

J21 F1

DESIGN REPORT
Temporary Sedimentation Structure

J21-F1

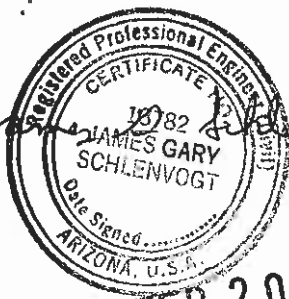
Kayenta Mine

Navajo County, Arizona

For

PEABODY WESTERN COAL COMPANY

James G. Schlenvogt



FEB 20 1998

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
INSPECTION	1
SITE DESCRIPTION	2
LAND USE	2
DESIGN ANALYSES	2
GENERAL	2
STABILITY	2
HYDROLOGY	3
HYDRAULICS	3
EMERGENCY SPILLWAY AND OUTLET CHANNEL	5
STORAGE CAPACITY	5
APPENDIX A	Hydrology, Hydraulic and Sedimentation Calculations
APPENDIX B	SEDCAD+ (Input and Output) 10-Year, 24-Hour Storm Event
APPENDIX C	SEDCAD+ (Input and Output) 100-Year, 6-Hour Storm Event
EXHIBIT #1	J21-F and J21-F1 Temporary Proposed Sediment Ponds

INTRODUCTION

Sedimentation Structure J21-F1 will be an earthen embankment designed and constructed by Peabody Western Coal Company as a temporary sedimentation structure to control runoff and sediment from portions of the J21 disturbed surface mining area at the Kayenta Mine. The location of Structure J21-F1 and its watershed boundary are shown on Drawing No. 85400 (Sheet N-11) and Drawing No. 85405. The site-specific general construction plans are shown on the attached Exhibit 1.

This design report contains information specific to Structure J21-F1, which is in series with sedimentation structure J21-F. Mine-wide design, construction, and reclamation information is presented in the "General Report, Kayenta and Black Mesa Mines, Navajo County, Arizona, for Peabody Western Coal Company", December, 1985 (PAP), Chapter 6, Attachment D, Volume 2, along with the methods and results of analyses used for slope stability, hydrology, and hydraulics, and in Chapter 6, Pages 11 to 42, "Sediment and Water Control Facility Plan".

INSPECTION

The construction site of the proposed Structure J21-F1 was inspected in August, 1997 by a Registered Professional Engineer from Peabody Western Coal Company, to assure that the site is suitable and no adverse conditions exist to prevent the successful construction of this structure. A detailed geotechnical investigation was not performed, rather, the information in Chapter 6, Attachment D was utilized for embankment design and will be utilized during construction to construct a stable embankment.

SITE DESCRIPTION

LAND USE

The J21-F and J21-F1 Structures have a combined watershed of 317.9 acres and are located on a tributary upstream of Dinnebito Wash at the Kayenta Mine. The 301.4 acres watershed, which contributes directly to structure J21-F1 is classified as 72% spoil, 13% undisturbed, and 15%, disturbed.

DESIGN ANALYSES

GENERAL

Structure J21-F1 was designed under the supervision of a Registered Professional Engineer from Peabody Western Coal Company. The design was performed in accordance with applicable 30 CFR 780 and 816 regulations of the United States Department of Interior, Office of Surface Mining (OSM) and included a review of available project files. The most current information contained in the Peabody Western Coal Company files includes topographic maps developed from aerial photography flown in 1992 for Peabody Western Coal Company and was used in the analyses of the structure.

STABILITY

Structure J21-F1 is assumed to be a Category A-3 embankment. The embankment category will be reevaluated during construction under the supervision of a Register Professional Engineer and Table 3-6, Attachment D, Chapter 6 will be utilized as the guidance to construct stable embankment slopes. A homogeneous earthen embankment, compacted in lifts to design specifications, and approximately 15 feet wide on top will be constructed. An upstream slope of 3:1 (horizontal to vertical) or flatter slope and a downstream slope of 4.0:1 or flatter slope is assumed. Based on the total embankment height of approximately 18 feet, these slopes are equal to or flatter than the recommended "worst case" embankment/foundation condition slopes in Table 3-6, Attachment D, Chapter 6; therefore, the embankment will be stable. The emergency spillway will be a minimum 30-foot wide, riprap-lined, trapezoidal channel.

HYDROLOGY

The hydrologic analysis was completed using the computer program SEDCAD+ (see Appendices A, B, and C). Structure J21-F1 will be constructed in series with proposed downstream Structure J21-F. Structure J21-F1 is classified as a low hazard structure (see Drawing No. 85408). In addition, the mine area is sparsely populated with no one living in the downstream floodplain. The structure will impound less than 20 acre-feet and be less than 20 vertical feet in height from the upstream toe of the embankment of the natural stream elevation to the emergency spillway invert elevation. The two structures have a combined capacity greater than 20 acre-feet; therefore, the spillway was analyzed using the 100-year, 6-hour storm event in lieu of the 25-year, 6-hour event. Structures J21-F and J21-F1 were conservatively assumed to be full to the emergency spillway at the time of 100-year storm event. The storage capacity of structure J21-F1 was analyzed using the 10-year, 24-hour storm event. The combined ponds in series were verified to completely contain the 10-year, 24-hour storm event, and provide adequate sediment storage volume, without discharging into the Dinnebito Wash.

The following parameters were used in the hydrologic analysis (see Appendix B and C):

	<u>J21-F1</u>
1. Water Course length, L	0.871 mi.
2. Elevation Difference, H	220 ft
3. Time of Concentration, T _c	0.277 hr
4. SCS Curve Number	85
5. Rainfall Depth, 10-year, 24-hour storm	2.1 in
100-year, 6-hour storm	2.4 in
6. Drainage Area, 10-year, 24-hour storm	301.4 acres
100-year, 6-hour storm	301.4 acres

HYDRAULICS

The SEDCAD+ and Flow Master computer programs were used to evaluate inflow to the sedimentation structure, outflow from the structure and the resulting water surface elevations. The initial conditions and results of the analysis are summarized in the following table (supporting calculations are presented in Appendices A, B, and C).

J21-F1 SEDIMENTATION POND HYDRAULICS TABLE

	Units	10-Yr, 24-Hr Storm	100-Yr, 6-Hr Storm
Initial Reservoir Volume Condition		Empty	Full to emergency spillway
Inflow			
Peak Flow	cfs	223.1	399.5
Volume	ac-ft	21.8	27.6
Storage			
Peak Stage	msl	N/A	6891.2
Emerg. Spillway Elev.	msl	6889.0	6889.0
Peak Storage	ac-ft	N/A	27.3
Storage Capacity	ac-ft	19.97	19.97
Outflow			
Peak Flow	cfs	N/A	279.9
Spillway Elevation	msl	6889.0	6889.0
Embankment Crest Elev.	msl	6893	6893
Peak Stage	msl	--	6891.2
Freeboard	ft	--	1.8
Emergency Spillway Channel			
Flow Depth	ft	--	2.2
Critical Velocity	fps	--	6.2
Mannings "n"	--	--	.031
Width	ft	--	30
Outflow Channel			
Slope	%	--	15
Normal Velocity	fps	--	9.0
Normal Depth	ft	--	1.0
Mannings "n"	--	--	.058
Riprap D ₅₀	in	--	9

EMERGENCY SPILLWAY AND OUTLET CHANNEL

The emergency spillway and outlet channel for J21-F1 will be a trapezoidal channel with dimensions listed below. The alignment and dimensions are shown on Exhibit 1.

Minimum Channel Depth	(Spillway)	4.0	ft
	(Outflow)	2.0	ft
Channel Width		30	ft
Channel Length	(Spillway)	40	ft
	(Outflow)	250	ft
Sideslopes (Horizontal to Vertical)		3:1	or flatter
Average Slope	(Spillway)	0	%
Maximum Slope	(Outflow)	15.0	%
Spillway Elevation		6889.0	ft

A minimum 15-foot long, riprap-lined, channel will be constructed beyond the toe of the embankment as a transition into the downstream channel.

STORAGE CAPACITY

The impoundment stage-capacity table (see Exhibit 1) is based on the 1992 aerial topographic mapping conducted for Peabody Western Coal Company. Structure J21-F1 is designed to contain approximately 19.97 acre-feet.

The calculations for the sediment load entering structure J21-F1 were made utilizing the Revised Universal Soil Loss Equation with the following parameters:

1.	Rainfall Factor, R	40
2.	Soil Erodibility Factor, K	0.15
3.	Slope Factor, LS	5.41
4.	Cover Factor, C	0.896
5.	Erosion Control Factor, P	0.857

The hydrologic analysis gives the storage volume required to contain the 10-year, 24-hour storm, and the remaining storage volume available for storing sediment. Structure J21-F1 does not have sufficient storage to contain the 10-year, 24-hour storm by itself; however, in series with structure J21-F the cumulative storage capacity of the two ponds is adequate. The combined sediment storage capacity was determined for the two structures in series and the results of the analysis are presented in the following table.

Combined Storage for Structures J21-F and J21-F1

	<u>J21-F</u>	<u>J21-F1</u>	<u>Combined</u>
Total Storage Capacity	19.93	19.97	39.90 acre-ft
10-Year, 24-Hour Storm Inflow	0.92	21.83	22.75 acre-ft
Available Sediment Storage Capacity	--	--	17.15 acre-ft
Sediment Inflow Rate/Year	0.17	3.35	3.52 acre-ft
Sediment Storage Life	--	--	4.9 years

* * *

The following appendices and drawing are attached and complete this design report.

- Appendix A - Hydrology, Hydraulic, and Sedimentation Calculations
- Appendix B - SEDCAD+ (Input and Output) 10-Year, 24-Hour Storm Event
- Appendix C - SEDCAD+ (Input and Output) 100-Year, 6-Hour Storm Event
- Exhibit #1 - J21-F and J21-F1 Temporary Proposed Sediment Ponds

APPENDIX A

Hydrology, Hydraulic, and Sedimentation Calculations

**PEABODY WESTERN COAL COMPANY
CALCULATED HYDROLOGIC DATA**

PROJECT: J21 AREA

STRUCTURE: J21-F1

TIME OF CONCENTRATION:

Start Elevation (ft) = 7100
 End Elevation (ft) = 6880
 Elevation Difference, E (ft) = 220

Watercourse Length (ft) = 4600
 Watercourse Length, L (mi) = 0.871

$T_c = (11.9L^{0.3}/E)^{0.385} = \underline{\underline{0.277 \text{ hours}}}$

ROUTING PARAMETERS:

Between structure routing parameters were calculated using the SCS Upland Method in SEDCAD+. Input and output parameters are shown on the SEDCAD+ printouts in Appendices B and C.

SCS CURVE NUMBER:

Cover Type	Soil Group	Curve Number	Area (acres)	CN*Area
Sagebrush-Grass	C	73	17.0	1241
Pinyon Juniper	C	78	22.9	1786.2
Disturbed	C	91	45.6	4149.6
Spoil	B	86	215.9	18567.4
TOTAL:			301.4	25744.2

Weighted CN = Total CN*Area/ Total Area = 85

DRAINAGE BASIN AREA:

301.4 Acres

**PEABODY WESTERN COAL COMPANY
CALCULATED SEDIMENTOLOGY DATA**

PROJECT: J21-F1 Pond

SOIL ERODIBILITY FACTOR:

Soil Type	Erodibility Factor, K	Area (acres)	K*Area
Spoil	0.12	215.9	25.91
Disturbed	0.22	45.6	10.03
20	0.25	39.9	9.98
TOTAL:		301.4	45.92

Weighted K = Total K*Area/ Total Area = 0.15

SLOPE FACTOR:

Length (ft)	Elevation Change (ft)	Slope (%)	m	Slope Angle (deg)	LS Factor
450	40	8.9%	0.5	5.1	2.46
700	90	12.9%	0.6	7.3	6.40
500	55	11.0%	0.6	6.3	4.26
500	100	20.0%	0.6	11.3	8.90
300	60	20.0%	0.6	11.3	6.55
700	60	8.6%	0.5	4.9	2.96
400	35	8.8%	0.5	5.0	2.28
250	80	32.0%	0.6	17.7	9.70
400	90	22.5%	0.6	12.7	8.87
350	25	7.1%	0.5	4.1	1.76

Average LS = 5.41

The LS Factor was calculated by:

$LS = (Slope\ Length/72.6)^m * (10.8 * \sin(slope\ angle) + 0.03)$ for Slopes < 9%

$LS = (Slope\ Length/72.6)^m * (16.8 * \sin(slope\ angle) - 0.5)$ for Slopes > 9%

Where:

Slope < 3% m = 0.3

Slope = 4% m = 0.4

5% > Slope < 10% m = 0.5

Slope > 10% m = 0.6

COVER AND PRACTICE FACTORS:

Cover Type	Cover (%)	Canopy (%)	Area (acres)	Cover Factor, C	C*Area	Practice Factor, P	P*Area
Sagebrush-Grass	20%	25%	17.0	0.20	3.40	1.00	17.00
Pinyon Juniper	20%	25%	22.9	0.22	5.04	1.00	22.90
Disturbed	0%	0%	45.6	1.00	45.60	1.00	45.60
Spoil	0%	0%	215.9	1.00	215.90	0.80	172.72
TOTAL:			301.4		269.94		258.22

Weighted C = Total C*Area/ Total Area = 0.896

Weighted P = Total P*Area/ Total Area = 0.857

RAINFALL FACTOR:

R = 40

PEABODY WESTERN COAL COMPANY
CALCULATED SEDIMENT YIELD

PROJECT: J21-F1 Pond

The following spreadsheet calculates the predicted sediment yield for the project area. The gross sediment yield is determined according to the Revised Universal Soil Loss Equation.

<u>PARAMETER DESCRIPTION</u>	<u>VALUE</u>
Annual Rainfall Factor	40.00
Soil Erodibility Factor	0.15
Length Slope Factor	5.41
Cover Factor	0.90
Practice Factor	0.86
Gross Annual Sediment Yield	25.30 tons/acre/year
Sediment Density	94.00 pcf
Gross Annual Sediment Yield	0.0124 acre-feet/acre/year
Sediment Delivery Ratio	90%
Estimated Annual Sediment Yield	0.0111 acre-feet/acre/year
Watershed Area	301.4 acres
Watershed Annual Sediment Yield	3.35 acre-feet/year
Number of years	1 years
Calculated Sediment Volume	3.35 acre-feet

SEDCAD+ RIPRAP CHANNEL DESIGN

J21-F1

INPUT VALUES:

Shape	TRAPEZOIDAL	
Discharge	279.90 cfs	
Slope	15.00 %	
Sideslopes (L and R)	3.00:1	3.00:1
Bottom Width	30.00 feet	
Freeboard	1 ft	

RESULTS:

Steep Slope Design - PADER Method

Depth	0.95 ft
with Freeboard	1.95 ft
Top Width	35.67 ft
with Freeboard	41.67 ft
Velocity	9.02 fps
Cross Sectional Area	31.04 sq ft
Hydraulic Radius	0.86 ft
Manning's n	0.058
Froude Number	1.70
Dmax	0.938 ft (11.25 in)
D50	0.750 ft (9.00 in)
D10	0.250 ft (3.00 in)

J21-F1 SPILLWAY
Worksheet for Trapezoidal Channel

Project Description	
Project File	untitled.fm2
Worksheet	J21
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.031
Channel Slope	0.013413 ft/ft
Left Side Slope	3.000000 H : V
Right Side Slope	3.000000 H : V
Bottom Width	30.00 ft
Discharge	279.90 cfs

Results	
Depth	1.33 ft
Flow Area	45.22 ft ²
Wetted Perimeter	38.41 ft
Top Width	37.98 ft
Critical Depth	1.33 ft
Critical Slope	0.013413 ft/ft
Velocity	6.19 ft/s
Velocity Head	0.60 ft
Specific Energy	1.93 ft
Froude Number	1.00
Flow is supercritical.	

APPENDIX B

SEDCAD+ (Input and Output) 10-Year, 24-Hour Storm Event

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

PEABODY WESTERN COAL COMPANY : PONDS F & F1 (10 YEAR, 24-HR)

by

Name: D. GLEASON

Company Name: ACZ, INC.
File Name: J:\861\0400\SEDCAD\J21F10

Date: 01-21-1998

Civil Software Design -- SEDCAD+ Version 3.1
 Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

Company Name: ACZ, INC.
 Filename: J:\861\0400\SEDCAD\J21F10 User: D. GLEASON
 Date: 01-21-1998 Time: 13:36:10
 PEABODY WESTERN COAL COMPANY : PONDS F & F1 (10 YEAR, 24-HR)
 Storm: 2.10 inches, 10 year-24 hour, SCS Type II
 Hydrograph Convolution Interval: 0.1 hr

=====

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

=====

-Hydrology-

JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	301.40	85 F	0.277	0.000	0.000	0.0	21.83	223.08
		Type: Pond	Label: J21-F1 POND					
111 Structure	301.40						21.83	
111 Total IN	301.40						21.83	223.08
111 Total OUT							21.83	170.76
112 1	16.50	81 F	0.092	0.000	0.000	0.0	0.92	12.18
		Type: Pond	Label: J21-F POND					
112 Structure	16.50						22.75	
112 Total IN	317.90						22.75	173.27
112 Total OUT							22.75	132.58
111 to 112 Routing				0.005	0.424			

APPENDIX C

SEDCAD+ (Input and Output) 100-Year, 6-Hour Storm Event

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

PEABODY WESTERN COAL COMPANY : POND F & F1 (100 YEAR, 6-HR)

by

Name: D. GLEASON

Company Name: ACZ, INC.
File Name: J:\861\0400\SEDCAD\J21FH

Date: 01-16-1998

Civil Software Design -- SEDCAD+ Version 3.1
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

Company Name: ACZ, INC.

Filename: J:\861\0400\SEDCAD\J21FH User: D. GLEASON

Date: 01-16-1998 Time: 15:34:40

PEABODY WESTERN COAL COMPANY : POND F & F1 (100 YEAR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

=====
GENERAL INPUT TABLE
=====

Detailed Between Structure Routing:

J	B	S	To Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Muskingum K	X
1	1	2	1	8	201.00	10.00	9.49	0.01	0.005	0.424

Company Name: ACZ, INC.

Filename: J:\861\0400\SEDCAD\J21FH User: D. GLEASON

Date: 01-16-1998 Time: 15:34:40

PEABODY WESTERN COAL COMPANY : POND F & F1 (100 YEAR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

=====

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

=====

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	301.40	85	F	0.277	0.000	0.000	0.0	27.61	399.49
			Type: Pond		Label: J21-F1 POND					
111	Structure	301.40							27.61	
111	Total IN	301.40							27.61	399.49
111	Total OUT								27.61	279.88
112	1	16.50	81	F	0.092	0.000	0.000	0.0	1.20	23.61
			Type: Pond		Label: J21-F POND					
	Structure	16.50							28.81	
112	Total IN	317.90							28.81	284.83
112	Total OUT								28.81	216.84
111	to 112 Routing					0.005	0.424			

Company Name: ACZ, INC.

Filename: J:\861\0400\SEDCAD\J21FH User: D. GLEASON

Date: 01-16-1998 Time: 15:34:40

PEABODY WESTERN COAL COMPANY : POND F & F1 (100 YEAR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

=====
 POND INPUT/OUTPUT TABLE
 =====

J1, B1, S1
 J21-F1 POND

Drainage Area from J1, B1, S1, SWS(s)1: 301.4 acres
 Total Contributing Drainage Area: 301.4 acres

DISCHARGE OPTIONS:

Emergency
 Spillway

=====
 Riser Diameter (in) ----
 Riser Height (ft) ----
 Barrel Diameter (in) ----
 Barrel Length (ft) ----
 Barrel Slope (%) ----
 Manning's n of Pipe ----
 Spillway Elevation ----
 Lowest Elevation of Holes ----
 % of Holes/Elevation ----
 Entrance Loss Coefficient ----
 Tailwater Depth (ft) ----
 Notch Angle (degrees) ----
 Weir Width (ft) ----
 Siphon Crest Elevation ----
 Siphon Tube Diameter (in) ----
 Siphon Tube Length (ft) ----
 Manning's n of Siphon ----
 Siphon Inlet Elevation ----
 Siphon Outlet Elevation ----
 Emergency Spillway Elevation 6889.0
 Crest Length (ft) 40.0
 :1 (Left and Right) 3 3
 Bottom Width (ft) 30.0

POND RESULTS:

Permanent
 Pool
 (ac-ft)
 =====
 20.0

	Runoff Volume (ac-ft)	Peak Discharge (cfs)
IN	27.61	399.49
OUT	27.61	279.88

Peak Elevation	Hydrograph Detention Time (hrs)
6891.2	0.23

J1, B1, S2
J21-F POND

Drainage Area from J1, B1, S2, SWS(s)1: 16.5 acres
Total Contributing Drainage Area: 317.9 acres

DISCHARGE OPTIONS:

Emergency
Spillway

Riser Diameter (in)	----
Riser Height (ft)	----
Barrel Diameter (in)	----
Barrel Length (ft)	----
Barrel Slope (%)	----
Manning's n of Pipe	----
Spillway Elevation	----
Lowest Elevation of Holes	----
# of Holes/Elevation	----
Entrance Loss Coefficient	----
Tailwater Depth (ft)	----
Notch Angle (degrees)	----
Weir Width (ft)	----
Siphon Crest Elevation	----
Siphon Tube Diameter (in)	----
Siphon Tube Length (ft)	----
Manning's n of Siphon	----
Siphon Inlet Elevation	----
Siphon Outlet Elevation	----
Emergency Spillway Elevation	6872.5
Crest Length (ft)	40.0
Z:1 (Left and Right)	3 3
Bottom Width (ft)	30.0

POND RESULTS:

Permanent
Pool
(ac-ft)

=====
19.9

	Runoff Volume (ac-ft)	Peak Discharge (cfs)
IN	28.81	284.83
OUT	28.81	216.84

Peak Elevation	Hydrograph Detention Time (hrs)
6874.4	0.25

Company Name: ACZ, INC.

Filename: J:\861\0400\SEDCAD\J21FH User: D. GLEASON

Date: 01-16-1998 Time: 15:34:40

PEABODY WESTERN COAL COMPANY : POND F & F1 (100 YEAR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

=====

ELEVATION-AREA-CAPACITY-DISCHARGE TABLE

=====

J1, B1, S1
 J21-F1 POND

Drainage Area from J1, B1, S1, SWS(s)1: 301.4 acres
 Total Contributing Drainage Area: 301.4 acres

SW#1: Emergency Spillway

Elev	Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	
6880.00	0.00	1.68	0.00	0.00	
6881.00	1.00	1.78	1.73	0.00	
6882.00	2.00	1.88	3.56	0.00	
6883.00	3.00	1.98	5.49	0.00	
4.00	4.00	2.09	7.52	0.00	
5.00	5.00	2.20	9.67	0.00	
6.00	6.00	2.38	11.96	0.00	
6887.00	7.00	2.57	14.43	0.00	
6888.00	8.00	2.77	17.10	0.00	
6889.00	9.00	2.97	19.97	0.00	Stage of SW#1
6889.70	9.70	3.12	22.10	30.80	
6889.80	9.80	3.14	22.41	40.29	
6889.90	9.90	3.16	22.73	50.68	
6890.00	10.00	3.18	23.05	61.92	
6890.50	10.50	3.37	24.68	136.90	
6891.00	11.00	3.55	26.41	229.05	
6891.24	11.24	3.64	27.29	279.88	Peak Stage
6891.50	11.50	3.74	28.23	334.84	
6892.00	12.00	3.93	30.15	472.05	
6892.50	12.50	4.13	32.17	629.82	
6893.00	13.00	4.33	34.28	819.57	

J1, B1, S2
 J21-F POND

Drainage Area from J1, B1, S2, SWS(s)1: 16.5 acres
 Total Contributing Drainage Area: 317.9 acres

SW#1: Emergency Spillway

Elev	Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)
6865.00	0.00	2.28	0.00	0.00

6866.00	1.00	2.38	2.33	0.00	
6867.00	2.00	2.47	4.75	0.00	
6868.00	3.00	2.57	7.28	0.00	
6869.00	4.00	2.68	9.90	0.00	
6870.00	5.00	2.78	12.63	0.00	
6871.00	6.00	2.89	15.47	0.00	
6872.00	7.00	3.01	18.41	0.00	
6872.50	7.50	3.06	19.93	0.00	Stage of SW#1
6873.00	8.00	3.12	21.48	22.00	
6873.20	8.20	3.15	22.10	30.80	
6873.30	8.30	3.16	22.42	40.29	
6873.40	8.40	3.17	22.74	50.68	
6873.50	8.50	3.18	23.05	61.92	
6874.00	9.00	3.24	24.66	136.90	
6874.43	9.43	3.29	26.08	216.84	Peak Stage
6874.50	9.50	3.30	26.29	229.05	
6875.00	10.00	3.36	27.96	334.84	
6875.50	10.50	3.48	29.67	472.05	
6876.00	11.00	3.60	31.44	629.82	
