

**Appendix P**  
**Rock Core Logs**



<b>PROJECT NUMBER</b> NJ022948.ST.WI	<b>BORING NUMBER</b> BRMW2	<b>SHEET 1 OF 3</b>
<b>ROCK CORE LOG</b>		

**PROJECT** Stepan Co. and Sears and Adjacent Properties RI
**LOCATION** Maywood, NJ  
**ELEVATION** \_\_\_\_\_ **DRILLING CONTRACTOR** Environmental Drilling, West Creek, NJ  
**DRILLING METHOD AND EQUIPMENT** B80 Mobile NX Core (5'); water Rotary
**ORIENTATION** Vertical, unoriented  
**WATER LEVEL AND DATE** \_\_\_\_\_ **START** 3/19/92 **FINISH** 3/19/92 **LOGGER** L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (ft)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING, ROD DROPS, TEST RESULTS, ETC
21.0	R1 4.4/5=88%	0	20.3' mechanical break		20-21.15' SANDSTONE, pale reddish brown, hard, very fine-fine sand, wellsorted	0909 begin coring 20-25'
22.0		>10	20.8' mechanical break 21.1'-21.6' numerous veins, open approx. 10 broken pieces recovered, subhorizontal. ? quartz coating on each thin pieces all <.1' thick planar, rough 21.65' Vein, healed (broken by LV) thin quartz and calcite coating 21.8' Vein, open, planar, smooth, thin coating of calcite and quartz, 2 coatings 22.06' and 22.4' Veins, tight, planar smooth thin coating of calcite and quartz, 22.7' Vein, healed, very thin 23'-23.5' multiple Veins, open, smooth, undulating, quartz and clay coating subhorizontal, approx. 6 broken core pieces		21.15-24.0' MUDSTONE, with thin interbeds of sandstone, pale reddish brown, grayish red, soft, cross beds abundant, (thin <.01"). Crossbeds of sandstone & mudstone more abundant from 22.5-24	
24.0		2				
25.0		7				
26.0	R2 4.8/5=96%	1	23.85' Vein, open, stepped, smooth, weathered, mica on edge, clay, coating approx. .01' 24.2' Joint, open, undulating, smooth, subhorizontal 24.8' Mechanical break		24.0-36.9' SANDSTONE, grayish red, very fine-fine sand, hard, wellsorted, bedding barely visible, quartz, bioturbation at bottom?	0952 trip out core 20-25'
27.0		1	25.4' Joint, open, undulating, rough, 25.9' Mechanical break			1000 begin coring 25-30'
28.0		1	26.55' Vein, tight, white coating/specks (reacts greatly to HCl.) planar, rough 26.75' Mechanical break 27.1'-27.8' Mechanical breaks crisscrossing			
29.0		0				
30.0		0	28.6' Mechanical break			
31.0		0				



PROJECT NUMBER

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BRMW2

SHEET 2 OF 3

## ROCK CORE LOG

PROJECT Stepan Co. and Sears and Adjacent Properties RI

LOCATION Maywood, NJ

ELEVATION

DRILLING CONTRACTOR

Environmental Drilling, West Creek, NJ

DRILLING METHOD AND EQUIPMENT B80 Mobile NX Core (5'); water Rotary

ORIENTATION Vertical, unoriented

WATER LEVEL AND DATE

START 3/19/92

FINISH 3/19/92

LOGGER L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (ft)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC
30.0	R3 4.9/5=98%	0	30.55' Mechanical break 30.85'-31.1' Mechanical breaks crisscross			1030 tripout core 25-30' 1035 begin coring 30-35'
32.0		0				
33.0		0	32.2' Mechanical break 32.3' Mechanical break			
34.0		0	33.1' Mechanical break			
35.0		0	33.6' 2 Mechanical breaks			
36.0		0				
37.0	R4 4.25/5=85%	0				1058 tripout core 30-35' 1104 begin coring 35-40'
38.0		0	35.85'-36.03' Mechanical break, friable sandstone			
39.0		1	37.1' Mechanical break 37.2' joint, open, smooth, undulating, slightly weathered, subhorizontal 37.3' Mechanical break 37.45'-37.55' Mechanical break, weak spot 38.25' Mechanical break 38.3'-38.5' vein, healed calcite, thin 38.7' Mechanical break		36.9-37.6' MUDSTONE, grayish red, soft smooth surface, finely laminated thin vein of calcite at 37.35	Well taking water approx. 36.5'
39.0		2			37.6-38.5' SANDSTONE, pale reddish brown, fine-med. sand, hard, some soft grains, quartz crossbeds at top with mudstone 38.5-41.1' Thin interbeds of MUDSTONE, SANDSTONE, pale reddish brown, SS hard, MS soft, crossbedding slight fining downward fine-med sand at 38.95-39 zone of white, soft-hard material, in sandstone noncalcareous, easily scratched feldspar ? doesn't react to HCI can be scratched with knife, intermixed with fine sandstone.	
39.0		1	38.9' joint, open, stepped, smooth, subhorizontal 38.7'-39.25' joint, open-tight, approx. 80 degrees, missing piece at top & bottom 38.70'-38.85' and 39.15'-39.25' 39.15' joint, open, undulating, smooth			1132 tripout core 35-40' 1139 begin coring 40-45'



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SHEET 3 OF 3

# ROCK CORE LOG

PROJECT Stepan Co. and Sears and Adjacent Properties RI

LOCATION Maywood, NJ

ELEVATION DRILLING CONTRACTOR Environmental Drilling, West Creek, NJ

DRILLING METHOD AND EQUIPMENT B80 Mobile NX Core (5'); water Rotary ORIENTATION Vertical, unoriented

WATER LEVEL AND DATE START 3/19/92 FINISH 3/19/92 LOGGER L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (ft)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		ROD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
41.0	R5 5/5=100%	0	40'-40.2' subhorizontal, joint, open, missing piece, undulating smooth		41.1-45.4' SANDSTONE, pale red pale reddish brown, 2 fining, upward sequences 41.1-42.5' and 42.5-45.4' very fine-fine sand, coarsening into medium coarse quartz feldspar, mudstone liths, sands, well graded pebbles of evaporite? react highly to HCl, very soft, scratched by nail located in coarse beds.	
42.0		2	41.0' joint, open, smooth, undulating, slightly weathered 41.1' BED PARTING, open, planar, rough			
		0	41.95' Mechanical break			
44.0		0	43.4' Mechanical break 43.65' Mechanical break 43.8' Mechanical break			
45.0	R6 5/5=100%	0	44.3' Mechanical break 44.5' Mechanical break		45.4-50.0' SANDSTONE, pale red, pale reddish brown, very fine-fine sands, hard, zones of mudstone at 47-47.19'. 47.55-48.4', grayish red; soft, white zone feldspar? (similar to 38.95'-39.00') at 47.15'-47.35' doesn't react to HCl, soft-hard, crossbeds throughout core length.	1200 tripout core 45-50' 1209 begin coring 45-50'
48.0		0	45.7' Mechanical break			
47.0		1	46.4'-46.83' joint, tight, undulating, smooth, approx. 70 deg.			
48.0		4	47' joint, open, stepped, rough, weathered, subhorizontal 47.1' joint, open, planar, rough, subhorizontal 47.55', 47.65', 47.95', 48.05', 4 joints, open, planar, rough, weathered, subhorizontal, trace clay coating			
49.0		2	48.75' Joint, tight, undulating, rough, 60 deg. meets with joint at 49'			
		1	49' joint, tight, undulating, rough, subhorizontal, thin crack from 49'-49.6'			1254 tripout core 45-50' end of coring
			49.6' Mechanical break			

BORING NUMBER

BRMW13

SHEET 1 OF 3

# ROCK CORE LOG

**PROJECT** Stepan Co. and Sears and Adjacent Properties RI

**LOCATION** Maywood, NJ

**ELEVATION** \_\_\_\_\_ **DRILLING CONTRACTOR** Environmental Drilling, West Creek, NJ

**DRLING METHOD AND EQUIPMENT** B80 Mobile NX Core (5'), water rotary

**ORIENTATION** Vertical, unoriented

WATER LEVEL AND DATE \_\_\_\_\_ START 4/9/92

**FINISH** 4/9/92

**LOGGER** S. Repko

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES			GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
22.0	R1 4.9/5.0=98%	2.41/5=48.2%	3	21.2' Fracture, weathered 21.5' Fracture, weathered	21'-36' SANDSTONE, medium reddish brown, massive, hard-very hard, some quartz-rich bands, weathering only in fractures, no visible primary porosity.	See Soil Boring Log 0845 Begin coring 20'-25'	
23.0			6	21.95' Fracture, weathered 22.0' Fracture, slightly weathered 22.1' Fracture, slightly weathered 22.75'-23.0' Fracture zone, weathered			
			4	23.2'-23.5' Fracture zone, weathered			
25.0			1	24.3' Fracture, slightly weathered			
			0	25.0' Mechanical break 25.4' Mechanical break			
				25.8' Mechanical Break			
26.0			4	26.5' Fractures 26.9' Fractures 27.2'-27.8' Vertical break (fracture?)			0930 tripout core 21'-26' 0935 begin coring 26'-31' driller estimate approximately 50% circulation loss from 26'-32'
27.0	2						
28.0	3	28.5'-29.33' Fractures (vertical and horizontal)					
29.0	R2 5.0/5.0=100%	4.87/5=93.4%	3				
30.0			1	30.5' Breaks mechanical & natural			



PROJECT NUMBER  
NJ022948.SR.SL

BORING NUMBER  
BRMW13

SHEET 2 OF 3



## ROCK CORE LOG

PROJECT Stepan Co. and Sears and Adjacent Properties RI

LOCATION Maywood, NJ

ELEVATION

DRILLING CONTRACTOR

Environmental Drilling, West Creek, NJ

DRILLING METHOD AND EQUIPMENT B80 Mobile NX Core (5'), water rotary

ORIENTATION Vertical, unoriented

WATER LEVEL AND DATE

START 4/9/92

FINISH 4/9/92

LOGGER S. Repko

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING, ROD DROPS, TEST RESULTS, ETC
32.0	R3 5.0/5.0=100%	4	31.3' Mechanical break 31.2'-31.75' Breaks-tight (mechanical?)			1007 tripout core 26'-31' 1012 begin coring 31'-26'
		2	32.2' Fractures, horizontal, vertical break			Circulation loss approximately 10%
33.0		1	33.1' Fracture, slightly weathered			
34.0		2	34.1' Fracture, slightly weathered 34.5' Fracture, slightly weathered			
35.0	R4 5.0/5.0=100%	11	35.1', 35.5' 2 Fractures, weathered 35.5'-36.0' Fracture zone, weathered			1050 tripout core 31'-36' 1100 begin coring 36'-41'
36.0		1			36'-51' SANDSTONE, medium reddish brown, massive, very little weathering (fractures only), hard-very hard, no visible primary porosity.	
37.0		4	37.2'-37.3' Fracture zone, weathered			Coring rate approximately 5 feet/40 min=0.13 feet/min
38.0		3	37.9' Fracture, slightly weathered 38.5' Fracture, slightly weathered			Circulation loss approximately 10%
39.0		1				
40.0		1	40.9' Fracture, slightly weathered			drilling smooth



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SHEET 3 OF 3

## ROCK CORE LOG

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LOCATION Maywood, NJ

ELEVATION

DRILLING CONTRACTOR Environmental Drilling, West Creek, NJ

DRILLING METHOD AND EQUIPMENT B80 Mobile NX Core (5'), water rotary

ORIENTATION Vertical, unoriented

WATER LEVEL AND DATE

START 4/9/92

FINISH 4/9/92

LOGGER S. Repko

DEPTH BELOW SURFACE (ft)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION		
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING, ROD DROPS, TEST RESULTS, ETC
				GRAPHIC LOG	
42.0	R5 5.0/5.0=100%	1	42.0' Fracture, slightly weathered		1143 tripout core 36'-41' 1150 begin coring 41'-46'
		1	42.5' Fracture, slightly weathered		
43.0		1	44.1' Fracture, weathered		
		2	44.6' Fracture, slightly weathered 44.7' Fracture, slightly weathered		
45.0	R6 4.75/5.0=95%	1	45.6' Fracture, slightly weathered		1245 tripout core 41'-46' 1250 begin coring 46'-51'
46.0		2	46.2'-46.4' Fracture zone, with vertical and horizontal fractures		
		1	47.9' Fracture zone, weathered (small)		
48.0		0	49'-50.1' Fracture zone		rough drilling inc. circulation loss approximately 30%
		?			
50.0		0			1330 tripout core 46'-51'  End of coring @ 51'

21  
8.550

1

21

1

1

1




**PROJECT NUMBER**

NJ022948.ST.SL

**BORING NUMBER**

BRMW17

SHEET 1 OF 3

**ROCK CORE LOG**
**PROJECT** Stepan Co. and Sears and Adjacent Properties RI

**LOCATION** Maywood, NJ

**ELEVATION**
**DRILLING CONTRACTOR**

Environmental Drilling, West Creek, NJ

**DRILLING METHOD AND EQUIPMENT** B80 Mobil Rig w/NX Core (5') water rotary

**ORIENTATION** Vertical unoriented

**WATER LEVEL AND DATE**
**START** 3/23/92

**FINISH** 3/23/92

**LOGGER** L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH, AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		ROD (%)	DESCRIPTION			
			DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
21.0	R1 4.95/5=99%	4.75/5=95%	1		20'-23.3' SANDSTONE, pale red-pale reddish brown, hard fining upward sequence, poorly sorted, fine-medium sand coarsening to coarse-medium sand, trace coarse & pebbles throughout, quartz, feldspar, calcite, mudstone liths, rounded grains poorly, bedded	1007 begin coring 20'-25'
22.0	R1 4.95/5=99%	4.75/5=95%	0		20'-23.3' SANDSTONE, pale red-pale reddish brown, hard fining upward sequence, poorly sorted, fine-medium sand coarsening to coarse-medium sand, trace coarse & pebbles throughout, quartz, feldspar, calcite, mudstone liths, rounded grains poorly, bedded	22' well taking H2O
24.0	R1 4.95/5=99%	4.75/5=95%	0		20'-23.3' SANDSTONE, pale red-pale reddish brown, hard fining upward sequence, poorly sorted, fine-medium sand coarsening to coarse-medium sand, trace coarse & pebbles throughout, quartz, feldspar, calcite, mudstone liths, rounded grains poorly, bedded	1041 tripout core 20'-25' 1043 begin coring 25'-30'
25.0	R2 4.87/5=97%	4.05/5=81%	1		23.3'-25.5' SILTSTONE, pale red-pale reddish brown, hard, bioturbation throughout 23.5'-24.7', calcite in matrix, thin MUDSTONE BAND at 23.5', soft	
28.0	R2 4.87/5=97%	4.05/5=81%	3		25.5'-28.9' SANDSTONE, pale red-grayish red, hard, porous fine-medium sand, quartz, feldspar, subangular, orange specks throughout, poorly sorted porosity varies throughout core length	
27.0	R2 4.87/5=97%	4.05/5=81%	0		25.5'-28.9' SANDSTONE, pale red-grayish red, hard, porous fine-medium sand, quartz, feldspar, subangular, orange specks throughout, poorly sorted porosity varies throughout core length	
28.0	R2 4.87/5=97%	4.05/5=81%	0		25.5'-28.9' SANDSTONE, pale red-grayish red, hard, porous fine-medium sand, quartz, feldspar, subangular, orange specks throughout, poorly sorted porosity varies throughout core length	
29.0	R2 4.87/5=97%	4.05/5=81%	1		28.9'-35' SANDSTONE, very fine-fine sand, with silt, grayish red trace very coarse sand, slight fining upward sequence, hard, quartz, feldspar	1112 tripout core 25'-30' 1113 begin coring 30'-35' (actually 29.8'-35')



PROJECT NUMBER NJ022948.ST.SL	BORING NUMBER BRMW17	SHEET 2 OF 3
ROCK CORE LOG		

PROJECT Stepan Co. and Sears and Adjacent Properties RI LOCATION Maywood, NJ  
ELEVATION \_\_\_\_\_ DRILLING CONTRACTOR Environmental Drilling, West Creek, NJ  
DRILLING METHOD AND EQUIPMENT B80 Mobil Rig w/NX Core (5') water rotary ORIENTATION Vertical unoriented  
WATER LEVEL AND DATE \_\_\_\_\_ START 3/23/92 FINISH 3/23/92 LOGGER L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (ft)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING, ROD DROPS, TEST RESULTS, ETC
30.0	R3 5.2/5=10.4%	5.2/5=10.4%	30.0' Mechanical break, evaporite in crack 30.2' Mechanical break 30.8' Mechanical break			
31.2			31.2' Joint, open, undulating, rough, subhorizontal 31.45' Mechanical break			
32.0			32.05' Mechanical break			
33.0			33.3' Mechanical break 33.65' Mechanical break			
34.0			34.3' Mechanical break			
35.0	R4 3.27/5=65.4%	3.27/5=65.4%	34.9' Mechanical break 35.1' Joint, open, undulating, smooth, orange staining 35.3'-35.4' Crisscrossing mechanical breaks		35'-39.2' SANDSTONE, pale red, hard, quartz, feldspar, bioturbation?, fine-medium sand thin band of mudstone at 35.9'-36.2', soft, trace bedding (barely noticeable)	1140 tripout core 30'-35' 1143 begin coring 35'-40'
36.0			35.9'-36.2' numerous broken pieces, slightly weathered joints?, open, undulating, rough, trace clay coating 36.3' Mechanical break			
37.0			36.7'-36.8' Joints, tight, slightly weathered, planar, rough			
38.0			37.2'-37.35' Numerous broken pieces, joints, open, planar, rough 37.5' Joint, open, undulating, smooth 37.6' Joint, healed			
39.0			38.9' Mechanical break to fit in box 39.2'-39.45' Numerous joints, open, planar, planar, smooth, slightly weathered			
			39.6', 39.7', 39.75', 3 Joints open, planar, smooth, slightly weathered, trace clay coating		39.2'-42.05' SILTSTONE, grayish red, soft, cobbles of very soft material throughout (sparse), evaporite, reacts to HCL, thinly bedded, trace bioturbation	1228 tripout core 35'-40' 1230 begin coring



<b>PROJECT NUMBER</b> NJ022948.ST.SL	<b>BORING NUMBER</b> BRMW17	<b>SHEET 3 OF 3</b>
<b>ROCK CORE LOG</b>		

**PROJECT** Stepan Co. and Sears and Adjacent Properties RI **LOCATION** Maywood, NJ  
**ELEVATION** \_\_\_\_\_ **DRILLING CONTRACTOR** Environmental Drilling, West Creek, NJ  
**DRILLING METHOD AND EQUIPMENT** B80 Mobil Rig w/NX Core (5') water rotary **ORIENTATION** Vertical unoriented  
**WATER LEVEL AND DATE** \_\_\_\_\_ **START** 3/23/92 **FINISH** 3/23/92 **LOGGER** L. Vogel, viewed by D. Snyder

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH AND RECOVERY	RQD (%)	FRACTURES PER FOOT	DISCONTINUITIES	GRAPHIC LOG	LITHOLOGY	COMMENTS
				DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC
41.0	R5 5/5=100%	4.74/5=94.8%	0	40.35'-40.65' Vein, healed			
42.0			1				
			0	41.95' Joint, tight, planar, smooth, subhorizontal, slightly weathered, trace orange staining 42.4' Mechanical break 42.7' Mechanical break 42.95' Mechanical break		42.05'-43.65' SANDSTONE, pale red, hard, quartz, feldspar, fine-medium sand, calcite in matrix; cobble size grains of quartz, mudstone liths, feldspar, rounded	
44.0			1	43.85' BEDPARTING, open, planar, smooth, missing piece		43.85'-44.5' MUDSTONE, grayish red, soft finely bedding, thin orthoclase band at 43.9' and cobble at 44.3'	
	R6 5/5=100%	3.75/5=75%	4	44.2'-44.3', 2 Veins, tight, planar, smooth, thin calcite coating, slightly weathered		44.5'-45.4' SANDSTONE, pale red, hard, quartz, feldspar, fine-medium sand, bioturbated coarse sand throughout, mudstone liths	1307 tripout core 40'-45' 1309 begin coring 45'-50'
45.0			3	45.0'-45.03', 2 Veins, tight, undulating rough, thin calcite coating, possibly realed & broken by drilling 45.4' BEDPARTING, open, planar, smooth		45.4'-46.0' MUDSTONE, grayish red, soft, finely bedded	
46.0				45.65'-45.85', 2 Joints, open, planar, smooth, slight weathering, clay coating		46.0'-48.3' Fining upward sequence of SANDSTONE, med-coarse, fining to very fine-fine sand, quartz, feldspar, trace cobbles of feldspar, bedding apparent in coarse material	
47.0			0	46.3' Mechanical break to fit in box			
				46.85' Mechanical break			
48.0			0				
48.0			4	48.3' BEDPARTING, open, planar, smooth, slightly weathered 48.5', 48.6', 48.85', 48.95' 4 Joints, open, slightly weathered mechanical breaks at 48.7', 48.9' 49.2' Vein, open, planar, smooth, trace quartz coating		48.3'-50' Fining upward sequence of SANDSTONE-MUDSTONE, pale red-grayish red, very fine-fine quartz sand, trace bedding (barely noticeable)	
49.0			1				1345 tripout core 45'-50'



**PROJECT NUMBER**  
NJ022948.FH.WI

**BORING NUMBER**  
BRMW8

SHEET 1 OF 3

## ROCK CORE LOG

**PROJECT** Stepan Co. and Sears and Adjacent Properties RI **LOCATION** Maywood, NJ  
**ELEVATION** **DRILLING CONTRACTOR** Environmental Drilling, West Creek, NJ  
**DRILLING METHOD AND EQUIPMENT** B80 Mobile NX Core (5') **ORIENTATION** Vertical, unoriented  
**WATER LEVEL AND DATE** **START** 3/28/92 **FINISH** 3/28/92 **LOGGER** S. Repko, veiwed by D. Snyder

DEPTH BELOW SURFACE (ft.)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION		ROCK TYPE, COLOR, MINERALOGY, TEXTURE WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC
30.0	RI 4.9/5=98%	1	30'-30.6' Fracture vertical, broken, weathered, one side broken		30'-39.8' SANDSTONE, fine sand with silt, moderate reddish brown	0901 begin coring 30'-35'
			31.0' Fracture, horizontal, flat, weathered undulating, smooth, no fill or stain			
32.0		3	31.5' Fracture, angled, weathered undulating, smooth w/no fill or stain			
		>10	31.9'-34.5' weathered fracture zone to Rock fragments vary in size from 0.25" to 0.1 or less, all weathered some healed, fractures, visible high angle fracture at 32.9'			
	R2 4.5/5=90%	>10				0934 tripout core 30'-35' 0941 begin coring 35'-40'
34.0			34.0' Short vertical fracture (45°)			
		7	34.5' Vertical fracture (45°)			
35.0			35'-35.4' Core weathered, but not fractured			
	3.08/5=61.2%	4				
36.0			35.5'-36.0' 4 fractures all highly weathered Vertical (90°) and horizontal 36-36.4 Low angle at 36.4' (25°)			
		>5				
37.0			37.1' Horizontal, weathered, no filling or stain, smooth undulating			
	0	2	37.4' High angle fracture (25°) weathered smooth			
38.0						
39.0		1	39.8' Flat tight fracture, slightly weathered.		39.8'-45' Same as above, except more coarse-grained and more white (quartz) significantly fewer fractures	



## PROJECT NUMBER

NJ022948.FH.WI

## BORING NUMBER

BRMW8

SHEET 2 OF 3

## ROCK CORE LOG

PROJECT Stepan Co. and Sears and Adjacent Properties RI

LOCATION Maywood, NJ

ELEVATION

DRILLING CONTRACTOR

Environmental Drilling, West Creek, NJ

DRILLING METHOD AND EQUIPMENT B80 Mobile NX Core (5')

ORIENTATION Vertical, unoriented

WATER LEVEL AND DATE

START 3/28/92

FINISH 3/28/92

LOGGER S. Repko, veiwed by D. Snyder

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH AND RECOVERY	RQD (%)	FRACTURES PER FOOT	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS	
				DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS		SIZE AND DEPTH OF CASING, FLUID LOSS CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC		
41.0	R3 4.98/5=99.2%	4.94/5=98.8%	0	43.8', 43.85' two closely spaced tight fractures, slightly weathered				1025 tripout core 35'-40' 1028 begin coring 40'-45'	
42.0			0						
43.0			2						
44.0			0						
45.0	R4 4.91/5=98.2%	4.18/5=83.2%	0	44.6' Healed angled fracture				1053 tripout core 40'-45'	
46.0			2	45'-45.2' Rounded edges due to coring, broken pieces, orientation unknown. 45.2'-45.3' Vein, filled with calcite, cavity with crystals, 85' 45.7'-46.3' SHEAR FRACTURE, tight, approx. 75', slickensided, stepped, coating of Calcite and calcite crystals				45'-45.2' SILTSTONE, dark reddish brown, well sorted, soft, broken, rounded edges, orientation not discernible.	1058 begin coring 45'-50'
47.0			1	45.8' Joint, tight, subhorizontal, rough, undulating (cuts fracture at 45.7'-46.3') 46.1' Joint, open, subhorizontal, rough, undulating (cuts fracture at 45.7'-46.3')				45.2'-47.3' grayish red, SANDSTONE fine-medium sand, moderately sorted, hard fining upward, bands of quartz throughout, very coarse pebble size grains in bottom, fining to medium size quartz grains, matrix slightly calcareous.	
48.0			1	47.45' Joint, tight, subhorizontal, rough, planor, possible mechanical break 47.8' Mechanical break				47.3'-48.15' SANDSTONE, grayish red, very fine-fine sand, hard, wellsorted.	
49.0			1	48.75' BED PARTING, open, subhorizontal, rough, undulating 48.8' Mechanical break, subhorizontal				48.15'-48.75' CONGLOMERATE, pale reddish brown, grayish orange pink pebbles, liths. include chalk (CaCo3), quartz, feldspar, mudstone; mudstone liths, oriented horizontally, up to 1" long coarse sand to pebble size, medium graded with fining upward 48.75'-53.5' SANDSTONE, grayish red, very fine-medium sand, hard, slight fining up, % increase of medium quartz sand in bottom	


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SHEET 3 OF 3

**ROCK CORE LOG**
**PROJECT** Stepan Co. and Sears and Adjacent Properties RI

**LOCATION** Maywood, NJ

**ELEVATION**
**DRILLING CONTRACTOR**

Environmental Drilling, West Creek, NJ

**DRILLING METHOD AND EQUIPMENT** B80 Mobile NX Core (5')

**ORIENTATION** Vertical, unoriented

**WATER LEVEL AND DATE**
**START** 3/28/92

**FINISH** 3/28/92

**LOGGER** S. Repko, veiwed by D. Snyder

DEPTH BELOW SURFACE (FT)	CORE RUN LENGTH AND RECOVERY	DISCONTINUITIES		GRAPHIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	DESCRIPTION			
50.0	R5 5.25/5.25=100%	0	50'-50.1' Rounded broken pieces due to coring, orientation unknown			
52.0		0				
		0	52.48' Mechanical break 52.48' Mechanical break to fit in box 52.9'-53.3' healed, vein, approx. 60' crystals of calcite in 2 small cavities			Well taking water
54.0		6	53.5' BED PARTING, open, planar, subhorizontal rough 53.55' Joint, open, undulating, smooth, weathered surface, clay coating, subhorizontal 53.64' Joint, open, undulating, smooth, weathered surface, clay coating, subhorizontal 53.8' Joint, open, undulating, weathered surface, clay coating, rough 53.94' Joint, open, undulating, rough, weathered surface, thin 54.9' Vein, open, stepped, rough, calcite coating, subhorizontal		53.5'-55.3' MUDSTONE, grayish red, soft, smooth surface, finely laminated	Mechanical break at weak spot while logging
56.0	R8 4.75/4.75=100%	0			55.3'-60' SANDSTONE, pale reddish brown, very hard, fining upward, fine-medium sand, quartz	
58.0		0	56.15' Mechanical break to fit in box			1202 tripout core 50'-55' 1210 begin coring 55'-60'
57.0		1	57.03' Joint, tight, planar, smooth subhorizontal			
58.0		1	58.0'-58.5' Vein, open, stepped rough, 50' thick calcite coating, white, calcite of crystals			
59.0		1	59.55' Joint, open, undulating rough, subhorizontal		End of Coring	1235 tripout core