APPENDIX 11-T

SOUTH DIXON PONDS 1, 2 & 3 HYDROLOGY

(06/95, 11/05)

APPENDIX 11-T

South Dixon Ponds 1 to 3 Hydrology

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South Dixon Pond #1

The as-built is presented on Exhibit 11-51C. The location and watershed area are presented on Exhibit 11-13E. The SedCad model was updated on 11/20/08 by Shawn Smith to reflect current watershed. Structure 1 watershed increase from 287.23 to 285.19 acres. The watershed boundary was modified using actual surveys and aerial flight data.

LR

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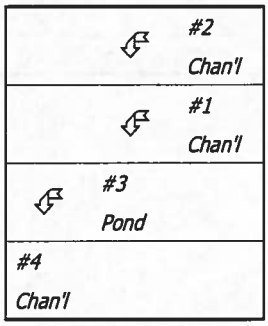
General Information

Storm Information:

Storm Type:	Type II-70
Design Storm:	10 yr - 24 hr
Rainfall Depth:	1.600 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#3	0.000	0.000	NW Inlet
Channel	#2	==>	#3	0.000	0.000	SE Inlet
Pond	#3	==>	#4	0.000	0.000	South Dixon Pond 1
Channel	#4	==>	End	0.000	0.000	Spillway Outflow



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Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2		11.270	11.270	3.23	0.25
#1		285.190	285.190	70.01	6.38
#3	In	0.000	296.460	73.11	6.63
	Out			39.52	6.63
#4		0.000	296.460	39.52	6.63

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#2	1	11.270	0.333	0.000	0.000	80.000	M	3.23	0.253
	Σ	**11.270**						**3.23**	**0.253**
#1	1	285.190	0.430	0.000	0.000	80.000	M	70.01	6.378
	Σ	**285.190**						**70.01**	**6.378**
#3	1	0.000	0.000	0.000	0.000	1.000	0.00	0.000	
	Σ	**296.460**						**73.11**	**6.631**
#4	Σ	**296.460**						**39.52**	**6.631**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	4.47	30.00	671.00	2.110	0.088
		8. Large gullies, diversions, and low flowing streams	2.23	123.00	5,517.00	4.470	0.342
#1	**1**	**Time of Concentration:**					**0.430**
#2	1	5. Nearly bare and untilled, and alluvial valley fans	3.03	58.00	1,913.00	1.740	0.305
		8. Large gullies, diversions, and low flowing streams	3.16	17.00	538.00	5.330	0.028
#2	**1**	**Time of Concentration:**					**0.333**

General Information

Storm Information:

Storm Type:	Type II-70
Design Storm:	25 yr - 6 hr
Rainfall Depth:	1.600 inches

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Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2		11.270	11.270	4.35	0.25
#1		285.190	285.190	94.36	6.38
#3	In	0.000	296.460	98.51	6.63
	Out			61.11	6.63
#4		0.000	296.460	61.11	6.63

Structure Detail:

Structure #3 (Pond)

South Dixon Pond 1

Pond Inputs:

Initial Pool Elev:	5,246.90 ft
Initial Pool:	11.89 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
5,246.90	25.00	3.00:1	3.00:1	15.00

Pond Results:

Peak Elevation:	5,248.17 ft
Dewater Time:	0.26 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
5,237.00	0.777	0.000	0.000		
5,237.01	0.779	0.008	0.000		
5,238.00	1.006	0.889	0.000		
5,239.00	1.058	1.921	0.000		
5,240.00	1.107	3.003	0.000		
5,241.00	1.157	4.135	0.000		
5,242.00	1.207	5.317	0.000		
5,243.00	1.258	6.550	0.000		
5,244.00	1.311	7.834	0.000		
5,245.00	1.368	9.173	0.000		
5,246.00	1.430	10.572	0.000		
5,246.90	1.488	11.885	0.000		Spillway #1
5,247.00	1.495	12.035	3.988	3.30	
5,248.00	1.555	13.560	43.833	2.70	
5,248.17	1.557	13.823	61.111	0.30	Peak Stage
5,249.00	1.602	15.138	147.308		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
5,237.00	0.000	0.000
5,237.01	0.000	0.000
5,238.00	0.000	0.000
5,239.00	0.000	0.000
5,240.00	0.000	0.000
5,241.00	0.000	0.000
5,242.00	0.000	0.000
5,243.00	0.000	0.000
5,244.00	0.000	0.000
5,245.00	0.000	0.000
5,246.00	0.000	0.000
5,246.90	0.000	0.000
5,247.00	3.988	3.988
5,248.00	43.833	43.833
5,249.00	147.308	147.308

Structure Detail:

Structure #4 (Riprap Channel)

Spillway Outflow

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	3.0:1	3.0:1	12.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	61.11 cfs	
Depth:	0.42 ft	1.42 ft
Top Width:	14.52 ft	20.52 ft
Velocity*:		
X-Section Area:	5.58 sq ft	
Hydraulic Radius:	0.380 ft	
Froude Number*:		
Manning's n*:		
Dmin:	3.00 in	
D50:	9.00 in	
Dmax:	11.25 in	

Velocity and Manning's n calculations may not apply for this method.

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General Information

Storm Information:

Storm Type:	Type II-70
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

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Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2		11.270	11.270	2.43	0.15
#1		285.190	285.190	52.31	3.68
#3	In	0.000	296.460	54.70	3.83
	Out			29.54	3.83
#4		0.000	296.460	29.54	3.83

Structure Detail:

Structure #2 (Riprap Channel)

SE Inlet

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	3.0:1	3.0:1	15.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.43 cfs	
Depth:	0.05 ft	1.05 ft
Top Width:	8.32 ft	14.32 ft
Velocity*:		
X-Section Area:	0.44 sq ft	
Hydraulic Radius:	0.052 ft	
Froude Number*:		
Manning's n*:		
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	7.50 in	

Velocity and Manning's n calculations may not apply for this method.

Structure Detail:

Structure #1 (Riprap Channel)

NW Inlet

Trapezoidal Riprap Channel Inputs:

Material: Riprap

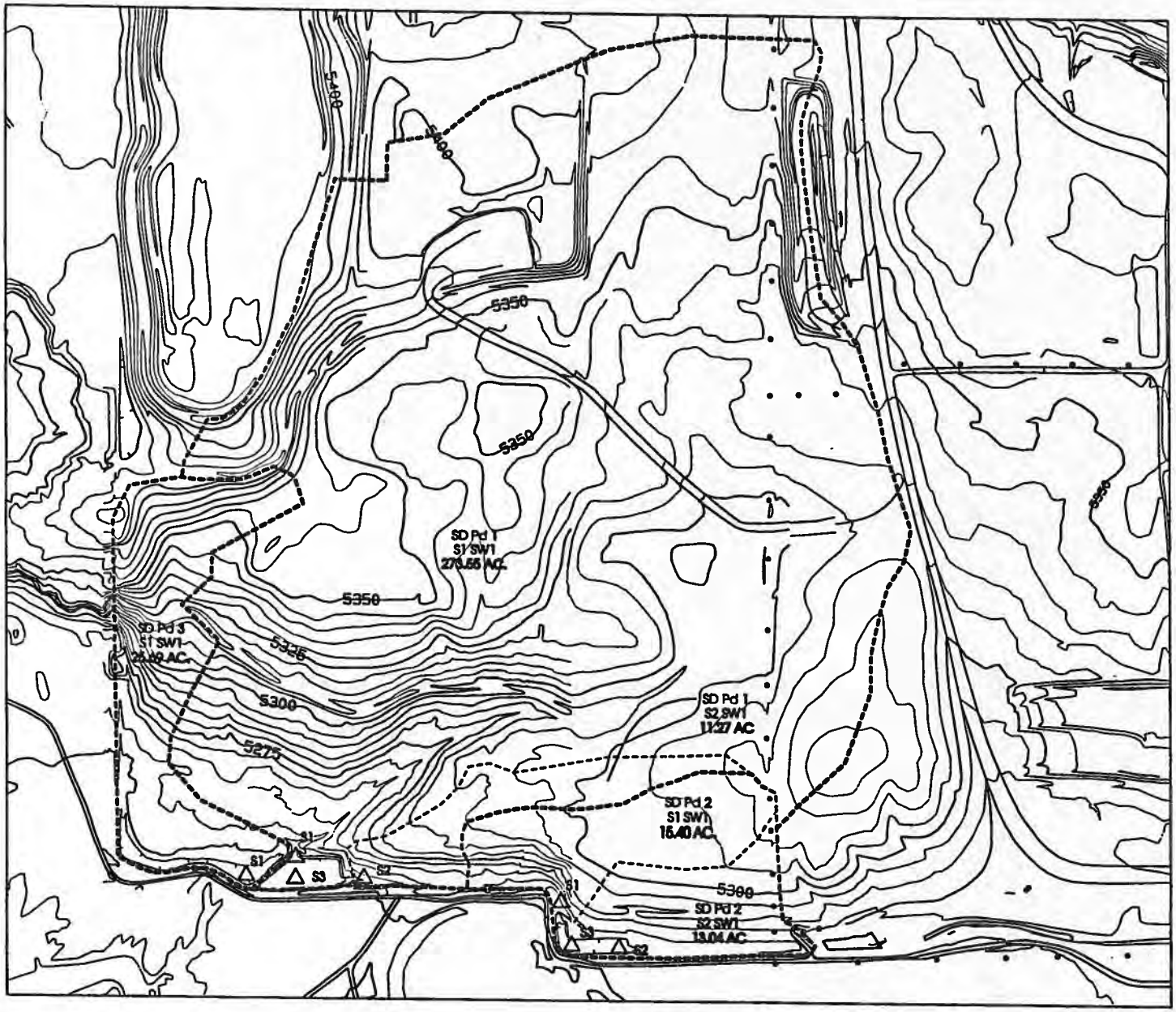
Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	3.0:1	3.0:1	15.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	52.31 cfs	
Depth:	0.44 ft	1.44 ft
Top Width:	10.66 ft	16.66 ft
Velocity*:		
X-Section Area:	4.14 sq ft	
Hydraulic Radius:	0.383 ft	
Froude Number*:		
Manning's n*:		
Dmin:	4.00 in	
D50:	12.00 in	
Dmax:	15.00 in	

Velocity and Manning's n calculations may not apply for this method.



SOUTH DIXON POND 1, 2 AND 3
HYDROLOGY MODEL (11/2005)
NTS

South Dixon Pond 2
Design Modification

The erosion of north bank of the Cottonwood Wash is encroaching onto the pond embankment. The embankment also functions as a roadway for residences west of the mine lease. To prevent possible breach of the embankment and enhance the safety of the road, a reach of the embankment was realigned. The design modification of the embankment is presented on Exhibit 11-117A. The location and watershed area are presented on Exhibit 11-13E. The hydrology model is presented on a 8 1/2 X 11 sheet attached.

LR

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87416

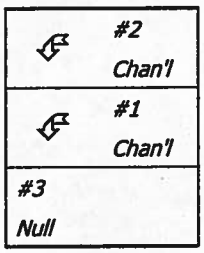
General Information

Storm Information:

Storm Type:	Type II-60
Design Storm:	100 yr - 6 hr
Rainfall Depth:	2.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#3	0.000	0.000	NW Inlet
Channel	#2	==>	#3	0.000	0.000	East Inlet
Null	#3	==>	End	0.000	0.000	South Dixon Pd 2



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2	13.040	13.040	16.54	0.61
#1	15.400	15.400	9.85	0.72
#3	0.000	28.440	23.15	1.33

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#2	1	13.040	0.123	0.000	0.000	80.000	M	16.54	0.611
	Σ	**13.040**						**16.54**	**0.611**
#1	1	15.400	0.236	0.000	0.000	80.000	M	9.85	0.722
	Σ	**15.400**						**9.85**	**0.722**
#3	Σ	**28.440**						**23.15**	**1.333**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	3.08	42.00	1,362.00	1.750	0.216
		8. Large gullies, diversions, and low flowing streams	5.70	30.00	526.00	7.160	0.020
#1	**1**	**Time of Concentration:**					**0.236**
#2	1	5. Nearly bare and untilled, and alluvial valley fans	9.68	64.00	661.00	3.110	0.059
		8. Large gullies, diversions, and low flowing streams	1.75	16.00	916.00	3.960	0.064
#2	**1**	**Time of Concentration:**					**0.123**

General Information

Storm Information:

Storm Type:	Type II-60
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2	13.040	13.040	6.43	0.21
#1	15.400	15.400	3.22	0.25
#3	0.000	28.440	7.84	0.46

Structure Detail:

Structure #2 (Riprap Channel)

East Inlet

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)}	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
6.00	2.0:1	2.0:1	14.0	1.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.43 cfs	
Depth:	0.11 ft	1.11 ft
Top Width:	6.43 ft	10.43 ft
Velocity*:		
X-Section Area:	0.66 sq ft	
Hydraulic Radius:	0.102	
Froude Number*:		
Manning's n*:		
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	7.50 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #1 (Riprap Channel)

NW Inlet

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)}	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
8.00	2.0:1	2.0:1	15.0	1.00		

Riprap Channel Results:

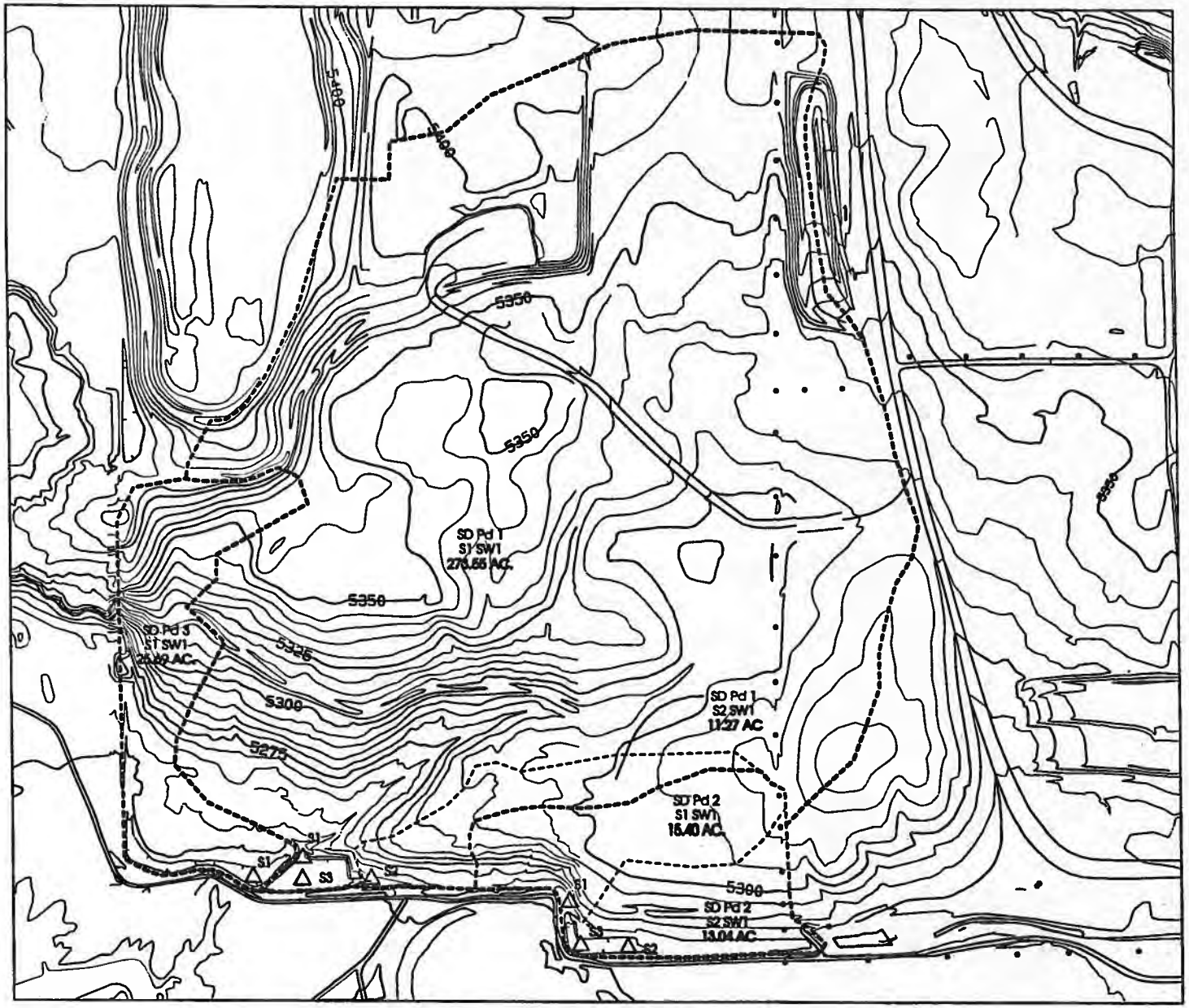
Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.22 cfs	
Depth:	0.06 ft	1.06 ft
Top Width:	8.24 ft	12.24 ft
Velocity*:		
X-Section Area:	0.50 sq ft	
Hydraulic Radius:	0.060	
Froude Number*:		
Manning's n*:		
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	7.50 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #3 (Null)

South Dixon Pd 2



SOUTH DIXON POND 1, 2 AND 3
HYDROLOGY MODEL (11/2005)
NTS

South Dixon Pond 3

The as-built is presented on Exhibit 11-51D. The location and watershed area are presented on Exhibit 11-13E. The watershed boundary was modified using actual surveys and aerial flight data.

LR

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General Information

Storm Information:

Storm Type:	Type II-70
Design Storm:	100 yr - 6 hr
Rainfall Depth:	2.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	South Dixon Pd 3

#1
Null

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	28.180	28.180	22.60	1.05

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	28.180	0.204	0.000	0.000	80.000	M	22.60	1.055
	Σ	**28.180**						**22.60**	**1.055**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	10.32	105.00	1,017.00	3.210	0.088
		8. Large gullies, diversions, and low flowing streams	1.86	32.00	1,719.00	4.090	0.116
#1	**1**	**Time of Concentration:**					**0.204**