008
0.0700	-2.015
0.0733	-2.030
0.0766	-2.021
0.0800	-2.018
0.0833	-2.018
0.0866	-2.021
0.0900	-1.811
0.0933	-2.049
0.0966	-2.024
0.1000	-2.033 H_o
0.1033	-2.015
0.1066	-2.024
0.1100	-2.018
0.1133	-2.021
0.1166	-2.024
0.1200	-2.024

H/H_o	t
1.00	0.0000

00212

0.1233	-2.021
0.1266	-2.021
0.1300	-2.024
0.1333	-2.008
0.1366	-2.043
0.1400	-2.024
0.1433	-2.021
0.1466	-2.021
0.1500	-2.021
0.1533	-2.018
0.1566	-2.021
0.1600	-2.021
0.1633	-2.018
0.1666	-2.011
0.1700	-2.018
0.1733	-2.018
0.1766	-2.015
0.1800	-2.018
0.1833	-2.015
0.1866	-2.015
0.1900	-2.015
0.1933	-2.015
0.1966	-2.015
0.2000	-2.015
0.2033	-2.015
0.2066	-2.015
0.2100	-2.015
0.2133	-2.015
0.2166	-2.015
0.2200	-2.015
0.2233	-2.015
0.2266	-2.011
0.2300	-2.011
0.2333	-2.011
0.2366	-2.011
0.2400	-2.011
0.2433	-2.011
0.2466	-2.008
0.2500	-2.011
0.2533	-2.011
0.2566	-2.008
0.2600	-2.008
0.2633	-2.008
0.2666	-2.008
0.2700	-2.008
0.2733	-2.008
0.2766	-2.008
0.2800	-2.027
0.2833	-2.005
0.2866	-2.008
0.2900	-2.008
0.2933	-2.008
0.2966	-2.005
0.3000	-2.008
0.3033	-2.005
0.3066	-2.008
0.3100	-2.005
0.3133	-2.005
0.3166	-2.005
0.3200	-2.005

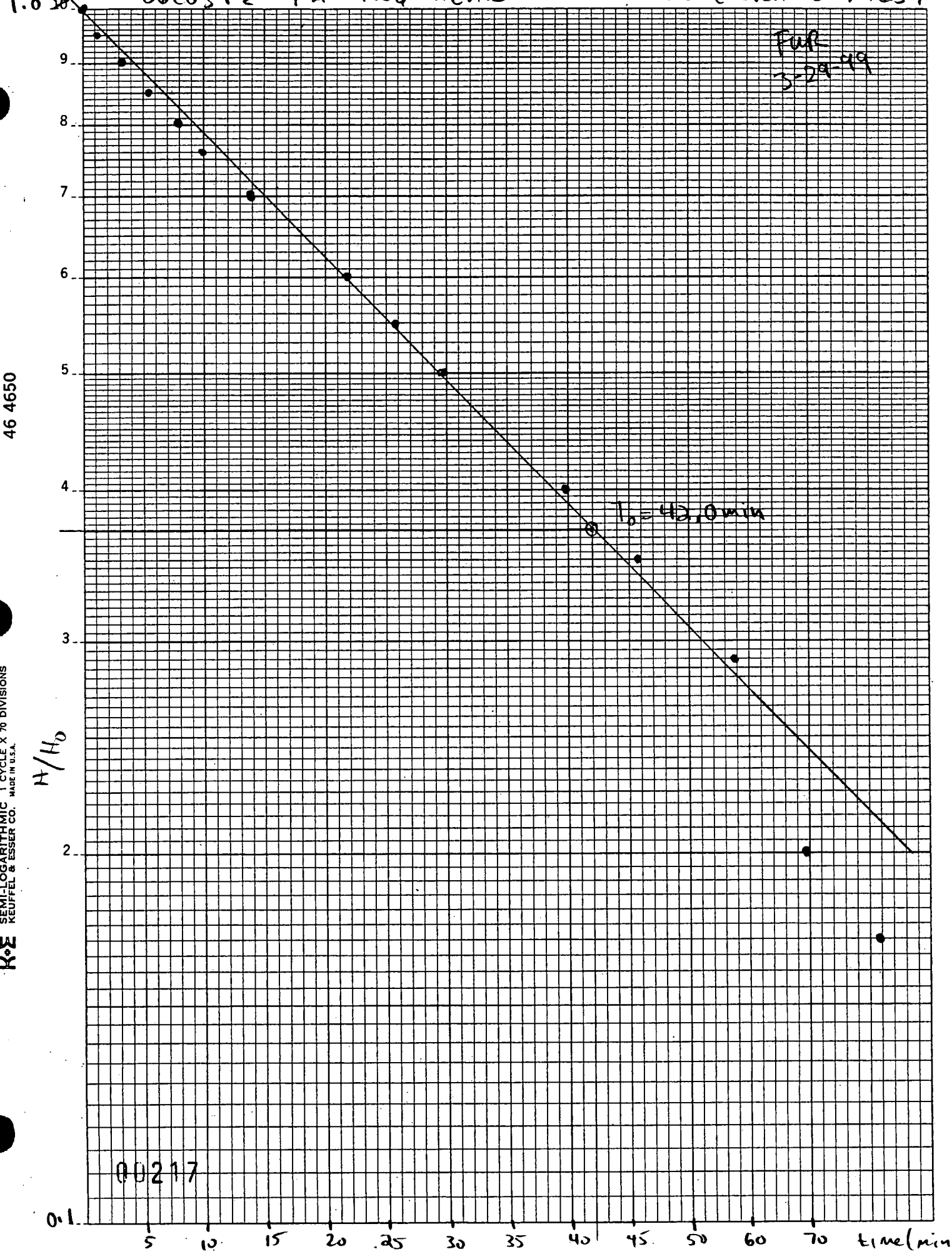
0.3233	-2.005	
0.3266	-2.005	
0.3300	-2.005	
0.3333	-2.005	
0.3500	-2.005	
0.3666	-2.005	
0.3833	-2.002	
0.4000	-2.002	
0.4166	-2.002	
0.4333	-1.999	
0.4500	-1.999	
0.4666	-1.996	
0.4833	-1.996	
0.5000	-1.993	
0.5166	-1.996	
0.5333	-1.993	
0.5500	-1.993	
0.5666	-1.993	
0.5833	-1.990	
0.6000	-1.990	
0.6166	-1.990	
0.6333	-1.986	
0.6500	-1.986	
0.6666	-1.986	
0.6833	-1.983	
0.7000	-1.983	
0.7166	-1.983	
0.7333	-1.983	
0.7500	-1.980	
0.7666	-1.977	
0.7833	-1.977	
0.8000	-1.977	
0.8166	-1.977	
0.8333	-1.974	
0.8500	-1.974	
0.8666	-1.974	
0.8833	-1.971	
0.9000	-1.971	
0.9166	-1.967	
0.9333	-1.967	
0.9500	-1.967	
0.9666	-1.967	
0.9833	-1.967	
1.0000	-1.967	
1.2000	-1.952	
1.4000	-1.939	0.95 1.3000
1.6000	-1.930	
1.8000	-1.914	
2.0000	-1.908	
2.2000	-1.895	
2.4000	-1.886	
2.6000	-1.876	
2.8000	-1.867	
3.0000	-1.854	
3.2000	-1.845	
3.4000	-1.836	0.90 3.300
3.6000	-1.823	
3.8000	-1.817	
4.0000	-1.807	
4.2000	-1.798	

4.4000	-1.788		
4.6000	-1.779		
4.8000	-1.773		
5.0000	-1.760		
5.2000	-1.754		
5.4000	-1.745		
5.6000	-1.735	0.85	5.5000
5.8000	-1.726		
6.0000	-1.720		
6.2000	-1.710		
6.4000	-1.704		
6.6000	-1.691		
6.8000	-1.685		
7.0000	-1.676		
7.2000	-1.666		
7.4000	-1.654		
7.6000	-1.647		
7.8000	-1.644		
8.0000	-1.635	0.80	7.9000
8.2000	-1.625		
8.4000	-1.616		
8.6000	-1.610		
8.8000	-1.603		
9.0000	-1.594		
9.2000	-1.584		
9.4000	-1.581		
9.6000	-1.569		
9.8000	-1.559		
10.0000	-1.553	0.70	9.9000
12.0000	-1.481		
14.0000	-1.415	0.70	13.9000
16.0000	-1.349		
18.0000	-1.302		
20.0000	-1.252		
22.0000	-1.211	0.60	21.9000
24.0000	-1.170		
26.0000	-1.117	0.55	25.9000
28.0000	-1.070		
30.0000	-1.023	0.50	29.9000
32.0000	-0.979		
34.0000	-0.935		
36.0000	-0.897		
38.0000	-0.856		
40.0000	-0.819	0.40	39.9000
42.0000	-0.781		
44.0000	-0.746		
46.0000	-0.715	0.35	45.9000
48.0000	-0.684		
50.0000	-0.652		
52.0000	-0.621		
54.0000	-0.590	0.29	53.9000
56.0000	-0.567		
58.0000	-0.542		
60.0000	-0.517		
62.0000	-0.492		
64.0000	-0.470		
66.0000	-0.445		
68.0000	-0.426		
70.0000	-0.404	0.20	69.9000
72.0000	-0.389		

74.0000	-0.370		
76.0000	-0.351	0.17	75.9000
78.0000	-0.332		
80.0000	-0.317		
82.0000	-0.298	0.15	81.9000
84.0000	-0.285		
86.0000	-0.269		
88.0000	-0.257		
90.0000	-0.241		
92.0000	-0.229		
94.0000	-0.216		
96.0000	-0.203	0.10	95.9000
98.0000	-0.194		
100.000	-0.182		
120.000	-0.084		
140.000	-0.025		

END

06C03 P2 FALLING HEAD NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C0382 Falling Head Test		
BASED ON	Hvorslev (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-29-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 42.0$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(10.0\ ft / 0.167\ ft)}{2(10.0\ ft)(42.0\ min)}$$

$K = 3.36 \times 10^{-5}$ ft/min $\times$ 1440 min/day

$K = 4.83 \times 10^{-2}$ ft/day $\times$ 1 cm/s / 2835 ft/day

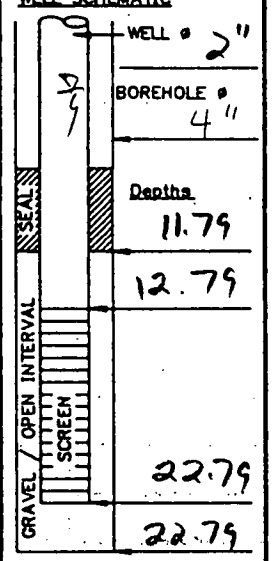
$= 1.70 \times 10^{-5}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

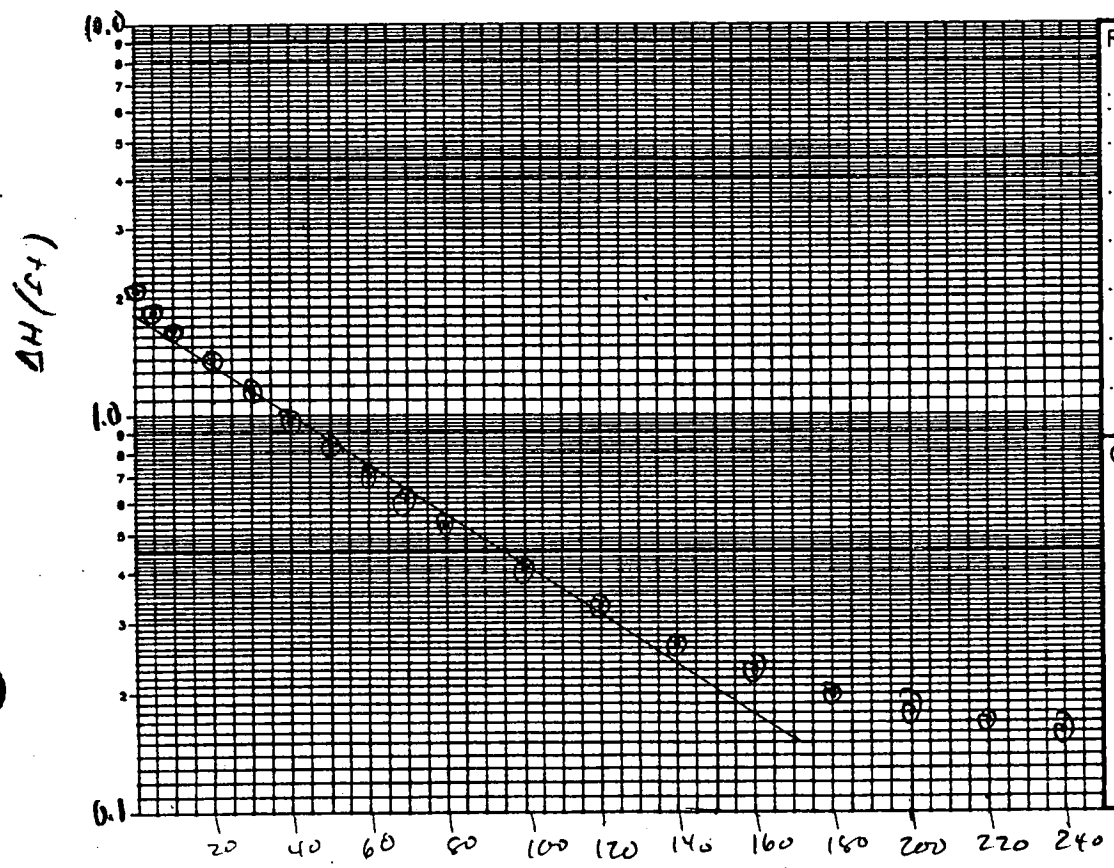
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C03P2
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T165Ø
STATIC WATER LEVEL (Depth/Elevation): 3.83' DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 3.20') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		2.10	120.00		0.33
5.00		1.85	140.00		0.27
10.00		1.67	160.00		0.23
20.00		1.39	180.00		0.20
30.00		1.16	200.00		0.18
40.00		0.98	220.00		0.17
50.00		0.84	240.00		0.16
60.00		0.71			
70.00		0.61			
80.00		0.53			
90.00		0.46			
100.00		0.41			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi
H_2O above XO = 19.65'
Start @ 1313
Stop @ 1728

CALCS, SKETCH MAPS, ETC.:
file:
06C03P2 Rise.txt
no data in file!

FMR
3-29-99

SE1000C
Environmental Logger
03/13 18:33

Unit# 00143 Test 16

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60032
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Step 0 03/13 13:13:47

Well # 06C03P2
Rising Head Test
06C03P2 RISE.txt

Elapsed Time	INPUT 1
0.0000	0.652
0.0033	1.919
0.0066	1.377
0.0100	1.737
0.0133	2.148
0.0166	2.145
0.0200	2.151
0.0233	2.145
0.0266	2.142
0.0300	2.142
0.0333	2.129
0.0366	2.123
0.0400	2.123
0.0433	2.129
0.0466	2.113
0.0500	2.116
0.0533	2.113
0.0566	2.113
0.0600	2.110
0.0633	2.113
0.0666	2.116
0.0700	2.123
0.0733	2.107
0.0766	2.104
0.0800	2.107
0.0833	2.107
0.0866	2.116
0.0900	2.101
0.0933	2.095
0.0966	2.101 ←
0.1000	2.088
0.1033	2.098
0.1066	2.098
0.1100	2.098
0.1133	2.095
0.1166	2.095
0.1200	2.095

H/H_0	t
1.00	0.0000

00220

0.1233	2.095		
0.1266	2.095		
0.1300	2.095		
0.1333	2.095		
0.1366	2.091		
0.1400	2.091		
0.1433	2.091		
0.1466	2.088		
0.1500	2.088		
0.1533	2.088		
0.1566	2.088		
0.1600	2.088		
0.1633	2.088		
0.1666	2.088	0.99	0.0700
0.1700	2.085		
0.1733	2.085		
0.1766	2.085		
0.1800	2.085		
0.1833	2.085		
0.1866	2.085		
0.1900	2.085		
0.1933	2.082		
0.1966	2.085		
0.2000	2.082		
0.2033	2.082		
0.2066	2.082		
0.2100	2.082		
0.2133	2.079		
0.2166	2.079		
0.2200	2.079		
0.2233	2.079		
0.2266	2.079		
0.2300	2.079		
0.2333	2.079		
0.2366	2.076		
0.2400	2.076		
0.2433	2.076		
0.2466	2.076		
0.2500	2.076		
0.2533	2.076		
0.2566	2.073		
0.2600	2.076		
0.2633	2.076		
0.2666	2.073		
0.2700	2.076		
0.2733	2.073		
0.2766	2.073		
0.2800	2.073		
0.2833	2.073		
0.2866	2.073		
0.2900	2.073		
0.2933	2.073		
0.2966	2.070	0.98	0.20000
0.3000	2.070		
0.3033	2.066		
0.3066	2.070		
0.3100	2.070		
0.3133	2.070		
0.3166	2.070		
0.3200	2.070		

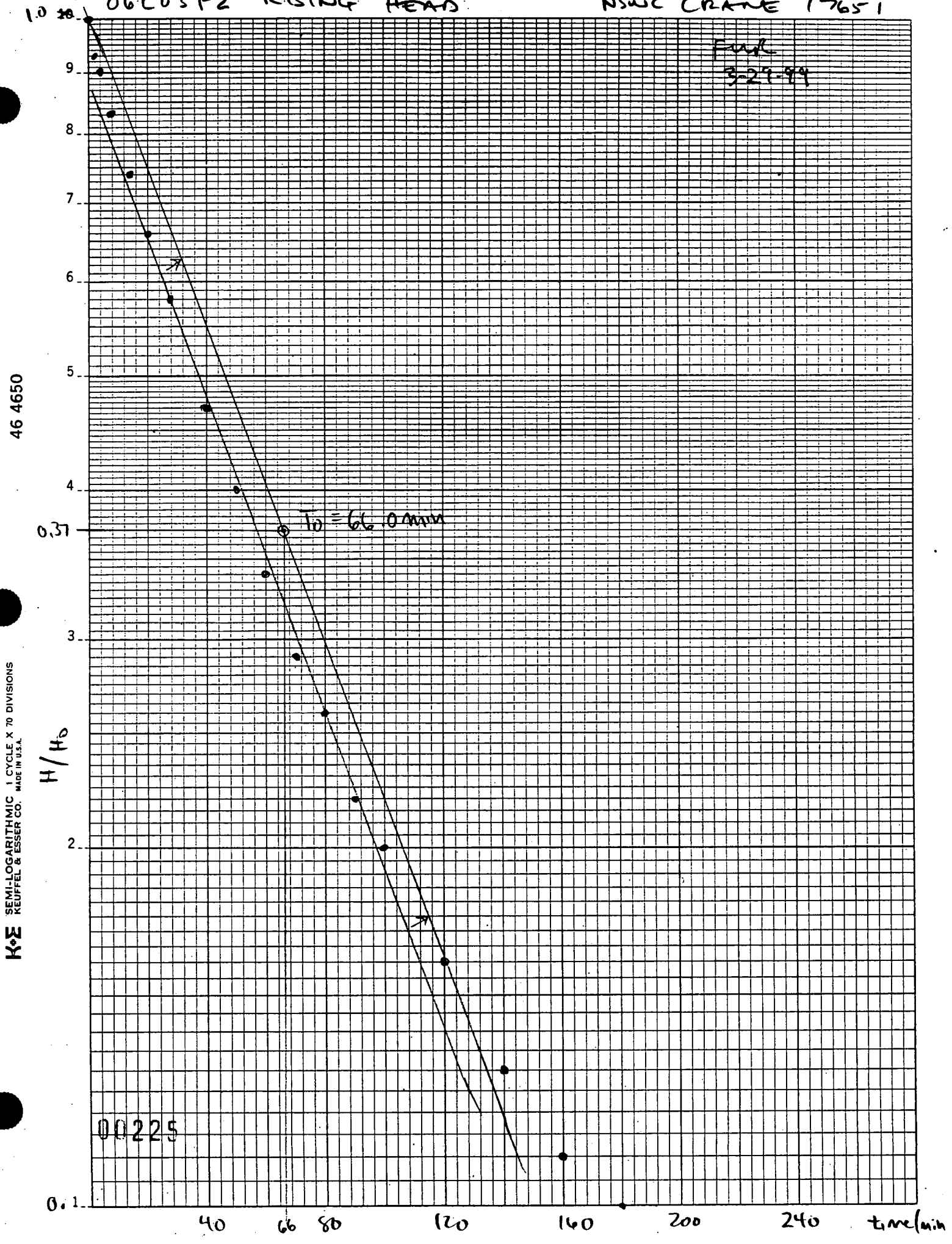
0.3233	2.066		
0.3266	2.070		
0.3300	2.066		
0.3333	2.066		
0.3500	2.066		
0.3666	2.063		
0.3833	2.063		
0.4000	2.060		
0.4166	2.057		
0.4333	2.060		
0.4500	2.057		
0.4666	2.054		
0.4833	2.054		
0.5000	2.054		
0.5166	2.051		
0.5333	2.051		
0.5500	2.051		
0.5666	2.047		
0.5833	2.047		
0.6000	2.047		
0.6166	2.047		
0.6333	2.047		
0.6500	2.044		
0.6666	2.047	0.47	0.5700
0.6833	2.044		
0.7000	2.044		
0.7166	2.041		
0.7333	2.038		
0.7500	2.038		
0.7666	2.038		
0.7833	2.035		
0.8000	2.035		
0.8166	2.035		
0.8333	2.032		
0.8500	2.032		
0.8666	2.032		
0.8833	2.029		
0.9000	2.029		
0.9166	2.029		
0.9333	2.026		
0.9500	2.022		
0.9666	2.022		
0.9833	2.019		
1.0000	2.019		
1.2000	2.010		
1.4000	2.001		
1.6000	1.991		
1.8000	1.982		
2.0000	1.972	0.94	1.9034
2.2000	1.963		
2.4000	1.957		
2.6000	1.944		
2.8000	1.938		
3.0000	1.928		
3.2000	1.919		
3.4000	1.916		
3.6000	1.903		
3.8000	1.897		
4.0000	1.888	0.90	3.9034
4.2000	1.885		

4.4000	1.872		
4.6000	1.869		
4.8000	1.859		
5.0000	1.850		
5.2000	1.844		
5.4000	1.837		
5.6000	1.831		
5.8000	1.822		
6.0000	1.816	0.86	5.9034
6.2000	1.809		
6.4000	1.800		
6.6000	1.794		
6.8000	1.784		
7.0000	1.781		
7.2000	1.772		
7.4000	1.765		
7.6000	1.759		
7.8000	1.753		
8.0000	1.746	0.83	7.9034
8.2000	1.740		
8.4000	1.731		
8.6000	1.725		
8.8000	1.718		
9.0000	1.712		
9.2000	1.706		
9.4000	1.700		
9.6000	1.693		
9.8000	1.687		9.9034
10.0000	1.678	0.80	
12.0000	1.615		
14.0000	1.558	0.74	13.9034
16.0000	1.502		
18.0000	1.445		
20.0000	1.395	0.66	19.9034
22.0000	1.345		
24.0000	1.301		
26.0000	1.254		
28.0000	1.210	0.58	27.9034
30.0000	1.169		
32.0000	1.132		
34.0000	1.094		
36.0000	1.057		
38.0000	1.022		
40.0000	0.988	0.47	39.9034
42.0000	0.956		
44.0000	0.925		
46.0000	0.897		
48.0000	0.865		
50.0000	0.840	0.40	49.9034
52.0000	0.815		
54.0000	0.787		
56.0000	0.765		
58.0000	0.743		
60.0000	0.718	0.34	59.9034
62.0000	0.696		
64.0000	0.674		
66.0000	0.658		
68.0000	0.636		
70.0000	0.618	0.29	69.9034
72.0000	0.602		

74.0000	0.589		
76.0000	0.567		
78.0000	0.552		
80.0000	0.539	0.26	79.9034
82.0000	0.523		
84.0000	0.508		
86.0000	0.495		
88.0000	0.483		
90.0000	0.467	0.22	89.9034
92.0000	0.458		
94.0000	0.448		
96.0000	0.436		
98.0000	0.423		
100.000	0.414	0.20	99.9034
120.000	0.332	0.16	119.9034
140.000	0.272	0.13	139.9034
160.000	0.232	0.11	159.9034
180.000	0.207	0.10	179.9034
200.000	0.188		
220.000	0.175		
240.000	0.163		

END

06C03P2 RISING HEAD NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C03 P2 Rising Head Test			
BASED ON H Vorslev (1951)		DRAWING NUMBER	
BY TSE	CHECKED BY EURamsey 3-29-99	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 66.0$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(10.0\ \text{ft}/0.167\ \text{ft})}{2(10.0\ \text{ft})(66.0\ \text{min})}$$

$K = 2.14 \times 10^{-5}$ ft/min $\times$ 1440 min/day

$K = 3.08 \times 10^{-2}$ ft/day $\times$ 1 cm/s / 283.5 ft/day

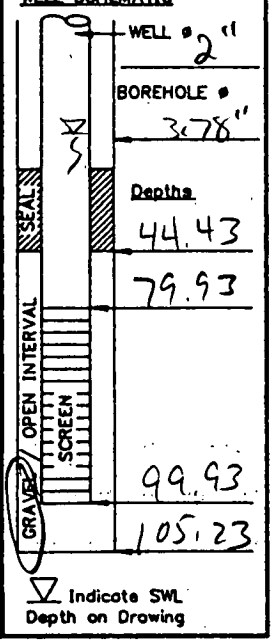
$= 1.08 \times 10^{-5}$ cm/s

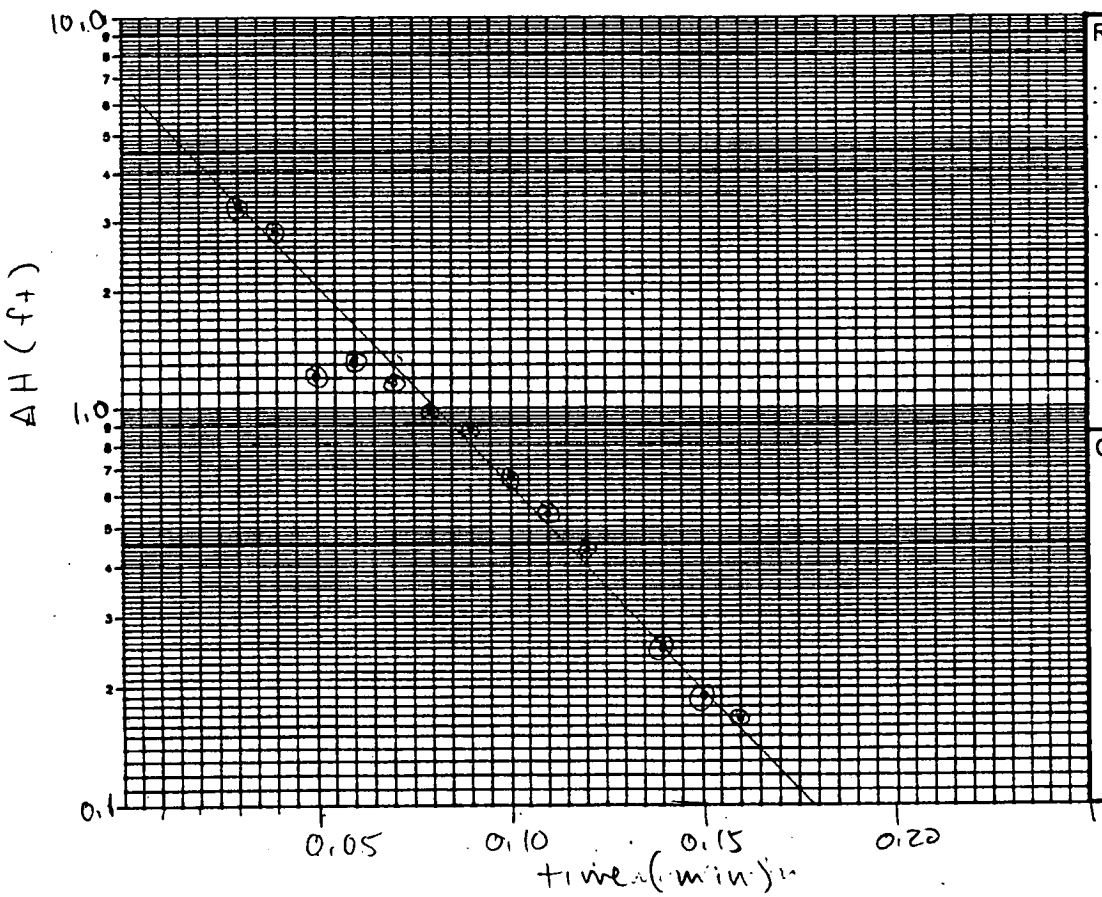
HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC Caprine WELL/BORING NO.: 06C04
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T85Ø
STATIC WATER LEVEL (Depth/Elevation): 27.34' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		-3.33	0.16		-0.17
0.04		-2.88	0.17		-0.08
0.05		-1.18	0.18		-0.04
0.06		-1.31	0.19		-0.03
0.07		-1.15	0.20		-0.01
0.08		-0.99			
0.09		-0.89			
0.10		-0.67			
0.11		-0.54			
0.12		-0.44			
0.14		-0.25			
0.15		-0.19			

WELL SCHEMATIC





REMARKS:
Hermit # 145
XD s/N 203120
50 psi
H_2O above XD = 70.07
Start @ 1327
Stop @ 1344

CALCS, SKETCH MAPS, ETC.:
file:
06C04Fall.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:23

Unit# 00145 Test 8

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60040
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C04
Falling Head Test
Ø6CØ4 Fall. txt

Step 0 03/13 13:27:16

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	-0.016
0.0066	-0.160
0.0100	-0.464
0.0133	-1.041
0.0166	-1.810
0.0200	-2.483
0.0233	-2.868
0.0266	-3.124
0.0300	-3.188
0.0333	-3.332
0.0366	-3.108
0.0400	-2.884
0.0433	-2.291
0.0466	-1.217
0.0500	-1.185
0.0533	-1.409
0.0566	-1.441
0.0600	-1.313
0.0633	-1.281
0.0666	-1.217
0.0700	-1.153
0.0733	-1.105
0.0766	-1.041
0.0800	-0.993
0.0833	-0.928
0.0866	-0.912
0.0900	-0.897
0.0933	-0.721
0.0966	-0.753
0.1000	-0.673
0.1033	-0.641
0.1066	-0.592
0.1100	-0.545
0.1133	-0.513
0.1166	-0.480
0.1200	-0.448

H/H_0	t
1.00	0.0000
0.84	0.0100
0.80	0.0134
0.72	0.0200
0.63	0.0300
0.50	0.0367
0.52	0.0400
0.41	0.0560
0.33	0.0600

00228

0.1233	-0.416		
0.1266	-0.384	0.27	0.0700
0.1300	-0.352		
0.1333	-0.320		
0.1366	-0.304	0.21	0.0800
0.1400	-0.256		
0.1433	-0.240		
0.1466	-0.223	0.15	0.0900
0.1500	-0.192		
0.1533	-0.176		
0.1566	-0.160	0.11	0.1000
0.1600	-0.176		
0.1633	-0.095		
0.1666	-0.128	0.09	0.1100
0.1700	-0.080		
0.1733	-0.095		
0.1766	-0.048		
0.1800	-0.048		
0.1833	-0.048		
0.1866	-0.032		
0.1900	-0.032		
0.1933	-0.032		
0.1966	-0.016		
0.2000	-0.016		
0.2033	-0.016		
0.2066	0.000		
0.2100	0.000		
0.2133	-0.016		
0.2166	0.000		
0.2200	0.000		
0.2233	0.000		
0.2266	0.016		
0.2300	0.016		
0.2333	0.000		
0.2366	0.016		
0.2400	0.016		
0.2433	0.000		
0.2466	0.016		
0.2500	0.000		
0.2533	0.000		
0.2566	0.000		
0.2600	0.000		
0.2633	0.000		
0.2666	0.000		
0.2700	-0.016		
0.2733	-0.016		
0.2766	0.000		
0.2800	0.000		
0.2833	0.000		
0.2866	0.000		
0.2900	-0.016		
0.2933	-0.016		
0.2966	-0.016		
0.3000	0.000		
0.3033	-0.016		
0.3066	-0.016		
0.3100	-0.016		
0.3133	-0.016		
0.3166	0.000		
0.3200	-0.016		

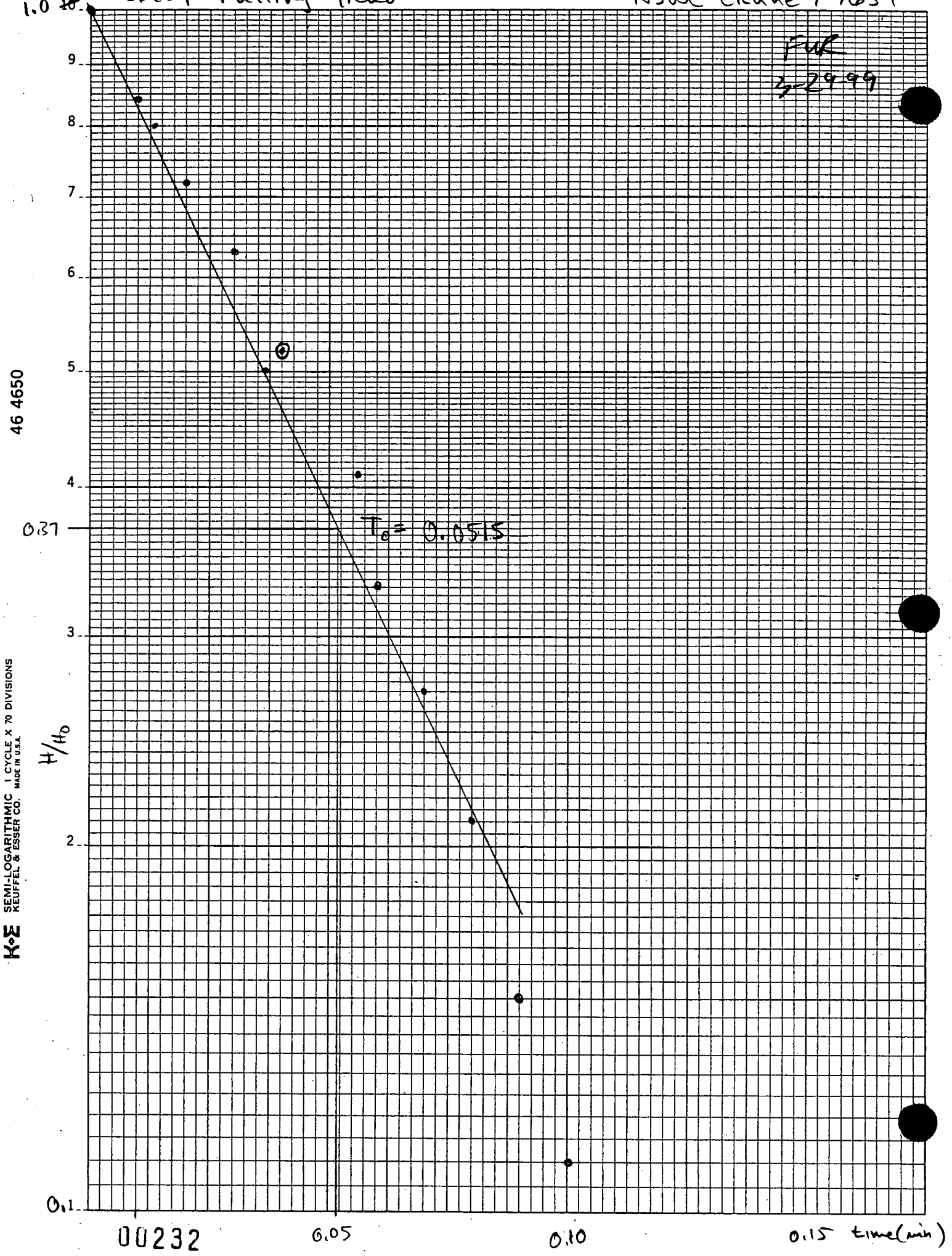
0.3233	-0.016
0.3266	-0.016
0.3300	-0.016
0.3333	-0.016
0.3500	-0.016
0.3666	-0.016
0.3833	-0.032
0.4000	0.000
0.4166	-0.016
0.4333	0.000
0.4500	-0.016
0.4666	-0.016
0.4833	-0.016
0.5000	-0.016
0.5166	-0.016
0.5333	-0.016
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	-0.016
0.6166	-0.016
0.6333	0.000
0.6500	-0.016
0.6666	-0.016
0.6833	-0.032
0.7000	-0.016
0.7166	0.000
0.7333	0.000
0.7500	-0.016
0.7666	-0.016
0.7833	-0.016
0.8000	-0.016
0.8166	-0.016
0.8333	-0.016
0.8500	0.000
0.8666	-0.016
0.8833	0.000
0.9000	-0.016
0.9166	-0.016
0.9333	-0.016
0.9500	0.000
0.9666	0.000
0.9833	-0.016
1.0000	0.000
1.2000	0.000
1.4000	-0.016
1.6000	0.000
1.8000	0.000
2.0000	0.000
2.2000	0.000
2.4000	-0.016
2.6000	0.000
2.8000	-0.016
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.016
4.2000	0.000

4.4000	-0.016
4.6000	0.000
4.8000	-0.016
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	-0.016
6.2000	0.000
6.4000	0.000
6.6000	-0.016
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	-0.016
12.0000	0.000
14.0000	0.000
16.0000	0.016

END

06C04 Falling Head NSWC Crane / 7651

FWK 2-29-99



00232

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C04 Falling Head Test		
BASED ON	Hvorslev (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-29-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.0515$ min

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

$$K = \frac{(0.083\text{ ft})^2 \ln(20.0\text{ ft}/0.16\text{ ft})}{2(20.0\text{ ft})(0.0515\text{ min})}$$

$k = 1.61 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$k = 2.33 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

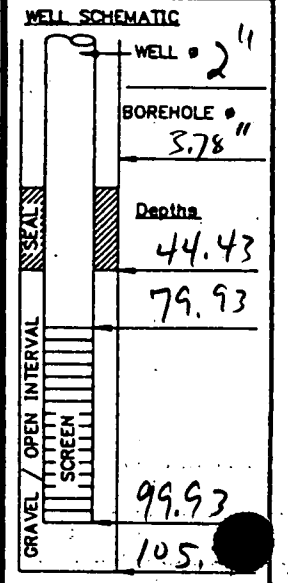
$= 8.20 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

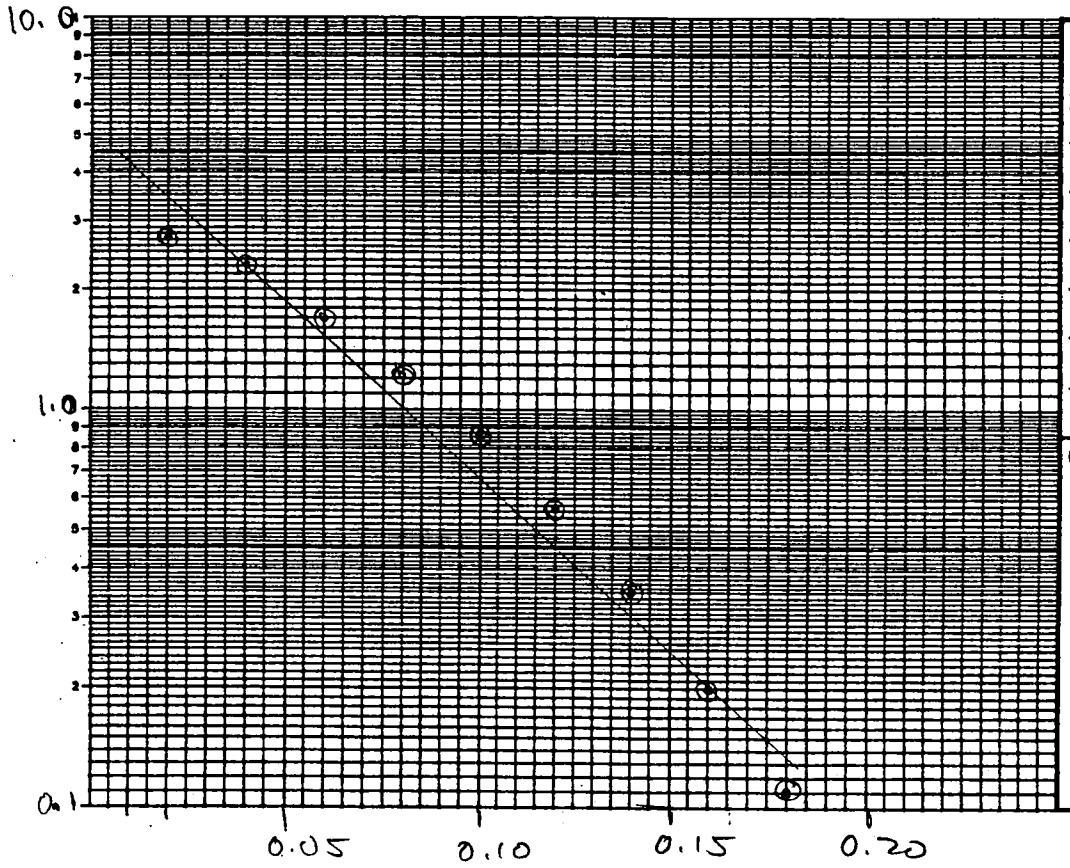
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C04
PROJECT NO.: 7651 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T9S6
STATIC WATER LEVEL (Depth/Elevation): 27.33' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø X 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.72			
0.04		2.32			
0.06		1.69			
0.08		1.23			
0.10		0.86			
0.12		0.57			
0.14		0.35			
0.16		0.20			
0.18		0.11			
0.20		0.04			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD = 70.70
Start @ 1346
Stop @ 1357

CALCS, SKETCH MAPS, ETC.:
file:
06C04 Rise.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:26

Unit# 00145 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60040
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/13 13:46:34

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	0.000
0.0066	0.320
0.0100	0.768
0.0133	1.201
0.0166	1.521
0.0200	1.970
0.0233	2.514
0.0266	2.723 ← H_0
0.0300	2.658
0.0333	2.546
0.0366	2.435
0.0400	2.322
0.0433	2.178
0.0466	2.082
0.0500	1.986
0.0533	1.890
0.0566	1.809
0.0600	1.697
0.0633	1.617
0.0666	1.538
0.0700	1.457
0.0733	1.377
0.0766	1.297
0.0800	1.233
0.0833	1.153
0.0866	1.089
0.0900	1.041
0.0933	0.976
0.0966	0.913
0.1000	0.864
0.1033	0.800
0.1066	0.752
0.1100	0.705
0.1133	0.672
0.1166	0.609
0.1200	0.576

Well #06C04
Rising Head Test
Ø6CØ4Rise.txt

H/H_0	t
1.00	0.0000
0.85	0.0134
0.76	0.0200
0.66	0.0300
0.56	0.0400
0.48	0.0500
0.40	0.0600
0.34	0.0700
0.28	0.0800
0.22	0.0900

0.1233	0.512
0.1266	0.496
0.1300	0.448
0.1333	0.416
0.1366	0.400
0.1400	0.352
0.1433	0.336
0.1466	0.304
0.1500	0.288
0.1533	0.256
0.1566	0.224
0.1600	0.208
0.1633	0.192
0.1666	0.175
0.1700	0.144
0.1733	0.144
0.1766	0.128
0.1800	0.112
0.1833	0.112
0.1866	0.096
0.1900	0.096
0.1933	0.079
0.1966	0.063
0.2000	0.047
0.2033	0.063
0.2066	0.047
0.2100	0.047
0.2133	0.032
0.2166	0.032
0.2200	0.032
0.2233	0.032
0.2266	0.032
0.2300	0.016
0.2333	0.016
0.2366	0.032
0.2400	0.016
0.2433	0.032
0.2466	0.016
0.2500	0.032
0.2533	0.016
0.2566	0.016
0.2600	0.016
0.2633	0.016
0.2666	0.016
0.2700	0.032
0.2733	0.016
0.2766	0.016
0.2800	0.032
0.2833	0.032
0.2866	0.032
0.2900	0.032
0.2933	0.016
0.2966	0.032
0.3000	0.032
0.3033	0.032
0.3066	0.032
0.3100	0.032
0.3133	0.032
0.3166	0.032
0.3200	0.032

0.18	0.1000
0.15	0.1100
0.11	0.1200
0.09	0.1300

0.3233	0.047
0.3266	0.032
0.3300	0.032
0.3333	0.032
0.3500	0.032
0.3666	0.032
0.3833	0.032
0.4000	0.032
0.4166	0.016
0.4333	0.032
0.4500	0.016
0.4666	0.016
0.4833	0.032
0.5000	0.032
0.5166	0.016
0.5333	0.016
0.5500	0.016
0.5666	0.016
0.5833	0.016
0.6000	0.016
0.6166	0.016
0.6333	0.016
0.6500	0.016
0.6666	0.032
0.6833	0.016
0.7000	0.016
0.7166	0.016
0.7333	0.016
0.7500	0.016
0.7666	0.016
0.7833	0.016
0.8000	0.016
0.8166	0.016
0.8333	0.016
0.8500	0.016
0.8666	0.016
0.8833	0.016
0.9000	0.032
0.9166	0.016
0.9333	0.016
0.9500	0.016
0.9666	0.000
0.9833	0.016
1.0000	0.016
1.2000	0.016
1.4000	0.000
1.6000	0.016
1.8000	0.000
2.0000	0.000
2.2000	0.000
2.4000	0.000
2.6000	0.016
2.8000	0.000
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.016
4.2000	0.000

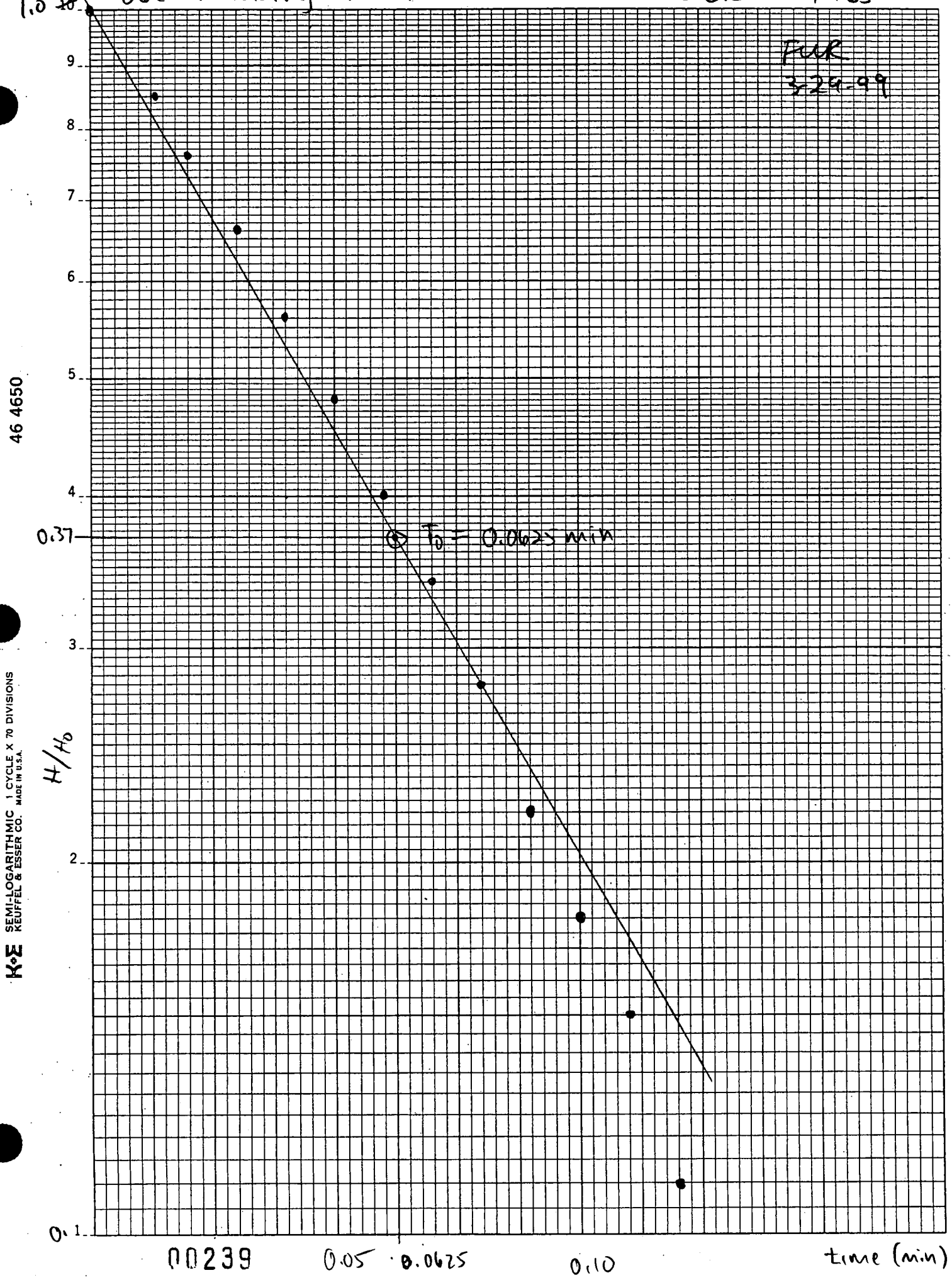
4.4000	0.000
4.6000	0.000
4.8000	0.000
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.016
6.4000	0.000
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	-0.016
7.4000	0.016
7.6000	0.016
7.8000	0.000
8.0000	0.000
8.2000	0.016
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	-0.016
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	-0.016
10.0000	0.000

END

06C04 Rising Head

NSWC CRANE /7651

FWR
3-29-99



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	D6C04 Rising Head Test		
BASED ON	Hvorslev (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-29-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.0625$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\text{ ft})^2 \ln(20.0\text{ ft}/0.16\text{ ft})}{2(20.0\text{ ft})(0.0625\text{ min})}$$

$K = 1.33 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 1.92 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

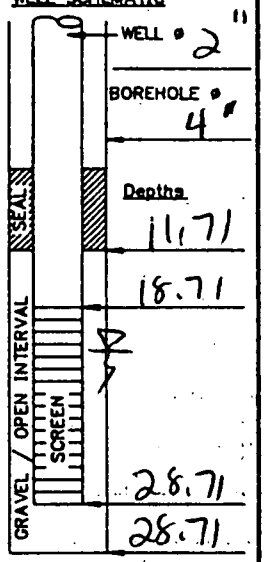
$= 6.76 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

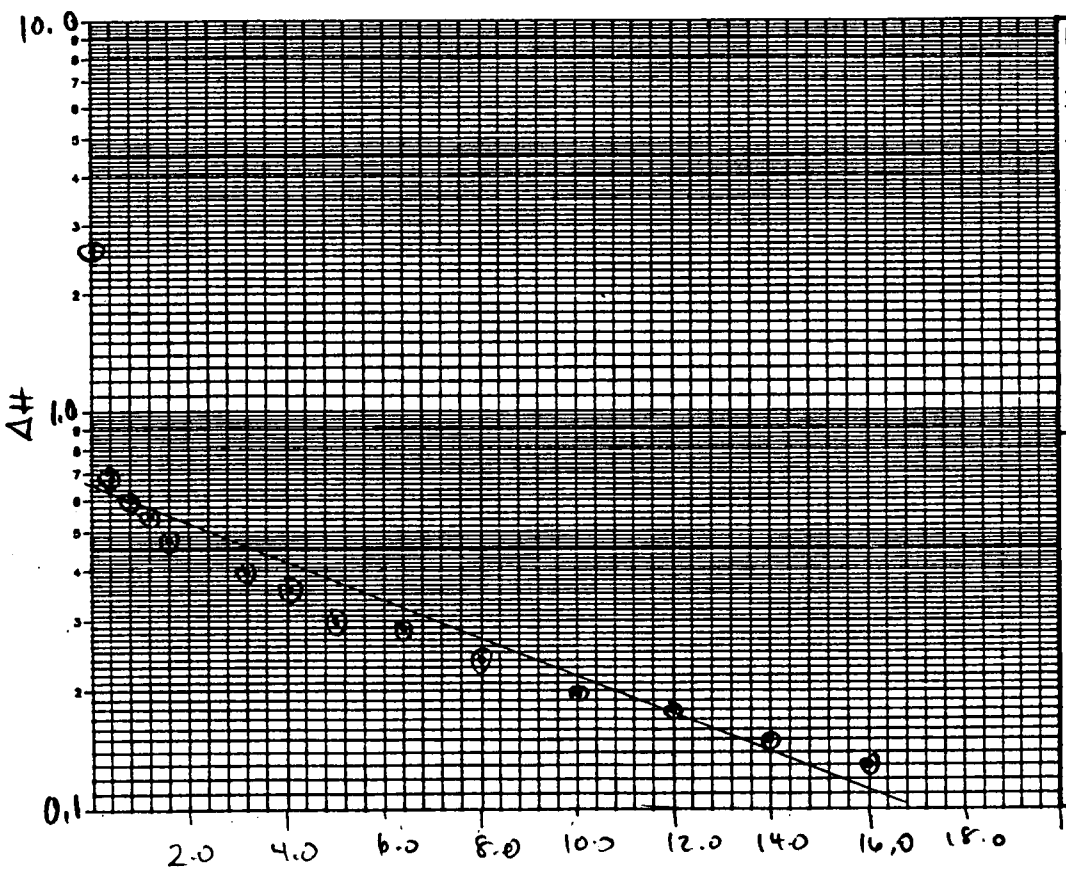
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C04P2
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1750
STATIC WATER LEVEL (Depth/Elevation): 19.39' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.62	10.00		0.20
0.40		0.68	12.00		0.18
0.80		0.60	14.00		0.15
1.20		0.55	16.00		0.13
2.00		0.47			
3.20		0.40			
4.00		0.36			
5.00		0.33			
6.00		0.29			
7.00		0.26			
8.00		0.24			
9.00		0.22			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 201804
20 psi
H_2O above XD 7.89
Start @ 1738
Stop @ 1914

CALCS, SKETCH MAPS, ETC.:
file:
06C04P2Rise.txt

UU241

FWR
3-29-99

SE1000C
Environmental Logger
03/14 08:22

Unit# 00145 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60042
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Step 0 03/13 17:38:32

Elapsed Time	INPUT 1
0.0000	-0.057
0.0033	3.055
0.0066	2.648
0.0100	2.782
0.0133	2.242
0.0166	2.508
0.0200	2.623 ←
0.0233	2.540
0.0266	2.445
0.0300	2.375
0.0333	2.305
0.0366	2.223
0.0400	2.147
0.0433	2.077
0.0466	2.013
0.0500	1.918
0.0533	1.854
0.0566	1.797
0.0600	1.721
0.0633	1.658
0.0666	1.594
0.0700	1.530
0.0733	1.467
0.0766	1.403
0.0800	1.353
0.0833	1.289
0.0866	1.245
0.0900	1.200
0.0933	1.156
0.0966	1.118
0.1000	1.079
0.1033	1.048
0.1066	1.016
0.1100	0.991
0.1133	0.965
0.1166	0.946
0.1200	0.927

Well # 06C04P2
Rising Head Test
06C04P2 Rise.txt

H/H_0	t
1.00	0.0000
0.91	0.0100
0.82	0.0200
0.66	0.0400
0.52	0.0600
0.40	0.0833
0.35	0.1000

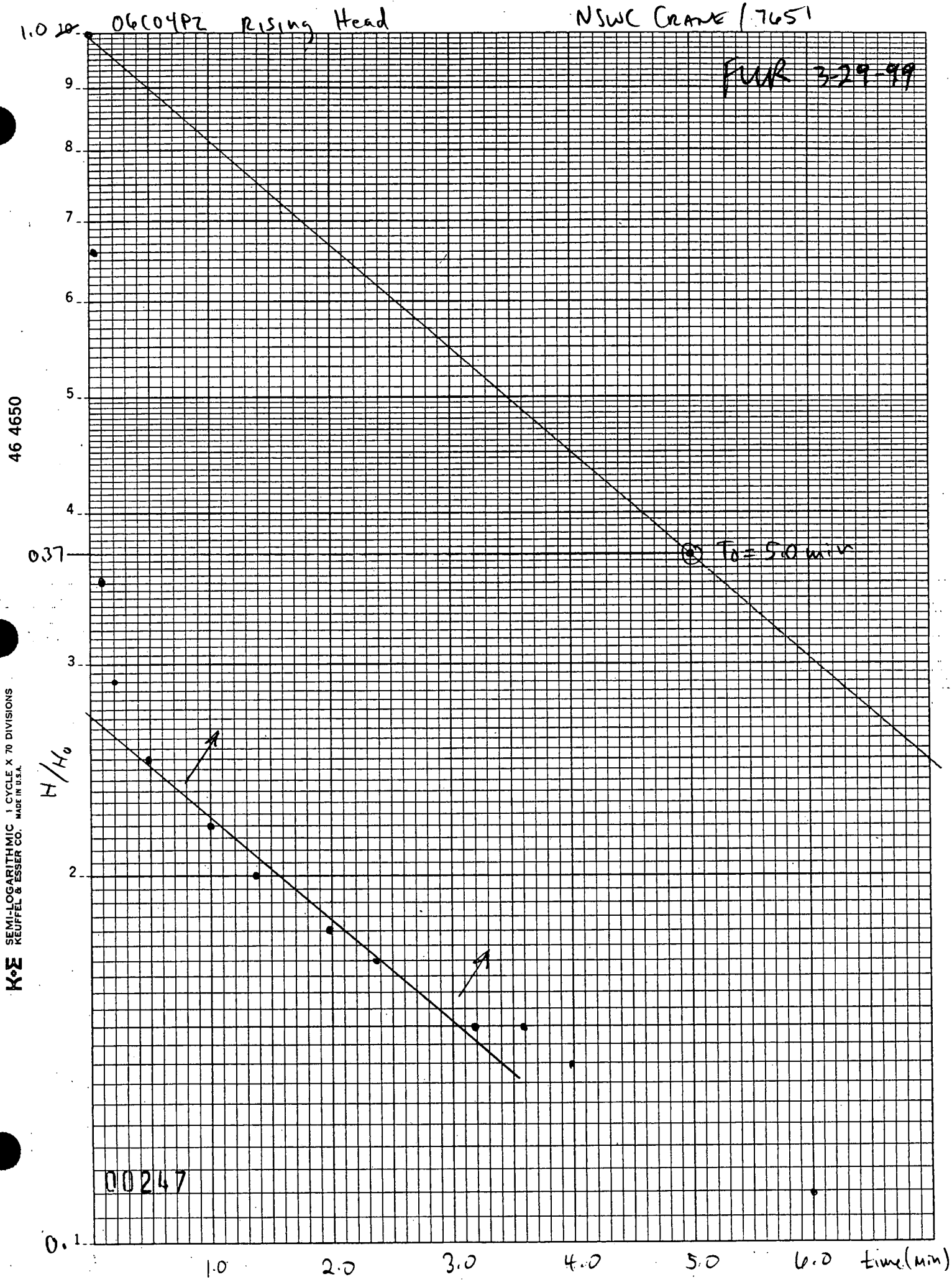
0.1233	0.914		
0.1266	0.902		
0.1300	0.889		
0.1333	0.883		
0.1366	0.870		
0.1400	0.863		
0.1433	0.851		
0.1466	0.851		
0.1500	0.844		
0.1533	0.838		
0.1566	0.832		
0.1600	0.825		
0.1633	0.825		
0.1666	0.819		
0.1700	0.819		
0.1733	0.813		
0.1766	0.819		
0.1800	0.806		
0.1833	0.806		
0.1866	0.794		
0.1900	0.794	0.30	0.1700
0.1933	0.794		
0.1966	0.787		
0.2000	0.794		
0.2033	0.787		
0.2066	0.787		
0.2100	0.781		
0.2133	0.775		
0.2166	0.775		
0.2200	0.768	0.29	0.2000
0.2233	0.768		
0.2266	0.762		
0.2300	0.762		
0.2333	0.755		
0.2366	0.762		
0.2400	0.755		
0.2433	0.762		
0.2466	0.755		
0.2500	0.762		
0.2533	0.755		
0.2566	0.749		
0.2600	0.749		
0.2633	0.749		
0.2666	0.755		
0.2700	0.743		
0.2733	0.736		
0.2766	0.736		
0.2800	0.743		
0.2833	0.736		
0.2866	0.736		
0.2900	0.730		
0.2933	0.730		
0.2966	0.730		
0.3000	0.717		
0.3033	0.736		
0.3066	0.736		
0.3100	0.730		
0.3133	0.724		
0.3166	0.717		
0.3200	0.717		

0.3233	0.717		
0.3266	0.717		
0.3300	0.717		
0.3333	0.705		
0.3500	0.711		
0.3666	0.698		
0.3833	0.698		
0.4000	0.686		
0.4166	0.686		
0.4333	0.679	0.26	0.4133
0.4500	0.673		
0.4666	0.667		
0.4833	0.654		
0.5000	0.667	0.25	0.4800
0.5166	0.660		
0.5333	0.654		
0.5500	0.648		
0.5666	0.641		
0.5833	0.641		
0.6000	0.641		
0.6166	0.635		
0.6333	0.635		
0.6500	0.628		
0.6666	0.628		
0.6833	0.628		
0.7000	0.622		
0.7166	0.622		
0.7333	0.616		
0.7500	0.622		
0.7666	0.609		
0.7833	0.609		
0.8000	0.603		
0.8166	0.603		
0.8333	0.603		
0.8500	0.597		
0.8666	0.597		
0.8833	0.597		
0.9000	0.597		
0.9166	0.590		
0.9333	0.590		
0.9500	0.584		
0.9666	0.584		
0.9833	0.584		
1.0000	0.578	0.22	0.9800
1.2000	0.552		
1.4000	0.533	0.20	1.3800
1.6000	0.514		
1.8000	0.495		
2.0000	0.476	0.18	1.9800
2.2000	0.470		
2.4000	0.451	0.17	2.3800
2.6000	0.444		
2.8000	0.432		
3.0000	0.419		
3.2000	0.406	0.15	3.1800
3.4000	0.393		
3.6000	0.393	0.15	3.5800
3.8000	0.381		
4.0000	0.368	0.14	3.9800
4.2000	0.362		

4.4000	0.355		
4.6000	0.343		
4.8000	0.343		
5.0000	0.336		
5.2000	0.324		
5.4000	0.317		
5.6000	0.304		
5.8000	0.304		
6.0000	0.298	0.11	5.9800
6.2000	0.292		
6.4000	0.285		
6.6000	0.279		
6.8000	0.273	0.12	6.7800
7.0000	0.266		
7.2000	0.260		
7.4000	0.260		
7.6000	0.254		
7.8000	0.254		
8.0000	0.247		
8.2000	0.241		
8.4000	0.241		
8.6000	0.235		
8.8000	0.228		
9.0000	0.228		
9.2000	0.222		
9.4000	0.209		
9.6000	0.216		
9.8000	0.209		
10.0000	0.203		
12.0000	0.184		
14.0000	0.152		
16.0000	0.133		
18.0000	0.127		
20.0000	0.108		
22.0000	0.101		
24.0000	0.088		
26.0000	0.088		
28.0000	0.076		
30.0000	0.076		
32.0000	0.076		
34.0000	0.063		
36.0000	0.063		
38.0000	0.063		
40.0000	0.057		
42.0000	0.050		
44.0000	0.050		
46.0000	0.050		
48.0000	0.050		
50.0000	0.050		
52.0000	0.050		
54.0000	0.044		
56.0000	0.044		
58.0000	0.044		
60.0000	0.044		
62.0000	0.044		
64.0000	0.044		
66.0000	0.038		
68.0000	0.044		
70.0000	0.044		
72.0000	0.038		

74.0000	0.038
76.0000	0.038
78.0000	0.031
80.0000	0.038
82.0000	0.031
84.0000	0.038
86.0000	0.038
88.0000	0.038
90.0000	0.038
92.0000	0.038
94.0000	0.038
96.0000	0.031

END


06C04P2 Rising Head
NSWC Crane / 7651
FWR 3-29-99
1.0
9
8
7
6
5
4
0.37
3
2
0.1
H/H₀
T₀ = 5.0 min
1.0
2.0
3.0
4.0
5.0
6.0
time (min)
00247
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06C04P2 RISING HEAD			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: 3-29-99	APPROVED BY:	DATE:

$$r = \sqrt{r_i^2(1-n) + n\,r_o^2}$$ (Dawson & Istok, 1991)

where r_i = well screen I.D.
n = porosity of filter pack, assumed 0.25
r_o = filter pack or borehole O.D.

$\therefore$

$$r = \sqrt{(0.083\ ft)^2(1-0.25) + (0.25)(0.167\ ft)^2}$$

$$= \sqrt{0.0121\ ft^2}$$

$$= 0.110\ ft$$

$R = 0.167\ ft$
$L = 9.32\ ft$

$t_o = 5.0\ min$

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

$$K = \frac{(0.110\ ft)^2 \ln(9.32\ ft / 0.167\ ft)}{2(9.32\ ft)(5.0\ min)}$$

$$K = 5.22 \times 10^{-4}\ ft/min \times 1440\ min/day$$

$$K = 7.51 \times 10^{-1}\ ft/day \times 1\ cm/s / 2835\ ft/day$$

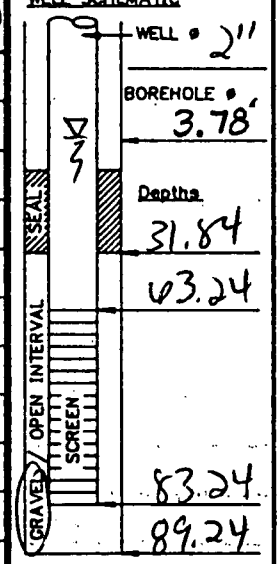
$$= 2.65 \times 10^{-4}\ cm/s$$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

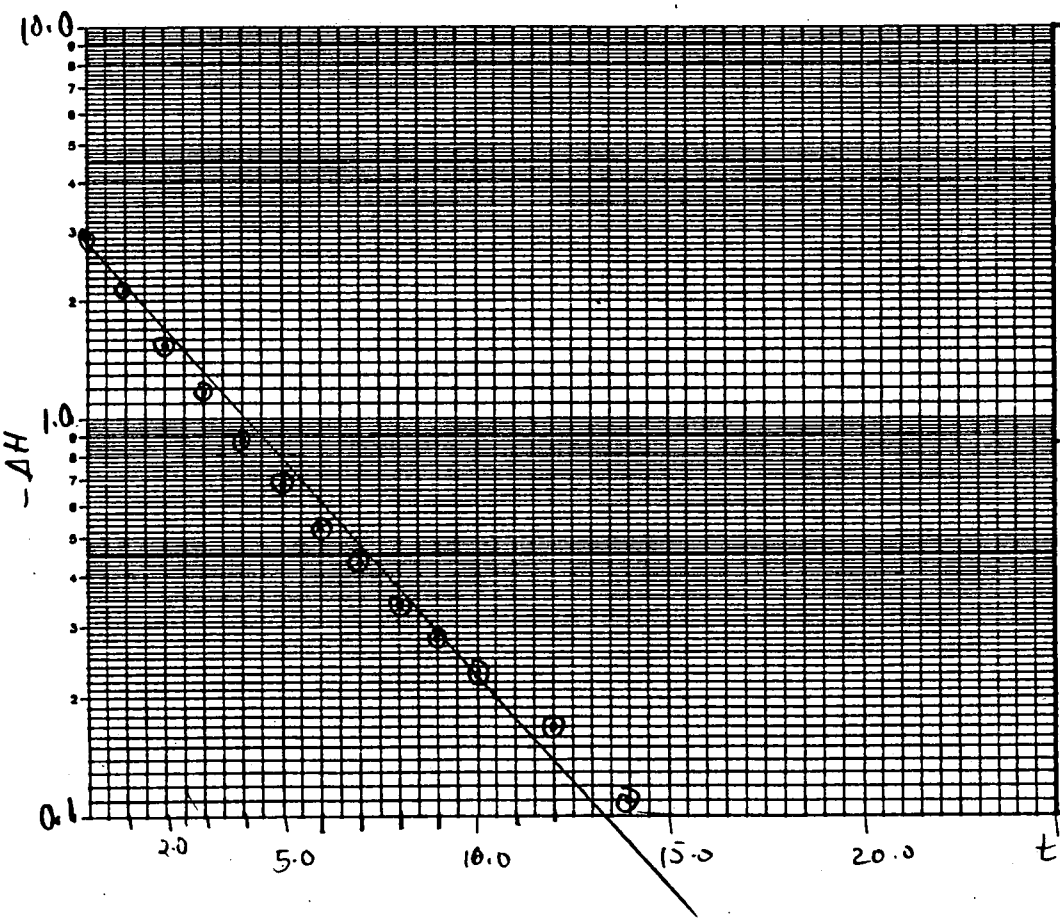
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C05
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T105Ø
STATIC WATER LEVEL (Depth/Elevation): 15.53' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.09		-2.90	10.00		-0.23
0.10		-2.886	12.00		-0.17
0.50		-2.52	14.00		-0.11
1.00		-2.14	16.00		-0.07
2.00		-1.55			
3.00		-1.17			
4.00		-0.88			
5.00		-0.69			
6.00		-0.53			
7.00		-0.44			
8.00		-0.34			
9.00		-0.28			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XO S/N 1670
50 psi
H_2O above XO = 65.42
Start @ 1423
Stop @ 1440

CALCS, SKETCH MAPS, ETC.:
file:
06C05 Fall.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:35

Unit# 00145 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60050
Reference	0.000
Linearity	0.070
Scale factor	50.240
Offset	-0.080
Delay mSEC	50.000

Step 0 03/13 14:23:17

Elapsed Time	INPUT 1
0.0000	-0.016
0.0033	-1.633
0.0066	-2.854
0.0100	-4.108
0.0133	-4.822
0.0166	-4.695
0.0200	-4.361
0.0233	-4.425
0.0266	-4.441
0.0300	-4.393
0.0333	-4.425
0.0366	-4.457
0.0400	-4.393
0.0433	-3.600
0.0466	-2.315
0.0500	-2.347
0.0533	-2.442
0.0566	-3.124
0.0600	-2.965
0.0633	-2.934
0.0666	-2.918
0.0700	-2.918
0.0733	-2.902
0.0766	-2.918
0.0800	-2.902
0.0833	-2.934
0.0866	-2.886
0.0900	-2.902
0.0933	-2.886
0.0966	-2.902 ←
0.1000	-2.886
0.1033	-2.886
0.1066	-2.870
0.1100	-2.870
0.1133	-2.870
0.1166	-2.870
0.1200	-2.870

Well # 06C05
Falling Head Test
Ø6CØ5 FALL.txt

H/H_0	t
1.00	0.0000
0.94	0.0267

00250

0.1233	-2.854		
0.1266	-2.854		
0.1300	-2.854		
0.1333	-2.854		
0.1366	-2.839		
0.1400	-2.839		
0.1433	-2.839		
0.1466	-2.839		
0.1500	-2.839		
0.1533	-2.839		
0.1566	-2.807		
0.1600	-2.823		
0.1633	-2.823		
0.1666	-2.759		
0.1700	-2.807	0.90	0.1134
0.1733	-2.807		
0.1766	-2.807		
0.1800	-2.807		
0.1833	-2.791		
0.1866	-2.791		
0.1900	-2.791		
0.1933	-2.791		
0.1966	-2.775		
0.2000	-2.918		
0.2033	-2.664		
0.2066	-2.759		
0.2100	-2.759		
0.2133	-2.759		
0.2166	-2.743		
0.2200	-2.775		
0.2233	-2.759		
0.2266	-2.759		
0.2300	-2.743		
0.2333	-2.743		
0.2366	-2.743		
0.2400	-2.743		
0.2433	-2.727		
0.2466	-2.743		
0.2500	-2.743		
0.2533	-2.727		
0.2566	-2.727	0.87	0.2000
0.2600	-2.727		
0.2633	-2.712		
0.2666	-2.712		
0.2700	-2.712		
0.2733	-2.712		
0.2766	-2.712		
0.2800	-2.712		
0.2833	-2.696		
0.2866	-2.696		
0.2900	-2.696		
0.2933	-2.696		
0.2966	-2.696		
0.3000	-2.680		
0.3033	-2.680		
0.3066	-2.680		
0.3100	-2.680		
0.3133	-2.664		
0.3166	-2.680		
0.3200	-2.664	0.85	0.2634

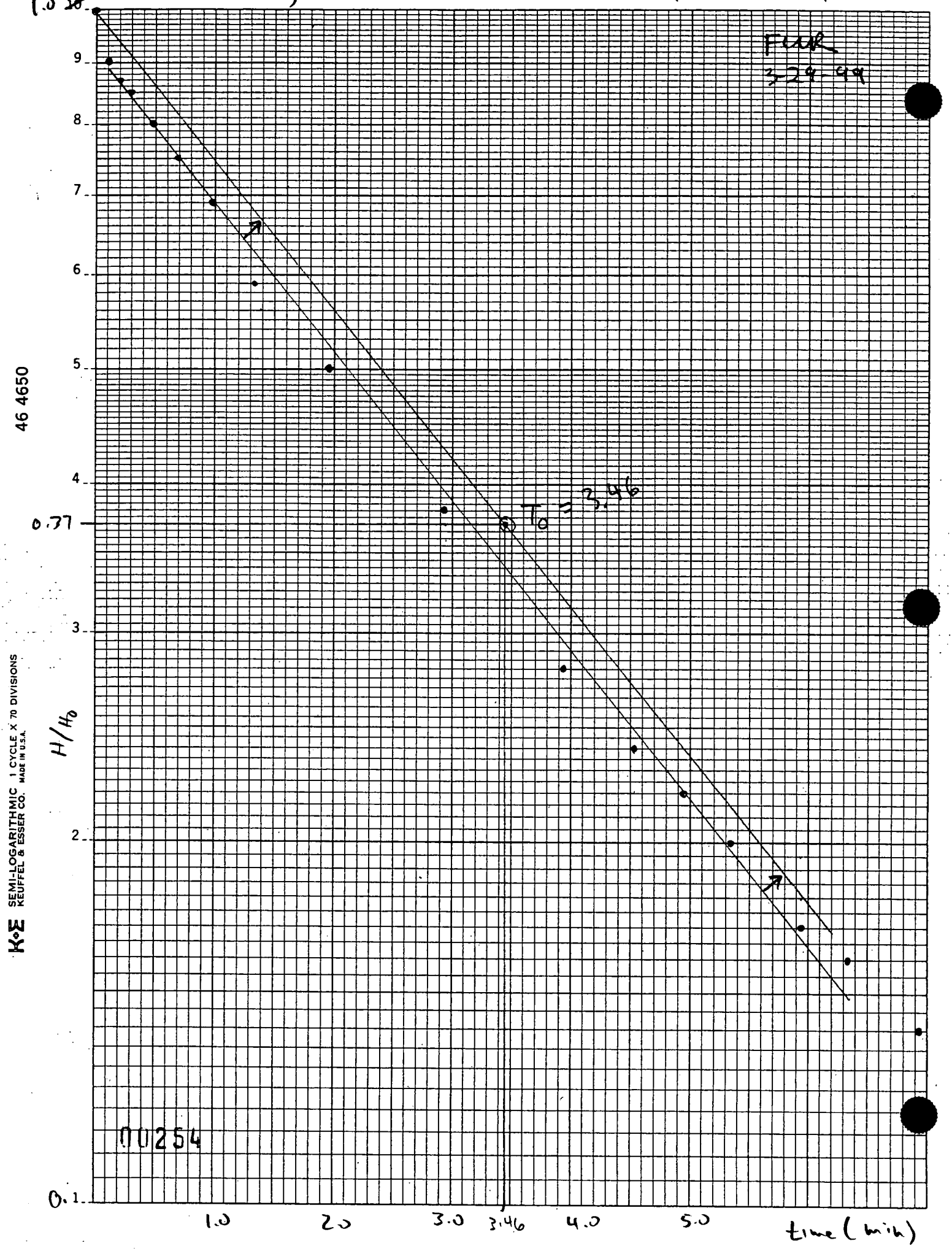
0.3233	-2.664		
0.3266	-2.664		
0.3300	-2.648		
0.3333	-2.648		
0.3500	-2.648		
0.3666	-2.648		
0.3833	-2.632		
0.4000	-2.616		
0.4166	-2.601		
0.4333	-2.585		
0.4500	-2.569		
0.4666	-2.553		
0.4833	-2.537		
0.5000	-2.521		
0.5166	-2.505	0.80	0.4600
0.5333	-2.490		
0.5500	-2.490		
0.5666	-2.474		
0.5833	-2.458		
0.6000	-2.442		
0.6166	-2.426		
0.6333	-2.410		
0.6500	-2.395		
0.6666	-2.395		
0.6833	-2.378		
0.7000	-2.363		
0.7166	-2.347	0.75	0.6600
0.7333	-2.331		
0.7500	-2.331		
0.7666	-2.315		
0.7833	-2.299		
0.8000	-2.283		
0.8166	-2.267		
0.8333	-2.267		
0.8500	-2.252		
0.8666	-2.236		
0.8833	-2.220		
0.9000	-2.220		
0.9166	-2.204		
0.9333	-2.188		
0.9500	-2.172	0.70	0.8934
0.9666	-2.172		
0.9833	-2.157		
1.0000	-2.141	0.64	0.9434
1.2000	-1.982		
1.4000	-1.856	0.54	1.3434
1.6000	-1.744		
1.8000	-1.649		
2.0000	-1.554	0.50	1.9434
2.2000	-1.459		
2.4000	-1.380	0.44	2.3434
2.6000	-1.301		
2.8000	-1.237		
3.0000	-1.173	0.38	2.9434
3.2000	-1.110		
3.4000	-1.046		
3.6000	-0.983	0.31	3.5434
3.8000	-0.935		
4.0000	-0.888	0.28	3.9434
4.2000	-0.841		

4.4000	-0.809		
4.6000	-0.761	0.24	4.5434
4.8000	-0.729		
5.0000	-0.698	0.22	4.9434
5.2000	-0.666		
5.4000	-0.634	0.20	5.3434
5.6000	-0.603		
5.8000	-0.570		
6.0000	-0.539	0.17	5.9435
6.2000	-0.523		
6.4000	-0.491	0.16	6.3434
6.6000	-0.475		
6.8000	-0.460		
7.0000	-0.444	0.14	6.9434
7.2000	-0.412		
7.4000	-0.396		
7.6000	-0.381		
7.8000	-0.365		
8.0000	-0.349	0.11	7.9434
8.2000	-0.349		
8.4000	-0.333		
8.6000	-0.317		
8.8000	-0.301		
9.0000	-0.285	0.09	8.9434
9.2000	-0.285		
9.4000	-0.269		
9.6000	-0.254		
9.8000	-0.254		
10.0000	-0.238		
12.0000	-0.174		
14.0000	-0.111		
16.0000	-0.079		

END

06C05 Falling Head

NSWC Crane /7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C05 Falling Head Test		
BASED ON	Hvorslev (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-29-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 3.46$ min

$$K = \frac{r^2 \ln(L/R)}{2LR}$$

$$K = \frac{(0.083\ ft)^2 \ln(20.0\ ft / 0.16\ ft)}{2(20.0\ ft)(0.167\ ft)}$$

$K = 4.98 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 7.17 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

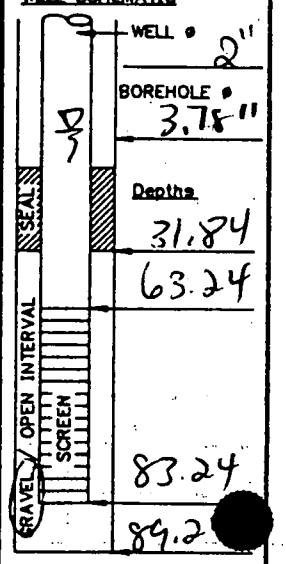
$= 2.53 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

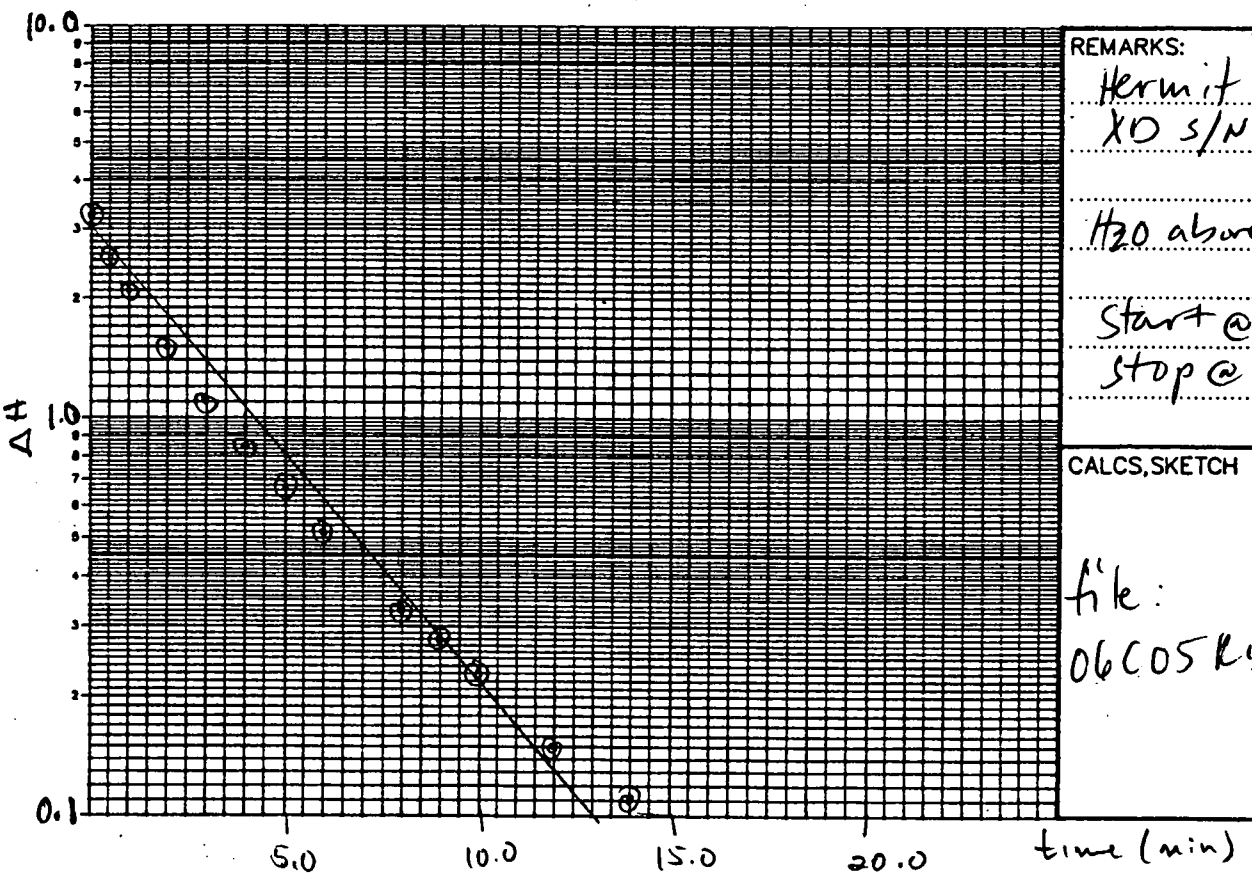
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C05
PROJECT NO.: 7657 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 TEST NO.: T 1150
STATIC WATER LEVEL (Depth/Elevation): 15.48' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		3.29	12.00		0.15
0.50		2.49	14.00		0.11
1.00		2.09			
2.00		1.50			
3.00		1.12			
4.00		0.85			
5.00		0.66			
6.00		0.52			
8.00		0.33			
9.00		0.28			
10.00		0.23			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50 psi
H2O above XD = 6.50
Start @ 1441
Stop @ 1456

CALCS, SKETCH MAPS, ETC.:
file:
06C05Rise

00256

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:38

Unit# 00145 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60050
Reference	0.000
Linearity	0.070
Scale factor	50.240
Offset	-0.080
Delay mSEC	50.000

Well # 06C05
Rising Head Test
06C05 Rise.txt

Step 0 03/13 14:41:01

Elapsed Time	INPUT 1		H/H_0	t
0.0000	-0.063			
0.0033	-0.063			
0.0066	0.475			
0.0100	4.773			
0.0133	2.823			
0.0166	2.458			
0.0200	3.299	← H_0	1.00	0.0000
0.0233	3.156			
0.0266	3.108			
0.0300	3.092			
0.0333	3.076			
0.0366	3.076			
0.0400	3.060			
0.0433	3.045			
0.0466	3.029			
0.0500	3.029			
0.0533	3.013			
0.0566	3.013			
0.0600	2.997			
0.0633	2.997			
0.0666	2.997			
0.0700	2.981		0.90	0.0500
0.0733	2.965			
0.0766	2.965			
0.0800	2.965			
0.0833	2.950			
0.0866	2.950			
0.0900	2.934			
0.0933	2.934			
0.0966	2.934			
0.1000	2.950			
0.1033	2.934			
0.1066	2.934			
0.1100	2.918			
0.1133	2.918			
0.1166	2.918			
0.1200	2.902		0.88	0.1000

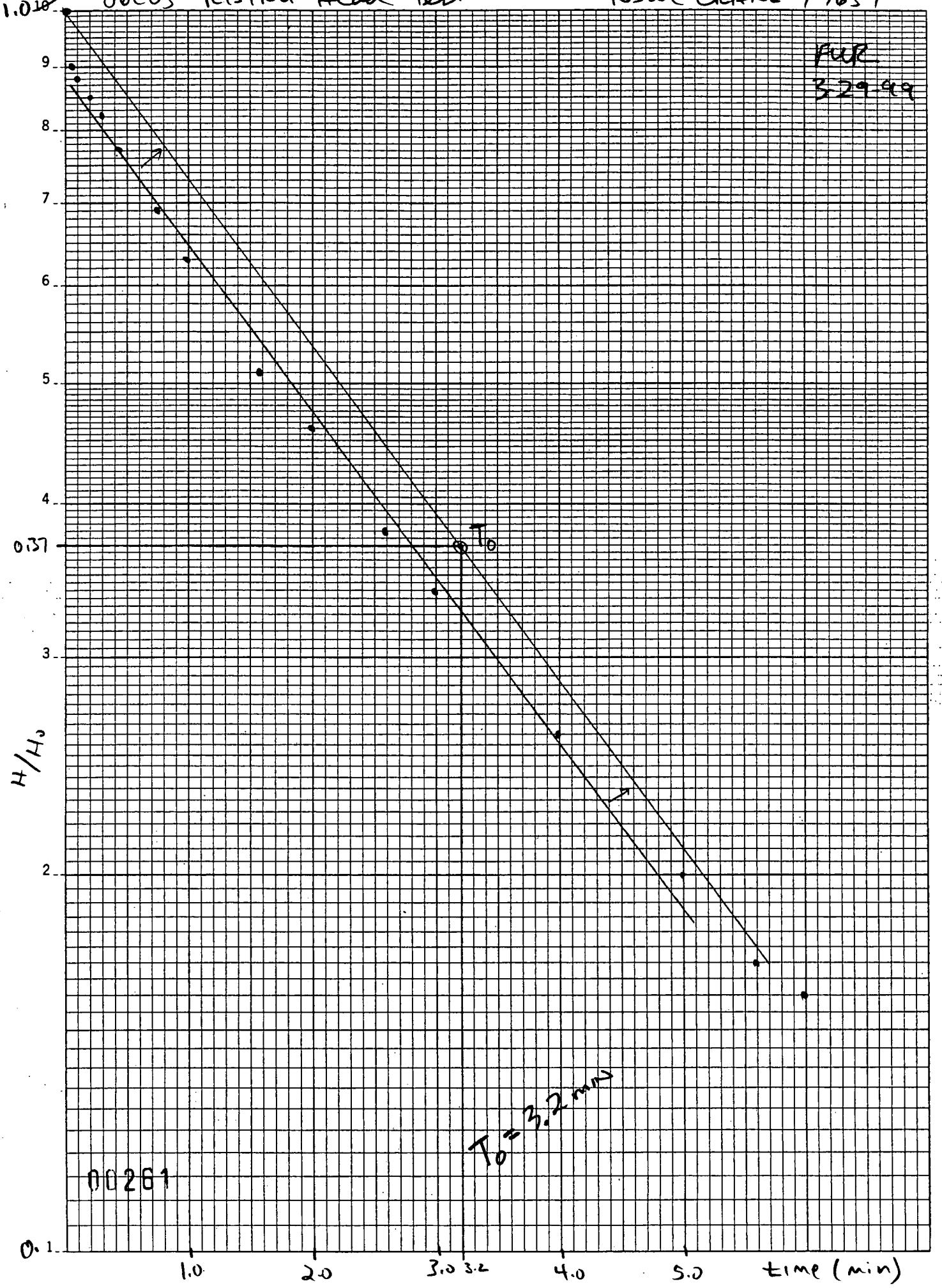
0.1233	2.902		
0.1266	2.902		
0.1300	2.902		
0.1333	2.886		
0.1366	2.886		
0.1400	2.886		
0.1433	2.870		
0.1466	2.870		
0.1500	2.870		
0.1533	2.854		
0.1566	2.870		
0.1600	2.854		
0.1633	2.839		
0.1666	2.854		
0.1700	2.839		
0.1733	2.839		
0.1766	2.839		
0.1800	2.839		
0.1833	2.839		
0.1866	2.823		
0.1900	2.823		
0.1933	2.823		
0.1966	2.807		
0.2000	2.807		
0.2033	2.807		
0.2066	2.807		
0.2100	2.807		
0.2133	2.791		
0.2166	2.791		
0.2200	2.791	0.85	0.2000
0.2233	2.775		
0.2266	2.775		
0.2300	2.775		
0.2333	2.775		
0.2366	2.759		
0.2400	2.775		
0.2433	2.743		
0.2466	2.759		
0.2500	2.759		
0.2533	2.759		
0.2566	2.759		
0.2600	2.759		
0.2633	2.727		
0.2666	2.743		
0.2700	2.743		
0.2733	2.727		
0.2766	2.727		
0.2800	2.727		
0.2833	2.727		
0.2866	2.712		
0.2900	2.712		
0.2933	2.712		
0.2966	2.712		
0.3000	2.712		
0.3033	2.696		
0.3066	2.696		
0.3100	2.696		
0.3133	2.696		
0.3166	2.696		
0.3200	2.696	0.82	0.3000

0.3233	2.680		
0.3266	2.680		
0.3300	2.680		
0.3333	2.680		
0.3500	2.632		
0.3666	2.616		
0.3833	2.601		
0.4000	2.585		
0.4166	2.553		
0.4333	2.553		
0.4500	2.537	0.77	0.4300
0.4666	2.521		
0.4833	2.490		
0.5000	2.490		
0.5166	2.474		
0.5333	2.458		
0.5500	2.442		
0.5666	2.426		
0.5833	2.410		
0.6000	2.395		
0.6166	2.379		
0.6333	2.363		
0.6500	2.363		
0.6666	2.347		
0.6833	2.331		
0.7000	2.315		
0.7166	2.299		
0.7333	2.283		
0.7500	2.267		
0.7666	2.267	0.69	0.7466
0.7833	2.252		
0.8000	2.236		
0.8166	2.220		
0.8333	2.204		
0.8500	2.204		
0.8666	2.188		
0.8833	2.172		
0.9000	2.157		
0.9166	2.157		
0.9333	2.141		
0.9500	2.125		
0.9666	2.109		
0.9833	2.109		
1.0000	2.093	0.63	0.9800
1.2000	1.919		
1.4000	1.808		
1.6000	1.697	0.51	1.5800
1.8000	1.602		
2.0000	1.506	0.46	1.9800
2.2000	1.411		
2.4000	1.332		
2.6000	1.253	0.38	2.5800
2.8000	1.189		
3.0000	1.126	0.34	2.9800
3.2000	1.062		
3.4000	1.015		
3.6000	0.951		
3.8000	0.904		
4.0000	0.856	0.26	3.9800
4.2000	0.808		

4.4000	0.777		
4.6000	0.729		
4.8000	0.698		
5.0000	0.666	0.20	4.9800
5.2000	0.634		
5.4000	0.602		
5.6000	0.571	0.17	5.5800
5.8000	0.555		
6.0000	0.523	0.16	5.9800
6.2000	0.507		
6.4000	0.475		
6.6000	0.459		
6.8000	0.444		
7.0000	0.428	0.13	6.9800
7.2000	0.396		
7.4000	0.380		
7.6000	0.364		
7.8000	0.348		
8.0000	0.333		
8.2000	0.317		
8.4000	0.317		
8.6000	0.301		
8.8000	0.285		
9.0000	0.285		
9.2000	0.269		
9.4000	0.254		
9.6000	0.254		
9.8000	0.238		
10.0000	0.238		
12.0000	0.158		
14.0000	0.110		

END

06C05 Rising Head test NSWC Crane 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C05 RISING HEAD TEST			
BASED ON Hvorslev (1951		DRAWING NUMBER	
BY TSE	CHECKED BY SRRamaer 3-29-99	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 3.2$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\text{ ft})^2 \ln(20.0\text{ ft}/0.16\text{ ft})}{2(20.0\text{ ft})(3.2\text{ min})}$$

$K = 2.60 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 3.74 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

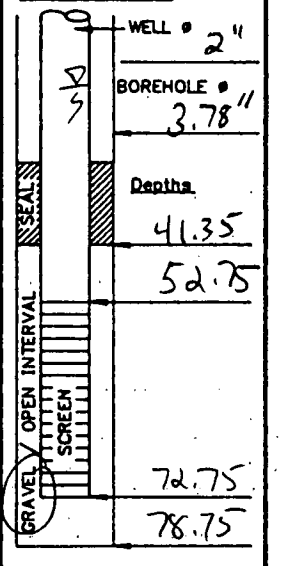
$= 1.32 \times 10^{-4}$ cm/s

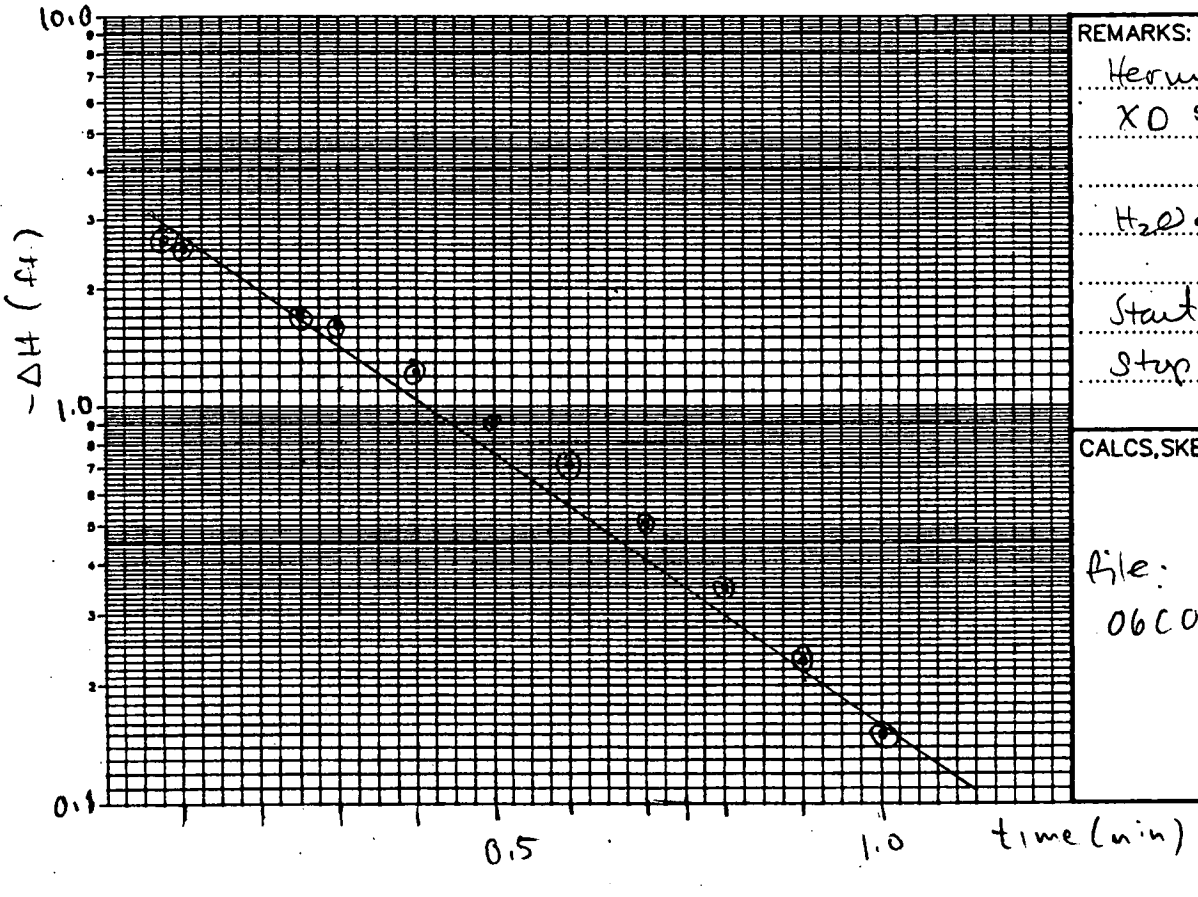
HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C06
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NETL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T1250
STATIC WATER LEVEL (Depth/Elevation): 19.12' TOC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.08		-2.65	1.40		-0.01
0.10		-2.54			
0.25		-1.80			
0.30		-1.61			
0.40		-1.23			
0.50		-0.92			
0.60		-0.72			
0.70		-0.51			
0.80		-0.35			
0.90		-0.23			
1.00		-0.15			
1.20		-0.03			

WELL SCHEMATIC





REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD 51.37
Start @ 1510
Stop @ 1524

CALCS, SKETCH MAPS, ETC.:
file: 06C06Fall.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:49

Unit# 00145 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60060
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C06
Falling Head Test
06C06 Fall.txt

Step 0 03/13 15:10:07

Elapsed Time	INPUT 1
0.0000	0.016
0.0033	0.016
0.0066	0.032
0.0100	0.016
0.0133	0.016
0.0166	0.000
0.0200	-0.512
0.0233	-1.904
0.0266	-3.474
0.0300	-3.906
0.0333	-3.922
0.0366	-3.922
0.0400	-4.082
0.0433	-3.938
0.0466	-3.858
0.0500	-3.842
0.0533	-3.954
0.0566	-4.130
0.0600	-4.146
0.0633	-3.505
0.0666	-2.369
0.0700	-1.984
0.0733	-2.337
0.0766	-2.561
0.0800	-2.497
0.0833	-2.657 ←
0.0866	-2.577
0.0900	-2.577
0.0933	-2.577
0.0966	-2.545
0.1000	-2.545
0.1033	-2.513
0.1066	-2.497
0.1100	-2.497
0.1133	-2.465
0.1166	-2.449
0.1200	-2.449

H/H_0	t
1.00	0.0000
0.96	0.0167

00264

0.1233	-2.449		
0.1266	-2.369		
0.1300	-2.369		
0.1333	-2.353	0.89	0.0500
0.1366	-2.337		
0.1400	-2.321		
0.1433	-2.305		
0.1466	-2.288		
0.1500	-2.273		
0.1533	-2.241		
0.1566	-2.241		
0.1600	-2.225		
0.1633	-2.209		
0.1666	-2.193		
0.1700	-2.177		
0.1733	-2.160		
0.1766	-2.145		
0.1800	-2.129		
0.1833	-2.112	0.79	0.1000
0.1866	-2.097		
0.1900	-2.081		
0.1933	-2.064		
0.1966	-2.049		
0.2000	-2.049		
0.2033	-2.032		
0.2066	-2.001		
0.2100	-1.984		
0.2133	-1.969		
0.2166	-1.952		
0.2200	-1.952		
0.2233	-1.952	0.74	0.1500
0.2266	-1.921		
0.2300	-1.904		
0.2333	-1.904		
0.2366	-1.856		
0.2400	-1.873		
0.2433	-1.840		
0.2466	-1.824		
0.2500	-1.808		
0.2533	-1.808		
0.2566	-1.792		
0.2600	-1.776		
0.2633	-1.760		
0.2666	-1.744		
0.2700	-1.744		
0.2733	-1.728		
0.2766	-1.696		
0.2800	-1.696		
0.2833	-1.696	0.64	0.2000
0.2866	-1.664		
0.2900	-1.648		
0.2933	-1.632		
0.2966	-1.632		
0.3000	-1.616		
0.3033	-1.616		
0.3066	-1.584		
0.3100	-1.584		
0.3133	-1.584		
0.3166	-1.552		
0.3200	-1.552		

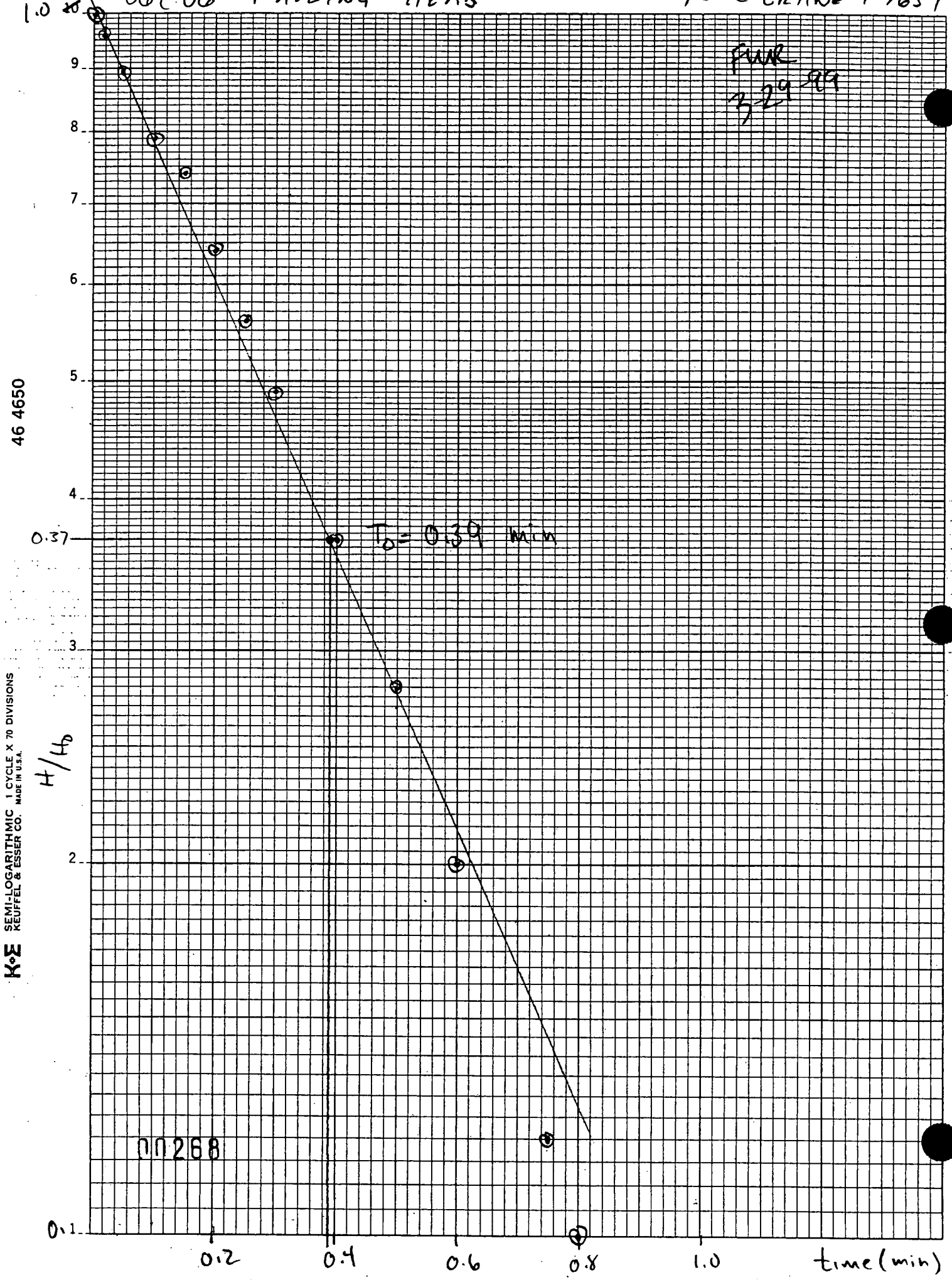
0.3233	-1.536		
0.3266	-1.504		
0.3300	-1.488		
0.3333	-1.488	0.56	0.2500
0.3500	-1.424		
0.3666	-1.360		
0.3833	-1.312	0.49	0.3000
0.4000	-1.232		
0.4166	-1.200		
0.4333	-1.136		
0.4500	-1.088		
0.4666	-1.040		
0.4833	-0.992	0.37	0.4000
0.5000	-0.928		
0.5166	-0.896		
0.5333	-0.848		
0.5500	-0.816		
0.5666	-0.768		
0.5833	-0.736	0.28	0.5000
0.6000	-0.720		
0.6166	-0.656		
0.6333	-0.640		
0.6500	-0.592		
0.6666	-0.576		
0.6833	-0.543	0.20	0.6000
0.7000	-0.512		
0.7166	-0.480		
0.7333	-0.464		
0.7500	-0.432		
0.7666	-0.400		
0.7833	-0.384		
0.8000	-0.352		
0.8166	-0.336		
0.8333	-0.320	0.12	0.7500
0.8500	-0.320		
0.8666	-0.287		
0.8833	-0.256	0.10	0.8000
0.9000	-0.239		
0.9166	-0.239		
0.9333	-0.224		
0.9500	-0.208		
0.9666	-0.191		
0.9833	-0.175		
1.0000	-0.159		
1.2000	-0.031		
1.4000	-0.015		
1.6000	0.000		
1.8000	0.016		
2.0000	0.016		
2.2000	0.016		
2.4000	0.016		
2.6000	0.016		
2.8000	0.000		
3.0000	0.016		
3.2000	0.032		
3.4000	0.032		
3.6000	0.016		
3.8000	0.016		
4.0000	0.000		
4.2000	0.016		

4.4000	0.000
4.6000	0.000
4.8000	0.016
5.0000	0.000
5.2000	0.016
5.4000	0.016
5.6000	0.016
5.8000	0.016
6.0000	0.016
6.2000	0.016
6.4000	0.016
6.6000	0.016
6.8000	0.016
7.0000	0.016
7.2000	0.032
7.4000	0.016
7.6000	0.000
7.8000	0.016
8.0000	0.016
8.2000	0.016
8.4000	0.016
8.6000	0.016
8.8000	0.016
9.0000	0.016
9.2000	0.016
9.4000	0.032
9.6000	0.016
9.8000	0.016
10.0000	0.000
12.0000	0.000
14.0000	0.016

END

06C.06 FALLING HEAD

NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C06 Falling Head Test		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY 3-29-99 JMRamsey	APPROVED BY / DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_0 = 0.39$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(0.39 \text{ min})}$$

$K = 2.13 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 3.07 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

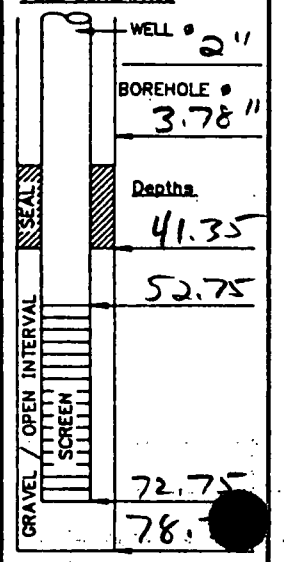
$= 1.08 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

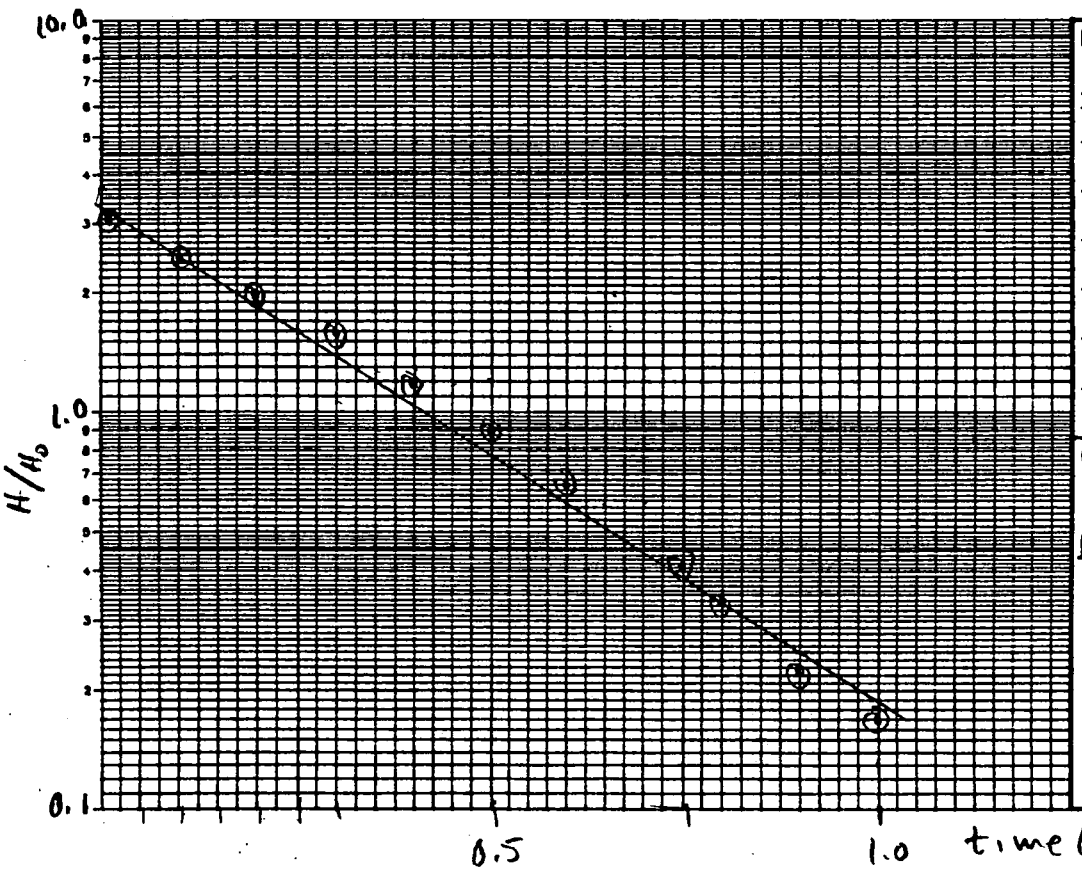
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C06
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T1350
STATIC WATER LEVEL (Depth/Elevation): 19.10' TOPC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ϕ x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.07	1.40		0.03
0.10		2.49			
0.20		1.98			
0.30		1.56			
0.40		1.18			
0.50		0.89			
0.60		0.65			
0.75		0.41			
0.80		0.33			
0.90		0.22			
1.00		0.17			
1.20		0.06			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit #
XO S/N 203120
50 psi
H_2O above XO = 51.39'
Start @ 1526
Stop @ 1536

CALCS, SKETCH MAPS, ETC.:
file:
06C06 rise.txt

FWR
3-29-99

SE1000C
Environmental Logger
03/14 07:57

Unit# 00145 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60060
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # Ø6C06
Rising Head Test
Ø6CØ6 Rise. txt

Step 0 03/13 15:26:40

Elapsed Time	INPUT 1		H/H_o	t
0.0000	3.377			
0.0033	2.177			
0.0066	2.305			
0.0100	3.057			
0.0133	3.073	← H_o	1.00	0.0000
0.0166	3.057			
0.0200	3.025			
0.0233	3.009			
0.0266	2.993			
0.0300	2.961			
0.0333	2.929		0.95	0.0200
0.0366	2.897			
0.0400	2.881			
0.0433	2.849			
0.0466	2.833			
0.0500	2.817			
0.0533	2.785			
0.0566	2.753			
0.0600	2.737			
0.0633	2.721		0.89	0.0500
0.0666	2.705			
0.0700	2.689			
0.0733	2.673			
0.0766	2.641			
0.0800	2.609			
0.0833	2.625		0.85	0.0700
0.0866	2.577			
0.0900	2.561			
0.0933	2.545			
0.0966	2.529			
0.1000	2.497			
0.1033	2.481			
0.1066	2.465			
0.1100	2.433			
0.1133	2.433		0.79	0.1000
0.1166	2.417			
0.1200	2.385			

0.1233	2.385		
0.1266	2.369		
0.1300	2.353		
0.1333	2.305		
0.1366	2.305		
0.1400	2.289		
0.1433	2.257		
0.1466	2.257		
0.1500	2.225		
0.1533	2.225		
0.1566	2.193		
0.1600	2.177		
0.1633	2.161	0.70	0.1500
0.1666	2.161		
0.1700	2.129		
0.1733	2.113		
0.1766	2.081		
0.1800	2.081		
0.1833	2.081		
0.1866	2.049		
0.1900	2.033		
0.1933	2.017		
0.1966	2.001		
0.2000	1.985		
0.2033	1.969		
0.2066	1.953		
0.2100	1.937		
0.2133	1.921	0.63	0.2000
0.2166	1.905		
0.2200	1.905		
0.2233	1.873		
0.2266	1.873		
0.2300	1.857		
0.2333	1.825		
0.2366	1.825		
0.2400	1.809		
0.2433	1.809		
0.2466	1.777		
0.2500	1.760		
0.2533	1.745		
0.2566	1.745		
0.2600	1.712		
0.2633	1.712	0.56	0.2500
0.2666	1.680		
0.2700	1.680		
0.2733	1.665		
0.2766	1.649		
0.2800	1.649		
0.2833	1.632		
0.2866	1.600		
0.2900	1.600		
0.2933	1.600		
0.2966	1.569		
0.3000	1.569		
0.3033	1.552		
0.3066	1.537		
0.3100	1.537		
0.3133	1.504	0.49	0.3000
0.3166	1.504		
0.3200	1.489		

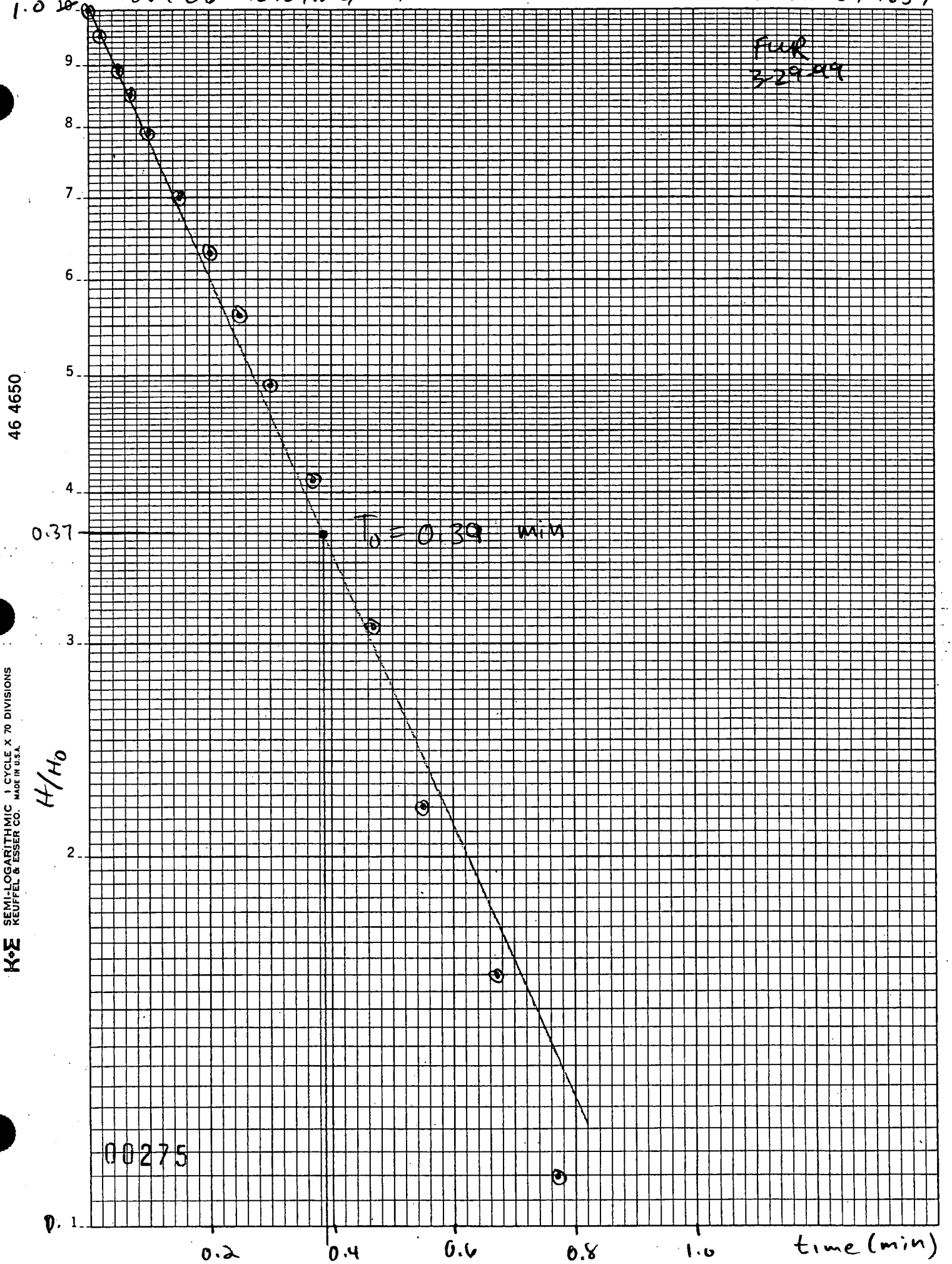
0.3233	1.472		
0.3266	1.472		
0.3300	1.456		
0.3333	1.424		
0.3500	1.376		
0.3666	1.313		
0.3833	1.248	0.41	0.3700
0.4000	1.184		
0.4166	1.136		
0.4333	1.088		
0.4500	1.040		
0.4666	1.008		
0.4833	0.960	0.31	0.4700
0.5000	0.896		
0.5166	0.848		
0.5333	0.816		
0.5500	0.768		
0.5666	0.720		
0.5833	0.688	0.22	0.5700
0.6000	0.656		
0.6166	0.624		
0.6333	0.592		
0.6500	0.560		
0.6666	0.528		
0.6833	0.496	0.16	0.6700
0.7000	0.460		
0.7166	0.448		
0.7333	0.416		
0.7500	0.416		
0.7666	0.384		
0.7833	0.352	0.11	0.7700
0.8000	0.336		
0.8166	0.320		
0.8333	0.304		
0.8500	0.288		
0.8666	0.288		
0.8833	0.256		
0.9000	0.224		
0.9166	0.240		
0.9333	0.208		
0.9500	0.208		
0.9666	0.192		
0.9833	0.176		
1.0000	0.176		
1.2000	0.064		
1.4000	0.032		
1.6000	0.032		
1.8000	0.016		
2.0000	0.016		
2.2000	0.000		
2.4000	0.016		
2.6000	0.016		
2.8000	0.016		
3.0000	0.016		
3.2000	0.016		
3.4000	0.032		
3.6000	0.016		
3.8000	0.016		
4.0000	0.032		
4.2000	0.000		

4.4000	0.016
4.6000	0.016
4.8000	0.016
5.0000	0.016
5.2000	0.016
5.4000	0.016
5.6000	0.016
5.8000	0.016
6.0000	0.016
6.2000	0.016
6.4000	0.016
6.6000	0.016
6.8000	0.016
7.0000	0.016
7.2000	0.016
7.4000	0.016
7.6000	0.016
7.8000	0.016
8.0000	0.016
8.2000	0.016
8.4000	0.016
8.6000	0.016
8.8000	0.016
9.0000	0.016
9.2000	0.032
9.4000	0.016
9.6000	0.016
9.8000	0.016
10.0000	0.016

END

06/06 RISING HEAD

NSWC CRANE / 7651



00275

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06C06 RISING HEAD			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: JMRamser 3/29/99	APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_o = 0.39$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(0.39 \text{ min})}$$

$K = 2.13 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 3.07 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

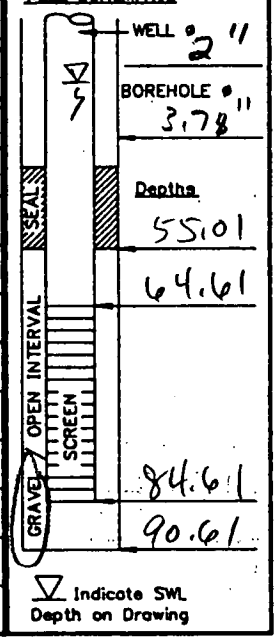
$= 1.08 \times 10^{-3}$ cm/s

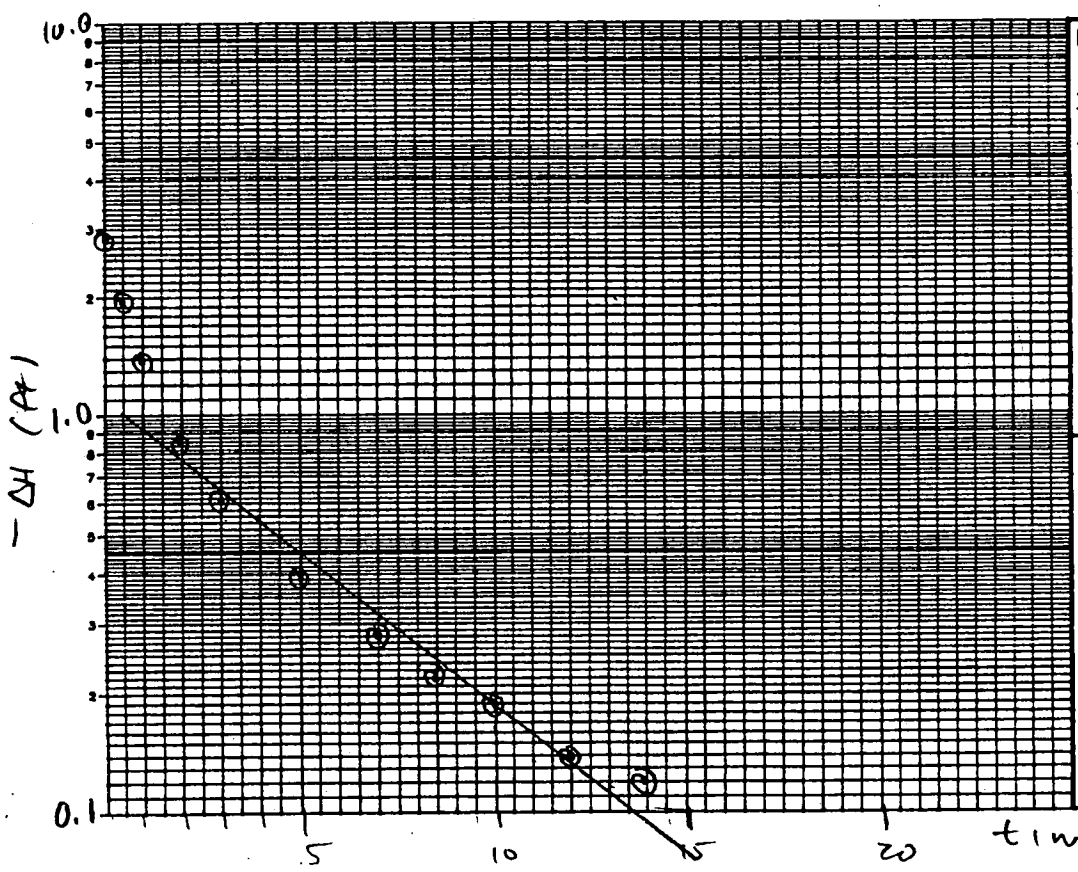
HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C07
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T1450
STATIC WATER LEVEL (Depth/Elevation): 18.97 / TPVC DATE: 3-17-99
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: SLUG (0.13'ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-2.85			
0.50		-1.93			
1.00		-1.36			
2.00		-0.84			
3.00		-0.61			
5.00		-0.39			
7.00		-0.28			
9.00		-0.22			
10.00		-0.19			
12.00		-0.14			
14.00		-0.12			
16.00		-0.09			

WELL SCHEMATIC





REMARKS:
Hermit S/N 145
XD S/N 1670
50psi
H_2O above XD = 64.12'
Start@ 1548
Stop@ 1604

CALCS, SKETCH MAPS, ETC.:
file:
06C07Fall.txt

00277

FWR 3-29-99

SE1000C
Environmental Logger
03/14 08:04

Unit# 00145 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60070
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Step 0 03/13 15:48:29

Well #06C07
Falling Head Test
Ø6CØ7Fall.txt

Elapsed Time	INPUT 1
0.0000	-0.793
0.0033	-2.061
0.0066	-2.983
0.0100	-3.759
0.0133	-4.315
0.0166	-4.268
0.0200	-4.331
0.0233	-4.362
0.0266	-4.395
0.0300	-4.378
0.0333	-4.395
0.0366	-4.378
0.0400	-4.299
0.0433	-3.505
0.0466	-2.252
0.0500	-2.189
0.0533	-2.236
0.0566	-3.173
0.0600	-2.649
0.0633	-2.855 ←
0.0666	-2.840
0.0700	-2.776
0.0733	-2.792
0.0766	-2.776
0.0800	-2.776
0.0833	-2.776
0.0866	-2.760
0.0900	-2.744
0.0933	-2.744
0.0966	-2.729
0.1000	-2.729
0.1033	-2.712
0.1066	-2.712
0.1100	-2.680
0.1133	-2.680
0.1166	-2.664
0.1200	-2.554

H/H_0	t
1.00	0.0000
0.98	0.0100
0.94	0.0500

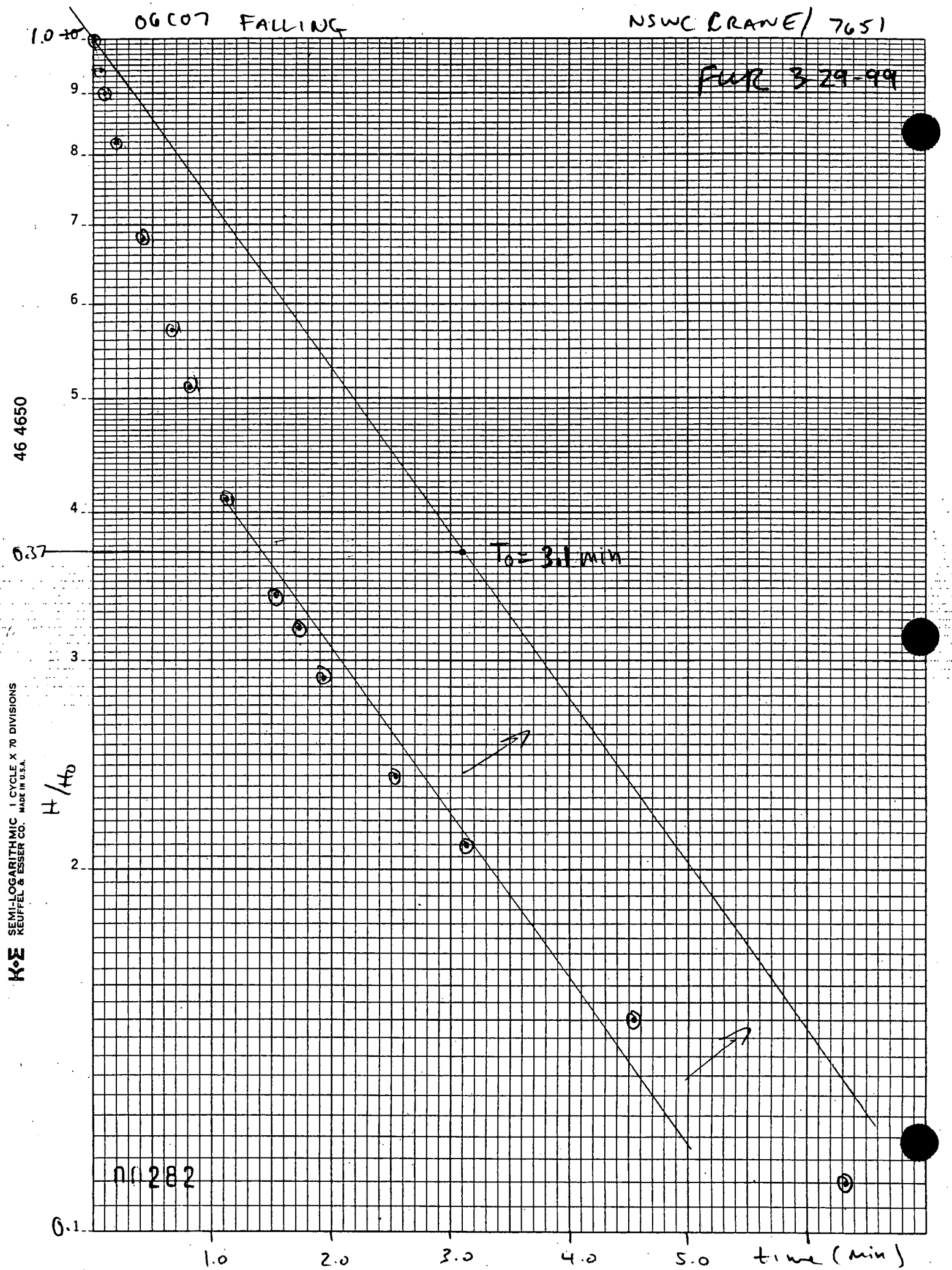
00278

0.1233	-2.871		
0.1266	-2.664		
0.1300	-2.760		
0.1333	-2.522		
0.1366	-2.633		
0.1400	-2.570		
0.1433	-2.633		
0.1466	-2.601		
0.1500	-2.522		
0.1533	-2.617		
0.1566	-2.586		
0.1600	-2.570		
0.1633	-2.570	0.90	0.1000
0.1666	-2.554		
0.1700	-2.554		
0.1733	-2.538		
0.1766	-2.522		
0.1800	-2.522		
0.1833	-2.506		
0.1866	-2.506		
0.1900	-2.506		
0.1933	-2.491		
0.1966	-2.491		
0.2000	-2.491		
0.2033	-2.474		
0.2066	-2.474		
0.2100	-2.458		
0.2133	-2.443	0.86	0.1500
0.2166	-2.443		
0.2200	-2.427		
0.2233	-2.427		
0.2266	-2.427		
0.2300	-2.411		
0.2333	-2.411		
0.2366	-2.395		
0.2400	-2.395		
0.2433	-2.395		
0.2466	-2.379		
0.2500	-2.363		
0.2533	-2.363		
0.2566	-2.363		
0.2600	-2.347		
0.2633	-2.347	0.82	0.2000
0.2666	-2.332		
0.2700	-2.332		
0.2733	-2.332		
0.2766	-2.316		
0.2800	-2.316		
0.2833	-2.300		
0.2866	-2.300		
0.2900	-2.285		
0.2933	-2.285		
0.2966	-2.285		
0.3000	-2.268		
0.3033	-2.268		
0.3066	-2.268		
0.3100	-2.252		
0.3133	-2.252		
0.3166	-2.236		
0.3200	-2.236		

0.3233	-2.236		
0.3266	-2.220		
0.3300	-2.220		
0.3333	-2.204		
0.3500	-2.189		
0.3666	-2.157		
0.3833	-2.126		
0.4000	-2.109		
0.4166	-2.078		
0.4333	-2.046		
0.4500	-2.014		
0.4666	-1.983		
0.4833	-1.951	0.68	0.4200
0.5000	-1.935		
0.5166	-1.903		
0.5333	-1.872		
0.5500	-1.855		
0.5666	-1.840		
0.5833	-1.808		
0.6000	-1.792		
0.6166	-1.760		
0.6333	-1.745		
0.6500	-1.713		
0.6666	-1.697		
0.6833	-1.682		
0.7000	-1.665		
0.7166	-1.634		
0.7333	-1.617	0.57	0.6700
0.7500	-1.602		
0.7666	-1.586		
0.7833	-1.554		
0.8000	-1.539		
0.8166	-1.522		
0.8333	-1.506		
0.8500	-1.490		
0.8666	-1.475		
0.8833	-1.459	0.51	0.8200
0.9000	-1.443		
0.9166	-1.428		
0.9333	-1.411		
0.9500	-1.396		
0.9666	-1.379		
0.9833	-1.363		
1.0000	-1.363		
1.2000	-1.173	0.41	1.1367
1.4000	-1.062		
1.6000	-0.967	0.34	1.5367
1.8000	-0.904	0.32	1.7367
2.0000	-0.840	0.29	1.9367
2.2000	-0.777		
2.4000	-0.729		
2.6000	-0.698	0.24	2.5367
2.8000	-0.650		
3.0000	-0.618		
3.2000	-0.587	0.21	3.1367
3.4000	-0.571		
3.6000	-0.539		
3.8000	-0.507		
4.0000	-0.491		
4.2000	-0.475		

4.4000	-0.459	
4.6000	-0.428	0.15 4.5367
4.8000	-0.412	
5.0000	-0.396	
5.2000	-0.396	
5.4000	-0.380	
5.6000	-0.365	
5.8000	-0.349	
6.0000	-0.333	
6.2000	-0.333	
6.4000	-0.317	0.11 6.3367
6.6000	-0.301	
6.8000	-0.301	
7.0000	-0.285	
7.2000	-0.285	
7.4000	-0.269	
7.6000	-0.269	
7.8000	-0.253	
8.0000	-0.253	
8.2000	-0.238	
8.4000	-0.238	
8.6000	-0.222	
8.8000	-0.222	
9.0000	-0.222	
9.2000	-0.206	
9.4000	-0.206	
9.6000	-0.206	
9.8000	-0.190	
10.0000	-0.190	
12.0000	-0.142	
14.0000	-0.127	
16.0000	-0.095	

END


06C07 FALLING
NSWC CRANE/ 7651
FWC 3-29-99
1.0
9
8
7
6
5
4
0.37
3
2
0.1
T_0 = 3.1 min
t/t_0
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
1.0
2.0
3.0
4.0
5.0
time (min)
00282

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C07 FALLING HEAD TEST	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: JWRamsey 3-29-99
APPROVED BY:	DATE:

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_0 = 3.1$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(3.1 \text{ min})}$$

$K = 2.68 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 3.86 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

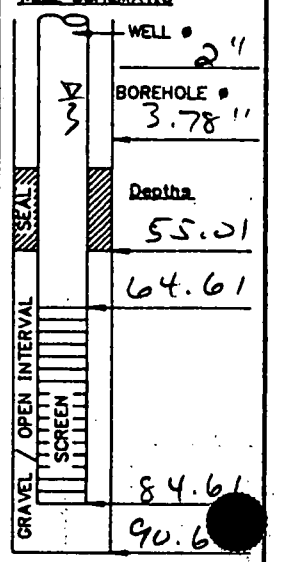
$= 1.36 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

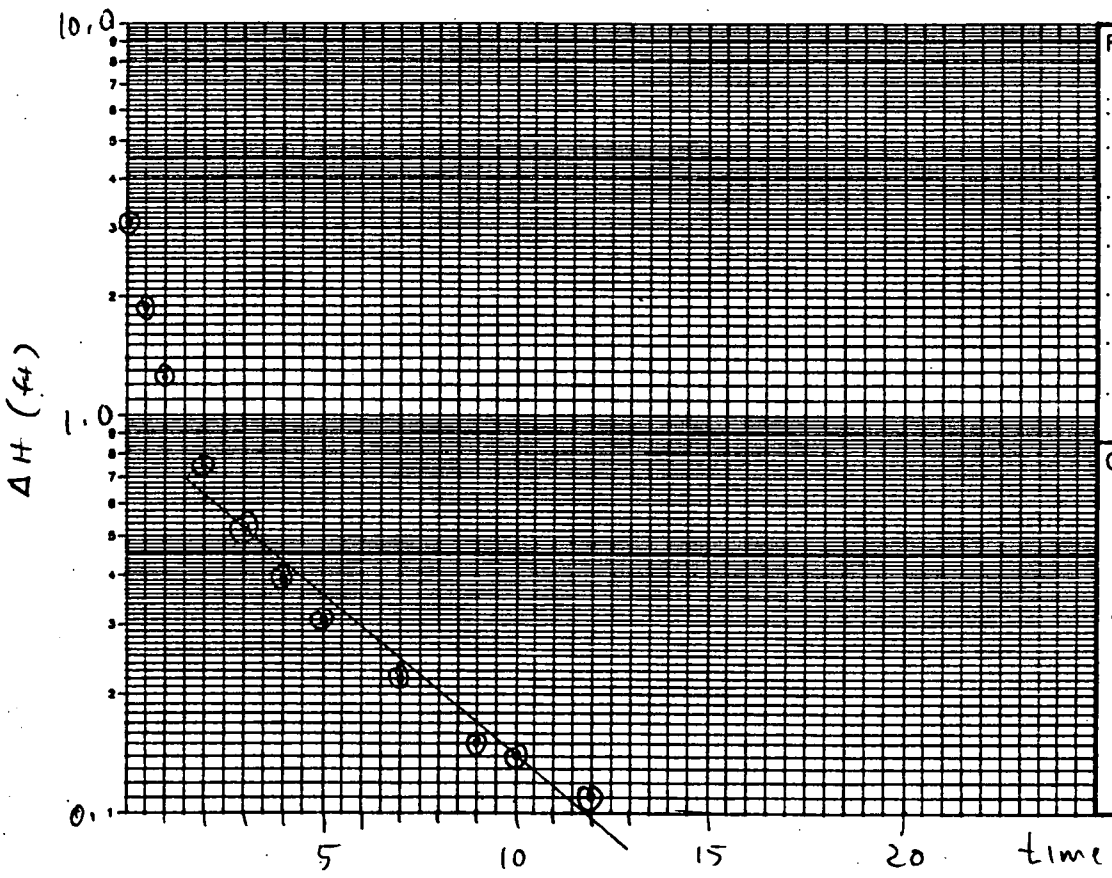
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C07
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NEIL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T 155
STATIC WATER LEVEL (Depth/Elevation): 18.89' TPVC DATE: 3-13-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.10			
0.50		1.87			
1.00		1.26			
2.00		0.74			
4.00		0.39	3.00		0.52
5.00		0.31			
7.00		0.22			
9.00		0.15			
10.00		0.14			
12.00		0.11			
14.00		0.07			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50 psi
H_2O above XD = 64.20'
Start @ 1606
Stop @ 1623

CALCS, SKETCH MAPS, ETC.:
file:
06C07rise.tx

FWR 3-29-99

SE1000C
Environmental Logger
03/14 08:11

Unit# 00145 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60070
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C07
Rising Head Test
06C07Rise.txt

Step 0 03/13 16:05:45

Elapsed Time	INPUT 1		H/H₀	t
0.0000	-0.047			
0.0033	4.029			
0.0066	3.109			
0.0100	2.458			
0.0133	2.998			
0.0166	3.109	← H_0	1.00	0.0000
0.0200	3.093			
0.0233	3.077			
0.0266	3.061			
0.0300	3.045			
0.0333	3.061			
0.0366	2.998			
0.0400	2.982			
0.0433	2.950			
0.0466	2.950			
0.0500	2.934			
0.0533	2.918			
0.0566	2.918			
0.0600	2.903			
0.0633	2.903			
0.0666	2.887		0.93	0.0500
0.0700	2.871			
0.0733	2.855			
0.0766	2.839			
0.0800	2.823			
0.0833	2.823			
0.0866	2.807			
0.0900	2.807			
0.0933	2.791			
0.0966	2.775			
0.1000	2.775			
0.1033	2.775			
0.1066	2.760			
0.1100	2.744			
0.1133	2.728			
0.1166	2.728		0.88	0.1000
0.1200	2.712			

0.1233	2.712		
0.1266	2.696		
0.1300	2.712		
0.1333	2.680		
0.1366	2.664		
0.1400	2.664		
0.1433	2.649		
0.1466	2.633		
0.1500	2.633		
0.1533	2.617		
0.1566	2.617		
0.1600	2.601		
0.1633	2.601		
0.1666	2.585	0.83	0.1500
0.1700	2.601		
0.1733	2.569		
0.1766	2.569		
0.1800	2.554		
0.1833	2.538		
0.1866	2.522		
0.1900	2.522		
0.1933	2.522		
0.1966	2.538		
0.2000	2.522		
0.2033	2.506		
0.2066	2.490		
0.2100	2.490		
0.2133	2.474		
0.2166	2.474	0.80	0.2000
0.2200	2.458		
0.2233	2.458		
0.2266	2.442		
0.2300	2.442		
0.2333	2.427		
0.2366	2.427		
0.2400	2.411		
0.2433	2.411		
0.2466	2.395		
0.2500	2.395		
0.2533	2.379		
0.2566	2.379		
0.2600	2.379		
0.2633	2.363		
0.2666	2.363	0.76	0.2500
0.2700	2.347		
0.2733	2.347		
0.2766	2.331		
0.2800	2.331		
0.2833	2.315		
0.2866	2.315		
0.2900	2.300		
0.2933	2.300		
0.2966	2.300		
0.3000	2.284		
0.3033	2.284		
0.3066	2.300		
0.3100	2.252		
0.3133	2.252		
0.3166	2.252	0.72	0.3000
0.3200	2.236		

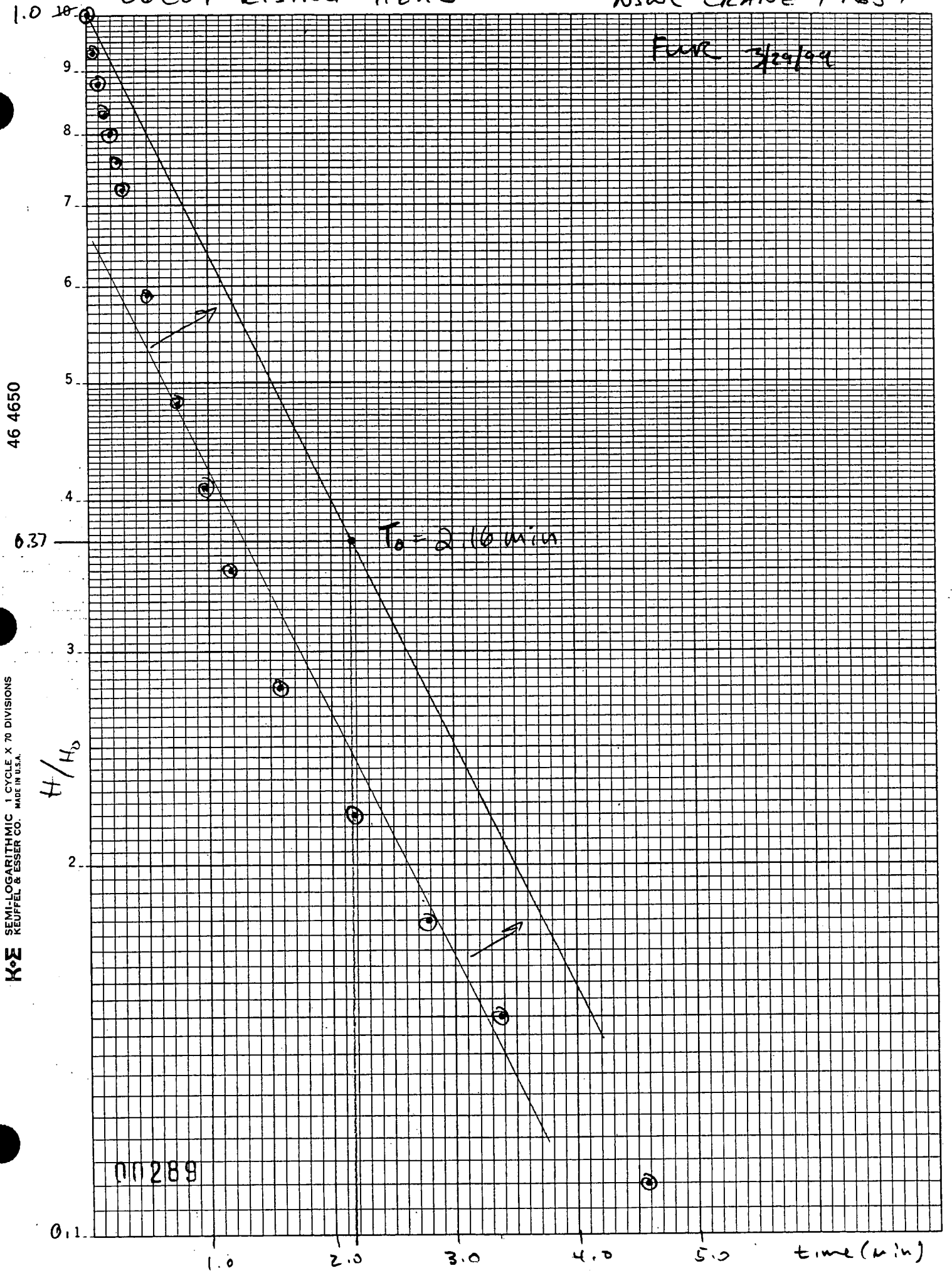
0.3233	2.236		
0.3266	2.236		
0.3300	2.220		
0.3333	2.220		
0.3500	2.157		
0.3666	2.125		
0.3833	2.094		
0.4000	2.062		
0.4166	2.030		
0.4333	1.982		
0.4500	1.951		
0.4666	1.935		
0.4833	1.903		
0.5000	1.871		
0.5166	1.840	0.54	0.5000
0.5333	1.824		
0.5500	1.792		
0.5666	1.760		
0.5833	1.744		
0.6000	1.713		
0.6166	1.697		
0.6333	1.665		
0.6500	1.649		
0.6666	1.617		
0.6833	1.602		
0.7000	1.586		
0.7166	1.554		
0.7333	1.538		
0.7500	1.522		
0.7666	1.507	0.48	0.7500
0.7833	1.491		
0.8000	1.459		
0.8166	1.443		
0.8333	1.427		
0.8500	1.411		
0.8666	1.396		
0.8833	1.380		
0.9000	1.364		
0.9166	1.348		
0.9333	1.332		
0.9500	1.316		
0.9666	1.300		
0.9833	1.284		
1.0000	1.268	0.41	0.9834
1.2000	1.078	0.35	1.1834
1.4000	0.967		
1.6000	0.872	0.28	1.5834
1.8000	0.809		
2.0000	0.745		
2.2000	0.681	0.22	2.1834
2.4000	0.634		
2.6000	0.586		
2.8000	0.555	0.18	2.7834
3.0000	0.523		
3.2000	0.491		
3.4000	0.475	0.15	3.3834
3.6000	0.444		
3.8000	0.428		
4.0000	0.396		
4.2000	0.380		

4.4000	0.364
4.6000	0.348
4.8000	0.333
5.0000	0.317
5.2000	0.301
5.4000	0.301
5.6000	0.285
5.8000	0.269
6.0000	0.269
6.2000	0.253
6.4000	0.253
6.6000	0.237
6.8000	0.221
7.0000	0.221
7.2000	0.206
7.4000	0.206
7.6000	0.206
7.8000	0.190
8.0000	0.190
8.2000	0.174
8.4000	0.174
8.6000	0.174
8.8000	0.174
9.0000	0.158
9.2000	0.158
9.4000	0.142
9.6000	0.142
9.8000	0.142
10.0000	0.142
12.0000	0.111
14.0000	0.079
16.0000	0.063

END

0.11 4.5834

06C07 RISING HEAD NSWC CRANE 17651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06 C07 RISING HEAD TEST			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: 3-29-99	APPROVED BY:	DATE:

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_0 = 2.16$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(2.16 \text{ min})}$$

$K = 3.85 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 5.54 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

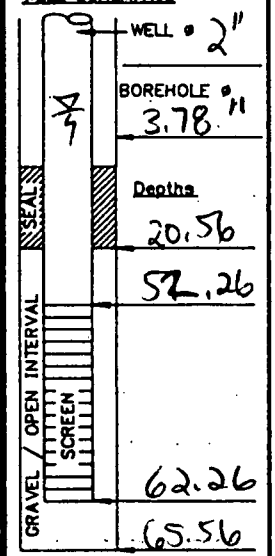
$= 1.96 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

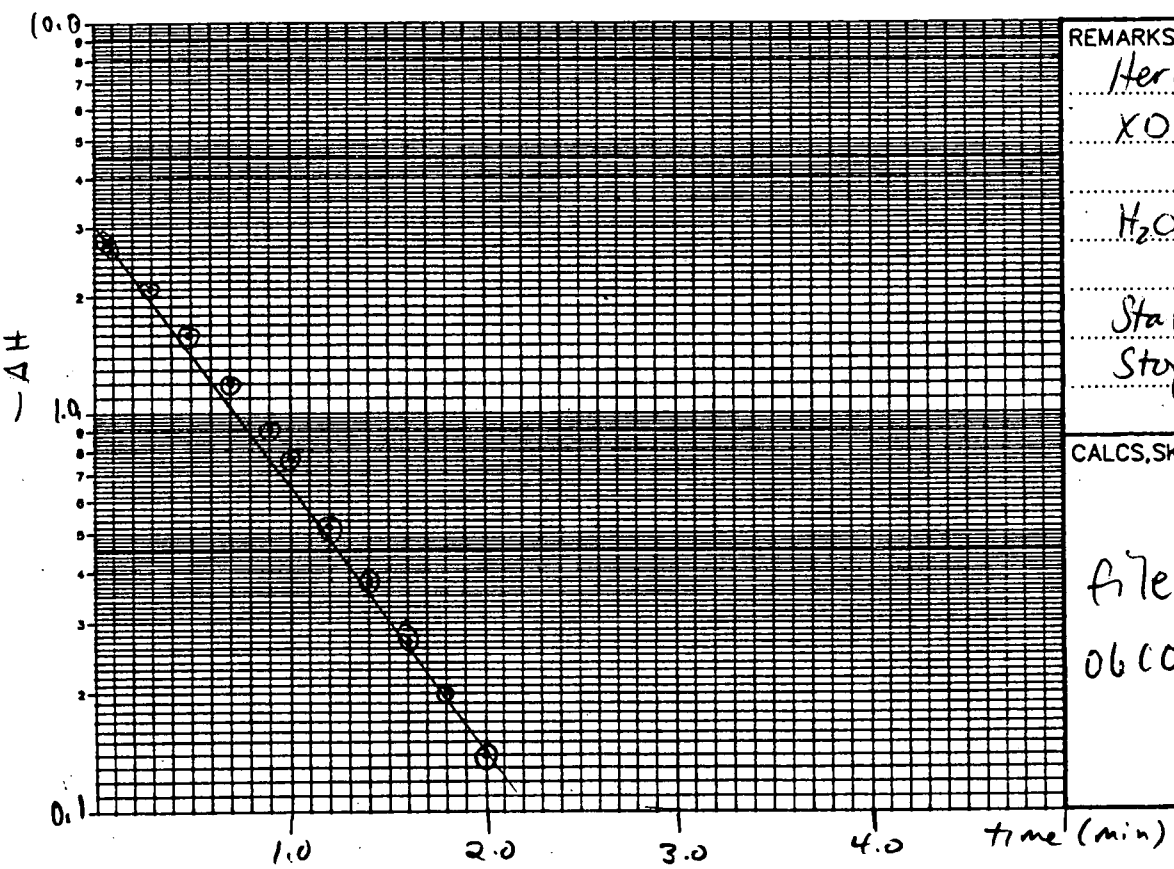
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C09
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T75Ø
STATIC WATER LEVEL (Depth/Elevation): 12.91' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.07		-2.81	3.00		-0.03
0.10		-2.71	4.00		0.00
0.30		-2.11			
0.50		-1.62			
0.70		-1.20			
0.90		-0.90			
1.00		-0.77			
1.20		-0.52			
1.40		-0.38			
1.80		-0.20	1.60		-0.27
2.00		-0.14			
2.40		-0.06			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XO s/n 1670
50 psi
H_2O above XD 47.52
Start @ 1142
Stop @ 1322

CALCS, SKETCH MAPS, ETC.:
file:
06C09fall.txt

✓FUR

SE1000C
Environmental Logger
03/13 08:26

Unit# 00143 Test 7

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60900
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well 06C09
Falling Head Test
06C09 Fall.txt

Step 0 03/12 11:42:20

Elapsed Time	INPUT 1
0.0000	-0.127
0.0033	-2.652
0.0066	-3.271
0.0100	-3.843
0.0133	-4.526
0.0166	-4.145
0.0200	-4.415
0.0233	-4.367
0.0266	-4.383
0.0300	-4.351
0.0333	-4.399
0.0366	-4.256
0.0400	-3.510
0.0433	-2.557
0.0466	-1.969
0.0500	-2.906
0.0533	-3.303
0.0566	-2.779
0.0600	-2.366
0.0633	-2.763
0.0666	-2.795
0.0700	-2.795
0.0733	-2.811 ← Ho
0.0766	-2.795
0.0800	-2.779
0.0833	-2.763
0.0866	-2.747
0.0900	-2.747
0.0933	-2.731
0.0966	-2.715
0.1000	-2.715
0.1033	-2.700
0.1066	-2.684
0.1100	-2.684
0.1133	-2.668
0.1166	-2.652
0.1200	-2.652

H/Ho	T
1.00	0
.95	.0400

00292

0.1233	-2.636		
0.1266	-2.620		
0.1300	-2.620		
0.1333	-2.605		
0.1366	-2.589		
0.1400	-2.589		
0.1433	-2.573		
0.1466	-2.557		
0.1500	-2.541		
0.1533	-2.541		
0.1566	-2.525		
0.1600	-2.525		
0.1633	-2.509		
0.1666	-2.493		
0.1700	-2.493		
0.1733	-2.477		
0.1766	-2.446		
0.1800	-2.446		
0.1833	-2.446		
0.1866	-2.430		
0.1900	-2.430		
0.1933	-2.414		
0.1966	-2.398		
0.2000	-2.398		
0.2033	-2.382		
0.2066	-2.366		
0.2100	-2.366		
0.2133	-2.350		
0.2166	-2.350		
0.2200	-2.334		
0.2233	-2.334		
0.2266	-2.318		
0.2300	-2.303		
0.2333	-2.303		
0.2366	-2.287		
0.2400	-2.271		
0.2433	-2.271		
0.2466	-2.255		
0.2500	-2.255		
0.2533	-2.239		
0.2566	-2.223	.80	.1833
0.2600	-2.223		
0.2633	-2.208		
0.2666	-2.208		
0.2700	-2.192		
0.2733	-2.192	.78	.2
0.2766	-2.176		
0.2800	-2.160		
0.2833	-2.160		
0.2866	-2.144		
0.2900	-2.144		.220
0.2933	-2.128	.76	
0.2966	-2.112		
0.3000	-2.112		
0.3033	-2.096		
0.3066	-2.096		
0.3100	-2.080		
0.3133	-2.080		
0.3166	-2.064		
0.3200	-2.064		

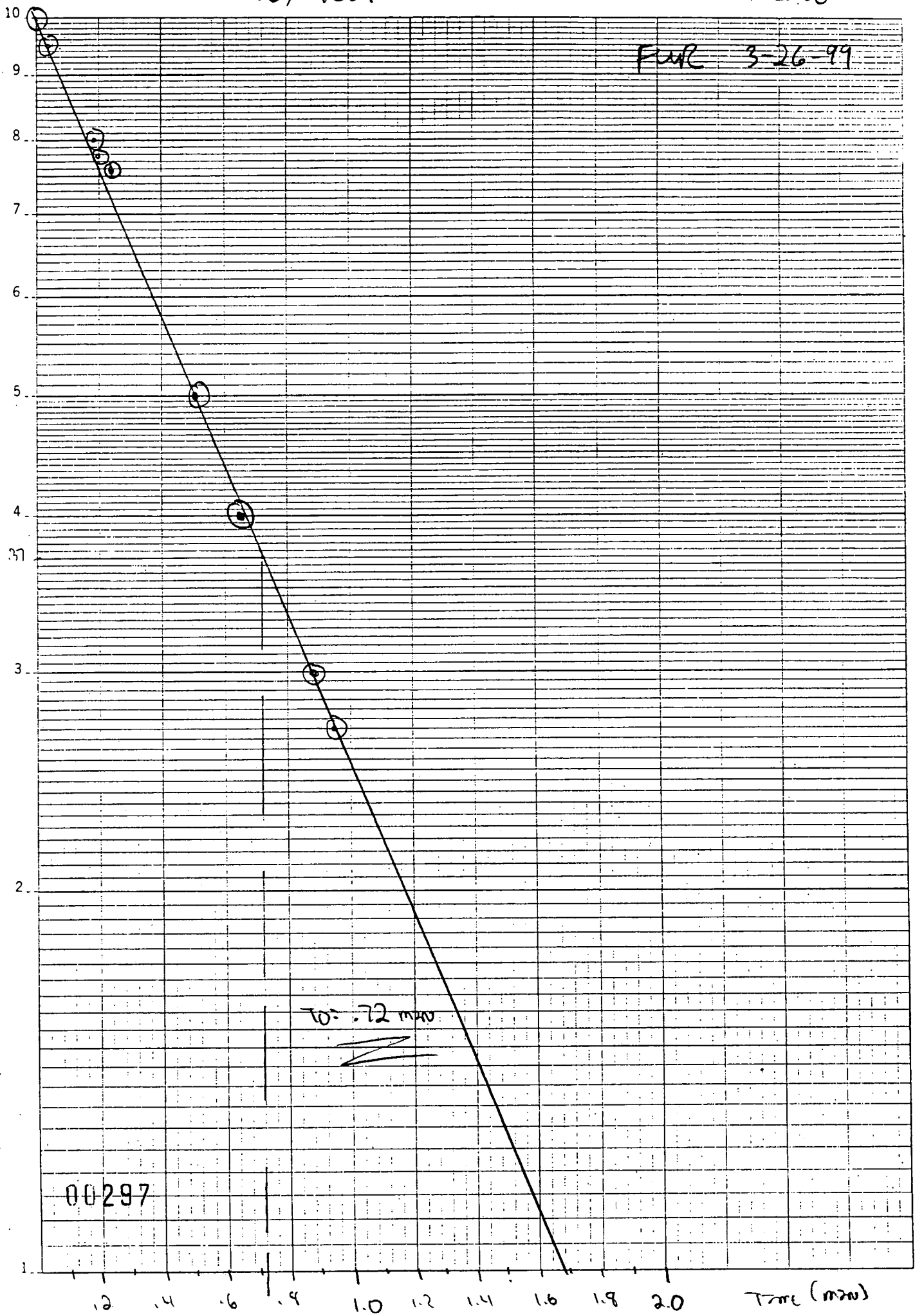
0.3233	-2.049		
0.3266	-2.033		
0.3300	-2.033		
0.3333	-2.017		
0.3500	-1.985		
0.3666	-1.953		
0.3833	-1.906		
0.4000	-1.874		
0.4166	-1.826		
0.4333	-1.778		
0.4500	-1.747		
0.4666	-1.699		
0.4833	-1.667		
0.5000	-1.620		
0.5166	-1.588		
0.5333	-1.540		
0.5500	-1.508		
0.5666	-1.477		
0.5833	-1.429	.50	.51
.0733 0.6000	-1.397		
0.6166	-1.366		
0.6333	-1.334		
0.6500	-1.302		
0.6666	-1.270		
0.6833	-1.239		
0.7000	-1.207		
0.7166	-1.191		
0.7333	-1.159		
0.7500	-1.127	.40	.6767
0.7666	-1.096		
0.7833	-1.064		
0.8000	-1.048		
0.8166	-1.016		
0.8333	-1.000		
0.8500	-0.968		
0.8666	-0.952		
0.8833	-0.921		
0.9000	-0.905		
0.9166	-0.873		
0.9333	-0.857		
0.9500	-0.842	.30	.8767
0.9666	-0.810		
0.9833	-0.794		
1.0000	-0.778	.27	.9267
1.2000	-0.524		
1.4000	-0.381		
1.6000	-0.270	.09	1.5267
1.8000	-0.206		
2.0000	-0.143	.05	1.9267
2.2000	-0.095		
2.4000	-0.063		
2.6000	-0.047		
2.8000	-0.032		
3.0000	-0.032		
3.2000	-0.016		
3.4000	-0.016		
3.6000	-0.016		
3.8000	0.000		
4.0000	0.000		
4.2000	0.000		

4.4000	0.000
4.6000	0.000
4.8000	0.000
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	0.000
12.0000	0.000
14.0000	0.000
16.0000	0.000
18.0000	0.000
20.0000	0.000
22.0000	0.000
24.0000	0.000
26.0000	0.000
28.0000	0.000
30.0000	0.015
32.0000	0.000
34.0000	0.000
36.0000	0.015
38.0000	0.015
40.0000	0.000
42.0000	0.015
44.0000	0.015
46.0000	0.015
48.0000	0.015
50.0000	0.015
52.0000	0.015
54.0000	0.015
56.0000	0.015
58.0000	0.015
60.0000	0.015
62.0000	0.015
64.0000	0.015
66.0000	0.015
68.0000	0.015
70.0000	0.015
72.0000	0.015

74.0000	0.000
76.0000	0.015
78.0000	0.015
80.0000	0.015
82.0000	0.015
84.0000	0.015
86.0000	0.015
88.0000	0.015
90.0000	0.015
92.0000	0.015
94.0000	0.015
96.0000	0.015
98.0000	0.015
100.000	0.015

END

NSWC CRANE/7651 06C09 FALLING



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K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C09 FALLING HEAD TEST			
BASED ON HORSLEV 1951		DRAWING NUMBER	
BY RMB	CHECKED BY SWLamsetz 3-26-99	APPROVED BY	DATE

$r = 0.083$ FT

$R = 0.158$ FT

$L = 10$ FT

$T_o = .72$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / 0.158\,FT)}{2(10\,FT)(.72\,MIN)}$$

$K = 1.98 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 2.86$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

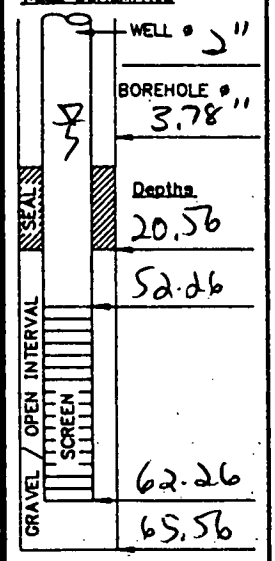
$K = 1.01 \times 10^{-3}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

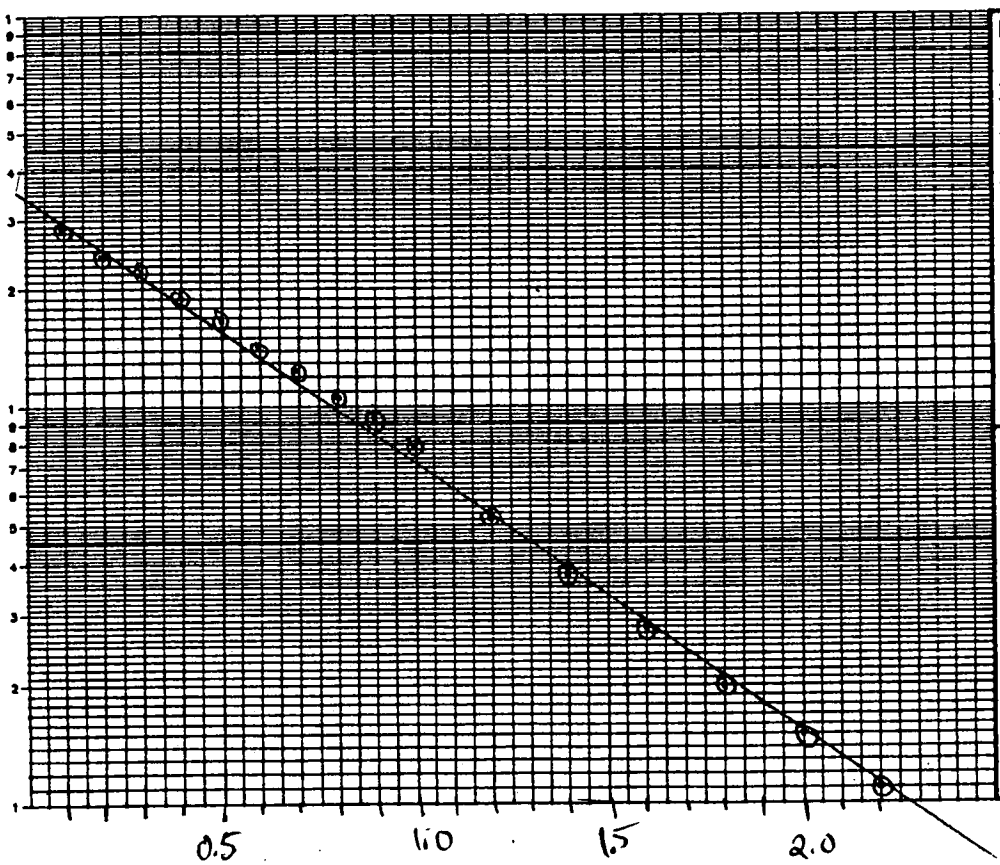
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C09
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: TEST NO.: T850
STATIC WATER LEVEL (Depth/Elevation): 12.92' TOVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.12		2.82			
0.20		2.52			
0.40		1.92	0.30		2.22
0.80		1.06	0.50		1.65
0.90		0.92	0.60		1.42
1.00		0.79	0.70		1.23
1.20		0.52			
1.40		0.38			
1.60		0.28			
1.80		0.20			
2.00		0.15			
2.20		0.11			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit #143
XD S/N 1670
50 psi
H_2O above XD 47.51
Start @ 1405
Stop @ 1418

CALCS, SKETCH MAPS, ETC.:
file:
06C09 Rise.txt

FWR

SE1000C
Environmental Logger
03/13 08:30

Unit# 00143 Test 8

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60900
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well 06C09
Rising Head Test
06C09 Rise.txt

Step 0 03/12 14:05:00

Elapsed Time	INPUT 1
0.0000	0.015
0.0033	3.827
0.0066	3.430
0.0100	2.969
0.0133	3.350
0.0166	3.191
0.0200	3.239
0.0233	3.160
0.0266	3.191
0.0300	3.112
0.0333	3.128
0.0366	3.112
0.0400	3.096
0.0433	3.064
0.0466	3.064
0.0500	3.017
0.0533	3.017
0.0566	2.969
0.0600	3.032
0.0633	3.048
0.0666	3.017
0.0700	2.953
0.0733	3.001
0.0766	2.969
0.0800	2.953
0.0833	2.826
0.0866	2.921
0.0900	2.906
0.0933	2.874
0.0966	2.890
0.1000	2.874
0.1033	2.858
0.1066	2.874
0.1100	2.858
0.1133	2.826
0.1166	2.778
0.1200	2.826 ← H_0

H/H_0	T
1.00	0

00300

0.1233	2.778		
0.1266	2.778		
0.1300	2.731		
0.1333	2.747		
0.1366	2.731		
0.1400	2.715		
0.1433	2.715		
0.1466	2.699		
0.1500	2.683	.95	.03
0.1533	2.683		
0.1566	2.667		
0.1600	2.635		
0.1633	2.651		
0.1666	2.619		
0.1700	2.619		
0.1733	2.667		
0.1766	2.588		
0.1800	2.588		
0.1833	2.588		
0.1866	2.572		
0.1900	2.556		
0.1933	2.540	.90	.0433
0.1966	2.540		
0.2000	2.524		
0.2033	2.509		
0.2066	2.509		
0.2100	2.493		
0.2133	2.477		
0.2166	2.477		
0.2200	2.461		
0.2233	2.461		
0.2266	2.445		
0.2300	2.429		
0.2333	2.429		
0.2366	2.413		
0.2400	2.397		
0.2433	2.397		
0.2466	2.381		
0.2500	2.366		
0.2533	2.366		
0.2566	2.350		
0.2600	2.334		
0.2633	2.334		
0.2666	2.318		
0.2700	2.318		
0.2733	2.302		
0.2766	2.286		
0.2800	2.286		
0.2833	2.270		
0.2866	2.270		
0.2900	2.254	.80	.17
0.2933	2.286		
0.2966	2.222		
0.3000	2.222		
0.3033	2.222		
0.3066	2.207		
0.3100	2.207		
0.3133	2.191		
0.3166	2.175		
0.3200	2.175		

0.3233	2.159		
0.3266	2.159		
0.3300	2.143		
0.3333	2.127	.75	.2133
0.3500	2.064		
0.3666	2.016		
0.3833	1.953		
0.4000	1.921		
0.4166	1.873		
0.4333	1.841		
0.4500	1.778		
0.4666	1.730		
0.4833	1.699	.60	.3633
0.5000	1.651		
0.5166	1.619		
0.5333	1.587		
0.5500	1.540		
0.5666	1.508		
0.5833	1.476		
0.6000	1.429	.51	.4800
0.6166	1.397		
0.6333	1.365		
0.6500	1.333		
0.6666	1.302		
0.6833	1.270		
0.7000	1.238	.45	.5633
0.7166	1.206		
0.7333	1.174		
0.7500	1.159		
0.7666	1.127		
0.7833	1.095		
0.8000	1.063	.38	.6800
0.8166	1.047		
0.8333	1.016		
0.8500	1.000		
0.8666	0.968		
0.8833	0.952		
0.9000	0.920	.33	.7800
0.9166	0.905		
0.9333	0.873		
0.9500	0.857		
0.9666	0.841		
0.9833	0.809		
1.0000	0.793	.28	.8800
1.2000	0.523		
1.4000	0.380	.13	1.280
1.6000	0.285	.10	1.480
1.8000	0.206		
2.0000	0.158		
2.2000	0.110		
2.4000	0.079		
2.6000	0.063		
2.8000	0.047		
3.0000	0.031		
3.2000	0.031		
3.4000	0.031		
3.6000	0.015		
3.8000	0.015		
4.0000	0.015		
4.2000	0.015		

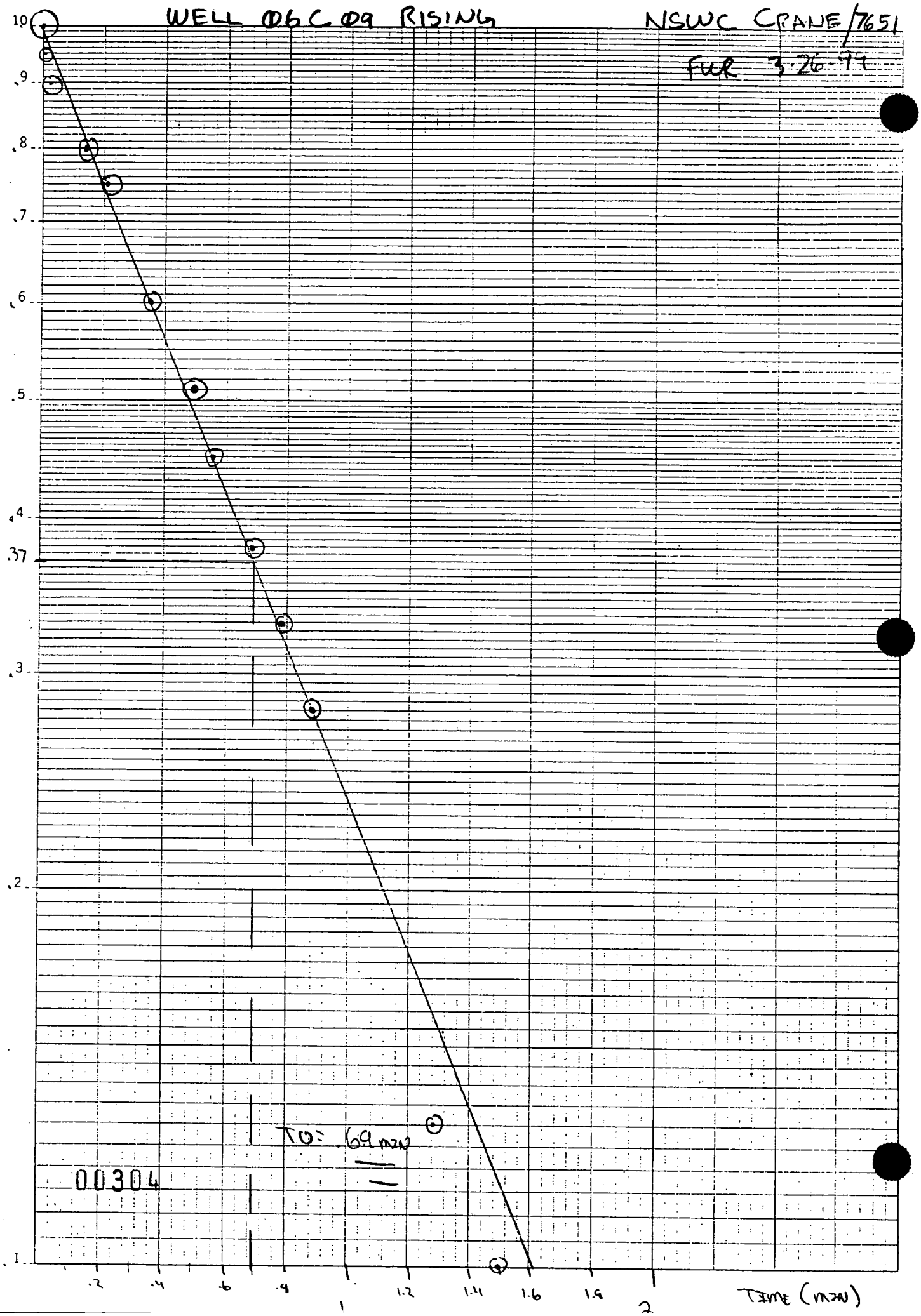
4.4000	0.015
4.6000	0.015
4.8000	0.015
5.0000	0.000
5.2000	0.015
5.4000	0.015
5.6000	0.015
5.8000	0.015
6.0000	0.015
6.2000	0.015
6.4000	0.015
6.6000	0.015
6.8000	0.015
7.0000	0.015
7.2000	0.015
7.4000	0.015
7.6000	0.015
7.8000	0.015
8.0000	0.015
8.2000	0.015
8.4000	0.015
8.6000	0.015
8.8000	0.015
9.0000	0.015
9.2000	0.015
9.4000	0.015
9.6000	0.015
9.8000	0.015
10.0000	0.015
12.0000	0.015

END

WELL 06C09 RISING

NSWC CRANE/7651

FWR 3-26-77



00304

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K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C09 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB / CHECKED BY: S. Ramser 3-26-99	APPROVED BY: / DATE:

$r = 0.083$ FT

$R = 0.158$ FT

$L = 10$ FT

$T_o = .69$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / 0.158\,FT)}{2(10\,FT)(.69\,MIN)}$$

$K = 2.02 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 2.98$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

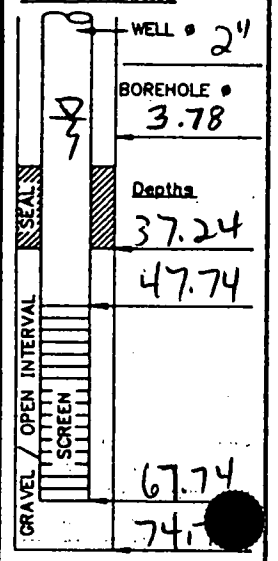
$K = 1.05 \times 10^{-3}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

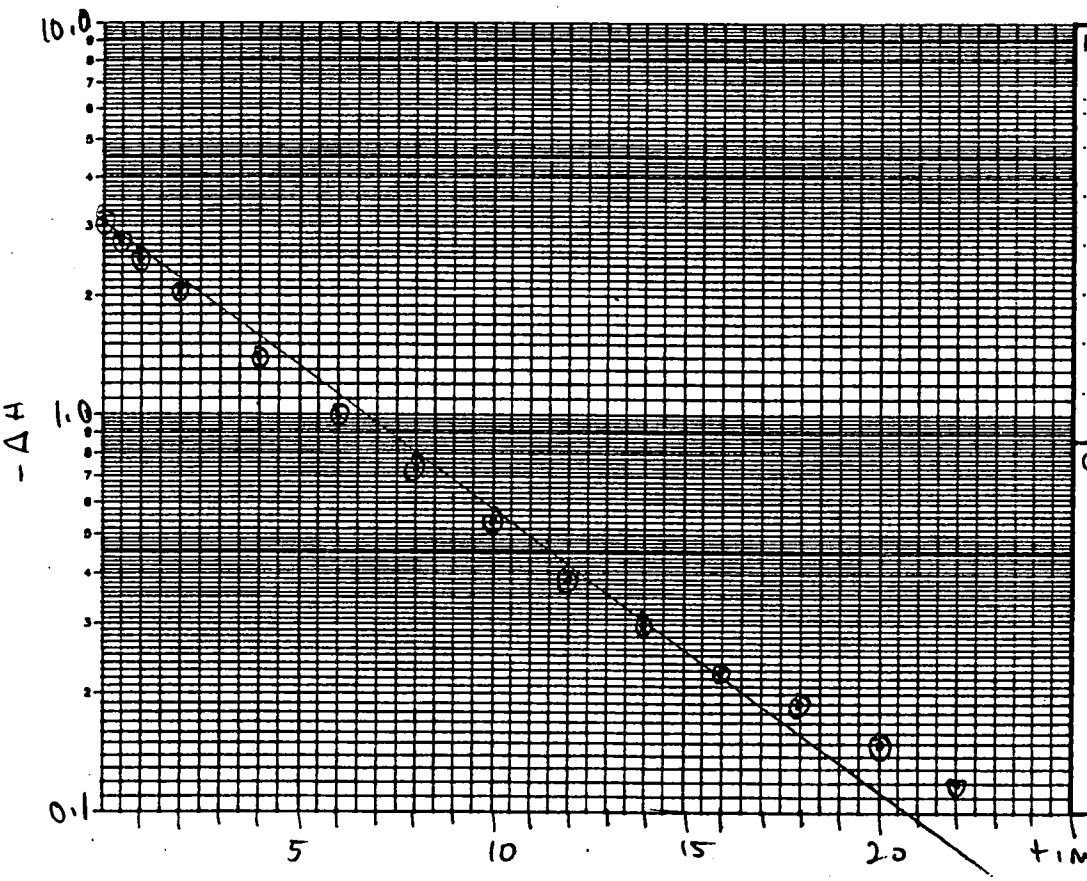
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C10
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T3SØ
STATIC WATER LEVEL (Depth/Elevation): 13.19' TPVC DATE: 3/11/99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-3.04	20.00		-0.15
0.50		-2.77	22.00		-0.12
1.00		-2.50	24.00		0.11
2.00		-2.03			
4.00		-1.41			
6.00		-1.00			
8.00		-0.73			
10.00		-0.54			
12.00		-0.39			
14.00		-0.30			
16.00		-0.23			
18.00		-0.19			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 1670
50 psi
H_2O above XO 53.37
Start @ 1725
Stop @ 0834 (3/12)

CALCS, SKETCH MAPS, ETC.:
file:
06C10Fall.txt

FUR
3-26-99

SE1000C
Environmental Logger
03/13 08:07

Unit# 00143 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60100
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well 06C10
Falling Head Test
file: 06C10 FALL.txt

Step 0 03/11 17:25:04

Elapsed Time	INPUT 1
0.0000	-3.891
0.0033	-3.875
0.0066	-5.130
0.0100	-4.606
0.0133	-4.606
0.0166	-4.606
0.0200	-4.511
0.0233	-4.495
0.0266	-4.272
0.0300	-4.431
0.0333	-4.400
0.0366	-4.161
0.0400	-3.891
0.0433	0.095
0.0466	-3.256
0.0500	-3.716
0.0533	-2.859
0.0566	-3.049 ← h_0
0.0600	-3.018
0.0633	-3.018
0.0666	-3.001
0.0700	-3.001
0.0733	-3.001
0.0766	-3.001
0.0800	-3.001
0.0833	-3.001
0.0866	-3.001
0.0900	-3.001
0.0933	-2.986
0.0966	-2.986
0.1000	-2.986
0.1033	-2.986
0.1066	-2.986
0.1100	-2.986
0.1133	-2.986
0.1166	-2.986
0.1200	-2.986

H/H_0	T
100	0

0.1233	-2.986
0.1266	-2.970
0.1300	-2.970
0.1333	-2.970
0.1366	-2.970
0.1400	-2.970
0.1433	-2.970
0.1466	-2.954
0.1500	-2.954
0.1533	-2.954
0.1566	-2.954
0.1600	-2.954
0.1633	-2.954
0.1666	-2.954
0.1700	-2.938
0.1733	-2.938
0.1766	-2.938
0.1800	-2.938
0.1833	-2.938
0.1866	-2.938
0.1900	-2.938
0.1933	-2.938
0.1966	-2.922
0.2000	-2.922
0.2033	-2.922
0.2066	-2.922
0.2100	-2.922
0.2133	-2.922
0.2166	-2.922
0.2200	-2.906
0.2233	-2.906
0.2266	-2.906
0.2300	-2.906
0.2333	-2.906
0.2366	-2.906
0.2400	-2.906
0.2433	-2.906
0.2466	-2.906
0.2500	-2.890
0.2533	-2.890
0.2566	-2.890
0.2600	-2.890
0.2633	-2.890
0.2666	-2.890
0.2700	-2.890
0.2733	-2.875
0.2766	-2.875
0.2800	-2.875
0.2833	-2.875
0.2866	-2.875
0.2900	-2.875
0.2933	-2.875
0.2966	-2.875
0.3000	-2.875
0.3033	-2.859
0.3066	-2.859
0.3100	-2.859
0.3133	-2.859
0.3166	-2.859
0.3200	-2.859

.95 .20

0.3233	-2.859		
0.3266	-2.859		
0.3300	-2.843		
0.3333	-2.843		
0.3500	-2.859		
0.3666	-2.859		
0.3833	-2.843		
0.4000	-2.827		
0.4166	-2.827		
0.4333	-2.795		
0.4500	-2.811		
0.4666	-2.795		
0.4833	-2.779		
0.5000	-2.779		
0.5166	-2.763		
0.5333	-2.763		
0.5500	-2.747		
0.5666	-2.732		
0.5833	-2.732		
0.6000	-2.716		
0.6166	-2.716		
0.6333	-2.700		
0.6500	-2.700		
0.6666	-2.684		
0.6833	-2.668		
0.7000	-2.668		
0.7166	-2.652		
0.7333	-2.652		
0.7500	-2.636		
0.7666	-2.636		
0.7833	-2.620		
0.8000	-2.604	.85	.7467
0.8166	-2.604		
0.8333	-2.589		
0.8500	-2.589		
0.8666	-2.573		
0.8833	-2.573		
0.9000	-2.557		
0.9166	-2.557		
0.9333	-2.541		
0.9500	-2.541		
0.9666	-2.525		
0.9833	-2.525		
1.0000	-2.509		
1.2000	-2.382		
1.4000	-2.287		
1.6000	-2.192		
1.8000	-2.112	.70	1.7467
2.0000	-2.033		
2.2000	-1.953		
2.4000	-1.890		
2.6000	-1.826	.60	2.5467
2.8000	-1.747		
3.0000	-1.683		
3.2000	-1.636		
3.4000	-1.572		
3.6000	-1.509	.50	3.5467
3.8000	-1.461		
4.0000	-1.413		
4.2000	-1.366		

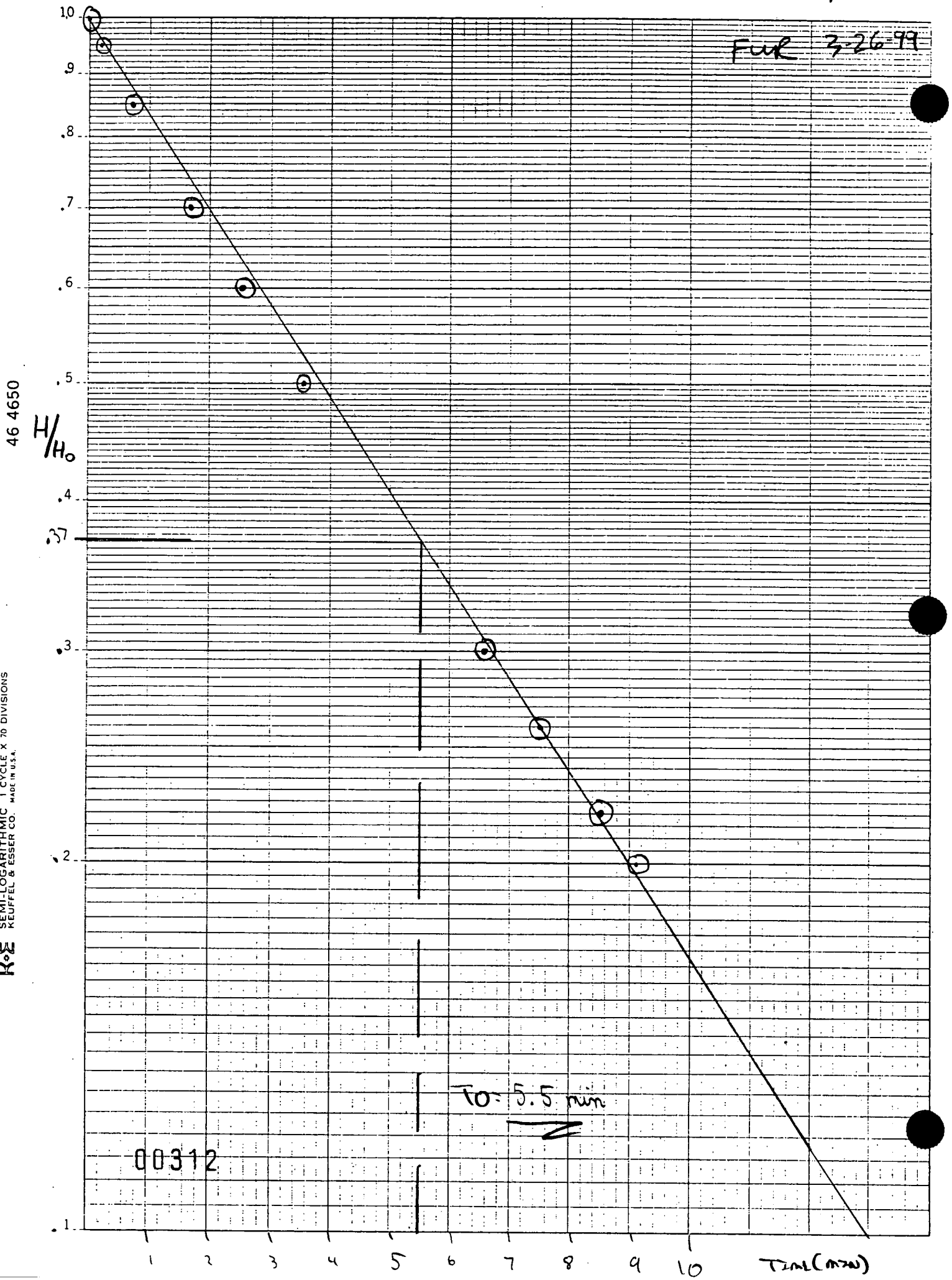
4.4000	-1.318		
4.6000	-1.270		
4.8000	-1.223		
5.0000	-1.191		
5.2000	-1.143		
5.4000	-1.111		
5.6000	-1.080		
5.8000	-1.032		
6.0000	-1.000		
6.2000	-0.969		
6.4000	-0.937		
6.6000	-0.905	.30	6.5467
6.8000	-0.889		
7.0000	-0.857		
7.2000	-0.826		
7.4000	-0.794		
7.6000	-0.778	.26	7.5467
7.8000	-0.746		
8.0000	-0.730		
8.2000	-0.698		
8.4000	-0.683		8.5467
8.6000	-0.667	.22	
8.8000	-0.635		
9.0000	-0.619		
9.2000	-0.603	.20	9.1467
9.4000	-0.587		
9.6000	-0.571		
9.8000	-0.555		
10.0000	-0.540		
12.0000	-0.397		
14.0000	-0.301		
16.0000	-0.238		
18.0000	-0.190		
20.0000	-0.158		
22.0000	-0.127		
24.0000	-0.111		
26.0000	-0.095		
28.0000	-0.079		
30.0000	-0.063		
32.0000	-0.063		
34.0000	-0.047		
36.0000	-0.047		
38.0000	-0.031		
40.0000	-0.031		
42.0000	-0.031		
44.0000	-0.031		
46.0000	-0.031		
48.0000	-0.031		
50.0000	-0.015		
52.0000	-0.015		
54.0000	-0.015		
56.0000	-0.015		
58.0000	-0.015		
60.0000	-0.015		
62.0000	-0.015		
64.0000	-0.015		
66.0000	-0.015		
68.0000	-0.015		
70.0000	0.000		
72.0000	-0.015		

74.0000	0.000
76.0000	-0.015
78.0000	-0.015
80.0000	-0.015
82.0000	-0.015
84.0000	-0.015
86.0000	0.000
88.0000	-0.015
90.0000	-0.015
92.0000	-0.015
94.0000	-0.015
96.0000	-0.015
98.0000	-0.015
100.000	-0.015
120.000	0.000
140.000	0.000
160.000	0.000
180.000	0.000
200.000	0.000
220.000	0.000
240.000	0.000
260.000	0.000
280.000	0.000
300.000	0.000
320.000	-0.015
340.000	-0.015
360.000	-0.015
380.000	-0.015
400.000	-0.015
420.000	-0.015
440.000	-0.015
460.000	-0.015
480.000	-0.015
500.000	-0.031
520.000	-0.015
540.000	-0.031
560.000	-0.015
580.000	-0.031
600.000	-0.031
620.000	-0.031
640.000	-0.031
660.000	-0.015
680.000	-0.015
700.000	-0.015
720.000	-0.015
740.000	-0.015
760.000	-0.015
780.000	0.000
800.000	0.000
820.000	0.000
840.000	0.000
860.000	0.015
880.000	0.015
900.000	0.031

END

06 C10 FALLING

NSWC CRANE / 7651



00312

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C10 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB / CHECKED BY: FURamsey 3-26-99	APPROVED BY: / DATE:

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = 5.5$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(5.5\,MIN)}$$

$K = 1.52 \times 10^{-4}$ FT/MIN $\times$ 1440 MIN/DAY

$K =$ ~~0.22~~ 0.218 TE 3/31 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

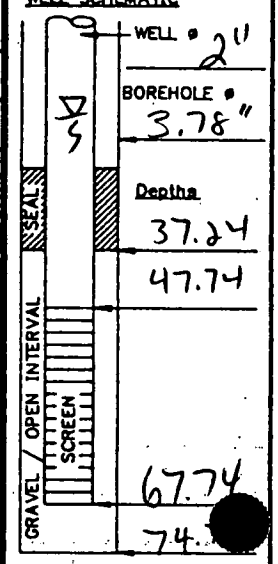
$K = 7.20 \times 10^{-5}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

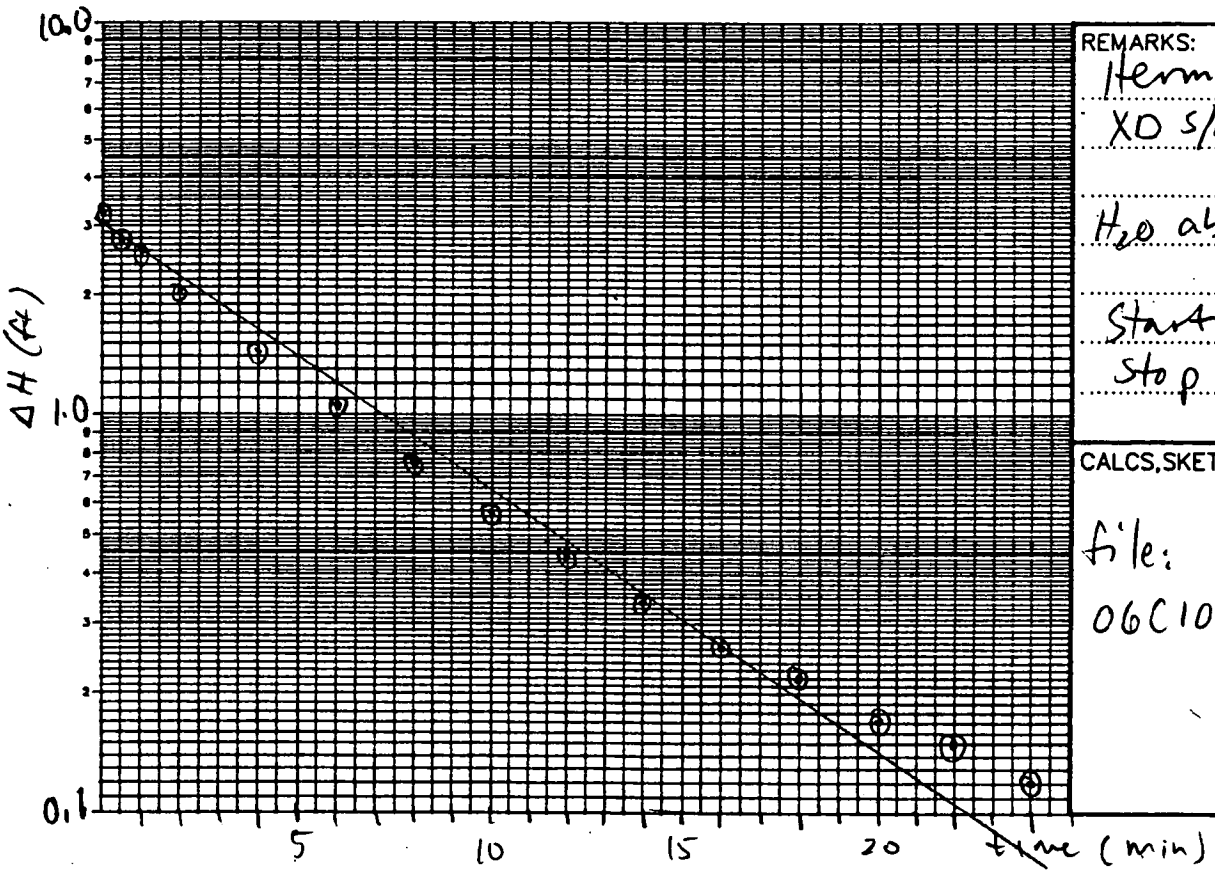
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C10
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T450
STATIC WATER LEVEL (Depth/Elevation): 13.23' TPVC DATE: 3/12/99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (~~0.0~~ 0.13' ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.27	20.00		0.17
0.50		2.81	22.00		0.15
1.00		2.54	24.00		0.12
2.00		2.06	26.00		0.11
4.00		1.44	28.00		0.11
6.00		1.04			
8.00		0.76			
10.00		0.57			
12.00		0.44			
14.00		0.34			
16.00		0.26			
18.00		0.22			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 1670
50 psi
H_2O above XD 53.33

Start @ 0837
Stop @ 0908

CALCS, SKETCH MAPS, ETC.:
file:
06C10 Rise.txt

✓ FWK

SE1000C
Environmental Logger
03/13 08:15

Unit# 00143 Test 4

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60100
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well 06C10
Rising Head Test
file: Ø6CIØRISE.TXT

Step 0 03/12 08:37:02

Elapsed Time	INPUT 1
0.0000	1.778
0.0033	3.811
0.0066	2.747
0.0100	3.049
0.0133	3.192
0.0166	3.272 ← Ho
0.0200	3.256
0.0233	3.224
0.0266	3.224
0.0300	3.208
0.0333	3.208
0.0366	3.192
0.0400	3.176
0.0433	3.192
0.0466	3.176
0.0500	3.176
0.0533	3.176
0.0566	3.160
0.0600	3.160
0.0633	3.160
0.0666	3.160
0.0700	3.160
0.0733	3.144
0.0766	3.144
0.0800	3.144
0.0833	3.144
0.0866	3.144
0.0900	3.129
0.0933	3.129
0.0966	3.129
0.1000	3.129
0.1033	3.129
0.1066	3.113
0.1100	3.113
0.1133	3.113
0.1166	3.113
0.1200	3.097

H/Ho	τ
1.00	0
.95	.100

00315

0.1233	3.097
0.1266	3.097
0.1300	3.097
0.1333	3.097
0.1366	3.081
0.1400	3.081
0.1433	3.081
0.1466	3.081
0.1500	3.081
0.1533	3.065
0.1566	3.065
0.1600	3.065
0.1633	3.065
0.1666	3.065
0.1700	3.065
0.1733	3.049
0.1766	3.049
0.1800	3.049
0.1833	3.049
0.1866	3.049
0.1900	3.049
0.1933	3.049
0.1966	3.033
0.2000	3.033
0.2033	3.033
0.2066	3.033
0.2100	3.033
0.2133	3.033
0.2166	3.033
0.2200	3.033
0.2233	3.017
0.2266	3.017
0.2300	3.017
0.2333	3.017
0.2366	3.017
0.2400	3.017
0.2433	3.017
0.2466	3.001
0.2500	3.001
0.2533	3.001
0.2566	3.001
0.2600	3.001
0.2633	3.001
0.2666	3.001
0.2700	2.986
0.2733	2.986
0.2766	2.986
0.2800	2.986
0.2833	2.986
0.2866	2.986
0.2900	2.986
0.2933	2.986
0.2966	2.970
0.3000	2.970
0.3033	2.970
0.3066	2.970
0.3100	2.970
0.3133	2.970
0.3166	2.954
0.3200	2.954

.90 .300

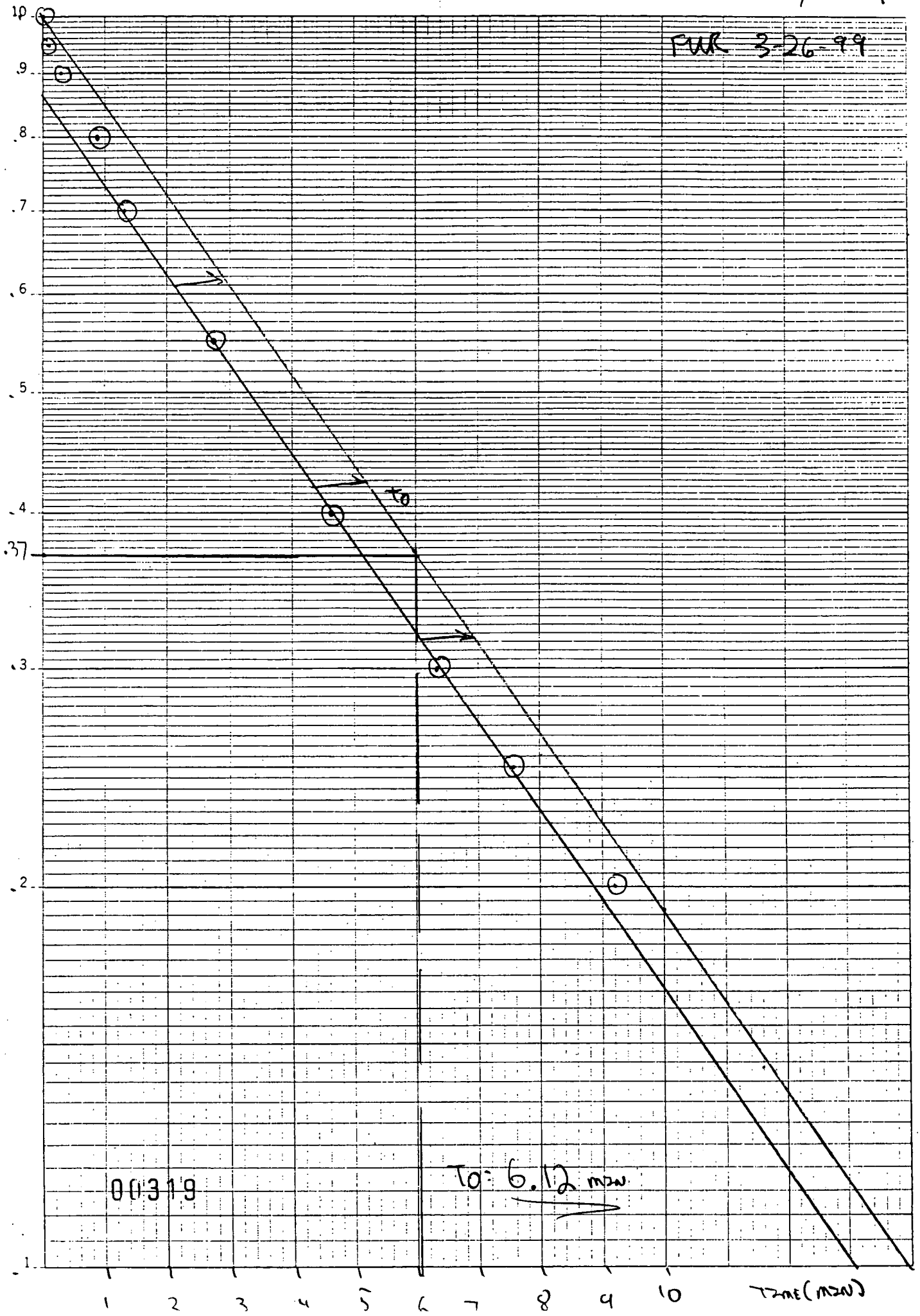
0.3233	2.954		
0.3266	2.954		
0.3300	2.954		
0.3333	2.954		
0.3500	2.922		
0.3666	2.906		
0.3833	2.890		
0.4000	2.874		
0.4166	2.874		
0.4333	2.858		
0.4500	2.843		
0.4666	2.827		
0.4833	2.827		
0.5000	2.811		
0.5166	2.795		
0.5333	2.795		
0.5500	2.779		
0.5666	2.763		
0.5833	2.763		
0.6000	2.747		
0.6166	2.747		
0.6333	2.731		
0.6500	2.716		
0.6666	2.716		
0.6833	2.700		
0.7000	2.700		
0.7166	2.684		
0.7333	2.668		
0.7500	2.668		
0.7666	2.652		
0.7833	2.652		
0.8000	2.636		
0.8166	2.636		
0.8333	2.620		
0.8500	2.620	.80	.8333
0.8666	2.604		
0.8833	2.589		
0.9000	2.589		
0.9166	2.573		
0.9333	2.573		
0.9500	2.557		
0.9666	2.557		
0.9833	2.541		
1.0000	2.541		
1.2000	2.414		
1.4000	2.318	.70	1.3833
1.6000	2.223		
1.8000	2.144		
2.0000	2.064		
2.2000	1.985		
2.4000	1.921		
2.6000	1.858		
2.8000	1.778	.55	2.7833
3.0000	1.731		
3.2000	1.667		
3.4000	1.604		
3.6000	1.556		
3.8000	1.492		
4.0000	1.445		
4.2000	1.397		

4.4000	1.349		
4.6000	1.318	.40	4.5833
4.8000	1.270		
5.0000	1.223		
5.2000	1.191		
5.4000	1.143		
5.6000	1.111		
5.8000	1.080		
6.0000	1.048		
6.2000	1.016		
6.4000	0.984	.30	6.3833
6.6000	0.952		
6.8000	0.921		
7.0000	0.889		
7.2000	0.873		
7.4000	0.842		
7.6000	0.809	.25	7.5833
7.8000	0.794		
8.0000	0.762		
8.2000	0.746		
8.4000	0.714		
8.6000	0.699		
8.8000	0.683		
9.0000	0.667		
9.2000	0.651	.20	9.1833
9.4000	0.619		
9.6000	0.603		
9.8000	0.587		
10.0000	0.571		
12.0000	0.444		
14.0000	0.349		
16.0000	0.269		
18.0000	0.222		
20.0000	0.174		
22.0000	0.159		
24.0000	0.127		
26.0000	0.111		
28.0000	0.111		
30.0000	0.095		

END

06010 R2572X

NSWC CRANE / 7651



00319

46 4650

K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C10 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: FURamsor 3-26-99
APPROVED BY:	DATE:

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = 6.12$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(6.12\,MIN)}$$

$K = 1.36 \times 10^{-4}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 0.196$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

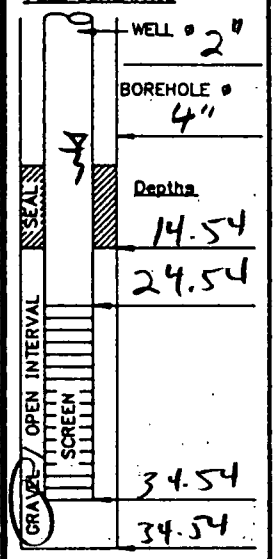
$K = 6.92 \times 10^{-5}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

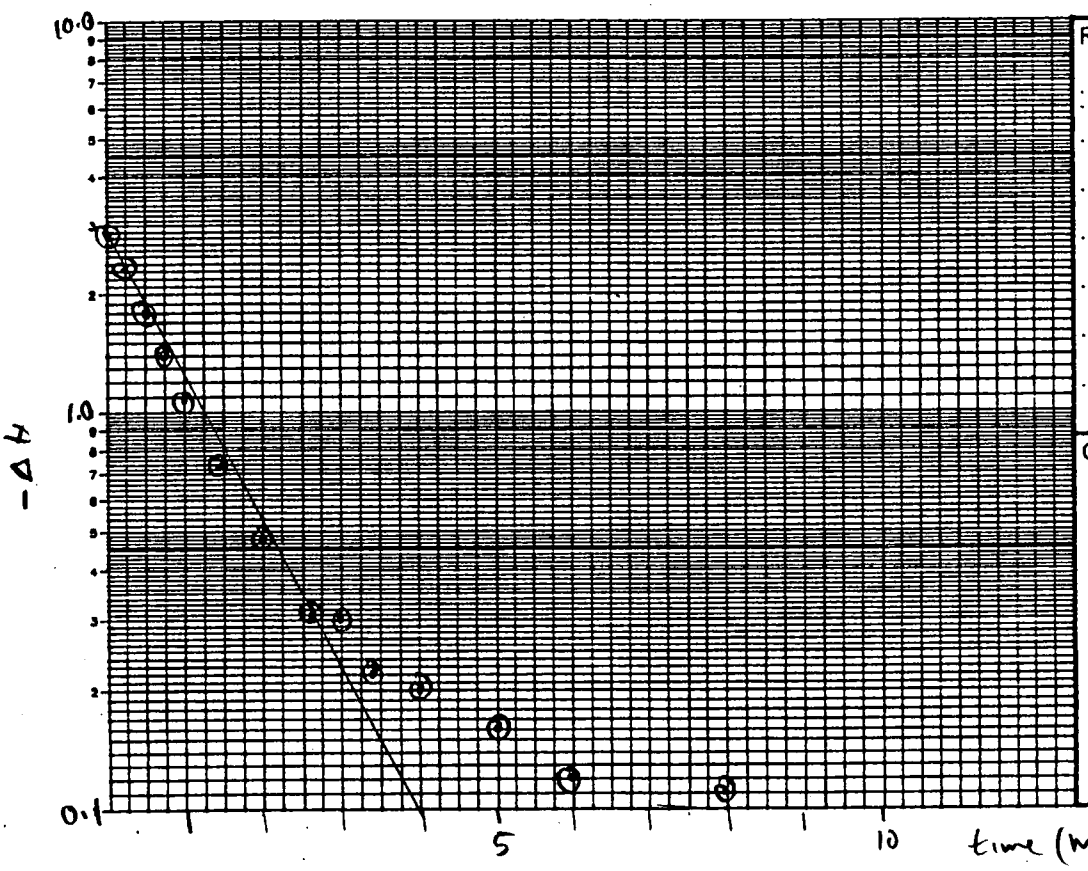
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C10P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: T1650
STATIC WATER LEVEL (Depth/Elevation): 12.32' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.07		-2.87	8.00		-0.11
0.50		-1.79			
1.00		-1.08	0.25		-2.33
1.40		-0.73	0.75		-1.40
2.00		-0.47			
2.60		-0.31			
3.00		-0.30			
3.40		-0.22			
4.00		-0.20			
4.60		-0.17			
5.00		-0.16			
6.00		-0.12			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD = 20.56'
Start @ 0915
Stop @ 0935

CALCS, SKETCH MAPS, ETC.:
file: 06C10P2Fall.txt

FLR
3-26-99

SE1000C
Environmental Logger
03/12 14:06

Unit# 00145 Test 16

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60102
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C10P2
Falling Head Test
Ø6C1ØP2 Fall.txt

Step 0 03/12 09:15:12

Elapsed Time	INPUT 1		H/Ho	T
0.0000	0.000			
0.0033	-0.175			
0.0066	-3.118			
0.0100	-4.429			
0.0133	-4.749			
0.0166	-4.301			
0.0200	-4.077			
0.0233	-4.253			
0.0266	-4.125			
0.0300	-4.157			
0.0333	-4.045			
0.0366	-4.061			
0.0400	-4.109			
0.0433	-4.061			
0.0466	-3.438			
0.0500	-1.998			
0.0533	-1.982			
0.0566	-2.894			
0.0600	-2.862			
0.0633	-3.454			
0.0666	-2.702			
0.0700	-2.670			
0.0733	-2.878	← Ho	1.00	0
0.0766	-2.798			
0.0800	-2.798			
0.0833	-2.702			
0.0866	-2.798			
0.0900	-2.750			
0.0933	-2.750			
0.0966	-2.766			
0.1000	-2.766			
0.1033	-2.814			
0.1066	-2.718			
0.1100	-2.734		.95	.0366
0.1133	-2.702			
0.1166	-2.686			
0.1200	-2.670			

.0733

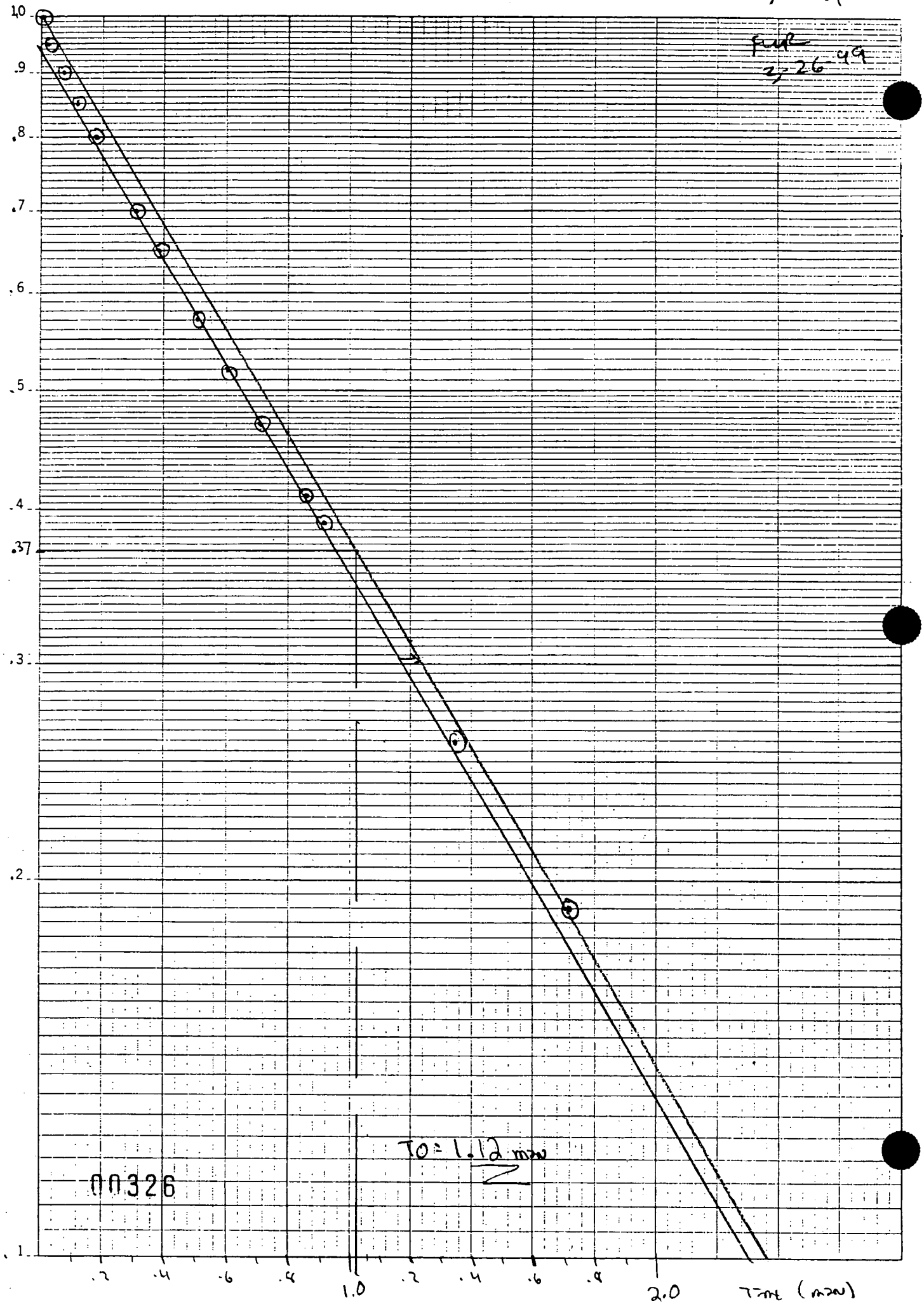
0.1233	-2.718		
0.1266	-2.670		
0.1300	-2.654		
0.1333	-2.638		
0.1366	-2.638		
0.1400	-2.622		
0.1433	-2.606	.90	.0700
0.1466	-2.606		
0.1500	-2.670		
0.1533	-2.494		
0.1566	-2.574		
0.1600	-2.558		
0.1633	-2.558		
0.1666	-2.558		
0.1700	-2.542		
0.1733	-2.542		
0.1766	-2.510		
0.1800	-2.510		
0.1833	-2.510		
0.1866	-2.494		
0.1900	-2.478		
0.1933	-2.478		
0.1966	-2.478		
0.2000	-2.462		
0.2033	-2.446	.85	.1300
0.2066	-2.446		
0.2100	-2.430		
0.2133	-2.430		
0.2166	-2.414		
0.2200	-2.414		
0.2233	-2.398		
0.2266	-2.398		
0.2300	-2.382		
0.2333	-2.382		
0.2366	-2.382		
0.2400	-2.366		
0.2433	-2.350		
0.2466	-2.350		
0.2500	-2.334		
0.2533	-2.334		
0.2566	-2.318		
0.2600	-2.318		
0.2633	-2.302	.80	.1900
0.2666	-2.302		
0.2700	-2.302		
0.2733	-2.270		
0.2766	-2.286		
0.2800	-2.254		
0.2833	-2.254		
0.2866	-2.238		
0.2900	-2.254		
0.2933	-2.238		
0.2966	-2.238		
0.3000	-2.222		
0.3033	-2.222		
0.3066	-2.206		
0.3100	-2.206		
0.3133	-2.190		
0.3166	-2.174		
0.3200	-2.174		

0.3233	-2.158		
0.3266	-2.158		
0.3300	-2.142		
0.3333	-2.158		
0.3500	-2.126		
0.3666	-2.078		
0.3833	-2.030	.70	.3100
0.4000	-1.998		
0.4166	-1.966		
0.4333	-1.918		
0.4500	-1.886		
0.4666	-1.870	.65	.3933
0.4833	-1.822		
0.5000	-1.791		
0.5166	-1.774		
0.5333	-1.743		
0.5500	-1.695		
0.5666	-1.663		
0.5833	-1.647	.57	.5100
0.6000	-1.631		
0.6166	-1.599		
0.6333	-1.567		
0.6500	-1.535		
0.6666	-1.503		
0.6833	-1.503	.52	.6100
0.7000	-1.455		
0.7166	-1.439		
0.7333	-1.423		
0.7500	-1.407		
0.7666	-1.375		
0.7833	-1.343	.47	.7100
0.8000	-1.327		
0.8166	-1.311		
0.8333	-1.311		
0.8500	-1.263		
0.8666	-1.247		
0.8833	-1.215		
0.9000	-1.215		
0.9166	-1.199		
0.9333	-1.183	.41	.8600
0.9500	-1.167		
0.9666	-1.135		
0.9833	-1.119	.39	.9100
1.0000	-1.087		
1.2000	-0.895		
1.4000	-0.735	.26	1.3266
1.6000	-0.639		
1.8000	-0.543	.19	1.7266
2.0000	-0.479		
2.2000	-0.431		
2.4000	-0.383		
2.6000	-0.319		
2.8000	-0.303		
3.0000	-0.303		
3.2000	-0.255		
3.4000	-0.223		
3.6000	-0.223		
3.8000	-0.191		
4.0000	-0.207		
4.2000	-0.191		

4.4000	-0.175
4.6000	-0.175
4.8000	-0.175
5.0000	-0.160
5.2000	-0.160
5.4000	-0.143
5.6000	-0.127
5.8000	-0.143
6.0000	-0.127
6.2000	-0.127
6.4000	-0.112
6.6000	-0.112
6.8000	-0.127
7.0000	-0.127
7.2000	-0.112
7.4000	-0.127
7.6000	-0.112
7.8000	-0.095
8.0000	-0.112
8.2000	-0.112
8.4000	-0.095
8.6000	-0.095
8.8000	-0.095
9.0000	-0.095
9.2000	-0.095
9.4000	-0.079
9.6000	-0.079
9.8000	-0.095
10.0000	-0.079
12.0000	-0.064
14.0000	-0.064
16.0000	-0.064
18.0000	-0.048

END

06C10P2 FALLING NSWC CRANE/7651



K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4650

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C10P2 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: 3-26-99	APPROVED BY:	DATE:

$r = 0.083$ FT

$R = \cancel{0.158}$ 0.167 FT FUR 3-26-99

$L = 10$ FT

$T_o = 1.12$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / \cancel{0.158}\,0.167\,FT)}{2(10\,FT)(1.12\,MIN)}$$

FUR 3-26-99

$K = \cancel{1.28} \times 10^{-3}$ 1.26 FT/MIN × 1440 MIN/DAY

FUR 3-26-99

$K = \cancel{1.84}$ 1.81 FT/DAY × 1 cm/SEC / 2835 FT/DAY

FUR 3-26-99

$K = \cancel{6.48} \times 10^{-4}$ 6.39 cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C10P2

PROJECT NO.: 7651 GEOLOGIST: T. Evans

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1750

STATIC WATER LEVEL (Depth/Elevation): 12.29' DATE: 3-12-99

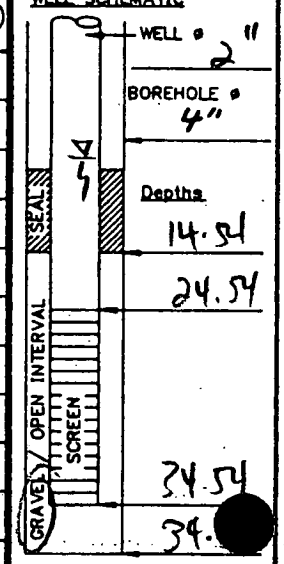
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:

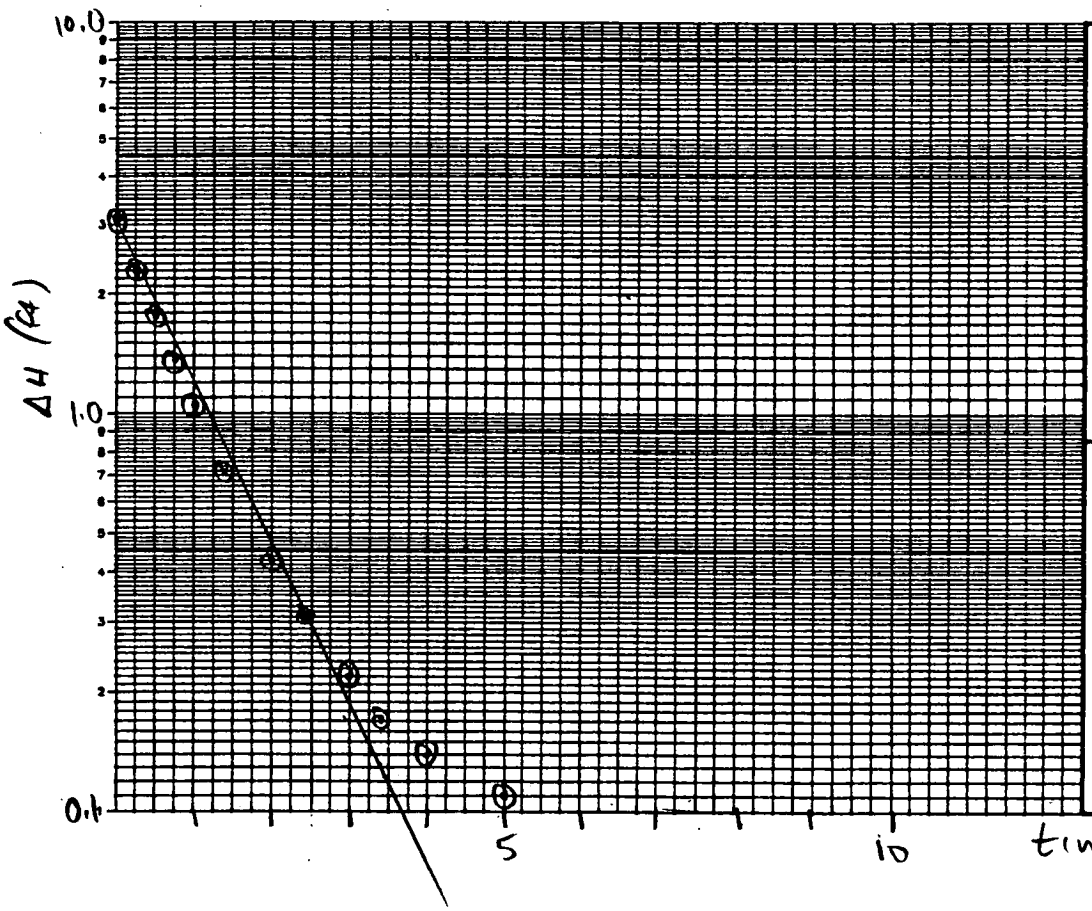
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 4.7') PAGE ... OF ...

REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.14	5.00		0.11
0.25		2.31	5.40		0.09
0.50		1.79			
0.75		1.37			
1.00		1.05			
1.40		0.71			
2.00		0.43			
2.40		0.31			
3.00		0.22			
3.40		0.17			
4.00		0.14			
4.40		0.12			

WELL SCHEMATIC





REMARKS:
Permit # 145
XD S/N 203120
50psi
H_2O above XD —
Start @ 0936
Stop @ 0947

CALCS, SKETCH MAPS, ETC.:
File:
06C10P2 Rise.txt

FWR
3-26-99

SE1000C
Environmental Logger
03/12 14:19

Unit# 00145 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60102
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C10P2
Rising Head test
Ø6C1ØP2 Rise.txt

Step 0 03/12 09:36:01

Elapsed Time	INPUT 1		H/Ho	T
0.0000	-0.048			
0.0033	3.965			
0.0066	4.844			
0.0100	1.982			
0.0133	3.149	← Ho	1.00	0
0.0166	3.149			
0.0200	3.118			
0.0233	3.101			
0.0266	3.070			
0.0300	3.054			
0.0333	3.022			
0.0366	3.006		.95	.02
0.0400	2.974			
0.0433	2.974			
0.0466	2.958			
0.0500	2.926			
0.0533	2.926			
0.0566	2.926			
0.0600	2.894			
0.0633	2.894			
0.0666	2.878			
0.0700	2.862			
0.0733	2.846			
0.0766	2.846			
0.0800	2.846			
0.0833	2.814			
0.0866	2.814		.90	.05
0.0900	2.814			
0.0933	2.782			
0.0966	2.766			
0.1000	2.766			
0.1033	2.750			
0.1066	2.750			
0.1100	2.734			
0.1133	2.718			
0.1166	2.718			

0.1200	2.718		
0.1233	2.702		
0.1266	2.686		
0.1300	2.670		
0.1333	2.670	.85	.1200
0.1366	2.638		
0.1400	2.654		
0.1433	2.638		
0.1466	2.606		
0.1500	2.606		
0.1533	2.606		
0.1566	2.574		
0.1600	2.574		
0.1633	2.574		
0.1666	2.542		
0.1700	2.542		
0.1733	2.542		
0.1766	2.526	.80	.1633
0.1800	2.526		
0.1833	2.510		
0.1866	2.510		
0.1900	2.494		
0.1933	2.494		
0.1966	2.478		
0.2000	2.478		
0.2033	2.462		
0.2066	2.462		
0.2100	2.446		
0.2133	2.430		
0.2166	2.430		
0.2200	2.414		
0.2233	2.382		
0.2266	2.382		
0.2300	2.398		
0.2333	2.382		
0.2366	2.382		
0.2400	2.350		
0.2433	2.350		
0.2466	2.350		
0.2500	2.318		
0.2533	2.334		
0.2566	2.318		
0.2600	2.318		
0.2633	2.302		
0.2666	2.286		
0.2700	2.302		
0.2733	2.270		
0.2766	2.270		
0.2800	2.254		
0.2833	2.254		
0.2866	2.238		
0.2900	2.238		
0.2933	2.238		
0.2966	2.222	.70	.2833
0.3000	2.206		
0.3033	2.206		
0.3066	2.206		
0.3100	2.190		
0.3133	2.190		
0.3166	2.174		

0.3200	2.156		
0.3233	2.156		
0.3266	2.142		
0.3300	2.142		
0.3333	2.142		
0.3500	2.094		
0.3666	2.078		
0.3833	2.014		
0.4000	1.998		
0.4166	1.950		
0.4333	1.918		
0.4500	1.886		
0.4666	1.854		
0.4833	1.806		
0.5000	1.790		
0.5166	1.758		
0.5333	1.711	.54	.5200
0.5500	1.663		
0.5666	1.663		
0.5833	1.647		
0.6000	1.599		
0.6166	1.583		
0.6333	1.551	.49	.6200
0.6500	1.519		
0.6666	1.503		
0.6833	1.471		
0.7000	1.439		
0.7166	1.423		
0.7333	1.375	.43	.7200
0.7500	1.375		
0.7666	1.359		
0.7833	1.327		
0.8000	1.295		
0.8166	1.263		
0.8333	1.263	.40	.8200
0.8500	1.247		
0.8666	1.215		
0.8833	1.183		
0.9000	1.183		
0.9166	1.167		
0.9333	1.151	.37	.9200
0.9500	1.135		
0.9666	1.103		
0.9833	1.087	.35	.9700
1.0000	1.055		
1.2000	0.847		
1.4000	0.719		
1.6000	0.591	.20	1.5866
1.8000	0.511		
2.0000	0.431		
2.2000	0.383		
2.4000	0.319		
2.6000	0.287		
2.8000	0.255		
3.0000	0.223		
3.2000	0.223		
3.4000	0.175		
3.6000	0.175		
3.8000	0.143		
4.0000	0.143		

.0133

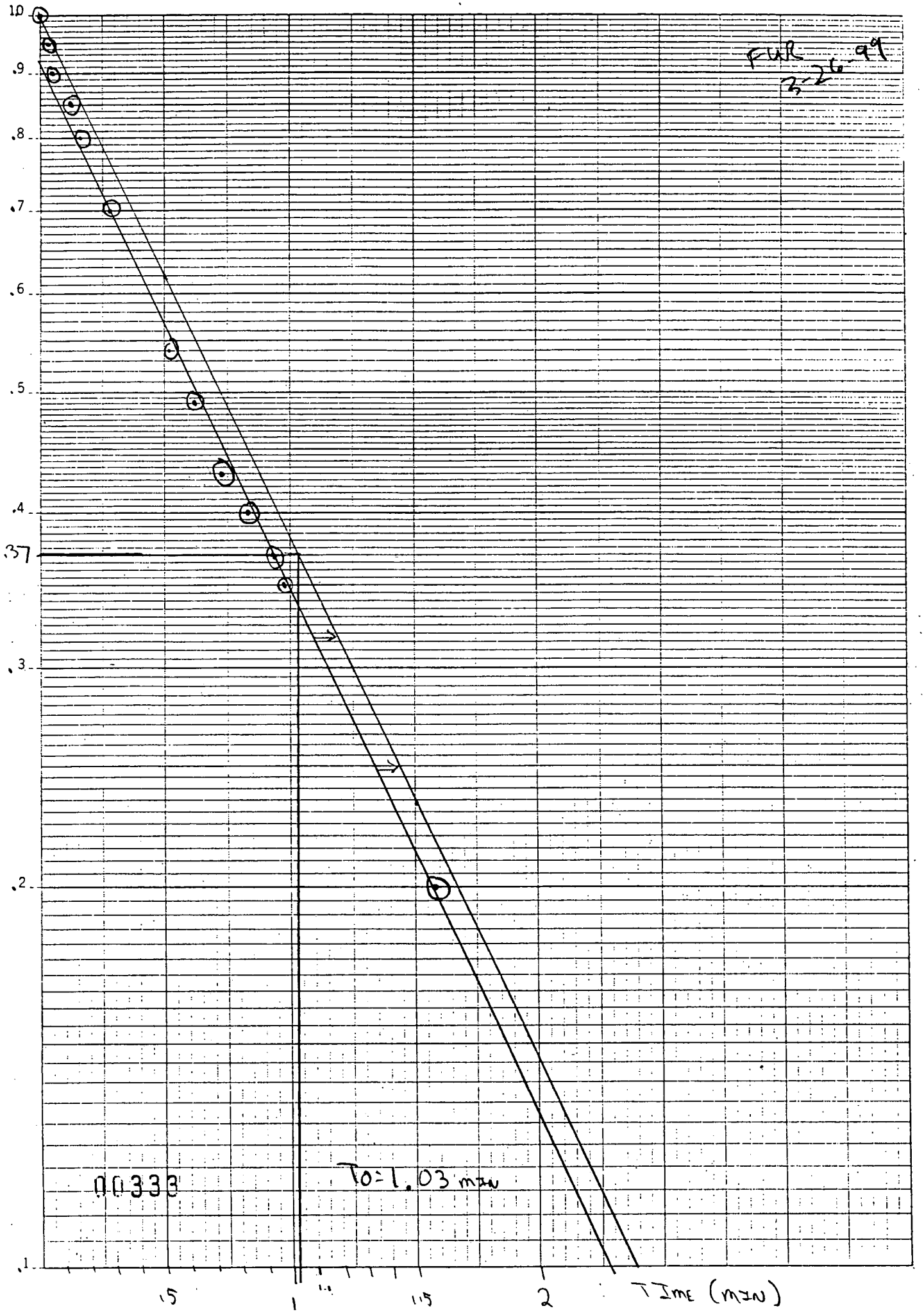
3.149

4.2000	0.143
4.4000	0.127
4.6000	0.127
4.8000	0.112
5.0000	0.112
5.2000	0.112
5.4000	0.096
5.6000	0.096
5.8000	0.096
6.0000	0.112
6.2000	0.096
6.4000	0.079
6.6000	0.096
6.8000	0.079
7.0000	0.079
7.2000	0.079
7.4000	0.079
7.6000	0.079
7.8000	0.079
8.0000	0.079
8.2000	0.064
8.4000	0.064
8.6000	0.079
8.8000	0.064
9.0000	0.064
9.2000	0.064
9.4000	0.048
9.6000	0.064
9.8000	0.048
10.0000	0.048

END

06C10P2

NSWC CRANE / 7651



46 4650
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TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OGC10P2 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: FLRamsier 3-26-99
APPROVED BY:	DATE:

$r = 0.083$ FT

$R = \cancel{0.158}$ 0.167 FT FLR 3-26-99

$L = 10$ FT

$T_o = 1.03$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / \cancel{0.158}\,0.167\,FT)}{2(10\,FT)(1.03\,MIN)}$$ FLR 3-26-99

$K = \cancel{1.39} \times 10^{-3}$ 1.37 FLR 3-26-99 FT/MIN $\times$ 1440 MIN/DAY

$K = \cancel{1.99}$ 1.97 FLR 3-26-99 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

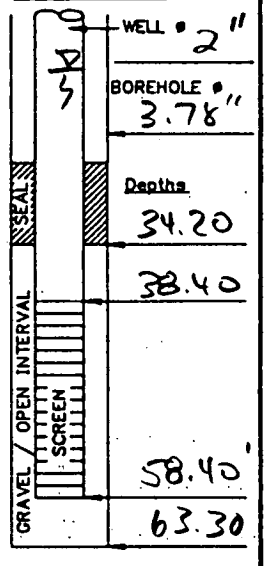
$K = \cancel{2.05} \times 10^{-4}$ 6.95 FLR 3-26-99 cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

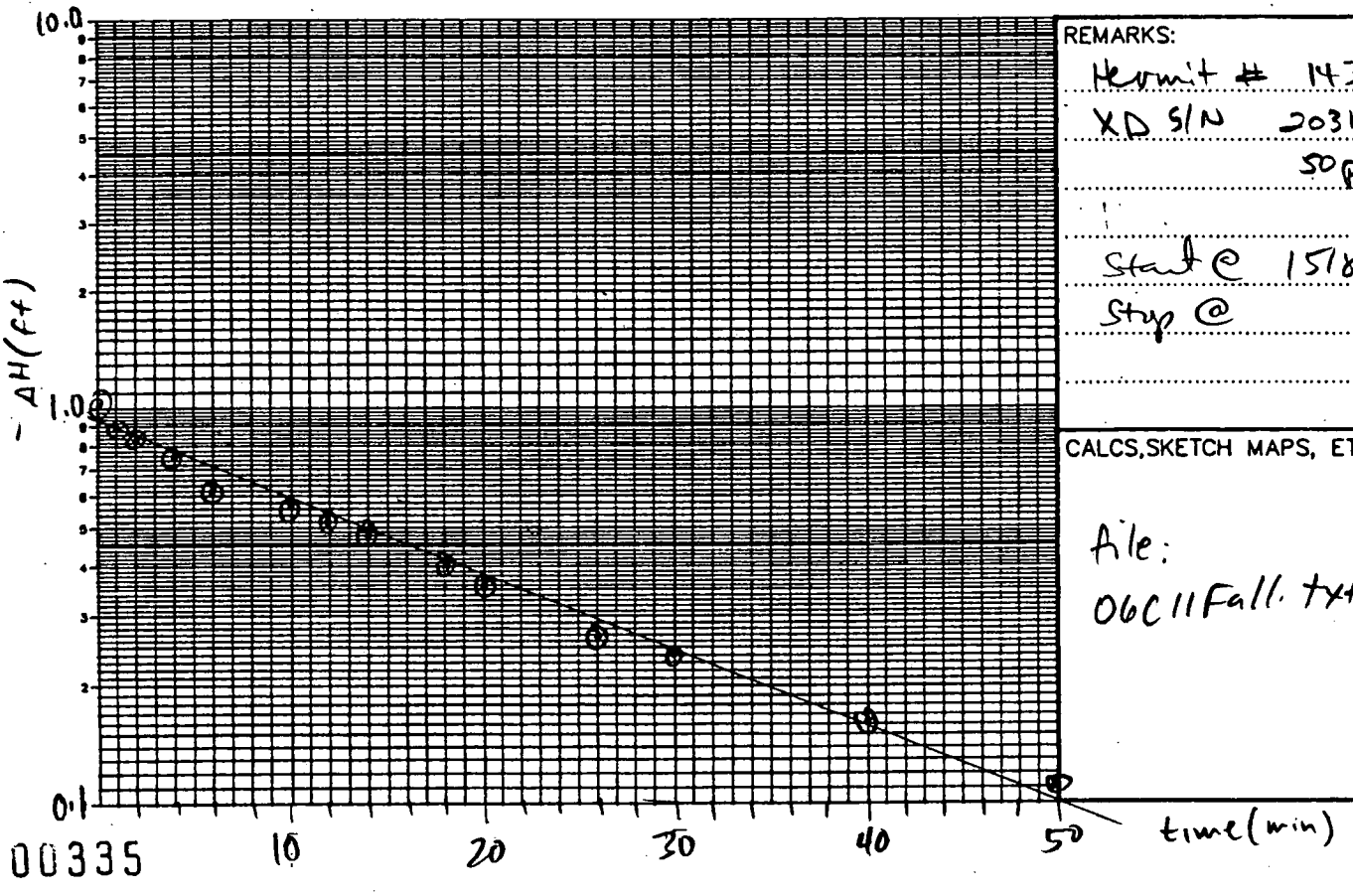
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C11
PROJECT NO.: 7657 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: TEST NO.: TØ5Ø
STATIC WATER LEVEL (Depth/Elevation): 3.75' TPVC DATE: 3-8-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 2.56') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-1.01	14.00		-0.48
1.00		-0.89	16.00		-0.43
2.00		-0.84	18.00		-0.40
3.00		-0.81	20.00		-0.36
4.00		-0.76	26.00		-0.27
5.00		-0.73	30.00		-0.24
6.00		-0.68	40.00		-0.16
7.00		-0.65	50.00		-0.11
8.00		-0.62			
9.00		-0.60			
10.00		-0.57			
12.00		-0.52			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50psi
Start @ 1518
Stop @

CALCS, SKETCH MAPS, ETC.:
File:
06C11Fall.txt

00335

SE10000
Environmental Logger
03/08 19:46

Unit# 00043 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
T.D.	61100
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C11
Falling Head Test
Ø6C11 FALL. TXT

Step 0 03/08 15:17:55

Elapsed Time	INPUT 1
0.0000	-0.625
0.0033	-1.042
0.0066	-1.619
0.0100	-1.042
0.0133	-0.753
0.0166	-0.593
0.0200	-0.866
0.0233	-1.042
0.0266	-0.994
0.0300	-0.962
0.0333	-0.962
0.0366	-0.978
0.0400	-0.962
0.0433	-0.962
0.0466	-0.946
0.0500	-1.010 ← Ho
0.0533	-0.962
0.0566	-0.962
0.0600	-0.978
0.0633	-0.946
0.0666	-0.962
0.0700	-0.962
0.0733	-0.978
0.0766	-0.946
0.0800	-0.962
0.0833	-0.946
0.0866	-0.994
0.0900	-0.881
0.0933	-0.930
0.0966	-0.962
0.1000	-0.946
0.1033	-0.946
0.1066	-0.946
0.1100	-0.946
0.1133	-0.946
0.1166	-0.962
0.1200	-0.866

H/Ho	T
1.00	0
.95	.0200

00336

0.1233	-1.122
0.1266	-0.898
0.1300	-0.913
0.1333	-0.930
0.1366	-1.010
0.1400	-0.962
0.1433	-0.946
0.1466	-0.946
0.1500	-0.946
0.1533	-0.946
0.1566	-0.946
0.1600	-0.946
0.1633	-0.946
0.1666	-0.946
0.1700	-0.946
0.1733	-0.946
0.1766	-0.946
0.1800	-0.946
0.1833	-0.930
0.1866	-0.946
0.1900	-0.946
0.1933	-0.946
0.1966	-0.946
0.2000	-0.946
0.2033	-0.946
0.2066	-0.946
0.2100	-0.946
0.2133	-0.946
0.2166	-0.946
0.2200	-0.930
0.2233	-0.946
0.2266	-0.946
0.2300	-0.946
0.2333	-0.946
0.2366	-0.946
0.2400	-0.946
0.2433	-0.930
0.2466	-0.930
0.2500	-0.946
0.2533	-0.930
0.2566	-0.946
0.2600	-0.930
0.2633	-0.930
0.2666	-0.946
0.2700	-0.946
0.2733	-0.946
0.2766	-0.930
0.2800	-0.946
0.2833	-0.946
0.2866	-0.946
0.2900	-0.930
0.2933	-0.930
0.2966	-0.946
0.3000	-0.930
0.3033	-0.930
0.3066	-0.930
0.3100	-0.930
0.3133	-0.930
0.3166	-0.930
0.3200	-0.930

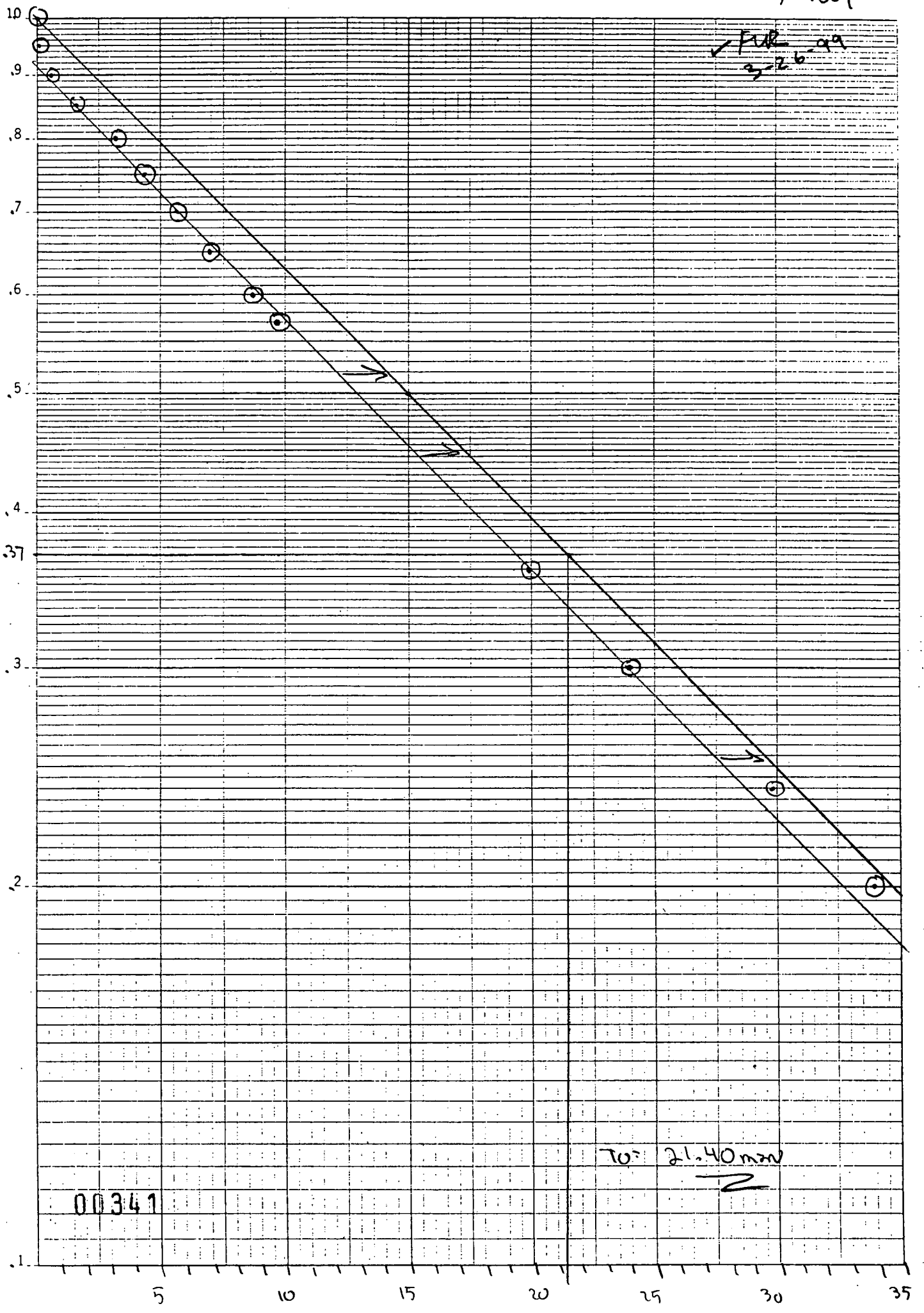
0.3233	-0.930		
0.3266	-0.930		
0.3300	-0.930		
0.3333	-0.930		
0.3500	-0.930		
0.3666	-0.930		
0.3833	-0.930		
0.4000	-0.930		
0.4166	-0.930		
0.4333	-0.930		
0.4500	-0.930		
0.4666	-0.930		
0.4833	-0.930		
0.5000	-0.930		
0.5166	-0.930		
0.5333	-0.930		
0.5500	-0.930		
0.5666	-0.930		
0.5833	-0.930		
0.6000	-0.913	.90	.5500
0.6166	-0.913		
0.6333	-0.913		
0.6500	-0.913		
0.6666	-0.913		
0.6833	-0.913		
0.7000	-0.913		
0.7166	-0.913		
0.7333	-0.913		
0.7500	-0.913		
0.7666	-0.913		
0.7833	-0.913		
0.8000	-0.913		
0.8166	-0.913		
0.8333	-0.913		
0.8500	-0.913		
0.8666	-0.913		
0.8833	-0.913		
0.9000	-0.913		
0.9166	-0.913		
0.9333	-0.898		
0.9500	-0.913		
0.9666	-0.898		
0.9833	-0.898		
1.0000	-0.898		
1.2000	-0.898		
1.4000	-0.881		
1.6000	-0.866	.85	1.5500
1.8000	-0.866		
2.0000	-0.849		
2.2000	-0.849		
2.4000	-0.833		
2.6000	-0.833		
2.8000	-0.817		
3.0000	-0.817		
3.2000	-0.801	.80	3.1500
3.4000	-0.785		
3.6000	-0.785		
3.8000	-0.769		
4.0000	-0.769		
4.2000	-0.769		

4.4000	-0.753	.75	4.350
4.6000	-0.753		
4.8000	-0.737		
5.0000	-0.737		
5.2000	-0.721		
5.4000	-0.721		
5.6000	-0.705	.70	5.550
5.8000	-0.705		
6.0000	-0.689		
6.2000	-0.689		
6.4000	-0.689		
6.6000	-0.673		
6.8000	-0.673		
7.0000	-0.657	.65	6.950
7.2000	-0.657		
7.4000	-0.641		
7.6000	-0.641		
7.8000	-0.641		
8.0000	-0.625		
8.2000	-0.625		
8.4000	-0.625		
8.6000	-0.625		
8.8000	-0.609	.60	8.750
9.0000	-0.609		
9.2000	-0.593		
9.4000	-0.593		
9.6000	-0.577		
9.8000	-0.577		
10.0000	-0.577	.57	9.950
12.0000	-0.529		
14.0000	-0.481		
16.0000	-0.433		
18.0000	-0.400		19.950
20.0000	-0.368	.36	
22.0000	-0.336		
24.0000	-0.304	.30	23.950
26.0000	-0.272		
28.0000	-0.256		
30.0000	-0.240	.24	29.950
32.0000	-0.224		
34.0000	-0.208	.20	33.950
36.0000	-0.192		
38.0000	-0.176		
40.0000	-0.160		
42.0000	-0.144		
44.0000	-0.144		
46.0000	-0.128		
48.0000	-0.112		
50.0000	-0.112		
52.0000	-0.112		
54.0000	-0.112		
56.0000	-0.096		
58.0000	-0.096		
60.0000	-0.080		
62.0000	-0.080		
64.0000	-0.080		
66.0000	-0.080		
68.0000	-0.064		
70.0000	-0.064		
72.0000	-0.064		

74.0000	-0.064
76.0000	-0.064
78.0000	-0.064

END

06C11 FALLING NSWC CRANE / 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C11 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: SKramer 3-26-99
APPROVED BY:	DATE:

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = 21.40$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(21.40\,MIN)}$$

$K = 3.90 \times 10^{-5}$ FT/MIN $\times$ 1440 MIN/DAY

$K =$ ~~0.06~~ 0.0561 TB 3/31/99 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K = 1.98 \times 10^{-5}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C11

PROJECT NO.: 7651 GEOLOGIST: T. Evans / Kimpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: TEST NO.: T1S0

STATIC WATER LEVEL (Depth/Elevation): 3.64' TPVC DATE: 3-8-99

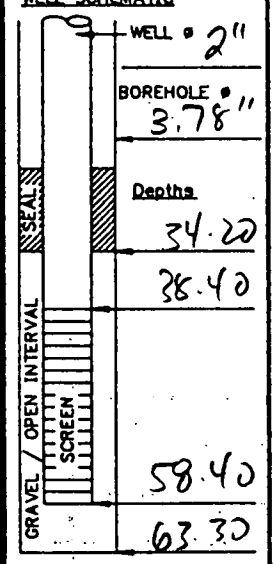
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø X 2.56' PAGE ... OF ...

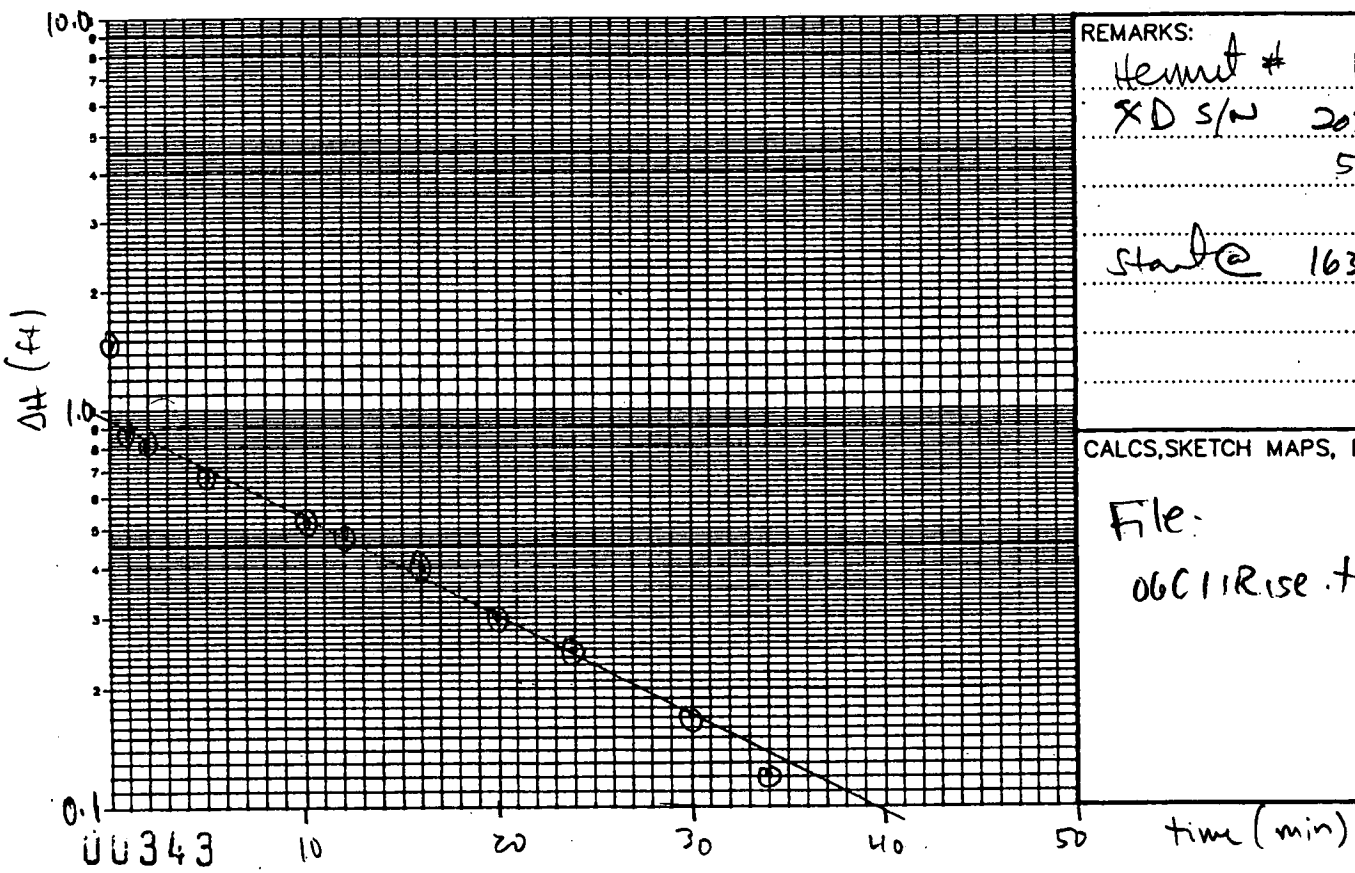
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		1.42	44.00		
1.00		0.86	50.00		
2.00		0.81			
5.00		0.68			
10.00		0.52			
12.00		0.48			
16.00		0.40			
20.00		0.30			
24.00		0.25			
30.00		0.17			
34.00		0.12			
40.00		0.09			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
Start @ 1637

CALCS, SKETCH MAPS, ETC.:
File:
06C11Rise.txt

00343

FUR

SE1000C
Environmental Logger
03/08 19:50

Unit# 00043 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61100
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C11
Rising Head Test
Ø6C11RISE.TXT

Step 0 03/08 16:36:54

Elapsed Time	INPUT 1
0.0000	-0.064
0.0033	0.256
0.0066	1.298
0.0100	0.352
0.0133	1.426 ← Ho
0.0166	1.042
0.0200	1.026
0.0233	1.026
0.0266	0.978
0.0300	0.962
0.0333	0.962
0.0366	0.962
0.0400	0.962
0.0433	0.945
0.0466	0.945
0.0500	0.945
0.0533	0.945
0.0566	0.945
0.0600	0.945
0.0633	0.945
0.0666	0.945
0.0700	0.945
0.0733	0.930
0.0766	0.930
0.0800	0.930
0.0833	0.930
0.0866	0.930
0.0900	0.930
0.0933	0.930
0.0966	0.930
0.1000	0.930
0.1033	0.930
0.1066	0.930
0.1100	0.930
0.1133	0.930
0.1166	0.930
0.1200	0.930

H/Ho	T
1.00	0
.73	.0033
.72	.0100
.65	.0633

00344

0.1233	0.930
0.1266	0.930
0.1300	0.930
0.1333	0.930
0.1366	0.930
0.1400	0.930
0.1433	0.930
0.1466	0.930
0.1500	0.930
0.1533	0.930
0.1566	0.913
0.1600	0.930
0.1633	0.930
0.1666	0.930
0.1700	0.930
0.1733	0.930
0.1766	0.913
0.1800	0.930
0.1833	0.930
0.1866	0.913
0.1900	0.913
0.1933	0.913
0.1966	0.913
0.2000	0.913
0.2033	0.913
0.2066	0.913
0.2100	0.930
0.2133	0.913
0.2166	0.913
0.2200	0.913
0.2233	0.913
0.2266	0.913
0.2300	0.913
0.2333	0.913
0.2366	0.913
0.2400	0.913
0.2433	0.913
0.2466	0.913
0.2500	0.913
0.2533	0.913
0.2566	0.913
0.2600	0.913
0.2633	0.913
0.2666	0.913
0.2700	0.913
0.2733	0.913
0.2766	0.913
0.2800	0.913
0.2833	0.913
0.2866	0.913
0.2900	0.913
0.2933	0.913
0.2966	0.913
0.3000	0.913
0.3033	0.913
0.3066	0.913
0.3100	0.913
0.3133	0.913
0.3166	0.913
0.3200	0.913

.64

.1800

00345

0.3233	0.913		
0.3266	0.913		
0.3300	0.913		
0.3333	0.913		
0.3500	0.913		
0.3666	0.913		
0.3833	0.913		
0.4000	0.913		
0.4166	0.913		
0.4333	0.897		
0.4500	0.897		
0.4666	0.897	.63	.4700
0.4833	0.897		
0.5000	0.897		
0.5166	0.897		
0.5333	0.897		
0.5500	0.897		
0.5666	0.897		
0.5833	0.897		
0.6000	0.897		
0.6166	0.897		
0.6333	0.882		
0.6500	0.882		
0.6666	0.882		
0.6833	0.882		
0.7000	0.882		
0.7166	0.882		
0.7333	0.882		
0.7500	0.882		
0.7666	0.882		
0.7833	0.882		
0.8000	0.882		
0.8166	0.882		
0.8333	0.882		
0.8500	0.882		
0.8666	0.882		
0.8833	0.882		
0.9000	0.865		
0.9166	0.865		
0.9333	0.865		
0.9500	0.865		
0.9666	0.865		
0.9833	0.865		
1.0000	0.865		
1.2000	0.849	.60	1.1866
1.4000	0.849		
1.6000	0.833		
1.8000	0.833		
2.0000	0.817		
2.2000	0.801		
2.4000	0.801		
2.6000	0.785	.55	2.5866
2.8000	0.785		
3.0000	0.769		
3.2000	0.769		
3.4000	0.753		
3.6000	0.737		
3.8000	0.737		
4.0000	0.721		
4.2000	0.721		

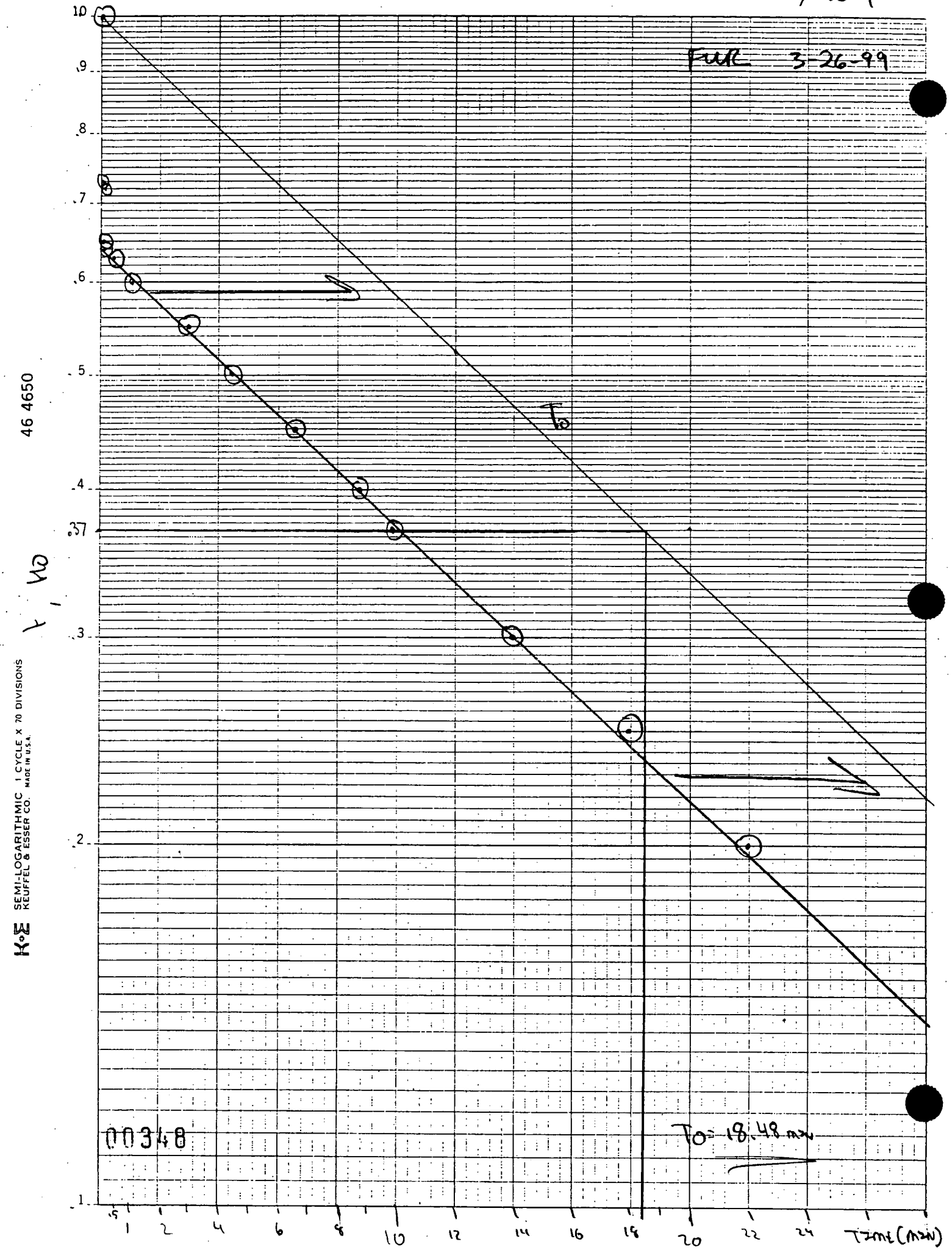
00346

.003

4.4000	0.721	.50	4.3867
4.6000	0.705		
4.8000	0.705		
5.0000	0.689		
5.2000	0.673		
5.4000	0.673		
5.6000	0.673		
5.8000	0.657		
6.0000	0.657		
6.2000	0.641		
6.4000	0.641		
6.6000	0.641	.45	6.5867
6.8000	0.625		
7.0000	0.625		
7.2000	0.609		
7.4000	0.609		
7.6000	0.609		
7.8000	0.593		
8.0000	0.593		
8.2000	0.593		
8.4000	0.577		
8.6000	0.577	.40	8.5867
8.8000	0.561		
9.0000	0.561		
9.2000	0.545		
9.4000	0.545		
9.6000	0.545		
9.8000	0.528	.37	9.7867
10.0000	0.528		
12.0000	0.480		
14.0000	0.432	.30	13.9867
16.0000	0.400		
18.0000	0.352	.25	17.9867
20.0000	0.304		
22.0000	0.288	.20	21.9867
24.0000	0.256		
26.0000	0.224		
28.0000	0.208		
30.0000	0.176		
32.0000	0.144		
34.0000	0.128		
36.0000	0.112		
38.0000	0.112		
40.0000	0.096		
42.0000	0.063		

END

06C11 RISING NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OGC11 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB / CHECKED BY: FWLamson 3/26/99	APPROVED BY: / DATE:

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = 18.48$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(18.48\,MIN)}$$

$K = 4.51 \times 10^{-5}$ FT/MIN $\times$ 1440 MIN/DAY ✓

$K = 0.0649$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K =$ ~~2.44×10^{-5}~~ FWL 3/26
2.29×10^{-5} cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C11P2

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T050

STATIC WATER LEVEL (Depth/Elevation): 3.73' TOC DATE: 3-8-99

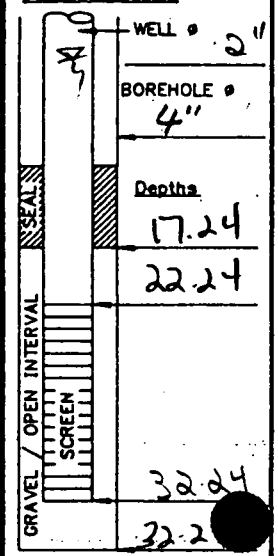
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 2.57') PAGE ... OF ...

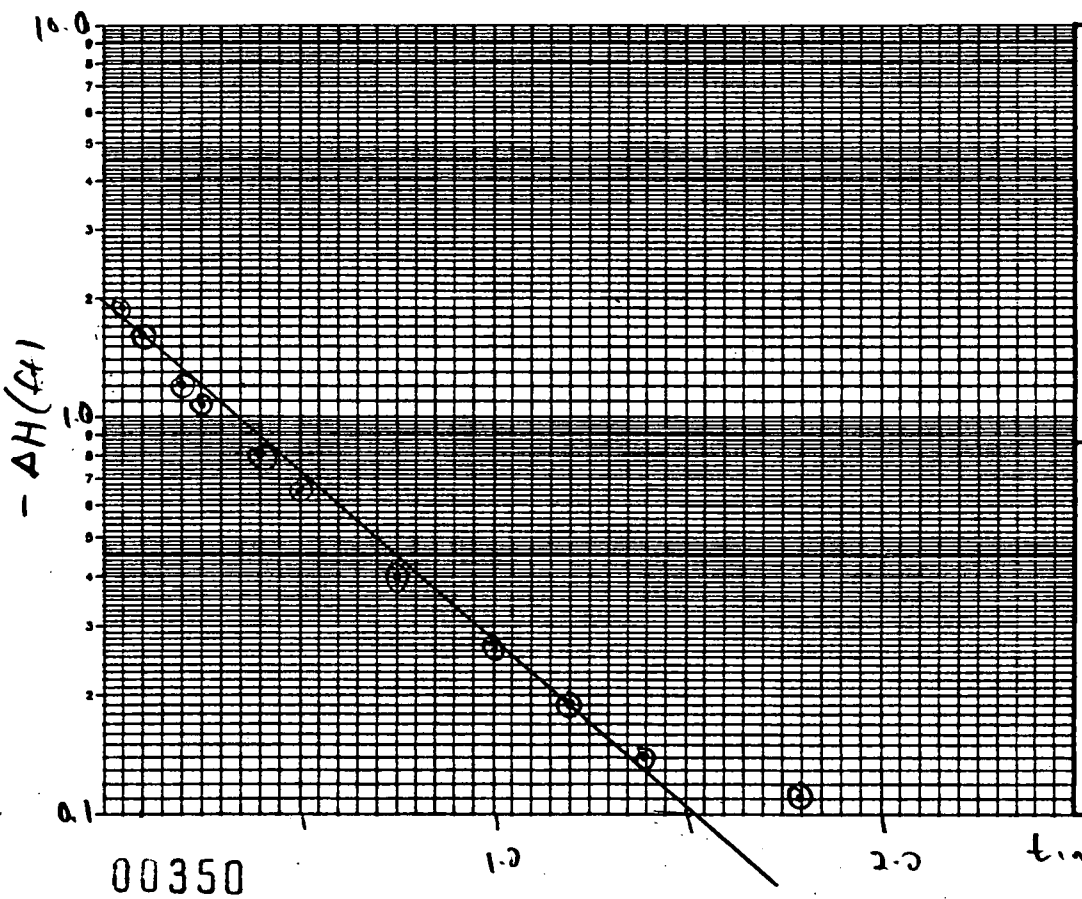
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.10		-1.62			
0.20		-1.21	0.05		-1.92
0.40		-0.80	0.25		-1.09
0.50		-0.65			
0.75		-0.40			
1.00		-0.26			
1.20		-0.19			
1.40		-0.14			
1.60		-0.12			
1.80		-0.10			
2.00		-0.08			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 201804
20 ps.

Start @ 1607

CALCS, SKETCH MAPS, ETC.:

file:
06C11P2Fall.txt

00350

FWR
3-28-99

SE1000C
Environmental Logger
03/08 18:41

Unit# 00145 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61102
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Step 0 03/08 16:06:58

Elapsed Time	INPUT 1
0.0000	0.019
0.0033	0.019
0.0066	-0.468
0.0100	-1.743
0.0133	-3.576
0.0166	-4.227
0.0200	-3.493
0.0233	-2.758
0.0266	-2.515
0.0300	-2.637
0.0333	-2.726
0.0366	-2.445
0.0400	-0.217
0.0433	-0.638
0.0466	-1.717
0.0500	-1.921 ←
0.0533	-1.921
0.0566	-1.775
0.0600	-1.653
0.0633	-1.589
0.0666	-1.621
0.0700	-1.641
0.0733	-1.621
0.0766	-1.596
0.0800	-1.602
0.0833	-1.570
0.0866	-1.500
0.0900	-1.449
0.0933	-1.468
0.0966	-1.583
0.1000	-1.628 ← Ho
0.1033	-1.557
0.1066	-1.494
0.1100	-1.468
0.1133	-1.455
0.1166	-1.462
0.1200	-1.455

well # 06C11P2
Falling Head Test
Ø6C11P2 FALL. TXT

H/Ho	t
1.00	0
.95	.0033
.90	.0166

00351

0.1233	-1.443		
0.1266	-1.429		
0.1300	-1.417		
0.1333	-1.411		
0.1366	-1.398		
0.1400	-1.385	.85	.04
0.1433	-1.372		
0.1466	-1.366		
0.1500	-1.353		
0.1533	-1.347		
0.1566	-1.340		
0.1600	-1.328		
0.1633	-1.315		
0.1666	-1.302	.80	.0666
0.1700	-1.289		
0.1733	-1.283		
0.1766	-1.277		
0.1800	-1.264		
0.1833	-1.257		
0.1866	-1.251		
0.1900	-1.244		
0.1933	-1.232		
0.1966	-1.225	.75	.0966
0.2000	-1.213		
0.2033	-1.206		
0.2066	-1.200		
0.2100	-1.187		
0.2133	-1.187		
0.2166	-1.174		
0.2200	-1.168		
0.2233	-1.155		
0.2266	-1.149		
0.2300	-1.143		
0.2333	-1.130		
0.2366	-1.123		
0.2400	-1.117		
0.2433	-1.110	.68	.1433
0.2466	-1.104		
0.2500	-1.097		
0.2533	-1.085		
0.2566	-1.079		
0.2600	-1.072		
0.2633	-1.066		
0.2666	-1.059		
0.2700	-1.053		
0.2733	-1.040		
0.2766	-1.040		
0.2800	-1.027		
0.2833	-1.027		
0.2866	-1.014		
0.2900	-1.002		
0.2933	-1.002		
0.2966	-0.996		
0.3000	-0.983		
0.3033	-0.983		
0.3066	-0.976		
0.3100	-0.964		
0.3133	-0.957		
0.3166	-0.957		
0.3200	-0.951		

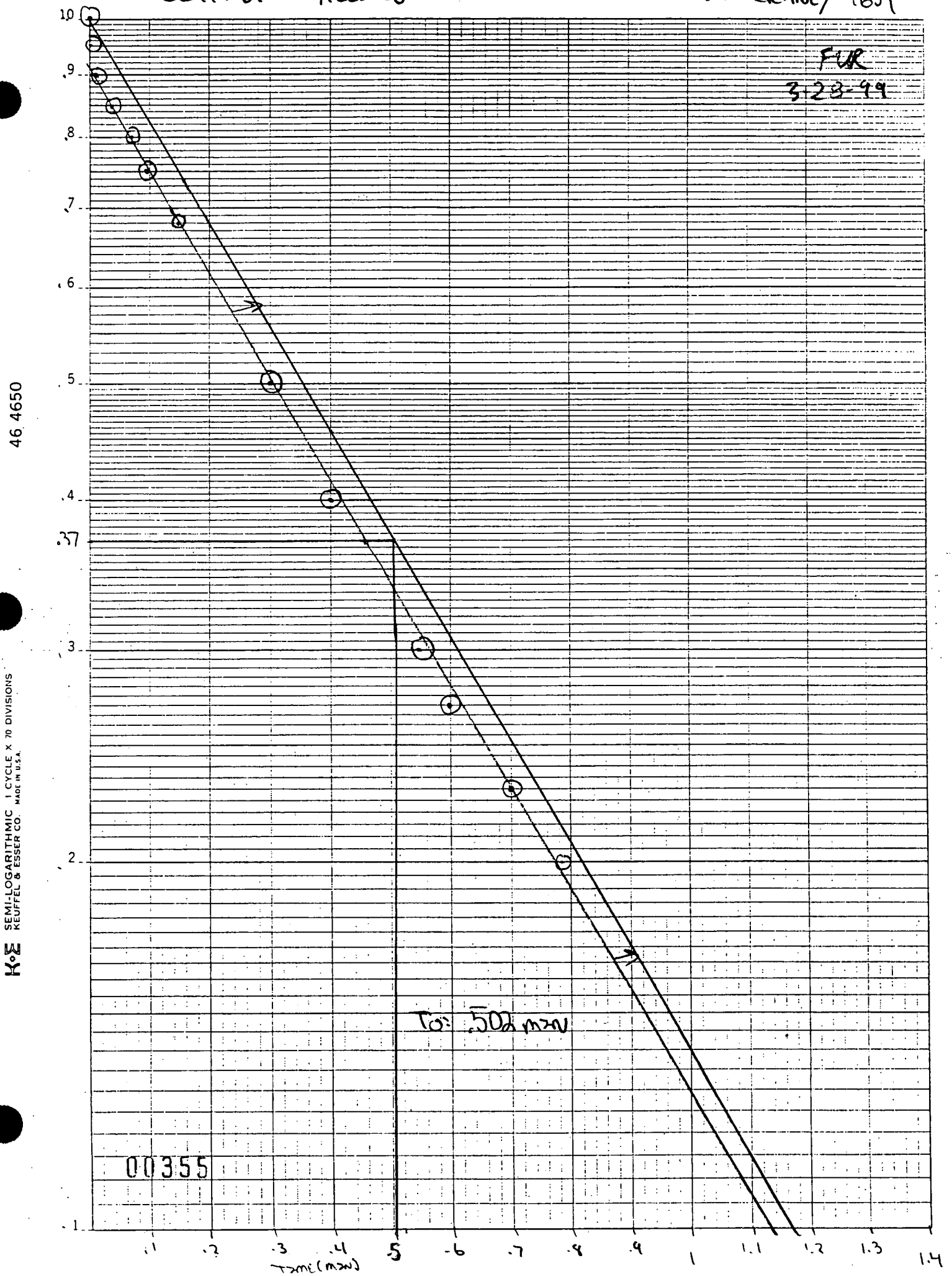
0.3233	-0.938		
0.3266	-0.932		
0.3300	-0.925		
0.3333	-0.925		
0.3500	-0.887		
0.3666	-0.862		
0.3833	-0.829		
0.4000	-0.804	.50	.300
0.4166	-0.772		
0.4333	-0.746		
0.4500	-0.727		
0.4666	-0.695		
0.4833	-0.676		
0.5000	-0.650	.40	.400
0.5166	-0.631		
0.5333	-0.612		
0.5500	-0.587		
0.5666	-0.561		
0.5833	-0.555		
0.6000	-0.530		
0.6166	-0.517		
0.6333	-0.504		
0.6500	-0.485	.30	.550
0.6666	-0.466		
0.6833	-0.459		
0.7000	-0.434	.27	.600
0.7166	-0.434		
0.7333	-0.421		
0.7500	-0.408		
0.7666	-0.395		
0.7833	-0.383		
0.8000	-0.376	.23	.700
0.8166	-0.363		
0.8333	-0.351		
0.8500	-0.357		
0.8666	-0.331		
0.8833	-0.319	.20	.7833
0.9000	-0.319		
0.9166	-0.306		
0.9333	-0.299		
0.9500	-0.287		
0.9666	-0.287		
0.9833	-0.274		
1.0000	-0.268		
1.2000	-0.191		
1.4000	-0.146		
1.6000	-0.121		
1.8000	-0.102		
2.0000	-0.089		
2.2000	-0.076		
2.4000	-0.064		
2.6000	-0.057		
2.8000	-0.051		
3.0000	-0.044		
3.2000	-0.044		
3.4000	-0.031		
3.6000	-0.038		
3.8000	-0.031		
4.0000	-0.025		
4.2000	-0.025		

4.4000	-0.025
4.6000	-0.025
4.8000	-0.018
5.0000	-0.018
5.2000	-0.018
5.4000	-0.012
5.6000	-0.018
5.8000	-0.012
6.0000	-0.012
6.2000	-0.012
6.4000	-0.006
6.6000	-0.012
6.8000	-0.012
7.0000	-0.012
7.2000	-0.012
7.4000	-0.006
7.6000	-0.006
7.8000	-0.012
8.0000	-0.006
8.2000	-0.006
8.4000	-0.006
8.6000	-0.012
8.8000	-0.006
9.0000	-0.012
9.2000	-0.006
9.4000	-0.006
9.6000	-0.006
9.8000	-0.006
10.0000	-0.006
12.0000	-0.006
14.0000	0.000
16.0000	-0.006
18.0000	0.000
20.0000	-0.006
22.0000	-0.006
24.0000	0.000
26.0000	-0.006
28.0000	-0.006
30.0000	-0.006
32.0000	-0.006

END

OGC11P2 FALLING

NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OGCLIP2 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: 3-26-99	APPROVED BY:	DATE:

$r = 0.083$ FT

$R = 0.\cancel{158}\ .167$ FT FWR 3-26

$L = 10$ FT

$T_o = .502$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\text{ FT})^2 \ln(10\text{ FT}/0.\cancel{158}\ .167\text{ FT})}{2(10\text{ FT})(.502\text{ MIN})}$$

$K = \cancel{2.85}\ 2.81 \times 10^{-3}$ FT/MIN FWR 3-26 $\times$ 1440 MIN/DAY

$K = \cancel{4.10}\ 4.05$ FT/DAY FWR 3-26 $\times$ 1 cm/SEC / 2835 FT/DAY

$K = \cancel{1.45}\ 1.43 \times 10^{-3}$ cm/SEC FWR 3-26

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C11P2

PROJECT NO.: 7651 GEOLOGIST:

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.:

STATIC WATER LEVEL (Depth/Elevation): 3.73' TPVC DATE:

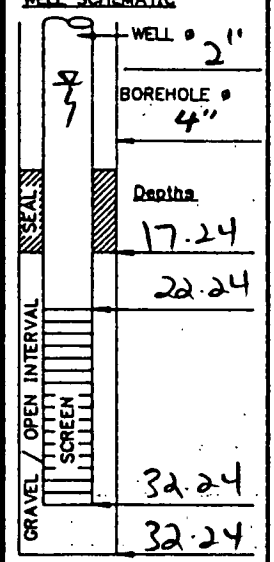
TEST TYPE (Rising/Falling/Constant Head): CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: PAGE ... OF ...

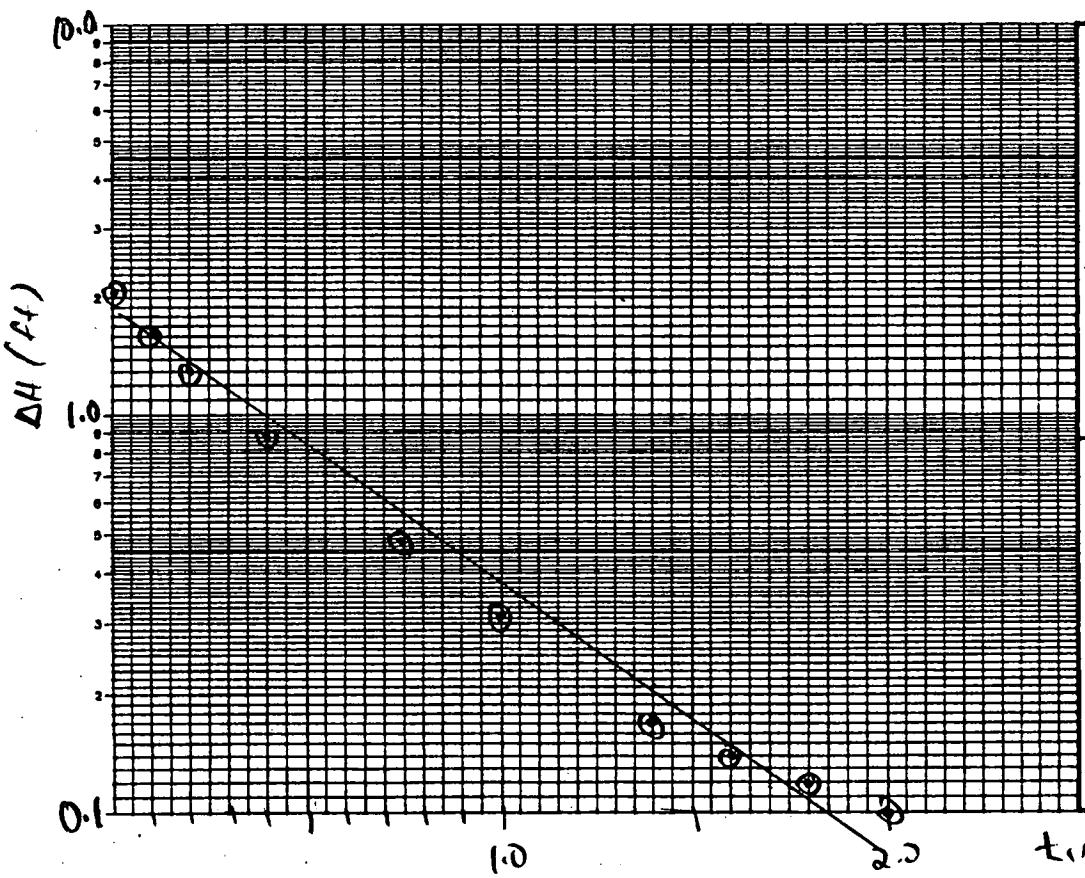
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.):

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.06	2.40		0.07
0.20		1.30			
0.40		0.88	0.10		1.61
0.50		0.73			
0.75		0.47			
1.00		0.31			
1.20		0.22			
1.40		0.17			
1.60		0.14			
1.80		0.12			
2.00		0.10			
2.20		0.08			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 201804
20 psi
Start @ 1642

CALCS, SKETCH MAPS, ETC.:
file:
06C11P2 Rise.txt

00357

FMC
3-26-99

0.1
SE1000C
Environmental Logger
03/08 18:56

Unit# 00145 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61102
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C11P2
Rising Head Test
Ø6C11P2 RISE1.TXT

Step 0 03/08 16:41:59

Elapsed Time	INPUT 1		H/Ho	T
0.0000	0.006			
0.0033	0.051			
0.0066	3.177			
0.0100	4.242			
0.0133	2.361			
0.0166	1.704			
0.0200	1.831			
0.0233	2.067	← Ho	1.00	0
0.0266	2.035			
0.0300	1.946			
0.0333	1.914			
0.0366	1.908			
0.0400	1.889			
0.0433	1.870		.90	.02
0.0466	1.844			
0.0500	1.825			
0.0533	1.806			
0.0566	1.793			
0.0600	1.774			
0.0633	1.761		.85	.04
0.0666	1.748			
0.0700	1.736			
0.0733	1.716			
0.0766	1.710			
0.0800	1.684			
0.0833	1.678			
0.0866	1.665			
0.0900	1.653		.80	.0667
0.0933	1.640			
0.0966	1.621			
0.1000	1.614			
0.1033	1.602			
0.1066	1.589			
0.1100	1.582			
0.1133	1.570			
0.1166	1.557		.75	.0933
0.1200	1.544			

00358

.0233

0.1233	1.537		
0.1266	1.525		
0.1300	1.512		
0.1333	1.499		
0.1366	1.493		
0.1400	1.480		
0.1433	1.474		
0.1466	1.461		
0.1500	1.448	.70	.1267
0.1533	1.442		
0.1566	1.423		
0.1600	1.423		
0.1633	1.410		
0.1666	1.397		
0.1700	1.391		
0.1733	1.378		
0.1766	1.372		
0.1800	1.366		
0.1833	1.352		
0.1866	1.346		
0.1900	1.340	.65	.1667
0.1933	1.327		
0.1966	1.314		
0.2000	1.308		
0.2033	1.301		
0.2066	1.295		
0.2100	1.283		
0.2133	1.276		
0.2166	1.270		
0.2200	1.257		
0.2233	1.250		
0.2266	1.244		
0.2300	1.238	.60	.2067
0.2333	1.225		
0.2366	1.219		
0.2400	1.212		
0.2433	1.199		
0.2466	1.193		
0.2500	1.187		
0.2533	1.180		
0.2566	1.167		
0.2600	1.161		
0.2633	1.155		
0.2666	1.148		
0.2700	1.142		
0.2733	1.136	.55	.2500
0.2766	1.123		
0.2800	1.123		
0.2833	1.110		
0.2866	1.104		
0.2900	1.098		
0.2933	1.098		
0.2966	1.085		
0.3000	1.078		
0.3033	1.072		
0.3066	1.065		
0.3100	1.059		
0.3133	1.053		
0.3166	1.046		
0.3200	1.040		

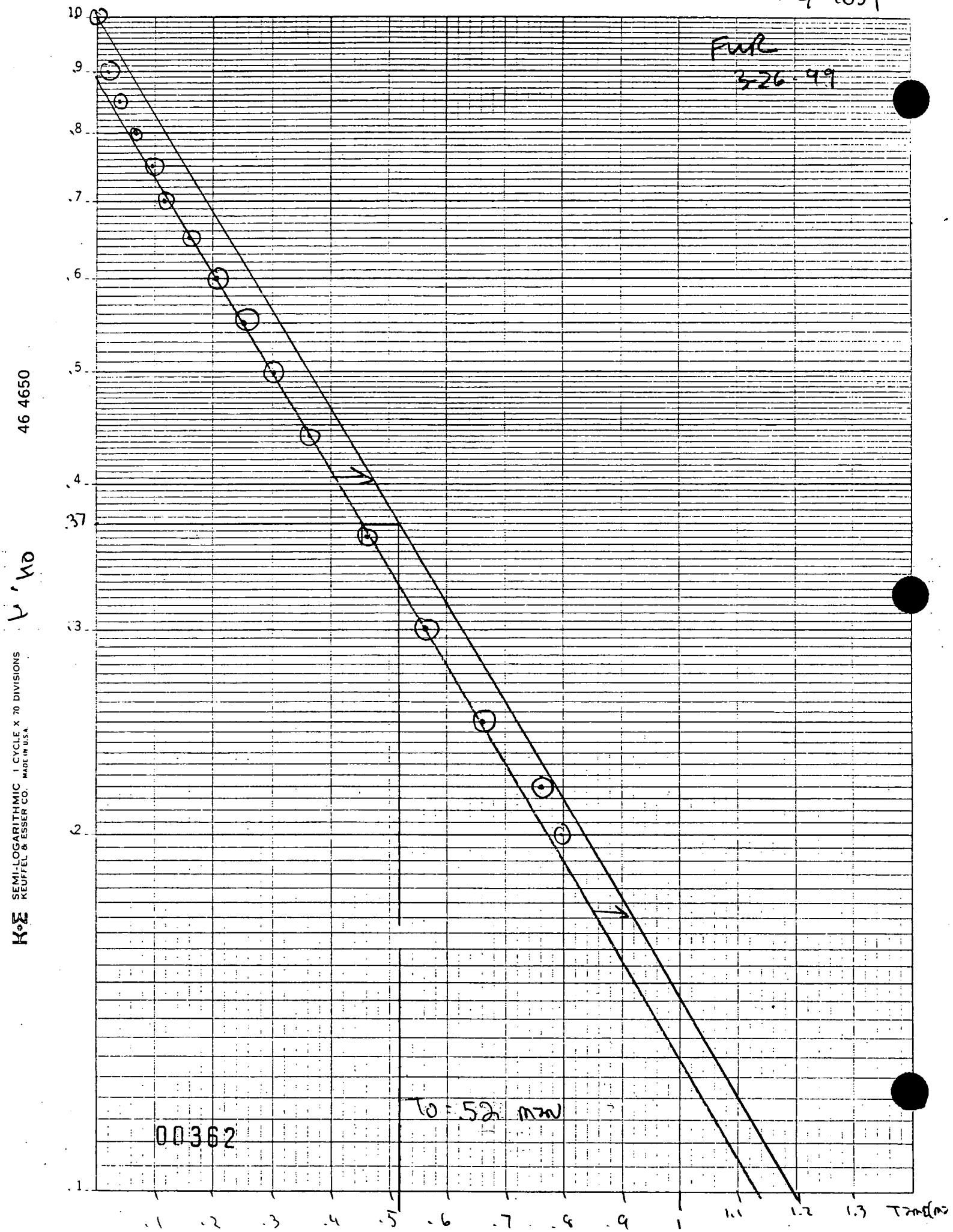
00359

0.3233	1.034	.50	.3000
0.3266	1.027		
0.3300	1.021		
0.3333	1.021		
0.3500	0.976		
0.3666	0.944		
0.3833	0.919	.44	.3600
0.4000	0.887		
0.4166	0.861		
0.4333	0.835		
0.4500	0.804		
0.4666	0.779		
0.4833	0.753	.36	.4600
0.5000	0.734		
0.5166	0.708		
0.5333	0.689		
0.5500	0.663		
0.5666	0.644		
0.5833	0.625	.30	.5600
0.6000	0.606		
0.6166	0.587		
0.6333	0.574		
0.6500	0.555		
0.6666	0.536		
0.6833	0.523	.25	.6600
0.7000	0.504		
0.7166	0.491		
0.7333	0.478		
0.7500	0.472		
0.7666	0.459		
0.7833	0.447	.22	.7600
0.8000	0.434		
0.8166	0.415	.20	.7933
0.8333	0.408		
0.8500	0.395		
0.8666	0.389		
0.8833	0.376		
0.9000	0.363		
0.9166	0.357		
0.9333	0.351		
0.9500	0.344		
0.9666	0.331		
0.9833	0.319		
1.0000	0.319		
1.2000	0.229		
1.4000	0.178		
1.6000	0.146		
1.8000	0.127		
2.0000	0.102		
2.2000	0.089		
2.4000	0.076		
2.6000	0.070		
2.8000	0.063		
3.0000	0.063		
3.2000	0.057		
3.4000	0.051		
3.6000	0.051		
3.8000	0.044		
4.0000	0.044		
4.2000	0.038		

4.4000	0.044
4.6000	0.038
4.8000	0.038
5.0000	0.038
5.2000	0.031
5.4000	0.031
5.6000	0.031
5.8000	0.025
6.0000	0.025
6.2000	0.031
6.4000	0.025
6.6000	0.031
6.8000	0.025
7.0000	0.025
7.2000	0.025
7.4000	0.025
7.6000	0.025
7.8000	0.019
8.0000	0.025
8.2000	0.019
8.4000	0.019
8.6000	0.025
8.8000	0.019
9.0000	0.019
9.2000	0.019
9.4000	0.019
9.6000	0.012
9.8000	0.019
10.0000	0.019
12.0000	0.012
14.0000	0.012
16.0000	0.012
18.0000	0.012

END

06C11P2 RISING NSWC CRANE/7651



00362

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OBC11P2 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: Fred Ramser 3-26-99
APPROVED BY:	DATE:

$r = 0.083$ FT

$R = \cancel{0.158}$ 0.167 FT FWR 3-26-99

$L = 10$ FT

$T_o = .52$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / \cancel{0.158}\,FT)}{2(10\,FT)(.52\,MIN)}$$ FWR 3-26-99

$K = \cancel{2.75} \times 10^{-3}$ 2.71 FWR 3-26-99 FT/MIN $\times$ 1440 MIN/DAY

$K = \cancel{3.96}$ 3.90 FWR 3-26-99 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

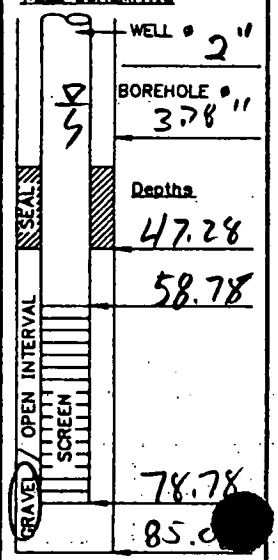
$K = \cancel{1.40} \times 10^{-3}$ 1.38×10^{-3} FWR 3-26-99 cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

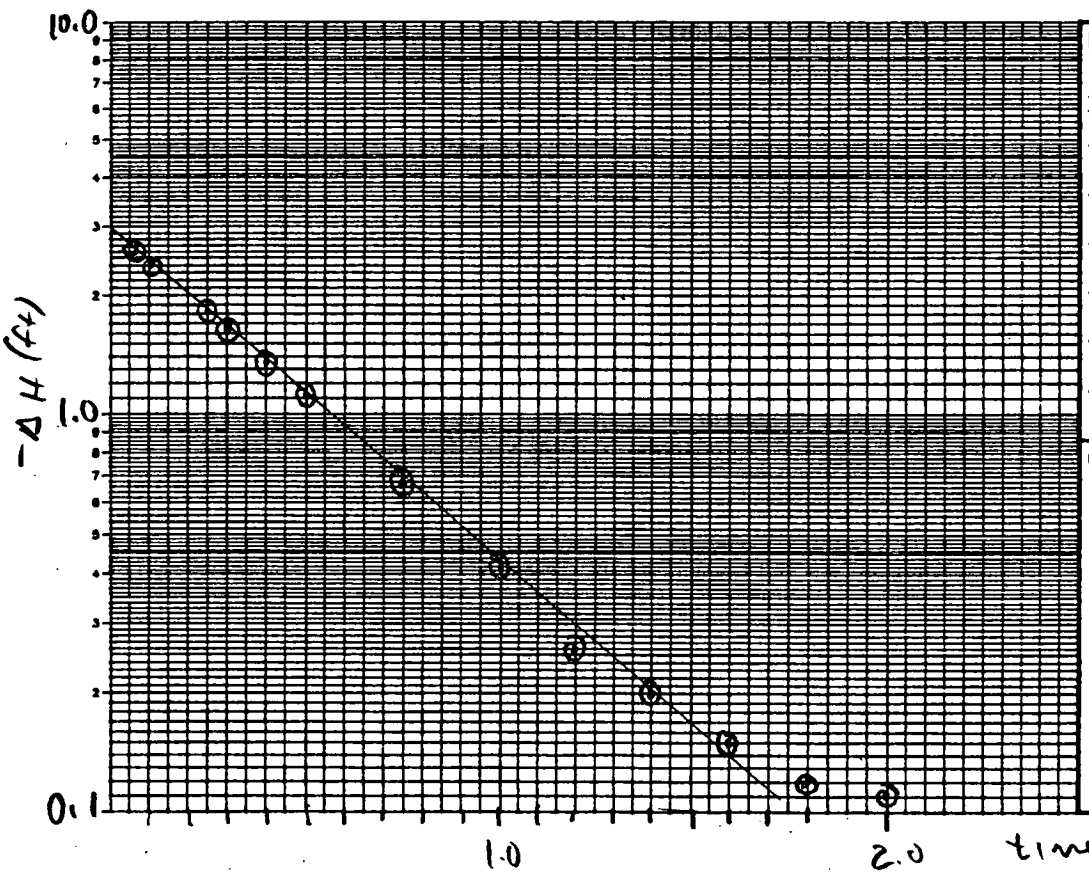
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C12
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T2S8
STATIC WATER LEVEL (Depth/Elevation): 21.84' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: SLUG (0.13' ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-2.69			
0.10		-2.42			
0.25		-1.82			
0.50		-1.12	0.30		-1.66
0.75		-0.69	0.40		-1.37
1.00		-0.42			
1.20		-0.26			
1.40		-0.20			
1.60		-0.15			
1.80		-0.12			
2.00		-0.11			
2.20		-0.09			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50psi
H_2O above XD = 55.41
Start @ 1645
Stop @ 1704

CALCS, SKETCH MAPS, ETC.:
file:
06C12fall.txt

FWR
3-26-99

0.1033	-2.41

SE1000C
Environmental Logger
03/13 07:35

Unit# 00145 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60120
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Step 0 03/12 16:45:16

Well 06C12
Falling Head Test
File: 06C12FALL.txt

Elapsed Time	INPUT 1		H/Ho	T
0.0000	-0.016			
0.0033	-2.173			
0.0066	-4.472			
0.0100	-5.297			
0.0133	-4.806			
0.0166	-4.472			
0.0200	-4.409			
0.0233	-4.361			
0.0266	-4.330			
0.0300	-4.282			
0.0333	-4.219			
0.0366	-3.568			
0.0400	-2.236			
0.0433	-1.760			
0.0466	-2.966			
0.0500	-2.347			
0.0533	-2.173			
0.0566	-2.680			
0.0600	-2.696	← Ho	1.00	0
0.0633	-2.601			
0.0666	-2.569			
0.0700	-2.553		.95	.01
0.0733	-2.553			
0.0766	-2.537			
0.0800	-2.521			
0.0833	-2.506			
0.0866	-2.490			
0.0900	-2.474			
0.0933	-2.458			
0.0966	-2.442			
0.1000	-2.426		.90	.04
0.1033	-2.411			
0.1066	-2.395			
0.1100	-2.379			
0.1133	-2.363			
0.1166	-2.347			
0.1200	-2.347			

0.1233	-2.331		
0.1266	-2.315		
0.1300	-2.299	.85	.0700
0.1333	-2.284		
0.1366	-2.268		
0.1400	-2.252		
0.1433	-2.236		
0.1466	-2.220		
0.1500	-2.204		
0.1533	-2.188		
0.1566	-2.173		
0.1600	-2.173		
0.1633	-2.157	.80	.1033
0.1666	-2.141		
0.1700	-2.125		
0.1733	-2.109		
0.1766	-2.093		
0.1800	-2.077		
0.1833	-2.077		
0.1866	-2.062		
0.1900	-2.046		
0.1933	-2.030		
0.1966	-2.014		
0.2000	-2.014	.75	.1400
0.2033	-1.998		
0.2066	-1.982		
0.2100	-1.966		
0.2133	-1.950		
0.2166	-1.950		
0.2200	-1.935		
0.2233	-1.919		
0.2266	-1.903		
0.2300	-1.903		
0.2333	-1.887	.70	.1733
0.2366	-1.871		
0.2400	-1.855		
0.2433	-1.855		
0.2466	-1.840		
0.2500	-1.824		
0.2533	-1.808		
0.2566	-1.792		
0.2600	-1.792		
0.2633	-1.776		
0.2666	-1.760		
0.2700	-1.760		
0.2733	-1.744		
0.2766	-1.744		
0.2800	-1.728		
0.2833	-1.713		
0.2866	-1.713		
0.2900	-1.697		
0.2933	-1.681		
0.2966	-1.681		
0.3000	-1.665		
0.3033	-1.649		
0.3066	-1.649		
0.3100	-1.633		
0.3133	-1.617	.60	.2533
0.3166	-1.617		
0.3200	-1.602		

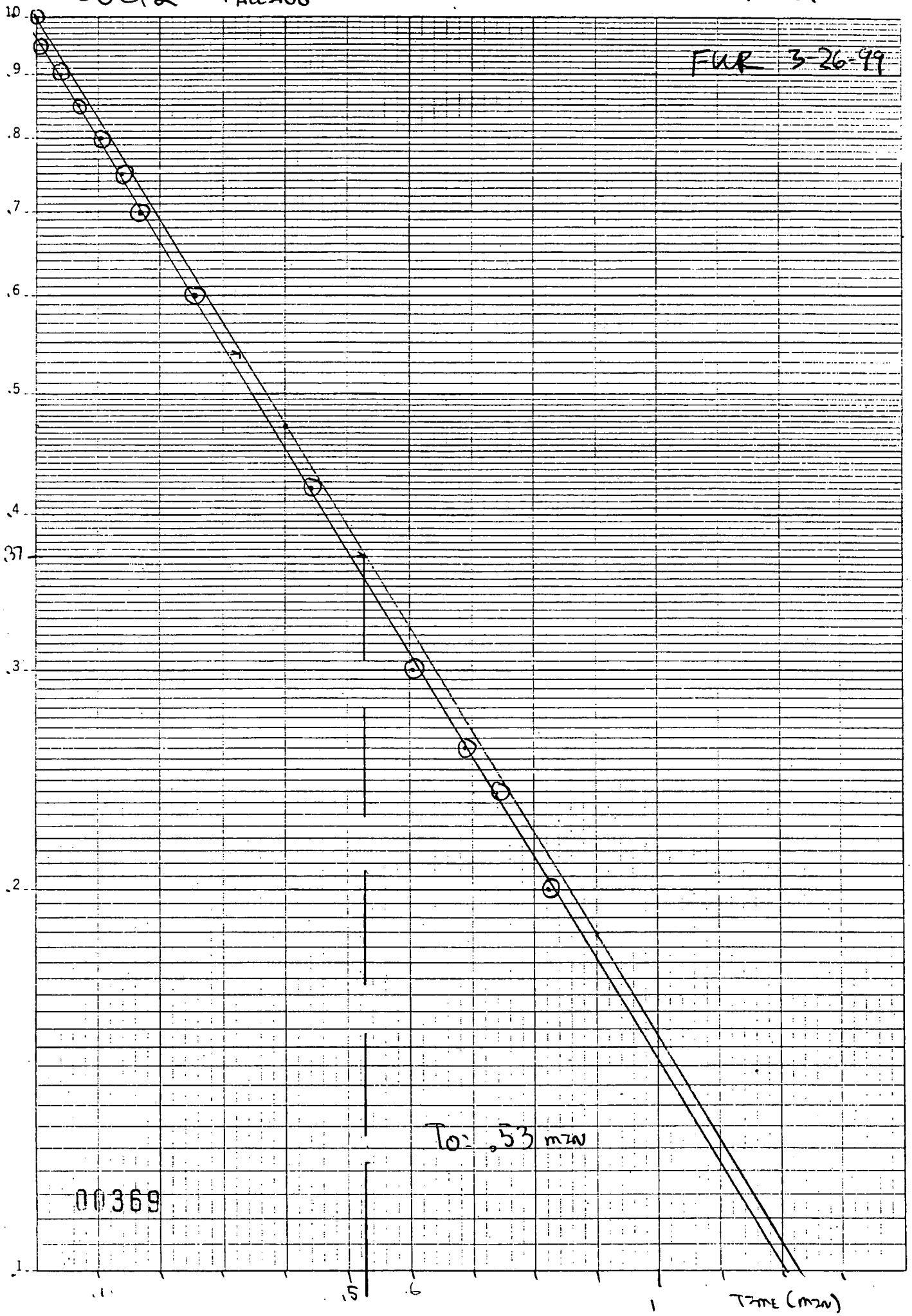
0.3233	-1.602		
0.3266	-1.586		
0.3300	-1.570		
0.3333	-1.570		
0.3500	-1.522		
0.3666	-1.474		
0.3833	-1.427		
0.4000	-1.379		
0.4166	-1.332		
0.4333	-1.284		
0.4500	-1.253		
0.4666	-1.205		
0.4833	-1.173		
0.5000	-1.126	.42	.4400
0.5166	-1.094		
0.5333	-1.062		
0.5500	-1.015		
0.5666	-0.983		
0.5833	-0.951		
0.6000	-0.919		
0.6166	-0.888		
0.6333	-0.856		
0.6500	-0.840		
0.6666	-0.809	.30	.6066
0.6833	-0.792		
0.7000	-0.761		
0.7166	-0.745		
0.7333	-0.713		
0.7500	-0.698	.26	.6900
0.7666	-0.666		
0.7833	-0.650		
0.8000	-0.634	.24	.7400
0.8166	-0.602		
0.8333	-0.586		
0.8500	-0.570		
0.8666	-0.555		
0.8833	-0.539	.20	.8233
0.9000	-0.523		
0.9166	-0.507		
0.9333	-0.491		
0.9500	-0.476		
0.9666	-0.460		
0.9833	-0.444		
1.0000	-0.428		
1.2000	-0.285		
1.4000	-0.206		
1.6000	-0.158		
1.8000	-0.127		
2.0000	-0.111		
2.2000	-0.095		
2.4000	-0.079		
2.6000	-0.079		
2.8000	-0.063		
3.0000	-0.063		
3.2000	-0.063		
3.4000	-0.063		
3.6000	-0.047		
3.8000	-0.047		
4.0000	-0.047		
4.2000	-0.047		

4.4000	-0.047
4.6000	-0.047
4.8000	-0.047
5.0000	-0.047
5.2000	-0.047
5.4000	-0.047
5.6000	-0.047
5.8000	-0.047
6.0000	-0.047
6.2000	-0.047
6.4000	-0.047
6.6000	-0.031
6.8000	-0.047
7.0000	-0.031
7.2000	-0.031
7.4000	-0.031
7.6000	-0.031
7.8000	-0.031
8.0000	-0.031
8.2000	-0.031
8.4000	-0.031
8.6000	-0.031
8.8000	-0.031
9.0000	-0.031
9.2000	-0.031
9.4000	-0.031
9.6000	-0.031
9.8000	-0.031
10.0000	-0.031
12.0000	-0.031
14.0000	-0.031
16.0000	-0.031
18.0000	-0.031

END

06C12 FALLING

NSWC CRANE/7651



00369

46 4650

K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C12 FALLING HEAD TEST			
BASED ON HORSLEV 1951		DRAWING NUMBER	
BY RMB	CHECKED BY JKRamsier 3-26-99	APPROVED BY	DATE

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = .53$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(.53\,MIN)}$$

$K = 1.52 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 2.27$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

$K = 7.99 \times 10^{-4}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C12

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0' TEST NO.: T350

STATIC WATER LEVEL (Depth/Elevation): 21.81' TOVC DATE: 3/12/99

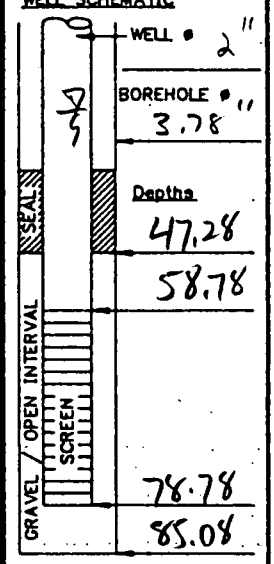
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: SLUG (0.13'ø x 4.7) PAGE ... OF ...

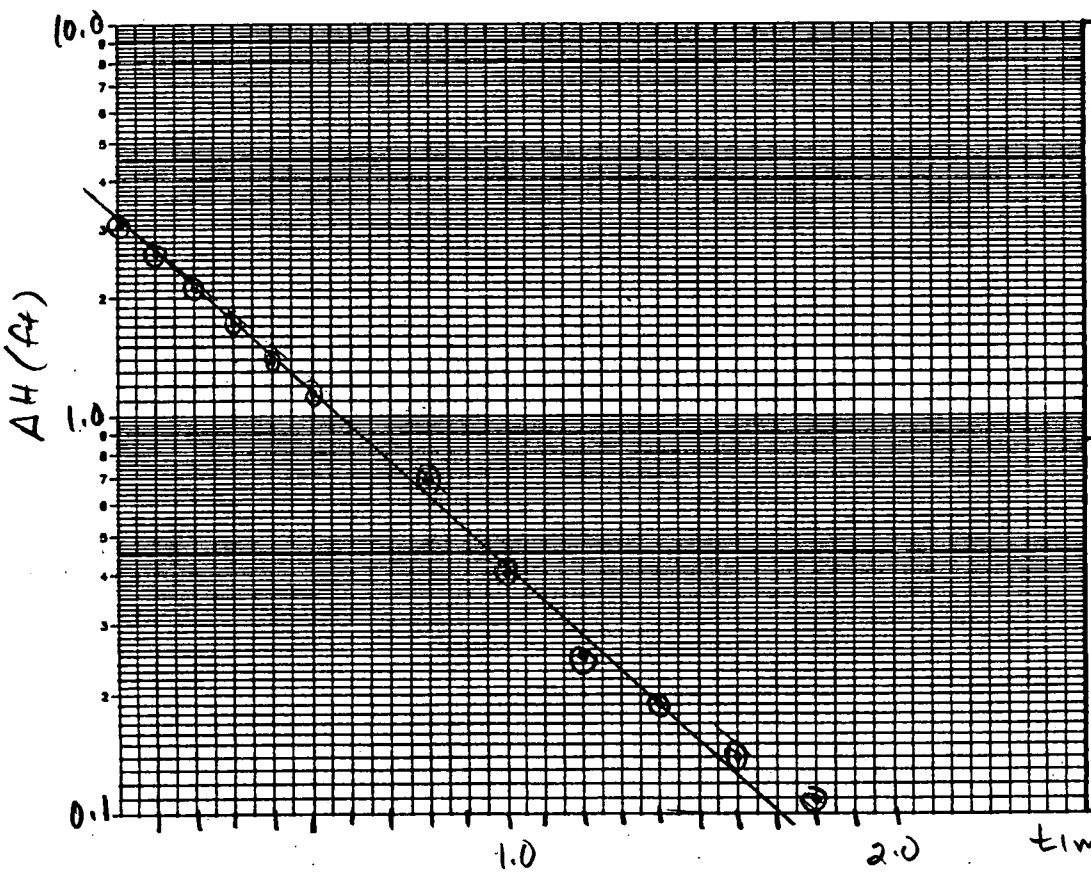
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.10	2.00		0.07
0.10		2.56	2.20		0.06
0.20		2.12			
0.30		1.74			
0.40		1.39			
0.50		1.14			
0.75		0.68			
1.00		0.41			
1.20		0.25			
1.40		0.19			
1.60		0.14			
1.80		0.11			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit #145
XD S/N 1670
50 psi
H_2O above XD 55.44
Start @ 1705
Stop 1722

CALCS, SKETCH MAPS, ETC.:

file:
06C12Rise.txt

FWR
3-26-99

SE1000C
Environmental Logger
03/13 07:45

Unit# 00145 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60120
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well 06C12
Rising Head Test
file : Ø6C12RISE.txt

Step 0 03/12 17:05:35

Elapsed Time	INPUT 1		H/Ho	T
0.0000	-0.031			
0.0033	3.520			
0.0066	4.297			
0.0100	2.918			
0.0133	3.076			
0.0166	3.108	← Ho	1.00	0
0.0200	3.092			
0.0233	3.060			
0.0266	3.045			
0.0300	3.013			
0.0333	2.981			
0.0366	2.950		.95	.02
0.0400	2.918			
0.0433	2.886			
0.0466	2.854			
0.0500	2.854			
0.0533	2.838			
0.0566	2.807			
0.0600	2.791		.90	.0333
0.0633	2.759			
0.0666	2.759			
0.0700	2.727			
0.0733	2.696			
0.0766	2.696			
0.0800	2.680			
0.0833	2.664			
0.0866	2.632		.85	.0700
0.0900	2.616			
0.0933	2.601			
0.0966	2.585			
0.1000	2.569			
0.1033	2.553			
0.1066	2.537			
0.1100	2.505			
0.1133	2.489			
0.1166	2.489		.80	.1000
0.1200	2.473			

00372

.0166

0.1233	2.458		
0.1266	2.442		
0.1300	2.426		
0.1333	2.394		
0.1366	2.394		
0.1400	2.363		
0.1433	2.347		
0.1466	2.347		
0.1500	2.331	.75	.1333
0.1533	2.315		
0.1566	2.299		
0.1600	2.283		
0.1633	2.283		
0.1666	2.252		
0.1700	2.252		
0.1733	2.236		
0.1766	2.220		
0.1800	2.204		
0.1833	2.204		
0.1866	2.188		
0.1900	2.172	.70	.1733
0.1933	2.172		
0.1966	2.156		
0.2000	2.125		
0.2033	2.109		
0.2066	2.093		
0.2100	2.093		
0.2133	2.061		
0.2166	2.061		
0.2200	2.046		
0.2233	2.014		
0.2266	2.014		
0.2300	1.998		
0.2333	1.982		
0.2366	1.966		
0.2400	1.950		
0.2433	1.934		
0.2466	1.918		
0.2500	1.918		
0.2533	1.903		
0.2566	1.887		
0.2600	1.871		
0.2633	1.871		
0.2666	1.855	.60	.2500
0.2700	1.839		
0.2733	1.839		
0.2766	1.823		
0.2800	1.807		
0.2833	1.792		
0.2866	1.792		
0.2900	1.776		
0.2933	1.760		
0.2966	1.760		
0.3000	1.744		
0.3033	1.728		
0.3066	1.712		
0.3100	1.712		
0.3133	1.697		
0.3166	1.697		
0.3200	1.681		

.0166
3.008

0.3233	1.665		
0.3266	1.649		
0.3300	1.649		
0.3333	1.633		
0.3500	1.569	.50	.3333
0.3666	1.506		
0.3833	1.458		
0.4000	1.395		
0.4166	1.348		
0.4333	1.300		
0.4500	1.268		
0.4666	1.221	.40	.4500
0.4833	1.173		
0.5000	1.142		
0.5166	1.094		
0.5333	1.062		
0.5500	1.030		
0.5666	0.999		
0.5833	0.951		
0.6000	0.919	.30	.5833
0.6166	0.888		
0.6333	0.872		
0.6500	0.840		
0.6666	0.808		
0.6833	0.777		
0.7000	0.761		
0.7166	0.729	.23	.7000
0.7333	0.697		
0.7500	0.681		
0.7666	0.666		
0.7833	0.634		
0.8000	0.618	.20	.7833
0.8166	0.586		
0.8333	0.570		
0.8500	0.554		
0.8666	0.539		
0.8833	0.523		
0.9000	0.507		
0.9166	0.491		
0.9333	0.475		
0.9500	0.459		
0.9666	0.444		
0.9833	0.428		
1.0000	0.412		
1.2000	0.253		
1.4000	0.190		
1.6000	0.142		
1.8000	0.111		
2.0000	0.079		
2.2000	0.063		
2.4000	0.063		
2.6000	0.047		
2.8000	0.047		
3.0000	0.047		
3.2000	0.031		
3.4000	0.031		
3.6000	0.031		
3.8000	0.031		
4.0000	0.031		
4.2000	0.031		

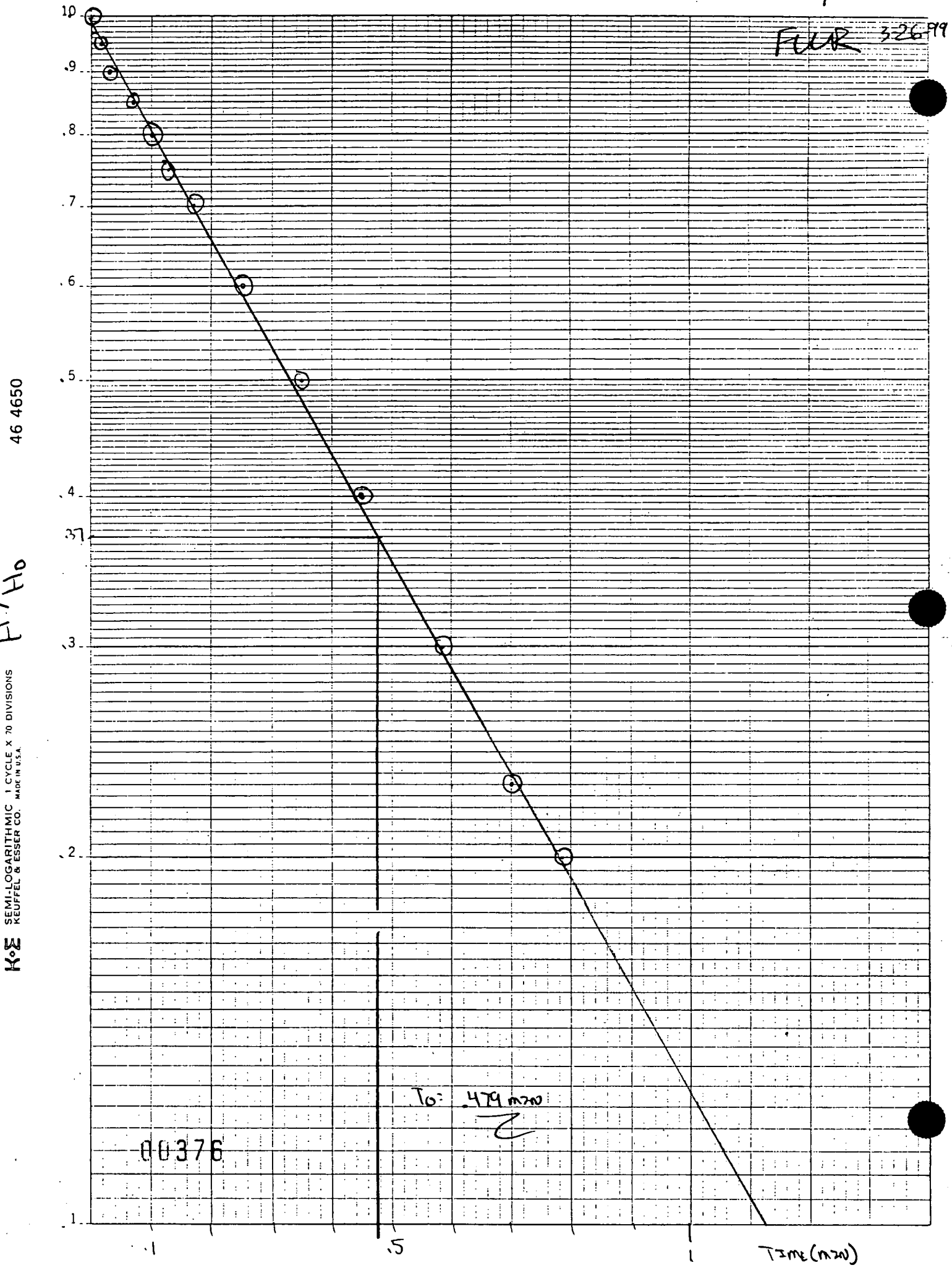
4.4000	0.031
4.6000	0.031
4.8000	0.015
5.0000	0.015
5.2000	0.015
5.4000	0.015
5.6000	0.015
5.8000	0.015
6.0000	0.015
6.2000	0.015
6.4000	0.015
6.6000	0.015
6.8000	0.015
7.0000	0.015
7.2000	0.015
7.4000	0.015
7.6000	0.015
7.8000	0.015
8.0000	0.015
8.2000	0.015
8.4000	0.015
8.6000	0.015
8.8000	0.015
9.0000	0.015
9.2000	0.015
9.4000	0.015
9.6000	0.000
9.8000	0.015
10.0000	0.015
12.0000	0.015
14.0000	0.000
16.0000	0.000

END

06C12 RISING

NSWC CRANE / 7651

FLUR 3-26-99



00376

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C12 RISING HEAD TEST			
BASED ON HORSLEV 1951		DRAWING NUMBER	
BY RMB	CHECKED BY 3-26-99	APPROVED BY	DATE

$r = 0.083$ FT

$R = 0.158$ FT

$L = 20$ FT

$T_o = .479$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(20\,FT / 0.158\,FT)}{2(20\,FT)(.479\,MIN)}$$

$K = 1.74 \times 10^{-3}$ FT/MIN $\times$ 1440 MIN/DAY

$K = 2.51$ FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

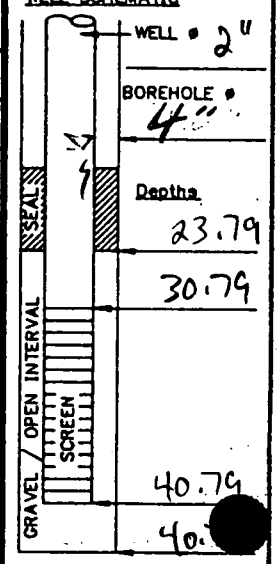
$K = 8.84 \times 10^{-4}$ cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

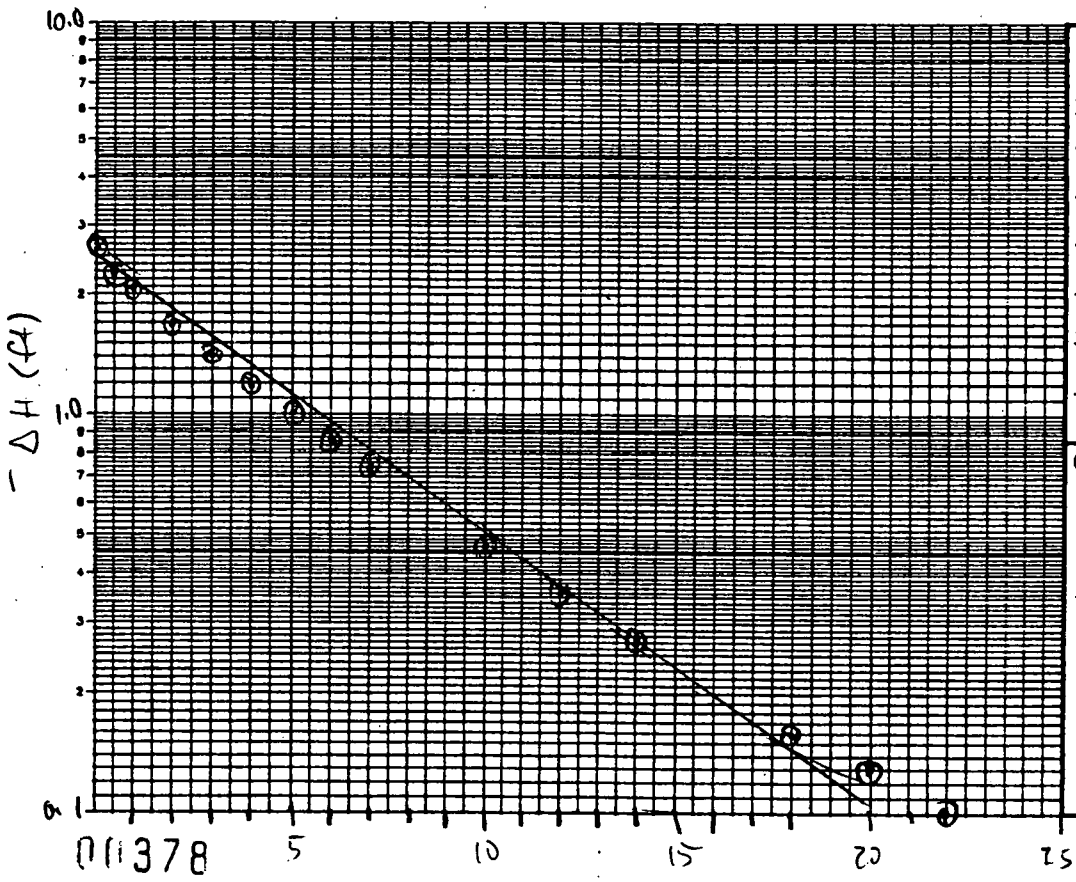
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C12P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1150
STATIC WATER LEVEL (Depth/Elevation): 21.48' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: SLUG (0.10'Ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-2.64	20.00		-0.13
0.50		-2.28	22.00		-0.10
1.00		-2.07	24.00		-0.08
2.00		-1.69	26.00		-0.06
4.00		-1.19			
5.00		-1.01			
7.00		-0.74	3.00		-1.42
10.00		-0.47	6.00		-0.86
12.00		-0.36			
14.00		-0.27			
16.00		-0.21			
18.00		-0.16			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi
H_2O above XD = 13.80'

Start @ 1440
Stop @ 1706

CALCS, SKETCH MAPS, ETC.:

file:
06C12P2Fall.txt

011378

FWR
3-26-99

SE1000C
Environmental Logger
03/13 08:42

Unit# 00143 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60122
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well 06C12P2
Falling Head Test
file: 06C12P2FALL.txt

Step 0 03/12 16:40:14

Elapsed Time	INPUT 1
0.0000	0.003
0.0033	-0.710
0.0066	-3.251
0.0100	-5.305
0.0133	-6.253
0.0166	-3.844
0.0200	-2.452
0.0233	-2.744
0.0266	-0.936
0.0300	-1.970
0.0333	-2.305
0.0366	-3.364
0.0400	-2.509
0.0433	-2.424
0.0466	-2.706
0.0500	-2.559
0.0533	-2.640 ← H_0
0.0566	-2.606
0.0600	-2.596
0.0633	-2.587
0.0666	-2.584
0.0700	-2.574
0.0733	-2.568
0.0766	-2.559
0.0800	-2.556
0.0833	-2.549
0.0866	-2.543
0.0900	-2.537
0.0933	-2.534
0.0966	-2.527
0.1000	-2.524
0.1033	-2.518
0.1066	-2.515
0.1100	-2.512
0.1133	-2.509
0.1166	-2.506
0.1200	-2.502

H/H_0	T
1.00	0
.95	.0600

00379

0.1233	-2.499
0.1266	-2.496
0.1300	-2.496
0.1333	-2.490
0.1366	-2.490
0.1400	-2.487
0.1433	-2.483
0.1466	-2.480
0.1500	-2.477
0.1533	-2.477
0.1566	-2.474
0.1600	-2.471
0.1633	-2.468
0.1666	-2.465
0.1700	-2.465
0.1733	-2.462
0.1766	-2.458
0.1800	-2.458
0.1833	-2.455
0.1866	-2.452
0.1900	-2.452
0.1933	-2.449
0.1966	-2.449
0.2000	-2.443
0.2033	-2.443
0.2066	-2.440
0.2100	-2.440
0.2133	-2.440
0.2166	-2.437
0.2200	-2.433
0.2233	-2.433
0.2266	-2.430
0.2300	-2.427
0.2333	-2.424
0.2366	-2.424
0.2400	-2.421
0.2433	-2.421
0.2466	-2.418
0.2500	-2.415
0.2533	-2.415
0.2566	-2.411
0.2600	-2.411
0.2633	-2.408
0.2666	-2.405
0.2700	-2.405
0.2733	-2.402
0.2766	-2.402
0.2800	-2.399
0.2833	-2.396
0.2866	-2.396
0.2900	-2.393
0.2933	-2.393
0.2966	-2.389
0.3000	-2.389
0.3033	-2.386
0.3066	-2.386
0.3100	-2.383
0.3133	-2.383
0.3166	-2.380
0.3200	-2.380

.0533
2640

0.3233	-2.377	.90	.2700
0.3266	-2.377		
0.3300	-2.374		
0.3333	-2.371		
0.3500	-2.361		
0.3666	-2.355		
0.3833	-2.346		
0.4000	-2.336		
0.4166	-2.327		
0.4333	-2.321		
0.4500	-2.311		
0.4666	-2.302		
0.4833	-2.296		
0.5000	-2.286		
0.5166	-2.280		
0.5333	-2.274		
0.5500	-2.264		
0.5666	-2.255		
0.5833	-2.248		
0.6000	-2.239		
0.6166	-2.296		
0.6333	-2.227	.85	.5800
0.6500	-2.202		
0.6666	-2.208		
0.6833	-2.202		
0.7000	-2.195		
0.7166	-2.189		
0.7333	-2.180		
0.7500	-2.173		
0.7666	-2.164		
0.7833	-2.158		
0.8000	-2.148		
0.8166	-2.145		
0.8333	-2.136		
0.8500	-2.133		
0.8666	-2.123		
0.8833	-2.117	.80	.8300
0.9000	-2.108		
0.9166	-2.104		
0.9333	-2.095		
0.9500	-2.085		
0.9666	-2.079		
0.9833	-2.073		
1.0000	-2.070		
1.2000	-1.970		
1.4000	-1.894	.72	1.3467
1.6000	-1.825		
1.8000	-1.760		
2.0000	-1.694		
2.2000	-1.634		
2.4000	-1.578		
2.6000	-1.522		
2.8000	-1.468		
3.0000	-1.421		
3.2000	-1.374		
3.4000	-1.327	.50	3.3467
3.6000	-1.280		
3.8000	-1.240		
4.0000	-1.199		
4.2000	-1.158		

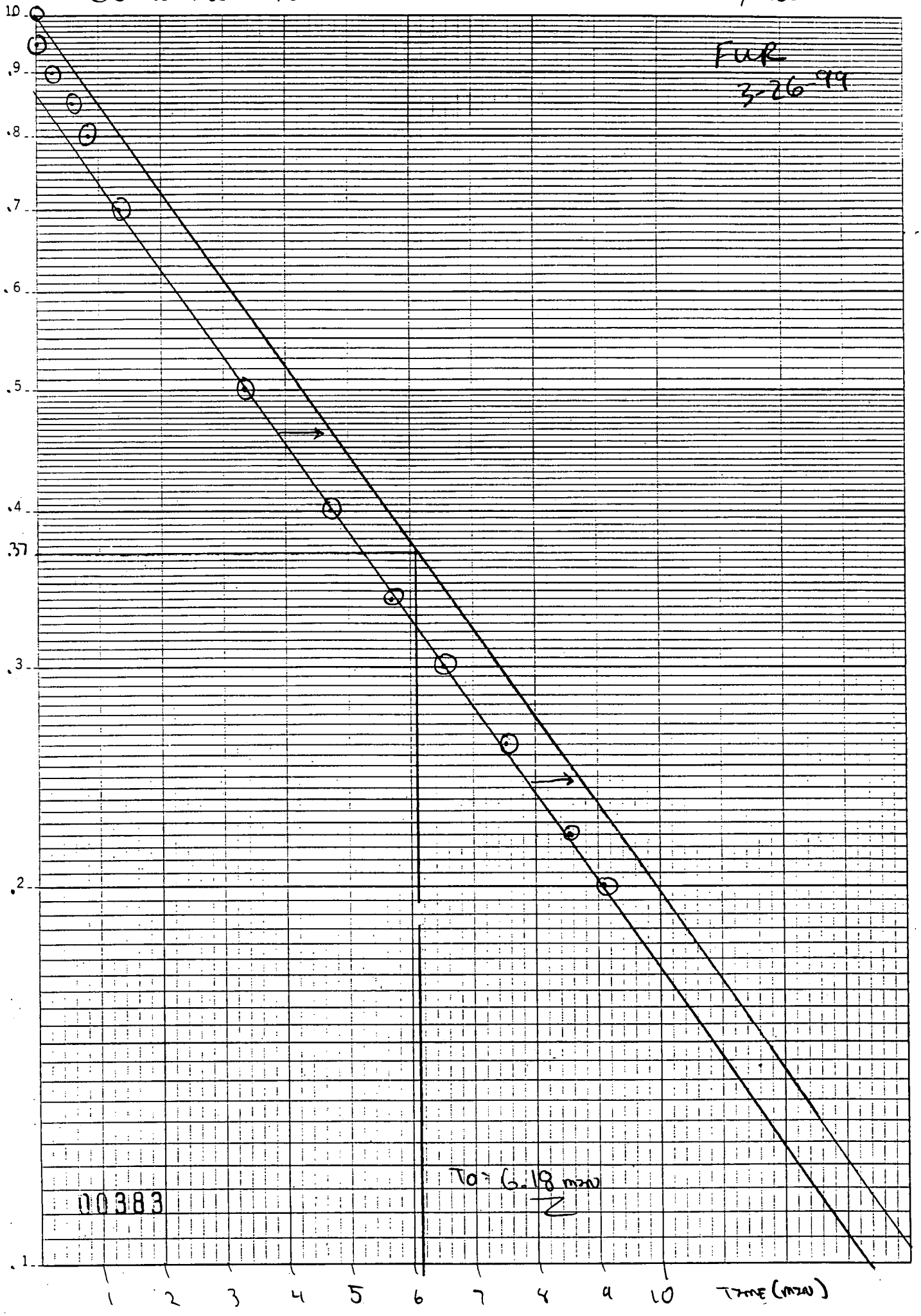
.2640

4.4000	-1.124		
4.6000	-1.083	.40	4.7467
4.8000	-1.052		
5.0000	-1.017		
5.2000	-0.983		
5.4000	-0.952		
5.6000	-0.923		
5.8000	-0.892	.34	5.7467
6.0000	-0.867		
6.2000	-0.839		
6.4000	-0.810		
6.6000	-0.789	.30	6.5467
6.8000	-0.764		
7.0000	-0.742		
7.2000	-0.717		
7.4000	-0.698		
7.6000	-0.676	.26	7.5467
7.8000	-0.657		
8.0000	-0.635		
8.2000	-0.616		
8.4000	-0.598		
8.6000	-0.582	.22	8.5467
8.8000	-0.563		
9.0000	-0.547		
9.2000	-0.535	.20	9.1467
9.4000	-0.519		
9.6000	-0.504		
9.8000	-0.491		
10.0000	-0.472		
12.0000	-0.360		
14.0000	-0.278		
16.0000	-0.216		
18.0000	-0.169		
20.0000	-0.134		
22.0000	-0.109		
24.0000	-0.087		
26.0000	-0.068		

END

OGC12 P2 FALLING

NSWC CRANE / 7651



00383

46 4650

K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C12P2 FALLING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: FMRamser 3-26-99
APPROVED BY:	DATE:

$r = 0.083$ FT

$R = \cancel{0.158}$ FUR 3-26-99 0.167 FT

$L = 10$ FT

$T_o = 6.18$ MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / \cancel{0.158\,FT}\ 0.167)}{2(10\,FT)(6.18\,MIN)}$$

$K = \cancel{2.31 \times 10^{-4}}$ FUR 3-26-99 2.28 FT/MIN $\times$ 1440 MIN/DAY

$K = \cancel{0.33}$ TE 3/31/99 0.328 FT/DAY $\times$ 1 cm/SEC / 2835 FT/DAY

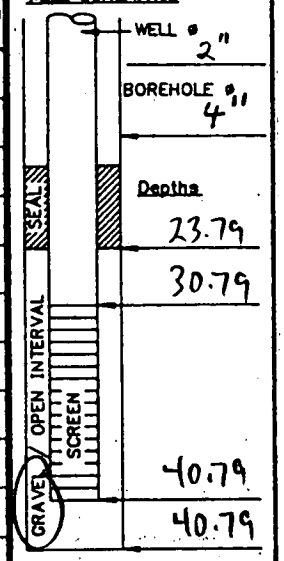
$K = \cancel{1.11 \times 10^{-4}}$ FUR 3-26-99 1.16 cm/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

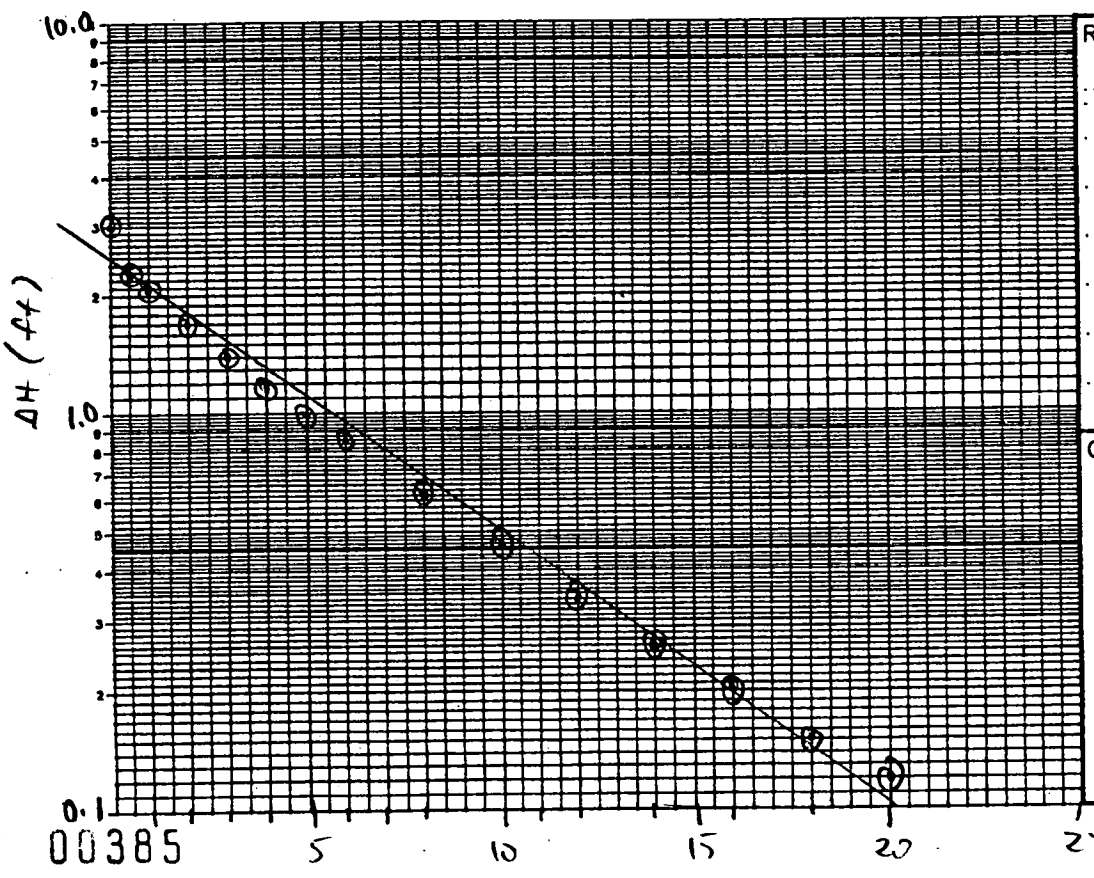
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C12P2
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.:
STATIC WATER LEVEL (Depth/Elevation): 21.41' TPVC DATE:
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: SLUG ( ) PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.97	16.00		0.20
0.50		2.26	18.00		0.15
1.00		2.04	20.00		0.12
2.00		1.67	22.00		0.09
3.00		1.39			
4.00		1.17			
5.00		0.99			
6.00		0.85			
8.00		0.62			
10.00		0.46			
12.00		0.34			
14.00		0.26			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi
H_2O above XD
Start @
Stop @

CALCS, SKETCH MAPS, ETC.:
file
06C12P2Rise.txt

00385

FUR 3-26-99

SE1000C
Environmental Logger
03/13 08:45

Unit# 00143 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60122
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well 06C12P2
Rising Head Test
file: 06C12P2RISE.txt

Step 0 03/12 17:07:45

Elapsed Time	INPUT 1		H/Ho	T
0.0000	0.500			
0.0033	3.757			
0.0066	1.430			
0.0100	0.165			
0.0133	1.596			
0.0166	2.059			
0.0200	2.744			
0.0233	2.976	← Ho	1.00	0
0.0266	2.847			
0.0300	2.813		.45	.0067
0.0333	2.797			
0.0366	2.782			
0.0400	2.750			
0.0433	2.716			
0.0466	2.716			
0.0500	2.688			
0.0533	2.672		.90	.03
0.0566	2.657			
0.0600	2.644			
0.0633	2.628			
0.0666	2.625			
0.0700	2.613			
0.0733	2.597			
0.0766	2.591			
0.0800	2.585			
0.0833	2.575			
0.0866	2.566			
0.0900	2.557			
0.0933	2.553		.86	.07
0.0966	2.544			
0.1000	2.535			
0.1033	2.531			
0.1066	2.525			
0.1100	2.516			
0.1133	2.510			
0.1166	2.510			
0.1200	2.503			

0.1233	2.500
0.1266	2.494
0.1300	2.491
0.1333	2.491
0.1366	2.485
0.1400	2.478
0.1433	2.478
0.1466	2.466
0.1500	2.469
0.1533	2.466
0.1566	2.460
0.1600	2.460
0.1633	2.469
0.1666	2.450
0.1700	2.453
0.1733	2.447
0.1766	2.441
0.1800	2.431
0.1833	2.438
0.1866	2.434
0.1900	2.434
0.1933	2.434
0.1966	2.431
0.2000	2.431
0.2033	2.450
0.2066	2.422
0.2100	2.425
0.2133	2.422
0.2166	2.419
0.2200	2.419
0.2233	2.416
0.2266	2.413
0.2300	2.413
0.2333	2.409
0.2366	2.406
0.2400	2.403
0.2433	2.400
0.2466	2.400
0.2500	2.397
0.2533	2.394
0.2566	2.391
0.2600	2.388
0.2633	2.388
0.2666	2.384
0.2700	2.384
0.2733	2.384
0.2766	2.381
0.2800	2.381
0.2833	2.378
0.2866	2.378
0.2900	2.375
0.2933	2.375
0.2966	2.372
0.3000	2.372
0.3033	2.369
0.3066	2.369
0.3100	2.366
0.3133	2.363
0.3166	2.363
0.3200	2.363

.0233

.80 .2533

	0.3233	2.359		
	0.3266	2.356		
	0.3300	2.356		
	0.3333	2.353		
	0.3500	2.344		
	0.3666	2.334		
	0.3833	2.322		
	0.4000	2.319		
	0.4166	2.309		
	0.4333	2.297		
	0.4500	2.287		
	0.4666	2.278		
	0.4833	2.272		
	0.5000	2.262		
	0.5166	2.253		
	0.5333	2.247		
.0233	0.5500	2.237		
	0.5666	2.231	.75	.5433
	0.5833	2.225		
	0.6000	2.215		
	0.6166	2.206		
	0.6333	2.197		
	0.6500	2.190		
	0.6666	2.181		
	0.6833	2.184		
	0.7000	2.169		
	0.7166	2.165		
	0.7333	2.159		
	0.7500	2.150		
	0.7666	2.137		
	0.7833	2.128		
	0.8000	2.125		
	0.8166	2.115		
	0.8333	2.109		
	0.8500	2.103		
	0.8666	2.093		
	0.8833	2.093	.70	.8600
	0.9000	2.084		
	0.9166	2.075		
	0.9333	2.068		
	0.9500	2.065		
	0.9666	2.056		
	0.9833	2.047		
	1.0000	2.040		
	1.2000	1.940	.65	1.1767
	1.4000	1.868		
	1.6000	1.799	.60	1.5767
	1.8000	1.731		
	2.0000	1.671		
	2.2000	1.612		
	2.4000	1.552		
	2.6000	1.499	.50	2.5767
	2.8000	1.446		
	3.0000	1.396		
	3.2000	1.349		
	3.4000	1.305		
	3.6000	1.261		
	3.8000	1.220		
	4.0000	1.177	.40	3.9767
	4.2000	1.139		

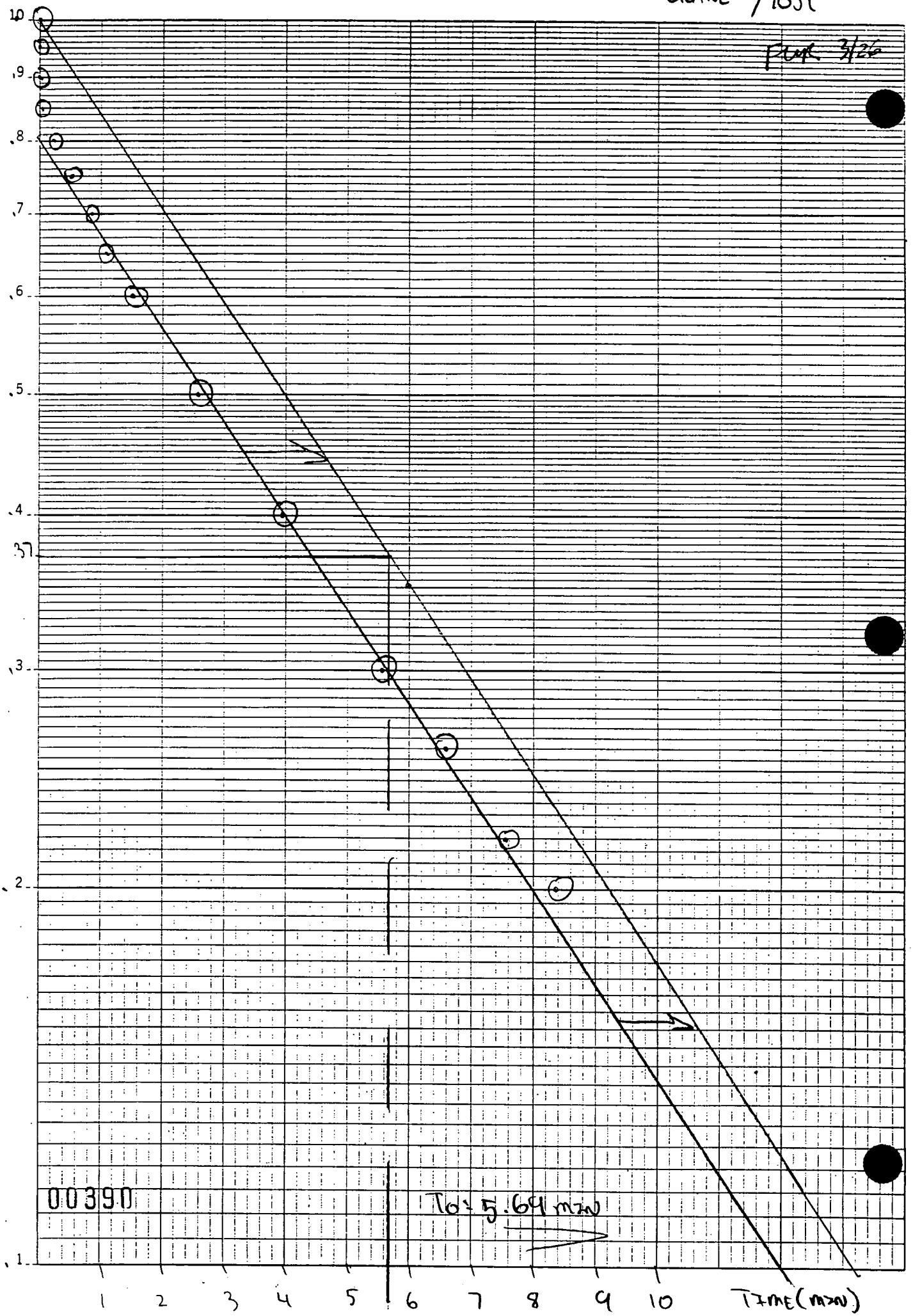
4.4000	1.101		
4.6000	1.064		
4.8000	1.033		
5.0000	0.998		
5.2000	0.964		
5.4000	0.932		
5.6000	0.904	.30	5.5767
5.8000	0.873		
6.0000	0.851		
6.2000	0.823		
6.4000	0.798		
6.6000	0.773	.26	6.5767
6.8000	0.748		
7.0000	0.726		
7.2000	0.701		
7.4000	0.685		
7.6000	0.660	.22	7.5767
7.8000	0.641		
8.0000	0.623		
8.2000	0.604		
8.4000	0.588	.20	8.3767
8.6000	0.566		
8.8000	0.551		
9.0000	0.535		
9.2000	0.519		
9.4000	0.507		
9.6000	0.488		
9.8000	0.475		
10.0000	0.463		
12.0000	0.347		
14.0000	0.263		
16.0000	0.203		
18.0000	0.156		
20.0000	0.122		
22.0000	0.097		

END

06C12P2 RZSNG

NSWC CRANE /7651

FLUK 3/26



00390

46 4650

K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C12P2 RISING HEAD TEST	
BASED ON: HORSLEV 1951	DRAWING NUMBER:
BY: RMB	CHECKED BY: Fred Ramser 3-26-99
APPROVED BY:	DATE:

r = 0.083 FT

R = ~~0.083~~ FUR 3/26 FT 0.167 FT

L = 10 FT

T_0 = 5.64 MZN

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\,FT)^2 \ln(10\,FT / \cancel{0.083\,FT}\ 0.167)}{2(10\,FT)(5.64\,MZN)}$$ FUR 3/26

K = ~~2.40~~ 2.48 FUR 3/26 $\times 10^{-4}$ FT/MZN × 1440 MZN/DAY

K = ~~0.42~~ ~~0.36~~ 0.357 FUR 3/26 FT/DAY × 1 CM/SEC / 2835 FT/DAY

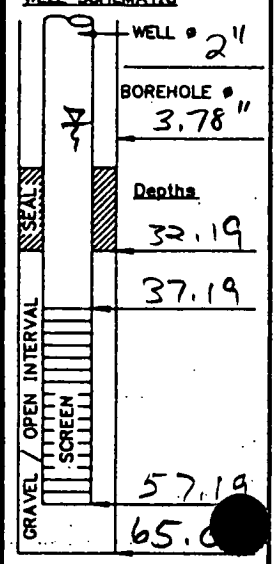
K = ~~1.47~~ 1.26 FUR 3/26 $\times 10^{-4}$ CM/SEC

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

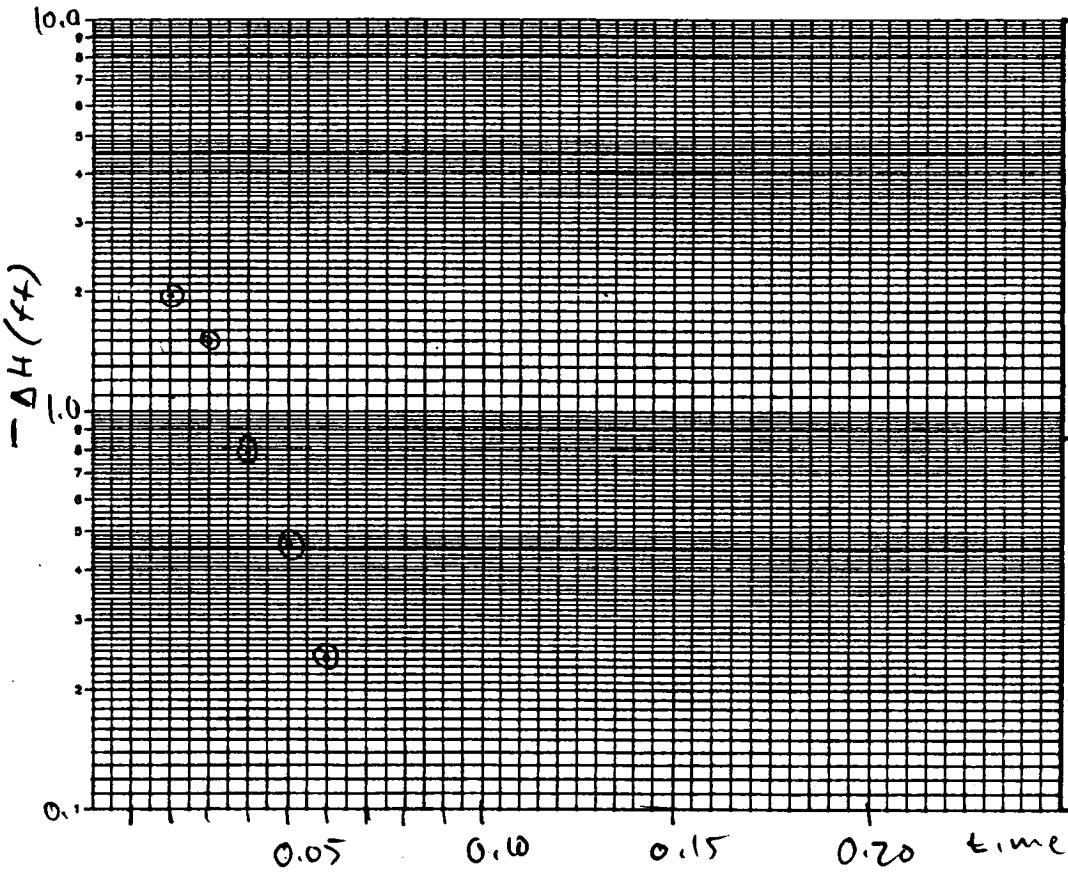
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C13
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. JIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T950
STATIC WATER LEVEL (Depth/Elevation): 8.69' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		-1.95	0.14		-0.03
0.03		-1.47	0.15		-0.04
0.04		-0.78	0.16		-0.04
0.05		-0.46	0.18		-0.04
0.06		-0.24	0.19		-0.03
0.07		-0.06	0.20		-0.01
0.08		-0.11			
0.09		+0.14			
0.10		+0.09			
0.11		+0.06			
0.12		+0.01			
0.13		-0.01			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
H_2O above XD 47.06

Start @ 1537
Stop @ 1604

CALCS, SKETCH MAPS, ETC.:
• File: 06C13Fall.txt
• 1st Run

SE1000C
Environmental Logger
03/13 08:34

Unit# 00143 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60130
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well 06C13 (1st Test)
Falling Head Test
06C13 Fall.txt

Step 0 03/12 15:37:04

Elapsed Time	INPUT 1
0.0000	-0.016
0.0033	-0.016
0.0066	-0.208
0.0100	-0.833
0.0133	-1.346
0.0166	-1.715
0.0200	-1.955
0.0233	-1.907
0.0266	-1.603
0.0300	-1.474
0.0333	-1.378
0.0366	-1.106
0.0400	-0.785
0.0433	-0.689
0.0466	-0.561
0.0500	-0.465
0.0533	-0.400
0.0566	-0.336
0.0600	-0.240
0.0633	-0.192
0.0666	-0.112
0.0700	-0.064
0.0733	0.000
0.0766	0.048
0.0800	0.111
0.0833	0.128
0.0866	0.144
0.0900	0.144
0.0933	0.144
0.0966	0.128
0.1000	0.096
0.1033	0.080
0.1066	0.064
0.1100	0.064
0.1133	0.048
0.1166	0.032

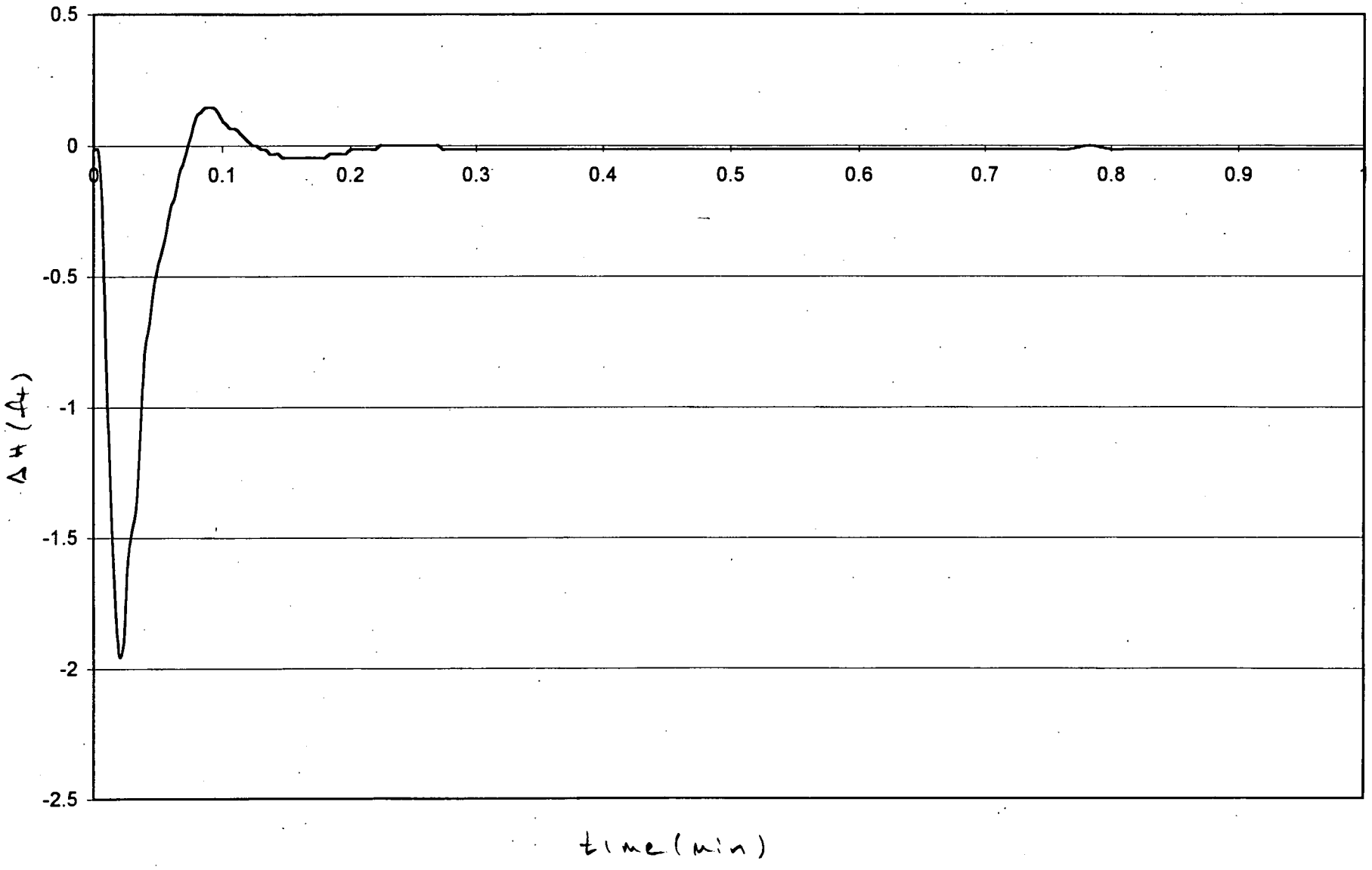
0.1200	0.016
0.1233	0.000
0.1266	0.000
0.1300	-0.016
0.1333	-0.016
0.1366	-0.032
0.1400	-0.032
0.1433	-0.032
0.1466	-0.048
0.1500	-0.048
0.1533	-0.048
0.1566	-0.048
0.1600	-0.048
0.1633	-0.048
0.1666	-0.048
0.1700	-0.048
0.1733	-0.048
0.1766	-0.048
0.1800	-0.048
0.1833	-0.032
0.1866	-0.032
0.1900	-0.032
0.1933	-0.032
0.1966	-0.032
0.2000	-0.016
0.2033	-0.016
0.2066	-0.016
0.2100	-0.016
0.2133	-0.016
0.2166	-0.016
0.2200	-0.016
0.2233	0.000
0.2266	0.000
0.2300	0.000
0.2333	0.000
0.2366	0.000
0.2400	0.000
0.2433	0.000
0.2466	0.000
0.2500	0.000
0.2533	0.000
0.2566	0.000
0.2600	0.000
0.2633	0.000
0.2666	0.000
0.2700	0.000
0.2733	-0.016
0.2766	-0.016
0.2800	-0.016
0.2833	-0.016
0.2866	-0.016
0.2900	-0.016
0.2933	-0.016
0.2966	-0.016
0.3000	-0.016
0.3033	-0.016
0.3066	-0.016
0.3100	-0.016
0.3133	-0.016
0.3166	-0.016

0.3200	-0.016
0.3233	-0.016
0.3266	-0.016
0.3300	-0.016
0.3333	-0.016
0.3500	-0.016
0.3666	-0.016
0.3833	-0.016
0.4000	-0.016
0.4166	-0.016
0.4333	-0.016
0.4500	-0.016
0.4666	-0.016
0.4833	-0.016
0.5000	-0.016
0.5166	-0.016
0.5333	-0.016
0.5500	-0.016
0.5666	-0.016
0.5833	-0.016
0.6000	-0.016
0.6166	-0.016
0.6333	-0.016
0.6500	-0.016
0.6666	-0.016
0.6833	-0.016
0.7000	-0.016
0.7166	-0.016
0.7333	-0.016
0.7500	-0.016
0.7666	-0.016
0.7833	0.000
0.8000	-0.016
0.8166	-0.016
0.8333	-0.016
0.8500	-0.016
0.8666	-0.016
0.8833	-0.016
0.9000	-0.016
0.9166	-0.016
0.9333	-0.016
0.9500	-0.016
0.9666	-0.016
0.9833	-0.016
1.0000	-0.016
1.2000	-0.016
1.4000	-0.016
1.6000	-0.016
1.8000	-0.016
2.0000	-0.016
2.2000	-0.016
2.4000	-0.016
2.6000	-0.016
2.8000	-0.016
3.0000	-0.016
3.2000	-0.016
3.4000	-0.016
3.6000	-0.016
3.8000	-0.016
4.0000	-0.016

4.2000	-0.016
4.4000	-0.032
4.6000	-0.032
4.8000	-0.032
5.0000	-0.032
5.2000	-0.016
5.4000	-0.016
5.6000	-0.016
5.8000	-0.016
6.0000	-0.016
6.2000	-0.016
6.4000	-0.016
6.6000	-0.016
6.8000	-0.016
7.0000	-0.016
7.2000	-0.016
7.4000	-0.032
7.6000	-0.016
7.8000	-0.016
8.0000	-0.016
8.2000	-0.016
8.4000	-0.016
8.6000	-0.016
8.8000	-0.016
9.0000	-0.016
9.2000	-0.016
9.4000	-0.016
9.6000	-0.016
9.8000	-0.016
10.0000	-0.016
12.0000	-0.016
14.0000	-0.016
16.0000	-0.016
18.0000	-0.016
20.0000	0.000
22.0000	-0.016
24.0000	-0.016
26.0000	-0.016

END

06C13 Falling Head Test



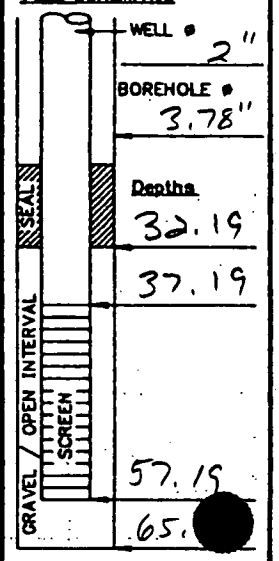
00397

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

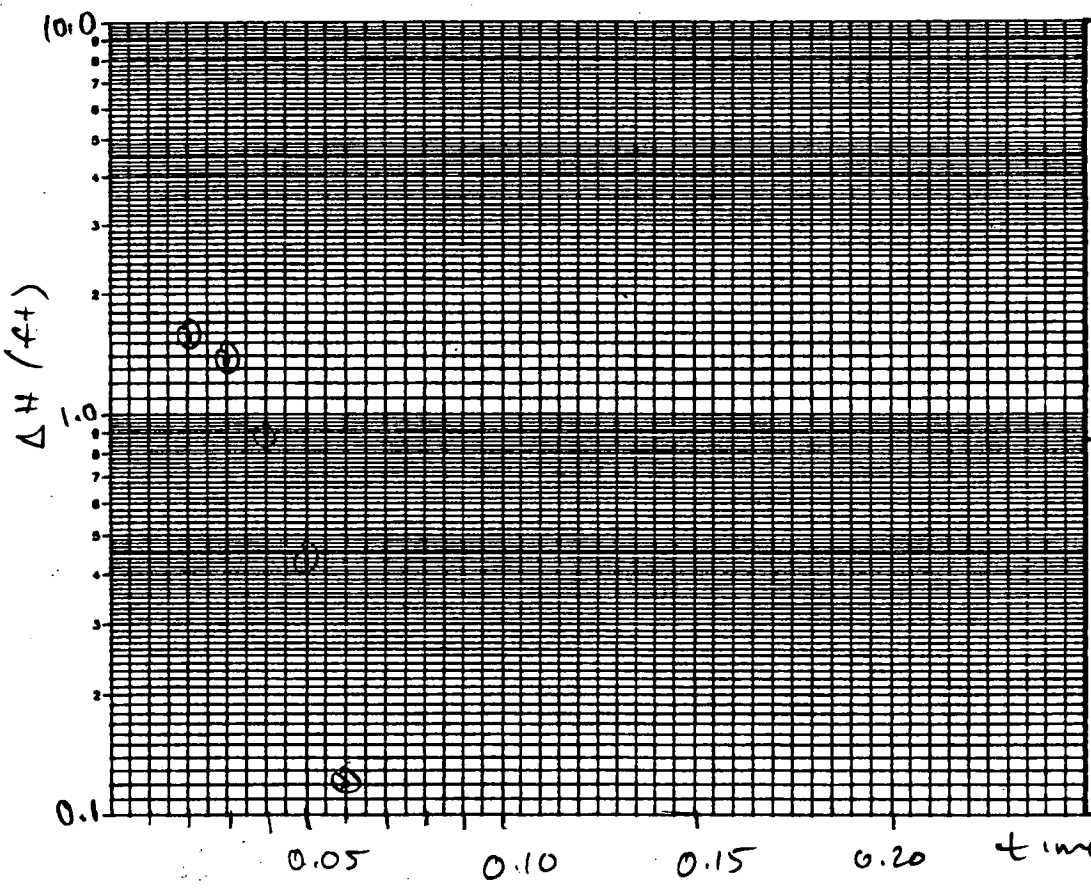
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C13
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T1050
STATIC WATER LEVEL (Depth/Elevation): 8.67' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		1.58	0.14		0.04
0.03		1.37	0.15		0.06
0.04		0.89	0.16		0.08
0.05		0.43	0.17		0.08
0.06		0.12	0.18		0.06
0.07		-0.09	0.19		0.03
0.08		-0.17	0.20		0.00
0.09		-0.20	0.21		-0.01
0.10		-0.19	0.23		-0.01
0.11		-0.14			
0.12		-0.07			
0.13		0.00			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
H_2O above XD 47.08
Start @ 1609
Stop @ 1620

CALCS, SKETCH MAPS, ETC.:
• file: 06C13Rise.txt
• 1st RUN

00398

SE1000C
Environmental Logger
03/13 08:37

Unit# 00143 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60130
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well 06C13 (1st Test)
Rising Head Test
06C13 Rise.txt

Step 0 03/12 16:09:07

Elapsed Time	INPUT 1
0.0000	0.465
0.0033	0.817
0.0066	1.010
0.0100	1.154
0.0133	1.394
0.0166	1.539
0.0200	1.586
0.0233	1.571
0.0266	1.491
0.0300	1.378
0.0333	1.218
0.0366	1.074
0.0400	0.897
0.0433	0.753
0.0466	0.609
0.0500	0.432
0.0533	0.336
0.0566	0.224
0.0600	0.128
0.0633	0.048
0.0666	-0.031
0.0700	-0.096
0.0733	-0.111
0.0766	-0.160
0.0800	-0.176
0.0833	-0.192
0.0866	-0.208
0.0900	-0.208
0.0933	-0.208
0.0966	-0.208
0.1000	-0.192
0.1033	-0.176
0.1066	-0.160
0.1100	-0.144
0.1133	-0.128
0.1166	-0.096
0.1200	-0.079

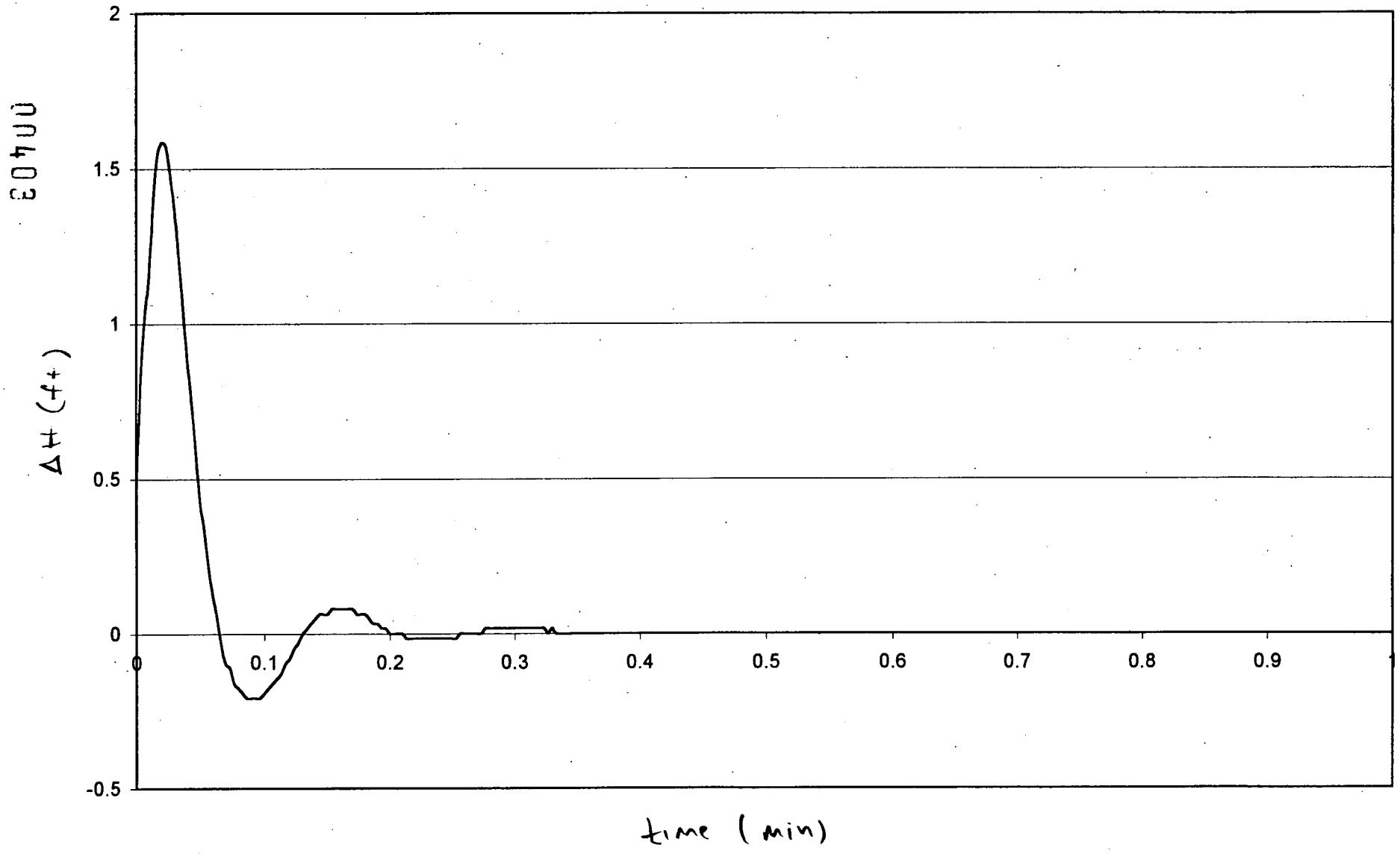
0.1233	-0.047
0.1266	-0.031
0.1300	0.000
0.1333	0.016
0.1366	0.032
0.1400	0.048
0.1433	0.064
0.1466	0.064
0.1500	0.064
0.1533	0.080
0.1566	0.080
0.1600	0.080
0.1633	0.080
0.1666	0.080
0.1700	0.080
0.1733	0.064
0.1766	0.064
0.1800	0.064
0.1833	0.048
0.1866	0.032
0.1900	0.032
0.1933	0.016
0.1966	0.016
0.2000	0.000
0.2033	0.000
0.2066	0.000
0.2100	0.000
0.2133	-0.016
0.2166	-0.016
0.2200	-0.016
0.2233	-0.016
0.2266	-0.016
0.2300	-0.016
0.2333	-0.016
0.2366	-0.016
0.2400	-0.016
0.2433	-0.016
0.2466	-0.016
0.2500	-0.016
0.2533	-0.016
0.2566	0.000
0.2600	0.000
0.2633	0.000
0.2666	0.000
0.2700	0.000
0.2733	0.000
0.2766	0.016
0.2800	0.016
0.2833	0.016
0.2866	0.016
0.2900	0.016
0.2933	0.016
0.2966	0.016
0.3000	0.016
0.3033	0.016
0.3066	0.016
0.3100	0.016
0.3133	0.016
0.3166	0.016
0.3200	0.016

0.3233	0.016
0.3266	0.000
0.3300	0.016
0.3333	0.000
0.3500	0.000
0.3666	0.000
0.3833	0.000
0.4000	0.000
0.4166	0.000
0.4333	0.000
0.4500	0.000
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	0.000
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.000
0.9833	0.000
1.0000	0.000
1.2000	0.000
1.4000	0.000
1.6000	0.000
1.8000	0.000
2.0000	0.000
2.2000	0.000
2.4000	0.000
2.6000	0.000
2.8000	0.000
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.000
4.2000	0.000

4.4000	0.000
4.6000	0.000
4.8000	0.000
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	0.000

END

06C13 Rising Head Test

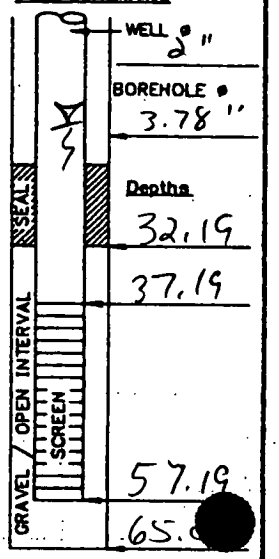


HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

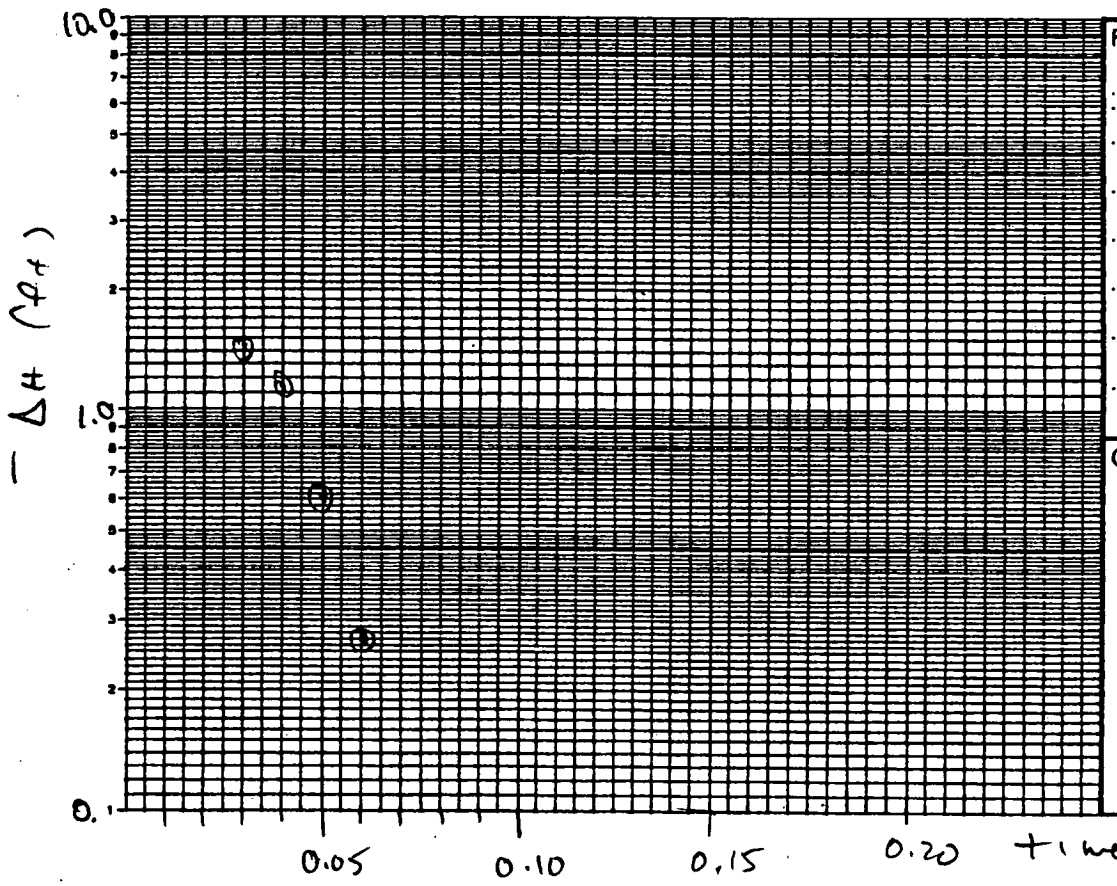
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C13
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / S. NETL
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T1750
STATIC WATER LEVEL (Depth/Elevation): 8.58' TPVC DATE: 3-14-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		-1.44	0.15		-0.04
0.04		-1.13	0.16		-0.03
0.05		-0.60	0.17		-0.03
0.06		-0.27	0.18		-0.01
0.07		+0.01	0.20		+0.01
0.08		+0.16			
0.09		+0.19			
0.10		+0.12			
0.11		+0.06			
0.12		+0.01			
0.13		-0.01			
0.14		-0.03			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203120
50 psi
H_2O above XD = 47.48'
Start @ 1320
Stop @ 1334

CALCS, SKETCH MAPS, ETC.:
- file: 06C13Fall2.txt
- 2ND RUN

00404

SE1000C
Environmental Logger
03/14 15:11

Unit# 00143 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60130
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/14 13:20:05

Elapsed Time	INPUT 1
0.0000	0.000
0.0033	-0.096
0.0066	-0.272
0.0100	-0.528
0.0133	-0.769
0.0166	-1.057
0.0200	-1.282
0.0233	-1.376
0.0266	-1.410
0.0300	-1.442
0.0333	-1.410
0.0366	-1.298
0.0400	-1.137
0.0433	-0.977
0.0466	-0.801
0.0500	-0.609
0.0533	-0.400
0.0566	-0.352
0.0600	-0.272
0.0633	-0.160
0.0666	-0.079
0.0700	0.016
0.0733	0.080
0.0766	0.128
0.0800	0.160
0.0833	0.192
0.0866	0.192
0.0900	0.192
0.0933	0.176
0.0966	0.160
0.1000	0.128
0.1033	0.096
0.1066	0.080
0.1100	0.064
0.1133	0.048
0.1166	0.032
0.1200	0.016

Well # 06C13 (2nd Test)
Falling Head Test
Ø6 C13 Fall 2.txt

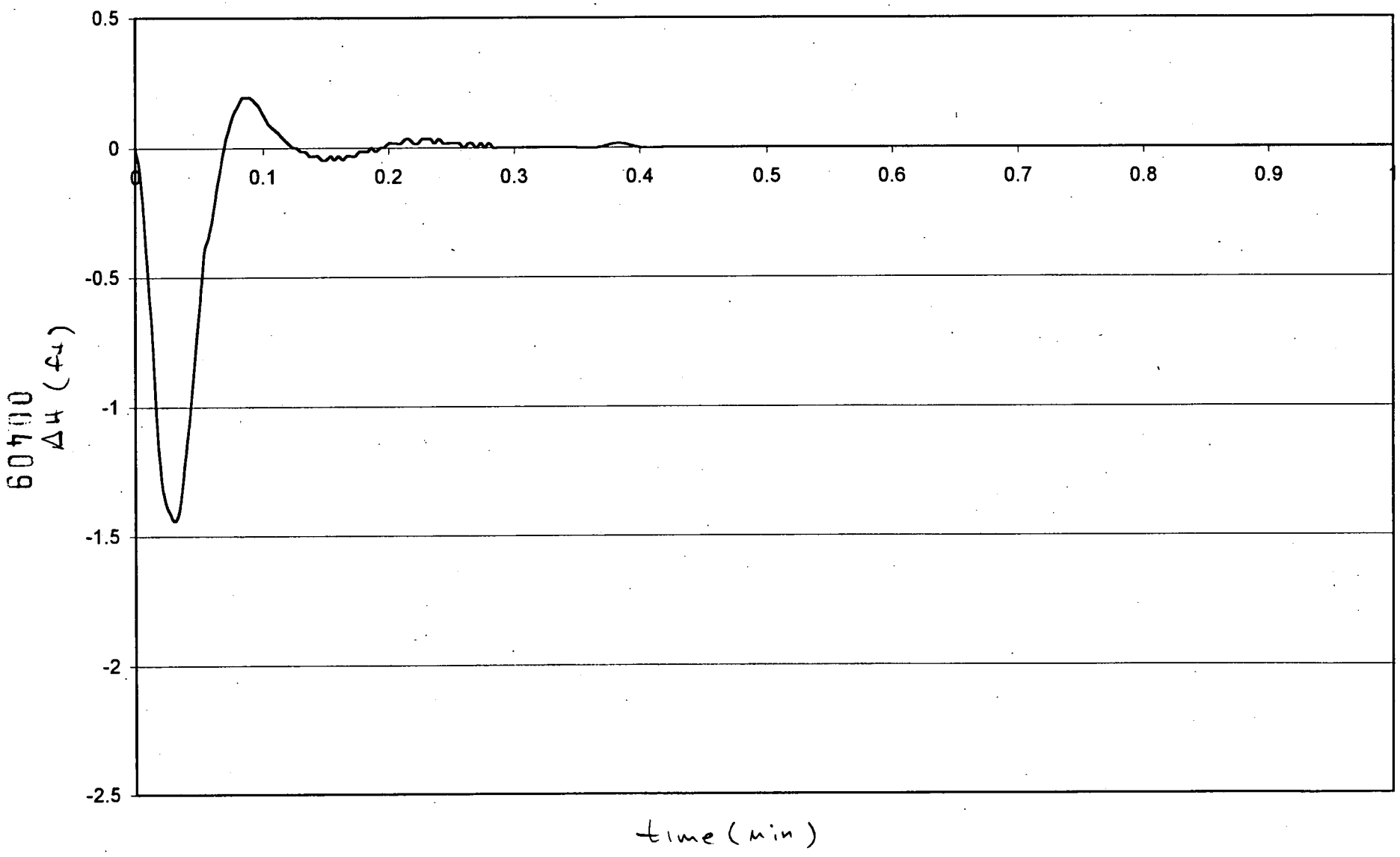
0.1233	0.000
0.1266	0.000
0.1300	-0.015
0.1333	-0.015
0.1366	-0.032
0.1400	-0.032
0.1433	-0.032
0.1466	-0.048
0.1500	-0.048
0.1533	-0.032
0.1566	-0.048
0.1600	-0.032
0.1633	-0.048
0.1666	-0.032
0.1700	-0.032
0.1733	-0.032
0.1766	-0.015
0.1800	-0.015
0.1833	-0.015
0.1866	0.000
0.1900	-0.015
0.1933	0.000
0.1966	0.000
0.2000	0.016
0.2033	0.016
0.2066	0.016
0.2100	0.016
0.2133	0.032
0.2166	0.032
0.2200	0.016
0.2233	0.016
0.2266	0.032
0.2300	0.032
0.2333	0.032
0.2366	0.016
0.2400	0.032
0.2433	0.016
0.2466	0.016
0.2500	0.016
0.2533	0.016
0.2566	0.016
0.2600	0.000
0.2633	0.016
0.2666	0.016
0.2700	0.000
0.2733	0.016
0.2766	0.000
0.2800	0.016
0.2833	0.000
0.2866	0.000
0.2900	0.000
0.2933	0.000
0.2966	0.000
0.3000	0.000
0.3033	0.000
0.3066	0.000
0.3100	0.000
0.3133	0.000
0.3166	0.000
0.3200	0.000

0.3233	0.000
0.3266	0.000
0.3300	0.000
0.3333	0.000
0.3500	0.000
0.3666	0.000
0.3833	0.016
0.4000	0.000
0.4166	0.000
0.4333	0.000
0.4500	0.000
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	0.000
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.000
0.9833	0.000
1.0000	0.000
1.2000	0.000
1.4000	0.000
1.6000	0.000
1.8000	0.016
2.0000	0.000
2.2000	0.016
2.4000	0.000
2.6000	0.000
2.8000	0.000
3.0000	0.000
3.2000	0.016
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.000
4.2000	0.000

4.4000	0.000
4.6000	0.000
4.8000	0.000
5.0000	0.000
5.2000	0.016
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.000
6.8000	0.016
7.0000	0.000
7.2000	0.016
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.016
9.0000	0.016
9.2000	0.000
9.4000	0.000
9.6000	0.016
9.8000	0.000
10.0000	0.000
12.0000	0.000

END

06C13 Falling Head Test (2)



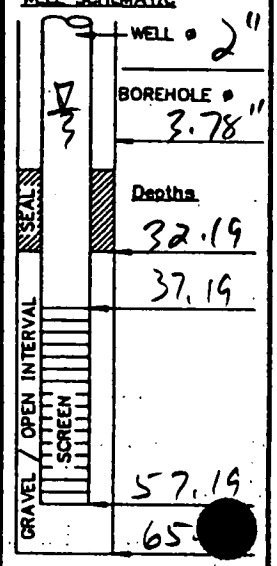
604700

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

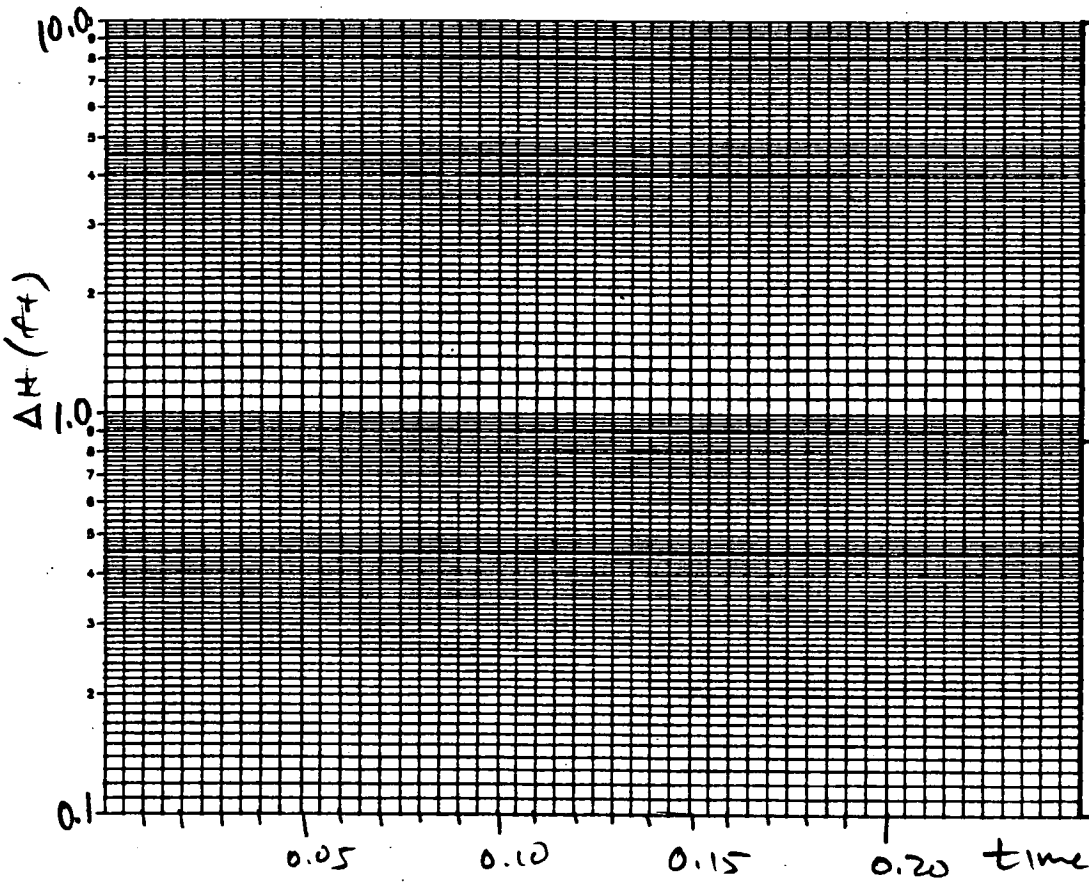
PROJECT NAME: NSWC Crane WELL/BORING NO.: 06C13
PROJECT NO.: 7657 GEOLOGIST: T. Evans / S. Neil
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T1850
STATIC WATER LEVEL (Depth/Elevation): 8.58' TPVC DATE: 3-14-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		1.39	0.15		0.04
0.04		1.12	0.16		0.08
0.05		0.68	0.17		0.08
0.06		0.30	0.18		0.06
0.07		0.04	0.20		0.03
0.08		-0.11			
0.09		-0.20			
0.10		-0.22			
0.11		-0.19			
0.12		-0.11			
0.13		-0.03			
0.14		0.03			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203.20
50 psi
H_2O above XD = 47.48'
Start @ 1338
Stop @ 1350

CALCS, SKETCH MAPS, ETC.:
- file: 06C13Rise2.txt
- 2ND RUN

00410

SE1000C
Environmental Logger
03/14 15:14

Unit# 00143 Test 18

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60130
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/14 13:38:31

Elapsed Time	INPUT 1
0.0000	0.160
0.0033	0.320
0.0066	0.400
0.0100	0.528
0.0133	0.625
0.0166	0.753
0.0200	0.993
0.0233	1.170
0.0266	1.314
0.0300	1.378
0.0333	1.394
0.0366	1.314
0.0400	1.234
0.0433	1.122
0.0466	0.978
0.0500	0.817
0.0533	0.689
0.0566	0.561
0.0600	0.417
0.0633	0.304
0.0666	0.208
0.0700	0.112
0.0733	0.048
0.0766	-0.032
0.0800	-0.079
0.0833	-0.111
0.0866	-0.160
0.0900	-0.192
0.0933	-0.208
0.0966	-0.208
0.1000	-0.224
0.1033	-0.208
0.1066	-0.224
0.1100	-0.224
0.1133	-0.192
0.1166	-0.160
0.1200	-0.144

Well #06C13 (2nd Test)
Rising Head Test
06C13 Rise2.txt

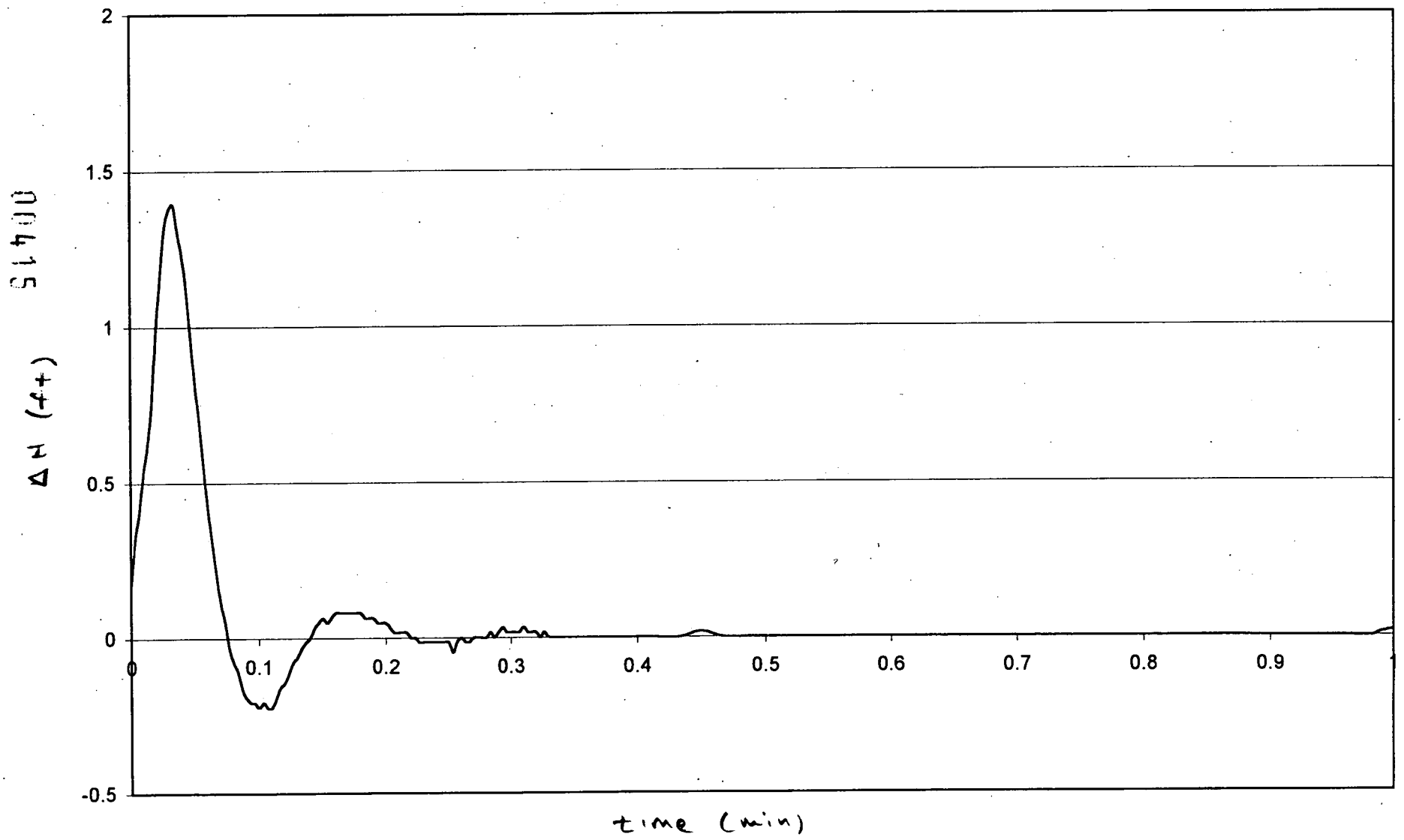
0.1233	-0.111
0.1266	-0.079
0.1300	-0.063
0.1333	-0.032
0.1366	-0.015
0.1400	0.000
0.1433	0.032
0.1466	0.048
0.1500	0.064
0.1533	0.048
0.1566	0.064
0.1600	0.080
0.1633	0.080
0.1666	0.080
0.1700	0.080
0.1733	0.080
0.1766	0.080
0.1800	0.080
0.1833	0.064
0.1866	0.064
0.1900	0.064
0.1933	0.048
0.1966	0.048
0.2000	0.048
0.2033	0.032
0.2066	0.016
0.2100	0.016
0.2133	0.016
0.2166	0.016
0.2200	0.000
0.2233	0.000
0.2266	-0.015
0.2300	-0.015
0.2333	-0.015
0.2366	-0.015
0.2400	-0.015
0.2433	-0.015
0.2466	-0.015
0.2500	-0.015
0.2533	-0.048
0.2566	-0.015
0.2600	0.000
0.2633	-0.015
0.2666	-0.015
0.2700	0.000
0.2733	0.000
0.2766	0.000
0.2800	0.000
0.2833	0.016
0.2866	0.000
0.2900	0.016
0.2933	0.032
0.2966	0.016
0.3000	0.016
0.3033	0.016
0.3066	0.016
0.3100	0.032
0.3133	0.016
0.3166	0.016
0.3200	0.016

0.3233	0.000
0.3266	0.016
0.3300	0.000
0.3333	0.000
0.3500	0.000
0.3666	0.000
0.3833	0.000
0.4000	0.000
0.4166	0.000
0.4333	0.000
0.4500	0.016
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	0.000
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.000
0.9833	0.000
1.0000	0.016
1.2000	0.000
1.4000	0.000
1.6000	0.000
1.8000	0.000
2.0000	0.000
2.2000	0.000
2.4000	0.000
2.6000	0.000
2.8000	0.000
3.0000	0.000
3.2000	0.016
3.4000	0.000
3.6000	0.016
3.8000	0.000
4.0000	0.000
4.2000	0.000

4.4000	0.016
4.6000	0.000
4.8000	0.016
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.016
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.016
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.016
7.6000	0.016
7.8000	0.000
8.0000	0.016
8.2000	0.000
8.4000	0.016
8.6000	0.016
8.8000	0.000
9.0000	0.016
9.2000	0.000
9.4000	0.016
9.6000	0.016
9.8000	0.000
10.0000	0.000

END

06C13 Rising Head Test (2)



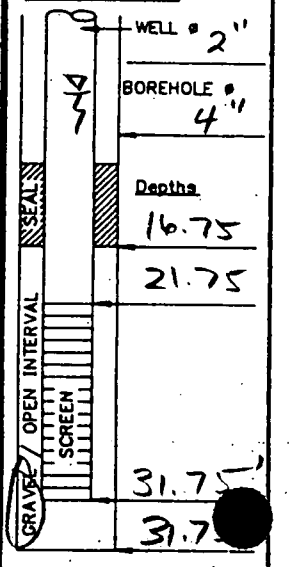
00415

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

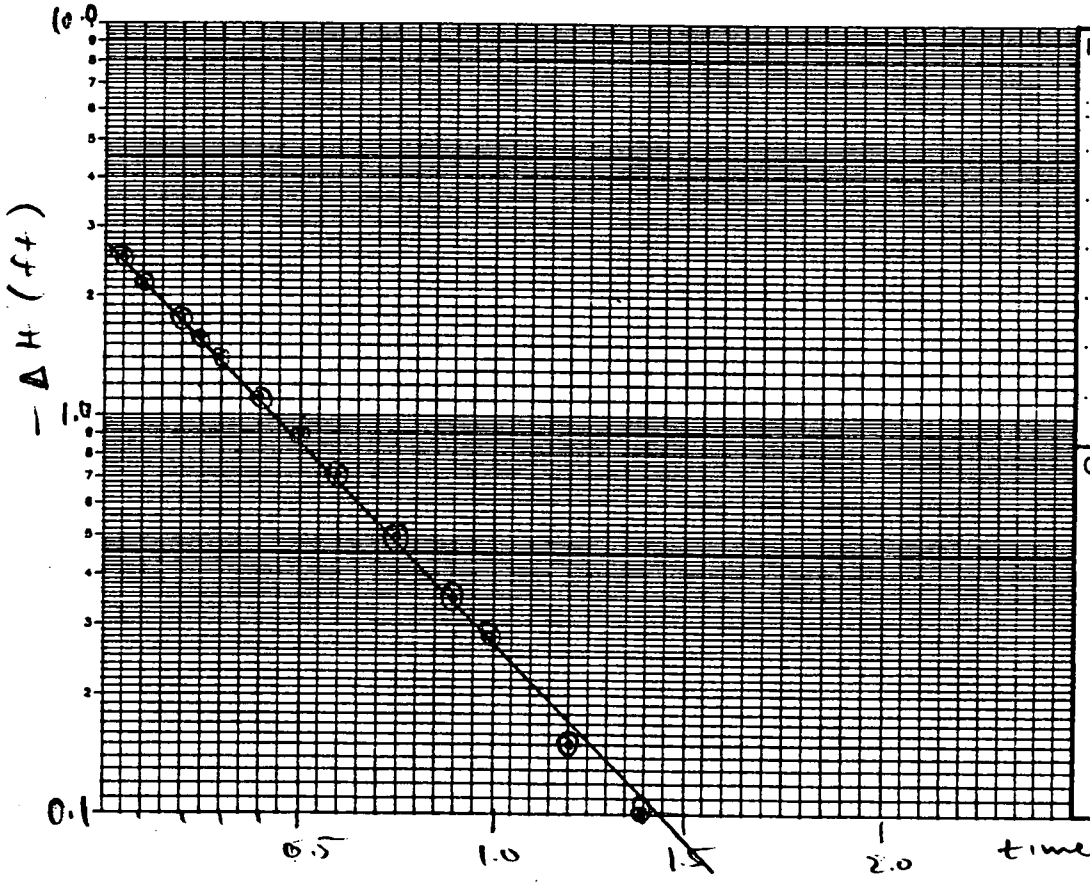
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C13P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: TØSØ
STATIC WATER LEVEL (Depth/Elevation): 8.42' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-2.48	1.00		-0.28
0.10		-2.18	1.20		-0.15
0.20		-1.74	1.40		-0.10
0.25		-1.56	1.60		-0.07
0.30		-1.41	1.80		-0.04
0.35		-1.26	2.00		-0.02
0.40		-1.12			
0.50		-0.89			
0.55		-0.80			
0.60		-0.71			
0.75		-0.50			
0.90		-0.35			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 201804
20 psi
H_2O above XD 22.01

Start @ 1541
Stop @ 1601

CALCS, SKETCH MAPS, ETC.:

file:
06C13P2 Fall.txt

FWR
3-30-99

SE1000C
Environmental Logger
03/13 07:24

Unit# 00145 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60132
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well 06C13P2
Falling Head Test
file: Ø6C13P2FALL.txt

Step 0 03/12 15:41:24

Elapsed Time	INPUT 1
0.0000	-0.057
0.0033	-0.848
0.0066	-2.920
0.0100	-4.835
0.0133	-5.779
0.0166	-5.383
0.0200	-1.866
0.0233	-0.809
0.0266	-2.129
0.0300	-2.359
0.0333	-2.231
0.0366	-2.506
0.0400	-2.627
0.0433	-2.435
0.0466	-2.219
0.0500	-2.334
0.0533	-2.455
0.0566	-2.480 ← Ho
0.0600	-2.423
0.0633	-2.359
0.0666	-2.340
0.0700	-2.334
0.0733	-2.334
0.0766	-2.308
0.0800	-2.282
0.0833	-2.257
0.0866	-2.244
0.0900	-2.231
0.0933	-2.212
0.0966	-2.200
0.1000	-2.180
0.1033	-2.161
0.1066	-2.149
0.1100	-2.136
0.1133	-2.116
0.1166	-2.098
0.1200	-2.085

H/H_o	t
1.00	0.0000
0.94	0.0100
0.93	0.0200
0.90	0.0300
0.89	0.0400
0.87	0.0500
0.85	0.0600

00417

0.1233	-2.072		
0.1266	-2.053	0.83	0.0700
0.1300	-2.040		
0.1333	-2.021		
0.1366	-2.008	0.81	0.0800
0.1400	-1.995		
0.1433	-1.976		
0.1466	-1.964	0.79	0.0900
0.1500	-1.951		
0.1533	-1.932		
0.1566	-1.919	0.77	0.1000
0.1600	-1.906		
0.1633	-1.893		
0.1666	-1.881		
0.1700	-1.868		
0.1733	-1.855		
0.1766	-1.836		
0.1800	-1.830		
0.1833	-1.810		
0.1866	-1.798		
0.1900	-1.791		
0.1933	-1.779		
0.1966	-1.760		
0.2000	-1.746		
0.2033	-1.740		
0.2066	-1.721	0.69	0.1500
0.2100	-1.715		
0.2133	-1.696		
0.2166	-1.683		
0.2200	-1.677		
0.2233	-1.657		
0.2266	-1.651		
0.2300	-1.645		
0.2333	-1.632		
0.2366	-1.619		
0.2400	-1.606		
0.2433	-1.594		
0.2466	-1.581		
0.2500	-1.568		
0.2533	-1.562		
0.2566	-1.549	0.62	0.2000
0.2600	-1.536		
0.2633	-1.530		
0.2666	-1.517		
0.2700	-1.505		
0.2733	-1.498		
0.2766	-1.485		
0.2800	-1.472		
0.2833	-1.466		
0.2866	-1.447		
0.2900	-1.441		
0.2933	-1.428		
0.2966	-1.421		
0.3000	-1.415		
0.3033	-1.402		
0.3066	-1.390	0.56	0.2500
0.3100	-1.383		
0.3133	-1.370		
0.3166	-1.364		
0.3200	-1.351		

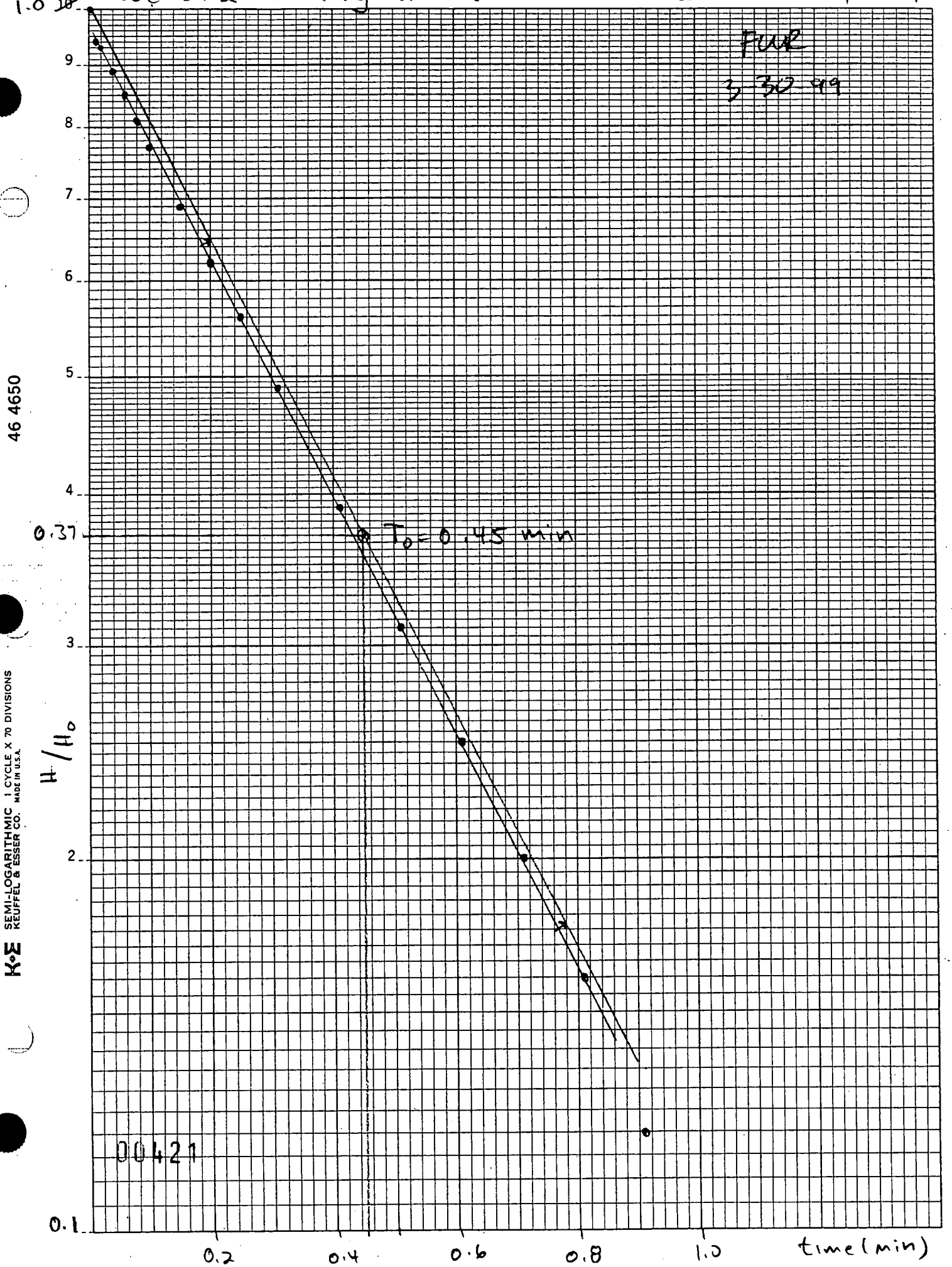
0.3233	-1.345		
0.3266	-1.332		
0.3300	-1.326		
0.3333	-1.313		
0.3500	-1.268		
0.3666	-1.224	0.49	0.3100
0.3833	-1.173		
0.4000	-1.128		
0.4166	-1.084		
0.4333	-1.052		
0.4500	-1.007		
0.4666	-0.969	0.39	0.4100
0.4833	-0.930		
0.5000	-0.899		
0.5166	-0.867		
0.5333	-0.835		
0.5500	-0.803		
0.5666	-0.771	0.31	0.5100
0.5833	-0.746		
0.6000	-0.714		
0.6166	-0.688		
0.6333	-0.663		
0.6500	-0.637		
0.6666	-0.612	0.25	0.6100
0.6833	-0.586		
0.7000	-0.573		
0.7166	-0.548		
0.7333	-0.522		
0.7500	-0.503		
0.7666	-0.484	0.20	0.7100
0.7833	-0.471		
0.8000	-0.452		
0.8166	-0.433		
0.8333	-0.420		
0.8500	-0.401		
0.8666	-0.388	0.16	0.8100
0.8833	-0.369		
0.9000	-0.357		
0.9166	-0.344		
0.9333	-0.331		
0.9500	-0.318		
0.9666	-0.306	0.12	0.9100
0.9833	-0.299		
1.0000	-0.286		
1.2000	-0.159	0.06	1.1434
1.4000	-0.102		
1.6000	-0.070		
1.8000	-0.044		
2.0000	-0.025		
2.2000	-0.019		
2.4000	-0.012		
2.6000	-0.012		
2.8000	-0.012		
3.0000	-0.012		
3.2000	-0.012		
3.4000	-0.012		
3.6000	-0.006		
3.8000	-0.006		
4.0000	-0.006		
4.2000	-0.006		

4.4000	-0.006
4.6000	-0.006
4.8000	-0.006
5.0000	-0.012
5.2000	-0.012
5.4000	-0.006
5.6000	-0.006
5.8000	-0.006
6.0000	-0.006
6.2000	-0.006
6.4000	-0.006
6.6000	-0.006
6.8000	-0.006
7.0000	-0.006
7.2000	-0.012
7.4000	-0.006
7.6000	0.000
7.8000	-0.006
8.0000	-0.006
8.2000	-0.006
8.4000	-0.006
8.6000	-0.006
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	-0.006
9.6000	-0.006
9.8000	-0.006
10.0000	0.000
12.0000	-0.006
14.0000	0.000
16.0000	0.000
18.0000	0.000
20.0000	-0.006

END

06C13P2 Falling Head

NSWC CRANE / 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C13P2 Falling Head Test		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-30-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 0.45$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.167 \text{ ft})}{2(10.0 \text{ ft})(0.45 \text{ min})}$$

$K = 3.13 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 4.51 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

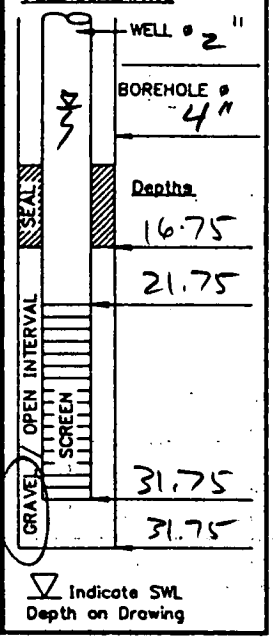
$= 1.60 \times 10^{-3}$ cm/s

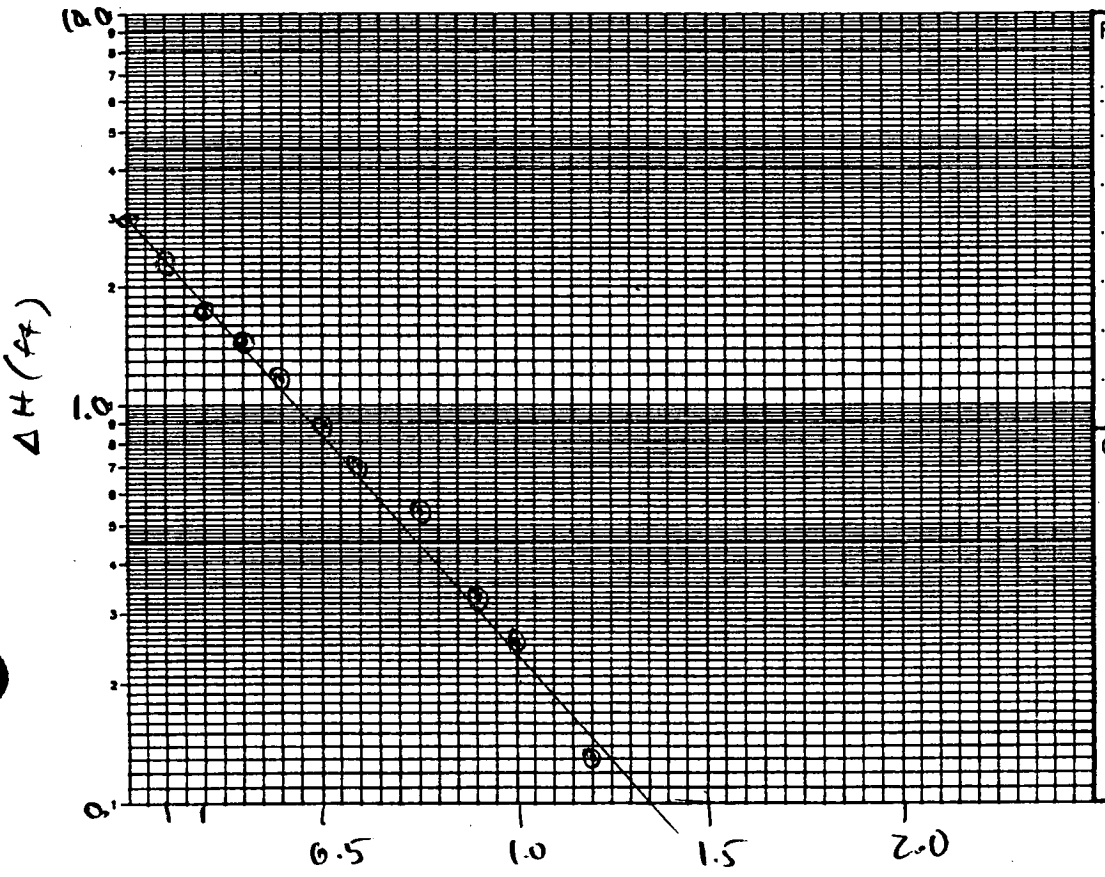
HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C13P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K.S
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T150
STATIC WATER LEVEL (Depth/Elevation): 8.42' TPVC DATE: 3-12-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø X 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		2.99	1.40		0.08
0.10		2.28	1.60		0.05
0.20		1.81			
0.30		1.45			
0.40		1.14			
0.50		0.89			
0.60		0.70			
0.70		0.54			
0.75		0.48			
0.90		0.33			
1.00		0.25			
1.20		0.13			

WELL SCHEMATIC





REMARKS:
Hermit # 145
XD S/N 201804
20 psi
H_2O above XD 22.01'
Start @ 1604
Stop @ 1618

CALCS, SKETCH MAPS, ETC.:
file:
06C13P2Rise.txt

00423

FWR
3-30-99

SE1000C
Environmental Logger
03/13 07:31

Unit# 00145 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	60132
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well 06C13P2
Rising Head Test
file : Ø6C13P2RISE.txt

Step 0 03/12 16:04:05

Elapsed Time	INPUT 1		H/H_0	
0.0000	0.108			
0.0033	2.721			
0.0066	3.077			
0.0100	0.490			
0.0133	0.968			
0.0166	2.173			
0.0200	2.224			
0.0233	2.727			
0.0266	2.995	$-H_0$	1.00	0.0000
0.0300	2.823			
0.0333	2.746			
0.0366	2.746		0.92	0.0100
0.0400	2.708			
0.0433	2.682			
0.0466	2.651		0.89	0.0200
0.0500	2.625			
0.0533	2.600			
0.0566	2.574			
0.0600	2.549			
0.0633	2.523			
0.0666	2.498		0.83	0.0400
0.0700	2.472			
0.0733	2.453			
0.0766	2.434			
0.0800	2.415			
0.0833	2.389			
0.0866	2.377			
0.0900	2.345			
0.0933	2.332			
0.0966	2.313			
0.1000	2.287			
0.1033	2.268			
0.1066	2.249		0.75	0.0800
0.1100	2.236			
0.1133	2.211			
0.1166	2.198			
0.1200	2.179			

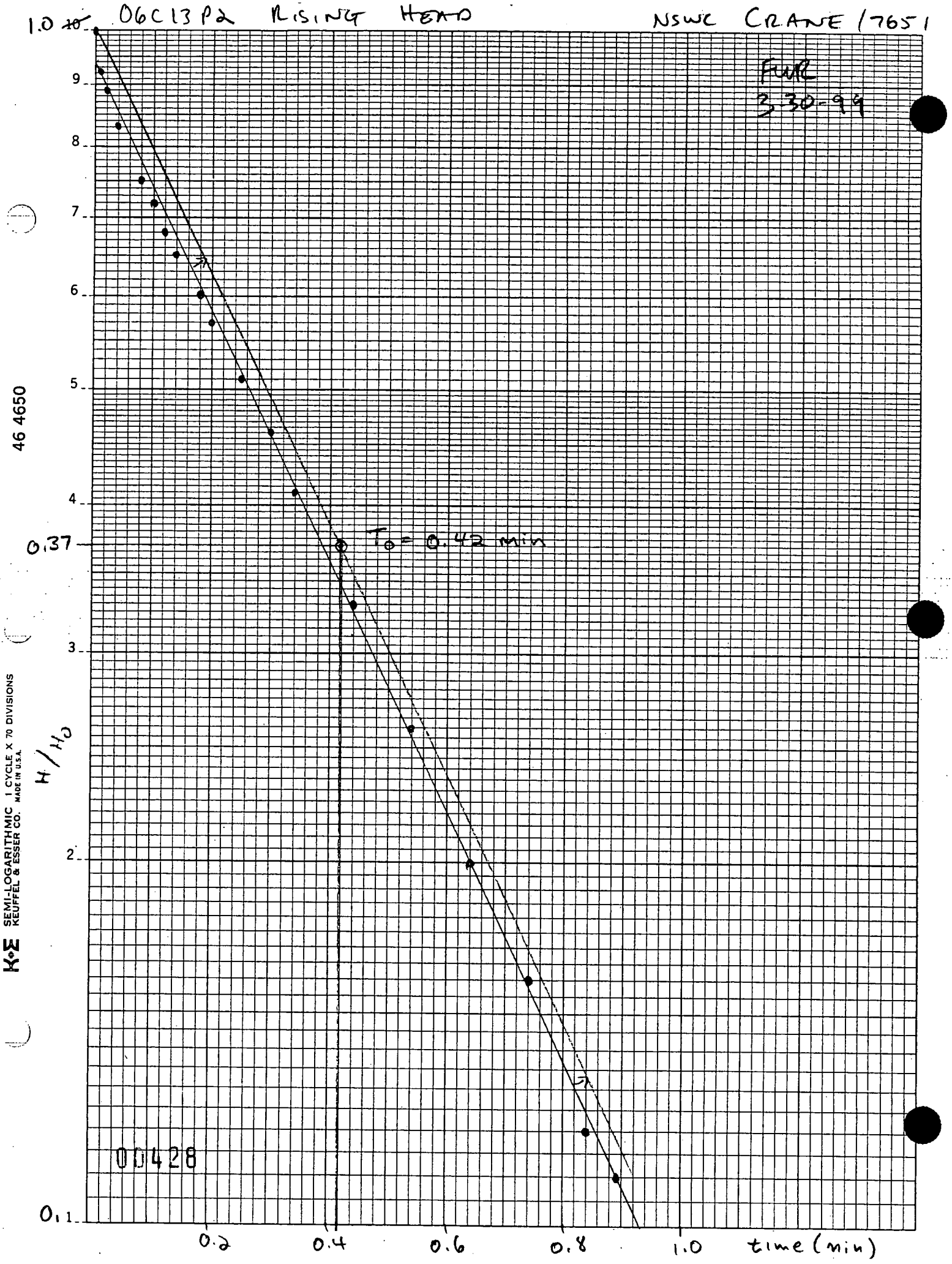
00424

0.1233	2.160		
0.1266	2.147	0.72	0.1000
0.1300	2.128		
0.1333	2.109		
0.1366	2.096		
0.1400	2.077		
0.1433	2.064		
0.1466	2.045	0.68	0.1200
0.1500	2.033		
0.1533	2.013		
0.1566	1.994		
0.1600	1.982		
0.1633	1.969		
0.1666	1.956	0.65	0.1400
0.1700	1.937		
0.1733	1.924		
0.1766	1.912		
0.1800	1.892		
0.1833	1.880		
0.1866	1.867		
0.1900	1.854		
0.1933	1.841		
0.1966	1.822		
0.2000	1.810		
0.2033	1.797		
0.2066	1.784	0.60	0.1800
0.2100	1.771		
0.2133	1.759		
0.2166	1.746		
0.2200	1.727		
0.2233	1.714		
0.2266	1.708	0.57	0.2000
0.2300	1.695		
0.2333	1.682		
0.2366	1.663		
0.2400	1.657		
0.2433	1.644		
0.2466	1.631		
0.2500	1.618		
0.2533	1.606		
0.2566	1.593		
0.2600	1.580		
0.2633	1.567		
0.2666	1.561		
0.2700	1.548		
0.2733	1.536		
0.2766	1.523	0.51	0.2500
0.2800	1.516		
0.2833	1.497		
0.2866	1.491		
0.2900	1.478		
0.2933	1.465		
0.2966	1.459		
0.3000	1.453		
0.3033	1.440		
0.3066	1.427		
0.3100	1.421		
0.3133	1.402		
0.3166	1.395		
0.3200	1.389		

0.3233	1.376		
0.3266	1.364	0.46	0.3000
0.3300	1.357		
0.3333	1.351		
0.3500	1.287		
0.3666	1.242	0.41	0.3400
0.3833	1.191		
0.4000	1.147		
0.4166	1.102		
0.4333	1.051		
0.4500	1.013		
0.4666	0.975	0.33	0.4400
0.4833	0.936		
0.5000	0.898		
0.5166	0.860		
0.5333	0.828		
0.5500	0.796		
0.5666	0.764	0.26	0.5400
0.5833	0.733		
0.6000	0.701		
0.6166	0.675		
0.6333	0.650		
0.6500	0.624		
0.6666	0.599	0.20	0.6400
0.6833	0.573		
0.7000	0.548		
0.7166	0.522		
0.7333	0.503		
0.7500	0.484		
0.7666	0.465	0.16	0.7400
0.7833	0.446		
0.8000	0.427		
0.8166	0.414		
0.8333	0.395		
0.8500	0.382		
0.8666	0.363	0.12	0.8400
0.8833	0.344		
0.9000	0.337		
0.9166	0.318	0.11	0.8900
0.9333	0.305		
0.9500	0.293		
0.9666	0.280		
0.9833	0.267		
1.0000	0.255		
1.2000	0.133		
1.4000	0.082		
1.6000	0.050		
1.8000	0.031		
2.0000	0.019		
2.2000	0.019		
2.4000	0.012		
2.6000	0.006		
2.8000	0.006		
3.0000	0.006		
3.2000	0.006		
3.4000	0.006		
3.6000	0.000		
3.8000	0.006		
4.0000	0.006		
4.2000	0.000		

4.4000	0.006
4.6000	0.000
4.8000	0.006
5.0000	0.000
5.2000	0.044
5.4000	0.031
5.6000	0.019
5.8000	0.012
6.0000	0.006
6.2000	0.006
6.4000	0.006
6.6000	0.006
6.8000	0.006
7.0000	0.006
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.006
8.2000	0.000
8.4000	0.006
8.6000	0.000
8.8000	0.006
9.0000	0.000
9.2000	0.006
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	0.000
12.0000	0.000
14.0000	0.000

END


06C13P2 RISING HEAD
NSWC CRANE 17651
FWR
3-30-99
1.0
9
8
7
6
5
4
0.37
3
2
0.1
T_0 = 0.42 min
H/H0
0.2
0.4
0.6
0.8
1.0
time (min)
00428
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C13P2 RISING HEAD TEST	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: JWRamsey 3-30-99
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 0.42$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.167 \text{ ft})}{2(10.0 \text{ ft})(0.42 \text{ min})}$$

$K = 3.36 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 4.84 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

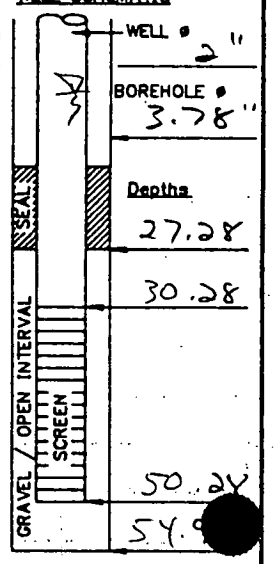
$= 1.71 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

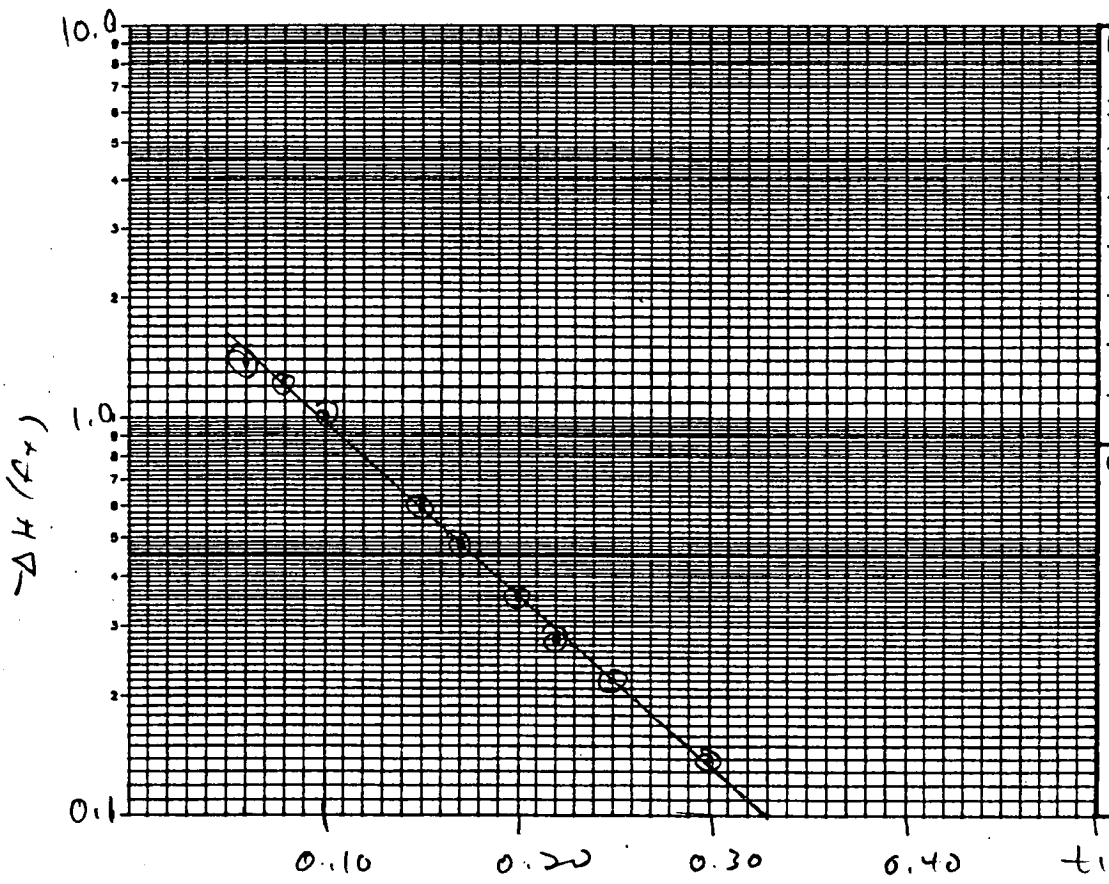
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C14
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simps
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T45Ø
STATIC WATER LEVEL (Depth/Elevation): 11.75' TPVC DATE: 3-09-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-1.39			
0.10		-1.02	0.08		-1.24
0.15		-0.60	0.17		-0.49
0.20		-0.36			
0.25		-0.22	0.22		-0.28
0.30		-0.14			
0.35		-0.11			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermitt 145
XD S/N 203120
50 psi
H_2O above XD = 38.12'

Start @ 0936
Stop @ 1000

CALCS, SKETCH MAPS, ETC.:
file:
06C14 Fall.txt

00430

FUR
3-29-99

SE1000C
Environmental Logger
03/09 18:18

Unit# 00145 Test 4

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	81400
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Step 0 03/09 09:36:00

Well #06C14
Falling Head Test
06 C 14 FALL.TXT

Elapsed Time	INPUT 1
0.0000	-0.015
0.0033	-0.015
0.0066	-0.224
0.0100	-0.368
0.0133	-0.112
0.0166	-0.448
0.0200	-1.248
0.0233	-2.480
0.0266	-3.296
0.0300	-3.296
0.0333	-3.072
0.0366	-2.640
0.0400	-2.864
0.0433	-2.656
0.0466	-2.368
0.0500	-2.240
0.0533	-2.032
0.0566	-1.408
0.0600	-1.120
0.0633	-1.392 ←
0.0666	-1.376
0.0700	-1.360
0.0733	-1.296
0.0766	-1.328
0.0800	-1.248
0.0833	-1.232
0.0866	-1.184
0.0900	-1.136
0.0933	-1.120
0.0966	-1.056
0.1000	-1.024
0.1033	-0.992
0.1066	-0.944
0.1100	-0.912
0.1133	-0.895
0.1166	-0.848
0.1200	-0.832

H/H_0	t
1.00	0.0000
0.93	0.0100
0.89	0.0200
0.71	0.0400
0.64	0.0500

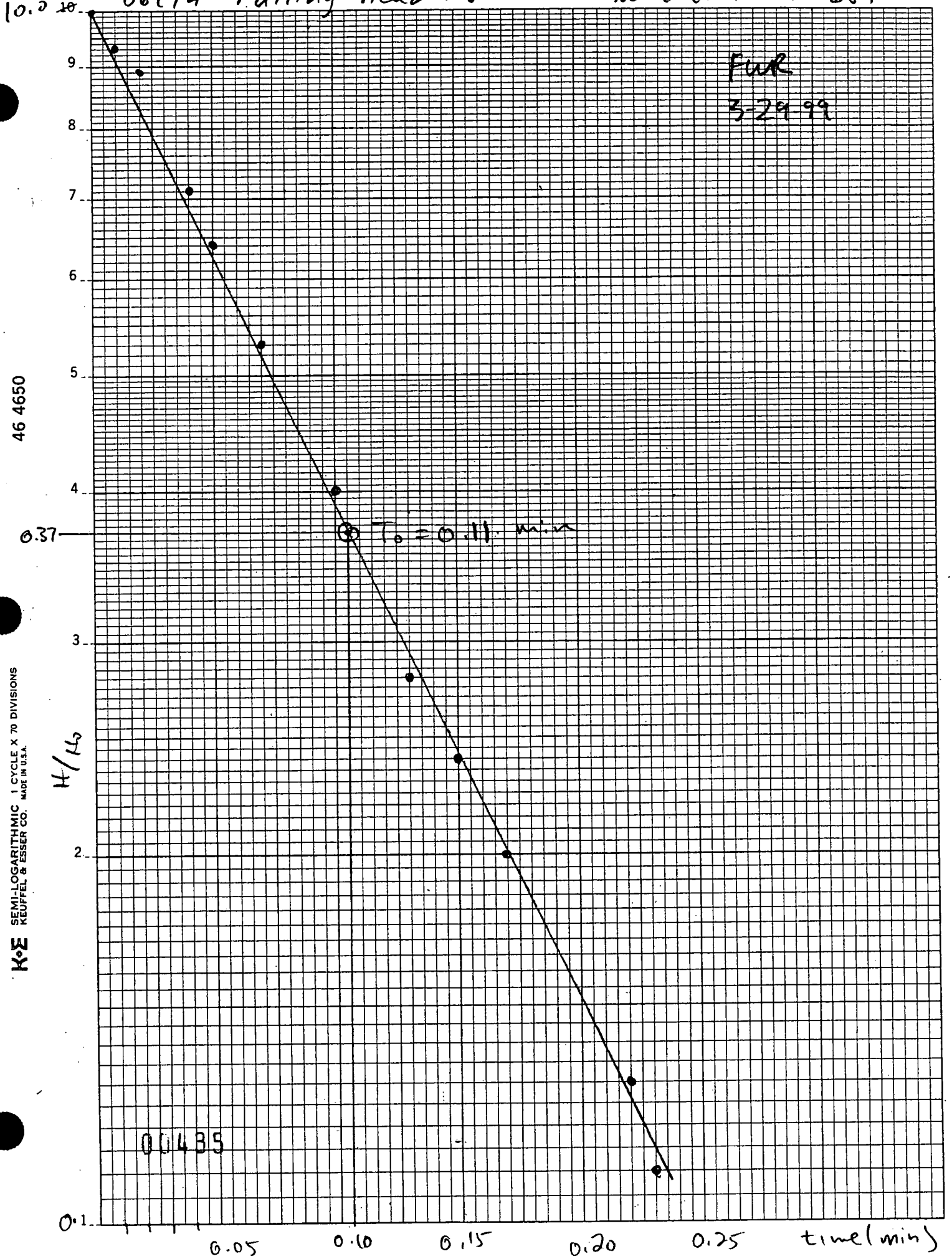
0.1233	-0.816		
0.1266	-0.784		
0.1300	-0.752		
0.1333	-0.736	0.53	0.0700
0.1366	-0.704		
0.1400	-0.704		
0.1433	-0.656		
0.1466	-0.640		
0.1500	-0.608		
0.1533	-0.592		
0.1566	-0.576		
0.1600	-0.543		
0.1633	-0.560	0.40	0.1000
0.1666	-0.496		
0.1700	-0.496		
0.1733	-0.480		
0.1766	-0.464		
0.1800	-0.448		
0.1833	-0.448		
0.1866	-0.432		
0.1900	-0.432		
0.1933	-0.384	0.28	0.1300
0.1966	-0.368		
0.2000	-0.368		
0.2033	-0.352		
0.2066	-0.336		
0.2100	-0.320		
0.2133	-0.336	0.24	0.1500
0.2166	-0.304		
0.2200	-0.288		
0.2233	-0.288		
0.2266	-0.272		
0.2300	-0.272		
0.2333	-0.272	0.20	0.1700
0.2366	-0.240		
0.2400	-0.224		
0.2433	-0.208	0.15	0.1800
0.2466	-0.224		
0.2500	-0.224		
0.2533	-0.208		
0.2566	-0.208		
0.2600	-0.208		
0.2633	-0.192	0.14	0.2000
0.2666	-0.192		
0.2700	-0.192		
0.2733	-0.176		
0.2766	-0.160		
0.2800	-0.160		
0.2833	-0.176	0.13	0.2200
0.2866	-0.160		
0.2900	-0.144		
0.2933	-0.144	0.11	0.2300
0.2966	-0.144		
0.3000	-0.144		
0.3033	-0.160		
0.3066	-0.144		
0.3100	-0.144		
0.3133	-0.112		
0.3166	-0.128		
0.3200	-0.128		

0.3233	-0.128
0.3266	-0.112
0.3300	-0.112
0.3333	-0.128
0.3500	-0.112
0.3666	-0.096
0.3833	-0.096
0.4000	-0.080
0.4166	-0.063
0.4333	-0.063
0.4500	-0.063
0.4666	-0.063
0.4833	-0.063
0.5000	-0.063
0.5166	-0.048
0.5333	-0.063
0.5500	-0.032
0.5666	-0.048
0.5833	-0.048
0.6000	-0.032
0.6166	-0.032
0.6333	-0.048
0.6500	-0.048
0.6666	-0.048
0.6833	-0.032
0.7000	-0.032
0.7166	-0.048
0.7333	-0.032
0.7500	-0.032
0.7666	-0.032
0.7833	-0.048
0.8000	-0.048
0.8166	-0.048
0.8333	-0.048
0.8500	-0.032
0.8666	-0.032
0.8833	-0.048
0.9000	-0.032
0.9166	-0.032
0.9333	-0.048
0.9500	-0.015
0.9666	-0.032
0.9833	-0.032
1.0000	-0.032
1.2000	-0.032
1.4000	-0.015
1.6000	-0.015
1.8000	-0.015
2.0000	-0.032
2.2000	-0.015
2.4000	-0.032
2.6000	-0.015
2.8000	-0.032
3.0000	-0.015
3.2000	0.000
3.4000	0.000
3.6000	-0.015
3.8000	-0.015
4.0000	0.000
4.2000	-0.015

4.4000	-0.015
4.6000	-0.032
4.8000	-0.015
5.0000	-0.015
5.2000	-0.015
5.4000	-0.015
5.6000	-0.032
5.8000	0.000
6.0000	0.000
6.2000	-0.032
6.4000	-0.032
6.6000	-0.015
6.8000	0.000
7.0000	-0.015
7.2000	-0.048
7.4000	-0.015
7.6000	-0.015
7.8000	-0.015
8.0000	0.000
8.2000	-0.015
8.4000	-0.015
8.6000	-0.032
8.8000	-0.015
9.0000	-0.032
9.2000	-0.015
9.4000	-0.032
9.6000	0.000
9.8000	0.000
10.0000	0.000
12.0000	-0.032
14.0000	-0.032
16.0000	-0.032
18.0000	-0.015
20.0000	-0.015
22.0000	-0.015
24.0000	-0.032

END

06C14 Falling Head Test NSWC CRANE / 7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C14 FALLING HEAD TEST		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY TSE	CHECKED BY 3-26-99 FLRamser	APPROVED BY	DATE

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_0 = 0.10$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(0.11 \text{ min})}$$

$K = 7.56 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 1.09 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

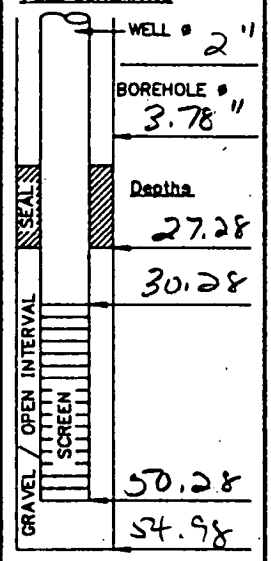
$= 3.85 \times 10^{-3}$ cm/sec

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

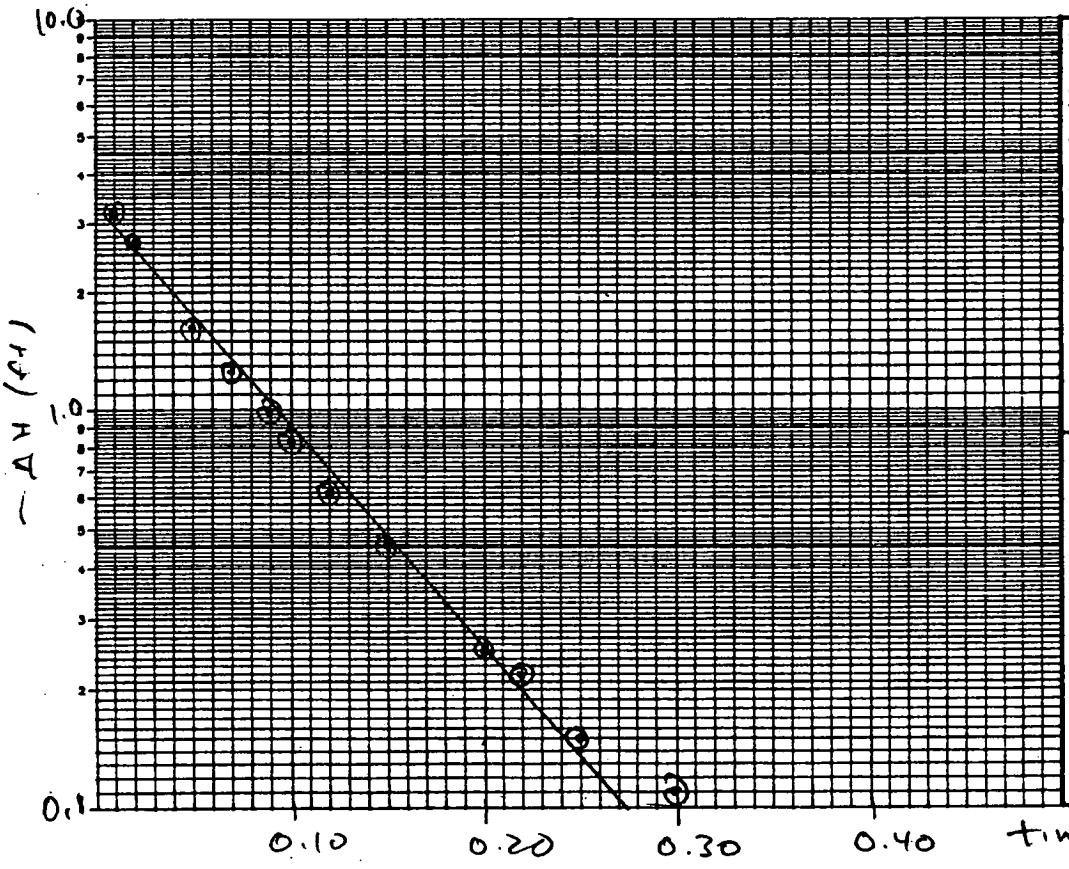
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C14
PROJECT NO.: 7651 GEOLOGIST: T. EVANS
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T5S0
STATIC WATER LEVEL (Depth/Elevation): DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.18	0.30		0.11
0.02		2.71			
0.04		1.96			
0.05		1.64			
0.07		1.26			
0.09		0.97			
0.10		0.83			
0.12		0.62			
0.15		0.46			
0.20		0.25			
0.22		0.22			
0.25		0.15			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD
Start @
Stop @

CALCS, SKETCH MAPS, ETC.:
File:
06C14 Rise.txt

00437

SE1000C
Environmental Logger
03/09 18:21

Unit# 00145 Test 5

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61400
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.140
Delay mSEC	50.000

Well # 06C14
Rising Head Test
Ø6C14RISE.TXT

Step 0 03/09 10:23:00

Elapsed Time	INPUT 1	H/H_o	t
0.0000	-0.016		
0.0033	0.000		
0.0066	1.407		
0.0100	3.183 ← H_o	1.00	0.0000
0.0133	2.927		
0.0166	2.768		
0.0200	2.719	0.85	0.0100
0.0233	2.623		
0.0266	2.511		
0.0300	2.351	0.74	0.0200
0.0333	2.207		
0.0366	2.079		
0.0400	1.968		
0.0433	1.871		
0.0466	1.759		
0.0500	1.647	0.52	0.0400
0.0533	1.551		
0.0566	1.487		
0.0600	1.423	0.45	0.0500
0.0633	1.359		
0.0666	1.199		
0.0700	1.264	0.40	0.0600
0.0733	1.151		
0.0766	1.119		
0.0800	1.088	0.34	0.0700
0.0833	1.023		
0.0866	0.975		
0.0900	0.975	0.31	0.0800
0.0933	0.912		
0.0966	0.863		
0.1000	0.831	0.26	0.0900
0.1033	0.799		
0.1066	0.784		
0.1100	0.736	0.23	0.1000
0.1133	0.687		
0.1166	0.671		
0.1200	0.623		

0.1233	0.592		
0.1266	0.592		
0.1300	0.559	0.18	0.1200
0.1333	0.559		
0.1366	0.511		
0.1400	0.495		
0.1433	0.464		
0.1466	0.447		
0.1500	0.464		
0.1533	0.432		
0.1566	0.432		
0.1600	0.383	0.12	0.1500
0.1633	0.399		
0.1666	0.367		
0.1700	0.351		
0.1733	0.336		
0.1766	0.336		
0.1800	0.319	0.10	0.1700
0.1833	0.319		
0.1866	0.288		
0.1900	0.288		
0.1933	0.256		
0.1966	0.256		
0.2000	0.256		
0.2033	0.256		
0.2066	0.239		
0.2100	0.239	0.08	0.2000
0.2133	0.223		
0.2166	0.223		
0.2200	0.223		
0.2233	0.207		
0.2266	0.207		
0.2300	0.191		
0.2333	0.176		
0.2366	0.159		
0.2400	0.159		
0.2433	0.159		
0.2466	0.159		
0.2500	0.159		
0.2533	0.159		
0.2566	0.159		
0.2600	0.143		
0.2633	0.128		
0.2666	0.143		
0.2700	0.143		
0.2733	0.128		
0.2766	0.143		
0.2800	0.095		
0.2833	0.111		
0.2866	0.128		
0.2900	0.095		
0.2933	0.111		
0.2966	0.111		
0.3000	0.111		
0.3033	0.111		
0.3066	0.095		
0.3100	0.111		
0.3133	0.095		
0.3166	0.080		
0.3200	0.080		

0.3233	0.080
0.3266	0.111
0.3300	0.095
0.3333	0.095
0.3500	0.080
0.3666	0.080
0.3833	0.080
0.4000	0.047
0.4166	0.047
0.4333	0.047
0.4500	0.031
0.4666	0.047
0.4833	0.031
0.5000	0.031
0.5166	0.031
0.5333	0.015
0.5500	0.015
0.5666	0.000
0.5833	0.015
0.6000	-0.016
0.6166	0.000
0.6333	0.000
0.6500	0.015
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	-0.016
0.7500	0.000
0.7666	0.015
0.7833	-0.016
0.8000	0.000
0.8166	-0.016
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.000
0.9833	0.000
1.0000	0.000
1.2000	-0.032
1.4000	0.000
1.6000	-0.016
1.8000	-0.032
2.0000	0.000
2.2000	0.000
2.4000	0.000
2.6000	-0.016
2.8000	-0.016
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	-0.016
3.8000	0.000
4.0000	-0.016
4.2000	-0.048

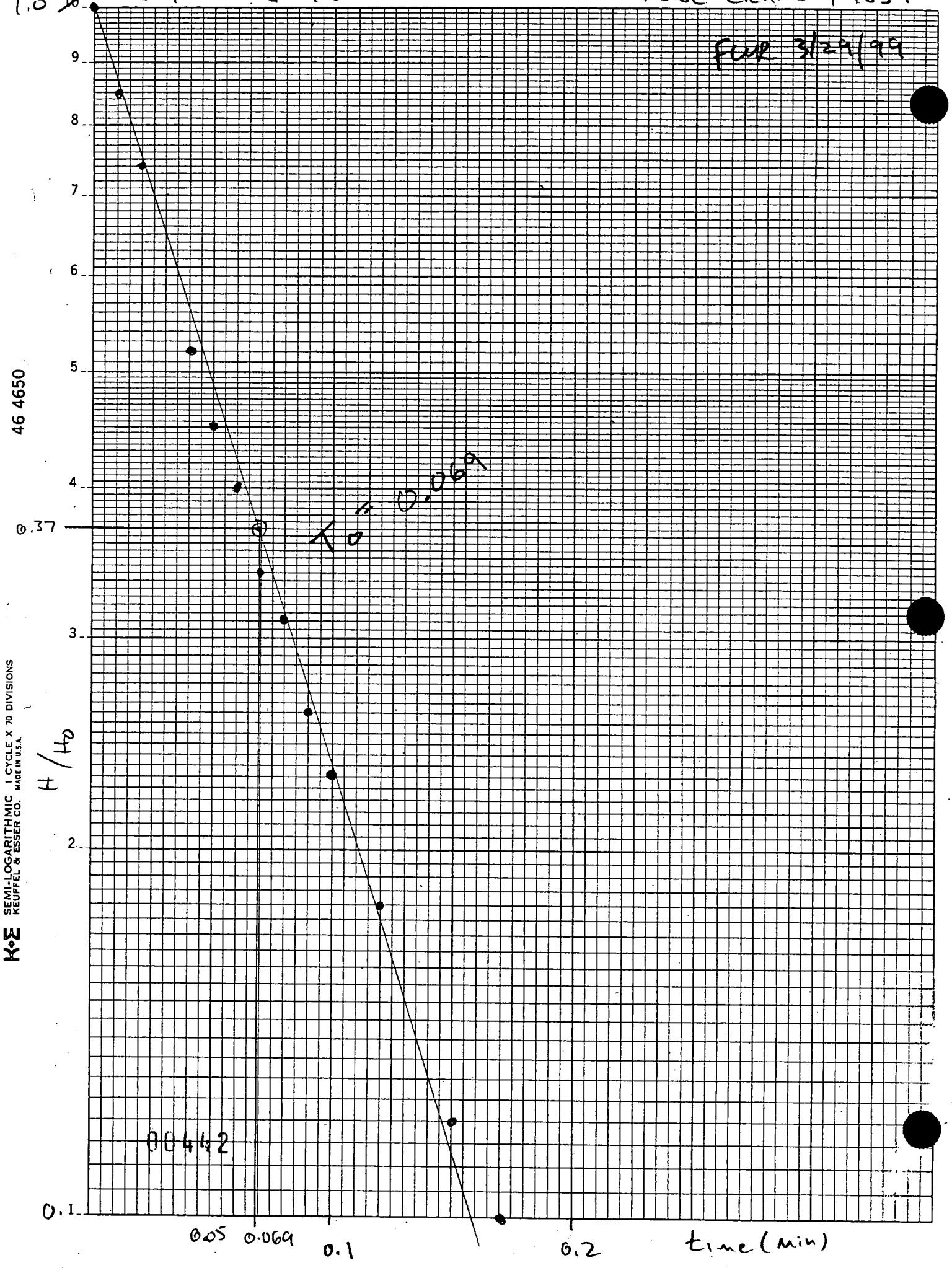
4.4000	-0.016
4.6000	0.000
4.8000	-0.016
5.0000	-0.016
5.2000	-0.016
5.4000	0.000
5.6000	-0.032
5.8000	-0.016
6.0000	-0.016
6.2000	-0.016
6.4000	0.000
6.6000	-0.016
6.8000	-0.016
7.0000	-0.016
7.2000	-0.032
7.4000	-0.016
7.6000	0.000
7.8000	-0.016
8.0000	-0.016
8.2000	-0.032
8.4000	-0.032
8.6000	-0.032
8.8000	-0.032
9.0000	0.000
9.2000	-0.032
9.4000	-0.016
9.6000	-0.016
9.8000	-0.016
10.0000	-0.016
12.0000	0.000
14.0000	-0.016
16.0000	-0.032
18.0000	0.000
20.0000	0.000

END

06C14 RUING HEAD

NWC CRANE / 7651

FWR 3/29/99



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C14 RISING		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.069$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft} / 0.16 \text{ ft})}{2 (20.0 \text{ ft}) (0.069 \text{ min})}$$

$K = 1.21 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 1.74 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 6.14 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC GRANE WELL/BORING NO.: 06C14P2

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / R. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0 ft TEST NO.: T4S0

STATIC WATER LEVEL (Depth/Elevation): 10.13' TPVC DATE: 3-9-99

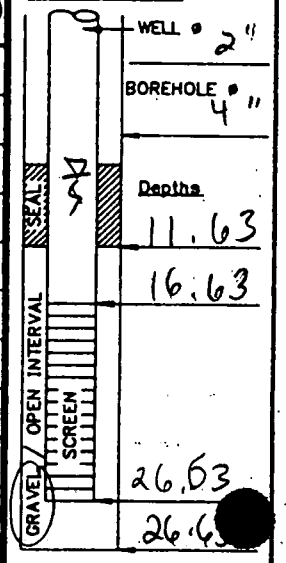
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø x 5.12') PAGE ___ OF ___

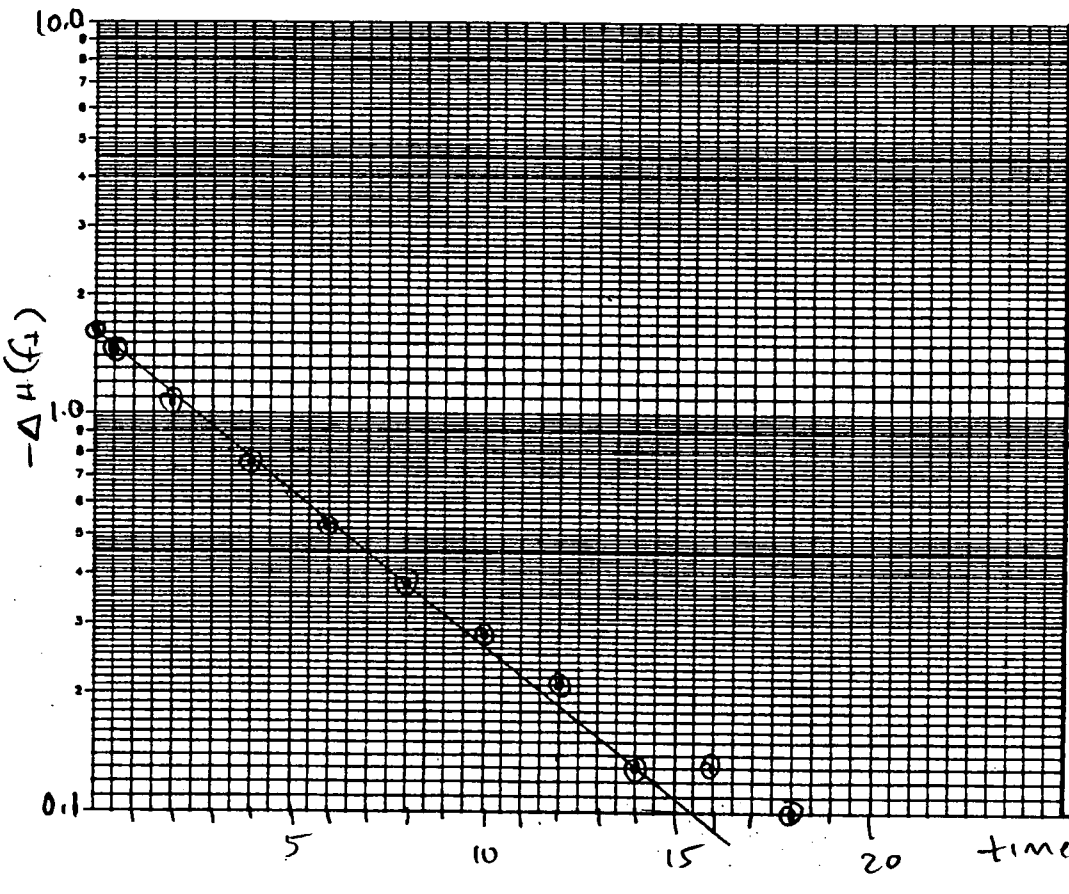
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-1.67	18.00		-0.10
0.10		-1.63	20.00		-0.08
0.50		-1.47			
1.00		-1.33			
2.00		-1.07			
4.00		-0.75			
6.00		-0.53			
8.00		-0.38			
10.00		-0.28			
12.00		-0.21			
14.00		-0.13			
16.00		-0.13			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 143

XD S/N 201804

20 psi

H_2O above XD = 15.92'

Start @ 1019

Stop @ 1044

CALCS, SKETCH MAPS, ETC.:

file:

06C14P2Fall.txt

00444

FWR 3/29/99

SE1000C
Environmental Logger
03/09 17:32

Unit# 00143 Test 4

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	81402
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C 14P2
Falling Head Test
Ø6C 14P2 FALL. TXT

Step 0 03/09 10:19:00

Elapsed Time	INPUT 1		H/H_0	t
0.0000	-0.070			
0.0033	-0.159			
0.0066	-1.166			
0.0100	-2.232			
0.0133	-1.734			
0.0166	-1.511			
0.0200	-1.696			
0.0233	-1.721			
0.0266	-1.983			
0.0300	-2.193			
0.0333	-2.193			
0.0366	-1.849			
0.0400	-1.689			
0.0433	-0.854			
0.0466	-1.638			
0.0500	-2.047			
0.0533	-1.868			
0.0566	-1.575			
0.0600	-1.581			
0.0633	-1.677	← H_0	1.00	0.0000
0.0666	-1.677			
0.0700	-1.670			
0.0733	-1.689			
0.0766	-1.664			
0.0800	-1.626			
0.0833	-1.677			
0.0866	-1.677			
0.0900	-1.632			
0.0933	-1.632			
0.0966	-1.645			
0.1000	-1.632			
0.1033	-1.632			
0.1066	-1.632			
0.1100	-1.626			
0.1133	-1.626		0.97	0.0500
0.1166	-1.619			
0.1200	-1.619			

00445

0.1233	-1.619		
0.1266	-1.651		
0.1300	-1.619		
0.1333	-1.613		
0.1366	-1.613		
0.1400	-1.606		
0.1433	-1.606		
0.1466	-1.606		
0.1500	-1.606		
0.1533	-1.600		
0.1566	-1.600		
0.1600	-1.600		
0.1633	-1.600	0.95	0.1000
0.1666	-1.594		
0.1700	-1.594		
0.1733	-1.594		
0.1766	-1.587		
0.1800	-1.594		
0.1833	-1.587		
0.1866	-1.587		
0.1900	-1.587		
0.1933	-1.587		
0.1966	-1.581		
0.2000	-1.581		
0.2033	-1.581		
0.2066	-1.581		
0.2100	-1.575		
0.2133	-1.575	0.94	0.1500
0.2166	-1.575		
0.2200	-1.575		
0.2233	-1.575		
0.2266	-1.575		
0.2300	-1.568		
0.2333	-1.568		
0.2366	-1.568		
0.2400	-1.568		
0.2433	-1.568		
0.2466	-1.568		
0.2500	-1.562		
0.2533	-1.562		
0.2566	-1.562		
0.2600	-1.562		
0.2633	-1.562	0.93	0.2000
0.2666	-1.562		
0.2700	-1.555		
0.2733	-1.555		
0.2766	-1.555		
0.2800	-1.555		
0.2833	-1.555		
0.2866	-1.549		
0.2900	-1.549		
0.2933	-1.549		
0.2966	-1.549		
0.3000	-1.543		
0.3033	-1.543		
0.3066	-1.543		
0.3100	-1.543		
0.3133	-1.543	0.92	0.2500
0.3166	-1.543		
0.3200	-1.543		

0.3233	-1.536		
0.3266	-1.536		
0.3300	-1.536		
0.3333	-1.530		
0.3500	-1.530		
0.3666	-1.524		
0.3833	-1.517		
0.4000	-1.511		
0.4166	-1.504		
0.4333	-1.498		
0.4500	-1.492		
0.4666	-1.485	0.89	0.4033
0.4833	-1.479		
0.5000	-1.479		
0.5166	-1.473		
0.5333	-1.466		
0.5500	-1.492		
0.5666	-1.453		
0.5833	-1.453		
0.6000	-1.447		
0.6166	-1.441		
0.6333	-1.434		
0.6500	-1.428		
0.6666	-1.428		
0.6833	-1.422		
0.7000	-1.415		
0.7166	-1.409		
0.7333	-1.402		
0.7500	-1.396		
0.7666	-1.396		
0.7833	-1.390		
0.8000	-1.383		
0.8166	-1.377		
0.8333	-1.377		
0.8500	-1.370		
0.8666	-1.364		
0.8833	-1.364		
0.9000	-1.358		
0.9166	-1.351		
0.9333	-1.345		
0.9500	-1.345		
0.9666	-1.339		
0.9833	-1.339	0.80	0.9200
1.0000	-1.332		
1.2000	-1.262	0.75	1.1367
1.4000	-1.211		
1.6000	-1.166	0.70	1.5367
1.8000	-1.122		
2.0000	-1.077		
2.2000	-1.039	0.62	2.1367
2.4000	-1.001		
2.6000	-0.969		
2.8000	-0.930	0.55	2.7367
3.0000	-0.899		
3.2000	-0.867		
3.4000	-0.841	0.50	3.367
3.6000	-0.809		
3.8000	-0.784		
4.0000	-0.758		
4.2000	-0.726		

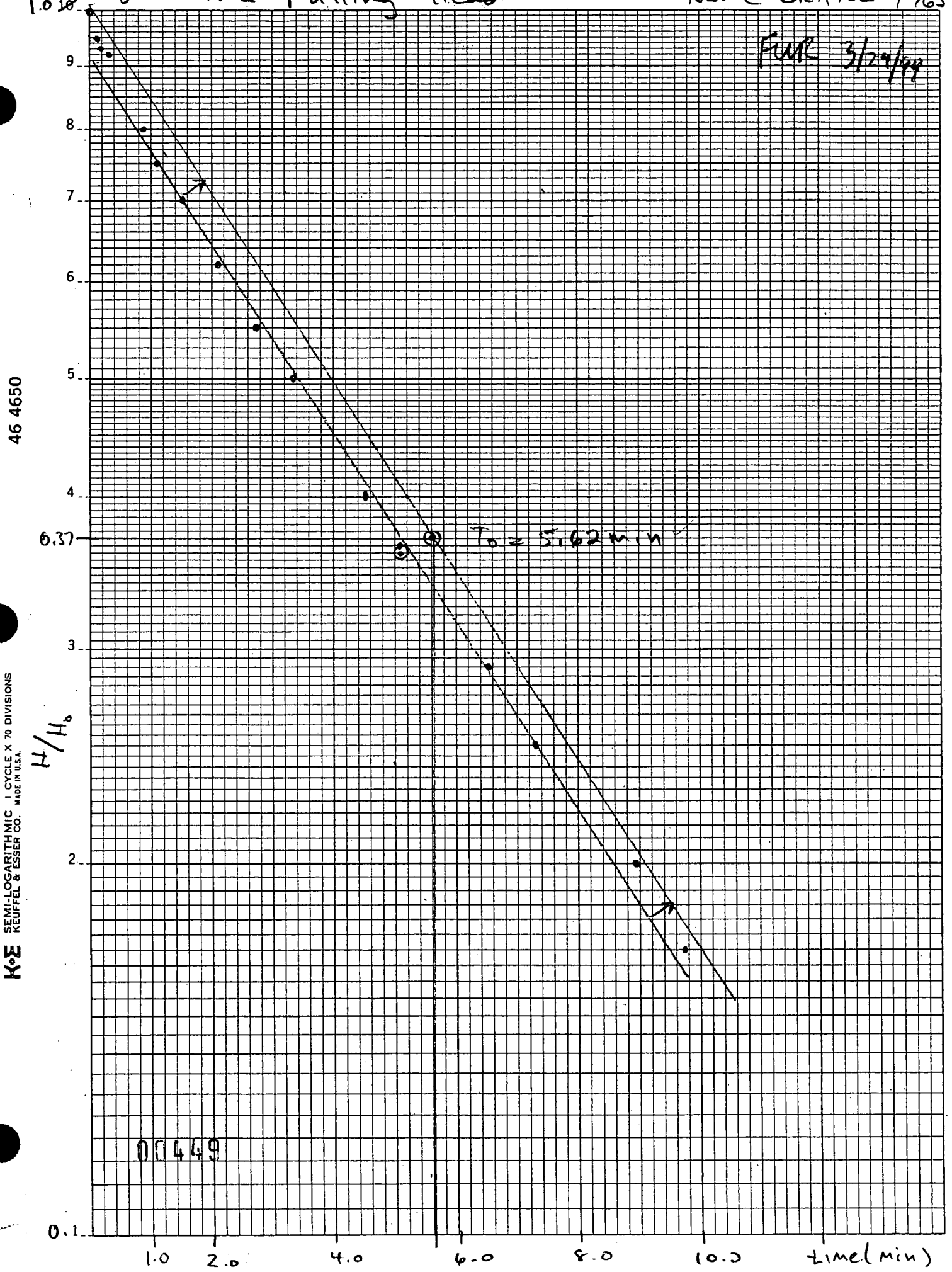
00447

4.4000	-0.701		
4.6000	-0.675	0.40	4.5367
4.8000	-0.650		
5.0000	-0.631		
5.2000	-0.605	0.36	5.1367
5.4000	-0.586		
5.6000	-0.567		
5.8000	-0.548		
6.0000	-0.535		
6.2000	-0.516		
6.4000	-0.497		
6.6000	-0.484	0.29	6.5367
6.8000	-0.465		
7.0000	-0.452		
7.2000	-0.439		
7.4000	-0.427	0.25	7.3367
7.6000	-0.414		
7.8000	-0.401		
8.0000	-0.388		
8.2000	-0.376		
8.4000	-0.363		
8.6000	-0.350		
8.8000	-0.344		
9.0000	-0.331	0.20	8.9367
9.2000	-0.318		
9.4000	-0.312		
9.6000	-0.306		
9.8000	-0.293	0.17	9.7367
10.0000	-0.286		
12.0000	-0.216		
14.0000	-0.165	0.10	13.9367
16.0000	-0.134		
18.0000	-0.108		
20.0000	-0.089		
22.0000	-0.076		
24.0000	-0.070		

END

06C14P2 Falling Head NSWC CRANE /7651

FWR 3/24/99



00449

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C14P2 Falling Head Test		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3/29/99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 5.62$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.167 \text{ ft})}{2(10.0 \text{ ft})(5.62 \text{ min})}$$

$K = 2.51 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 3.61 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 1.27 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C14P2

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T556

STATIC WATER LEVEL (Depth/Elevation): 10.13 DATE: 3-9-99

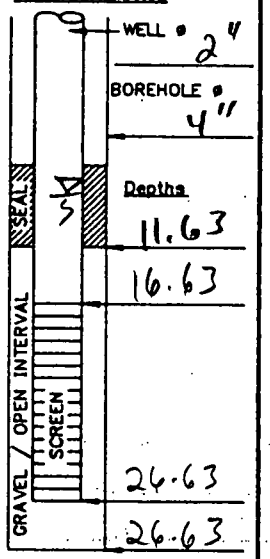
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 5.12') PAGE ... OF ...

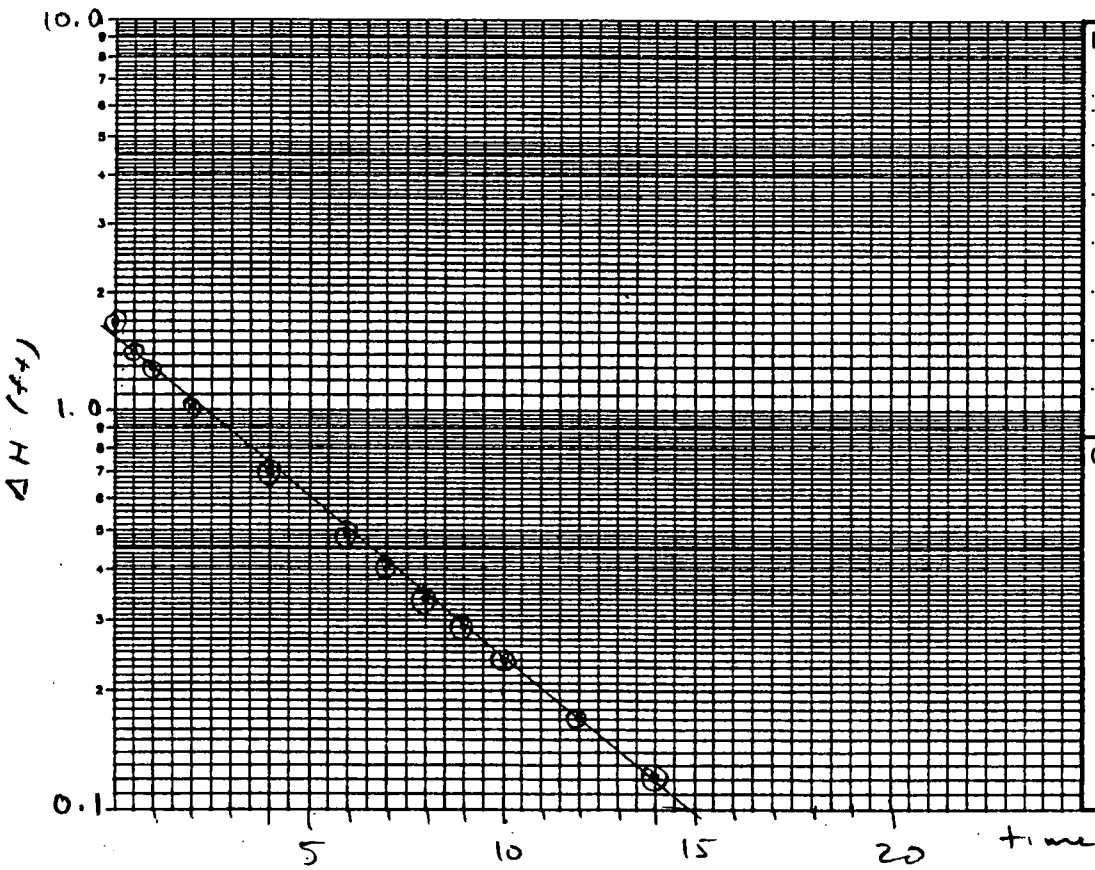
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.):

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.07		1.66	12.00		0.17
0.50		1.42	14.00		0.12
1.00		1.28	16.00		0.08
1.60		1.11	18.00		0.05
2.00		1.03	20.00		0.03
4.00		0.70			
5.00		0.59			
6.00		0.49			
7.00		0.41			
8.00		0.34			
9.00		0.29			
10.00		0.24			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 143
XD S/N 201504
20 psi

Start @ 1046
Stop @ 1108

CALCS, SKETCH MAPS, ETC.:

file:
06C14P2 Rise.txt

00451

FWR
3/29/94

SE1000C
Environmental Logger
03/09 17:37

Unit# 00143 Test 5

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61402
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C14P2
Rising Head Test
Ø6C14P2 RISE1 TXT

Step 0 03/09 10:46:00

Elapsed Time	INPUT 1
0.0000	-0.057
0.0033	-0.057
0.0066	-0.057
0.0100	-0.057
0.0133	2.077
0.0166	2.288
0.0200	0.662
0.0233	1.096
0.0266	2.090
0.0300	1.899
0.0333	1.873
0.0366	1.816
0.0400	1.797
0.0433	1.778
0.0466	1.771
0.0500	1.740
0.0533	1.714
0.0566	1.784
0.0600	1.459
0.0633	1.638
0.0666	1.657
0.0700	1.650
0.0733	1.663 ← H_0
0.0766	1.650
0.0800	1.644
0.0833	1.638
0.0866	1.631
0.0900	1.631
0.0933	1.625
0.0966	1.612
0.1000	1.612
0.1033	1.625
0.1066	1.606
0.1100	1.606
0.1133	1.599
0.1166	1.599
0.1200	1.599

H/H_0	t
1.00	0.0000

00452

0.1233	1.593		
0.1266	1.593		
0.1300	1.593		
0.1333	1.587	0.95	0.0600
0.1366	1.587		
0.1400	1.580		
0.1433	1.580		
0.1466	1.580		
0.1500	1.574		
0.1533	1.574		
0.1566	1.574		
0.1600	1.568		
0.1633	1.568		
0.1666	1.561		
0.1700	1.561		
0.1733	1.561		
0.1766	1.555		
0.1800	1.555		
0.1833	1.555		
0.1866	1.548		
0.1900	1.548		
0.1933	1.548		
0.1966	1.548		
0.2000	1.548		
0.2033	1.542		
0.2066	1.542		
0.2100	1.542		
0.2133	1.542		
0.2166	1.542		
0.2200	1.536		
0.2233	1.536	0.92	0.1500
0.2266	1.536		
0.2300	1.529		
0.2333	1.529		
0.2366	1.529		
0.2400	1.523		
0.2433	1.523		
0.2466	1.523		
0.2500	1.523		
0.2533	1.523		
0.2566	1.517		
0.2600	1.517		
0.2633	1.517		
0.2666	1.517		
0.2700	1.517		
0.2733	1.510	0.91	0.2000
0.2766	1.510		
0.2800	1.510		
0.2833	1.510		
0.2866	1.510		
0.2900	1.504		
0.2933	1.504		
0.2966	1.504		
0.3000	1.504		
0.3033	1.497		
0.3066	1.497		
0.3100	1.497		
0.3133	1.497		
0.3166	1.491		
0.3200	1.497		

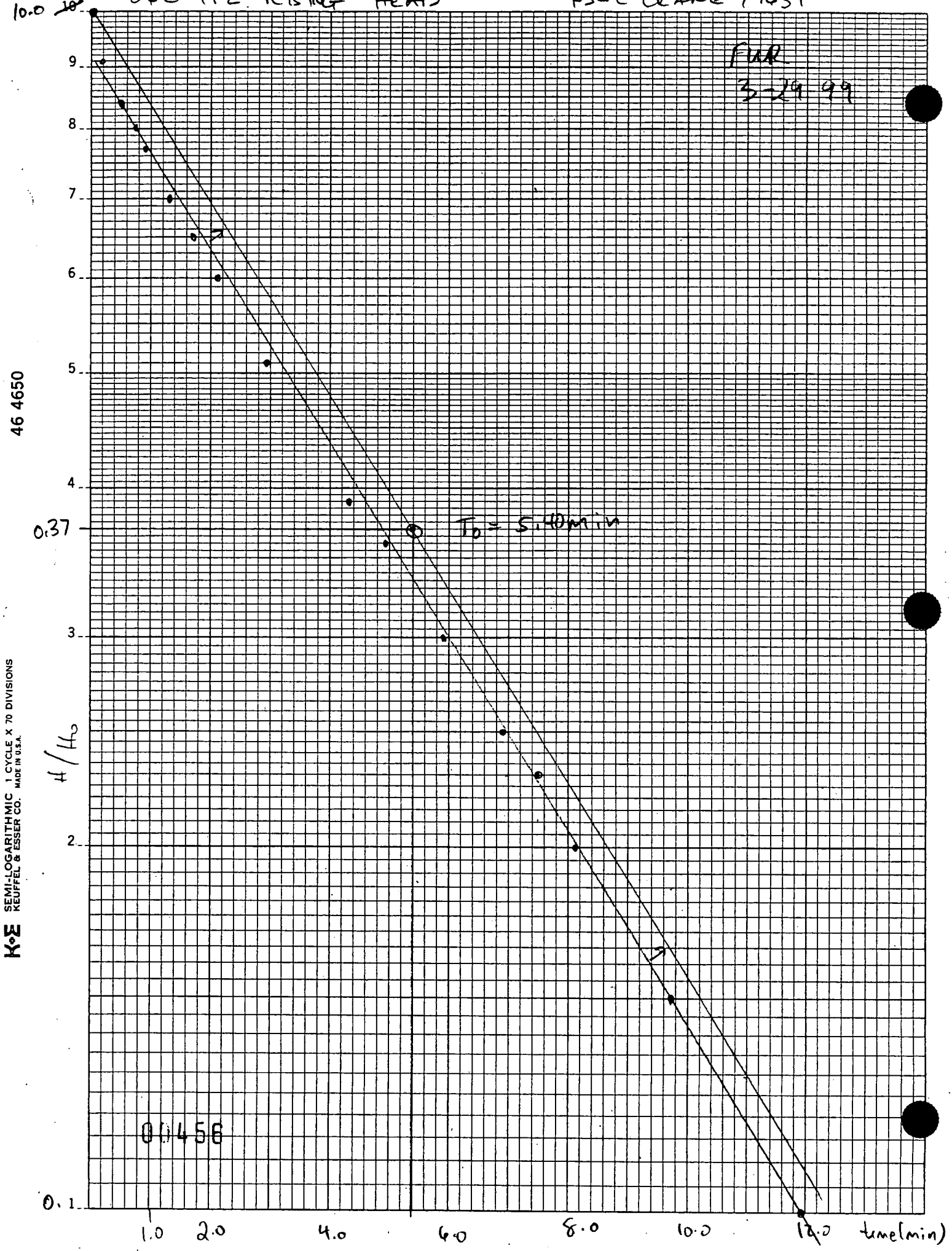
0.3233	1.491		
0.3266	1.491		
0.3300	1.491		
0.3333	1.491		
0.3500	1.485		
0.3666	1.472		
0.3833	1.472		
0.4000	1.466		
0.4166	1.459		
0.4333	1.446		
0.4500	1.446		
0.4666	1.440		
0.4833	1.434		
0.5000	1.427		
0.5166	1.421		
0.5333	1.415		
0.5500	1.408		
0.5666	1.402		
0.5833	1.396	0.84	0.5100
0.6000	1.396		
0.6166	1.389		
0.6333	1.383		
0.6500	1.376		
0.6666	1.370		
0.6833	1.370		
0.7000	1.364		
0.7166	1.357		
0.7333	1.351		
0.7500	1.351		
0.7666	1.344		
0.7833	1.338		
0.8000	1.332		
0.8166	1.325		
0.8333	1.325	0.80	0.7600
0.8500	1.319		
0.8666	1.313		
0.8833	1.306		
0.9000	1.306		
0.9166	1.300		
0.9333	1.294		
0.9500	1.294		
0.9666	1.287		
0.9833	1.281		
1.0000	1.281	0.77	0.9267
1.2000	1.211		
1.4000	1.166	0.70	1.3267
1.6000	1.115		
1.8000	1.077	0.65	1.7267
2.0000	1.032		
2.2000	0.994	0.60	2.1267
2.4000	0.956		
2.6000	0.924		
2.8000	0.886		
3.0000	0.854	0.51	2.9267
3.2000	0.822		
3.4000	0.790		
3.6000	0.764		
3.8000	0.739		
4.0000	0.707		
4.2000	0.682		

4.4000	0.656	0.39	4.3267
4.6000	0.637		
4.8000	0.612		
5.0000	0.592	0.36	4.9267
5.2000	0.573		
5.4000	0.548		
5.6000	0.535		
5.8000	0.516		
6.0000	0.497	0.30	5.9267
6.2000	0.478		
6.4000	0.458		
6.6000	0.446		
6.8000	0.433		
7.0000	0.414	0.25	6.9267
7.2000	0.401		
7.4000	0.388		
7.6000	0.376	0.23	7.5267
7.8000	0.363		
8.0000	0.344		
8.2000	0.337	0.20	8.1267
8.4000	0.325		
8.6000	0.312		
8.8000	0.299		
9.0000	0.293		
9.2000	0.280		
9.4000	0.274		
9.6000	0.261		
9.8000	0.255	0.15	9.7267
10.0000	0.242		
12.0000	0.172	0.10	11.9267
14.0000	0.121		
16.0000	0.089		
18.0000	0.057		
20.0000	0.038		
22.0000	0.025		

END

06C14P2 RISING HEAD NSWC CRANE 17651

FWR
3-29-99



01456

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C14P2 RISING HEAD TEST	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE / CHECKED BY: SMRamer 3/29/99	APPROVED BY: / DATE:

$r = 0.083$ ft
$R = 0.167$ ft
$L = 10.0$ ft

$T_0 = 5.40$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(10.0\ ft / 0.167\ ft)}{2\ (10.0\ ft)\ (5.40\ min)}$$

$K = 2.61 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 3.76 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

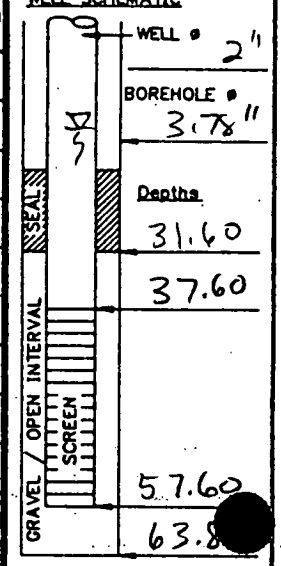
$= 1.33 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

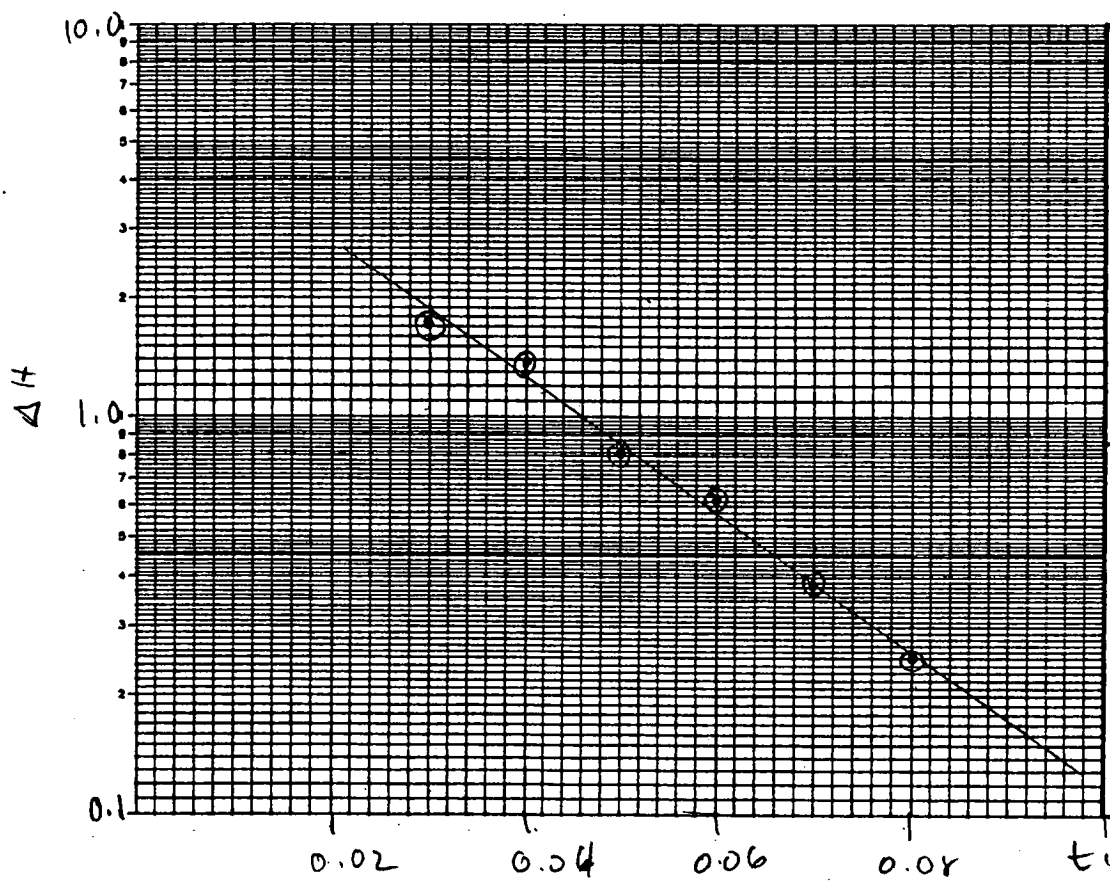
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C15
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: TGS0
STATIC WATER LEVEL (Depth/Elevation): 14.51' TOC DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		-1.74			
0.04		-1.36			
0.05		-0.80			
0.06		-0.61			
0.07		-0.38			
0.08		-0.25			
0.09		-0.09			
0.10		-0.03			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50 psi
H_2O above XD 42.07
Start @ 1415
Stop @ 1428

CALCS, SKETCH MAPS, ETC.:
File:
06C15Fall.txt

FLR
3/29/99

SE1000C
Environmental Logger
03/09 18:26

Unit# 00145 Test 6

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61500
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C15
Falling Head Test
06C15FALL.TXT

Step 0 03/09 14:15:46

Elapsed Time	INPUT 1	H/H_0	t
0.0000	0.000		
0.0033	-0.126		
0.0066	-0.570		
0.0100	-1.141		
0.0133	-1.807		
0.0166	-1.775		
0.0200	-1.632		
0.0233	-1.632		
0.0266	-1.601		
0.0300	-1.744 ←	1.00	0.0000
0.0333	-1.632	0.94	0.0033
0.0366	-1.506	0.86	0.0066
0.0400	-1.363	0.78	0.0100
0.0433	-1.189	0.68	0.0133
0.0466	-0.951	0.55	0.0166
0.0500	-0.808	0.46	0.0200
0.0533	-0.761	0.44	0.0233
0.0566	-0.713		
0.0600	-0.618	0.35	0.0300
0.0633	-0.507		
0.0666	-0.443		
0.0700	-0.380	0.22	0.0400
0.0733	-0.332		
0.0766	-0.285		
0.0800	-0.253	0.15	0.0500
0.0833	-0.190	0.11	0.0533
0.0866	-0.126		
0.0900	-0.095		
0.0933	-0.079		
0.0966	-0.015		
0.1000	-0.031		
0.1033	0.031		
0.1066	0.031		
0.1100	0.047		
0.1133	0.063		
0.1166	0.063		
0.1200	0.063		

00459

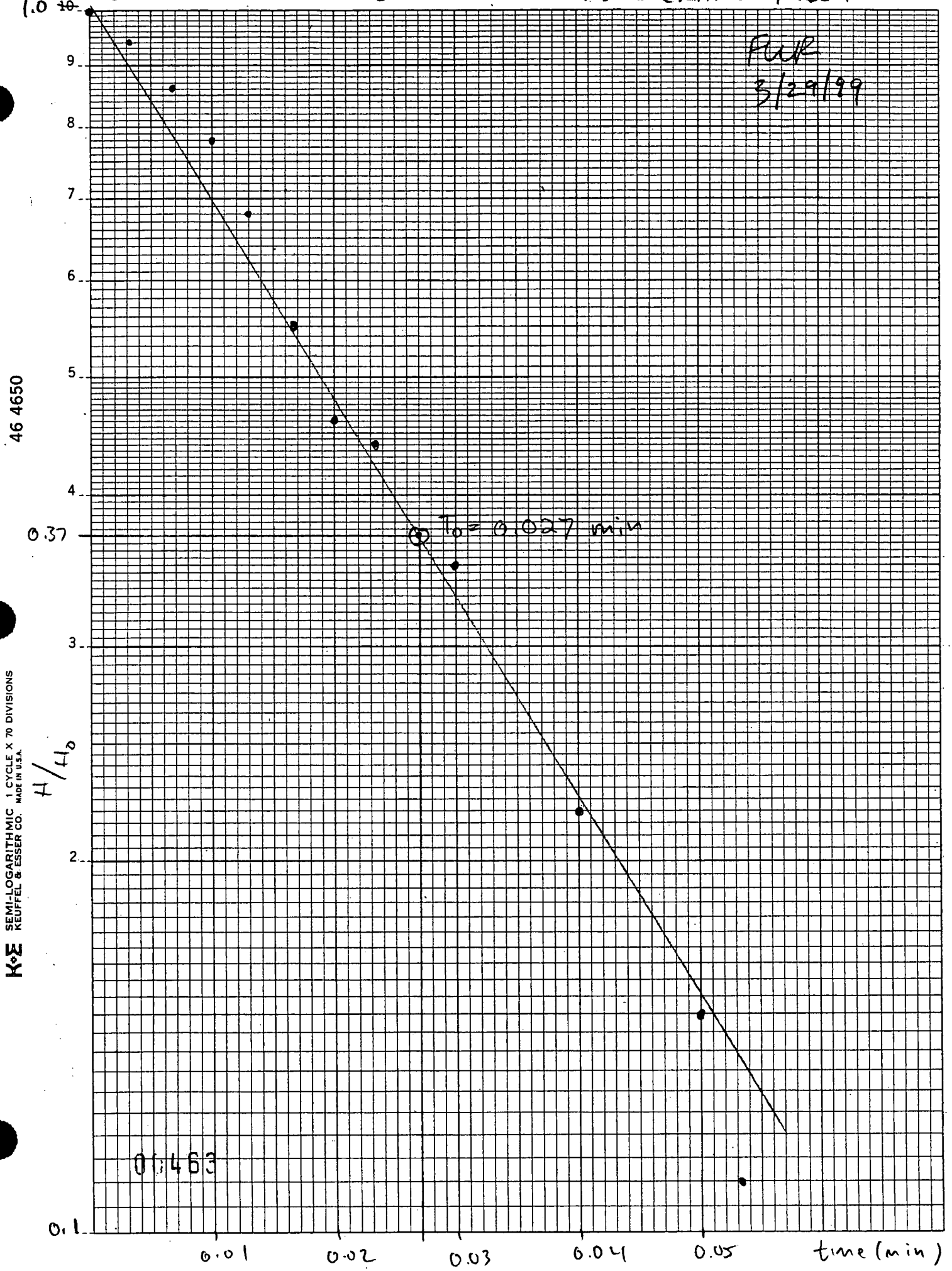
0.1233	0.079
0.1266	0.079
0.1300	0.095
0.1333	0.079
0.1366	0.079
0.1400	0.079
0.1433	0.079
0.1466	0.079
0.1500	0.079
0.1533	0.063
0.1566	0.063
0.1600	0.063
0.1633	0.063
0.1666	0.047
0.1700	0.047
0.1733	0.047
0.1766	0.031
0.1800	0.031
0.1833	0.031
0.1866	0.031
0.1900	0.031
0.1933	0.015
0.1966	0.031
0.2000	0.031
0.2033	0.015
0.2066	0.015
0.2100	0.015
0.2133	0.015
0.2166	0.015
0.2200	0.031
0.2233	0.015
0.2266	0.031
0.2300	0.031
0.2333	0.031
0.2366	0.031
0.2400	0.031
0.2433	0.031
0.2466	0.031
0.2500	0.031
0.2533	0.031
0.2566	0.031
0.2600	0.047
0.2633	0.031
0.2666	0.047
0.2700	0.031
0.2733	0.047
0.2766	0.047
0.2800	0.031
0.2833	0.047
0.2866	0.031
0.2900	0.031
0.2933	0.031
0.2966	0.031
0.3000	0.031
0.3033	0.047
0.3066	0.047
0.3100	0.047
0.3133	0.031
0.3166	0.031
0.3200	0.031

0.3233	0.031
0.3266	0.031
0.3300	0.031
0.3333	0.031
0.3500	0.015
0.3666	0.015
0.3833	0.015
0.4000	0.015
0.4166	0.015
0.4333	0.015
0.4500	0.015
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.015
0.5500	0.015
0.5666	0.000
0.5833	0.015
0.6000	0.000
0.6166	0.000
0.6333	0.015
0.6500	0.015
0.6666	0.000
0.6833	0.015
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.015
0.9666	0.000
0.9833	0.000
1.0000	0.000
1.2000	0.000
1.4000	0.000
1.6000	0.000
1.8000	0.015
2.0000	0.015
2.2000	0.000
2.4000	0.000
2.6000	0.000
2.8000	0.000
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.000
4.2000	0.000

4.4000	0.000
4.6000	0.000
4.8000	0.000
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	0.000
12.0000	0.015

END

06C15 FALLING HEAD NSWC CRANE /7651



FWR
3/29/99

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: OGC15 Falling Head Test	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: [illegible] 3/29/99
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.027$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(0.027 \text{ min})}$$

$K = 3.08 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 4.44 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

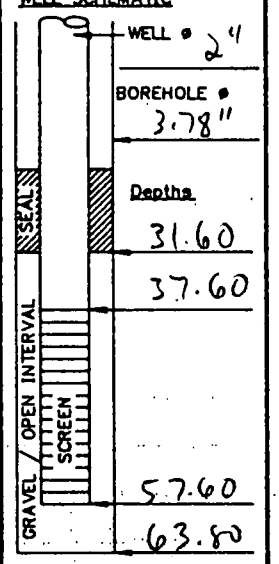
$= 1.57 \times 10^{-2}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

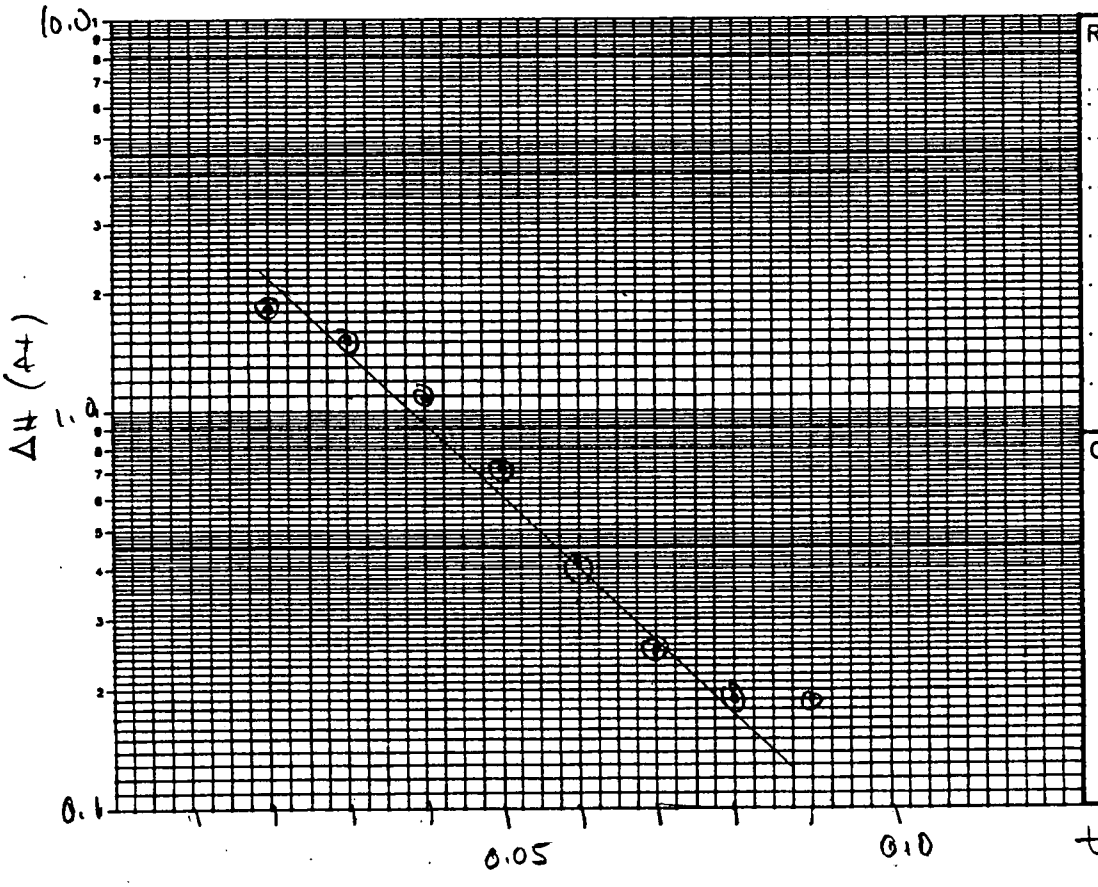
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C15
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 Ft TEST NO.: T 750
STATIC WATER LEVEL (Depth/Elevation): 14.51 DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		1.85			
0.03		1.52			
0.04		1.07			
0.05		0.71			
0.06		0.42			
0.07		0.25			
0.08		0.19			
0.09		0.19			
0.10		0.22			
0.11		0.00			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 1670
50 psi

start @ 1429
Stop @ 1441

CALCS, SKETCH MAPS, ETC.:

file:
06C15 fall.txt

00465

FWR
3/29/99

SE1000C
Environmental Logger
03/09 18:29

Unit# 00145 Test 7

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61500
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C15
Rising Head Test
Ø6C15RISE.TXT

Step 0 03/09 14:29:34

Elapsed Time	INPUT 1
0.0000	0.586
0.0033	1.030
0.0066	0.951
0.0100	0.935
0.0133	1.189
0.0166	1.332
0.0200	1.617
0.0233	1.823
0.0266	1.855 ←
0.0300	1.791
0.0333	1.664
0.0366	1.522
0.0400	1.363
0.0433	1.220
0.0466	1.078
0.0500	0.935
0.0533	0.824
0.0566	0.713
0.0600	0.618
0.0633	0.507
0.0666	0.428
0.0700	0.380
0.0733	0.333
0.0766	0.253
0.0800	0.190
0.0833	0.174
0.0866	0.190
0.0900	0.253
0.0933	0.253
0.0966	0.190
0.1000	0.079
0.1033	0.047
0.1066	0.222
0.1100	0.000
0.1133	-0.015
0.1166	-0.015
0.1200	-0.015

H/H_0	t
1.00	0.0000
0.97	0.0034
0.90	0.0067
0.82	0.0100
0.74	0.0134
0.66	0.0167
0.58	0.0200
0.50	0.0234
0.44	0.0267
0.38	0.0300
0.23	0.0400
0.14	0.0500
0.10	0.0600
0.10	0.0700
0.00	0.0834

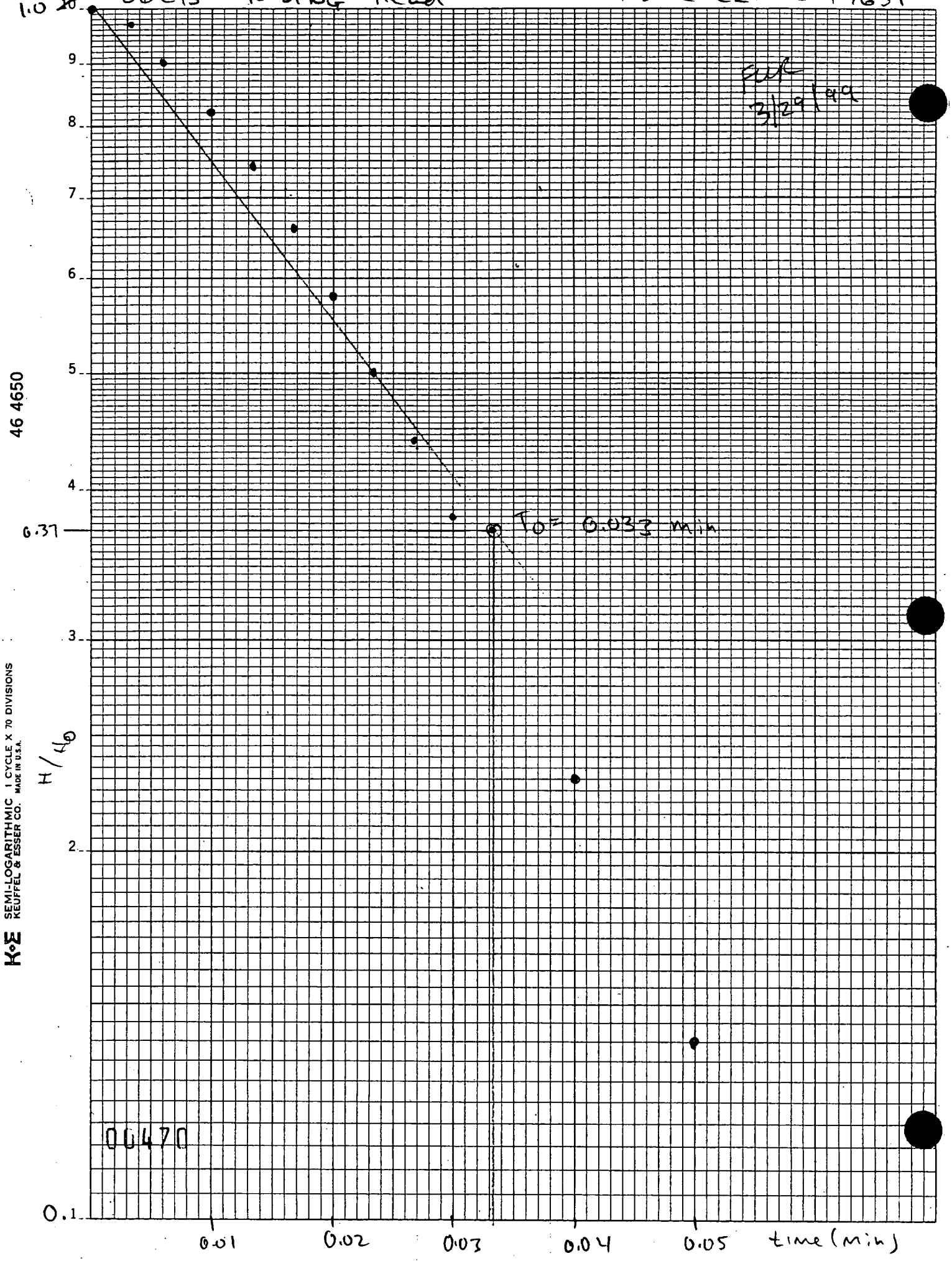
0.1233	-0.015
0.1266	0.000
0.1300	0.000
0.1333	0.000
0.1366	0.000
0.1400	0.015
0.1433	0.015
0.1466	0.015
0.1500	0.031
0.1533	0.031
0.1566	0.031
0.1600	0.047
0.1633	0.047
0.1666	0.063
0.1700	0.063
0.1733	0.063
0.1766	0.063
0.1800	0.079
0.1833	0.079
0.1866	0.079
0.1900	0.063
0.1933	0.079
0.1966	0.079
0.2000	0.079
0.2033	0.063
0.2066	0.079
0.2100	0.079
0.2133	0.063
0.2166	0.063
0.2200	0.063
0.2233	0.063
0.2266	0.063
0.2300	0.063
0.2333	0.063
0.2366	0.063
0.2400	0.063
0.2433	0.063
0.2466	0.063
0.2500	0.063
0.2533	0.063
0.2566	0.063
0.2600	0.063
0.2633	0.063
0.2666	0.063
0.2700	0.063
0.2733	0.063
0.2766	0.063
0.2800	0.063
0.2833	0.063
0.2866	0.063
0.2900	0.063
0.2933	0.063
0.2966	0.063
0.3000	0.063
0.3033	0.063
0.3066	0.063
0.3100	0.063
0.3133	0.063
0.3166	0.063
0.3200	0.063

0.3233	0.063
0.3266	0.063
0.3300	0.063
0.3333	0.063
0.3500	0.047
0.3666	0.031
0.3833	0.031
0.4000	0.031
0.4166	0.031
0.4333	0.031
0.4500	0.031
0.4666	0.031
0.4833	0.031
0.5000	0.031
0.5166	0.031
0.5333	0.031
0.5500	0.031
0.5666	0.031
0.5833	0.031
0.6000	0.031
0.6166	0.031
0.6333	0.031
0.6500	0.031
0.6666	0.031
0.6833	0.031
0.7000	0.031
0.7166	0.031
0.7333	0.031
0.7500	0.031
0.7666	0.031
0.7833	0.031
0.8000	0.031
0.8166	0.031
0.8333	0.031
0.8500	0.031
0.8666	0.031
0.8833	0.031
0.9000	0.031
0.9166	0.031
0.9333	0.031
0.9500	0.031
0.9666	0.031
0.9833	0.031
1.0000	0.031
1.2000	0.031
1.4000	0.031
1.6000	0.031
1.8000	0.031
2.0000	0.031
2.2000	0.031
2.4000	0.031
2.6000	0.031
2.8000	0.031
3.0000	0.031
3.2000	0.031
3.4000	0.031
3.6000	0.031
3.8000	0.031
4.0000	0.031
4.2000	0.031

4.4000	0.031
4.6000	0.031
4.8000	0.031
5.0000	0.031
5.2000	0.031
5.4000	0.031
5.6000	0.031
5.8000	0.031
6.0000	0.031
6.2000	0.031
6.4000	0.031
6.6000	0.031
6.8000	0.031
7.0000	0.031
7.2000	0.031
7.4000	0.031
7.6000	0.031
7.8000	0.031
8.0000	0.031
8.2000	0.031
8.4000	0.031
8.6000	0.031
8.8000	0.031
9.0000	0.031
9.2000	0.031
9.4000	0.031
9.6000	0.031
9.8000	0.031
10.0000	0.031

END

06C15 Rising Head NSWC CRANE 17651



3/29/99

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C15 RISING HEAD TEST	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: 3/29/99
APPROVED BY:	DATE:

$r = 0.083$ ft
$R = 0.16$ ft
$L = 20.0$ ft

$T_0 = 0.033$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2 (20.0 \text{ ft})(0.033 \text{ min})}$$

$K = 2.52 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 3.63 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

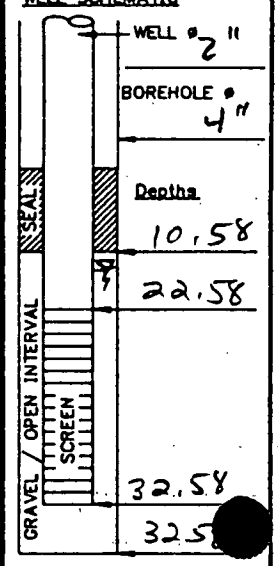
$= 1.28 \times 10^{-2}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

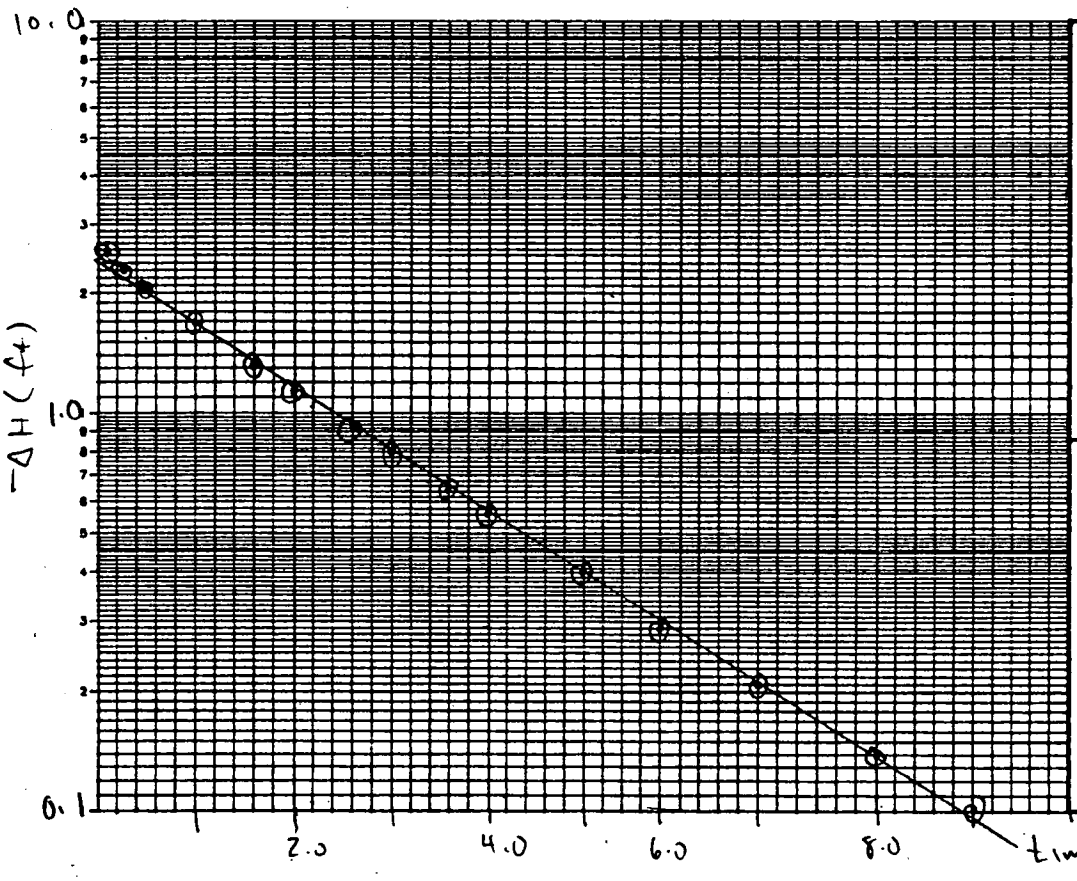
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C15P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0 ft TEST NO.: T6S0
STATIC WATER LEVEL (Depth/Elevation): 13.20' TPVC DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.09		-2.60	7.00		-0.21
0.25		-2.30	8.00		-0.14
0.50		-2.05	9.00		-0.10
1.00		-1.69			
1.60		-1.32			
2.00		-1.14			
2.60		-0.92			
3.00		-0.80			
3.60		-0.65			
4.00		-0.56			
5.00		-0.40			
6.00		-0.29			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi
H_2O above XD = 18.12'
Start @ 1354
Stop @ 1407

CALCS, SKETCH MAPS, ETC.:
file:
06C15P2Fall.txt

FWR
3-30-99

SE1000C
Environmental Logger
03/09 17:43

Unit# 00143 , Test 6

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61502
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06C15P2
Falling Head Test
Ø6C15P2FALL.TXT

Step 0 03/09 13:54:10

Elapsed Time	INPUT 1
0.0000	-0.122
0.0033	-0.975
0.0066	-3.175
0.0100	-5.351
0.0133	-3.030
0.0166	-2.327
0.0200	-2.597
0.0233	-3.103
0.0266	-2.955
0.0300	-2.582
0.0333	-2.334
0.0366	-2.506
0.0400	-2.801
0.0433	-2.654
0.0466	-2.406
0.0500	-2.597
0.0533	-2.663
0.0566	-2.676
0.0600	-2.440
0.0633	-3.068
0.0666	-2.767
0.0700	-2.440
0.0733	-2.597
0.0766	-2.236
0.0800	-3.018
0.0833	-2.782
0.0866	-2.525
0.0900	-2.456
0.0933	-2.603 ← H_0
0.0966	-2.569
0.1000	-2.569
0.1033	-2.563
0.1066	-2.553
0.1100	-2.547
0.1133	-2.541
0.1166	-2.528
0.1200	-2.597

H/H_0	t
1.00	0.0600

00473

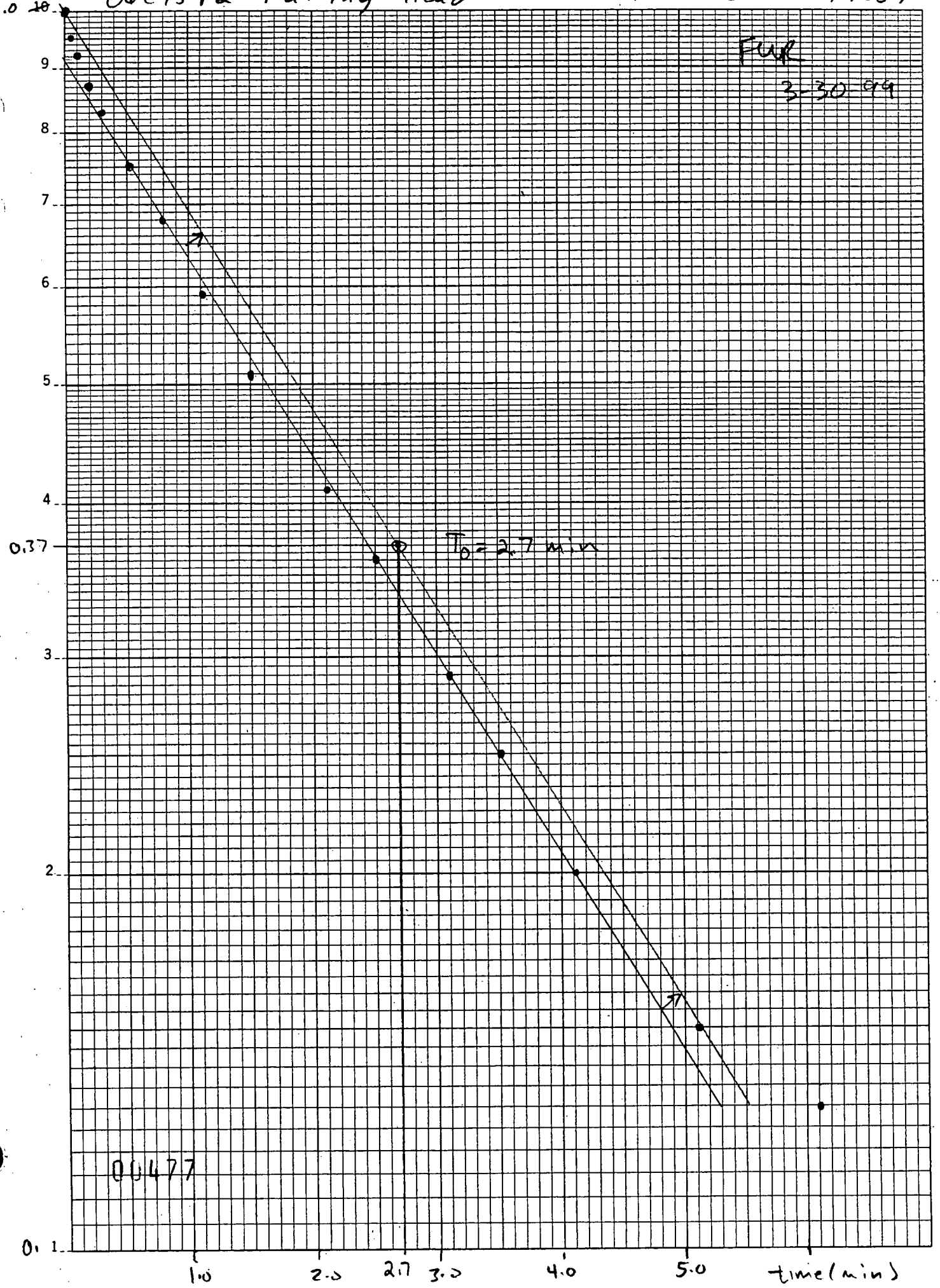
0.1233	-2.560		
0.1266	-2.509		
0.1300	-2.503		
0.1333	-2.490		
0.1366	-2.487		
0.1400	-2.481		
0.1433	-2.478	0.95	0.0500
0.1466	-2.472		
0.1500	-2.462		
0.1533	-2.456		
0.1566	-2.453		
0.1600	-2.440		
0.1633	-2.431		
0.1666	-2.431		
0.1700	-2.425		
0.1733	-2.418		
0.1766	-2.412		
0.1800	-2.409		
0.1833	-2.403		
0.1866	-2.396		
0.1900	-2.393		
0.1933	-2.387	0.92	0.1000
0.1966	-2.381		
0.2000	-2.378		
0.2033	-2.371		
0.2066	-2.365		
0.2100	-2.362		
0.2133	-2.355		
0.2166	-2.352		
0.2200	-2.346		
0.2233	-2.343		
0.2266	-2.337		
0.2300	-2.334		
0.2333	-2.327		
0.2366	-2.324		
0.2400	-2.321		
0.2433	-2.315	0.89	0.1500
0.2466	-2.312		
0.2500	-2.305		
0.2533	-2.302		
0.2566	-2.299		
0.2600	-2.321		
0.2633	-2.290		
0.2666	-2.287		
0.2700	-2.280		
0.2733	-2.280		
0.2766	-2.274		
0.2800	-2.271		
0.2833	-2.268		
0.2866	-2.264		
0.2900	-2.258		
0.2933	-2.255	0.87	0.2000
0.2966	-2.252		
0.3000	-2.249		
0.3033	-2.246		
0.3066	-2.243		
0.3100	-2.249		
0.3133	-2.233		
0.3166	-2.230		
0.3200	-2.227		

0.3233	-2.224		
0.3266	-2.208		
0.3300	-2.233		
0.3333	-2.205		
0.3500	-2.202		
0.3666	-1.853		
0.3833	-2.164		
0.4000	-2.148	0.83	0.3067
0.4166	-2.188		
0.4333	-2.088		
0.5000	-2.057		
0.5166	-2.057		
0.5333	-2.029		
0.5500	-2.014		
0.5666	-2.001		
0.5833	-1.988		
0.6000	-1.973		
0.6166	-1.960		
0.6333	-1.948	0.75	0.5400
0.6500	-1.935		
0.6666	-1.923		
0.6833	-1.910		
0.7000	-1.897		
0.7166	-1.885		
0.7333	-1.872		
0.7500	-1.860		
0.7666	-1.847		
0.7833	-1.835		
0.8000	-1.825		
0.8166	-1.813		
0.8333	-1.800		
0.8500	-1.788		
0.8666	-1.778		
0.8833	-1.766	0.68	0.7900
0.9000	-1.756		
0.9166	-1.744		
0.9333	-1.734		
0.9500	-1.722		
0.9666	-1.709		
0.9833	-1.700		
1.0000	-1.690		
1.2000	-1.543	0.59	1.1067
1.4000	-1.433		
1.6000	-1.329	0.51	1.5067
1.8000	-1.235		
2.0000	-1.147		
2.2000	-1.069	0.41	2.1067
2.4000	-0.994		
2.6000	-0.928	0.36	2.5067
2.8000	-0.862		
3.0000	-0.806		
3.2000	-0.752	0.29	3.1067
3.4000	-0.699		
3.6000	-0.652	0.25	3.5067
3.8000	-0.608		
4.0000	-0.567		
4.2000	-0.533	0.20	4.1067

4.6000	-0.464		
4.8000	-0.432		
5.0000	-0.407		
5.2000	-0.379	0.15	5.1067
5.4000	-0.354		
5.6000	-0.332	0.13	5.5067
5.8000	-0.310		
6.0000	-0.291	0.11	5.9067
6.2000	-0.272		
6.4000	-0.257		
6.6000	-0.238		
6.8000	-0.222		
7.0000	-0.210		
7.2000	-0.194		
7.4000	-0.181		
7.6000	-0.169		
7.8000	-0.156		
8.0000	-0.147		
8.2000	-0.138		
8.4000	-0.128		
8.6000	-0.119		
8.8000	-0.112		
9.0000	-0.106		
9.2000	-0.100		
9.4000	-0.094		
9.6000	-0.087		
9.8000	-0.081		
10.0000	-0.075		
12.0000	-0.040		

END

06C15P2 Falling Head NSWC CRANE / 7657



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: OGC 15 P2 FALLING HEAD			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: S Ramser 3-30-99	APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 2.7$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(10.0\ ft / 0.167\ ft)}{2\ (10.0\ ft)\ (2.7\ min)}$$

$K = 5.22 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.52 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

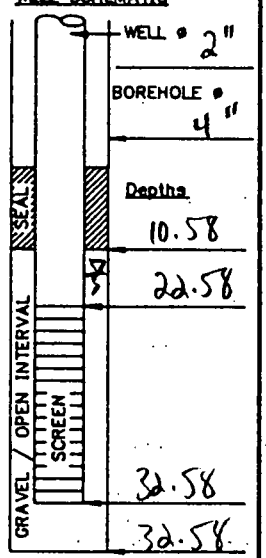
$= 2.65 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

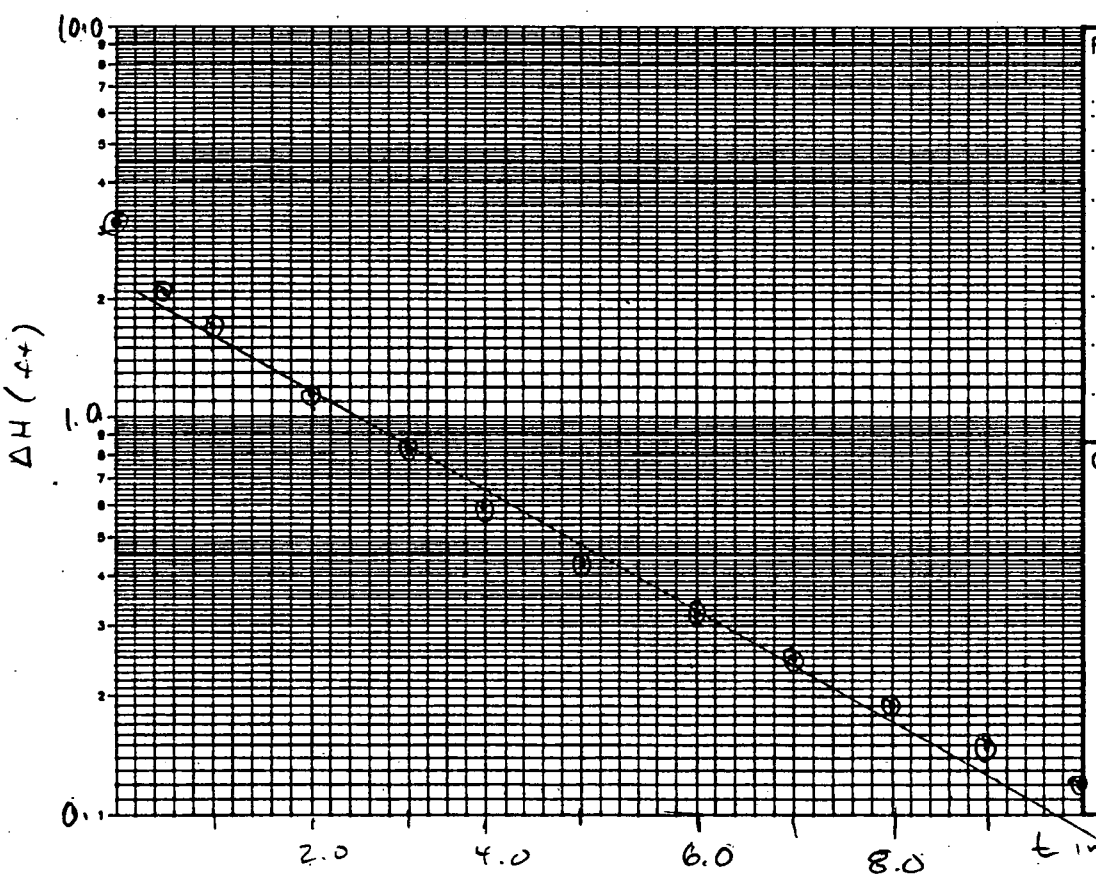
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C15P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0 ft TEST NO.: T750
STATIC WATER LEVEL (Depth/Elevation): 13.19' TPVC DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ___ OF ___
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.02		3.13	12.00		0.09
0.50		2.10			
1.00		1.72			
2.00		1.17			
3.00		0.83			
4.00		0.59			
5.00		0.43			
6.00		0.32			
7.00		0.25			
8.00		0.19			
9.00		0.15			
10.00		0.12			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 203210
10 psi

Start @ 1409
Stop @ 1425

CALCS, SKETCH MAPS, ETC.:

file:
06C15P2 Rise.txt

FWR
3-30-99

0.0400
SE1000C
Environmental Logger
03/09 17:54

Unit# 00143 Test 7

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	81502
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well #06C15P2
Rising Head Test
06C15P2Rise.txt

Step 0 03/09 14:09:20

Elapsed Time	INPUT 1	H/H₀	t
0.0000	0.000		
0.0033	0.000		
0.0066	0.755		
0.0100	4.937		
0.0133	1.589		
0.0166	0.940		
0.0200	2.451		
0.0233	2.670		
0.0266	3.131 ←	1.00	0.0000
0.0300	3.040		
0.0333	3.074		
0.0366	3.002	0.96	0.0100
0.0400	2.980		
0.0433	2.886		
0.0466	2.892		
0.0500	2.902		
0.0533	2.886		
0.0566	2.883		
0.0600	2.867		
0.0633	2.855		
0.0666	2.849	0.91	0.0400
0.0700	2.823		
0.0733	2.833		
0.0766	2.817	0.90	0.0500
0.0800	2.805		
0.0833	2.758		
0.0866	2.758		
0.0900	2.761		
0.0933	2.742		
0.0966	2.748		
0.1000	2.733		
0.1033	2.726		
0.1066	2.720		
0.1100	2.708		
0.1133	2.701		
0.1166	2.648	0.85	0.0900
0.1200	2.658		

0.1233	2.648		
0.1266	2.648		
0.1300	2.642		
0.1333	2.629		
0.1366	2.629		
0.1400	2.607		
0.1433	2.617		
0.1466	2.595		
0.1500	2.589		
0.1533	2.589		
0.1566	2.576		
0.1600	2.570		
0.1633	2.560		
0.1666	2.557		
0.1700	2.545		
0.1733	2.542		
0.1766	2.529	0.81	0.1500
0.1800	2.529		
0.1833	2.513		
0.1866	2.523		
0.1900	2.491		
0.1933	2.498		
0.1966	2.488		
0.2000	2.485		
0.2033	2.482		
0.2066	2.476		
0.2100	2.479		
0.2133	2.466		
0.2166	2.454		
0.2200	2.444		
0.2233	2.444		
0.2266	2.444	0.78	0.2000
0.2300	2.438		
0.2333	2.426		
0.2366	2.419		
0.2400	2.419		
0.2433	2.413		
0.2466	2.410		
0.2500	2.401		
0.2533	2.360		
0.2566	2.391		
0.2600	2.385		
0.2633	2.382		
0.2666	2.376		
0.2700	2.372		
0.2733	2.369		
0.2766	2.363	0.75	0.2500
0.2800	2.357		
0.2833	2.357		
0.2866	2.354		
0.2900	2.344		
0.2933	2.341		
0.2966	2.347		
0.3000	2.329		
0.3033	2.329		
0.3066	2.322		
0.3100	2.316		
0.3133	2.310		
0.3166	2.310		
0.3200	2.307		

00481

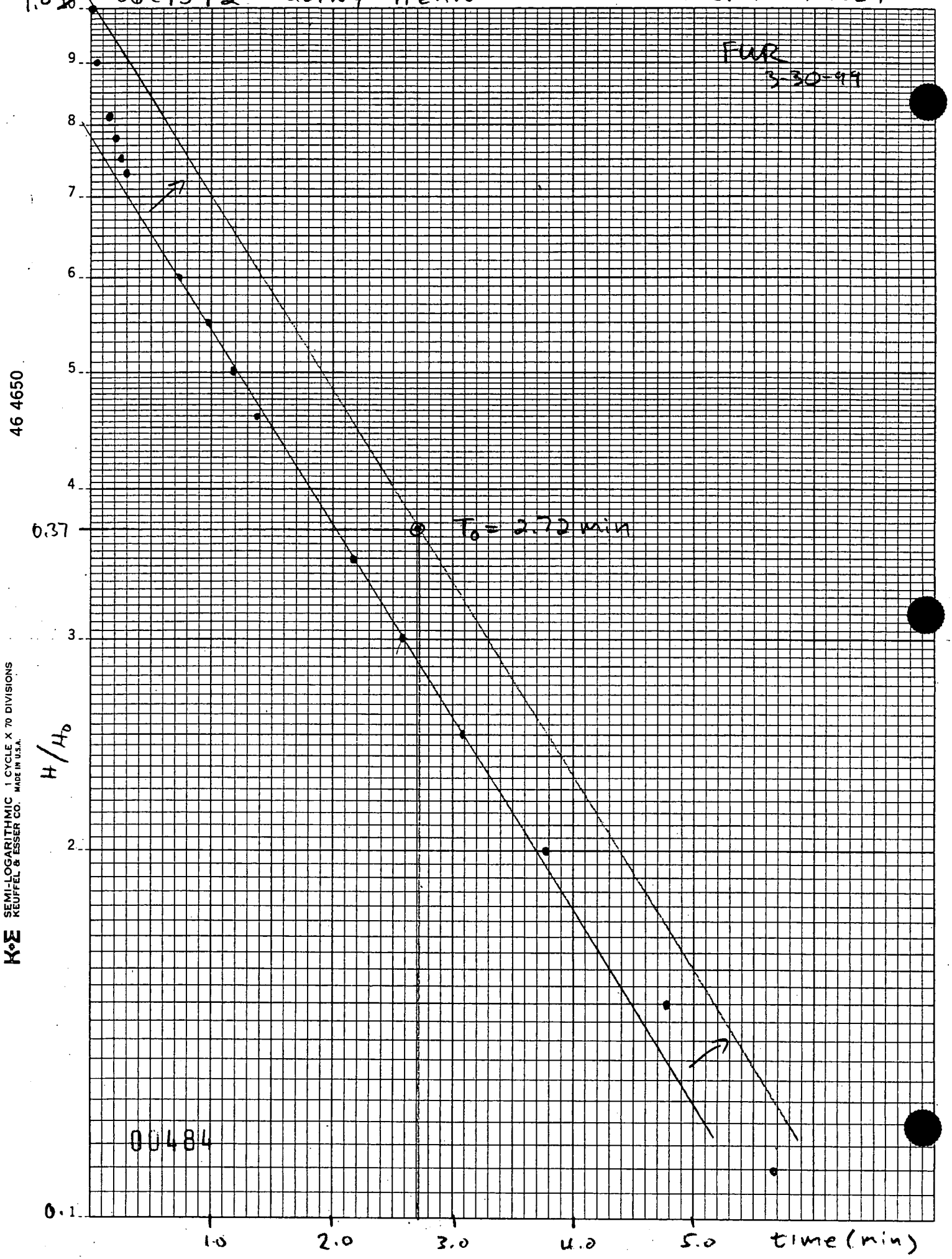
0.3233	2.300		
0.3266	2.297	0.73	0.3000
0.3300	2.294		
0.3333	2.291		
0.3500	2.266		
0.3666	2.247		
0.3833	2.228		
0.4000	2.210		
0.4166	2.191		
0.4333	2.175		
0.4500	2.156		
0.4666	2.141		
0.4833	2.122		
0.5000	2.106		
0.5166	2.093	0.67	0.4900
0.5333	2.075		
0.5500	2.059		
0.5666	2.047		
0.5833	2.031		
0.6000	2.015		
0.6166	2.003		
0.6333	1.987		
0.6500	1.974		
0.6666	1.962		
0.6833	1.949		
0.7000	1.934		
0.7166	1.921		
0.7333	1.909		
0.7500	1.896		
0.7666	1.884	0.60	0.7400
0.7833	1.871		
0.8000	1.858		
0.8166	1.846		
0.8333	1.833		
0.8500	1.821		
0.8666	1.812		
0.8833	1.799		
0.9000	1.787		
0.9166	1.774		
0.9333	1.764		
0.9500	1.752		
0.9666	1.743		
0.9833	1.730		
1.0000	1.721	0.55	0.9734
1.2000	1.567	0.50	1.1734
1.4000	1.454	0.46	1.3734
1.6000	1.351		
1.8000	1.257	0.40	1.7734
2.0000	1.172		
2.2000	1.091	0.35	2.1734
2.4000	1.019		
2.6000	0.953	0.30	2.5734
2.8000	0.890		
3.0000	0.830		
3.2000	0.777	0.25	3.1734
3.4000	0.727		
3.6000	0.683		
3.8000	0.639	0.20	3.7734
4.0000	0.598		
4.2000	0.564		

4.4000	0.526		
4.6000	0.495		
4.8000	0.464	0.15	4.7734
5.0000	0.439		
5.2000	0.414		
5.4000	0.392		
5.6000	0.370		
5.8000	0.348	0.11	5.7734
6.0000	0.329		
6.2000	0.313		
6.4000	0.294		
6.6000	0.282		
6.8000	0.266		
7.0000	0.257		
7.2000	0.238		
7.4000	0.228		
7.6000	0.216		
7.8000	0.207		
8.0000	0.197		
8.2000	0.188		
8.4000	0.178		
8.6000	0.172		
8.8000	0.163		
9.0000	0.156		
9.2000	0.153		
9.4000	0.147		
9.6000	0.138		
9.8000	0.134		
10.0000	0.128		
12.0000	0.090		
14.0000	0.072		
16.0000	0.062		

END

06C15P2 RISING HEAD NSWC CRANE/7651

FWR 3-30-94



00484

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C15 P2 RISING HEAD	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: 3-30-99	APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 2.72$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(10.0\ ft / 0.167\ ft)}{2\ (10.0\ ft)\ (2.72\ min)}$$

$K = 5.18 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.46 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

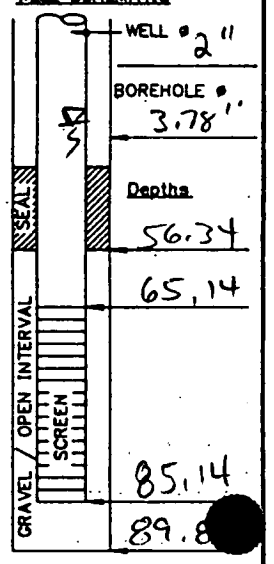
$= 2.63 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

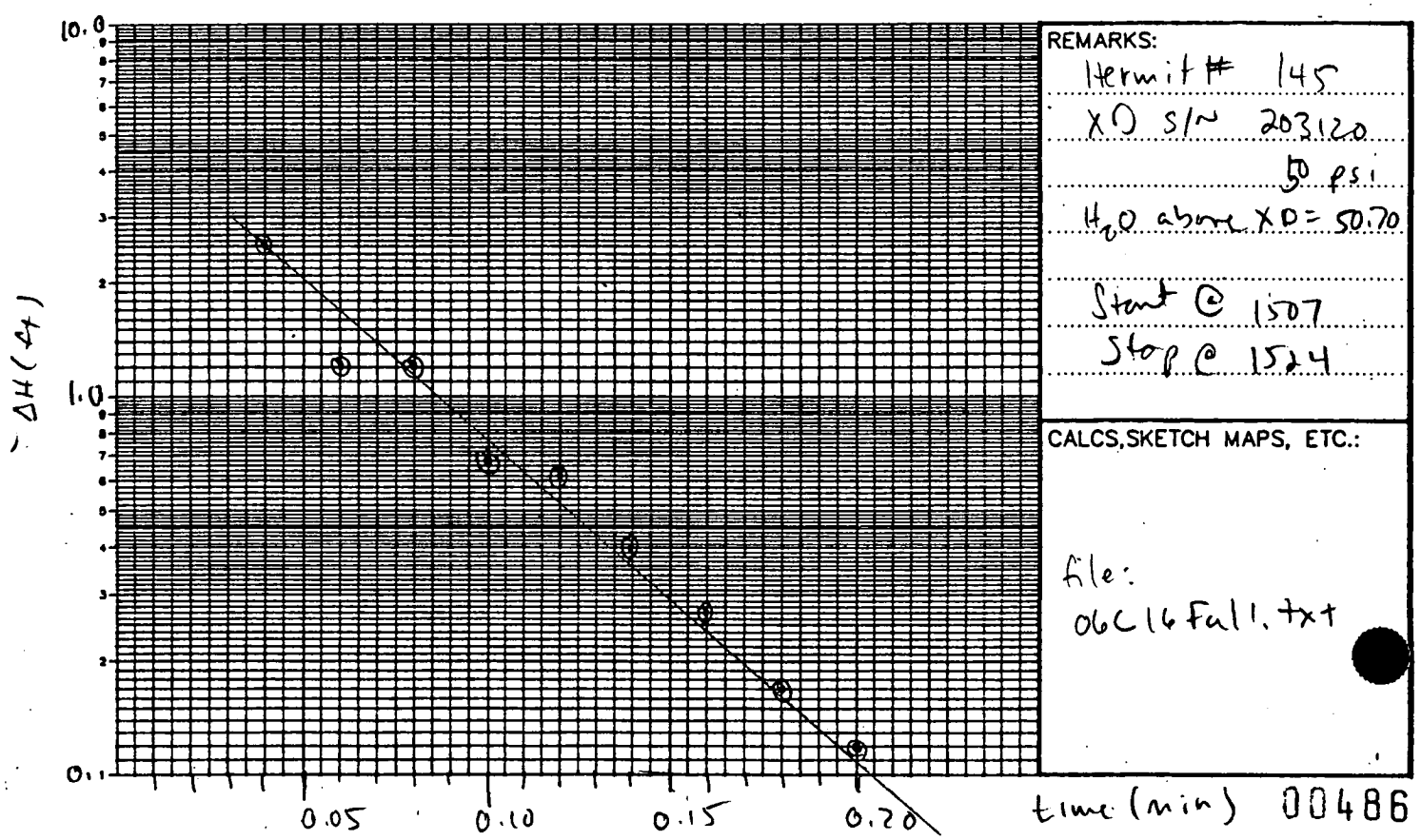
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C16
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T850
STATIC WATER LEVEL (Depth/Elevation): 33.56' TPVC DATE: 3-9-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø x 7.68') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.04		-2.52			
0.06		-1.23			
0.08		-1.23			
0.10		-0.88			
0.12		-0.62			
0.14		-0.41			
0.16		-0.27			
0.18		-0.17			
0.20		-0.11			
0.22		-0.06			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203120
50 psi
H_2O above XD = 50.70
Start @ 1507
Stop @ 1524

CALCS, SKETCH MAPS, ETC.:
file:
06C16Fall.txt

00486

SE1000C
Environmental Logger
03/09 18:33

Unit# 00145 Test 8

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61600
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.160
Delay mSEC	50.000

Step 0 03/09 15:07:38

Elapsed Time	INPUT 1
0.0000	-0.016
0.0033	0.000
0.0066	-0.160
0.0100	-0.496
0.0133	-1.008
0.0166	-1.200
0.0200	-1.296
0.0233	-1.489
0.0266	-1.793
0.0300	-2.161
0.0333	-2.337
0.0366	-2.401
0.0400	-2.529
0.0433	-2.177
0.0466	-2.001
0.0500	-1.937
0.0533	-1.777
0.0566	-1.280
0.0600	-1.232
0.0633	-1.376
0.0666	-1.424
0.0700	-1.392
0.0733	-1.312
0.0766	-1.264
0.0800	-1.232
0.0833	-1.168
0.0866	-1.120
0.0900	-1.040
0.0933	-0.976
0.0966	-0.928
0.1000	-0.880
0.1033	-0.832
0.1066	-0.864
0.1100	-0.704
0.1133	-0.704
0.1166	-0.672
0.1200	-0.624

Well # 06C16

Falling Head Test

Ø6C16FALL.TXT

- Should be -0.140
- See attached for ΔH corrections

00487

0.1233	-0.576
0.1266	-0.544
0.1300	-0.512
0.1333	-0.496
0.1366	-0.448
0.1400	-0.416
0.1433	-0.384
0.1466	-0.352
0.1500	-0.336
0.1533	-0.320
0.1566	-0.288
0.1600	-0.272
0.1633	-0.256
0.1666	-0.240
0.1700	-0.224
0.1733	-0.208
0.1766	-0.176
0.1800	-0.176
0.1833	-0.160
0.1866	-0.160
0.1900	-0.144
0.1933	-0.128
0.1966	-0.112
0.2000	-0.112
0.2033	-0.096
0.2066	-0.096
0.2100	-0.080
0.2133	-0.080
0.2166	-0.064
0.2200	-0.064
0.2233	-0.048
0.2266	-0.064
0.2300	-0.048
0.2333	-0.048
0.2366	-0.048
0.2400	-0.048
0.2433	-0.048
0.2466	-0.048
0.2500	-0.048
0.2533	-0.032
0.2566	-0.032
0.2600	-0.032
0.2633	-0.016
0.2666	-0.032
0.2700	-0.016
0.2733	-0.016
0.2766	-0.032
0.2800	-0.032
0.2833	-0.032
0.2866	-0.016
0.2900	-0.016
0.2933	-0.016
0.2966	-0.016
0.3000	-0.016
0.3033	0.000
0.3066	-0.016
0.3100	-0.032
0.3133	-0.016
0.3166	-0.016
0.3200	-0.016

0.3233	-0.016
0.3266	-0.016
0.3300	-0.016
0.3333	-0.016
0.3500	-0.032
0.3666	-0.016
0.3833	0.000
0.4000	0.000
0.4166	-0.016
0.4333	0.000
0.4500	-0.016
0.4666	-0.016
0.4833	-0.016
0.5000	-0.016
0.5166	-0.016
0.5333	-0.016
0.5500	-0.016
0.5666	-0.032
0.5833	-0.032
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	-0.016
0.6666	-0.016
0.6833	-0.032
0.7000	-0.016
0.7166	-0.016
0.7333	-0.016
0.7500	-0.016
0.7666	-0.032
0.7833	-0.016
0.8000	-0.016
0.8166	-0.016
0.8333	-0.016
0.8500	-0.016
0.8666	-0.016
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	-0.016
0.9500	-0.016
0.9666	-0.016
0.9833	-0.016
1.0000	-0.016
1.2000	-0.016
1.4000	-0.016
1.6000	0.000
1.8000	-0.016
2.0000	-0.016
2.2000	-0.016
2.4000	-0.016
2.6000	-0.016
2.8000	0.000
3.0000	-0.016
3.2000	-0.032
3.4000	0.000
3.6000	-0.016
3.8000	-0.032
4.0000	-0.032
4.2000	-0.016

4.4000	-0.032
4.6000	-0.016
4.8000	-0.016
5.0000	-0.016
5.2000	-0.016
5.4000	-0.016
5.6000	-0.016
5.8000	0.000
6.0000	-0.016
6.2000	-0.016
6.4000	-0.016
6.6000	0.000
6.8000	-0.032
7.0000	-0.016
7.2000	-0.016
7.4000	0.000
7.6000	-0.016
7.8000	-0.016
8.0000	-0.016
8.2000	-0.016
8.4000	-0.016
8.6000	0.000
8.8000	-0.016
9.0000	-0.032
9.2000	0.000
9.4000	-0.016
9.6000	-0.016
9.8000	-0.016
10.0000	-0.016
12.0000	-0.016
14.0000	-0.016
16.0000	-0.016

END

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC CRANE		JOB NUMBER 7651	
SUBJECT 06C16 ΔH Correction			
BASED ON In-Situ Operator's Manual		DRAWING NUMBER	
BY TSE	CHECKED BY K.W. Henn 4/1/99	APPROVED BY	DATE

① TRANSDUCER RECORDS ΔH as

$\Delta H = H_{ref} - H_t$ where ΔH = INPUT 1
= Head change from reference
H_{ref} = reference head
H_t = head @ time t (INPUT 1)

$\therefore H_t = H_{ref} - \Delta H$

② $H = P \times 2.3067$ psi/ft H_{2O} where H = head (ft)
P = pressure (psi)

$\therefore P = H \div 2.3067$ psi/ft H_2O

③ $P = Lx^2 + Sx + O$

where P = pressure
L = Linearity
S = Scale factor
O = Offset
x = transducer reading in milliamps

If $(Lx^2 + Sx)$ is constant,

then $P_{correct} = P_{incorrect} - O_{incorrect} + O_{correct}$

$O_{incorrect}$ ↓ incorrect offset; $O_{correct}$ ↓ correct offset

④ $H_{correct} = P_{correct} \cdot 2.3067$ psi/ft

⑤ $\Delta H_{correct} = H_{ref} - H_{correct}$ for t

06C16
Falling Head Test

FWR
3-30-99

SE1000C
Environmental Logger
03/09 18:33

Unit# 00145 Test 8

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61600
Reference	0.000 → Reference Head (H_{ref}) = 50.70 ft
Linearity	0.110
Scale factor	50.690
Offset	-0.160 → should be -0.14
Delay mSEC	50.000

Step 0 03/09 15:07:38

Elapsed Time	INPUT 1	① H_t (ft)	② P (psi)	③ P $-O_{incorr}$	P $+O_{corr}$	④ H_{corr} (ft)	⑤ $\Delta H_{correct}$	H/H_0	t
0.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062		
0.0033	0.000	50.700	21.980	22.140	22.000	50.746	-0.046		
0.0066	-0.160	50.860	22.049	22.209	22.069	50.906	-0.206		
0.0100	-0.496	51.196	22.195	22.355	22.215	51.242	-0.542		
0.0133	-1.008	51.708	22.417	22.577	22.437	51.754	-1.054		
0.0166	-1.200	51.900	22.500	22.660	22.520	51.946	-1.246		
0.0200	-1.296	51.996	22.542	22.702	22.562	52.042	-1.342		
0.0233	-1.489	52.189	22.625	22.785	22.645	52.235	-1.535		
0.0266	-1.793	52.493	22.757	22.917	22.777	52.539	-1.839		
0.0300	-2.161	52.861	22.917	23.077	22.937	52.907	-2.207		
0.0333	-2.337	53.037	22.993	23.153	23.013	53.083	-2.383		
0.0366	-2.401	53.101	23.021	23.181	23.041	53.147	-2.447		
0.0400	-2.529	53.229	23.076	23.236	23.096	53.275	-2.575		
0.0433	-2.177	52.877	22.924	23.084	22.944	52.923	-2.223		
0.0466	-2.001	52.701	22.847	23.007	22.867	52.747	-2.047		
0.0500	-1.937	52.637	22.819	22.979	22.839	52.683	-1.983		
0.0533	-1.777	52.477	22.750	22.910	22.770	52.523	-1.823		
0.0566	-1.280	51.980	22.535	22.695	22.555	52.026	-1.326		
0.0600	-1.232	51.932	22.514	22.674	22.534	51.978	-1.278		
0.0633	-1.376	52.076	22.576	22.736	22.596	52.122	-1.422		
H_0 → 0.0666	-1.424	52.124	22.597	22.757	22.617	52.170	-1.470	1.00	0.0000
0.0700	-1.392	52.092	22.583	22.743	22.603	52.138	-1.438		
0.0733	-1.312	52.012	22.549	22.709	22.569	52.058	-1.358		
0.0766	-1.264	51.964	22.528	22.688	22.548	52.010	-1.310	0.89	0.0100
0.0800	-1.232	51.932	22.514	22.674	22.534	51.978	-1.278		
0.0833	-1.168	51.868	22.486	22.646	22.506	51.914	-1.214		
0.0866	-1.120	51.820	22.465	22.625	22.485	51.866	-1.166	0.79	0.0200
0.0900	-1.040	51.740	22.431	22.591	22.451	51.786	-1.086		

								H/H_0	t
0.0933	-0.976	51.676	22.403	22.563	22.423	51.722	-1.022		
0.0966	-0.928	51.628	22.382	22.542	22.402	51.674	-0.974	0.66	0.0300
0.1000	-0.880	51.580	22.361	22.521	22.381	51.626	-0.926		
0.1033	-0.832	51.532	22.340	22.500	22.360	51.578	-0.878		
0.1066	-0.864	51.564	22.354	22.514	22.374	51.610	-0.910	0.62	0.0400
0.1100	-0.704	51.404	22.285	22.445	22.305	51.450	-0.750		
0.1133	-0.704	51.404	22.285	22.445	22.305	51.450	-0.750		
0.1166	-0.672	51.372	22.271	22.431	22.291	51.418	-0.718	0.49	0.0500
0.1200	-0.624	51.324	22.250	22.410	22.270	51.370	-0.670		
0.1233	-0.576	51.276	22.229	22.389	22.249	51.322	-0.622		
0.1266	-0.544	51.244	22.216	22.376	22.236	51.290	-0.590	0.40	0.0600
0.1300	-0.512	51.212	22.202	22.362	22.222	51.258	-0.558		
0.1333	-0.496	51.196	22.195	22.355	22.215	51.242	-0.542		
0.1366	-0.448	51.148	22.174	22.334	22.194	51.194	-0.494	0.34	0.0700
0.1400	-0.416	51.116	22.160	22.320	22.180	51.162	-0.462		
0.1433	-0.384	51.084	22.146	22.306	22.166	51.130	-0.430		
0.1466	-0.352	51.052	22.132	22.292	22.152	51.098	-0.398	0.27	0.0800
0.1500	-0.336	51.036	22.125	22.285	22.145	51.082	-0.382		
0.1533	-0.320	51.020	22.118	22.278	22.138	51.066	-0.366		
0.1566	-0.288	50.988	22.105	22.265	22.125	51.034	-0.334	0.23	0.0900
0.1600	-0.272	50.972	22.098	22.258	22.118	51.018	-0.318		
0.1633	-0.256	50.956	22.091	22.251	22.111	51.002	-0.302		
0.1666	-0.240	50.940	22.084	22.244	22.104	50.986	-0.286	0.20	0.1000
0.1700	-0.224	50.924	22.077	22.237	22.097	50.970	-0.270		
0.1733	-0.208	50.908	22.070	22.230	22.090	50.954	-0.254		
0.1766	-0.176	50.876	22.056	22.216	22.076	50.922	-0.222	0.15	0.1100
0.1800	-0.176	50.876	22.056	22.216	22.076	50.922	-0.222		
0.1833	-0.160	50.860	22.049	22.209	22.069	50.906	-0.206		
0.1866	-0.160	50.860	22.049	22.209	22.069	50.906	-0.206	0.14	0.1200
0.1900	-0.144	50.844	22.042	22.202	22.062	50.890	-0.190		
0.1933	-0.128	50.828	22.035	22.195	22.055	50.874	-0.174		
0.1966	-0.112	50.812	22.028	22.188	22.048	50.858	-0.158		
0.2000	-0.112	50.812	22.028	22.188	22.048	50.858	-0.158		
0.2033	-0.096	50.796	22.021	22.181	22.041	50.842	-0.142		
0.2066	-0.096	50.796	22.021	22.181	22.041	50.842	-0.142		
0.2100	-0.080	50.780	22.014	22.174	22.034	50.826	-0.126		
0.2133	-0.080	50.780	22.014	22.174	22.034	50.826	-0.126		
0.2166	-0.064	50.764	22.007	22.167	22.027	50.810	-0.110		
0.2200	-0.064	50.764	22.007	22.167	22.027	50.810	-0.110		
0.2233	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2266	-0.064	50.764	22.007	22.167	22.027	50.810	-0.110		
0.2300	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2333	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2366	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2400	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2433	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2466	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2500	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094		
0.2533	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078		
0.2566	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078		
0.2600	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078		

0.2633	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2666	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.2700	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2733	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2766	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.2800	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.2833	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.2866	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2900	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2933	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.2966	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3033	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3066	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3100	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.3133	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3200	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3233	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3266	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3300	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3500	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.3666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3833	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.4000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.4166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4333	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.4500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5666	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.5833	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.6166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.6333	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.6500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6833	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.7000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7666	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.7833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062

0.8333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8833	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.9000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.9166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.9333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
1.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.8000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
3.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
3.2000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
3.4000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
3.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
3.8000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
4.0000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
4.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
4.4000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
4.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
4.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.8000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
6.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
6.8000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
7.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.4000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
7.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
8.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.0000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078

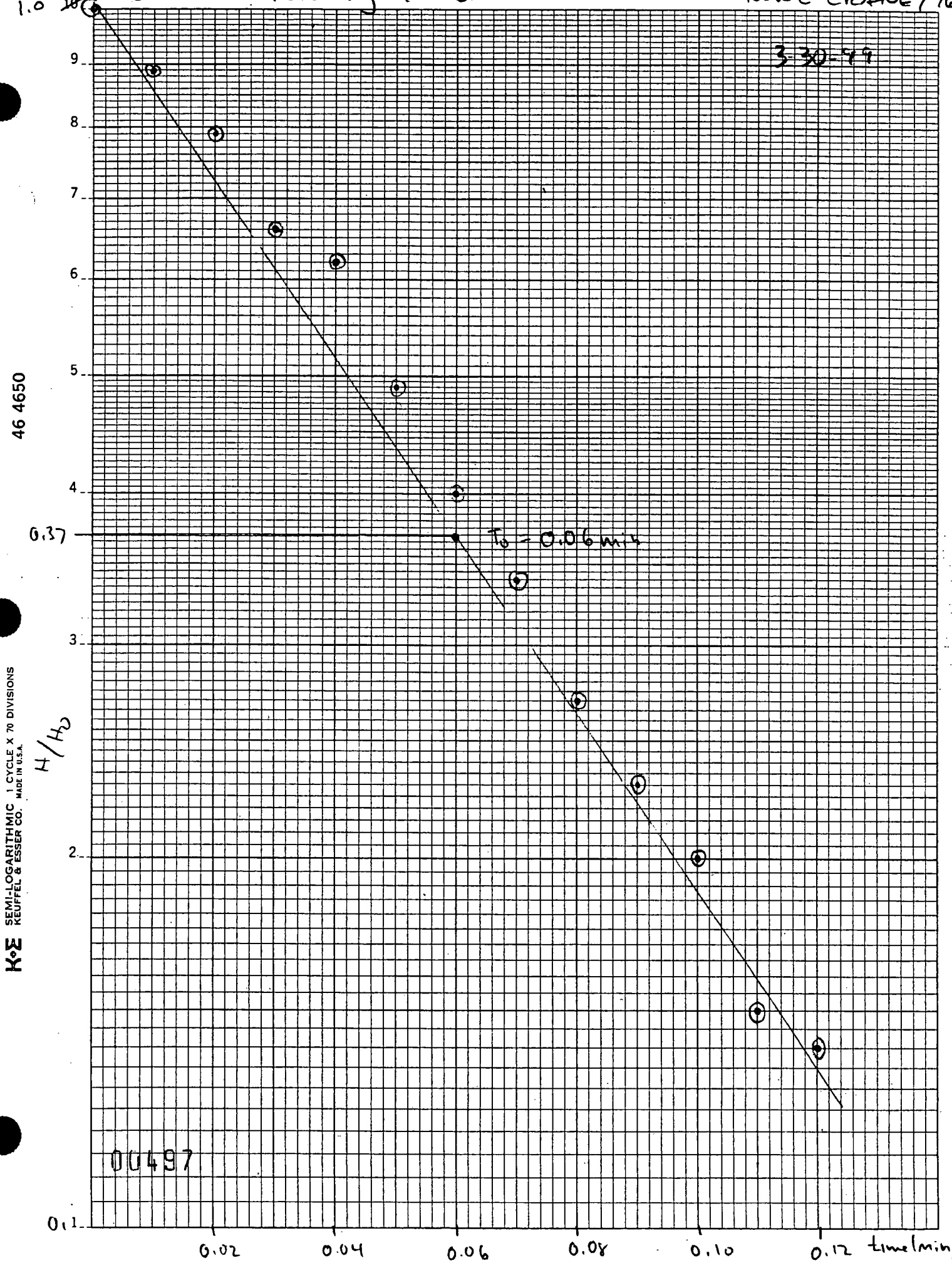
9.2000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
9.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
10.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
12.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
14.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
16.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062

END

06C16 Falling Head

NSWC CRANE/765

3-30-99



00497

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06C16 FALLING HEAD			
BASED ON: HVORSLEV (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: 3-30-99 FRamsey	APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.06$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ ft)^2 \ln(20.0\ ft / 0.16\ ft)}{2\ (20.0\ ft)\ (0.06\ min)}$$

$K = 1.39 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 2.00 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 7.04 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C16

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T9Sø

STATIC WATER LEVEL (Depth/Elevation): 33.56' TPVC DATE: 3-9-99

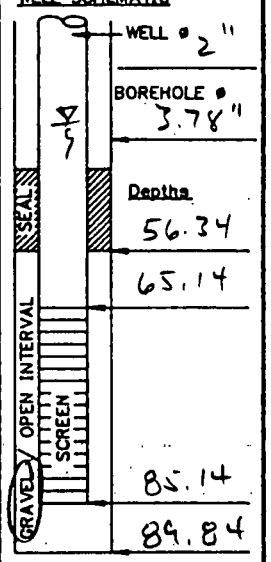
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'ø x 7.68') PAGE ... OF ...

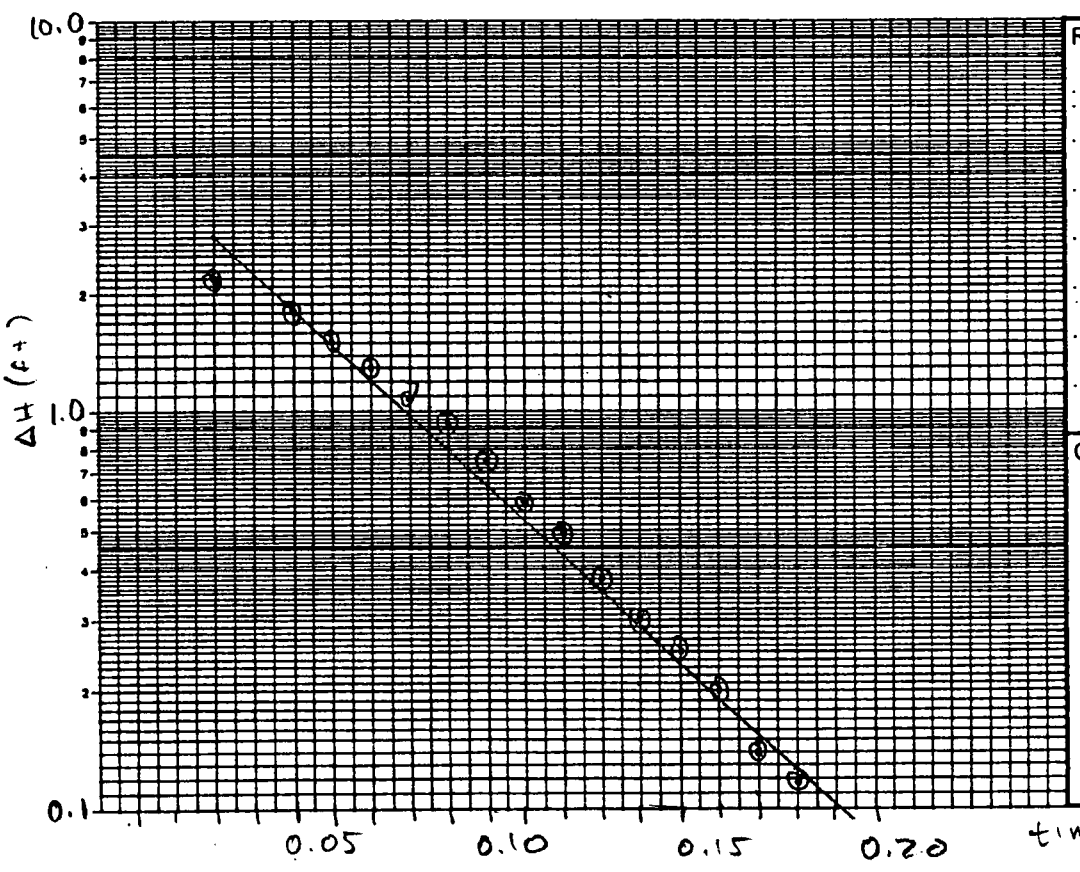
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		2.19	0.16		0.20
0.05		1.79	0.17		0.14
0.06		1.52	0.18		0.11
0.07		1.28	0.19		0.07
0.08		1.08	0.20		0.06
0.09		0.91			
0.10		0.75			
0.11		0.59			
0.12		0.49			
0.13		0.38			
0.14		0.30			
0.15		0.25			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

XD S/N 203120

50 psi

Start @ 1528

Stop @ 1539

CALCS, SKETCH MAPS, ETC.:

file: 06C16 Rise. txt

00499

SE1000C
Environmental Logger
03/09 18:36

Unit# 00145 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61600
Reference	0.000
Linearity	0.110
Scale factor	50.690
Offset	-0.160
Delay mSEC	50.000

Well # 06C16
Rising Head Test
06C16 RISE. TXT
should be -0.140
See attached for ΔH corrections

Step 0 03/09 15:28:30

Elapsed Time	INPUT 1
0.0000	0.608
0.0033	1.104
0.0066	0.880
0.0100	0.688
0.0133	0.992
0.0166	1.296
0.0200	1.584
0.0233	1.728
0.0266	2.016
0.0300	2.192
0.0333	2.192
0.0366	2.144
0.0400	2.064
0.0433	2.000
0.0466	1.872
0.0500	1.792
0.0533	1.712
0.0566	1.600
0.0600	1.520
0.0633	1.440
0.0666	1.376
0.0700	1.280
0.0733	1.232
0.0766	1.168
0.0800	1.088
0.0833	1.024
0.0866	0.960
0.0900	0.912
0.0933	0.848
0.0966	0.800
0.1000	0.752
0.1033	0.704
0.1066	0.672
0.1100	0.592
0.1133	0.560
0.1166	0.528
0.1200	0.496

0.1233	0.464
0.1266	0.432
0.1300	0.384
0.1333	0.352
0.1366	0.336
0.1400	0.304
0.1433	0.288
0.1466	0.256
0.1500	0.256
0.1533	0.223
0.1566	0.207
0.1600	0.207
0.1633	0.176
0.1666	0.144
0.1700	0.144
0.1733	0.128
0.1766	0.144
0.1800	0.112
0.1833	0.112
0.1866	0.095
0.1900	0.079
0.1933	0.063
0.1966	0.047
0.2000	0.063
0.2033	0.047
0.2066	0.047
0.2100	0.047
0.2133	0.031
0.2166	0.031
0.2200	0.031
0.2233	0.031
0.2266	0.016
0.2300	0.031
0.2333	0.016
0.2366	0.016
0.2400	0.000
0.2433	0.016
0.2466	0.016
0.2500	0.016
0.2533	0.016
0.2566	0.000
0.2600	0.016
0.2633	0.016
0.2666	0.016
0.2700	0.016
0.2733	0.000
0.2766	0.016
0.2800	0.000
0.2833	0.000
0.2866	0.000
0.2900	0.016
0.2933	0.000
0.2966	0.000
0.3000	0.000
0.3033	0.000
0.3066	0.000
0.3100	-0.016
0.3133	0.000
0.3166	0.000
0.3200	0.000

0.3233	0.000
0.3266	0.000
0.3300	0.000
0.3333	-0.016
0.3500	-0.016
0.3666	0.016
0.3833	0.000
0.4000	-0.016
0.4166	0.000
0.4333	-0.016
0.4500	-0.016
0.4666	-0.016
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	-0.016
0.5666	-0.016
0.5833	-0.016
0.6000	-0.016
0.6166	0.000
0.6333	-0.032
0.6500	-0.016
0.6666	-0.016
0.6833	-0.016
0.7000	-0.016
0.7166	-0.016
0.7333	-0.016
0.7500	-0.016
0.7666	-0.016
0.7833	-0.032
0.8000	-0.016
0.8166	-0.016
0.8333	-0.016
0.8500	-0.032
0.8666	0.000
0.8833	-0.016
0.9000	-0.016
0.9166	-0.016
0.9333	0.000
0.9500	-0.048
0.9666	-0.016
0.9833	-0.016
1.0000	-0.016
1.2000	-0.016
1.4000	0.000
1.6000	0.000
1.8000	-0.016
2.0000	-0.016
2.2000	0.000
2.4000	-0.016
2.6000	-0.016
2.8000	0.000
3.0000	-0.016
3.2000	0.000
3.4000	-0.016
3.6000	-0.016
3.8000	-0.016
4.0000	-0.032
4.2000	-0.016

4.4000	-0.016
4.6000	0.000
4.8000	-0.016
5.0000	-0.016
5.2000	-0.016
5.4000	0.000
5.6000	-0.016
5.8000	-0.032
6.0000	-0.032
6.2000	-0.016
6.4000	-0.016
6.6000	-0.016
6.8000	-0.016
7.0000	-0.016
7.2000	-0.016
7.4000	-0.016
7.6000	-0.016
7.8000	-0.016
8.0000	-0.016
8.2000	-0.016
8.4000	-0.016
8.6000	-0.032
8.8000	-0.016
9.0000	-0.016
9.2000	-0.016
9.4000	-0.016
9.6000	-0.016
9.8000	-0.016
10.0000	-0.032

END

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C16 ΔH Correction		
BASED ON	In-Situ Operator's Manual	DRAWING NUMBER	
BY TSE	CHECKED BY H.W. Henn 4/1/99	APPROVED BY	DATE

① TRANSDUCER RECORDS ΔH as

$\Delta H = H_{ref} - H_t$ where ΔH = INPUT 1
= Head change from reference
H_{ref} = reference head
H_t = head @ time t (INPUT 1)

$\therefore H_t = H_{ref} - \Delta H$

② $H = P \times 2.3067$ psi/ft H_{2O} where H = head (ft)
P = Pressure (psi)

$\therefore P = H \div 2.3067$ psi/ft H_2O

③ $P = Lx^2 + Sx + O$

where P = Pressure
L = Linearity
S = Scale factor
O = Offset
x = transducer reading in milliamps

If $(Lx^2 + Sx)$ is constant,

then $P_{correct} = P_{incorrect} - O_{incorrect} + O_{correct}$

$O_{incorrect}$ ↓ incorrect offset; $O_{correct}$ ↓ correct offset

④ $H_{correct} = P_{correct} \cdot 2.3067$ psi/ft

⑤ $\Delta H_{correct} = H_{ref} - H_{correct}$ for t

FWR
3-30-99

06C16
Rising Head

SE1000C
Environmental Logger
03/09 18:36

Unit# 00145 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61600
Reference	0.000 → Reference Head (H_{ref}) = 50.70 ft
Linearity	0.110
Scale factor	50.690
Offset	-0.160 → Should be -0.14
Delay mSEC	50.000

Step 0 03/09 15:28:30

Elapsed Time	INPUT 1	① H_t (ft)	② P (psi)	③ P $-O_{incorr}$ (psi)	P $+O_{corr}$ (psi)	④ H_{corr} (ft)	⑤ ΔH_{corr}	H/H_o	t
0.0000	0.608	50.092	21.716	21.876	21.736	50.138	0.562		
0.0033	1.104	49.596	21.501	21.661	21.521	49.642	1.058		
0.0066	0.880	49.820	21.598	21.758	21.618	49.866	0.834		
0.0100	0.688	50.012	21.681	21.841	21.701	50.058	0.642		
0.0133	0.992	49.708	21.550	21.710	21.570	49.754	0.946		
0.0166	1.296	49.404	21.418	21.578	21.438	49.450	1.250		
0.0200	1.584	49.116	21.293	21.453	21.313	49.162	1.538		
0.0233	1.728	48.972	21.231	21.391	21.251	49.018	1.682		
0.0266	2.016	48.684	21.106	21.266	21.126	48.730	1.970		
0.0300	2.192	48.508	21.029	21.189	21.049	48.554	2.146		
H_o → 0.0333	2.192	48.508	21.029	21.189	21.049	48.554	2.146	1.00	0.0000
0.0366	2.144	48.556	21.050	21.210	21.070	48.602	2.098		
0.0400	2.064	48.636	21.085	21.245	21.105	48.682	2.018		
0.0433	2.000	48.700	21.113	21.273	21.133	48.746	1.954	0.91	0.0100
0.0466	1.872	48.828	21.168	21.328	21.188	48.874	1.826		
0.0500	1.792	48.908	21.203	21.363	21.223	48.954	1.746		
0.0533	1.712	48.988	21.238	21.398	21.258	49.034	1.666	0.79	0.0200
0.0566	1.600	49.100	21.286	21.446	21.306	49.146	1.554		
0.0600	1.520	49.180	21.321	21.481	21.341	49.226	1.474		
0.0633	1.440	49.260	21.355	21.515	21.375	49.306	1.394	0.65	0.0300
0.0666	1.376	49.324	21.383	21.543	21.403	49.370	1.330		
0.0700	1.280	49.420	21.425	21.585	21.445	49.466	1.234		
0.0733	1.232	49.468	21.446	21.606	21.466	49.514	1.186	0.55	0.0400
0.0766	1.168	49.532	21.473	21.633	21.493	49.578	1.122		
0.0800	1.088	49.612	21.508	21.668	21.528	49.658	1.042		
0.0833	1.024	49.676	21.536	21.696	21.556	49.722	0.978	0.46	0.0500
0.0866	0.960	49.740	21.564	21.724	21.584	49.786	0.914		
0.0900	0.912	49.788	21.584	21.744	21.604	49.834	0.866		

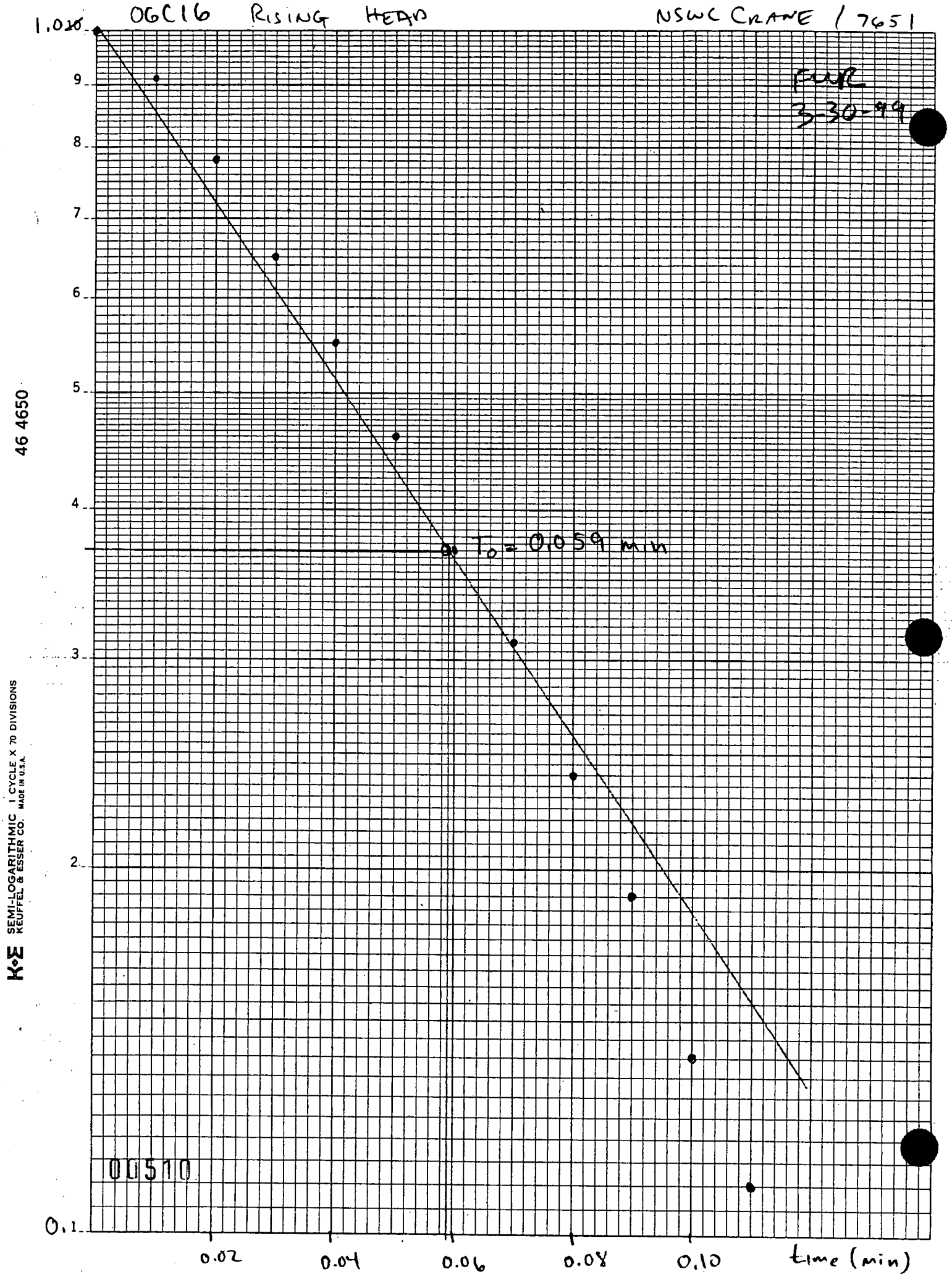
0.0933	0.848	49.852	21.612	21.772	21.632	49.898	0.802	0.37	0.0600
0.0966	0.800	49.900	21.633	21.793	21.653	49.946	0.754		
0.1000	0.752	49.948	21.654	21.814	21.674	49.994	0.706		
0.1033	0.704	49.996	21.675	21.835	21.695	50.042	0.658	0.31	0.0700
0.1066	0.672	50.028	21.688	21.848	21.708	50.074	0.626		
0.1100	0.592	50.108	21.723	21.883	21.743	50.154	0.546		
0.1133	0.560	50.140	21.737	21.897	21.757	50.186	0.514	0.24	0.0800
0.1166	0.528	50.172	21.751	21.911	21.771	50.218	0.482		
0.1200	0.496	50.204	21.765	21.925	21.785	50.250	0.450		
0.1233	0.464	50.236	21.779	21.939	21.799	50.282	0.418	0.19	0.0900
0.1266	0.432	50.268	21.792	21.952	21.812	50.314	0.386		
0.1300	0.384	50.316	21.813	21.973	21.833	50.362	0.338		
0.1333	0.352	50.348	21.827	21.987	21.847	50.394	0.306	0.14	0.1000
0.1366	0.336	50.364	21.834	21.994	21.854	50.410	0.290		
0.1400	0.304	50.396	21.848	22.008	21.868	50.442	0.258		
0.1433	0.288	50.412	21.855	22.015	21.875	50.458	0.242	0.11	0.1100
0.1466	0.256	50.444	21.869	22.029	21.889	50.490	0.210		
0.1500	0.256	50.444	21.869	22.029	21.889	50.490	0.210		
0.1533	0.223	50.477	21.883	22.043	21.903	50.523	0.177	0.08	0.1200
0.1566	0.207	50.493	21.890	22.050	21.910	50.539	0.161		
0.1600	0.207	50.493	21.890	22.050	21.910	50.539	0.161		
0.1633	0.176	50.524	21.903	22.063	21.923	50.570	0.130		
0.1666	0.144	50.556	21.917	22.077	21.937	50.602	0.098		
0.1700	0.144	50.556	21.917	22.077	21.937	50.602	0.098		
0.1733	0.128	50.572	21.924	22.084	21.944	50.618	0.082		
0.1766	0.144	50.556	21.917	22.077	21.937	50.602	0.098		
0.1800	0.112	50.588	21.931	22.091	21.951	50.634	0.066		
0.1833	0.112	50.588	21.931	22.091	21.951	50.634	0.066		
0.1866	0.095	50.605	21.939	22.099	21.959	50.651	0.049		
0.1900	0.079	50.621	21.945	22.105	21.965	50.667	0.033		
0.1933	0.063	50.637	21.952	22.112	21.972	50.683	0.017		
0.1966	0.047	50.653	21.959	22.119	21.979	50.699	0.001		
0.2000	0.063	50.637	21.952	22.112	21.972	50.683	0.017		
0.2033	0.047	50.653	21.959	22.119	21.979	50.699	0.001		
0.2066	0.047	50.653	21.959	22.119	21.979	50.699	0.001		
0.2100	0.047	50.653	21.959	22.119	21.979	50.699	0.001		
0.2133	0.031	50.669	21.966	22.126	21.986	50.715	-0.015		
0.2166	0.031	50.669	21.966	22.126	21.986	50.715	-0.015		
0.2200	0.031	50.669	21.966	22.126	21.986	50.715	-0.015		
0.2233	0.031	50.669	21.966	22.126	21.986	50.715	-0.015		
0.2266	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2300	0.031	50.669	21.966	22.126	21.986	50.715	-0.015		
0.2333	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2366	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2400	0.000	50.700	21.980	22.140	22.000	50.746	-0.046		
0.2433	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2466	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2500	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2533	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		
0.2566	0.000	50.700	21.980	22.140	22.000	50.746	-0.046		
0.2600	0.016	50.684	21.973	22.133	21.993	50.730	-0.030		

0.2633	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.2666	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.2700	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.2733	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.2766	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.2800	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.2833	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.2866	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.2900	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.2933	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.2966	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3033	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3066	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3100	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3133	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3200	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3233	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3266	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3300	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.3333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.3666	0.016	50.684	21.973	22.133	21.993	50.730	-0.030
0.3833	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.4333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.4833	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.5000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.5166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.5333	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.5500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.5833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6166	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.6333	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.6500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.6833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7500	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.7833	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062

0.8333	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.8500	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
0.8666	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.8833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9166	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9333	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
0.9500	-0.048	50.748	22.001	22.161	22.021	50.794	-0.094
0.9666	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
0.9833	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
1.4000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
1.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
1.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.2000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
2.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
2.8000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
3.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
3.2000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
3.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
3.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
3.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
4.0000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
4.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
4.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
4.6000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
4.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.4000	0.000	50.700	21.980	22.140	22.000	50.746	-0.046
5.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
5.8000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
6.0000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
6.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
6.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
7.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
8.6000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078
8.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.0000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062

9.2000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.4000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.6000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
9.8000	-0.016	50.716	21.987	22.147	22.007	50.762	-0.062
10.0000	-0.032	50.732	21.994	22.154	22.014	50.778	-0.078

END


06C16 RISING HEAD
NSWC CRANE / 7651
FWR
3-30-99
1.000
9
8
7
6
5
4
3
2
0.1
T_0 = 0.059 min
0.02
0.04
0.06
0.08
0.10
time (min)
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
00510

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C16 RISING HEAD TEST	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: 3-30-99
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 0.059$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(20.0\ \text{ft}/0.16\ \text{ft})}{2\,(20.0\ \text{ft})\,(0.059\ \text{min})}$$

$K = 1.41 \times 10^{-2}$ ft/min $\times$ 1440 min/day

$K = 2.03 \times 10^{1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 7.16 \times 10^{-3}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C16P2

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T8S0

STATIC WATER LEVEL (Depth/Elevation): 30.35' TOVC DATE: 3-9-99

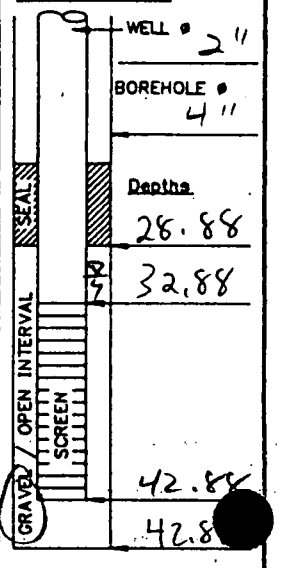
TEST TYPE (Rising/Falling/Constant Head): FALLING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' ø x 7.68') PAGE ... OF ...

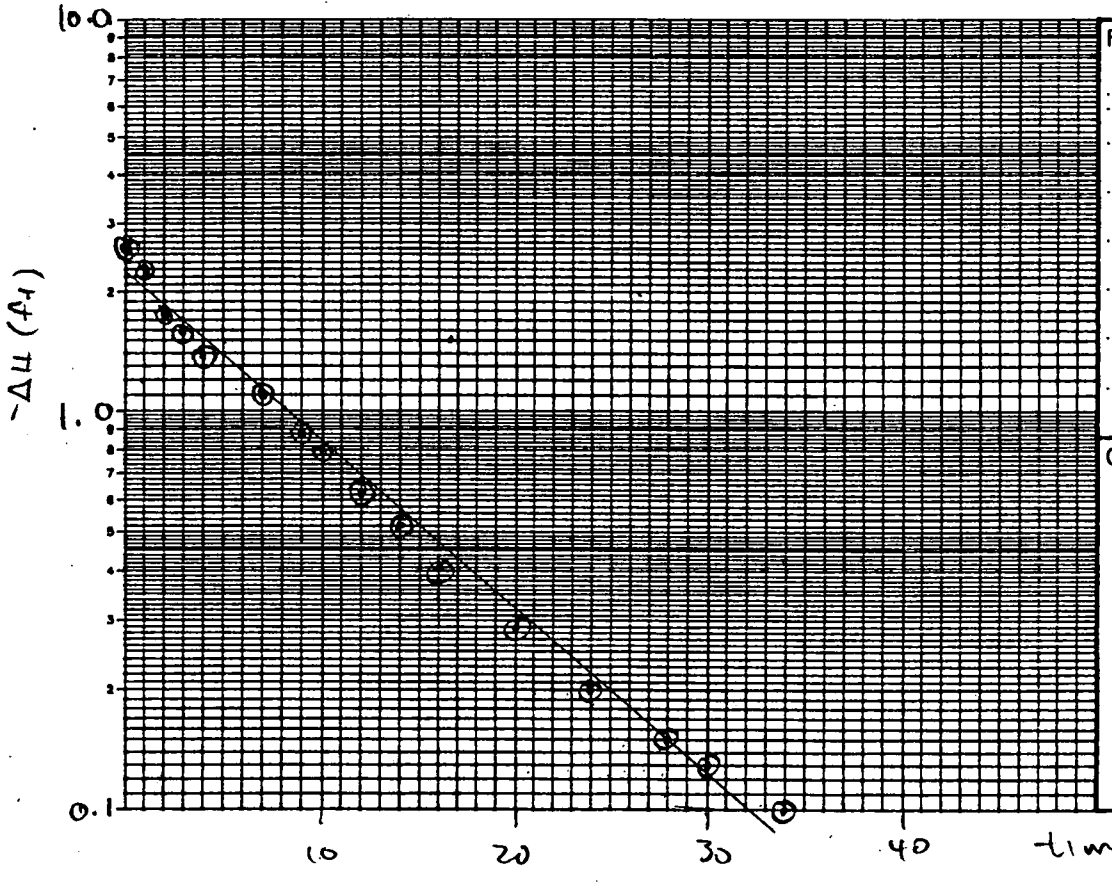
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.06		-2.61	16.00		-0.42
0.50		-2.39	20.00		-0.29
1.00		-2.24	24.00		-0.20
2.00		-1.98	28.00		-0.15
3.00		-1.75	30.00		-0.13
4.00		-1.56	34.00		-0.10
5.00		-1.38	36.00		-0.08
7.00		-1.10			
9.00		-0.88			
10.00		-0.79			
12.00		-0.63			
14.00		-0.52			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 143

XD S/N 201804 20 p.s.i.

H_2O above XD 12.30'

Start @ 1536

Stop @ 1618

CALCS, SKETCH MAPS, ETC.:

file:

06C10P2 Fall.txt

FWR
3-30-99

SE1000C
Environmental Logger
03/09 17:59

Unit# 00143 Test 8

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	~~61603~~ 61602
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C16P2
Falling Head Test
Ø6C16P2 FALL.TXT

Step 0 03/09 15:36:26

Elapsed Time	INPUT 1
0.0000	-0.178
0.0033	-1.815
0.0066	-3.626
0.0100	-1.720
0.0133	-3.294
0.0166	-4.034
0.0200	-4.308
0.0233	-3.696
0.0266	-3.422
0.0300	-2.198
0.0333	-2.115
0.0366	-2.466
0.0400	-2.752
0.0433	-2.695
0.0466	-2.542
0.0500	-2.587
0.0533	-2.574
0.0566	-2.485
0.0600	-2.172
0.0633	-2.440
0.0666	-2.612 ← H_0
0.0700	-2.568
0.0733	-2.542
0.0766	-2.536
0.0800	-2.536
0.0833	-2.529
0.0866	-2.529
0.0900	-2.523
0.0933	-2.523
0.0966	-2.523
0.1000	-2.517
0.1033	-2.517
0.1066	-2.517
0.1100	-2.517
0.1133	-2.510
0.1166	-2.510
0.1200	-2.510

H/H_0	t
1.00	0.0000

00513

0.1233	-2.510
0.1266	-2.510
0.1300	-2.510
0.1333	-2.504
0.1366	-2.504
0.1400	-2.504
0.1433	-2.504
0.1466	-2.504
0.1500	-2.497
0.1533	-2.497
0.1566	-2.497
0.1600	-2.497
0.1633	-2.497
0.1666	-2.497
0.1700	-2.497
0.1733	-2.491
0.1766	-2.491
0.1800	-2.491
0.1833	-2.491
0.1866	-2.491
0.1900	-2.491
0.1933	-2.485
0.1966	-2.485
0.2000	-2.485
0.2033	-2.485
0.2066	-2.485
0.2100	-2.478
0.2133	-2.478
0.2166	-2.478
0.2200	-2.478
0.2233	-2.478
0.2266	-2.478
0.2300	-2.478
0.2333	-2.478
0.2366	-2.472
0.2400	-2.472
0.2433	-2.472
0.2466	-2.472
0.2500	-2.472
0.2533	-2.466
0.2566	-2.472
0.2600	-2.466
0.2633	-2.466
0.2666	-2.466
0.2700	-2.466
0.2733	-2.466
0.2766	-2.459
0.2800	-2.459
0.2833	-2.459
0.2866	-2.459
0.2900	-2.459
0.2933	-2.459
0.2966	-2.453
0.3000	-2.453
0.3033	-2.453
0.3066	-2.453
0.3100	-2.453
0.3133	-2.453
0.3166	-2.453
0.3200	-2.446

0.94 0.2500

0.3233	-2.446		
0.3266	-2.446		
0.3300	-2.446		
0.3333	-2.446		
0.3500	-2.440		
0.3666	-2.434		
0.3833	-2.427		
0.4000	-2.427		
0.4166	-2.415		
0.4333	-2.415		
0.4500	-2.408		
0.4666	-2.402		
0.4833	-2.402		
0.5000	-2.395		
0.5166	-2.389		
0.5333	-2.383		
0.5500	-2.376		
0.5666	-2.376	0.91	0.5000
0.5833	-2.370		
0.6000	-2.364		
0.6166	-2.357		
0.6333	-2.357		
0.6500	-2.351		
0.6666	-2.344		
0.6833	-2.338		
0.7000	-2.338		
0.7166	-2.332		
0.7333	-2.325		
0.7500	-2.319		
0.7666	-2.313		
0.7833	-2.313		
0.8000	-2.306		
0.8166	-2.300	0.88	0.7500
0.8333	-2.293		
0.8500	-2.293		
0.8666	-2.287		
0.8833	-2.281		
0.9000	-2.281		
0.9166	-2.274		
0.9333	-2.268		
0.9500	-2.262		
0.9666	-2.262		
0.9833	-2.255		
1.0000	-2.249		
1.2000	-2.185	0.84	1.1334
1.4000	-2.134		
1.6000	-2.083		
1.8000	-2.032	0.78	1.7334
2.0000	-1.981		
2.2000	-1.937	0.74	2.1334
2.4000	-1.892		
2.6000	-1.847	0.71	2.5334
2.8000	-1.803		
3.0000	-1.758		
3.2000	-1.713	0.66	3.1334
3.4000	-1.675		
3.6000	-1.637		
3.8000	-1.592		
4.0000	-1.561	0.60	3.9334
4.2000	-1.522		

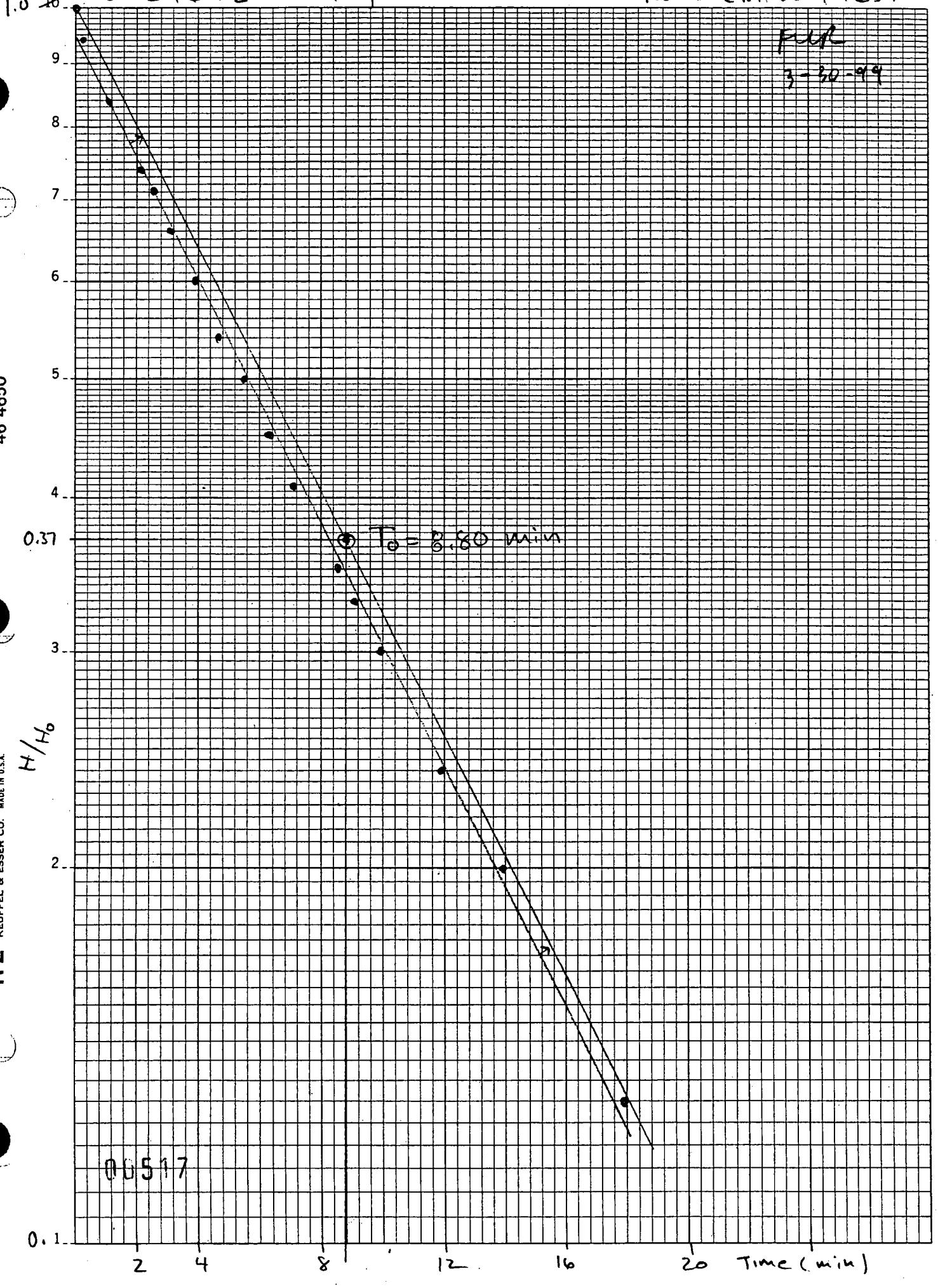
4.4000	-1.484		
4.6000	-1.452		
4.8000	-1.420	0.54	4.7334
5.0000	-1.382		
5.2000	-1.350		
5.4000	-1.325		
5.6000	-1.293	0.50	5.5334
5.8000	-1.261		
6.0000	-1.236		
6.2000	-1.210		
6.4000	-1.185	0.45	6.3334
6.6000	-1.153		
6.8000	-1.127		
7.0000	-1.102		
7.2000	-1.083	0.41	7.1334
7.4000	-1.057		
7.6000	-1.032		
7.8000	-1.013		
8.0000	-0.987		
8.2000	-0.968		
8.4000	-0.942		
8.6000	-0.923	0.35	8.5334
8.8000	-0.904		
9.0000	-0.885		
9.2000	-0.866	0.33	9.1334
9.4000	-0.847		
9.6000	-0.834		
9.8000	-0.815		
10.0000	-0.796	0.30	9.9334
12.0000	-0.637	0.24	11.9334
14.0000	-0.522	0.20	13.9334
16.0000	-0.426	0.16	15.9334
18.0000	-0.350	0.13	17.9334
20.0000	-0.293	0.11	19.9334
22.0000	-0.242		
24.0000	-0.203		
26.0000	-0.178		
28.0000	-0.152		
30.0000	-0.133		
32.0000	-0.121		
34.0000	-0.102		
36.0000	-0.089		
38.0000	-0.082		
40.0000	-0.076		

END

06C16P2 Falling Head

NSWC CRANE 17651

FMR
3-30-99



06517

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	OGC 16 P2 Falling Head Test		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-30-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 8.80$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.167 \text{ ft})}{2 (10.0 \text{ ft})(8.80 \text{ min})}$$

$K = 1.60 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 2.31 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 8.14 \times 10^{-5}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C16P2

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T95Ø

STATIC WATER LEVEL (Depth/Elevation): 30.26' TPVC DATE: 3-9-99

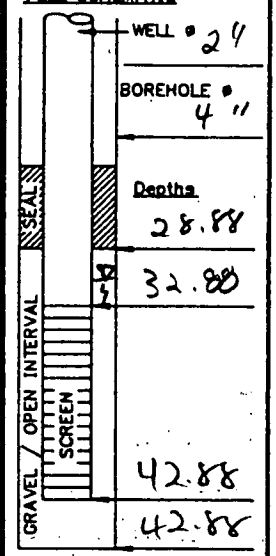
TEST TYPE (Rising/Falling/Constant Head): Rising CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10' Ø x 7.68') PAGE ___ OF ___

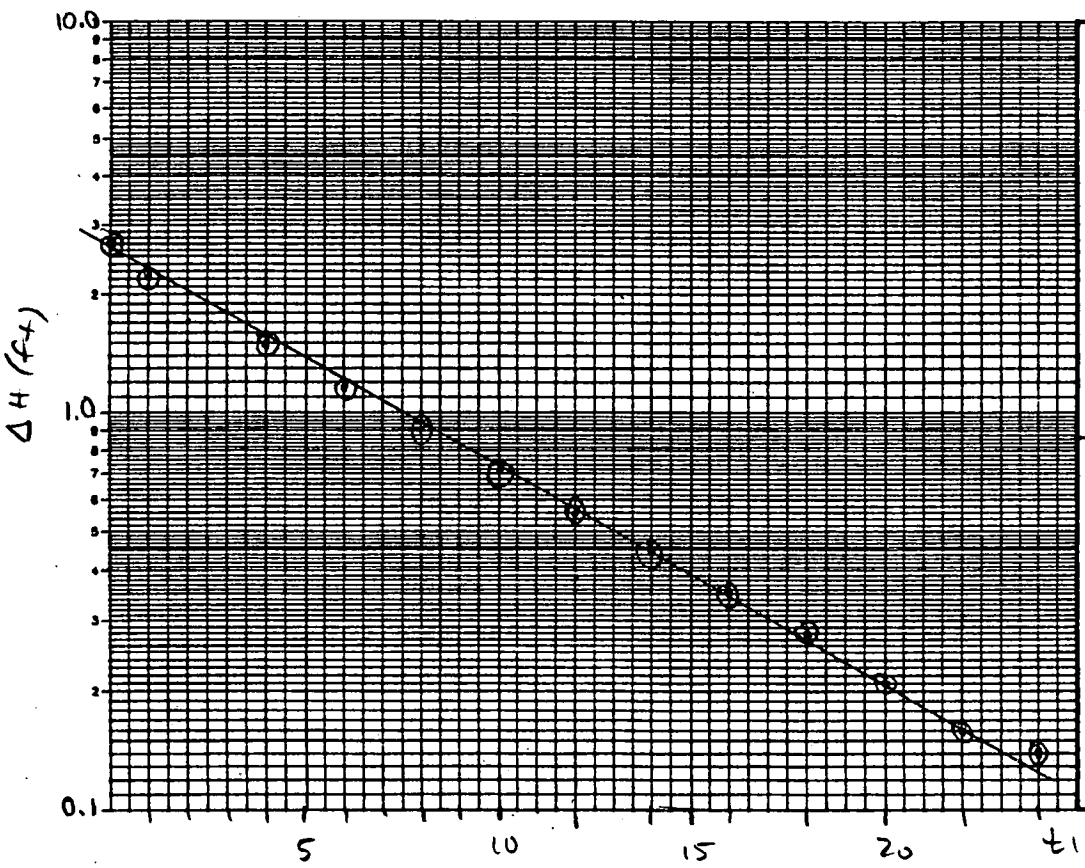
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		2.69	22.00		0.16
1.00		2.23	24.00		0.12
2.00		1.94	26.00		0.10
4.00		1.50			
6.00		1.17			
8.00		0.92			
10.00		0.72			
12.00		0.56			
14.00		0.44			
16.00		0.35			
18.00		0.27			
20.00		0.21			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD SIN 201804
20 psi

Start @ 1618
Stop @ 1651

CALCS, SKETCH MAPS, ETC.:
file:
06C16P2Rise.txt

FUR
3-30-99

E

SE1000C
Environmental Logger
03/09 18:07

Unit# 00143 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	~~61602~~ 61602
Reference	0.000
Linearity	0.110
Scale factor	20.120
Offset	-0.030
Delay mSEC	50.000

Well # 06C16P2
Rising Head Test
Ø6C16P2RISE.TXT

Step 0 03/09 18:18:20

Elapsed Time	INPUT 1
0.0000	3.222
0.0033	2.744
0.0066	1.318
0.0100	1.216
0.0133	2.101
0.0166	2.330
0.0200	2.820
0.0233	2.668
0.0266	2.693
0.0300	2.693 ← H_0
0.0333	2.674
0.0366	2.668
0.0400	2.655
0.0433	2.655
0.0466	2.642
0.0500	2.706
0.0533	2.591
0.0566	2.629
0.0600	2.617
0.0633	2.617
0.0666	2.610
0.0700	2.604
0.0733	2.598
0.0766	2.598
0.0800	2.598
0.0833	2.591
0.0866	2.591
0.0900	2.591
0.0933	2.579
0.0966	2.579
0.1000	2.585
0.1033	2.572
0.1066	2.572
0.1100	2.566
0.1133	2.566
0.1166	2.566
0.1200	2.566

H/H_0	t
1.00	0.0000

0.1233	2.559		
0.1266	2.559		
0.1300	2.559	0.95	0.1000
0.1333	2.553		
0.1366	2.559		
0.1400	2.547		
0.1433	2.547		
0.1466	2.547		
0.1500	2.547		
0.1533	2.540		
0.1566	2.547		
0.1600	2.540		
0.1633	2.540		
0.1666	2.534		
0.1700	2.579		
0.1733	2.540		
0.1766	2.534		
0.1800	2.528		
0.1833	2.528		
0.1866	2.521		
0.1900	2.521		
0.1933	2.521		
0.1966	2.521		
0.2000	2.515		
0.2033	2.515		
0.2066	2.515		
0.2100	2.515		
0.2133	2.509		
0.2166	2.509		
0.2200	2.496		
0.2233	2.502		
0.2266	2.502		
0.2300	2.502	0.93	0.2000
0.2333	2.502		
0.2366	2.496		
0.2400	2.496		
0.2433	2.496		
0.2466	2.496		
0.2500	2.496		
0.2533	2.489		
0.2566	2.489		
0.2600	2.489		
0.2633	2.489		
0.2666	2.489		
0.2700	2.483		
0.2733	2.483		
0.2766	2.483		
0.2800	2.483		
0.2833	2.477		
0.2866	2.477		
0.2900	2.477		
0.2933	2.477		
0.2966	2.477		
0.3000	2.470		
0.3033	2.470		
0.3066	2.470		
0.3100	2.470		
0.3133	2.470		
0.3166	2.470		
0.3200	2.464		

0.3233	2.464		
0.3266	2.464		
0.3300	2.464		
0.3333	2.458		
0.3500	2.458		
0.3666	2.445		
0.3833	2.445		
0.4000	2.439		
0.4166	2.426		
0.4333	2.426		
0.4500	2.413		
0.4666	2.407		
0.4833	2.400		
0.5000	2.394		
0.5166	2.388		
0.5333	2.381	0.88	0.5033
0.5500	2.381		
0.5666	2.369		
0.5833	2.369		
0.6000	2.362		
0.6166	2.356		
0.6333	2.349		
0.6500	2.343		
0.6666	2.337		
0.6833	2.330		
0.7000	2.330		
0.7166	2.324		
0.7333	2.318		
0.7500	2.311		
0.7666	2.305		
0.7833	2.298	0.85	0.7533
0.8000	2.292		
0.8166	2.286		
0.8333	2.286		
0.8500	2.279		
0.8666	2.273		
0.8833	2.267		
0.9000	2.260		
0.9166	2.260		
0.9333	2.254		
0.9500	2.248		
0.9666	2.241		
0.9833	2.235		
1.0000	2.235	0.83	0.9700
1.2000	2.158		
1.4000	2.101		
1.6000	2.044	0.76	1.5700
1.8000	1.993		
2.0000	1.942		
2.2000	1.891	0.70	2.1700
2.4000	1.846		
2.6000	1.802		
2.8000	1.751	0.65	2.7700
3.0000	1.713		
3.2000	1.668		
3.4000	1.624	0.60	3.3700
3.6000	1.585		
3.8000	1.547		
4.0000	1.509		
4.2000	1.471		

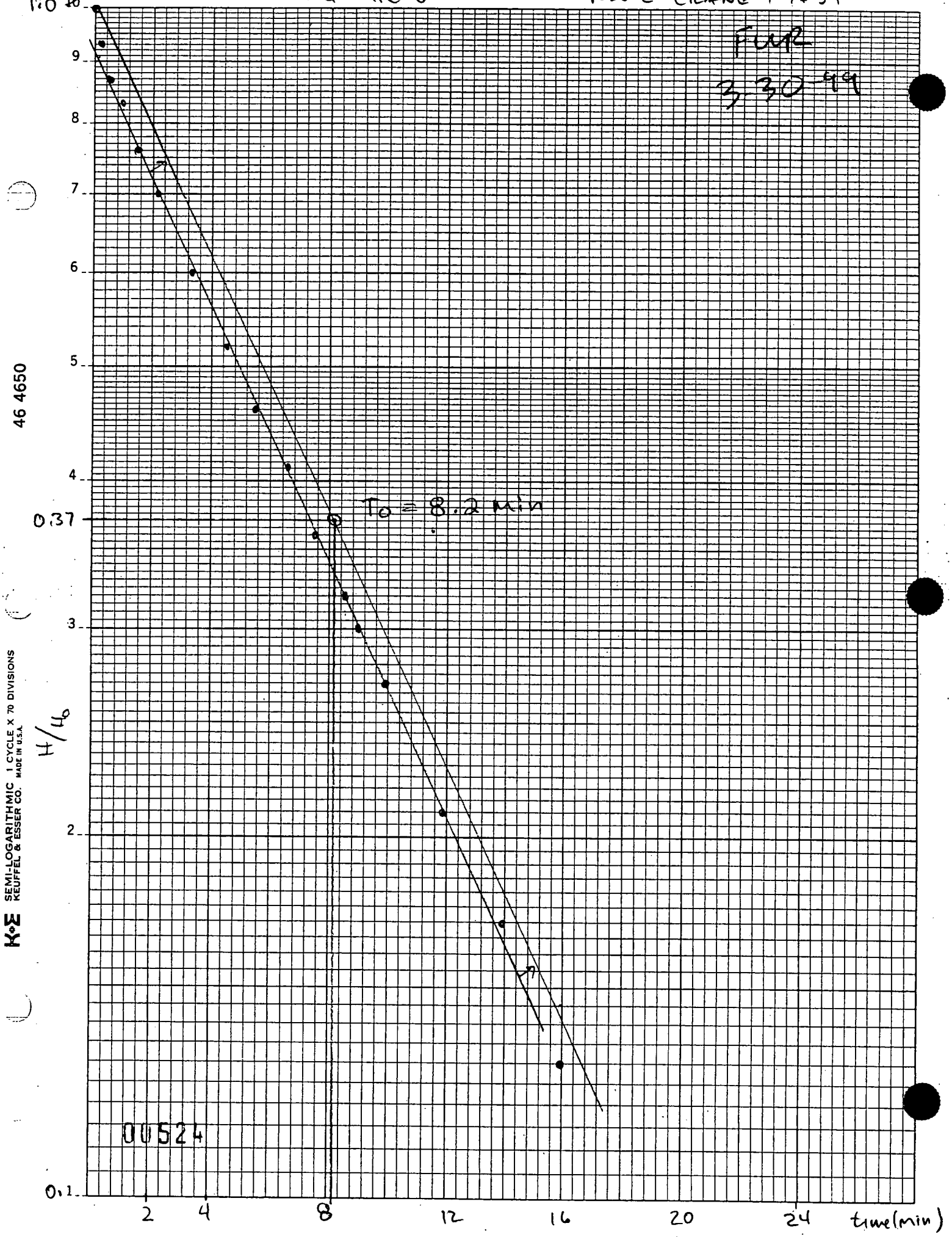
4.4000	1.439		
4.6000	1.401	0.52	4.5700
4.8000	1.369		
5.0000	1.337		
5.2000	1.305		
5.4000	1.267		
5.6000	1.242	0.46	5.5700
5.8000	1.210		
6.0000	1.178		
6.2000	1.152		
6.4000	1.127		
6.6000	1.095	0.41	6.5700
6.8000	1.070		
7.0000	1.044		
7.2000	1.019		
7.4000	0.993		
7.6000	0.968	0.36	7.5700
7.8000	0.949		
8.0000	0.923		
8.2000	0.904		
8.4000	0.878		
8.6000	0.859	0.32	8.5700
8.8000	0.840		
9.0000	0.821	0.30	8.9700
9.2000	0.796		
9.4000	0.777		
9.6000	0.764		
9.8000	0.745		
10.0000	0.726	0.27	9.9700
12.0000	0.566	0.21	11.9700
14.0000	0.445	0.17	13.9700
16.0000	0.350	0.13	15.9700
18.0000	0.273		
20.0000	0.216		
22.0000	0.165		
24.0000	0.127		
26.0000	0.101		
28.0000	0.076		
30.0000	0.057		
32.0000	0.044		

END

06C16P2 Rising Head

NSWC CRANE / 7651

FWR
3-30-99



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE	JOB NUMBER: 7651
SUBJECT: 06C16 P2 RISING HEAD	
BASED ON: HVORSLEV (1951)	DRAWING NUMBER:
BY: TSE	CHECKED BY: FWRamsey 3-30-99
APPROVED BY:	DATE:

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 8.2$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft}/0.167 \text{ ft})}{2 (10.0 \text{ ft})(8.2 \text{ min})}$$

$K = 1.72 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 2.48 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 8.74 \times 10^{-5}$ cm/s

00525

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C16P3

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T1056

STATIC WATER LEVEL (Depth/Elevation): 13.95' TPVC DATE: 3-9-99

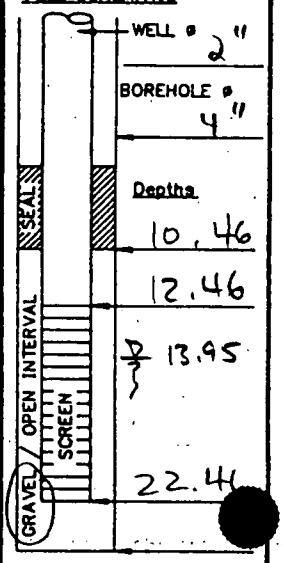
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' Ø x 4.7') PAGE ___ OF ___

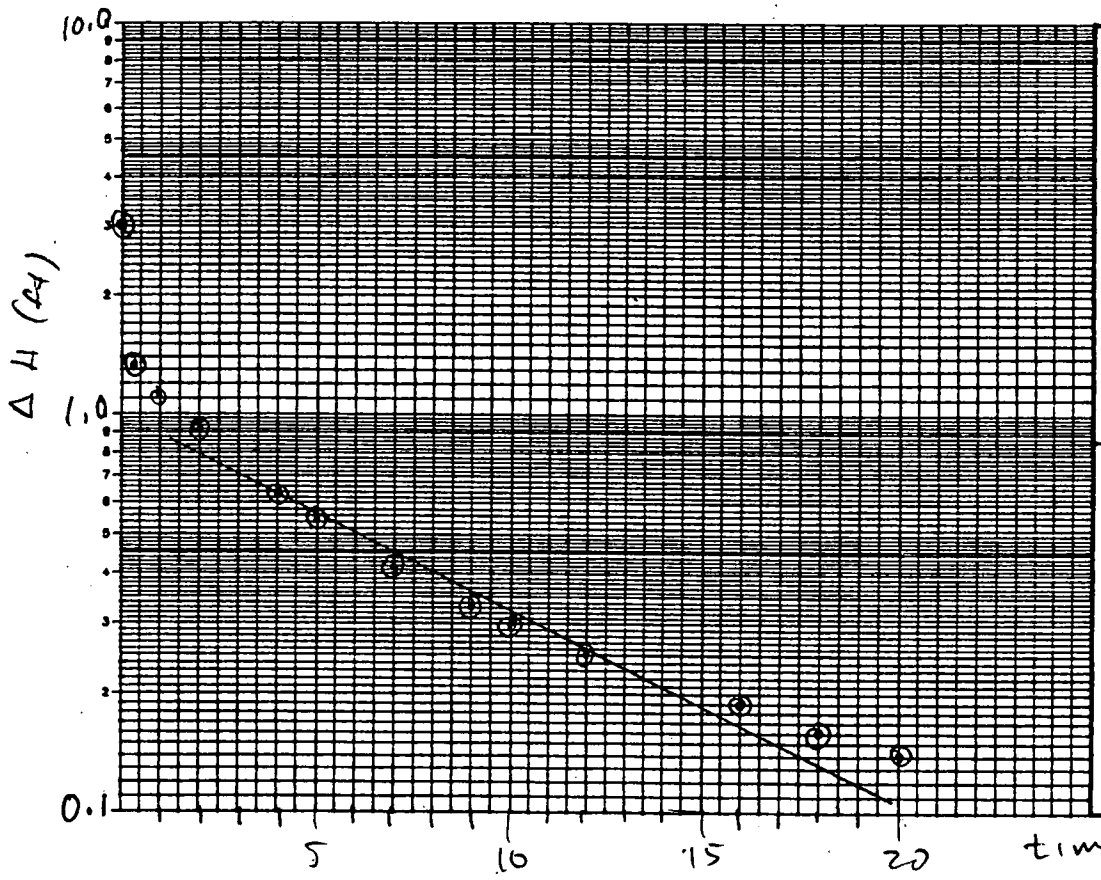
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.00	9.00		0.33
0.20		1.52	10.00		0.30
0.40		1.33	12.00		0.25
0.75		1.19	16.00		0.19
1.00		1.12	18.00		0.16
1.60		0.98	20.00		0.14
2.00		0.91	24.00		0.13
3.00		0.75	26.00		0.12
4.00		0.63	28.00		0.11
5.00		0.55			
6.00		0.48			
7.00		0.42			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:

Hermit # 145

XD S/N 203210 (10 psi)

H_{2O} above XD = 7.26

Start @ 1605

Stop @ 1657

CALCS, SKETCH MAPS, ETC.:

file:

06C16P3 Rise.tx

3-30-99
FWR

SE1000C
Environmental Logger
03/09 16:40

Unit# 00145 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61603
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06C16P3
Rising Head Test
Ø6C16P3 RISE.TXT

Step 0 03/09 16:05:01

Elapsed Time	INPUT 1	H/H_0	t
0.0000	0.031		
0.0033	4.945		
0.0066	5.739		
0.0100	3.385		
0.0133	3.002 ← H_0	1.00	0.0000
0.0166	2.936		
0.0200	2.871		
0.0233	2.784		
0.0266	2.752		
0.0300	2.690		
0.0333	2.631	0.88	0.0200
0.0366	2.569		
0.0400	2.547		
0.0433	2.509		
0.0466	2.400		
0.0500	2.428		
0.0533	2.385	0.79	0.0400
0.0566	2.363		
0.0600	2.310		
0.0633	2.338		
0.0666	2.248		
0.0700	2.223		
0.0733	2.195		
0.0766	2.163		
0.0800	2.126		
0.0833	2.114		
0.0866	2.073		
0.0900	2.029		
0.0933	2.008		
0.0966	1.983		
0.1000	1.967		
0.1033	1.886		
0.1066	1.908		
0.1100	1.895		
0.1133	1.863	0.63	0.1000
0.1166	1.845		
0.1200	1.833		

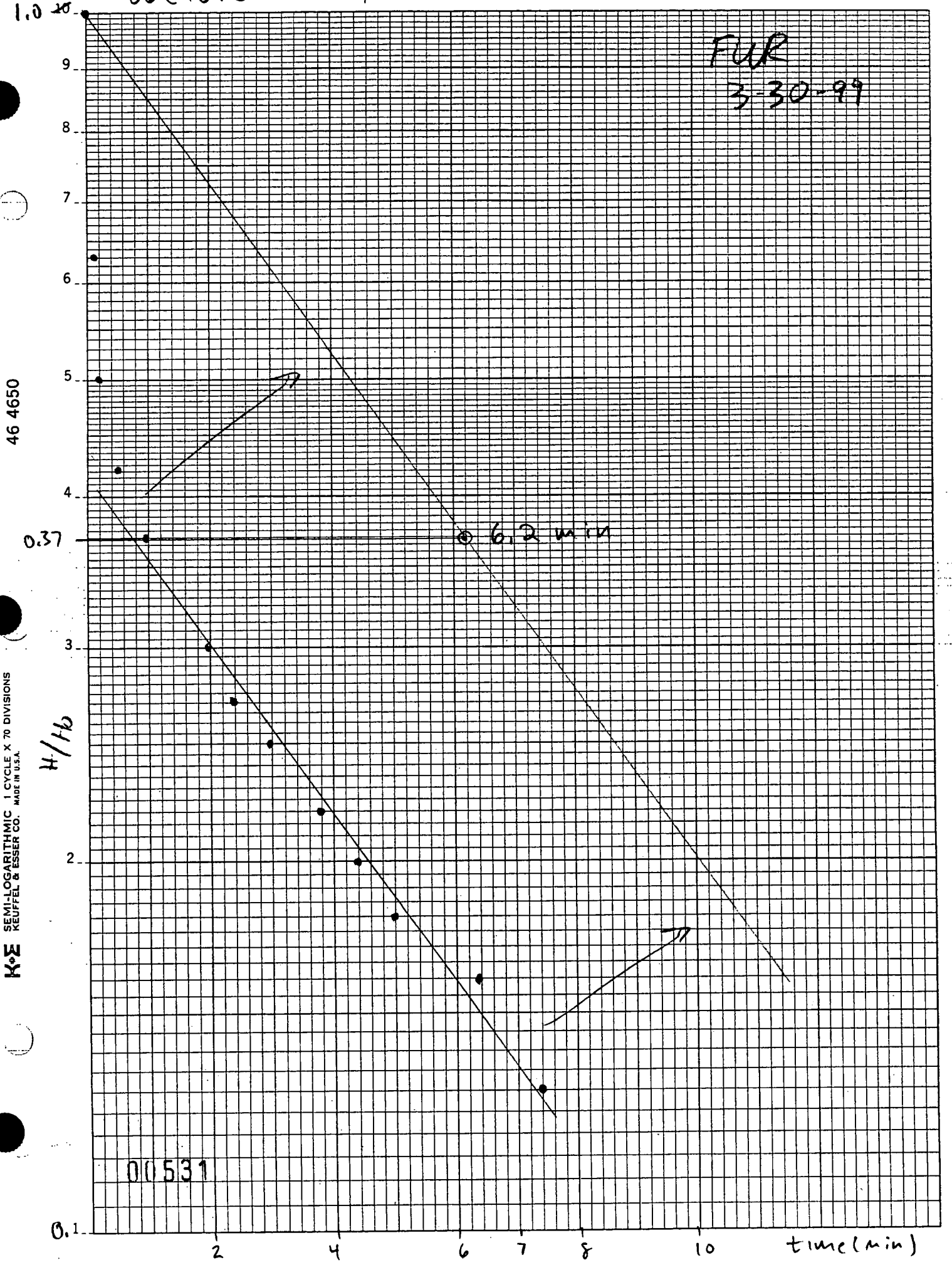
0.1233	1.802		
0.1266	1.796		
0.1300	1.764		
0.1333	1.752		
0.1366	1.736		
0.1400	1.724		
0.1433	1.705		
0.1466	1.693		
0.1500	1.683		
0.1533	1.662		
0.1566	1.649		
0.1600	1.646		
0.1633	1.624	0.54	0.1500
0.1666	1.615		
0.1700	1.609		
0.1733	1.581		
0.1766	1.590		
0.1800	1.574		
0.1833	1.568		
0.1866	1.559		
0.1900	1.549		
0.1933	1.540		
0.1966	1.537		
0.2000	1.527		
0.2033	1.518		
0.2066	1.515		
0.2100	1.509		
0.2133	1.503	0.50	0.2000
0.2166	1.493		
0.2200	1.490		
0.2233	1.487		
0.2266	1.481		
0.2300	1.475		
0.2333	1.468		
0.2366	1.465		
0.2400	1.459		
0.2433	1.453		
0.2466	1.450		
0.2500	1.450		
0.2533	1.440		
0.2566	1.440		
0.2600	1.434		
0.2633	1.425	0.47	0.2500
0.2666	1.431		
0.2700	1.425		
0.2733	1.422		
0.2766	1.418		
0.2800	1.412		
0.2833	1.412		
0.2866	1.409		
0.2900	1.403		
0.2933	1.403		
0.2966	1.400		
0.3000	1.400		
0.3033	1.393		
0.3066	1.393		
0.3100	1.390		
0.3133	1.384	0.46	0.3000
0.3166	1.384		
0.3200	1.384		

0.3233	1.381		
0.3266	1.378		
0.3300	1.378		
0.3333	1.372		
0.3500	1.359		
0.3666	1.353		
0.3833	1.334		
0.4000	1.331		
0.4166	1.322		
0.4333	1.312		
0.4500	1.303		
0.4666	1.297		
0.4833	1.291		
0.5000	1.281		
0.5166	1.275	0.42	0.5033
0.5333	1.269		
0.5500	1.259		
0.5666	1.259		
0.5833	1.250		
0.6000	1.241		
0.6166	1.234		
0.6333	1.231		
0.6500	1.228		
0.6666	1.216		
0.6833	1.213		
0.7000	1.206		
0.7166	1.200		
0.7333	1.200		
0.7500	1.194		
0.7666	1.188	0.40	0.7533
0.7833	1.181		
0.8000	1.178		
0.8166	1.175		
0.8333	1.163		
0.8500	1.163		
0.8666	1.156		
0.8833	1.156		
0.9000	1.147		
0.9166	1.144		
0.9333	1.138		
0.9500	1.135		
0.9666	1.132		
0.9833	1.125		
1.0000	1.122	0.37	0.9867
1.2000	1.063		
1.4000	1.019		
1.6000	0.985		
1.8000	0.948		
2.0000	0.910	0.30	1.9867
2.2000	0.885		
2.4000	0.848	0.28	2.3867
2.6000	0.820		
2.8000	0.789		
3.0000	0.757	0.25	2.9867
3.2000	0.732		
3.4000	0.714		
3.6000	0.689		
3.8000	0.664	0.22	3.7867
4.0000	0.639		
4.2000	0.620		

4.4000	0.601	0.20	4.3867
4.6000	0.592		
4.8000	0.567		
5.0000	0.555	0.18	4.9867
5.2000	0.539		
5.4000	0.524		
5.6000	0.508	0.17	5.5867
5.8000	0.492		
6.0000	0.480		
6.2000	0.470	0.16	6.1867
6.4000	0.455		
6.6000	0.442		
6.8000	0.433		
7.0000	0.424		
7.2000	0.417		
7.4000	0.405	0.13	7.3867
7.6000	0.393		
7.8000	0.386		
8.0000	0.374		
8.2000	0.364		
8.4000	0.361		
8.6000	0.349		
8.8000	0.343		
9.0000	0.333		
9.2000	0.327		
9.4000	0.321		
9.6000	0.311		
9.8000	0.311		
10.0000	0.308		
12.0000	0.255		
14.0000	0.218		
16.0000	0.193		
18.0000	0.165		
20.0000	0.149		
22.0000	0.137		
24.0000	0.134		
26.0000	0.121		
28.0000	0.115		
30.0000	0.106		
32.0000	0.106		
34.0000	0.106		
36.0000	0.102		
38.0000	0.099		
40.0000	0.093		
42.0000	0.096		
44.0000	0.093		
46.0000	0.087		
48.0000	0.087		
50.0000	0.077		
52.0000	0.081		

END

06C16P3 RISING HEAD



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT: NSWC CRANE		JOB NUMBER: 7651	
SUBJECT: 06C16P3 RISING HEAD			
BASED ON: Hvorslev (1951)		DRAWING NUMBER:	
BY: TSE	CHECKED BY: SMRamsey 3-30-99	APPROVED BY:	DATE:

$r = \sqrt{r_i^2(1-n) + n r_o^2}$ (Dawson & Istok, 1991)

where r_i = well screen I.D.,
n = porosity of filter pack, assumed 0.25
r_o = filter pack or borehole O.D.

$r = \sqrt{(0.083\,ft)^2(1-0.25) + (0.25)(0.167\,ft)^2}$
$= 0.110\ ft$

$R = 0.167\ ft$
$L = 8.51\ ft$

$t_o = 6.2\ min$

$$K = \frac{r^2 \ln(L/R)}{2 L t_o}$$

$$= \frac{(0.110\,ft)^2 \ln(8.51\,ft / 0.167\,ft)}{2(8.51\,ft)(6.2\,min)}$$

$K = 4.51 \times 10^{-4}\ ft/min \times 1440\ min/day$

$K = 6.49 \times 10^{-1}\ ft/day \times 1\ cm/s / 2835\ cm/s$

$K = 2.29 \times 10^{-4}\ cm/s$

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C18

PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T254

STATIC WATER LEVEL (Depth/Elevation): 8.95 / TPVC DATE: 3-8-99

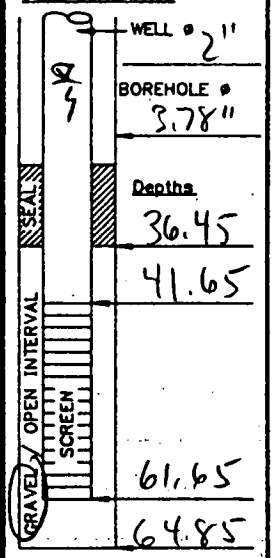
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13' ø x 4.7') PAGE ___ OF ___

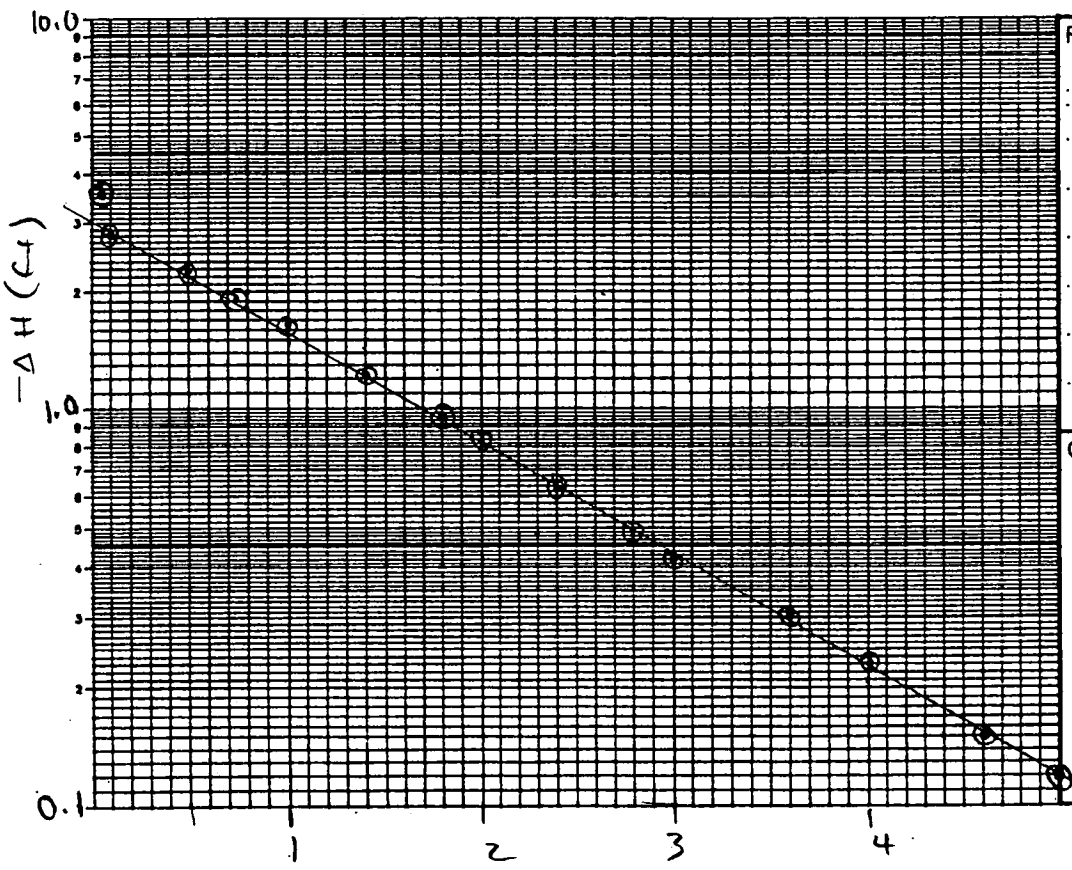
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-3.60	4.00		-0.23
0.10		-2.79	4.60		-0.15
0.50		-2.28	5.00		-0.12
0.75		-1.93	5.60		-0.09
1.00		-1.65			
1.40		-1.23			
1.80		-0.95			
2.00		-0.84			
2.40		-0.63			
2.80		-0.49			
3.00		-0.42			
3.60		-0.30			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD S/N 1670
50 psi
Start @ 1740
Stop @ 1753

CALCS, SKETCH MAPS, ETC.:
file:
06C18 Fall.txt

FUR.
3-30-99

SE1000C
Environmental Logger
03/08 19:53

Unit# 00043 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
T.D.	61800
Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C18
Falling Head Test
06C18FALL.TXT

Step 0 03/08 17:39:54

Elapsed Time	INPUT 1
0.0000	-0.032
0.0033	-0.047
0.0066	-2.192
0.0100	-5.750
0.0133	-5.448
0.0166	-4.828
0.0200	-4.384
0.0233	-4.654
0.0266	-4.526
0.0300	-4.511
0.0333	-4.495
0.0366	-4.479
0.0400	-4.463
0.0433	-4.336
0.0466	-2.795
0.0500	-1.191
0.0533	-3.605
0.0566	-2.986
0.0600	-2.859
0.0633	-2.954
0.0666	-3.113
0.0700	-2.986
0.0733	-2.748
0.0766	-2.938
0.0800	-2.891
0.0833	-2.954
0.0866	-2.763
0.0900	-2.906
0.0933	-2.906
0.0966	-2.938
0.1000	-2.795
0.1033	-2.906
0.1066	-2.954
0.1100	-2.859
0.1133	-2.874
0.1166	-2.795
0.1200	-2.763

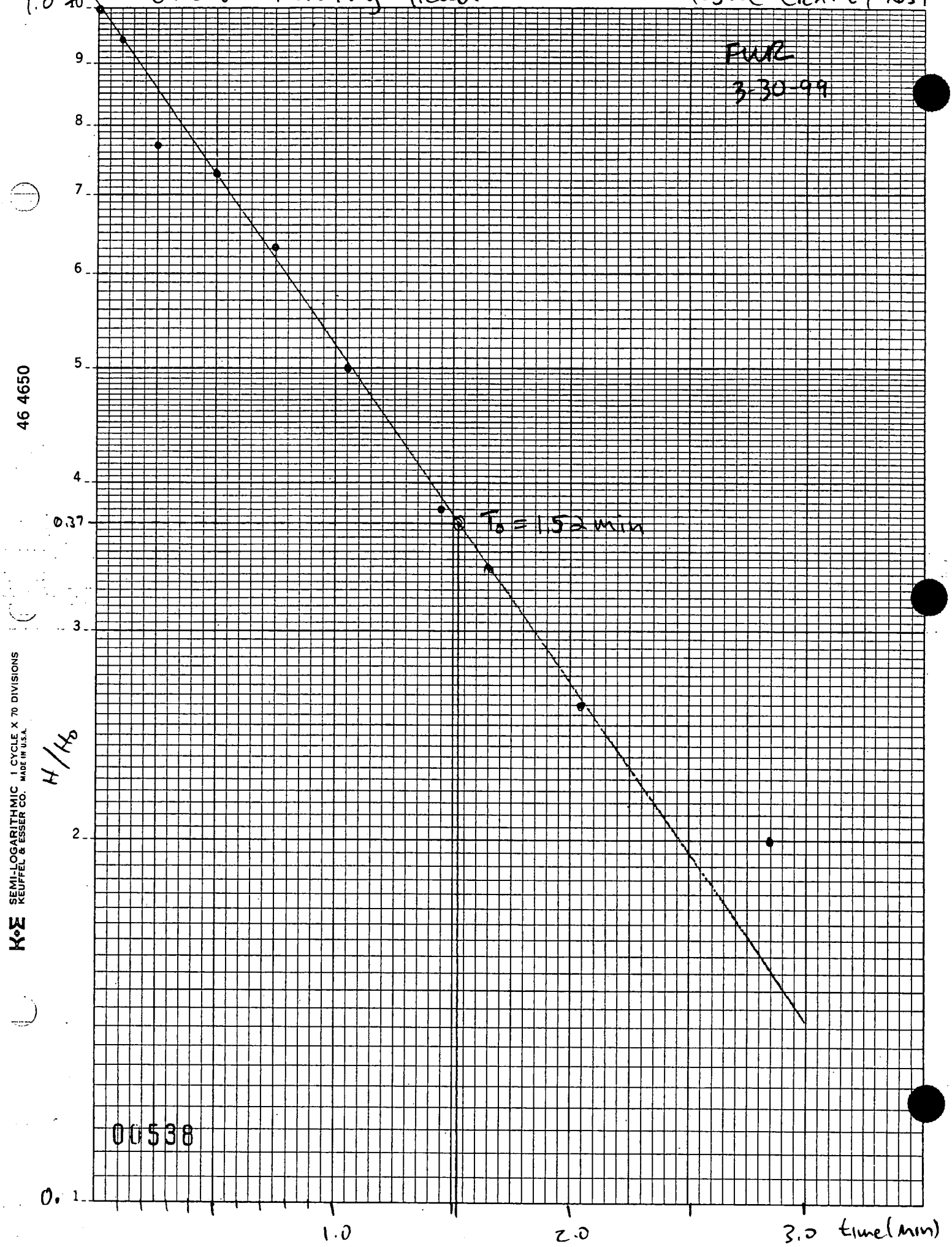
			H/H_0	t
0.1233	-2.859			
0.1266	-2.843			
0.1300	-2.843			
0.1333	-2.843			
0.1366	-2.859			
0.1400	-2.827			
0.1433	-2.922			
0.1466	-2.779			
0.1500	-2.811	← H_0	1.00	0.0000
0.1533	-2.795			
0.1566	-2.795			
0.1600	-2.795			
0.1633	-2.779			
0.1666	-2.779			
0.1700	-2.779			
0.1733	-2.763			
0.1766	-2.763			
0.1800	-2.763			
0.1833	-2.748			
0.1866	-2.748			
0.1900	-2.748			
0.1933	-2.732			
0.1966	-2.732			
0.2000	-2.732			
0.2033	-2.716			
0.2066	-2.716			
0.2100	-2.716			
0.2133	-2.700			
0.2166	-2.700			
0.2200	-2.700			
0.2233	-2.684			
0.2266	-2.684			
0.2300	-2.684			
0.2333	-2.668			
0.2366	-2.668			
0.2400	-2.668			
0.2433	-2.652			
0.2466	-2.652			
0.2500	-2.652		0.94	0.1000
0.2533	-2.636			
0.2566	-2.636			
0.2600	-2.636			
0.2633	-2.620			
0.2666	-2.620			
0.2700	-2.620			
0.2733	-2.605			
0.2766	-2.605			
0.2800	-2.605			
0.2833	-2.589			
0.2866	-2.589			
0.2900	-2.589			
0.2933	-2.573			
0.2966	-2.573			
0.3000	-2.573			
0.3033	-2.557			
0.3066	-2.557			
0.3100	-2.557			
0.3133	-2.557			
0.3166	-2.541			
0.3200	-2.541			

0.3233	-2.541		
0.3266	-2.525		
0.3300	-2.557		
0.3333	-2.525		
0.3500	-2.573		
0.3666	-1.985		
0.3833	-2.446		
0.4000	-2.176	0.77	0.2500
0.4166	-2.398		
0.4333	-2.382		
0.4500	-2.351		
0.4666	-2.334		
0.4833	-2.303		
0.5000	-2.287		
0.5166	-2.255		
0.5333	-2.239		
0.5500	-2.208		
0.5666	-2.176		
0.5833	-2.160		
0.6000	-2.144		
0.6166	-2.128		
0.6333	-2.096		
0.6500	-2.065	0.73	0.5000
0.6666	-2.049		
0.6833	-2.033		
0.7000	-2.001		
0.7166	-1.985		
0.7333	-1.953		
0.7500	-1.937		
0.7666	-1.922		
0.7833	-1.906		
0.8000	-1.874		
0.8166	-1.858		
0.8333	-1.842		
0.8500	-1.826		
0.8666	-1.794		
0.8833	-1.778		
0.9000	-1.763	0.63	0.7500
0.9166	-1.747		
0.9333	-1.731		
0.9500	-1.699		
0.9666	-1.683		
0.9833	-1.668		
1.0000	-1.652		
1.2000	-1.413	0.50	1.0500
1.4000	-1.239		
1.6000	-1.080	0.38	1.4500
1.8000	-0.953	0.34	1.6500
2.0000	-0.842		
2.2000	-0.730	0.26	2.0500
2.4000	-0.635		
2.6000	-0.572		
2.8000	-0.492		
3.0000	-0.429	0.15	2.8500
3.2000	-0.381		
3.4000	-0.333		
3.6000	-0.302	0.11	3.4500
3.8000	-0.270		
4.0000	-0.238		
4.2000	-0.206		

4.4000	-0.191
4.6000	-0.159
4.8000	-0.143
5.0000	-0.127
5.2000	-0.127
5.4000	-0.111
5.6000	-0.095
5.8000	-0.095
6.0000	-0.079
6.2000	-0.079
6.4000	-0.063
6.6000	-0.063
6.8000	-0.063
7.0000	-0.047
7.2000	-0.047
7.4000	-0.047
7.6000	-0.047
7.8000	-0.047
8.0000	-0.047
8.2000	-0.032
8.4000	-0.047
8.6000	-0.047
8.8000	-0.047
9.0000	-0.047
9.2000	-0.047
9.4000	-0.047
9.6000	-0.047
9.8000	-0.047
10.0000	-0.047
12.0000	-0.032

END

06C18 Falling Head NSWC CRANE/7651



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	DGC18 FALLING HEAD TEST		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY TSE	CHECKED BY SLRamsor 3-30-99	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 1.52$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083\ \text{ft})^2 \ln(20.0\ \text{ft}/0.16\ \text{ft})}{2\,(20.0\ \text{ft})\,(1.52\ \text{min})}$$

$K = 5.47 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 7.88 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

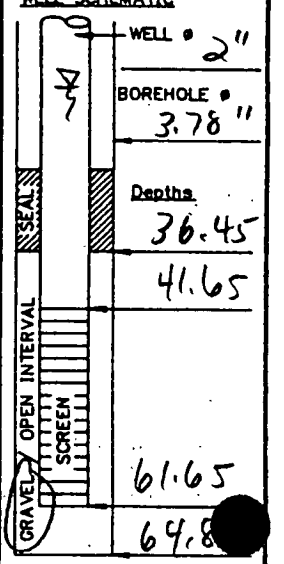
$= 2.78 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

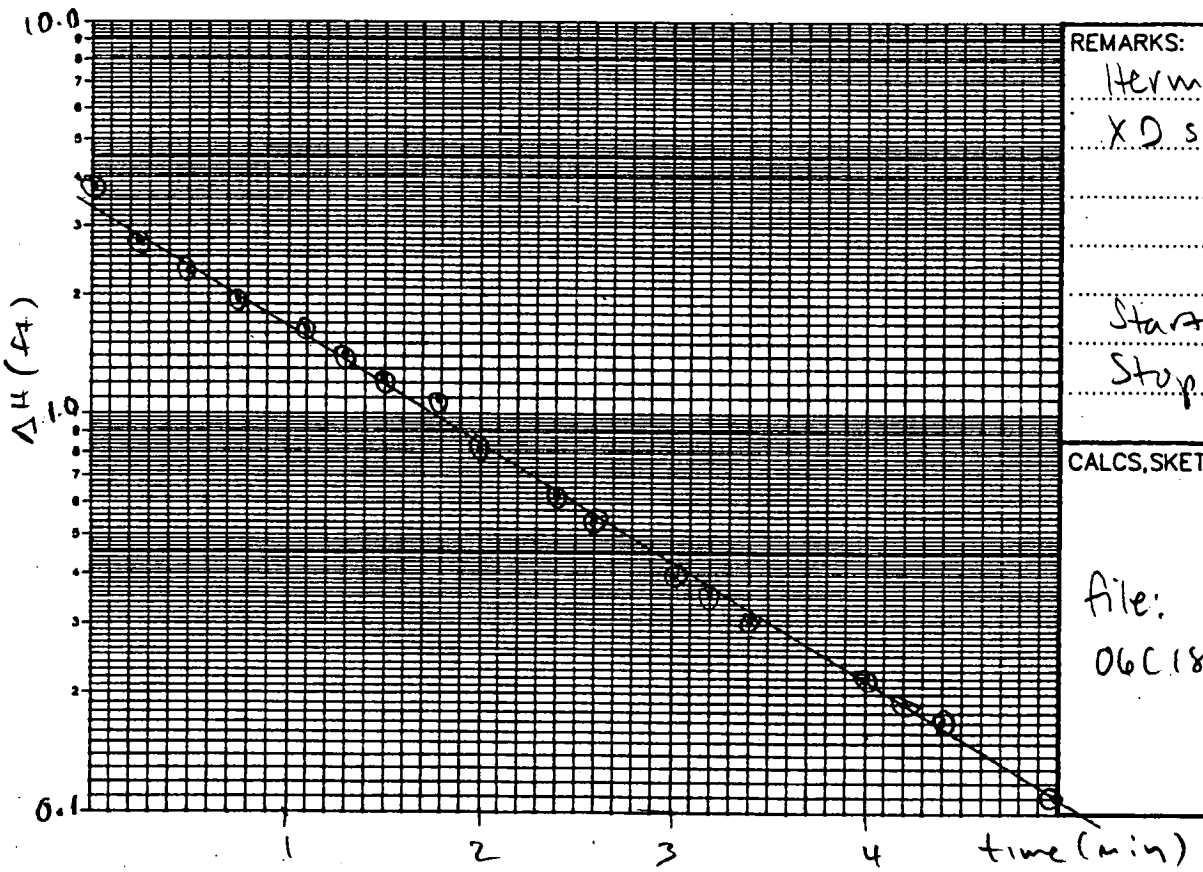
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C18
PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 20.0 ft TEST NO.: T3S0
STATIC WATER LEVEL (Depth/Elevation): 8.95' DATE: 3-8-99
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.13'Ø x 4.7') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.01		3.76	3.20		0.36
0.25		2.74	3.40		0.31
0.50		2.30	4.00		0.22
0.75		1.95	4.20		0.19
1.00		1.65	4.40		0.17
1.20		1.41	5.00		0.11
1.40		1.22			
1.60		1.08			
2.00		0.81			
2.40		0.63			
2.60		0.55			
3.00		0.41			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 143
XD s/N 1670, 50 psi

Start @ 1755
Stop @ 1806

CALCS, SKETCH MAPS, ETC.:

file:
06C18Rise.txt

00540

FLR
3-30-99

SE1000C
Environmental Logger
03/09 07:20

Unit# 00043 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61800

Reference	0.000
Linearity	0.070
Scale factor	50.250
Offset	-0.080
Delay mSEC	50.000

Well # 06C18
RISING HEAD TEST
Ø6C18RISE.txt

Step 0 03/08 17:54:54

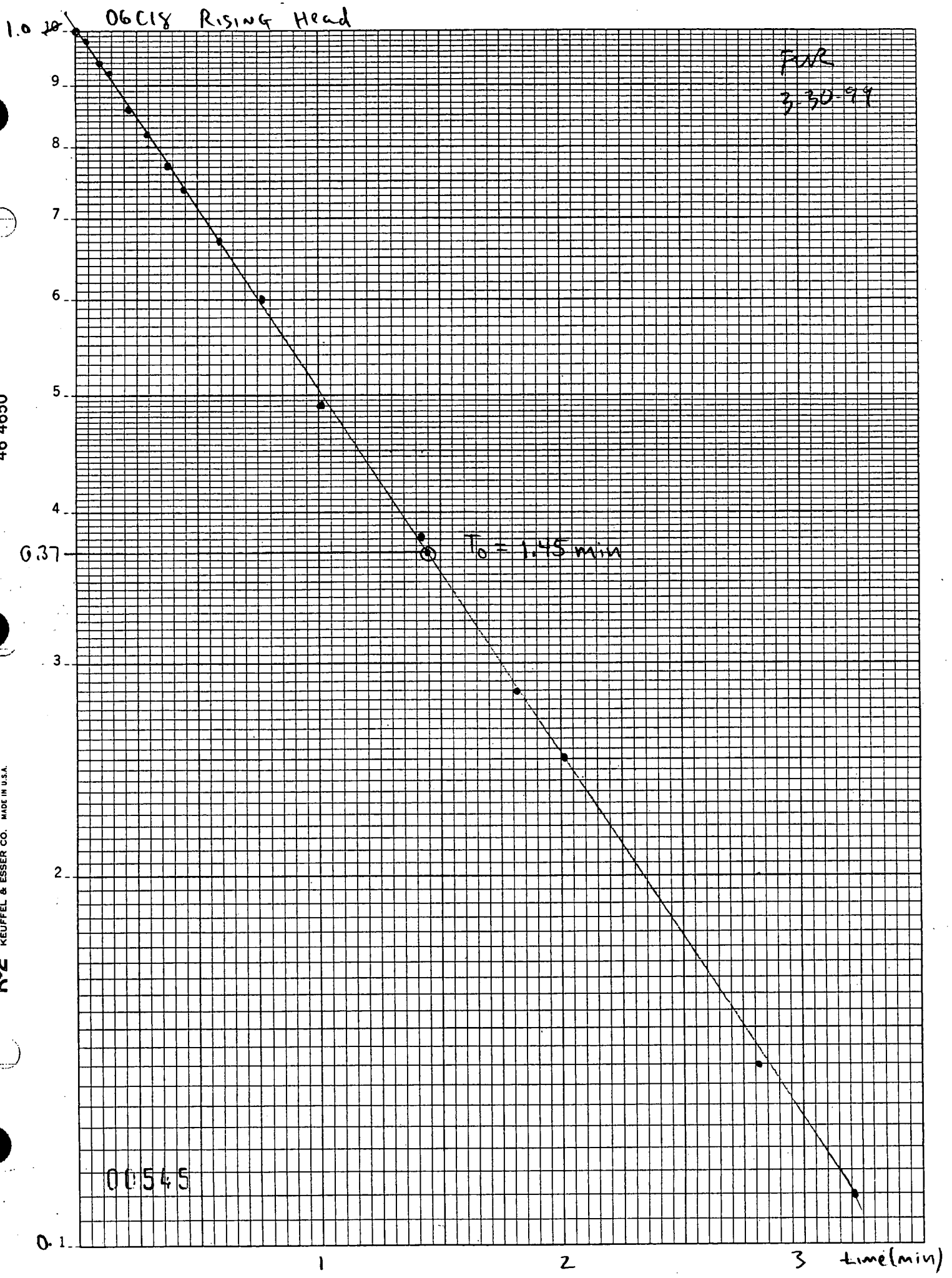
Elapsed Time	INPUT 1
0.0000	0.000
0.0033	0.000
0.0066	2.477
0.0100	6.289
0.0133	3.764
0.0166	3.541
0.0200	3.303
0.0233	3.303
0.0266	3.255
0.0300	3.255
0.0333	3.224
0.0366	3.192
0.0400	3.160
0.0433	3.160
0.0466	3.160
0.0500	3.144
0.0533	3.129
0.0566	3.129
0.0600	3.113
0.0633	3.097
0.0666	3.097
0.0700	3.097
0.0733	3.081
0.0766	3.081
0.0800	3.065
0.0833	3.065
0.0866	3.033
0.0900	3.049
0.0933	3.017
0.0966	3.033
0.1000	3.033
0.1033	3.017
0.1066	3.017

0.1100	3.001			
0.1133	3.001			
0.1166	2.986			
0.1200	2.986			
0.1233	2.986			
0.1266	2.970			
0.1300	2.970			
0.1333	2.954			
0.1366	2.954			
0.1400	2.954			
0.1433	2.938			
0.1466	2.938			
0.1500	2.938			
0.1533	2.922			
0.1566	2.906			
0.1600	2.906			
0.1633	2.906			
0.1666	2.890			
0.1700	2.890			
0.1733	2.890			
0.1766	2.875		H/H_0	t
0.1800	2.875			
0.1833	2.875			
0.1866	2.858	← H_0	1.00	0.0000
0.1900	2.858			
0.1933	2.843			
0.1966	2.843			
0.2000	2.843			
0.2033	2.827			
0.2066	2.827			
0.2100	2.811			
0.2133	2.811			
0.2166	2.811			
0.2200	2.795			
0.2233	2.795			
0.2266	2.795			
0.2300	2.779			
0.2333	2.779			
0.2366	2.763		0.97	0.0500
0.2400	2.763			
0.2433	2.763			
0.2466	2.747			
0.2500	2.747			
0.2533	2.747			
0.2566	2.732			
0.2600	2.732			
0.2633	2.732			
0.2666	2.716			
0.2700	2.716			
0.2733	2.716			
0.2766	2.700			
0.2800	2.700			
0.2833	2.684			
0.2866	2.684		0.94	0.1000
0.2900	2.684			
0.2933	2.668			

0.2966	2.668		
0.3000	2.668		
0.3033	2.652		
0.3066	2.652		
0.3100	2.652		
0.3133	2.636		
0.3166	2.636		
0.3200	2.636		
0.3233	2.620		
0.3266	2.620	0.92	0.1400
0.3300	2.620		
0.3333	2.604		
0.3500	2.557		
0.3666	2.525		
0.3833	2.493		
0.4000	2.461	0.86	0.2134
0.4166	2.446		
0.4333	2.414		
0.4500	2.382		
0.4666	2.366		
0.4833	2.335	0.82	0.2967
0.5000	2.303		
0.5166	2.287		
0.5333	2.255		
0.5500	2.239		
0.5666	2.207	0.77	0.3800
0.5833	2.176		
0.6000	2.160		
0.6166	2.144		
0.6333	2.112	0.74	0.4467
0.6500	2.096		
0.6666	2.064		
0.6833	2.049		
0.7000	2.017		
0.7166	2.001		
0.7333	1.985		
0.7500	1.953		
0.7666	1.937		
0.7833	1.922	0.67	0.5967
0.8000	1.890		
0.8166	1.874		
0.8333	1.858		
0.8500	1.826		
0.8666	1.810		
0.8833	1.795		
0.9000	1.779		
0.9166	1.747		
0.9333	1.731		
0.9500	1.715	0.60	0.7634
0.9666	1.699		
0.9833	1.683		
1.0000	1.651		
1.2000	1.413	0.49	1.0134
1.4000	1.223		
1.6000	1.080	0.38	1.4134
1.8000	0.937		

2.0000	0.810	0.28	1.8134
2.2000	0.714	0.25	2.0134
2.4000	0.635		
2.6000	0.555		
2.8000	0.476		
3.0000	0.413	0.14	2.8134
3.2000	0.365		
3.4000	0.317	0.11	3.2134
3.6000	0.286		
3.8000	0.254		
4.0000	0.222		
4.2000	0.190		
4.4000	0.174		
4.6000	0.143		
4.8000	0.127		
5.0000	0.111		
5.2000	0.095		
5.4000	0.095		
5.6000	0.079		
5.8000	0.079		
6.0000	0.063		
6.2000	0.063		
6.4000	0.047		
6.6000	0.047		
6.8000	0.047		
7.0000	0.047		
7.2000	0.047		
7.4000	0.047		
7.6000	0.047		
7.8000	0.047		
8.0000	0.047		
8.2000	0.047		
8.4000	0.032		
8.6000	0.032		
8.8000	0.032		
9.0000	0.032		
9.2000	0.032		
9.4000	0.032		
9.6000	0.032		
9.8000	0.032		
10.0000	0.032		

END


06C18 Rising Head
FNR
3-30-99
1.0
9
8
7
6
5
4
0.37
3
2
0.1
T_0 = 1.45 min
1
2
3
time(min)
00545
46 4650
K+E SEMI-LOGARITHMIC 1 CYCLE X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	OGC 18 RISING HEAD		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-30-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.16$ ft

$L = 20.0$ ft

$T_0 = 1.45$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(20.0 \text{ ft}/0.16 \text{ ft})}{2(20.0 \text{ ft})(1.45 \text{ min})}$$

$K = 5.73 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 8.26 \times 10^{-1}$ ft/day $\times$ 1 cm/s / 2835 ft/day

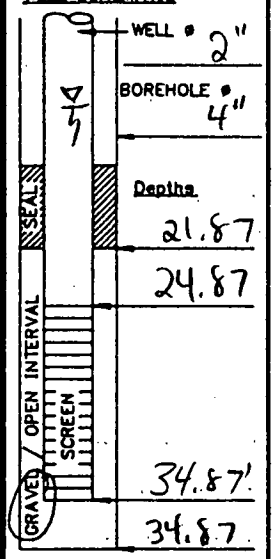
$= 2.91 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

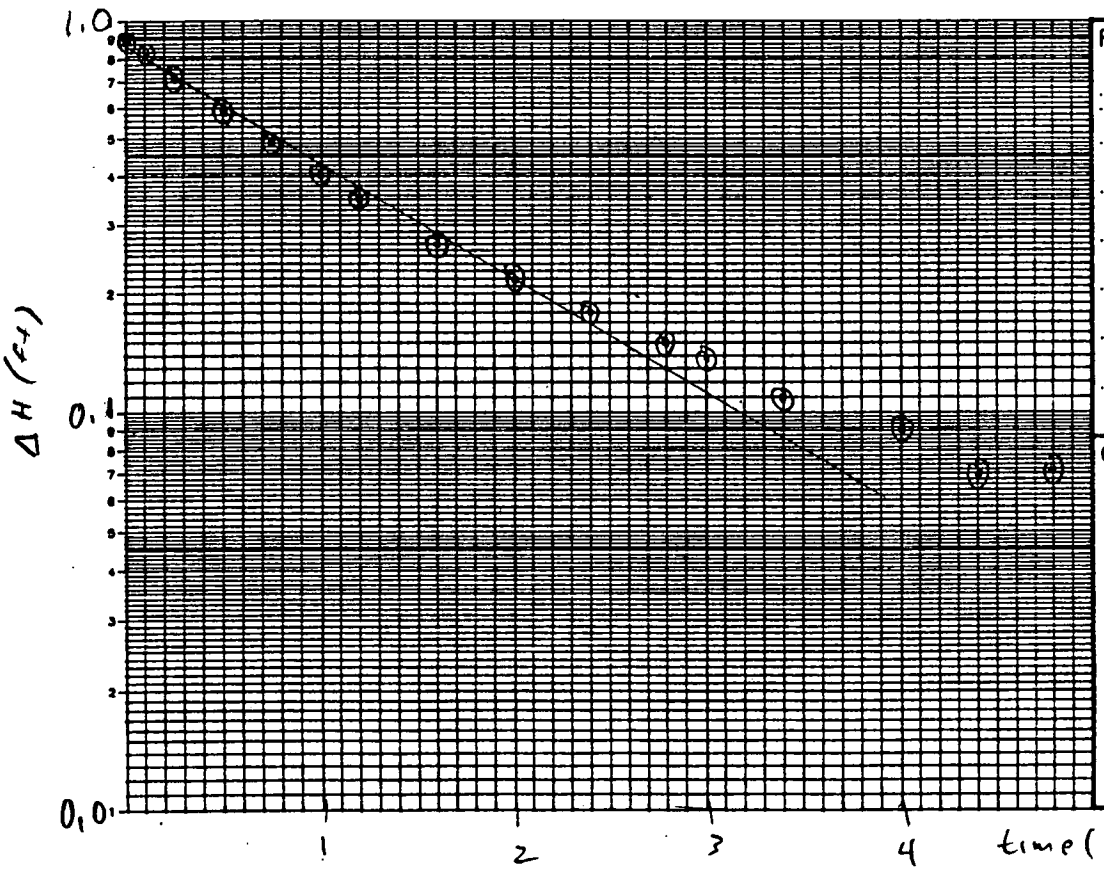
PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C18P2
PROJECT NO.: 7651 GEOLOGIST: T. Evans / K. Simpson
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T250
STATIC WATER LEVEL (Depth/Elevation): 9.02' TOPVC DATE: 3-8-99
TEST TYPE (Rising/Falling/Constant Head): Falling CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø x 2.56') PAGE ... OF ...
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.05		-0.89	3.40		-0.11
0.10		-0.83	4.00		-0.09
0.25		-0.72	4.40		-0.07
0.50		-0.59	4.80		
0.75		-0.49			
1.00		-0.41			
1.20		-0.35			
1.60		-0.27			
2.00		-0.22			
2.40		-0.18			
2.80		-0.15			
3.00		-0.14			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203210
10 psi
H_2O above XD = 5.92'
Start @ 1748
Stop @ 1800

CALCS, SKETCH MAPS, ETC.:
File:
06C18P2 Fall.txt

FWR
3-30-99

SE1000C
Environmental Logger
03/08 19:00

Unit# 00145 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61802
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Well # 06C18P2
Falling Head Test
Ø6 18P2 FALL. TXT

Step 0 03/08 17:47:59

Elapsed Time	INPUT 1
0.0000	-0.024
0.0033	-0.093
0.0066	-1.041
0.0100	-1.799
0.0133	-0.601
0.0166	-0.876
0.0200	-0.059
0.0233	-0.941
0.0266	-1.000
0.0300	-0.926
0.0333	-0.907
0.0366	-0.854
0.0400	-0.876
0.0433	-0.885
0.0466	-0.841
0.0500	-0.898 ← H_0
0.0533	-0.876
0.0566	-0.876
0.0600	-0.866
0.0633	-0.866
0.0666	-0.863
0.0700	-0.854
0.0733	-0.857
0.0766	-0.854
0.0800	-0.851
0.0833	-0.845
0.0866	-0.848
0.0900	-0.841
0.0933	-0.838
0.0966	-0.835
0.1000	-0.838
0.1033	-0.829
0.1066	-0.829
0.1100	-0.826
0.1133	-0.823
0.1166	-0.816
0.1200	-0.823

H/H_0	t
1.00	0.0000
0.96	0.0100
0.93	0.0500

00548

0.1233	-0.810		
0.1266	-0.807		
0.1300	-0.807		
0.1333	-0.804		
0.1366	-0.804		
0.1400	-0.801		
0.1433	-0.795		
0.1466	-0.798		
0.1500	-0.795	0.89	0.1000
0.1533	-0.791		
0.1566	-0.788		
0.1600	-0.788		
0.1633	-0.785		
0.1666	-0.785		
0.1700	-0.776		
0.1733	-0.773		
0.1766	-0.776		
0.1800	-0.773		
0.1833	-0.770		
0.1866	-0.767		
0.1900	-0.767		
0.1933	-0.763		
0.1966	-0.760		
0.2000	-0.754	0.84	0.1500
0.2033	-0.757		
0.2066	-0.751		
0.2100	-0.748		
0.2133	-0.748		
0.2166	-0.751		
0.2200	-0.745		
0.2233	-0.742		
0.2266	-0.742		
0.2300	-0.732		
0.2333	-0.732		
0.2366	-0.738		
0.2400	-0.732		
0.2433	-0.732		
0.2466	-0.729		
0.2500	-0.726	0.81	0.2000
0.2533	-0.723		
0.2566	-0.748		
0.2600	-0.720		
0.2633	-0.710		
0.2666	-0.714		
0.2700	-0.707		
0.2733	-0.710		
0.2766	-0.714		
0.2800	-0.707		
0.2833	-0.704		
0.2866	-0.710		
0.2900	-0.701		
0.2933	-0.704		
0.2966	-0.701		
0.3000	-0.695	0.77	0.2500
0.3033	-0.689		
0.3066	-0.695		
0.3100	-0.695		
0.3133	-0.704		
0.3166	-0.689		
0.3200	-0.689		

0.3233	-0.679		
0.3266	-0.670		
0.3300	-0.676		
0.3333	-0.676		
0.3500	-0.673		
0.3666	-0.657		
0.3833	-0.657		
0.4000	-0.636		
0.4166	-0.636		
0.4333	-0.629		
0.4500	-0.617		
0.4666	-0.608		
0.4833	-0.598		
0.5000	-0.598		
0.5166	-0.583		
0.5333	-0.576		
0.5500	-0.573	0.64	0.5000
0.5666	-0.567		
0.5833	-0.558		
0.6000	-0.548		
0.6166	-0.542		
0.6333	-0.536		
0.6500	-0.530		
0.6666	-0.520		
0.6833	-0.514		
0.7000	-0.505		
0.7166	-0.505		
0.7333	-0.495		
0.7500	-0.492		
0.7666	-0.486		
0.7833	-0.480		
0.8000	-0.477	0.53	0.7500
0.8166	-0.467		
0.8333	-0.461		
0.8500	-0.458		
0.8666	-0.449		
0.8833	-0.445		
0.9000	-0.442		
0.9166	-0.433		
0.9333	-0.427		
0.9500	-0.424		
0.9666	-0.420		
0.9833	-0.411		
1.0000	-0.411	0.46	0.9500
1.2000	-0.355	0.40	1.1500
1.4000	-0.311		
1.6000	-0.277	0.31	1.5500
1.8000	-0.249		
2.0000	-0.227	0.25	1.9500
2.2000	-0.202		
2.4000	-0.187	0.21	2.3500
2.6000	-0.165		
2.8000	-0.152	0.17	2.7500
3.0000	-0.140		
3.2000	-0.127		
3.4000	-0.115	0.13	3.3500
3.6000	-0.115		
3.8000	-0.099	0.11	3.7500
4.0000	-0.096		
4.2000	-0.084		

00550

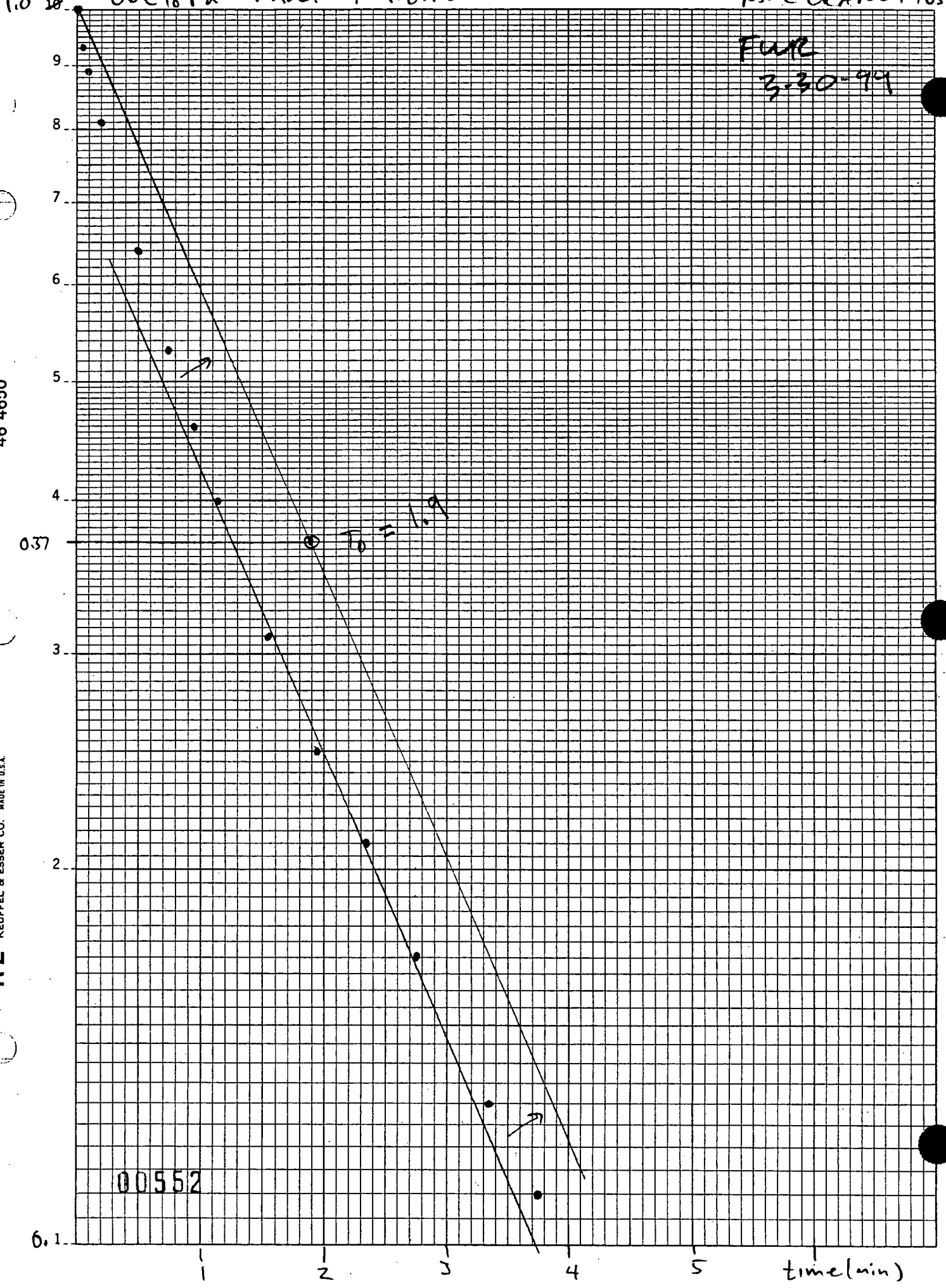
4.4000	-0.077
4.6000	-0.074
4.8000	-0.071
5.0000	-0.065
5.2000	-0.062
5.4000	-0.059
5.6000	-0.052
5.8000	-0.052
6.0000	-0.046
6.2000	-0.046
6.4000	-0.043
6.6000	-0.043
6.8000	-0.040
7.0000	-0.040
7.2000	-0.031
7.4000	-0.021
7.6000	-0.012
7.8000	0.003
8.0000	0.009
8.2000	0.015
8.4000	0.021
8.6000	0.024
8.8000	0.028
9.0000	0.034
9.2000	0.031
9.4000	0.034
9.6000	0.037
9.8000	0.028
10.0000	0.028
12.0000	0.018

END

06C18PA FALLING HEAD

NSWC CRANE/7651

FLARE
3-30-99



00552

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	OGC 18 P2 FALLING HEAD TEST		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY TSE	CHECKED BY 3-30-99	APPROVED BY	DATE

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 1.90$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft} / 0.167 \text{ ft})}{2 (10.0 \text{ ft})(1.90 \text{ min})}$$

$K = 7.42 \times 10^{-4}$ ft/min $\times$ 1440 min/day

$K = 1.07 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 3.77 \times 10^{-4}$ cm/s

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET

PROJECT NAME: NSWC CRANE WELL/BORING NO.: 06C18P2

PROJECT NO.: 7651 GEOLOGIST: T. EVANS / K. SIMPSON

WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10.0' TEST NO.: T35Ø

STATIC WATER LEVEL (Depth/Elevation): 9.02' TPVC DATE: 3-8-99

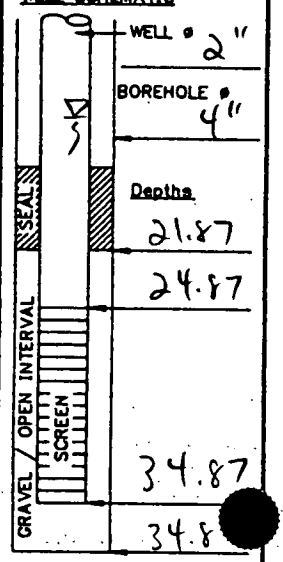
TEST TYPE (Rising/Falling/Constant Head): RISING CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Slug (0.10'Ø X 2.56') PAGE ... OF ...

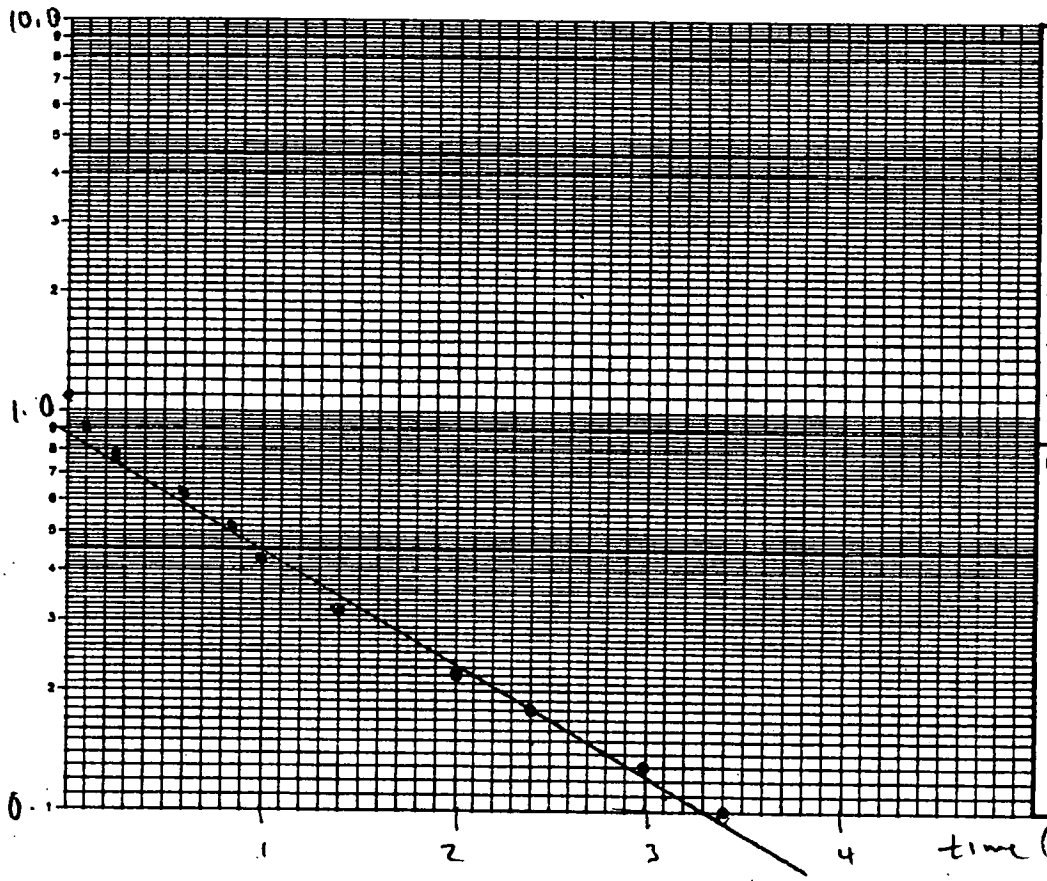
REFERENCE PT. FOR WL MEAS. (Top of Casing, Transducer, etc.): TOC

ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)	ELAPSED TIME (min. or sec.)	MEASURED WATER LEVEL (feet)	DRAWDOWN OR HEAD (ΔH) (feet)
0.03		1.10	1		
0.10		0.90			
0.25		0.78			
0.50		0.63			
0.75		0.52			
1.00		0.43			
1.40		0.32			
2.00		0.22			
2.40		0.18			
3.00		0.13			
3.40		0.10			
4.00		0.08			

WELL SCHEMATIC



▽ Indicate SWL Depth on Drawing



REMARKS:
Hermit # 145
XD S/N 203210
10 psi
H_2O above XD=5.92
Start @ 1801
Stop @ 1814

CALCS, SKETCH MAPS, ETC.:
file:
06C18P2 Rise.txt

00554

FWK
3-30-99

SE1000C
Environmental Logger
03/08 19:03

Unit# 00145 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	61802
Reference	0.000
Linearity	0.040
Scale factor	9.870
Offset	-0.010
Delay mSEC	50.000

Step 0 03/08 18:01:29

Well # 06C18P2
Rising Head Test
06C18P2 RISE.TXT

Elapsed Time	INPUT 1		
0.0000	-0.003		
0.0033	0.857		
0.0066	0.754		
0.0100	0.819		
0.0133	1.125		
0.0166	1.053		
0.0200	1.044		
0.0233	1.019		
0.0266	0.991	H/H_0	t
0.0300	1.019		
0.0333	1.100 ← H_0	1.00	0.0000
0.0366	1.028		
0.0400	0.978		
0.0433	0.969	0.88	0.0100
0.0466	0.966		
0.0500	0.960		
0.0533	0.956	0.87	0.0200
0.0566	0.950		
0.0600	0.947		
0.0633	0.941		
0.0666	0.941		
0.0700	0.935		
0.0733	0.932		
0.0766	0.928		
0.0800	0.925		
0.0833	0.922	0.84	0.0500
0.0866	0.919		
0.0900	0.916		
0.0933	0.910		
0.0966	0.910		
0.1000	0.907		
0.1033	0.903		
0.1066	0.897		
0.1100	0.897		
0.1133	0.891	0.81	0.0800
0.1166	0.891		
0.1200	0.885		

0.1233	0.882		
0.1266	0.879		
0.1300	0.875		
0.1333	0.872	0.79	0.1000
0.1366	0.872		
0.1400	0.866		
0.1433	0.863		
0.1466	0.857		
0.1500	0.863		
0.1533	0.857		
0.1566	0.854		
0.1600	0.850		
0.1633	0.847	0.77	0.1300
0.1666	0.844		
0.1700	0.844		
0.1733	0.838		
0.1766	0.835		
0.1800	0.835		
0.1833	0.829	0.75	0.1500
0.1866	0.832		
0.1900	0.826		
0.1933	0.826		
0.1966	0.819		
0.2000	0.819		
0.2033	0.816		
0.2066	0.813		
0.2100	0.810		
0.2133	0.810		
0.2166	0.807		
0.2200	0.804		
0.2233	0.797		
0.2266	0.801		
0.2300	0.791		
0.2333	0.791	0.72	0.2000
0.2366	0.791		
0.2400	0.791		
0.2433	0.788		
0.2466	0.788		
0.2500	0.782		
0.2533	0.779		
0.2566	0.776		
0.2600	0.773		
0.2633	0.769		
0.2666	0.769		
0.2700	0.766		
0.2733	0.763		
0.2766	0.763		
0.2800	0.760		
0.2833	0.757	0.69	0.2500
0.2866	0.757		
0.2900	0.757		
0.2933	0.754		
0.2966	0.748		
0.3000	0.748		
0.3033	0.744		
0.3066	0.744		
0.3100	0.738		
0.3133	0.741		
0.3166	0.738		
0.3200	0.732		

0.3233	0.735		
0.3266	0.732		
0.3300	0.729		
0.3333	0.726		
0.3500	0.716		
0.3666	0.701		
0.3833	0.695	0.63	0.3500
0.4000	0.682		
0.4166	0.676		
0.4333	0.667		
0.4500	0.654		
0.4666	0.651		
0.4833	0.639		
0.5000	0.632		
0.5166	0.623		
0.5333	0.617	0.56	0.5000
0.5500	0.604		
0.5666	0.595		
0.5833	0.589		
0.6000	0.579		
0.6166	0.576		
0.6333	0.564		
0.6500	0.557		
0.6666	0.551		
0.6833	0.542		
0.7000	0.539		
0.7166	0.529		
0.7333	0.526	0.48	0.7000
0.7500	0.520		
0.7666	0.511		
0.7833	0.505	0.46	0.7500
0.8000	0.498		
0.8166	0.495		
0.8333	0.486		
0.8500	0.480		
0.8666	0.480		
0.8833	0.473		
0.9000	0.464		
0.9166	0.458		
0.9333	0.451		
0.9500	0.448		
0.9666	0.439		
0.9833	0.439		
1.0000	0.436	0.40	0.9667
1.2000	0.364		
1.4000	0.324	0.29	1.3667
1.6000	0.283		
1.8000	0.255		
2.0000	0.224	0.20	1.9667
2.2000	0.205		
2.4000	0.180		
2.6000	0.162	0.15	2.5667
2.8000	0.146		
3.0000	0.134	0.12	2.9667
3.2000	0.121		
3.4000	0.109		
3.6000	0.096		
3.8000	0.090		
4.0000	0.087		
4.2000	0.071		

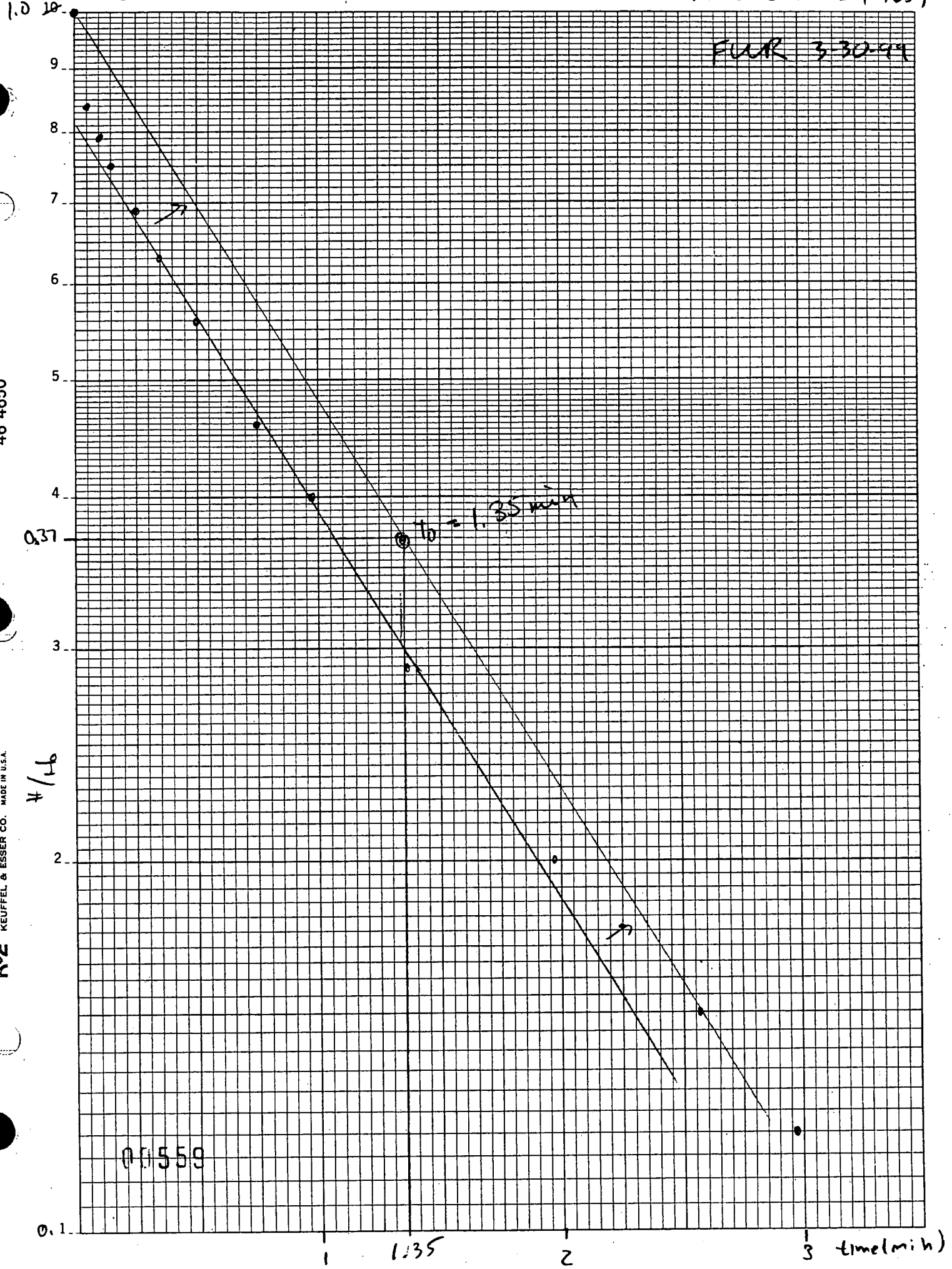
4.4000	0.065
4.6000	0.065
4.8000	0.056
5.0000	0.049
5.2000	0.049
5.4000	0.046
5.6000	0.043
5.8000	0.037
6.0000	0.031
6.2000	0.034
6.4000	0.034
6.6000	0.031
6.8000	0.024
7.0000	0.028
7.2000	0.021
7.4000	0.034
7.6000	0.031
7.8000	0.028
8.0000	0.031
8.2000	0.031
8.4000	0.028
8.6000	0.031
8.8000	0.021
9.0000	0.015
9.2000	0.006
9.4000	0.003
9.6000	-0.006
9.8000	-0.009
10.0000	-0.015
12.0000	-0.028

END

06C18P2 RISING HEAD

NSWC CRANE / 7651

FLAR 3-30-99



TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT	NSWC CRANE	JOB NUMBER	7651
SUBJECT	06C18P2 RISING HEAD TEST		
BASED ON	HVORSLEV (1951)	DRAWING NUMBER	
BY	TSE	CHECKED BY	3-30-99
APPROVED BY		DATE	

$r = 0.083$ ft

$R = 0.167$ ft

$L = 10.0$ ft

$T_0 = 1.35$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

$$K = \frac{(0.083 \text{ ft})^2 \ln(10.0 \text{ ft} / 0.167 \text{ ft})}{2 (10.0 \text{ ft})(1.35 \text{ min})}$$

$K = 1.04 \times 10^{-3}$ ft/min $\times$ 1440 min/day

$K = 1.50 \times 10^{0}$ ft/day $\times$ 1 cm/s / 2835 ft/day

$= 5.29 \times 10^{-4}$ cm/s