APPENDIX 3.5-H

Geologic Logs, Soil Test Data, Well Construction Diagrams, and Well Development Forms for Groundwater Modeling, 1988

LOG OF TEST BORING NO.: PZ-1007S

CLIENT: Kennecott
PROJECT: Groundwater Modeling
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 42939.60 N 41271.95 E

SURFACE ELEVATION: 1153.2
BORING DEPTH: 64.6'
DATE: 11/07/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1098.2	--55	55.0-56.5	SS	11	100	0.4	Lt ol brn(2.5Y 5/4) poorly graded SAND w/silt w/grvl. less cemented (Sandstone)		%g - s - si&cl 4 -87 - 9	
								SP-SM (SS)		
1093.2	--60	60.0-61.5	SS	12	100	0.4	Whitish grey poorly graded SAND w/silt w/grvl, less cemented, brn band			
		64.0-64.6	SS	13	100	0.4	Red, yellow, white SILT, brittle to plastic, vertical fracturing, (altered rock)	ML		
1088.2	--65						End of Boring at 64.6 feet			
1083.2	--70									
1078.2	--75									
1073.2	--80									
1068.2	--85									
1063.2	--90									
1058.2	--95									
1053.2	--100									
1048.2	--105									
1043.2	--110									

DRILLING DATA

START DATE: 11/07/88
COMPLETION DATE: 11/07/88
LOGGED BY: FJD
DRILLING METHOD: HSA to 50', Mud rotary to 65'.
DRILLING CONTRACTOR: Wisconsin Test Drilling

WATER LEVEL INFORMATION

DEPTH AT COMPLETION: NA
LATER TIME/DEPTH: NA
LATER TIME/DEPTH: NA
CAVE IN DEPTH: NA
DRILLING LOSSES: NA

Foth & Van Dyke and Associates Inc.
2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Monitoring Well - Soil Sample
Groundwater Modeling

SCOPE I.D. #: 87K10
DATE TYPED: 12/7/88

REPORTED TO: Kennecott

REPORT NUMBER: 1

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1007S
SAMPLE NUMBER: 11
DEPTH OF SAMPLE: 55-56.5'
SAMPLED BY: Fred Doran of F&VD

DATE SAMPLED: 11/07/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 2.5 Y. 5/4

LABORATORY DATA:

DATE TESTED: 11/23/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kepler

24 HRS. TURN AROUND ____YES __X__NO
WASHED GRADATION __X__YES ____NO
WEIGHT OF TEST SAMPLE 238.9 GRAMS

SIEVE SIZE	WEIGHT RETAINED (gms)	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½					
1					
3/4	0	0	100		
1/2	1.8	0.7	99.3		
3/8	1.1	0.5	98.8		
#4	7.1	3.0	95.8		
10	4.9	2.1	93.7		
40	91.8	38.4	55.3		
100	85.3	35.7	19.6		
200	25.7	10.8	8.8		
PAN	21.3	8.9			

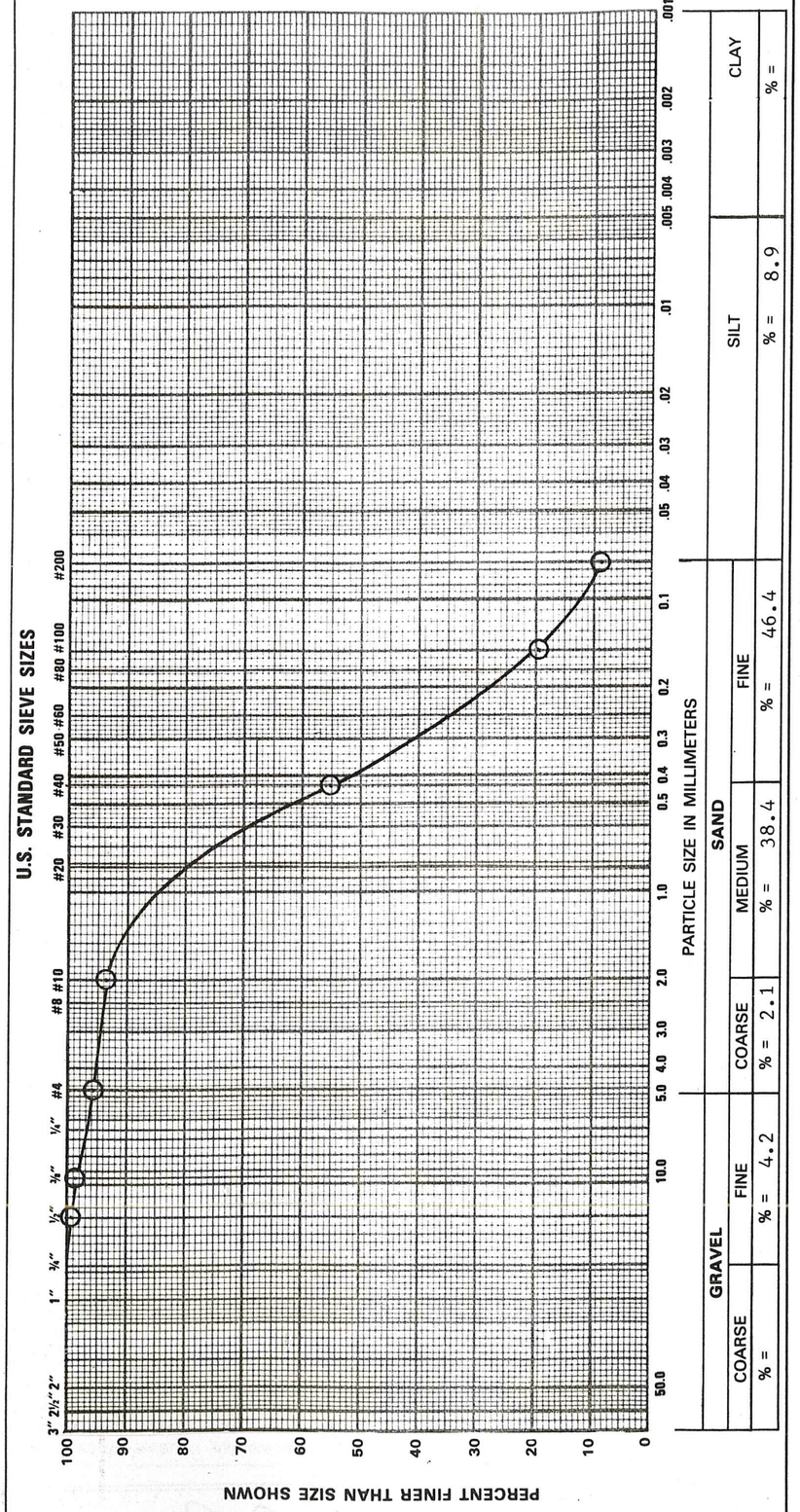
REMARKS:

FORM #329 SLB (Rev. 4/88)

 BY: Robert R. Rouse

Foth and Van Dyke Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE



PROJECT: Kennecott Groundwater

LOCATION SAMPLED: Boring: PZ-1007S - Sample No. 11 ELEV. OR DEPTH: 55-56.5' DRAWN BY: POK APPROVED BY: RRR

ATTERBERG LIMITS: LL PL PI SAMPLED MOISTURE CONTENT (%): 13.3 COEFFICIENTS: Cc = 5.8 Cu = 1.2

SAMPLE SOURCE: MUNSELL COLOR CODE: 2.5 Y. 5/4 DATE SAMPLED: 11/7/88

SOIL CLASSIFICATION (ASTM: D2487) SAND W/SILT, fine to medium grained, a little gravel, light olive brown (SP-SM)

DATE: 11/29/88 SAMPLE NO.: 1

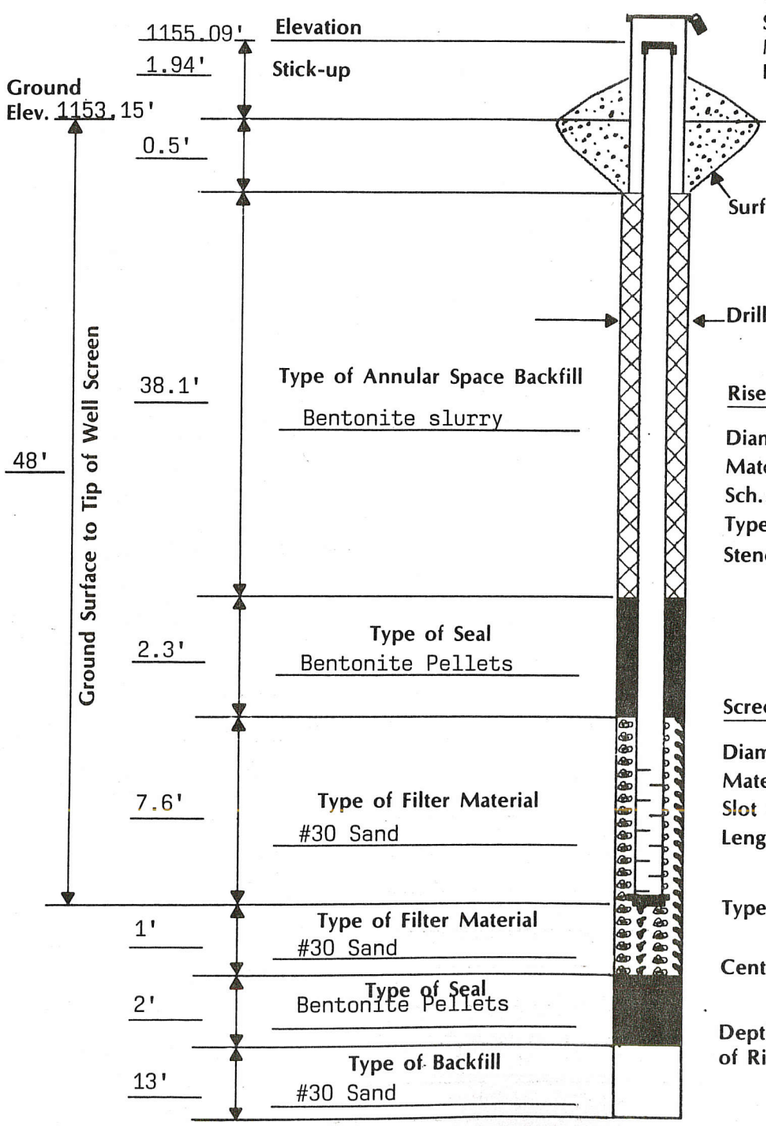
FORM #411 SL (2/87)

Foth & Van Dyke

Client: Kennecott Scope I.D.: 87K10
Project: Groundwater Modeling Page: 1 of 1
Prepared by: KAD Date: 1
Checked by: BJS Date: 12/2/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Wisconsin Test Drilling, Inc. Well No: PZ-1007S
Drilling Method: HSA to 60', Mud Rotary to 64' Date Installed: 11/8/88
Coordinates: N 42,939.60 E 41,312.37



Protector Pipe:
Size: 4"
Material: Steel
Lock No.: 2121

Riser:
Diameter: 2"
Material: PVC
Sch.: 40
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: _____

NOTE: Not to Scale

Foth & Van Dyke

Client: Kennecott Scope I.D.: 87K10
Project: Groundwater Modeling Page: 1
Prepared by: L.E. (WTD) Date: 11-11-88
Checked by: BJS Date: 12-20-88

MONITORING WELL DEVELOPMENT

Well Number: PZ-1007S
Well Diameter: 2"
Total Depth of Well: 48.0'

Depth to Water:
Initial: 39.2 '
Final: 43.9 '

Time of Measurement:

Description of Development Method:

Bailed and surged with hand bailer.
Bailed dry.

Volume of Water Removed From Well: 2 gallons
Clarity of Water in Well Before Development: Muddy
Clarity of Water in Well After Development: Muddy
Presence of Sediment at the Bottom of the Well: --
Volume of Water Added to Well: None
Source of Water Added to Well: --
Time Spent for Development: 0.5 Hours

Stabilization Readings:

Gal. Removed	Depth to Water	Time	Field Temperature	Spec. Cond.	pH

LOG OF TEST BORING NO.: PZ-1008, 1008G
CLIENT: Kennecott
PROJECT: Groundwater Modeling
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 39026.39 N 41362.47 E

SURFACE ELEVATION: 1145.4'
BORING DEPTH: 56.5'
DATE: 11/09/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1145.4	--0						Cuttings - red br SILT, tr clay and fgr sand, fgr grvl, dry, med dense	ML		
1140.4	--5	5.0-6.5	SS	1	36	1.5	Red br silty fgr SAND, tr fgr-cgr grvl, dry to damp, dense			
1135.4	--10	10.0-11.5	SS	2	52	1.5	Same as above, damp, dense			
1130.4	--15	15.0-16.5	SS	3	100	0.1	Rock in tip of sampler - grey blue quartzite, sugary texture, fine-grained, erratic boulder			
1125.4	--20	20.0-21.5	SS	4	36	1.5	Same as 10.0-11.5', damp, dense	SM		
1120.4	--25	25.0-26.5	SS	5	12	1.3	Same as above only fgr-mgr SAND w/ cgr sand, tr fgr-cgr grvl, wet, soft			
1115.4	--30	30.0-31.5	SS	6	16	1.2	Same as above, wet, soft Dk red brn (5YR 3/3)		%g -s -si -cl 8-62 -20 -10	
1110.4	--35	35.0-36.5	SS	7	16	1.1	Same as above only grey colored in spots, wet, soft			
1105.4	--40	40.0-41.5	SS	8	38	1.0	Top 6" Same as above. Next 6" Blk (5Y 2.5/1)fat CLAY, w/tr lt colored (qtz) s, med, w/disseminated organics (organic smell), then dk gray (5Y 3/1)fat CLAY, w/fn crumbly texture, moist, stiff (paleosol)	CH		
1100.4	--45	45.0-46.5	SS	9	100/.9	0.9	Dk gry (5Y 3/1) clayey SAND/GRAVEL w/med & cses, fn & cse grl, well rounded,some wea, pink granite, greenstone, red volc,basalt, clay skins around grl (weathered surf.)	SC/GC		
1095.4	--50	50.0-51.5	SS	10	32	1.0	V dk grey (10YR 3/2),poorly graded SAND,w/ fgr-cgr grvl, wet, some well rounded grains, mixed lithologies	SP	%g -s -si&cl 18 -78- 4	
1090.4	--55									

DRILLING DATA
START DATE: 11/09/88
COMPLETION DATE: 11/09/88
LOGGED BY: KAD
DRILLING METHOD: HSA to 50', mud rotary from 50' to 56.5'
DRILLING CONTRACTOR: Wisconsin Test Drilling

WATER LEVEL INFORMATION
DEPTH AT COMPLETION: NA
LATER TIME/DEPTH: NA
LATER TIME/DEPTH: NA
CAVE IN DEPTH: NA
DRILLING LOSSES: NA

LOG OF TEST BORING NO.: PZ-1008, 1008G

CLIENT: Kennecott
PROJECT: Groundwater Modeling
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 39026.39 N 41362.47 E

SURFACE ELEVATION: 1145.4'
BORING DEPTH: 56.5'
DATE: 11/09/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1090.4	--55						Blue green weathered bedrock, greasy" from chlorite, schistose,	ML		
		55.0-56.5	SS	11	70	1.2	soft, wet			
							End of boring at 56.5'			
1085.4	--60									
1080.4	--65									
1075.4	--70									
1070.4	--75									
1065.4	--80									
1060.4	--85									
1055.4	--90									
1050.4	--95									
1045.4	--100									
1040.4	--105									
1035.4	--110									

DRILLING DATA

START DATE: 11/09/88
COMPLETION DATE: 11/09/88
LOGGED BY: KAD
DRILLING METHOD: HSA to 50', then mud rotary to 56.5'
DRILLING CONTRACTOR: Wisconsin Test Drilling

WATER LEVEL INFORMATION

DEPTH AT COMPLETION: NA
LATER TIME/DEPTH: NA
LATER TIME/DEPTH: NA
CAVE IN DEPTH: NA
DRILLING LOSSES: NA

Foth & Van Dyke and Associates Inc.
2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Monitoring Well - Soil Sample
Groundwater Modeling

SCOPE I.D. #: 87K10
DATE TYPED: 12/7/88

REPORTED TO: Kennecott

REPORT NUMBER: 2

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1008G
SAMPLE NUMBER: 6
DEPTH OF SAMPLE: 30-31.5'
SAMPLED BY: Fred Doran of F&VD

DATE SAMPLED: 11/08/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 5 YR. 3/3

LABORATORY DATA:

DATE TESTED: 11/23/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kepler

24 HRS. TURN AROUND ___YES _X_NO
WASHED GRADATION _X_YES ___NO
WEIGHT OF TEST SAMPLE 171.2 GRAMS

SIEVE SIZE	WEIGHT RETAINED (gms)	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½					
1					
3/4					
1/2	0	0	100		
3/8	4.2	2.5	97.5		
#4	9.7	5.7	91.8		
10	9.3	5.4	86.4		
40	31.7	18.5	67.9		
100	48.8	28.5	39.4		
200	17.0	9.9	29.5		
PAN	50.6	29.6			

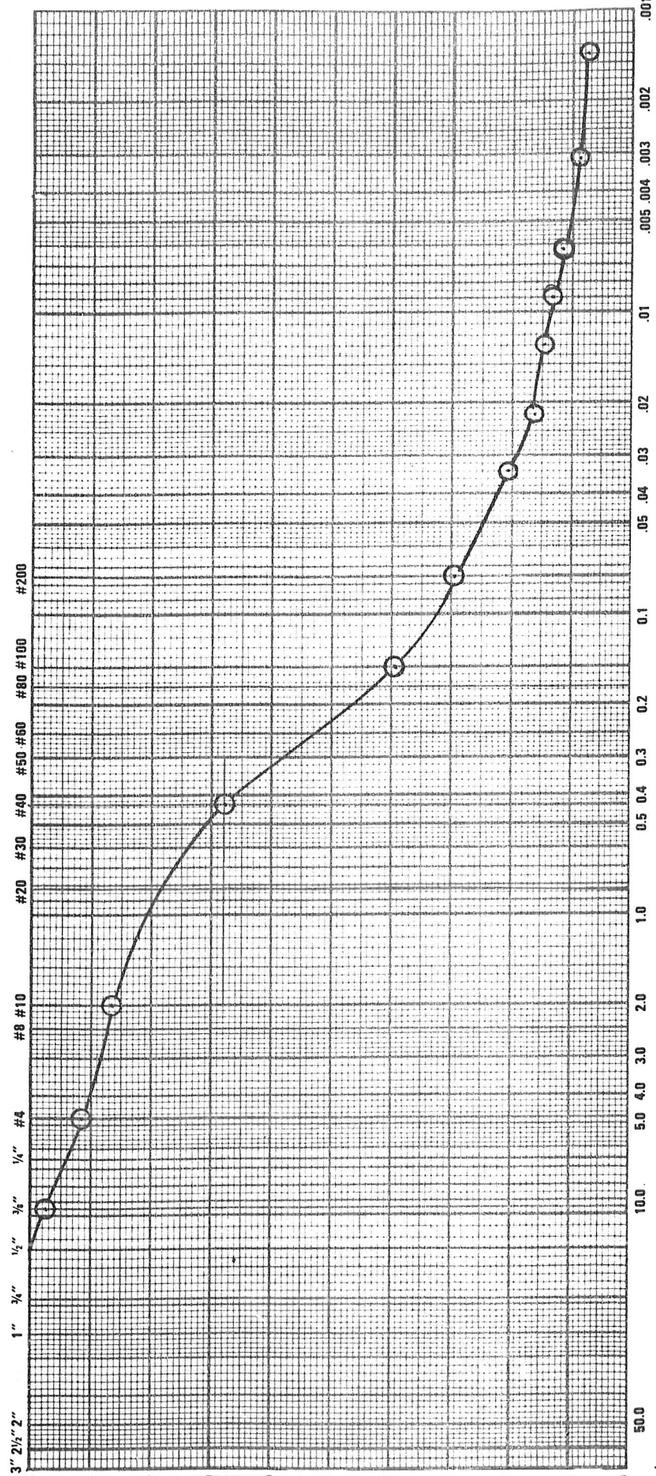
REMARKS:

FORM #329 SLB (Rev. 4/88)

BY: Robert R. Rouse

Foth & Van Dyke and Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE



PROJECT: Kennecott Groundwater

LOCATION SAMPLED: Boring: PZ-1008G - Sample No. 6 ELEV. OR DEPTH: 30-31.5' DRAWN BY: POK APPROVED BY: RRR

ATTERBERG LIMITS: LL ____ PL ____ PI ____ SAMPLED MOISTURE CONTENT (%): 11.4 COEFFICIENTS: Cc = ____ Cu = ____

SAMPLE SOURCE: ____ MUNSELL COLOR CODE: 5 YR. 3/3 DATE SAMPLED: 11/8/88

SOIL CLASSIFICATION (ASTM: D2487) SILTY SAND, fine to medium grained, a little gravel, dark reddish brown (SM)

DATE: 11/29/88 SAMPLE NO.: 2

FORM #411 SL (2/87)

Foth & Van Dyke and Associates Inc.

2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Monitoring Well - Soil Sample
Groundwater Modeling

REPORTED TO: Kennecott

SCOPE I.D. #: 87K10
DATE TYPED: 12/7/88
REPORT NUMBER: 3

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1008G
SAMPLE NUMBER: 10
DEPTH OF SAMPLE: 50.0'
SAMPLED BY: Fred Doran of F&VD

DATE SAMPLED: 11/08/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 10 YR. 3/2

LABORATORY DATA:

DATE TESTED: 11/23/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kaplan

24 HRS. TURN AROUND ____YES __X__NO
WASHED GRADATION __X__YES ____NO
WEIGHT OF TEST SAMPLE 245.7 GRAMS

SIEVE SIZE	WEIGHT RETAINED (gms)	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½					
1					
3/4	0	0	100		
1/2	9.6	3.9	96.1		
3/8	18.6	7.6	88.5		
#4	17.0	6.9	81.6		
10	29.7	12.1	69.5		
40	109.3	44.5	25.0		
100	45.9	18.7	6.3		
200	5.2	2.1	4.2		
PAN	10.0	4.1			

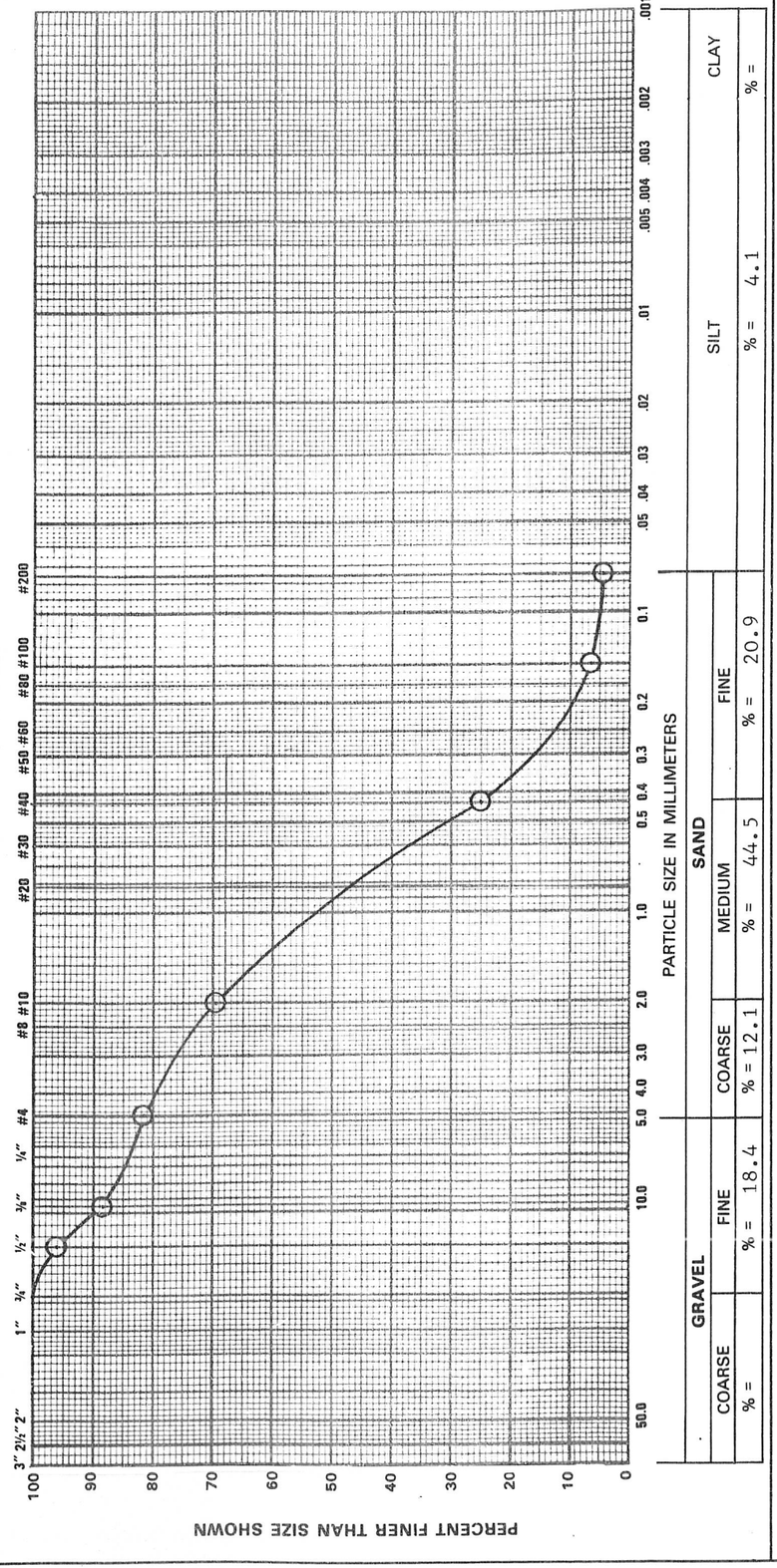
REMARKS:

FORM #329 SLB (Rev. 4/88)

3.5-H-BY: Robert R. Rouse

Foth and Van Dyke and Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE



PROJECT: Kennecott Groundwater

LOCATION SAMPLED: Boring: PZ-1008 - Sample No. 10 ELEV. OR DEPTH: 50.0' DRAWN BY: POK APPROVED BY: RRR

ATTERBERG LIMITS: LL PL PI SAMPLED MOISTURE CONTENT (%): 14.2 COEFFICIENTS: Cc = 0.9 Cu = 6.3

SAMPLE SOURCE: MUNSELL COLOR CODE: 10 YR. 3/2 DATE SAMPLED: 11/8/88

SOIL CLASSIFICATION (ASTM: D2487) SAND W/GRAVEL, medium to fine grained, very dark grayish brown (SP)

DATE: 11/29/88 SAMPLE NO.: 3

FORM #411 SL (2/87)

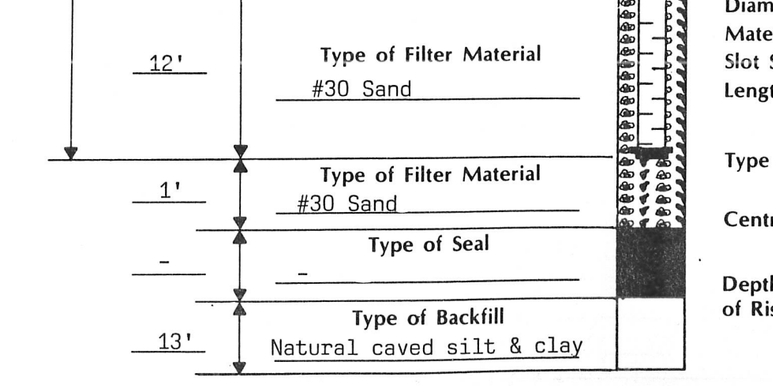
Foth & Van Dyke

Client: Kennecott Scope I.D.: 87K10
Project: Groundwater Modeling Page: 1
Prepared by: KAD Date: 11/10/88
Checked by: BJS Date: 12/5/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Wisconsin Test Drilling, Inc.
Drilling Method: Hollow stem augers to 50', mud rotary 50-55'
Coordinates: N 39028.36 E 41356.68

Well No: PZ-1008
Date Installed: 11/10/88



Protector Pipe:
Size: 4"
Material: Steel
Lock No.:

Surface Seal Material: Cement

Drill Hole Diameter: 8"

Type of Annular Space Backfill: -

Type of Seal: Bentonite Pellets

Type of Filter Material: #30 Sand

Type of Filter Material: #30 Sand

Type of Seal: -

Type of Backfill: Natural caved silt & clay

Riser:
Diameter: 2"
Material: PVC
Sch.: 40
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 10'

Type of Cap: PVC

Centralizer: Used ☐ Not Used ☑

Depth to Water From Top of Riser at Completion: -

NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: L.E. (WTD) — Date: 11-11-88
Checked by: BJS — Date: 12-20-88

MONITORING WELL DEVELOPMENT

Well Number: PZ-1008
Well Diameter: 2"
Total Depth of Well: 17.0'

Depth to Water:
Initial: 10.6'
Final: 15.1'

Time of Measurement:

Description of Development Method:

Bailed and surged with hand bailer.
Bailed dry.

Volume of Water Removed From Well: 6 gallons
Clarity of Water in Well Before Development: Muddy
Clarity of Water in Well After Development: Muddy
Presence of Sediment at the Bottom of the Well: --
Volume of Water Added to Well: None
Source of Water Added to Well: --
Time Spent for Development: 0.5 Hours

Stabilization Readings:

Gal. Removed	Depth to Water	Time	Field Temperature	Spec. Cond.	pH

FORM #449 GEM (5/88)

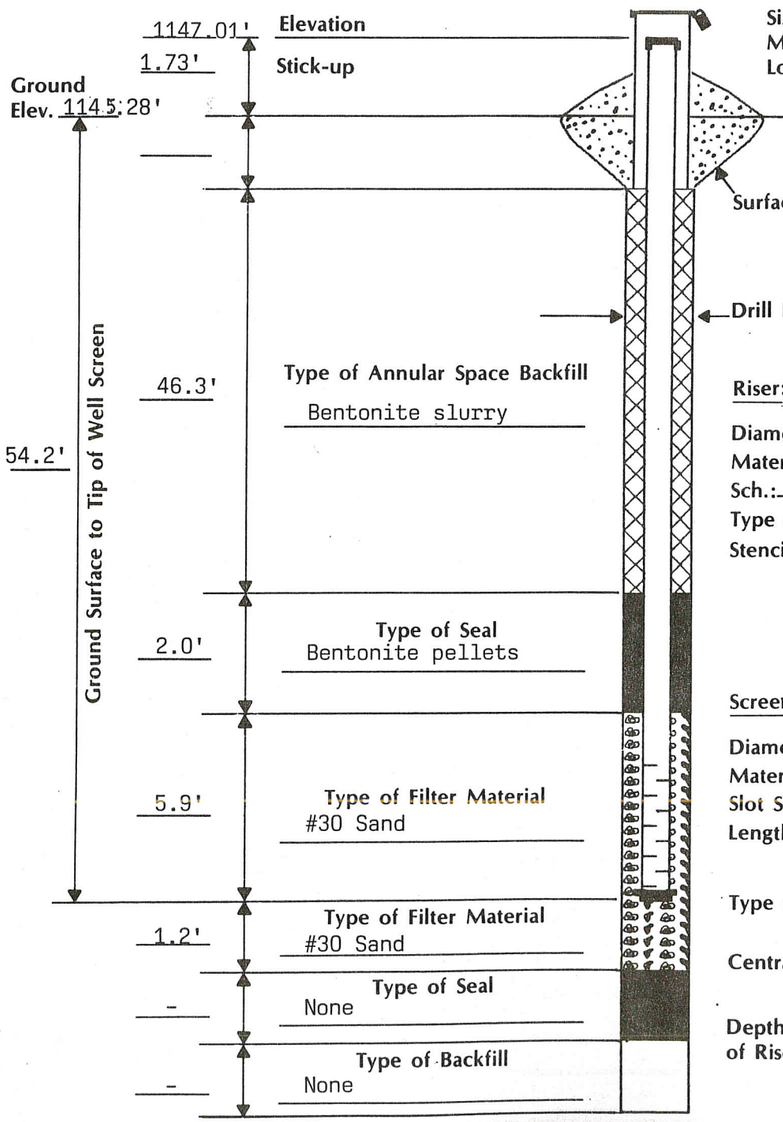
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/9/88
Checked by: BJS — Date: 12/5/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Wisconsin Test Drilling, Inc.
Drilling Method: Hollow stem auger to 50', mud rotary 50-56.5'
Coordinates: N 39026.39 E 41362.47

Well No: PZ-1008G
Date Installed: 11/9/88



Protector Pipe:
Size: 4"
Material: Steel
Lock No.: 2121

Surface Seal Material: Cement

Drill Hole Diameter: 8"

Riser:
Diameter: 2"
Material: PVC
Sch.: 40
Type of Joints: Flush threaded
Stenciled?

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'.

Type of Cap: PVC

Centralizer: Used ☐ Not Used ☒

Depth to Water From Top of Riser at Completion: -

NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: L.E. (WTD) — Date: 11-9-88
Checked by: BJS — Date: 12-20-88

MONITORING WELL DEVELOPMENT

Well Number: PZ-1008 G
Well Diameter: 2"
Total Depth of Well: 54.2'

Depth to Water:
Initial: 10.6'
Final: 15.4'

Time of Measurement:

Description of Development Method:

Bailed and surged with hand bailer.

Volume of Water Removed From Well: 30 gallons
Clarity of Water in Well Before Development: Muddy
Clarity of Water in Well After Development: Cloudy
Presence of Sediment at the Bottom of the Well: --
Volume of Water Added to Well: None
Source of Water Added to Well: --
Time Spent for Development: 1.5 Hours

Stabilization Readings:

Gal. Removed	Depth to Water	Time	Field Temperature	Spec. Cond.	pH

LOG OF TEST BORING NO.: PZ-1009, 1009G

CLIENT: Kennecott
PROJECT: Groundwater Modeling
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 41429.42 N 43434.80 E

SURFACE ELEVATION: 1152.5'
BORING DEPTH: 50.0'
DATE: 11/10/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1152.5	--0									
1147.5	--5	5.0-6.5	SS	1		1.5	Top 1' is red br clayey fgr-cgr SAND, tr silt and fgr grvl, dense, dense, damp, next 4" is red br fgr-cgr SAND w/ silt, next 2" same as very top	SC		
1142.5	--10	10.0-11.5	SS	2	56	1.2	Red br silty fgr-cgr SAND, tr clay, damp, dense, slightly cohesive			
1137.5	--15	15.0-16.5	SS	3	54	0.9	Red br silty fgr-cgr SAND, tr clay v. damp, dense, slightly cohesive	SM		
1132.5	--20	20.0-21.5	SS	4	63	1.0	Same as above			
1127.5	--25	25.0-26.5	SS	5	17	1.5	Red br clayey fgr-cgr SAND, tr silt and fgr-cgr grvl, dense, v. damp, cohesive		K= 2.1E - 07 cm/sec	
1122.5	--30	30.0-31.5	SS	6	14	1.0	Same as above only grey br color (except top 2" is red br), soft, wet			
1117.5	--35	35.0-36.5	SS	7	15	1.5	Same as above (grey/br color), soft, wet	SC		
1112.5	--40	40.0-41.5	SS	8	10	1.2	Same as above			
1107.5	--45	45.0-46.5	SS	9	40	1.5	Dk grey (10YR 3/2) fgr-cgr silty SAND, fn, mgr grvl, wet, dence		%g -s -si-cl 1-70 -22- 7	
1102.5	--50	50.0-51.5	SS	10	100/0	0	Very hard, auger refusal, split spoon refusal, assume bedrock			
							End of Boring at 50.0 feet	RK?		
1097.5	--55									

DRILLING DATA

START DATE: 11/10/88
COMPLETION DATE: 11/10/88
LOGGED BY: KAD
DRILLING METHOD: HSA to 50'
DRILLING CONTRACTOR: Wisconsin Test Drilling

WATER LEVEL INFORMATION

DEPTH AT COMPLETION: NA
LATER TIME/DEPTH: NA
LATER TIME/DEPTH: NA
CAVE IN DEPTH: NA
DRILLING LOSSES: NA

Foth & Van Dyke

Client: Kennecott Explorations **Scope I.D.:** 87K10
Project: Groundwater Modeling Report **Page:** 1
Prepared by: Robert Rouse **Date:** 12-18-88
Checked by: Perry O. Kepler **Date:** 1-26-89

REPORT OF:
FALLING HEAD PERMEABILITY TEST

Reported to: Kenncott Explorations **Copies to:**

General Data:

Boring/Test Pit Number:	PZ-1009G
Depth of Sample:	25'-27'
Sample Number:	5
Date Sampled:	November 10, 1988
Date Received:	November 17, 1988
Source of Sample:	

Laboratory Data: **Project Specifications**

Method of Test:	3" T.W. Tube (Rigid Wall)
Length of Sample *(inches)*:	5.25
Diameter of Sample *(inches)*:	2.80
Dates Tested:	December 5-12, 1988
Moisture Content *(%)*:	9.7
Dry Density *(pcf)*:	136.9
% Compaction:	
Soil Classification:	SILTY SAND W/GRAVEL, dark reddish brown (SM)
Permeant Used:	Tapwater
Technician:	R. Rouse
Coefficient of Permeability: *(cm/sec)*	2.1×10^{-7}

Atterberg Limits:

Liquid Limit:
Plastic Limit:
Plasticity Index:

Remarks:

Foth & Van Dyke and Associates Inc.
2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:
SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Groundwater Modeling
SCOPE I.D. #: 87K10
DATE TYPED: 1-26-89
REPORT NUMBER: 5
REPORTED TO: Kennecott Explorations

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1009G
SAMPLE NUMBER: 5
DEPTH OF SAMPLE: 25'-27'
SAMPLED BY: Fred Doran of F&VD
DATE SAMPLED: 11/10/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 5 YR. 3/4

LABORATORY DATA:

DATE TESTED: 12/27/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kepler 1-3-89
24 HRS. TURN AROUND ____YES ___x NO
WASHED GRADATION ___x___YES ____NO
WEIGHT OF TEST SAMPLE 754.1 **GRAMS**

SIEVE SIZE	WEIGHT RETAINED *(gms)*	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½	0	0	100		
1	53.0	7.0	93.0		
3/4	11.0	1.5	91.5		
1/2	13.4	1.8	89.7		
3/8	26.9	3.6	86.1		
#4	25.0	3.3	82.8		
10	37.7	5.0	77.8		
40	114.0	15.1	62.7		
100	192.2	25.5	37.2		
200	68.5	9.1	28.1		
PAN	212.3	28.2			

REMARKS:

BY: Robert R. Rouse

Foth & Van Dyke

Client: Kennecott Explorations Scope I.D.: 87K10
Project: Groundwater Modeling Report Page: 1
Prepared by: Robert Rouse Date: 12-18-88
Checked by: Perry O. Kepler Date: 1-26-89

REPORT OF:
FALLING HEAD PERMEABILITY TEST

Reported to: Kenncott Explorations **Copies to:**

General Data:

Boring/Test Pit Number:	PZ-1009G
Depth of Sample:	25'-27'
Sample Number:	5
Date Sampled:	November 10, 1988
Date Received:	November 17, 1988
Source of Sample:	

Laboratory Data: **Project Specifications**

Method of Test:	3" T.W. Tube (Rigid Wall)
Length of Sample *(inches)*:	5.25
Diameter of Sample *(inches)*:	2.80
Dates Tested:	December 5-12, 1988
Moisture Content *(%)*:	9.7
Dry Density *(pcf)*:	136.9
% Compaction:	
Soil Classification:	SILTY SAND W/GRAVEL, dark reddish brown (SM)
Permeant Used:	Tapwater
Technician:	R. Rouse
Coefficient of Permeability: *(cm/sec)*	2.1×10^{-7}

Atterberg Limits:

Liquid Limit:
Plastic Limit:
Plasticity Index:

Remarks:

FORM #407 SLB (Rev. 7/88)

Foth & Van Dyke and Associates Inc.

2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:
SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Groundwater Modeling
REPORTED TO: Kennecott Explorations

SCOPE I.D. #: 87K10
DATE TYPED: 1-26-89
REPORT NUMBER: 5

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1009G
SAMPLE NUMBER: 5
DEPTH OF SAMPLE: 25'-27'
SAMPLED BY: Fred Doran of F&VD

DATE SAMPLED: 11/10/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 5 YR. 3/4

LABORATORY DATA:

DATE TESTED: 12/27/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kepler 1-3-89

24 HRS. TURN AROUND _____YES ____xNO
WASHED GRADATION ___x___YES _____NO
WEIGHT OF TEST SAMPLE 754.1 GRAMS

SIEVE SIZE	WEIGHT RETAINED *(gms)*	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½	0	0	100		
1	53.0	7.0	93.0		
3/4	11.0	1.5	91.5		
1/2	13.4	1.8	89.7		
3/8	26.9	3.6	86.1		
#4	25.0	3.3	82.8		
10	37.7	5.0	77.8		
40	114.0	15.1	62.7		
100	192.2	25.5	37.2		
200	68.5	9.1	28.1		
PAN	212.3	28.2			

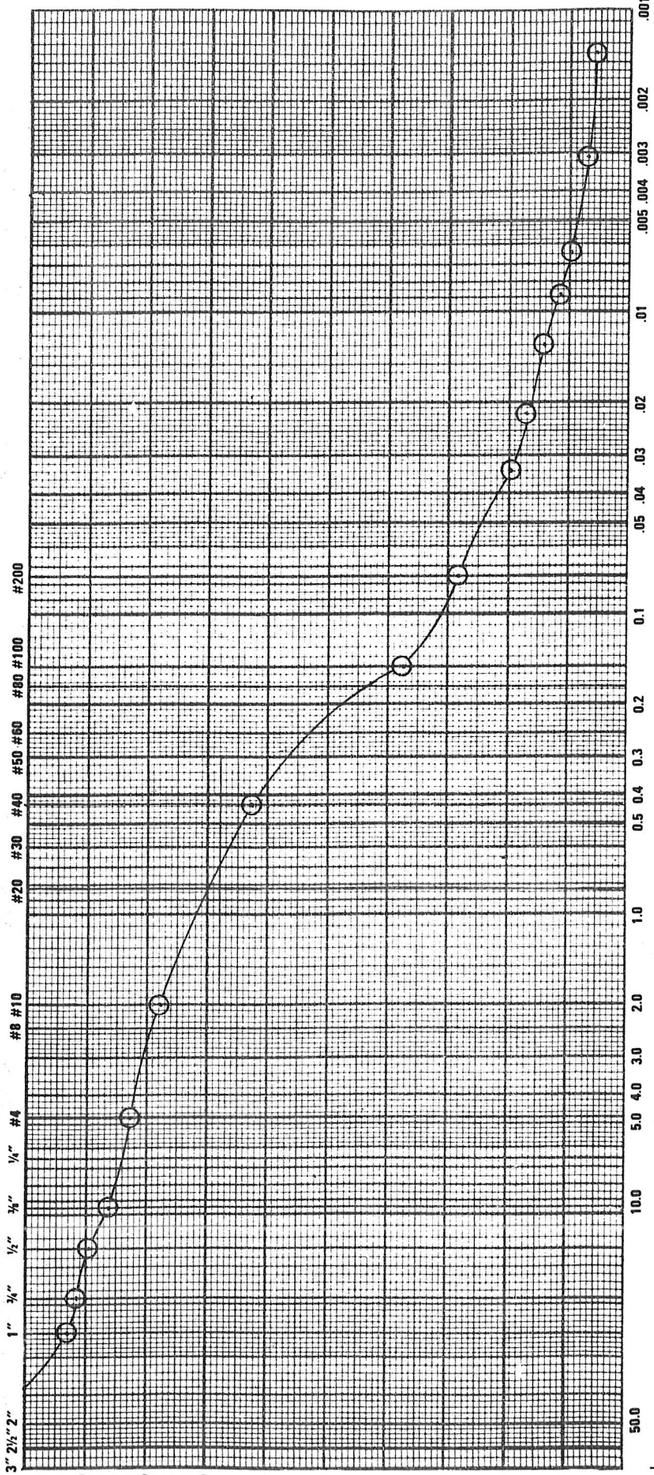
REMARKS:

FORM #329 SLB (Rev. 4/88)

BY: Robert R. Rouse

Foth & Van Dyke and Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE



PROJECT: Ground Water Modeling - Kennecott Explorations

LOCATION SAMPLED: PZ-1009G Sample No. 5 ELEV. OR DEPTH: 25.0'-27.0' DRAWN BY: POK APPROVED BY: RRR

ATTERBERG LIMITS: LL _____ PL _____ PI N.P. SAMPLED MOISTURE CONTENT (%): _____ COEFFICIENTS: Cc = _____ Cu = _____

SAMPLE SOURCE: _____ MUNSELL COLOR CODE: 5 YR. 3/4 DATE SAMPLED: 11-10-88

SOIL CLASSIFICATION (ASTM: D2487) SILTY SAND W/GRAVEL, fine to medium grained, dark reddish brown (SM)

FORM #411-GS (2/87)

3-5-H-20

Foth & Van Dyke and Associates Inc.

2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Monitoring Well - Soil Sample
Groundwater Modeling

REPORTED TO: Kennecott

SCOPE I.D. #: 87K10
DATE TYPED: 12/7/88
REPORT NUMBER: 4

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-1009G
SAMPLE NUMBER: 9
DEPTH OF SAMPLE: 45.0'
SAMPLED BY: Fred Doran of F&VD

DATE SAMPLED: 11/10/88
DATED RECEIVED: 11/17/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 10 YR. 3/2

LABORATORY DATA:

DATE TESTED: 11/23/88
TESTED PERFORMED BY: KAS
REVIEWED BY: P.O. Kepler

24 HRS. TURN AROUND ____YES __X__NO
WASHED GRADATION __X__YES ____NO
WEIGHT OF TEST SAMPLE 159.2 GRAMS

SIEVE SIZE	WEIGHT RETAINED (gms)	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½					
1					
3/4					
1/2					
3/8	0	0	100		
#4	1.7	1.1	98.9		
10	8.7	5.5	93.4		
40	18.8	11.8	81.6		
100	61.6	38.7	42.9		
200	22.6	14.2	28.7		
PAN	45.8	28.8			

REMARKS:

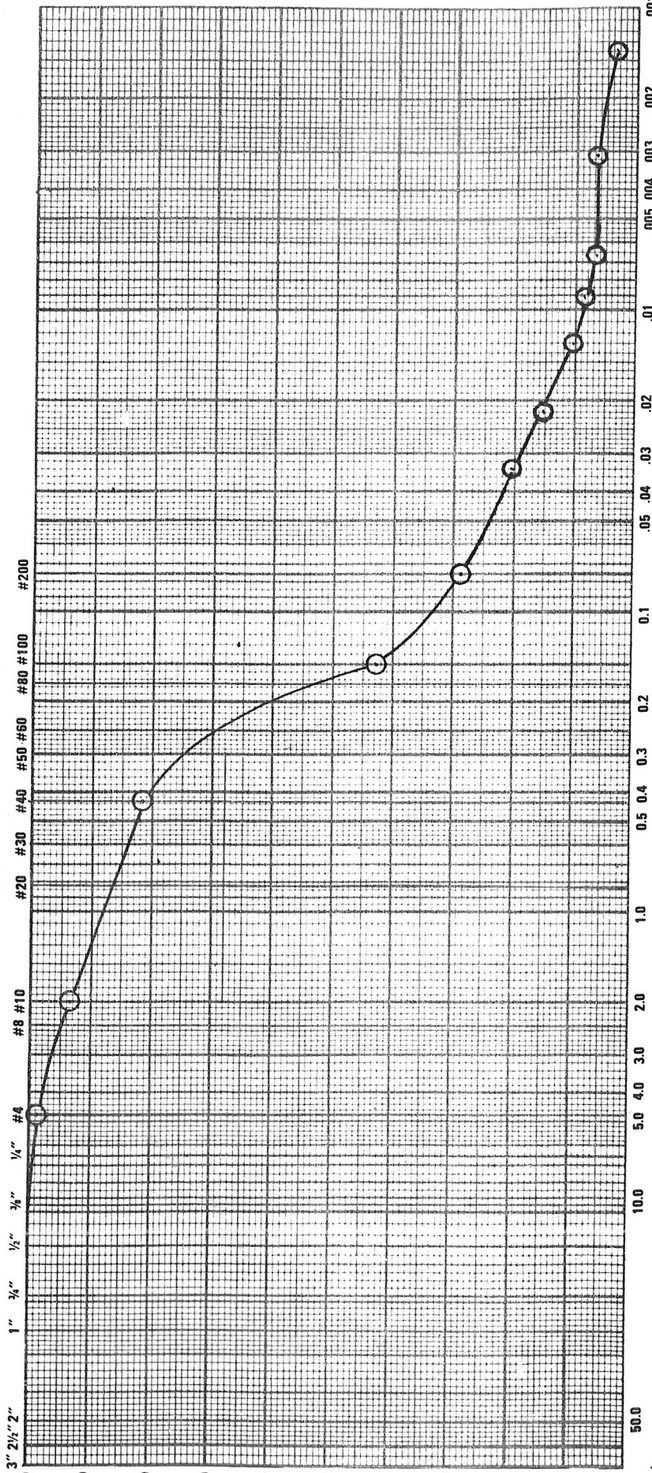
FORM #329 SLB (Rev. 4/88)

BY: Robert R. Rouse

3-5-H-21

Foth & Van Dyke and Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE



PROJECT: Kennecott Groundwater

LOCATION SAMPLED: Boring: PZ-1009G - Sample No. 9 ELEV. OR DEPTH: 45.0'

ATTERBERG LIMITS: LL _____ PL _____ PI _____ SAMPLED MOISTURE CONTENT (%): 16.7 COEFFICIENTS: Cc = _____ Cu = _____

SAMPLE SOURCE: _____ MUNSELL COLOR CODE: 10 YR. 3/2 DATE SAMPLED: 11/10/88

SOIL CLASSIFICATION (ASTM: D2487) SILTY SAND, fine grained, very dark grayish brown (SM)

DATE: 11/29/88 SAMPLE NO.: 4

DRAWN BY: POK APPROVED BY: RRR

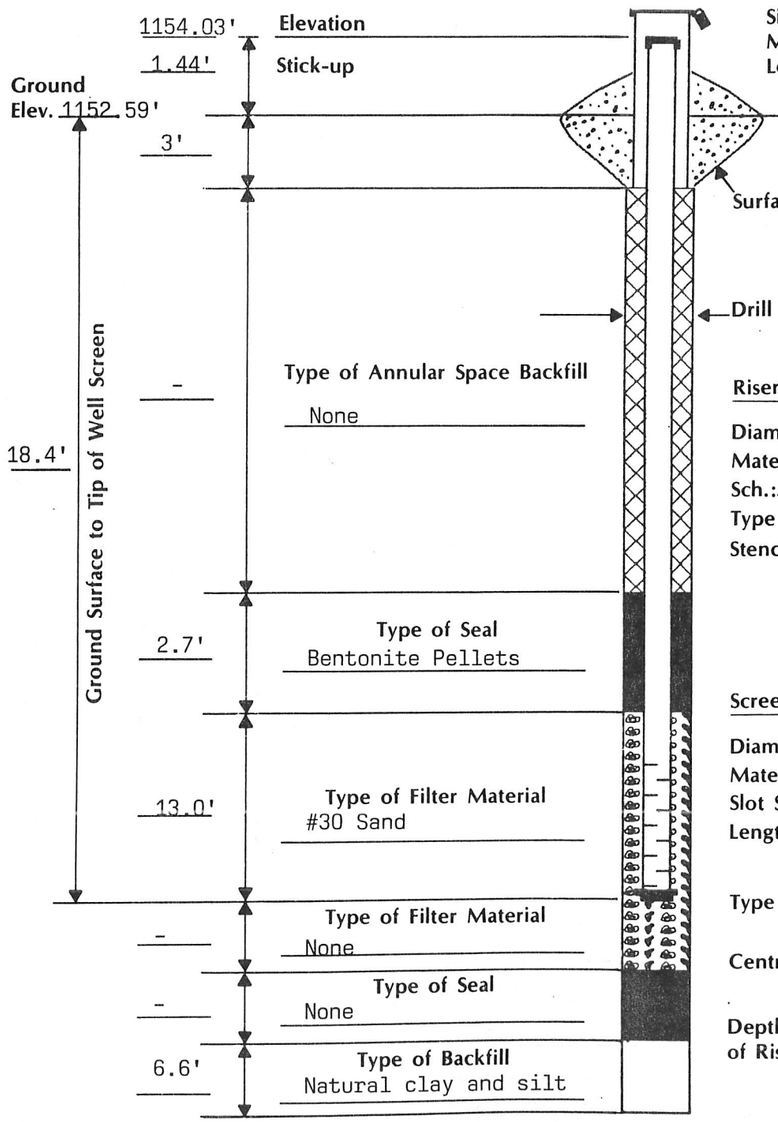
FORM #411 SL (2/87)

Foth & Van Dyke

Client: Kennecott Scope I.D.: 87K10
Project: Groundwater Modeling Page: 1
Prepared by: KAD Date: 11/12/88
Checked by: BJS Date: 12/3/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Wisconsin Test Drilling, Inc. Well No: PZ-1009
Drilling Method: Hollow stem augers Date Installed: 11/12/88
Coordinates: N 41424.42 E 43437.04



Protector Pipe:
Size: 4"
Material: Steel
Lock No.: 2121

Surface Seal Material: Cement

Drill Hole Diameter: 8"

Riser:
Diameter: 2"
Material: PVC
Sch.: 40
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 10'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: 12.6'

NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: L.E. (WTD) — Date: 11-11-88
Checked by: BJS — Date: 12-20-88

MONITORING WELL DEVELOPMENT

Well Number: PZ-1009
Well Diameter: 2"
Total Depth of Well: 18.4'

Depth to Water:
Initial: 11.8'
Final: 15.3'

Time of Measurement:

Description of Development Method:

Bailed and surged with hand bailer.
Bailed Dry.

Volume of Water Removed From Well: 2 gallons
Clarity of Water in Well Before Development: Muddy
Clarity of Water in Well After Development: Muddy
Presence of Sediment at the Bottom of the Well: --
Volume of Water Added to Well: None
Source of Water Added to Well: --
Time Spent for Development: 0.5 Hours

Stabilization Readings:

Gal. Removed	Depth to Water	Time	Field Temperature	Spec. Cond.	pH

FORM #449 GEM (5/88)

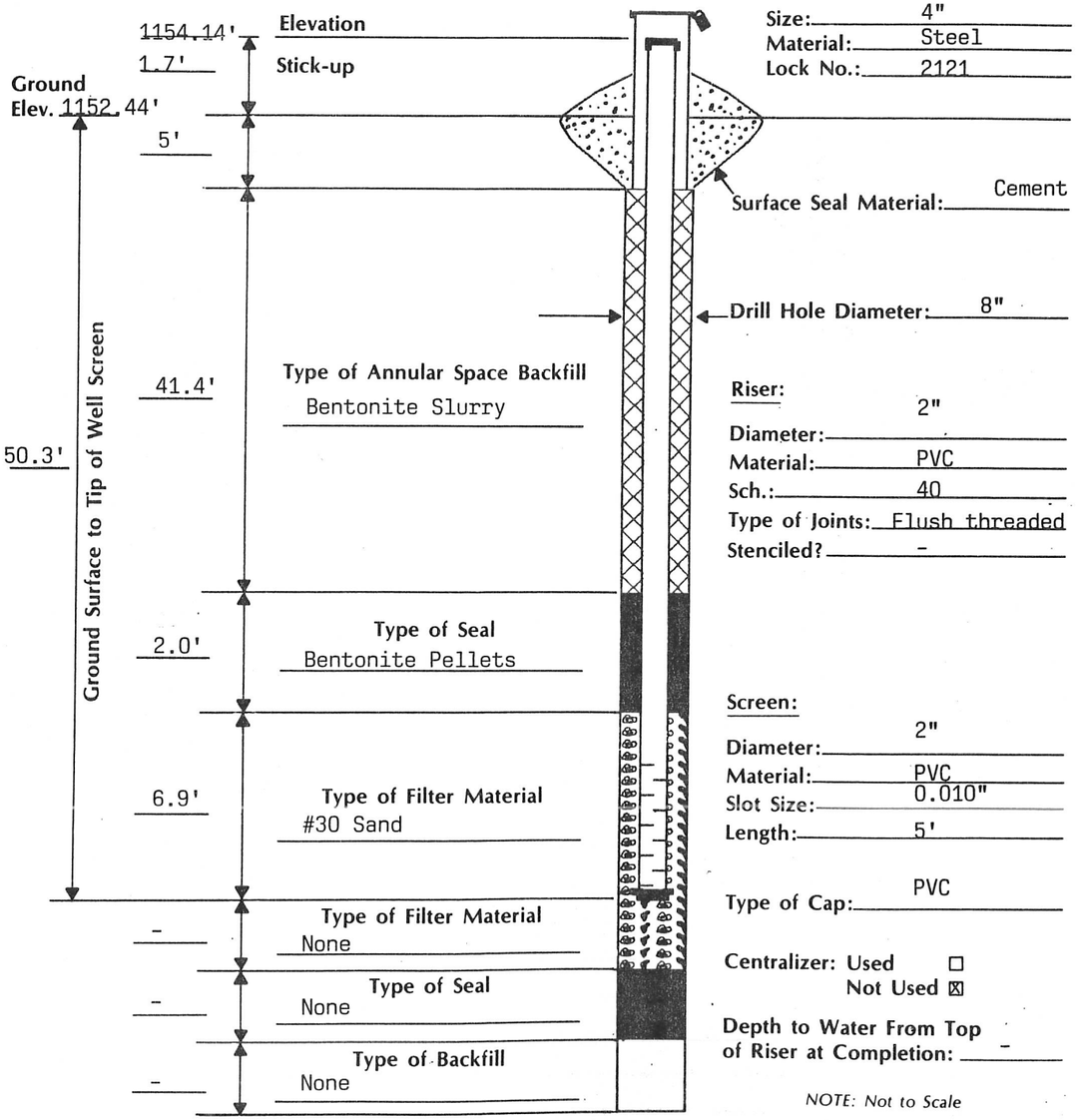
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/11/88
Checked by: BJS — Date: 12/3/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Wisconsin Test Drilling, Inc.
Drilling Method: Hollow stem augers
Coordinates: N 41,429.42 E 43,434.81

Well No: PZ-1009G
Date Installed: 11/11/88



NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: L.E. (WTD) — Date: 11-11-88
Checked by: BJS — Date: 12-20-88

MONITORING WELL DEVELOPMENT

Well Number: PZ-1009G
Well Diameter: 2"
Total Depth of Well: 50.3'

Depth to Water:
Initial: 12.1'
Final: 46.8'

Time of Measurement:

Description of Development Method:

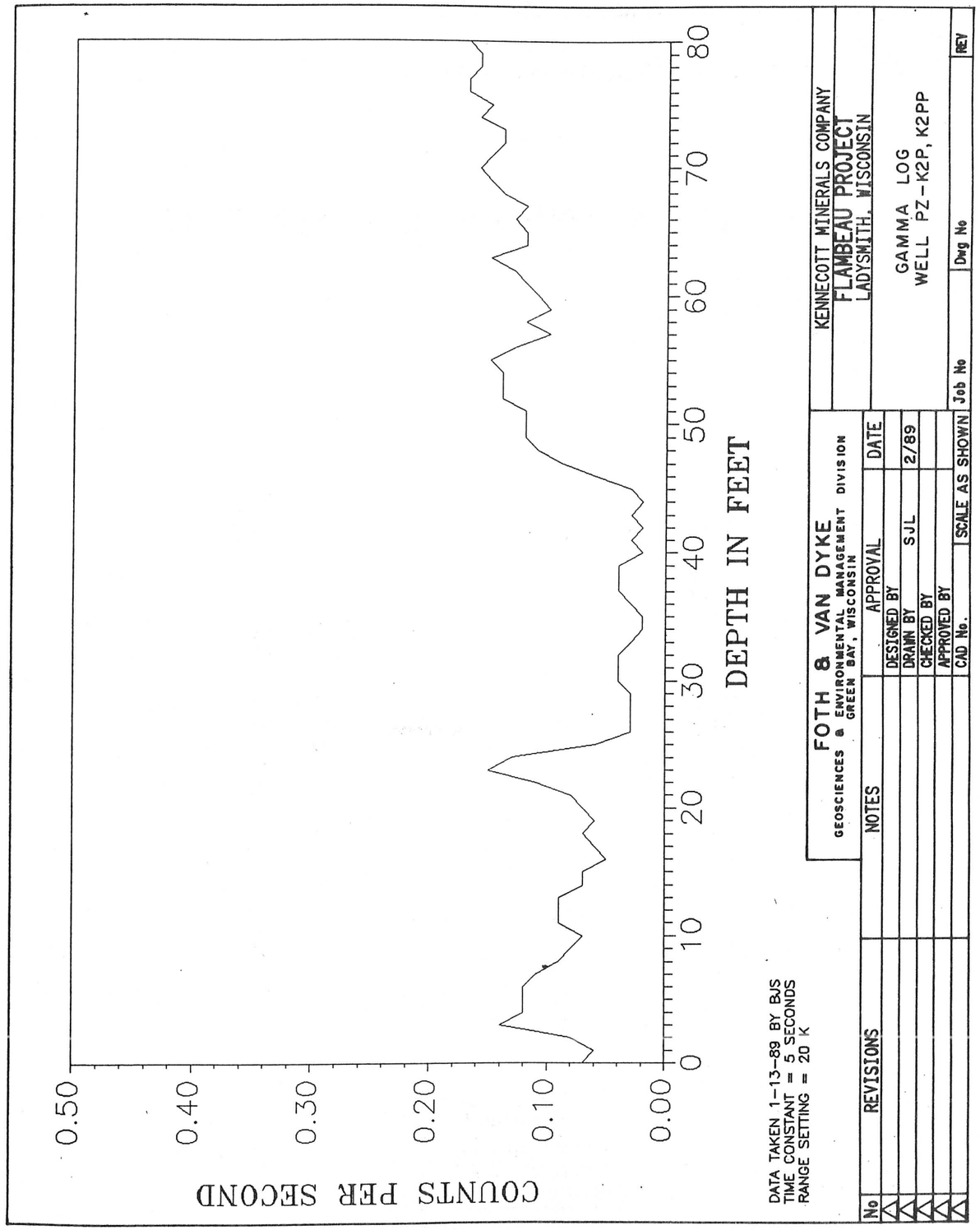
Bailed and surged with hand bailer.
Bailed dry.

Volume of Water Removed From Well: 5 gallons
Clarity of Water in Well Before Development: Muddy
Clarity of Water in Well After Development: Muddy
Presence of Sediment at the Bottom of the Well: --
Volume of Water Added to Well: None
Source of Water Added to Well: --
Time Spent for Development: 0.5 Hours

Stabilization Readings:

Gal. Removed	Depth to Water	Time	Field Temperature	Spec. Cond.	pH

FORM #449 GEM (5/88)



DATA TAKEN 1-13-89 BY BJS
TIME CONSTANT = 5 SECONDS
RANGE SETTING = 20 K

KENNECOTT MINERALS COMPANY
FLAMBEAU PROJECT
LADYSMITH, WISCONSIN

GAMMA LOG
WELL PZ-K2P, K2PP

FOTH & VAN DYKE
GEOSCIENCES & ENVIRONMENTAL MANAGEMENT DIVISION
GREEN BAY, WISCONSIN

	APPROVAL	DATE
DESIGNED BY		
DRAWN BY	SJL	2/89
CHECKED BY		
APPROVED BY		
CAD No.	SCALE AS SHOWN	Job No

No	REVISIONS	NOTES	Dwg No	REV

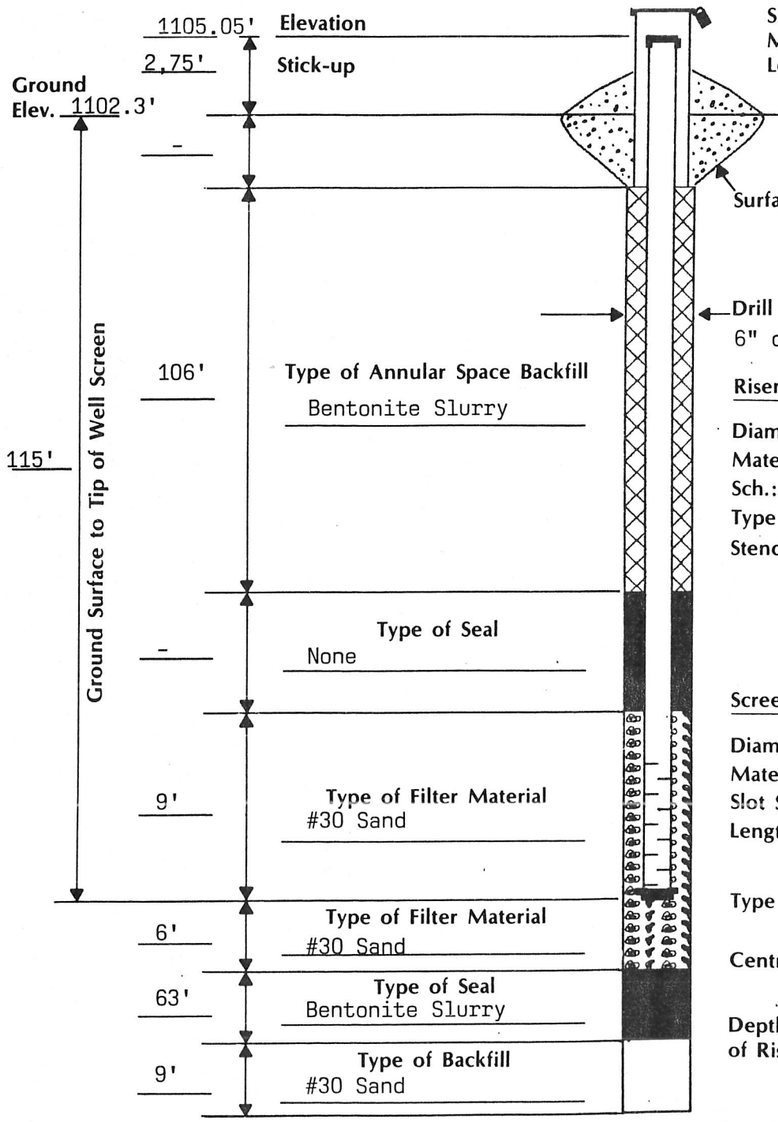
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/15/88
Checked by: BJS — Date: 12/3/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Luisier Drilling Inc.
Drilling Method: Mud, air rotary (Installed in open hole well TW-K2)
Coordinates: N 39750.05 E 39015.57

Well No: PZ-K2P
Date Installed: 11/15/88



Protector Pipe:
Size: 6"
Material: Steel
Lock No.: 2121

Surface Seal Material: None

Drill Hole Diameter: 9" tricone 0-30'
6" downhole air hammer 30-193'

Riser:
Diameter: 2"
Material: PVC
Sch.: 80
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: _____

NOTE: Not to Scale

3-5-H-28

FORM #309 GEM (Rev. 11/88)

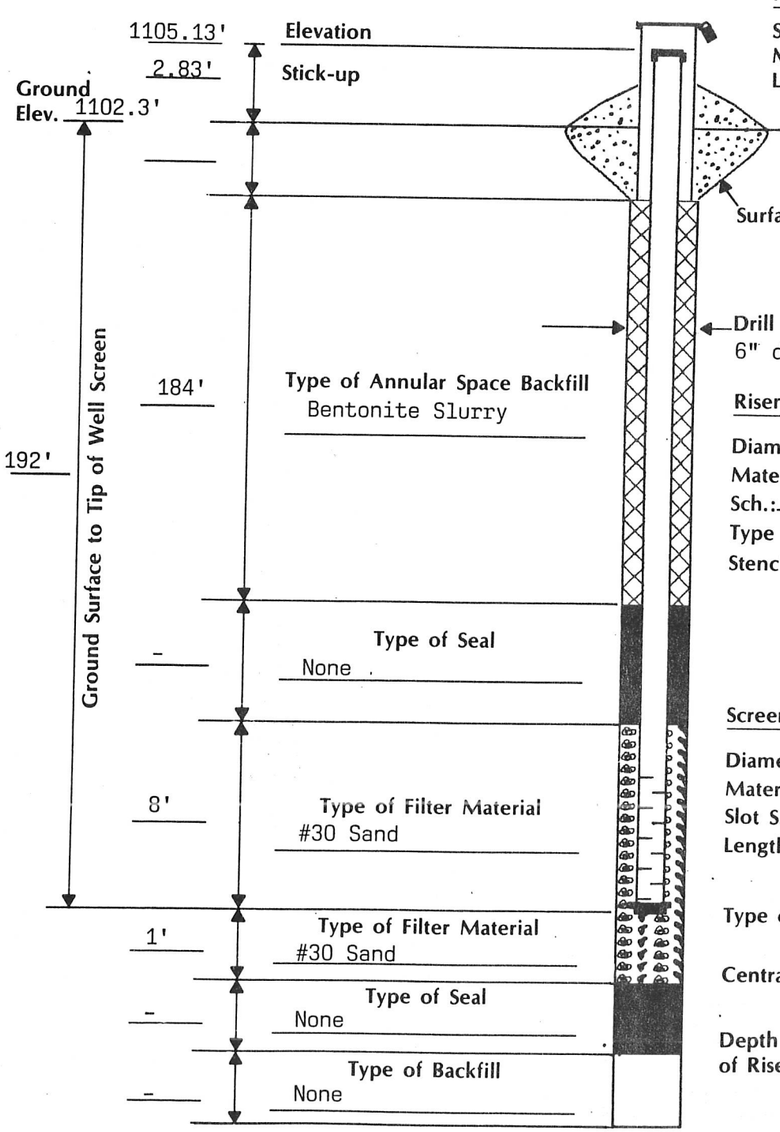
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/14/88
Checked by: BJS — Date: 12/3/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Luisier Drilling Inc.
Drilling Method: Mud, air rotary (Installed in open hole well TW-K2)
Coordinates: N 39750.05 E 39015.57

Well No: PZ -K2PP
Date Installed: 11/14/88



Protector Pipe:
Size: 6"
Material: Steel
Lock No.: 2121

Surface Seal Material: None

Drill Hole Diameter: 9" tricone 0-30'
6" downhole air hammer 30-193'

Riser:
Diameter: 2"
Material: PVC
Sch.: 80
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: -

NOTE: Not to Scale

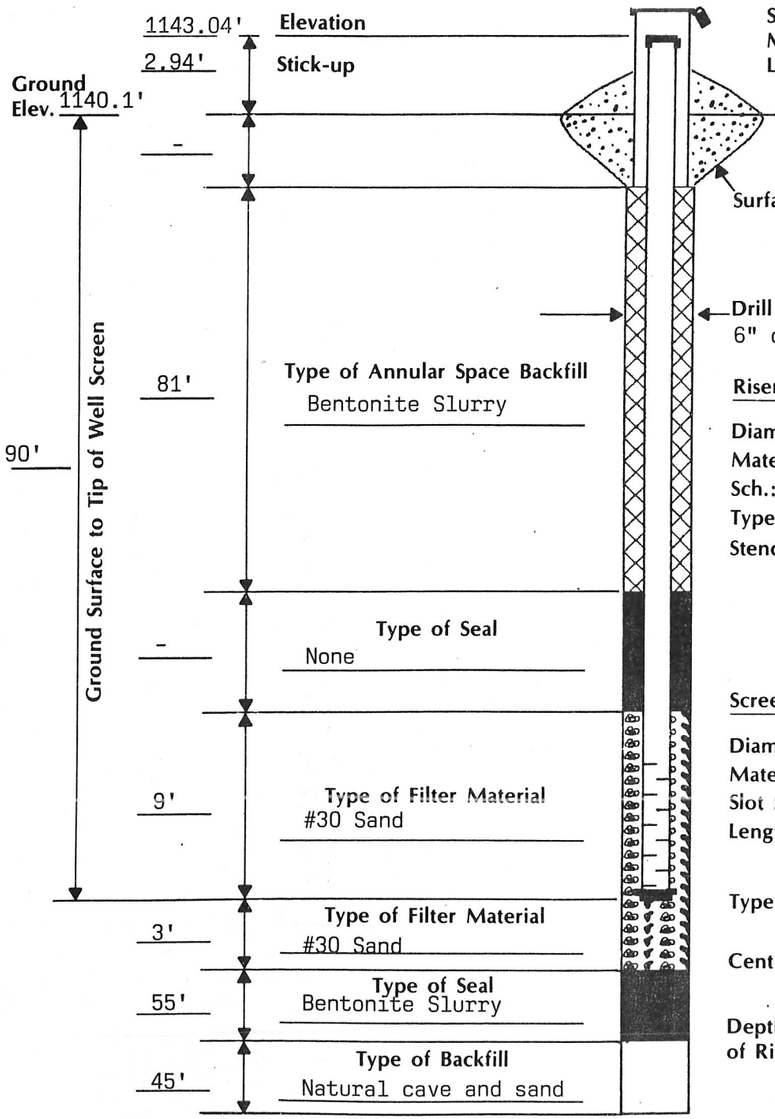
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/15/88
Checked by: BJS — Date: 12/3/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Luisier Drilling, Inc.
Drilling Method: Mud, Air Rotary (Installed in open hole well (TW-K4)
Coordinates: N 41204.15 E 40662.92

Well No: PZ-K4P
Date Installed: 11/15/88



Protector Pipe:
Size: 6"
Material: Steel
Lock No.: 2121

Surface Seal Material: None

Drill Hole Diameter: 9" tricone 0-50'
6" downhole air hammer 50-193'

Riser:
Diameter: 2"
Material: PVC
Sch.: 80
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: -

NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

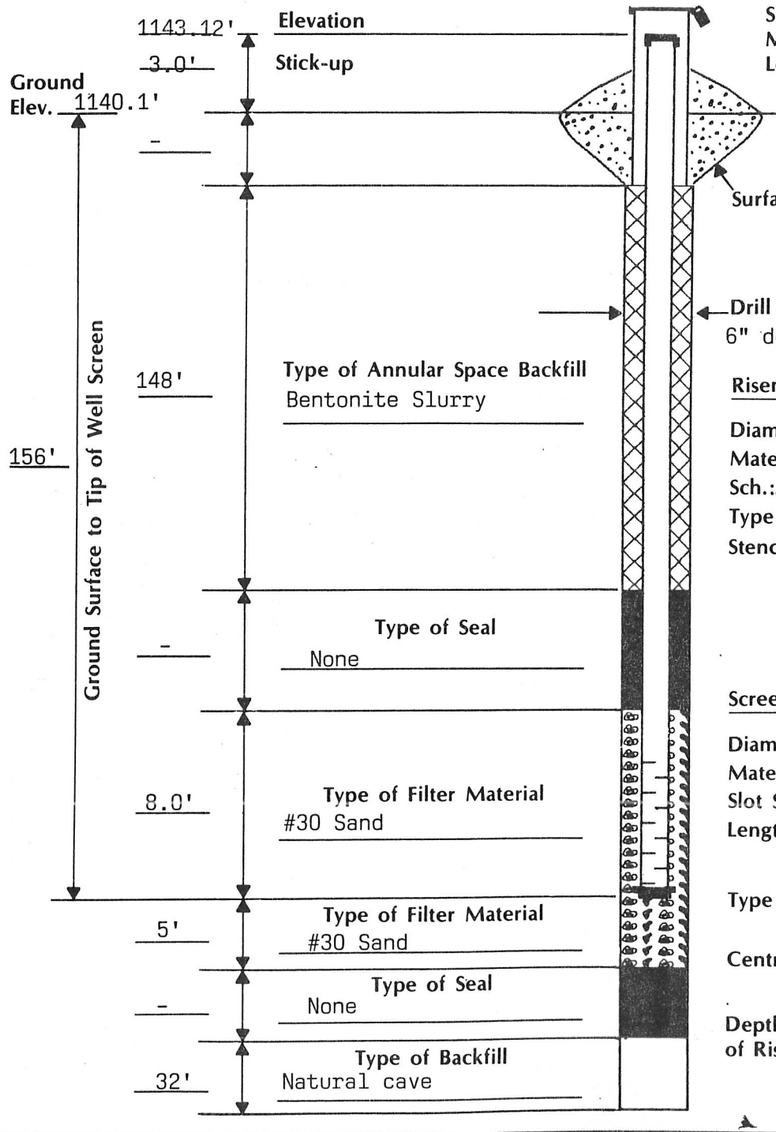
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Groundwater Modeling — Page: 1
Prepared by: KAD — Date: 11/14/88
Checked by: BJS — Date: 12/2/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Luisier Drilling, Inc.
Drilling Method: Mud, Air Rotary (Installed in open hole well TW-K4)
Coordinates: N 41204.15 E 40662.92

Well No: PZ-K4PP
Date Installed: 11/14/88



Protector Pipe:
Size: 6"
Material: Steel
Lock No.: 2121

Surface Seal Material: None

Drill Hole Diameter: 9" tricone 0-50'
6" downhole air hammer 50-193'

Riser:
Diameter: 2"
Material: PVC
Sch.: 80
Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 5'

Type of Cap: PVC flat

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: -

NOTE: Not to Scale

FORM #309 GEM (Rev. 11/88)

LOG OF TEST BORING NO.: PZ-SP6

CLIENT: Kennecott
PROJECT: Stockpile Borings
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 39652 N 40205 E

SURFACE ELEVATION: 1154.81
BORING DEPTH: 36.0
DATE: 11/08/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1154.8	--0.0	0.0-1.5	ss	1	6	1.4	Br org SILT, tr fgr sand, topsoil, loose, dry (top 4"?), rest is br fgr sandy SILT, dry, loose, non-plastic, non cohesive, very soft	ML		
1149.8	--5.0	4.5-6.0	ss	2	22	1.2	Br silty fgr-mgr SAND, loose, dry, subang to ang, some Fe-stained sand grains			
1144.8	--10.0	9.5-11.0	ss	3	53	1.3	Same as above only tending to be more fgr, dense, dry	SM		
1139.8	--15.0	14.5-16.0	ss	4	99	1.2	Same as above, dense, damp			
1134.8	--20.0	19.5-21.0	ss	5	51	1.3	Br fgr sandy SILT, non plastic, saturated(wet), dense, becoming more plastic and cohesive w/ depth			
1129.8	--25.0	24.5-26.0	ss	6	58	1.0	Dk red brn (5YR 3/8) fgr sandy SILT, tr clay, slightly plastic, cohesive, wet, dense, firm, more grvl and sand w/ depth	ML	%g-s-si-cl 5-32-46-17 LL=14 PI=0.6	
1124.8	--30.0	29.5-31.0	ss	7	30	1.5	Br fgr sandy SILT w/ fgr grvl and mgr-cgr sand, wet, dense, firm			
1119.8	--35.0	34.5-36.0	ss	8	74	1.4	Br red silty fgr-mgr SAND w/ fgr grvl and cgr sand, damp, firm, dense	SM		
1114.8	--40.0						End of Boring at 36.0 feet			
1109.8	--45.0									
1104.8	--50.0									
1099.8	--55.0									

DRILLING DATA

START DATE: 11/08/88
COMPLETION DATE: 11/08/88
LOGGED BY: KAD
DRILLING METHOD: RIG: CME 850 - All Terrain Mud rotary
DRILLING CONTRACTOR: Twin City Testing

WATER LEVEL INFORMATION

DEPTH AT COMPLETION:
LATER TIME/DEPTH:
LATER TIME/DEPTH:
CAVE IN DEPTH:
DRILLING LOSSES:

Foth & Van Dyke and Associates Inc.
2737 S. Ridge Road P. O. Box 19012 Green Bay, WI 54307-9012 414/497-2500

REPORT OF:

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES

PROJECT: Proposed Waste Rock Storage

SCOPE I.D. #: 87K10
DATE TYPED: 12-27-88
REPORT NUMBER: 4

REPORTED TO: Kennecott Explorations

TEST PERFORMED IN GENERAL ACCORDANCE OF ASTM: D1140

GENERAL DATA:

SAMPLE LOCATION: PZ-SP6
SAMPLE NUMBER:
DEPTH OF SAMPLE: 24.5'-26.0'
SAMPLED BY: B.J. Socha at F&VD

DATE SAMPLED: 11/8/88
DATED RECEIVED: 12/6/88
SOURCE OF SAMPLE:
MUNSELL COLOR CODE: 5 YR. 3/3

LABORATORY DATA:

DATE TESTED: December 6-8, 1988
TESTED PERFORMED BY: KAS
REVIEWED BY: POK (12-12-88)

24 HRS. TURN AROUND ____YES __x__NO
WASHED GRADATION __x__YES ____NO
WEIGHT OF TEST SAMPLE 201.8 GRAMS

SIEVE SIZE	WEIGHT RETAINED (gms)	% RETAINED	% PASSING	PROJECT SPECIFICATION % PASSING BY WEIGHT	SOURCE OF SPECIFICATION
3"					
1½					
1					
3/4	0	0	100		
1/2	3.5	1.7	98.3		
3/8	2.1	1.0	97.3		
#4	5.5	2.7	94.6		
10	7.4	3.7	90.9		
40	19.1	9.5	81.4		
100	26.6	13.2	68.2		
200	11.9	5.9	62.3		
PAN	125.9	62.4			

REMARKS:

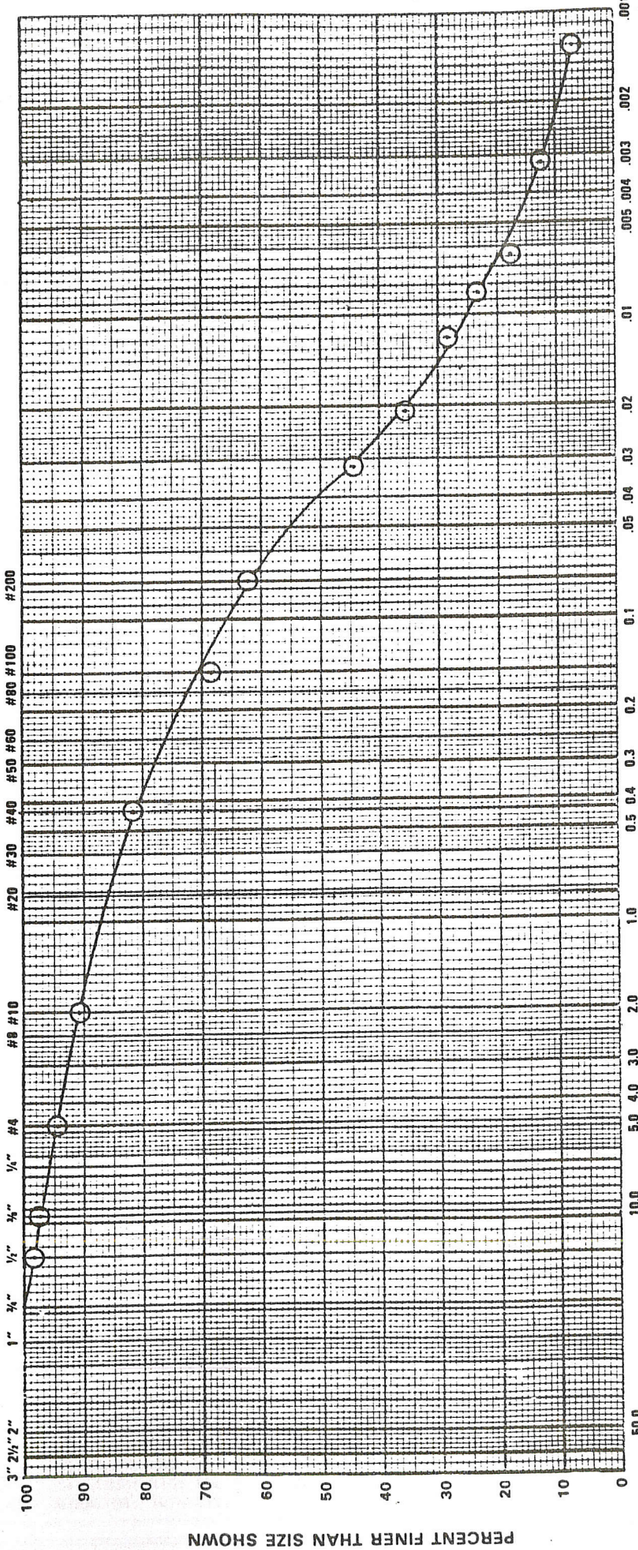
FORM #329 SLB (Rev. 4/88)

BY: Robert R. Rouse

Foth & Van Dyke and Associates Inc.

GRAIN SIZE DISTRIBUTION CURVE

U.S. STANDARD SIEVE SIZES



GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE			
% =	% = 5.4	% = 3.7	% = 9.5	% = 19.0		% = 45.6	% = 16.8

PROJECT: Kennecott - Proposed Waste Rock Storage

LOCATION SAMPLED: Boring: PZ-SP6 ELEV. OR DEPTH: 24.5'-26.0' DRAWN BY: POK APPROVED BY: RRR

ATTERBERG LIMITS: LL 14.0 PL 13.4 PI 0.6 SAMPLED MOISTURE CONTENT (%): 12.8 COEFFICIENTS: Cc = Cu =

SAMPLE SOURCE: MUNSELL COLOR CODE: 5 YR 3/3 DATE SAMPLED: 11-8-88

SOIL CLASSIFICATION (ASTM: D2487) SANDY SILT, a little gravel, dark reddish brown, (ML)

DATE: 12-12-88 SAMPLE NO: 4

FORM #411 SL (2/87)

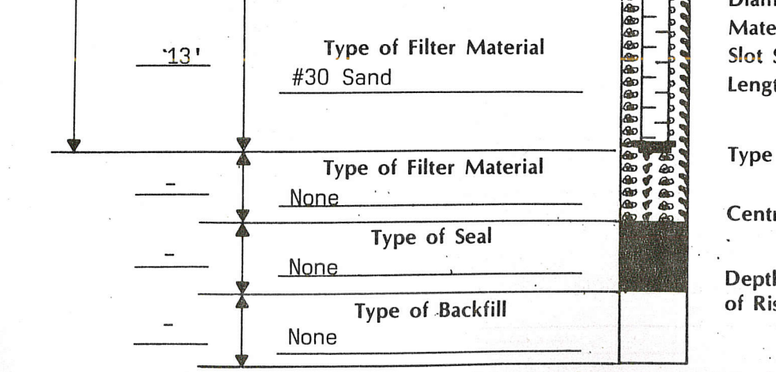
Foth & Van Dyke

Client: Kennecott Scope I.D.: 87K10
Project: Page: 1
Prepared by: KAD Date: 11/15/88
Checked by: BJS Date: 12/2/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Twin City Testing Corp.
Drilling Method: Hollow Stem Augers
Coordinates: N 39,652.74 E 40,204.73

Well No: PZ-SP6
Date Installed: 11/15/88



Protector Pipe:
Size: 4"
Material: Steel
Lock No.: 2121

Surface Seal Material: Cement

Drill Hole Diameter: 8"

Type of Annular Space Backfill: Bentonite Slurry

Type of Seal: Bentonite Pellets

Type of Filter Material: #30 Sand

Type of Filter Material: None

Type of Seal: None

Type of Backfill: None

Riser:
Diameter: 2"
Material: PVC
Sch.: 40
Type of Joints: Flush threaded
Stenciled? No

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 10'

Type of Cap: PVC

Centralizer: Used ☐
Not Used ☒

Depth to Water From Top of Riser at Completion: 20'

NOTE: Not to Scale

LOG OF TEST BORING NO.: PZ-SP8

CLIENT: Kennecott
PROJECT: Stockpile Borings
PROJECT NUMBER: 87K10
LOCATION: Ladysmith, Wisconsin
COORDINATES: 39662 N 40905 E

SURFACE ELEVATION: 1142.79
BORING DEPTH: 36.0
DATE: 11/11/88

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	LABORATORY TESTS	DRILLING AND SAMPLING NOTES
1142.8	--0.0	0.0-1.5	ss	1	10	1.5	Top .9' is blk fgr sandy SILT w/ org, moist to wet, very soft, next .6' is lt grey to red br mottled fgr sandy SILT, tr fgr-cgr grvl, moist, loose, 2.5-4.5 is red br	OL / ML / ML/CL		
1137.8	--5.0	4.5-6.0	ss	2	42	1.3	sandy, silty CLAY w/ fgr-cgr grvl, moist, v stiff Reddish br to lt br to grey silty SAND w/ fgr-cgr grvl, tr clay, moist, firm to dense, mottled,	SM		
1132.8	--10.0	9.5-11.0	ss	3	17	1.2	cgr grvl/cobbles @ 6' Reddish br clayey SAND w/ silt and fgr-cgr grvl, moist, dense	SC		
1127.8	--15.0	14.5-16.0	ss	4	12	1.5	Reddish br layered silty SAND and clayey SAND w/ fgr-cgr grvl and 1-2" seams of mgr-cgr SAND @ 11.8' & 14.5', saturated, firm to loose, cgr grvl and cobbles @ 10.0-11.5	SC/SM SP		
1122.8	--20.0	19.5-21.0	ss	5	15	1.5	Same.			
1117.8	--25.0	24.5-26.0	ss	6	9	1.1	Red br clayey fgr-cgr SAND, tr silt, firm, dense, plastic, cohesive	SC		
1112.8	--30.0	29.5-31.0	ss	7	7	0.8	Red br fgr-cgr SAND w/ clay and silt, plastic, soft, cohesive			
1107.8	--35.0	34.5-36.0	ss	8	7	0.5	Grey lean CLAY w/ fgr-cgr sand, tr fgr grvl, cohesive, soft, plastic	CL		
							End of Boring at 36.0 feet			
1102.8	--40.0									
1097.8	--45.0									
1092.8	--50.0									
1087.8	--55.0									

DRILLING DATA

START DATE: 11/11/88 @ 10:10 am
COMPLETION DATE: 11/11/88 @ 2:10 pm
LOGGED BY: REM/KAD
DRILLING METHOD: RIG: CME 850 - All Terrain HSA to 19', Mud to 36'
DRILLING CONTRACTOR: Twin City Testing

WATER LEVEL INFORMATION

DEPTH AT COMPLETION: 14.4' @ 16.0'
LATER TIME/DEPTH: 19.3' @ 21.0'
LATER TIME/DEPTH: NA
CAVE IN DEPTH: NA
DRILLING LOSSES: NA

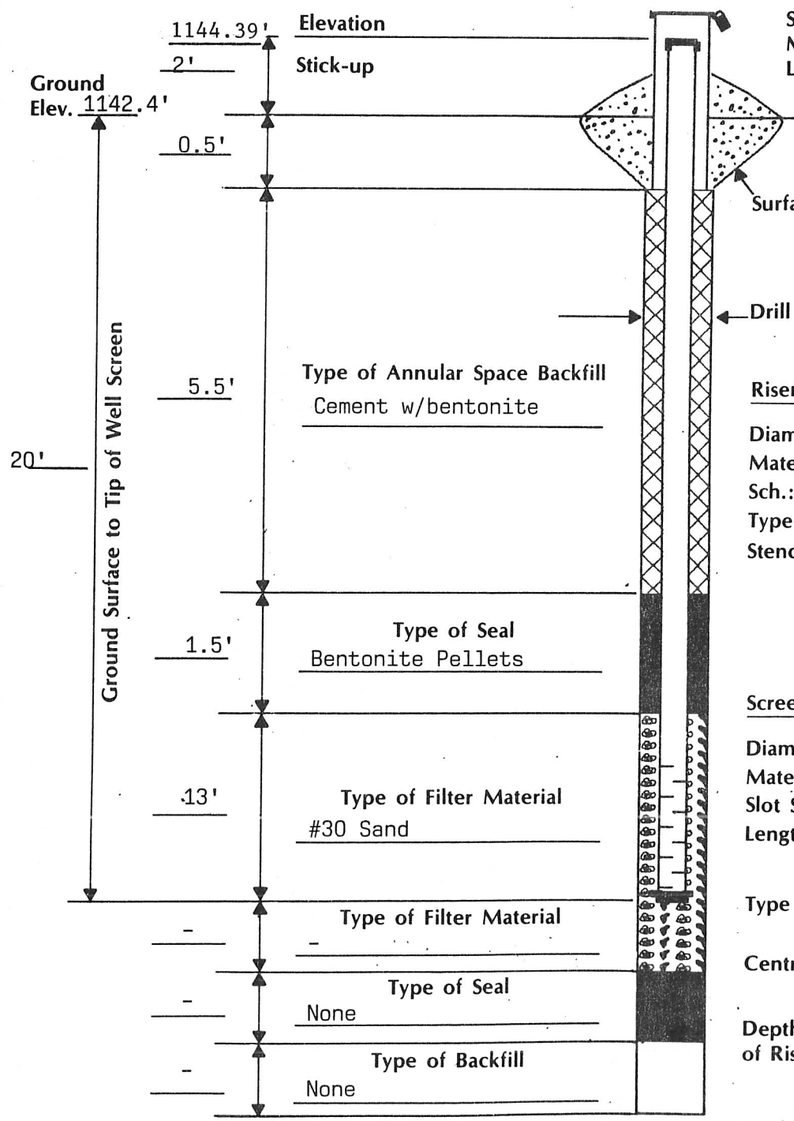
Foth & Van Dyke

Client: Kennecott — Scope I.D.: 87K10
Project: Type II Rock Storage — Page: 1
Prepared by: KAD — Date: 11/15/88
Checked by: BJS — Date: 12/2/88

MONITORING WELL CONSTRUCTION DIAGRAM

Driller: Twin City Testing Corp.
Drilling Method: Hollow Stem Augers
Coordinates: N 39662.24 E 40904.66

Well No: PZ-SP8
Date Installed: 11/15/88



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Material: PVC
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Type of Joints: Flush threaded
Stenciled? -

Screen:
Diameter: 2"
Material: PVC
Slot Size: 0.010"
Length: 10'

Type of Cap: PVC

Centralizer: Used ☐ Not Used ☒

Depth to Water From Top of Riser at Completion: 17'

NOTE: Not to Scale