TRI-STATE

January 31, 2023

Mr. Zach Trujillo
Environmental Protection Specialist
Colorado Division of Reclamation, Mining & Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Colowyo Coal Company L.P.
Permit No. C-1981-019
Technical Revision No. 158 (TR-158)
Adequacy Response

Dear Mr. Trujillo,

Tri-State Generation and Transmission Association Inc. (Tri-State), is the parent company to Axial Basin Coal Company, which is the general partner to Colowyo Coal Company L.P. (Colowyo). Therefore, Tri-State on behalf of Colowyo is submitting this adequacy response for technical revision 158 (TR-158) to Permit No. C-1981-019.

Tri-State received an adequacy letter from the Division dated January 26, 2023, and has the following response to the Division's concern:

1. *The Division has performed a cost estimate to determine the cost associated with the proposed updates to the Prospect Drainage proposed under TR-158. The total liability amount calculated by this estimate is* ***$100,910.00*** *(see attached cost estimate). The Division's cost estimate is consistent with previous cost estimates approved by both the Division and Colowyo. The Division respectfully requests a response from Colowyo with any questions regarding the cost estimate or an acceptance of the Division's estimate.*

Response: Tri-State has reviewed the Division's cost estimate provided under TR-158, and hereby provides concurrence with the Division's estimate.

2. *When reviewing proposed Appendix Exh. 7-14PP, page 1, paragraph 1, it refers to EP3 Inlet and Outlet profiles being presented on proposed Map 33. Reviewing proposed Map 33, these two ditch profiles were not included. Please provide an updated Map 33 including the profiles of EP3 Inlet and Outlet Ditches.*

Response: EP3 inlet and outlet channel profiles have been added to Map 33 as requested.

3. *There appears to be a typo found on Appendix Exh. 7-14PP, page 1, under paragraph 4 of the Prospect Pond section referring to the "Prospection Collection Ditch". Please provide updated page 1 of the proposed Appendix Exh. 7-14PP with a corrected reference to the Prospect Collection Ditch.*

P.O. BOX 33695
DENVER, CO 80233-0695
303-452-6111
WWW.TRISTATE.COOP

Response: The typographical error noted has been corrected.

4. *There appears to be an error in figure designation associated with proposed Appendix 7-14S15. Both associated Figures have been labeled as Figure Exh. 7-14S15-2 for the Pond Drainage Areas – Post Mining Condition and Section 15 Pond Design. Please provide and updated Figure with the corrected naming designation.*

Response: The typographical error in the figure designation for Appendix 7-14S15 has been corrected.

5. *When reviewing proposed Appendix 7-14S15, page 1, paragraph 1 there appears to be reference errors to figures associated with this appendix. For Pond Drainage Areas – Post Mining Condition, it refers to Figure Exh. 7-14Q-1 and for the Section 15 Pond Design it refers to Figure Exh. 7-14Q-2. Please provide updated references to the correct Figures (see Comment 3).*

Response: All citations to Figures within Appendix 7-14S15 have been corrected.

The following adequacy comments are in reference to the associated 10 – year, 24 – hour and 25 – year, 24 – hour SedCAD modes under proposed Appendix Exh. 7-14PP:

6. *When reviewing the Immediate Contributing Acreage for each Structure within the SedCAD model, it appears that Structure #12 is missing 2.4 acres from what the Division has calculated. This acreage seem to correspond to small acreages associated with curve number CN61. Please review the contributing acreage for Structure #12 and update the associated SedCAD model's Immediate Contributing Acreage as necessary.*

Response: The 2.4 acre subwatershed with an associated curve number of 61 has been added to the model accordingly.

7. *When reviewing the Immediate Contributing Acreage for each Structure within the SedCAD model, it appears that both Structure #28 and Structure #30 are missing 0.3 acres from what the Division has calculated. These acreages seem to correspond to small acreages associated with curve number CN62 for both Structures. Please review the contributing acreage for both Structure # 28 and Structure # 30 and update the associated SedCAD model's Immediate Contributing Acreage as necessary.*

Response: The 0.3 acres subwatershed that were missing from Structures #28 and #30 have been added to the model accordingly.

8. *When reviewing the Structure Networking, Structure #24 (EP1) reports to Structure #14 and by-passes Reach 1 of the Final East Pit Ditch. Additionally, there is no Structure assignment for Reach 1 of the Final East Pit Ditch along with the associated Immediate Contributing Acreage. Please provide an updated SedCAD model including Reach 1 of the Final East Pit Ditch and associated Immediate Contributing Acreage with a corrected Structure Networking.*

Response: First**,** two new Structures (#32 and #33) have been added to the model for the Final East Pit Ditch Reach 1 from the confluence of the Final East Pit Ditch and the North Tributary East Pit Ditch to EP1. Second, to correct the issue with EP1 being routed to Structure #14 only, EP1 is being modeled as two stock ponds. Since EP1 has two emergency spillways, one flows to EP3 and one flowing to Reach 1 of the Final East Pit Ditch (including the straight pipe), EP1 is being modeled as two ponds with a duplication of the capacity of the pond being routed to Structure #32 (Final East Pit Ditch Reach 1) and Structure #21 (EP3 Inlet Ditch). SEDCAD™ is limited in the routing functionality, so taking the capacity of the pond to each corresponding structure simulates both emergency spillways and the straight pipe all being engaged during the theoretical storm event.

9. *When reviewing the Structure Details in the associated SedCAD models for Structure #24 (EP1), a straight pipe has been included as part of the spillway discharge design. Based on the Structure Networking, Structure # 24 (including straight pipe discharge) reports to Structure #23 (EP3 Inlet Ditch). However, when reviewing proposed Figure Exh. 7-14PP-3, the straight pipe is shown reporting to Reach 1 of Final East Pit Ditch (see Comment 4 for additional items). Please provide one of the following items:*

    - *Additional rational for having the straight pipe spillway reporting to Structure #23 rather than the Reach 1 of the Final East Pit Ditch as shown on Figure Exh. 7-14PP-3,*
    - *Updated SedCAD models showing the straight pipe discharge of Structure #24 reporting to Reach 1 of the Final East Pit Ditch or,*
    - *Updated Figure Exh. 7-14PP-3 showing the straight pipe spill way reported to EP3 Inlet Ditch (Structure #23).*

Response: Please see response to comment 4 above. The change presented in comment 4 above correct the issues noted in this comment.

If you should have any additional questions or concerns, please feel free to contact Tony Tennyson at (970) 824-1232 at your convenience.

Sincerely,

DocuSigned by:
Chris Gilbreath
D250C711D0BF450...

Chris Gilbreath
Senior Manager,
Remediation and Reclamation

CG:TT:der

cc: Tony Tennyson (via email)
File: C. F. 1.1.2.143
G471-11.3(21)b

CHANGE SHEET FOR PERMIT REVISIONS, TECHNICAL REVISION, AND MINOR REVISIONS

Mine Company Name: **Colowyo Coal Company L.P.**
Permit Number: **C-1981-019**
Date: **January 30, 2023**
Revision Description: **TR-158 Prospect Pond Watershed Revision**

Volume Number	Page, Map or other Permit Entry to be REMOVED		Page, Map or other Permit Entry to be ADDED		Description of Change
1					No Change
2A					No Change
2B					No Change
2C					No Change
2D					No Change
2E	Pages 7-14PP-1 through 7-14PP-4 (4 pages)		Pages 7-14PP-1 through 7-14PP-4 (4 pages)		Appendix 7-14PP has been updated in response to comments.
2E	Appendix 7-14PP 10-year and 25 year, 24 hour SEDCAD models (80 pages)		Appendix 7-14PP 10-year and 25 year, 24 hour SEDCAD models (90 pages)		Appendix 7-14PP SEDCAD models have been updated.
2E	Figure Exh. 7-14PP-2		Figure Exh. 7-14PP-2		Figure Exh. 7-14PP-2 has been updated.
2E	Page Exh. 7-14S15-1 (1 page)		Page Exh. 7-14S15-1 (1 page)		Appendix 7-14S15 has been updated.
2E	Figure Exh. 7-14S15-1		Figure Exh. 7-14S15-1		Figure Exh. 7-14S15-1 has been updated.
3					No Change
4					No Change
5A					No Change
5B					No Change
6					No Change
7					No Change
8					No Change
9	Map 33		Map 33		Map 33 has been updated.
10					No Change
12					No Change
13					No Change
14					No Change
15					No Change
16					No Change
17					No Change
18A					No Change

CHANGE SHEET FOR PERMIT REVISIONS, TECHNICAL REVISION, AND MINOR REVISIONS

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18B					No Change
18C					No Change
18D					No Change
19					No Change
20					No Change
20					No Change
21					No Change
22					No Change

Appendix Exh. 7-14PP
Prospect Pond

The location of Prospect Pond is presented on Map 12, and the as-built configuration of the pond is presented on Figure Exh. 7-14PP-1. The profiles of the associated permanent channels associated with the Prospect Pond watershed are presented on Map 33. These channels consist of Prospect Ditch, North Tributary East Pit Ditch, EP3 Inlet and Outlet Ditch, and the Final East Pit Ditch. The design information for these post mine channels is presented in this appendix. The Prospect Pond watershed is also comprised of six post-mine stock ponds including PD1, PD2, NTEP1, EP1, EP2, and EP3. The design and as-built information for all these stock ponds can be found on Figure Exh. 7-14PP-3.

Exhibit 7, Item 14 in Volume 2D describes the hydrologic methodology used in sediment pond and post mine channel assumptions. Runoff curve numbers assigned to the undisturbed and reclaimed lands in various stages of reclamation have been selected in accordance with Table 1 in the Introductory Text for Exhibit 7 in Volume 2D. For channels protected by a riprap liner, selection of minimum riprap size is done using the Simons/OSM method in SEDCAD^{TM}. For channels to be protected by a vegetative liner, the permissible velocities are also determined using SEDCAD^{TM} routines.

Prospect Pond

The following pages present the results of the SEDCAD^{TM} models for the post mining condition. At this stage the oldest reclamation is on the eastern extent of the reclaimed East Pit, and the younger (topsoil and seeded) reclamation is the far western reaches of the Prospect Pond watershed.

The SEDCAD^{TM} model herein provides the results of the 10-year, 24-hour and 25-year, 24-hour design storms and demonstrates the Prospect Pond can adequately handle both modeled storm events.

The final post mining topographic surface and the final locations of the permanent drainage channels as presented on Map 12 were used to model the watershed for the post-mining condition. The six in-stream stock ponds are included in the permanent channels to decrease peak flows from the modeled storm event, and to provide a water source to support the post-mining land use.

Several specific items to note for the model for Prospect Pond. First, the curve numbers for sub-watersheds contributing the Section 16 Fill Ditch and Prospect Collection Ditch had to be artificially inflated to produce flows, since the approved curve numbers for the corresponding land conditions in those two watersheds did not produce enough flows for SEDCAD^{TM} to model them appropriately. Second, EP1 stock pond is designed with two emergency spillways and one straight pipe and water is routed to two different locations in the model. Due to the limitations of the routing routines in SEDCAD^{TM}, the EP1 stock pond (Structure #24) is modeled as two stock ponds with half toeh full capacity be applied to EP1 and to a dummy EP1 stock pond. A dummy EP1 stock pond (Structure #34) was included with an artificial subwatershed to ensure the model

captured a similar flow as produced by the upstream structure flowing into EP1 into the dummy EP1 stock pond. This allows flows to be properly routed through multiple spillways reporting to different structures in the model. Also, the dummy Ep1 stock pond receives an inflow nearly similar to the inflow of EP1; therefore, artificially increasing the total amount of surface water runoff into those structures in the model.

In summary, for the post mining condition, the 10-year, 24-hour storm produces 1.35 acre-feet of runoff into Prospect Pond, and the peak settleable solids concentration is 0.00 mg/l. For the 25-year, 24-hour storm event, the storm produces 11.9 acre-feet of runoff into Prospect Pond, and the storm peaks at the 6,750.1' elevation which is below the emergency spillway elevation of 6,752'.

Temporary Ditches

The Prospection Collection Ditch and the South Collection Ditch route water from native, disturbed, and reclaimed areas to Prospect Pond. The location of both temporary ditches can be found on Map 12 and Figure Exh. 7-14PP-2. Design information for the temporary ditches are as follows:

Prospect Collection Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Total Depth	Erosion Protection
0+00 to 16+50	0.57	3.0	V Ditch 2' Bottom Width	1H:1V Left 7H:1V Right	0.5	Vegetation

South Collection Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Total Depth	Erosion Protection
0+00 to 30+00	6.23	5.0	V Ditch 2' Bottom Width	1H:1V Left 7H:1V Right	1.2	Vegetation
30+00 to 90+00	1.32	4.0	V Ditch 2' Bottom Width	1H:1V Left 7H:1V Right	0.5	Vegetation
90+00 to 92+68	0.64	3.0	V Ditch 2' Bottom Width	1H:1V Left 7H:1V Right	0.5	Vegetation

Permanent Post Mine Channels

The Prospect Pond watershed is comprised of five post-mining channels. The locations of these channels are presented on Map 12 and Figure Exh. 7-14PP-2, and the channel profiles are presented on Map 33.

By Rule these channels are required to be designed in accordance with Rule 4.05.4(2)(b) for the 10-year, 24-hour storm event as the watershed reporting to the Prospect Pond is less than one square mile. However, for built in conservatism, all these channels have been designed to the 25-year, 24-hour storm event.

A road traverses across the Section 16 Fill Ditch near station 1+85, which provides access to maintain power line infrastructure in the area. A culvert is installed and maintained in the Section 16 Fill Ditch, but it is not a Colowyo mining related structure. Please see Volume 1, Section 4.12 for a further discussion. The culvert is modeled even though it is not a Colowyo culvert, to ensure it is sized appropriately. Given that, the peak storm discharge of 0.13 cfs requires a minimum of one 4" culvert is necessary in the Section 16 Fill Ditch. However, one 24" culvert is installed, which will more than suffice for the flows generated by the Section 16 Fill Ditch.

For the Final East Pit Ditch, Reach 2, structures will be placed approximately every 200 feet to create a stability wall to ensure riprap lining is

A SEDCAD™ model has been included which evaluates the peak flow and total runoff volume for each of the channel segments for the 25 year, 24-hour storm event. The channel configurations are summarized below.

Prospect Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
Reach 1	3.93	23.6	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 6"
Reach 2	1.45	13.0	Trapezoidal 12' bottom	2H:1V	Vegetation
Reach 3	1.23	12.4	Trapezoidal 15' bottom	2H:1V	Vegetation

North Tributary East Pit Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
Reach 1 Station 0+00 to 6.1+00	1.48	21.5	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 6"
Reach 1 Station 6.1+00 to 10+41	0.88	7.2	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"
Reach 2	1.28	12.2	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"

EP3 Inlet and Outlet Ditches

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection

EP3 Inlet Ditch	0.68	4.8	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"
EP3 Outlet Ditch	0.34	3.6	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 9"

Final East Pit Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
Reach 1	2.24	21.1	Trapezoidal 12' bottom	2H:1V	Shotcrete
Reach 2*	3.47	10.0	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"
Reach 3	5.43	6.4	Trapezoidal 12' bottom	3H:1V	Riprap, D50 = 3"

***** Within Reach 2, at about 200-foot intervals, four to six stability structures will be constructed within the this reach of the Final East Pit Ditch to ensure riprap lining within Reach 2 remains in place and the ditch functions as designed.

Section 16 Fill Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
0+00 to 8+60	0.64	17.8	Trapezoidal 12' bottom	3H:1V	Riprap, D50 = 6"

Appendix Exh. 7-14PP Prospect Pond

10- Year 24-Hour Storm Event

Effluent Deomonstration

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	1.800 inches

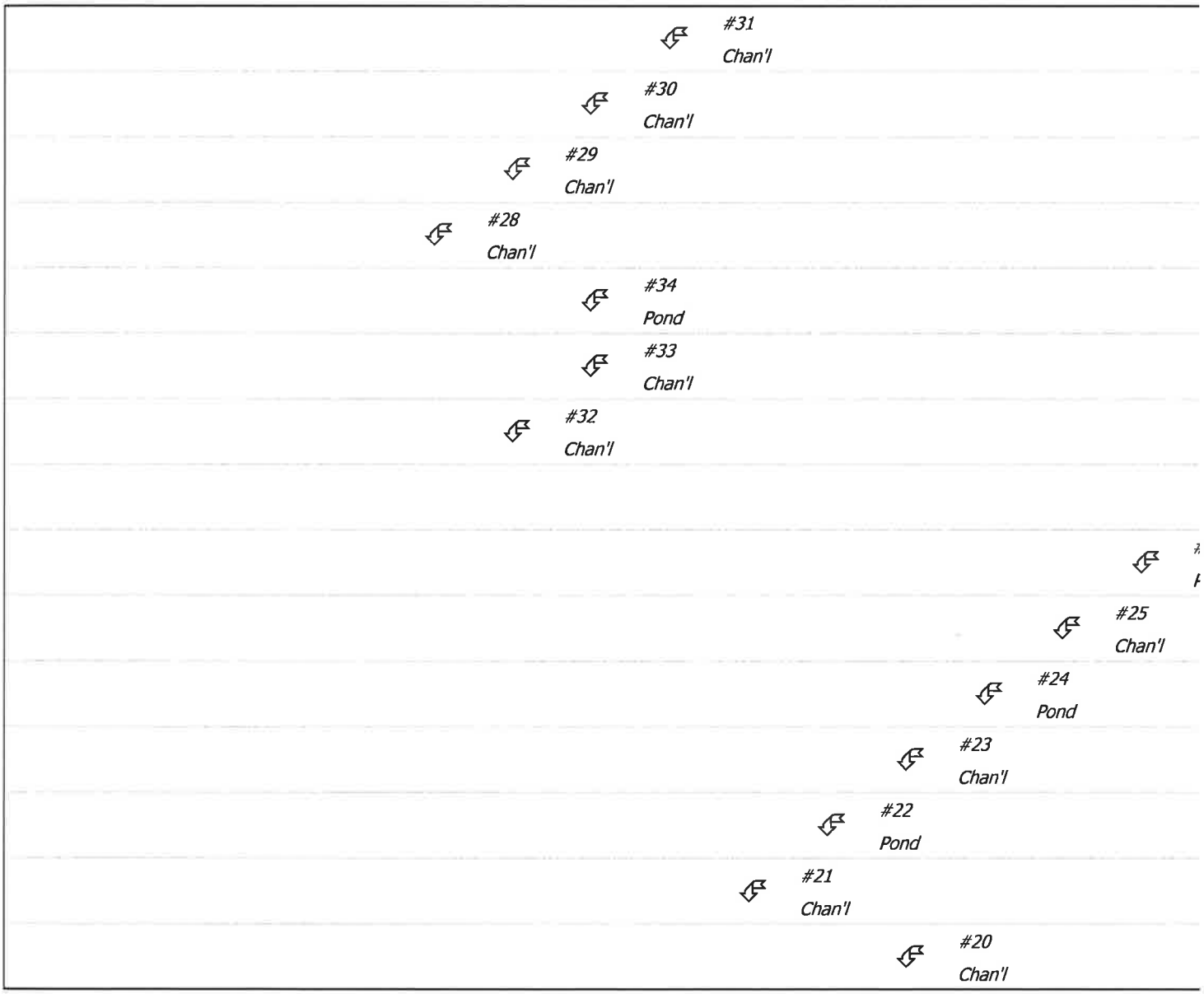
Particle Size Distribution:

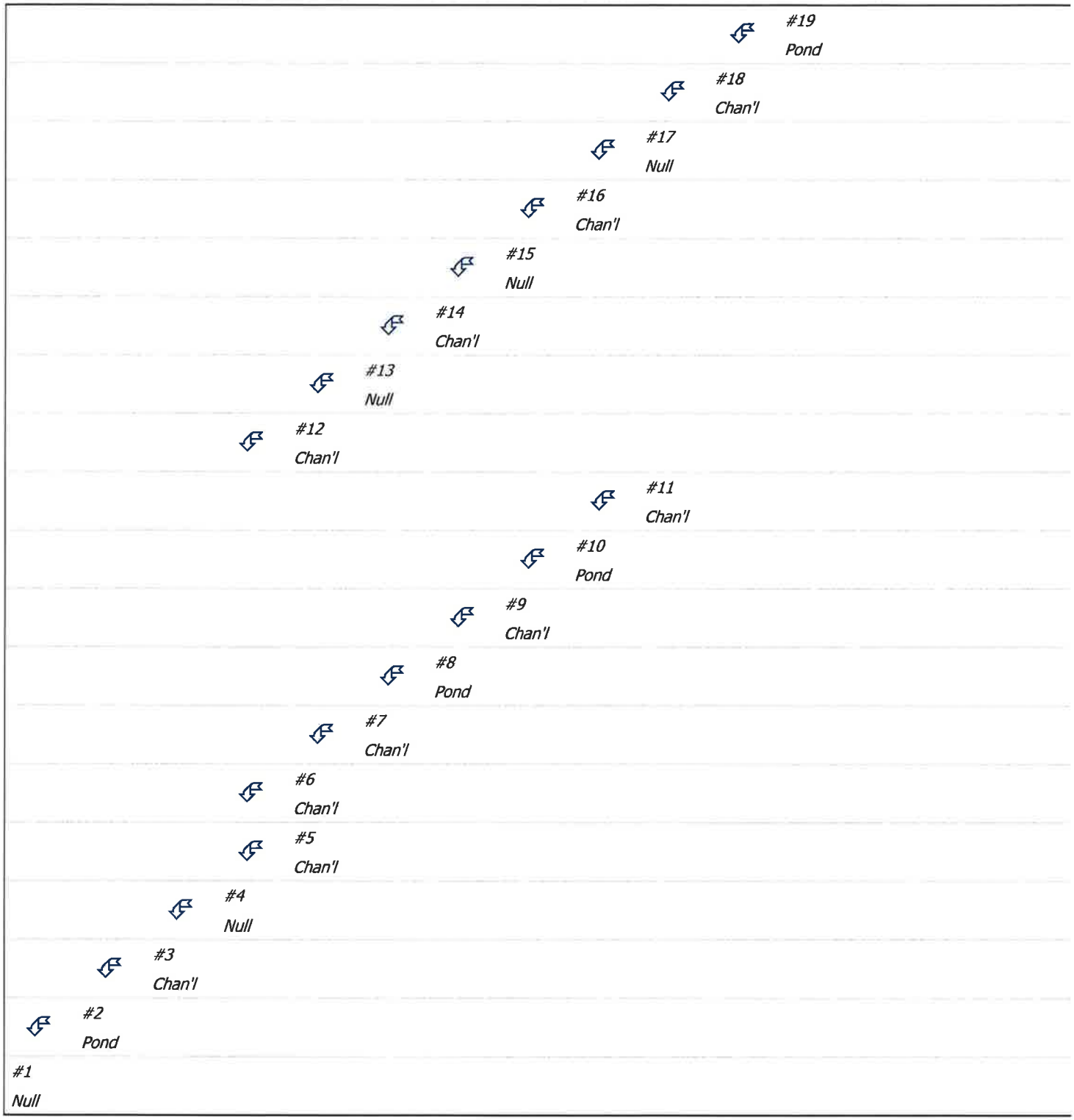
Size (mm)	Colowyo Particle Size
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null Below Prospect Pond
Pond	#2	==>	#1	0.000	0.000	Prospect Pond
Channel	#3	==>	#2	0.000	0.000	Natural Channel Above Prospect Pond
Null	#4	==>	#3	0.000	0.000	Confluence Prospect & South Collection Ditches
Channel	#5	==>	#4	0.000	0.000	Prospect Collection Ditch
Channel	#6	==>	#4	0.000	0.000	Natural Channel Below Reach 1 Prospect Ditch
Channel	#7	==>	#6	0.000	0.000	Prospect Ditch Reach 1
Pond	#8	==>	#7	0.000	0.000	PD1 Stockpond
Channel	#9	==>	#8	0.000	0.000	Prospect Ditch Reach 2
Pond	#10	==>	#9	0.000	0.000	PD2 Stockpond
Channel	#11	==>	#10	0.000	0.000	Prospect Ditch Reach 3
Channel	#12	==>	#4	0.000	0.000	South Collection Ditch Station 0+00 to 30+00
Null	#13	==>	#12	0.000	0.000	Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00
Channel	#14	==>	#13	0.000	0.000	Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch
Null	#15	==>	#14	0.000	0.000	Confluence Final East Pit Ditch and North Tributary East Pit Ditch
Channel	#16	==>	#15	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch
Null	#17	==>	#16	0.000	0.000	Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch
Channel	#18	==>	#17	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1
Pond	#19	==>	#18	0.000	0.000	NTEP1 Stockpond
Channel	#20	==>	#19	0.000	0.000	North Tributary Final East Pit Ditch Reach 2
Channel	#21	==>	#17	0.000	0.000	EP3 Stockpond Outlet Ditch
Pond	#22	==>	#21	0.000	0.000	EP3 Stockpond
Channel	#23	==>	#22	0.000	0.000	EP3 Stockpond Inlet Ditch
Pond	#24	==>	#23	0.000	0.000	EP1 Stockpond (to EP3 Stockpond)
Channel	#25	==>	#24	0.000	0.000	Final East Pit Ditch Reach 2
Pond	#26	==>	#25	0.000	0.000	EP2 Stockpond
Channel	#27	==>	#26	0.000	0.000	Final East Pit Ditch Reach 3
Channel	#28	==>	#13	0.000	0.000	South Collection Ditch 30+00 to 90+00

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#29	==>	#28	0.000	0.000	South Collection Ditch 90+00 to 92+68
Channel	#30	==>	#29	0.000	0.000	Natural Channel from Section 16 Fill Ditch to South Collection Ditch
Channel	#31	==>	#30	0.000	0.000	Section 16 Fill Ditch
Channel	#32	==>	#14	0.000	0.000	Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06
Channel	#33	==>	#32	0.000	0.000	Final East Pitch Ditch Reach 1 from Station 8+06 to EP1
Pond	#34	==>	#32	0.000	0.000	EP1 Stockpond (to Final East Pit Ditch) Reach 1




#19
Pond
#18
Chan'l
#17
Null
#16
Chan'l
#15
Null
#14
Chan'l
#13
Null
#12
Chan'l
#11
Chan'l
#10
Pond
#9
Chan'l
#8
Pond
#7
Chan'l
#6
Chan'l
#5
Chan'l
#4
Null
#3
Chan'l
#2
Pond
#1
Null

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#31		21.500	21.500	0.08	0.06	0.3	4,344	2.01	1.73
#30		19.600	41.100	0.08	0.06	0.3	4,344	2.01	1.73
#29		2.400	43.500	0.08	0.06	0.3	4,344	2.01	1.73
#28		181.700	225.200	0.13	0.08	0.3	3,438	1.60	1.26
#34	In	5.000	5.000	0.46	0.05	0.0	104	0.06	0.02
	Out			0.10	0.05	0.0	1	0.00	0.00
#33		3.000	3.000	0.02	0.01	0.0	417	0.24	0.19
#32		12.300	20.300	0.22	0.11	0.1	436	0.25	0.20
#27		69.700	69.700	3.09	0.43	9.4	65,396	37.25	8.98
#26	In	0.000	69.700	3.09	0.43	9.4	65,396	37.25	8.98
	Out			0.38	0.43	0.0	1	0.00	0.00
#25		22.300	92.000	0.49	0.52	0.1	245	0.14	0.06
#24	In	0.000	92.000	0.49	0.52	0.1	245	0.14	0.06
	Out			0.49	0.52	0.0	1	0.00	0.00
#23		4.900	96.900	0.52	0.54	0.0	37	0.02	0.01
#22	In	0.000	96.900	0.52	0.54	0.0	37	0.02	0.01
	Out			0.51	0.54	0.0	1	0.00	0.00
#21		1.300	98.200	0.51	0.54	0.0	1	0.00	0.00
#20		44.500	44.500	0.14	0.09	0.0	365	0.18	0.16
#19	In	0.000	44.500	0.14	0.09	0.0	365	0.18	0.16
	Out			0.00	0.00	0.0	0	0.00	0.00
#18		11.200	55.700	0.05	0.03	0.0	353	0.27	0.20
#17		0.000	153.900	0.54	0.57	0.0	52	0.04	0.01
#16		1.900	155.800	0.56	0.57	0.1	103	0.08	0.01
#15		0.000	155.800	0.56	0.57	0.1	103	0.08	0.01
#14		6.100	182.200	0.73	0.69	0.1	245	0.16	0.06
#13		0.000	407.400	0.85	0.78	0.4	541	0.28	0.20
#12		59.000	466.400	0.99	0.86	0.5	963	0.50	0.23
#11		18.300	18.300	0.07	0.04	0.0	182	0.10	0.08
#10	In	0.000	18.300	0.07	0.04	0.0	182	0.10	0.08
	Out			0.06	0.04	0.0	1	0.00	0.00
#9		21.400	39.700	0.09	0.06	0.0	131	0.07	0.05
#8	In	0.000	39.700	0.09	0.06	0.0	131	0.07	0.05
	Out			0.09	0.06	0.0	1	0.00	0.00
#7		59.200	98.900	0.24	0.15	0.1	397	0.23	0.15
#6		56.600	155.500	0.26	0.16	0.3	1,343	0.77	0.67
#5		28.300	28.300	0.08	0.06	0.2	2,687	1.34	1.19

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#4		0.000	650.200	1.31	1.09	1.0	1,110	0.59	0.36
#3		16.300	666.500	1.35	1.12	1.5	1,510	0.82	0.54
#2	In	0.000	666.500	1.35	1.12	1.5	1,510	0.82	0.54
	Out			0.30	0.75	0.0	1	0.00	0.00
#1		0.000	666.500	0.30	0.75	0.0	1	0.00	0.00

Particle Size Distribution(s) at Each Structure

Structure #31 (Section 16 Fill Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #30 (Natural Channel from Section 16 Fill Ditch to South Collection Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #29 (South Collection Ditch 90+00 to 92+68):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #28 (South Collection Ditch 30+00 to 90+00):

Size (mm)	In/Out
4.7500	100.000%
0.0750	99.373%
0.0400	48.135%
0.0010	29.173%

Structure #34 (EP1 Stockpond (to Final East Pit Ditch) Reach 1):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #33 (Final East Pitch Ditch Reach 1 from Station 8+06 to EP1):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #32 (Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #27 (Final East Pit Ditch Reach 3):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.116%
0.0400	33.052%
0.0010	20.032%

Structure #26 (EP2 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.116%	100.000%
0.0400	33.052%	100.000%
0.0010	20.032%	100.000%

Structure #25 (Final East Pit Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #24 (EP1 Stockpond (to EP3 Stockpond)):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #23 (EP3 Stockpond Inlet Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #22 (EP3 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #21 (EP3 Stockpond Outlet Ditch):

Size (mm)	In/Out
4.7500	0.000%
0.0750	0.000%
0.0400	0.000%
0.0010	0.000%

Structure #20 (North Tributary Final East Pit Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	94.485%
0.0400	42.712%
0.0010	25.886%

Structure #19 (NTEP1 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	0.000%
0.0750	94.485%	0.000%
0.0400	42.712%	0.000%
0.0010	25.886%	0.000%

Structure #18 (North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1):

Size (mm)	In/Out
4.7500	19.243%
0.0750	14.048%
0.0400	6.350%
0.0010	3.849%

Structure #17 (Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch):

Size (mm)	In/Out
4.7500	19.243%
0.0750	14.048%
0.0400	6.350%
0.0010	3.849%

Structure #16 (North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch):

Size (mm)	In/Out
4.7500	22.985%
0.0750	16.779%
0.0400	7.585%

Size (mm)	In/Out
0.0010	4.597%

Structure #15 (Confluence Final East Pit Ditch and North Tributary East Pit Ditch):

Size (mm)	In/Out
4.7500	22.985%
0.0750	16.779%
0.0400	7.585%
0.0010	4.597%

Structure #14 (Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch):

Size (mm)	In/Out
4.7500	64.361%
0.0750	46.984%
0.0400	21.239%
0.0010	12.872%

Structure #13 (Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00):

Size (mm)	In/Out
4.7500	90.547%
0.0750	85.477%
0.0400	41.001%
0.0010	24.849%

Structure #12 (South Collection Ditch Station 0+00 to 30+00):

Size (mm)	In/Out
4.7500	92.149%
0.0750	83.363%
0.0400	39.645%
0.0010	24.027%

Structure #11 (Prospect Ditch Reach 3):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #10 (PD2 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #9 (Prospect Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #8 (PD1 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #7 (Prospect Ditch Reach 1):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #6 (Natural Channel Below Reach 1 Prospect Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #5 (Prospect Collection Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	95.850%
0.0400	43.329%
0.0010	26.260%

Structure #4 (Confluence Prospect & South Collection Ditches):

Size (mm)	In/Out
4.7500	95.897%
0.0750	83.119%
0.0400	38.599%
0.0010	23.393%

Structure #3 (Natural Channel Above Prospect Pond):

Size (mm)	In/Out
4.7500	97.260%
0.0750	79.756%
0.0400	36.738%
0.0010	22.266%

Structure #2 (Prospect Pond):

Size (mm)	In	Out
4.7500	97.260%	100.000%
0.0750	79.756%	100.000%
0.0400	36.738%	100.000%
0.0010	22.266%	100.000%

Structure #1:

Size (mm)	In/Out
4.7500	0.000%
0.0750	0.000%
0.0400	0.000%
0.0010	0.000%

Structure Detail:

Structure #31 (Riprap Channel)

Section 16 Fill Ditch

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	17.8	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.08 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.09 ft	29.97 ft
Velocity:	0.45 fps	
X-Section Area:	0.18 sq ft	
Hydraulic Radius:	0.015 ft	
Froude Number:	0.65	
Manning's n:	0.0327	
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #30 (Erodible Channel)

Natural Channel from Section 16 Fill Ditch to South Collection Ditch

Parabolic Erodible Channel Inputs:

Material: Shales and hardpans

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
22.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.08 cfs	
Depth:	0.09 ft	
Top Width:	0.35 ft	
Velocity:	3.77 fps	
X-Section Area:	0.02 sq ft	
Hydraulic Radius:	0.049 ft	
Froude Number:	2.76	

Structure #29 (Vegetated Channel)

South Collection Ditch 90+00 to 92+68

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	3.0	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.08 cfs		0.08 cfs	
Depth:	0.11 ft		0.33 ft	
Top Width:	2.89 ft		4.61 ft	
Velocity:	0.30 fps		0.08 fps	
X-Section Area:	0.27 sq ft		1.08 sq ft	
Hydraulic Radius:	0.093 ft		0.230 ft	
Froude Number:	0.17		0.03	
Roughness Coefficient:	0.1737		1.2727	

Structure #28 (Vegetated Channel)

South Collection Ditch 30+00 to 90+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	4.0	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.13 cfs		0.13 cfs	
Depth:	0.12 ft		0.34 ft	
Top Width:	2.97 ft		4.70 ft	
Velocity:	0.42 fps		0.11 fps	
X-Section Area:	0.30 sq ft		1.13 sq ft	
Hydraulic Radius:	0.100 ft		0.237 ft	
Froude Number:	0.23		0.04	
Roughness Coefficient:	0.1538		1.0282	

Structure #34 (Pond)

EP1 Stockpond (to Final East Pit Ditch) Reach 1

Pond Inputs:

Initial Pool Elev:	7,376.00 ft
Initial Pool:	0.39 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	100.00	4.00	0.0150	7,376.00	0.90	0.00

Pond Results:

Peak Elevation:	7,376.05 ft

H'graph Detention Time:	0.65 hrs
Pond Model:	CSTRS
Dewater Time:	0.52 days
Trap Efficiency:	100.00 %

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)	
7,370.00	0.000	0.000	0.000		Top of Sed. Storage
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		Spillway #2
7,376.05	0.106	0.398	0.101	12.50	Peak Stage
7,377.00	0.118	0.504	2.094		
7,378.00	0.140	0.633	4.414		
7,379.00	0.165	0.786	5.883		Spillway #1
7,380.00	0.165	0.951	55.203		
7,381.00	0.166	1.116	174.677		
7,382.00	0.166	1.282	352.543		
7,383.00	0.167	1.449	585.314		
7,384.00	0.167	1.616	873.793		
7,385.00	0.168	1.783	1,219.515		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000	0.000
7,371.00	0.000	0.000	0.000
7,372.00	0.000	0.000	0.000
7,373.00	0.000	0.000	0.000
7,374.00	0.000	0.000	0.000
7,375.00	0.000	0.000	0.000
7,376.00	0.000	0.000	0.000
7,377.00	0.000	(3)>2.094	2.094

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	(5)>4.414	4.414
7,379.00	0.000	(5)>5.883	5.883
7,380.00	48.400	(5)>6.803	55.203
7,381.00	167.398	(6)>7.279	174.677
7,382.00	344.812	(6)>7.732	352.543
7,383.00	577.178	(6)>8.136	585.314
7,384.00	865.254	(6)>8.540	873.793
7,385.00	1,210.609	(6)>8.906	1,219.515

Structure #33 (Riprap Channel)

Final East Pitch Ditch Reach 1 from Station 8+06 to EP1

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	2.0:1	2.0:1	15.7	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.02 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.07 ft	23.99 ft
Velocity:	0.11 fps	
X-Section Area:	0.21 sq ft	
Hydraulic Radius:	0.018 ft	
Froude Number:	0.14	
Manning's n:	0.0320	
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #32 (Nonerodible Channel)

Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	18.0	0.0170	2.99		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.22 cfs	
Depth:	0.01 ft	3.00 ft
Top Width:	12.04 ft	24.00 ft
Velocity:	1.72 fps	
X-Section Area:	0.12 sq ft	
Hydraulic Radius:	0.010 ft	
Froude Number:	3.04	

Structure #27 (Riprap Channel)

Final East Pit Ditch Reach 3

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	2.0:1	2.0:1	6.4	2.93		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.09 cfs	
Depth:	0.07 ft	3.00 ft
Top Width:	12.28 ft	24.00 ft
Velocity*:		
X-Section Area:	0.86 sq ft	
Hydraulic Radius:	0.070 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #26 (Pond)

EP2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,500.00 ft
Initial Pool:	4.26 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,505.00	60.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	160.00	9.00	0.0150	7,500.00	0.50	0.00

Pond Results:

Peak Elevation:	7,500.18 ft
H'graph Detention Time:	4.13 hrs
Pond Model:	CSTRS
Dewater Time:	1.05 days
Trap Efficiency:	100.00 %

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)	
7,492.00	0.385	0.000	0.000		Top of Sed. Storage
7,493.00	0.419	0.402	0.000		
7,494.00	0.454	0.839	0.000		
7,495.00	0.491	1.311	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,496.00	0.529	1.821	0.000		
7,497.00	0.568	2.370	0.000		
7,498.00	0.609	2.958	0.000		
7,499.00	0.651	3.588	0.000		
7,500.00	0.694	4.260	0.000		Spillway #2
7,500.18	0.704	4.390	0.378	25.10	Peak Stage
7,501.00	0.741	4.978	2.094		
7,502.00	0.787	5.741	4.414		
7,503.00	0.834	6.552	5.883		
7,504.00	0.884	7.411	7.060		
7,505.00	0.932	8.319	8.069		Spillway #1
7,506.00	0.933	9.251	45.188		
7,507.00	0.934	10.185	151.737		
7,508.00	0.935	11.119	305.349		
7,509.00	0.936	12.055	524.315		
7,510.00	0.937	12.991	798.632		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,492.00	0.000	0.000	0.000
7,493.00	0.000	0.000	0.000
7,494.00	0.000	0.000	0.000
7,495.00	0.000	0.000	0.000
7,496.00	0.000	0.000	0.000
7,497.00	0.000	0.000	0.000
7,498.00	0.000	0.000	0.000
7,499.00	0.000	0.000	0.000
7,500.00	0.000	0.000	0.000
7,501.00	0.000	(3)>2.094	2.094
7,502.00	0.000	(5)>4.414	4.414
7,503.00	0.000	(5)>5.883	5.883
7,504.00	0.000	(5)>7.060	7.060
7,505.00	0.000	(5)>8.069	8.069
7,506.00	36.222	(5)>8.966	45.188
7,507.00	142.050	(5)>9.687	151.737
7,508.00	295.305	(5)>10.045	305.349
7,509.00	513.913	(6)>10.402	524.315

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,510.00	787.934	(6)>10.698	798.632

Structure #25 (Riprap Channel)

Final East Pit Ditch Reach 2

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	2.0:1	2.0:1	10.0	2.97		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.49 cfs	
Depth:	0.03 ft	3.00 ft
Top Width:	12.12 ft	24.00 ft
Velocity*:		
X-Section Area:	0.36 sq ft	
Hydraulic Radius:	0.030 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #24 (Pond)

EP1 Stockpond (to EP3 Stockpond)

Pond Inputs:

Initial Pool Elev:	7,379.00 ft
Initial Pool:	0.79 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,379.01 ft
H'graph Detention Time:	0.04 hrs
Pond Model:	CSTRS
Dewater Time:	1.08 days
Trap Efficiency:	100.00 %

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)	
7,370.00	0.000	0.000	0.000		Top of Sed. Storage
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		
7,377.00	0.118	0.504	0.000		
7,378.00	0.141	0.633	0.000		
7,379.00	0.165	0.786	0.000		Spillway #1
7,379.01	0.153	0.788	0.492	25.90	Peak Stage
7,380.00	0.165	0.951	48.400		
7,381.00	0.166	1.117	167.398		
7,382.00	0.166	1.283	344.812		
7,383.00	0.167	1.449	577.178		
7,384.00	0.167	1.616	865.254		
7,385.00	0.168	1.784	1,210.609		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000
7,371.00	0.000	0.000
7,372.00	0.000	0.000
7,373.00	0.000	0.000
7,374.00	0.000	0.000
7,375.00	0.000	0.000
7,376.00	0.000	0.000
7,377.00	0.000	0.000
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	48.400	48.400
7,381.00	167.398	167.398
7,382.00	344.812	344.812
7,383.00	577.178	577.178
7,384.00	865.254	865.254
7,385.00	1,210.609	1,210.609

Structure #23 (Riprap Channel)

EP3 Stockpond Inlet Ditch

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	2.0:1	2.0:1	4.8	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.52 cfs	
Depth:	0.05 ft	3.04 ft
Top Width:	12.21 ft	24.17 ft
Velocity:	0.81 fps	
X-Section Area:	0.64 sq ft	
Hydraulic Radius:	0.053 ft	
Froude Number:	0.62	
Manning's n:	0.0279	

	w/o Freeboard	w/ Freeboard
Dmin:	2.00 in	
D50:	3.00 in	
Dmax:	12.00 in	

Structure #22 (Pond)

EP3 Stockpond

Pond Inputs:

Initial Pool Elev:	7,357.00 ft
Initial Pool:	2.90 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,357.00	216.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	7,357.04 ft
H'graph Detention Time:	0.28 hrs
Pond Model:	CSTRS
Dewater Time:	1.07 days
Trap Efficiency:	100.00 %

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)	
7,340.00	0.032	0.000	0.000		Top of Sed. Storage
7,341.00	0.045	0.038	0.000		
7,342.00	0.060	0.091	0.000		
7,343.00	0.077	0.159	0.000		
7,344.00	0.095	0.245	0.000		
7,345.00	0.115	0.350	0.000		
7,346.00	0.129	0.472	0.000		
7,347.00	0.144	0.608	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,348.00	0.160	0.760	0.000		
7,349.00	0.176	0.928	0.000		
7,350.00	0.192	1.112	0.000		
7,351.00	0.210	1.313	0.000		
7,352.00	0.227	1.531	0.000		
7,353.00	0.246	1.768	0.000		
7,354.00	0.264	2.023	0.000		
7,355.00	0.284	2.297	0.000		
7,356.00	0.304	2.591	0.000		
7,357.00	0.322	2.904	0.000		Spillway #1
7,357.04	0.314	2.916	0.511	25.65	Peak Stage
7,358.00	0.322	3.226	14.150		
7,359.00	0.323	3.549	61.776		
7,360.00	0.324	3.873	147.685		
7,361.00	0.325	4.197	264.762		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,340.00	0.000	0.000
7,341.00	0.000	0.000
7,342.00	0.000	0.000
7,343.00	0.000	0.000
7,344.00	0.000	0.000
7,345.00	0.000	0.000
7,346.00	0.000	0.000
7,347.00	0.000	0.000
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	0.000	0.000
7,357.00	0.000	0.000
7,358.00	14.150	14.150

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,359.00	61.776	61.776
7,360.00	147.685	147.685
7,361.00	264.762	264.762

Structure #21 (Riprap Channel)

EP3 Stockpond Outlet Ditch

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	2.0:1	2.0:1	3.6	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.51 cfs	
Depth:	0.04 ft	3.03 ft
Top Width:	12.18 ft	24.14 ft
Velocity:	0.94 fps	
X-Section Area:	0.54 sq ft	
Hydraulic Radius:	0.044 ft	
Froude Number:	0.79	
Manning's n:	0.0377	
Dmin:	2.00 in	
D50:	9.00 in	
Dmax:	12.00 in	

Structure #20 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 2

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	2.0:1	2.0:1	12.2	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.14 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.10 ft	24.02 ft
Velocity:	0.48 fps	
X-Section Area:	0.29 sq ft	
Hydraulic Radius:	0.024 ft	
Froude Number:	0.55	
Manning's n:	0.0309	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #19 (Pond)

NTEP1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,385.00 ft
Initial Pool:	0.92 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,389.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,385.41 ft
H'graph Detention Time:	0.00 hrs
Pond Model:	CSTRS
Dewater Time:	0.00 days
Trap Efficiency:	0.00 %

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)	
7,378.00	0.041	0.000	0.000		Top of Sed. Storage
7,379.00	0.071	0.055	0.000		
7,380.00	0.096	0.138	0.000		
7,381.00	0.119	0.245	0.000		
7,382.00	0.143	0.376	0.000		
7,383.00	0.168	0.531	0.000		
7,384.00	0.194	0.712	0.000		
7,385.00	0.220	0.919	0.000		
7,385.41	0.231	1.013	0.000	0.00	Peak Stage
7,386.00	0.247	1.152	0.000		
7,387.00	0.275	1.413	0.000		
7,388.00	0.304	1.702	0.000		
7,389.00	0.338	2.023	0.000		Spillway #1
7,390.00	0.400	2.392	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	0.000	0.000
7,381.00	0.000	0.000
7,382.00	0.000	0.000
7,383.00	0.000	0.000
7,384.00	0.000	0.000
7,385.00	0.000	0.000
7,386.00	0.000	0.000
7,387.00	0.000	0.000
7,388.00	0.000	0.000
7,389.00	0.000	0.000
7,390.00	48.400	48.400

Structure #18 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1

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	2.0:1	2.0:1	7.2	2.96		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.05 cfs	
Depth:	0.04 ft	3.00 ft
Top Width:	12.16 ft	24.00 ft
Velocity:	0.10 fps	
X-Section Area:	0.47 sq ft	
Hydraulic Radius:	0.038 ft	
Froude Number:	0.09	
Manning's n:	0.0289	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #17 (Null)

Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch

Structure #16 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch

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	2.0:1	2.0:1	21.5	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.56 cfs	

	w/o Freeboard	w/ Freeboard
Depth:	0.01 ft	3.00 ft
Top Width:	12.05 ft	24.01 ft
Velocity*:		
X-Section Area:	0.15 sq ft	
Hydraulic Radius:	0.012 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 #15 (Null)

Confluence Final East Pit Ditch and North Tributary East Pit Ditch

Structure #14 (Nonerodible Channel)

Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	21.1	0.0170	4.00		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.73 cfs	
Depth:	0.02 ft	4.02 ft
Top Width:	12.08 ft	28.08 ft
Velocity:	2.95 fps	
X-Section Area:	0.24 sq ft	
Hydraulic Radius:	0.020 ft	
Froude Number:	3.69	

Structure #13 (Null)

Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00

Structure #12 (Vegetated Channel)

South Collection Ditch Station 0+00 to 30+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	5.0	D, B	0.87			7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.99 cfs		0.99 cfs	
Depth:	0.26 ft	1.13 ft	0.57 ft	1.44 ft
Top Width:	4.11 ft	11.07 ft	6.53 ft	13.49 ft
Velocity:	1.22 fps		0.41 fps	
X-Section Area:	0.81 sq ft		2.41 sq ft	
Hydraulic Radius:	0.193 ft		0.362 ft	
Froude Number:	0.49		0.12	
Roughness Coefficient:	0.0906		0.4135	

Structure #11 (Vegetated Channel)

Prospect Ditch Reach 3

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	12.0	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.07 cfs		0.07 cfs	
Depth:	0.03 ft		0.11 ft	
Top Width:	12.13 ft		12.44 ft	
Velocity:	0.17 fps		0.05 fps	
X-Section Area:	0.39 sq ft		1.36 sq ft	

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Hydraulic Radius:	0.032 ft		0.109 ft	
Froude Number:	0.17		0.03	
Roughness Coefficient:	0.2849		2.3618	

Structure #10 (Pond)

PD2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,565.00 ft
Initial Pool:	1.49 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,565.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,565.00 ft
H'graph Detention Time:	0.12 hrs
Pond Model:	CSTRS
Dewater Time:	0.46 days
Trap Efficiency:	100.00 %

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)	
7,556.00	0.054	0.000	0.000		Top of Sed. Storage
7,557.00	0.086	0.069	0.000		
7,558.00	0.106	0.165	0.000		
7,559.00	0.127	0.282	0.000		
7,560.00	0.150	0.420	0.000		
7,561.00	0.175	0.582	0.000		
7,562.00	0.200	0.770	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,563.00	0.227	0.983	0.000		
7,564.00	0.253	1.222	0.000		
7,565.00	0.280	1.489	0.000		Spillway #1
7,565.00	0.277	1.489	0.057	11.10	Peak Stage
7,566.00	0.300	1.779	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,556.00	0.000	0.000
7,557.00	0.000	0.000
7,558.00	0.000	0.000
7,559.00	0.000	0.000
7,560.00	0.000	0.000
7,561.00	0.000	0.000
7,562.00	0.000	0.000
7,563.00	0.000	0.000
7,564.00	0.000	0.000
7,565.00	0.000	0.000
7,566.00	48.400	48.400

Structure #9 (Vegetated Channel)

Prospect Ditch Reach 2

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	13.0	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.09 cfs		0.09 cfs	
Depth:	0.04 ft		0.12 ft	
Top Width:	12.14 ft		12.48 ft	

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Velocity:	0.22 fps		0.06 fps	
X-Section Area:	0.43 sq ft		1.47 sq ft	
Hydraulic Radius:	0.036 ft		0.117 ft	
Froude Number:	0.20		0.03	
Roughness Coefficient:	0.2571		1.9805	

Structure #8 (Pond)

PD1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,355.00 ft
Initial Pool:	0.88 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,355.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,355.00 ft
H'graph Detention Time:	0.05 hrs
Pond Model:	CSTRS
Dewater Time:	0.46 days
Trap Efficiency:	100.00 %

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)	
7,348.00	0.031	0.000	0.000		Top of Sed. Storage
7,349.00	0.074	0.051	0.000		
7,350.00	0.097	0.136	0.000		
7,351.00	0.120	0.244	0.000		
7,352.00	0.140	0.374	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,353.00	0.159	0.523	0.000		
7,354.00	0.180	0.692	0.000		
7,355.00	0.201	0.882	0.000		Spillway #1
7,355.00	0.201	0.883	0.089	11.15	Peak Stage
7,356.00	0.223	1.094	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	48.400	48.400

Structure #7 (Riprap Channel)

Prospect Ditch Reach 1

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	2.0:1	2.0:1	23.6			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.24 cfs	
Depth:	0.01 ft	
Top Width:	12.03 ft	
Velocity*:		
X-Section Area:	0.09 sq ft	

	w/o Freeboard	w/ Freeboard
Hydraulic Radius:	0.007 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 #6 (Erodible Channel)

Natural Channel Below Reach 1 Prospect Ditch

Parabolic Erodible Channel Inputs:

Material: Coarse gravel noncolloidal

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
21.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.26 cfs	
Depth:	0.14 ft	
Top Width:	0.55 ft	
Velocity:	5.03 fps	
X-Section Area:	0.05 sq ft	
Hydraulic Radius:	0.079 ft	
Froude Number:	2.92	

Structure #5 (Vegetated Channel)

Prospect Collection Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	11.9	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.08 cfs		0.08 cfs	
Depth:	0.03 ft		0.12 ft	
Top Width:	12.14 ft		12.47 ft	
Velocity:	0.19 fps		0.06 fps	
X-Section Area:	0.41 sq ft		1.43 sq ft	
Hydraulic Radius:	0.034 ft		0.114 ft	
Froude Number:	0.19		0.03	
Roughness Coefficient:	0.2710		2.1684	

Structure #4 (Null)

Confluence Prospect & South Collection Ditches

Structure #3 (Erodible Channel)

Natural Channel Above Prospect Pond

Parabolic Erodible Channel Inputs:

Material: Asphaltic Concrete, Machine Placed

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
20.0	0.0140				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.35 cfs	
Depth:	0.21 ft	
Top Width:	0.84 ft	
Velocity:	11.56 fps	
X-Section Area:	0.12 sq ft	
Hydraulic Radius:	0.120 ft	
Froude Number:	5.45	

Structure #2 (Pond)

Prospect Pond

Pond Inputs:

Initial Pool Elev:	6,744.00 ft

Initial Pool:	2.18 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
12.00	8.70	12.00	129.00	9.70	0.0150	6,750.30	2

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
6,752.00	20.00	1.50:1	1.50:1	12.00

Pond Results:

Peak Elevation:	6,746.05 ft
H'graph Detention Time:	12.96 hrs
Pond Model:	CSTRS
Dewater Time:	1.92 days
Trap Efficiency:	100.00 %

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)	
6,734.00	0.029	0.000	0.000		Top of Sed. Storage
6,735.00	0.088	0.056	0.000		
6,736.00	0.117	0.158	0.000		
6,737.00	0.149	0.291	0.000		
6,738.00	0.185	0.457	0.000		
6,739.00	0.225	0.662	0.000		
6,740.00	0.269	0.909	0.000		
6,741.00	0.293	1.190	0.000		
6,742.00	0.317	1.495	0.000		
6,743.00	0.341	1.823	0.000		
6,744.00	0.365	2.176	0.000		Low hole SPW #1
6,745.00	0.390	2.554	0.210	21.74*	
6,746.00	0.418	2.958	0.297	21.50	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
6,746.05	0.421	2.980	0.301	2.80	Peak Stage
6,747.00	0.448	3.391	0.364		
6,748.00	0.478	3.854	0.420		
6,749.00	0.509	4.347	0.470		
6,750.00	0.542	4.872	0.515		
6,750.30	0.551	5.036	0.527		Spillway #1
6,751.00	0.572	5.429	3.164		
6,752.00	0.604	6.017	4.931		Spillway #2
6,753.00	0.633	6.636	35.637		
6,754.00	0.664	7.284	110.493		
6,755.00	0.695	7.964	223.581		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Perf. Riser (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
6,734.00	0.000	0.000	0.000
6,735.00	0.000	0.000	0.000
6,736.00	0.000	0.000	0.000
6,737.00	0.000	0.000	0.000
6,738.00	0.000	0.000	0.000
6,739.00	0.000	0.000	0.000
6,740.00	0.000	0.000	0.000
6,741.00	0.000	0.000	0.000
6,742.00	0.000	0.000	0.000
6,743.00	0.000	0.000	0.000
6,744.00	2.00>0.000	0.000	0.000
6,745.00	0.210	0.000	0.210
6,746.00	0.297	0.000	0.297
6,747.00	0.364	0.000	0.364
6,748.00	0.420	0.000	0.420
6,749.00	0.470	0.000	0.470
6,750.00	0.515	0.000	0.515
6,750.30	0.527	0.000	0.527
6,751.00	3.164	0.000	3.164
6,752.00	4.931	0.000	4.931
6,753.00	6.214	29.423	35.637

Elevation (ft)	Perf. Riser (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
6,754.00	7.274	103.218	110.493
6,755.00	8.199	215.382	223.581

Structure #1 (Null)

Null Below Prospect Pond

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)
#31	1	21.500	0.135	0.000	0.000	62.000	S	0.08	0.059
	Σ	**21.500**						**0.08**	**0.059**
#30	1	12.500	0.089	0.000	0.000	47.000	S	0.00	0.000
	2	6.800	0.030	0.000	0.000	47.000	S	0.00	0.000
	3	0.300	0.031	0.000	0.000	62.000	F	0.00	0.000
	Σ	**41.100**						**0.08**	**0.059**
#29	1	2.400	0.041	0.000	0.000	47.000	S	0.00	0.000
	Σ	**43.500**						**0.08**	**0.059**
#28	1	2.200	0.112	0.000	0.000	62.000	M	0.02	0.004
	2	1.400	0.039	0.000	0.000	62.000	M	0.01	0.000
	3	23.000	0.222	0.000	0.000	47.000	S	0.00	0.000
	4	5.100	0.024	0.000	0.000	62.000	M	0.04	0.021
	5	149.700	0.146	0.000	0.000	47.000	S	0.00	0.000
	6	0.300	0.009	0.000	0.000	62.000	F	0.00	0.000
	Σ	**225.200**						**0.13**	**0.084**
#34	1	5.000	0.019	0.000	0.000	67.000	F	0.46	0.048
	Σ	**5.000**						**0.46**	**0.048**
#33	1	3.000	0.036	0.000	0.000	62.000	F	0.02	0.011
	Σ	**3.000**						**0.02**	**0.011**
#32	1	12.300	0.085	0.000	0.000	62.000	F	0.09	0.050
	Σ	**20.300**						**0.22**	**0.109**
#27	1	6.000	0.014	0.000	0.000	80.000	F	3.09	0.222
	2	63.700	0.237	0.000	0.000	62.000	M	0.30	0.210
	Σ	**69.700**						**3.09**	**0.432**
#26	**Σ**	**69.700**						**3.09**	**0.432**
#25	1	22.300	0.107	0.000	0.000	62.000	M	0.17	0.091
	Σ	**92.000**						**0.49**	**0.523**
#24	**Σ**	**92.000**						**0.49**	**0.523**
#23	1	4.900	0.074	0.000	0.000	62.000	M	0.04	0.020
	Σ	**96.900**						**0.52**	**0.543**
#22	**Σ**	**96.900**						**0.52**	**0.543**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#21	1	1.300	0.050	0.000	0.000	62.000	M	0.00	0.000
	Σ	**98.200**						**0.51**	**0.543**
#20	1	28.800	0.232	0.000	0.000	62.000	M	0.14	0.095
	2	15.700	0.120	0.000	0.000	47.000	S	0.00	0.000
	Σ	**44.500**						**0.14**	**0.095**
#19	**Σ**	**44.500**						**0.14**	**0.095**
#18	1	6.400	0.073	0.000	0.000	62.000	M	0.05	0.026
	2	4.800	0.057	0.000	0.000	47.000	S	0.00	0.000
	Σ	**55.700**						**0.05**	**0.026**
#17	**Σ**	**153.900**						**0.54**	**0.569**
#16	1	1.900	0.035	0.000	0.000	62.000	M	0.01	0.002
	Σ	**155.800**						**0.56**	**0.571**
#15	**Σ**	**155.800**						**0.56**	**0.571**
#14	1	2.300	0.025	0.000	0.000	47.000	S	0.00	0.000
	2	3.800	0.038	0.000	0.000	62.000	M	0.03	0.015
	Σ	**182.200**						**0.73**	**0.695**
#13	**Σ**	**407.400**						**0.85**	**0.779**
#12	1	36.000	0.073	0.000	0.000	47.000	S	0.00	0.000
	2	19.400	0.121	0.000	0.000	62.000	M	0.15	0.079
	3	1.200	0.018	0.000	0.000	47.000	S	0.00	0.000
	4	2.400	0.022	0.000	0.000	61.000	F	0.01	0.001
	Σ	**466.400**						**0.99**	**0.859**
#11	1	2.600	0.032	0.000	0.000	47.000	S	0.00	0.000
	2	8.900	0.041	0.000	0.000	62.000	M	0.07	0.036
	3	5.900	0.125	0.000	0.000	47.000	S	0.00	0.000
	4	0.900	0.065	0.000	0.000	47.000	S	0.00	0.000
	Σ	**18.300**						**0.07**	**0.036**
#10	**Σ**	**18.300**						**0.07**	**0.036**
#9	1	5.400	0.042	0.000	0.000	62.000	M	0.04	0.022
	2	16.000	0.080	0.000	0.000	47.000	S	0.00	0.000
	Σ	**39.700**						**0.09**	**0.058**
#8	**Σ**	**39.700**						**0.09**	**0.058**
#7	1	12.100	0.093	0.000	0.000	62.000	M	0.09	0.049
	2	34.400	0.192	0.000	0.000	47.000	S	0.00	0.000

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	3	9.800	0.062	0.000	0.000	62.000	M	0.07	0.040
	4	2.900	0.061	0.000	0.000	47.000	S	0.00	0.000
	Σ	**98.900**						**0.24**	**0.148**
#6	1	1.200	0.019	0.000	0.000	62.000	M	0.00	0.000
	2	1.100	0.029	0.000	0.000	47.000	S	0.00	0.000
	3	5.200	0.047	0.000	0.000	61.000	S	0.02	0.017
	4	4.800	0.025	0.000	0.000	47.000	S	0.00	0.000
	5	17.400	0.134	0.000	0.000	47.000	S	0.00	0.000
	6	26.900	0.234	0.000	0.000	47.000	S	0.00	0.000
	Σ	**155.500**						**0.26**	**0.165**
#5	1	27.800	0.150	0.000	0.000	61.000	S	0.08	0.061
	2	0.500	0.010	0.000	0.000	47.000	S	0.00	0.000
	Σ	**28.300**						**0.08**	**0.061**
#4	**Σ**	**650.200**						**1.31**	**1.086**
#3	1	7.200	0.036	0.000	0.000	47.000	S	0.00	0.000
	2	9.100	0.012	0.000	0.000	61.000	S	0.04	0.030
	Σ	**666.500**						**1.35**	**1.115**
#2	**Σ**	**666.500**						**1.35**	**1.115**
#1	**Σ**	**666.500**						**0.30**	**0.754**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#31	1	0.300	400.00	16.00	0.0310	0.9000	1	0.3	4,344	2.01	1.73
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#30	1	0.300	400.00	18.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	37.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	50.00	2.50	0.0310	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#29	1	0.300	100.00	33.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#28	1	0.300	100.00	4.00	0.0100	0.3800	1	0.0	81	0.05	0.04
	2	0.300	75.00	8.00	0.0100	0.3800	1	0.0	6,620	3.77	3.77

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	3	0.300	400.00	10.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	75.00	22.00	0.0100	0.3800	1	0.0	300	0.17	0.13
	5	0.300	400.00	16.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	6	0.300	50.00	20.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.3**	**3,438**	**1.60**	**1.26**
#34	1	0.300	50.00	2.00	0.0100	0.3800	1	0.0	104	0.06	0.02
	Σ							**0.0**	**104**	**0.06**	**0.02**
#33	1	0.300	100.00	24.00	0.0100	0.3800	1	0.0	417	0.24	0.19
	Σ							**0.0**	**417**	**0.24**	**0.19**
#32	1	0.300	400.00	22.00	0.0100	0.3800	1	0.0	909	0.52	0.39
	Σ							**0.1**	**436**	**0.25**	**0.20**
#27	1	0.300	50.00	13.00	0.8000	0.3800	1	9.4	65,396	37.27	17.37
	2	0.300	400.00	8.00	0.0100	0.3800	1	0.1	210	0.11	0.09
	Σ							**9.4**	**65,396**	**37.25**	**8.98**
#26	**Σ**							**9.4**	**65,396**	**37.25**	**8.98**
#25	1	0.300	400.00	15.00	0.0100	0.3800	1	0.1	621	0.35	0.27
	Σ							**0.1**	**245**	**0.14**	**0.06**
#24	**Σ**							**0.1**	**245**	**0.14**	**0.06**
#23	1	0.300	300.00	15.00	0.0100	0.3800	1	0.0	436	0.25	0.19
	Σ							**0.0**	**37**	**0.02**	**0.01**
#22	**Σ**							**0.0**	**37**	**0.02**	**0.01**
#21	1	0.300	50.00	3.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.0**	**1**	**0.00**	**0.00**
#20	1	0.300	400.00	11.00	0.0100	0.3800	1	0.0	365	0.18	0.16
	2	0.300	400.00	11.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**365**	**0.18**	**0.16**
#19	**Σ**							**0.0**	**365**	**0.18**	**0.16**
#18	1	0.300	200.00	15.00	0.0100	0.3800	1	0.0	353	0.20	0.15
	2	0.300	200.00	13.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**353**	**0.27**	**0.20**
#17	**Σ**							**0.0**	**52**	**0.04**	**0.01**
#16	1	0.300	100.00	21.00	0.0100	0.3800	1	0.0	1,274	0.73	0.68

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	Σ							**0.1**	**103**	**0.08**	**0.01**
#15	Σ							**0.1**	**103**	**0.08**	**0.01**
#14	1	0.300	100.00	39.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	150.00	26.00	0.0100	0.3800	1	0.0	528	0.30	0.23
	Σ							**0.1**	**245**	**0.16**	**0.06**
#13	Σ							**0.4**	**541**	**0.28**	**0.20**
#12	1	0.300	300.00	19.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	400.00	12.00	0.0100	0.3800	1	0.0	458	0.26	0.20
	3	0.300	50.00	13.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	50.00	38.00	0.0800	0.9000	1	0.0	38,755	22.09	21.53
	Σ							**0.5**	**963**	**0.50**	**0.23**
#11	1	0.300	50.00	14.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	12.00	0.0100	0.3800	1	0.0	182	0.10	0.08
	3	0.300	100.00	1.50	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	50.00	1.50	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**182**	**0.10**	**0.08**
#10	Σ							**0.0**	**182**	**0.10**	**0.08**
#9	1	0.300	100.00	19.00	0.0100	0.3800	1	0.0	304	0.17	0.13
	2	0.300	200.00	14.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**131**	**0.07**	**0.05**
#8	Σ							**0.0**	**131**	**0.07**	**0.05**
#7	1	0.300	400.00	22.00	0.0100	0.3800	1	0.0	907	0.52	0.39
	2	0.300	400.00	16.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	100.00	12.00	0.0100	0.3800	1	0.0	184	0.10	0.08
	4	0.300	100.00	6.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.1**	**397**	**0.23**	**0.15**
#6	1	0.300	50.00	26.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	2	0.300	75.00	10.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	200.00	30.00	0.0800	0.9000	1	0.2	10,504	5.99	5.18
	4	0.300	75.00	38.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	5	0.300	400.00	18.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	6	0.300	400.00	12.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.3**	**1,343**	**0.77**	**0.67**
#5	1	0.300	200.00	16.00	0.0310	0.9000	1	0.2	2,687	1.34	1.19
	2	0.300	50.00	19.00	0.0310	0.9000	1	0.0	1	0.00	0.00

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	Σ							**0.2**	**2,687**	**1.34**	**1.19**
#4	Σ							**1.0**	**1,110**	**0.59**	**0.36**
#3	1	0.300	200.00	45.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	59.00	0.0800	0.9000	1	0.5	13,801	7.87	6.81
	Σ							**1.5**	**1,510**	**0.82**	**0.54**
#2	Σ							**1.5**	**1,510**	**0.82**	**0.54**
#1	Σ							**0.0**	**1**	**0.00**	**0.00**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	2. Minimum tillage cultivation	45.00	198.90	442.00	3.350	0.036
#3	**1**	**Time of Concentration:**					**0.036**
#3	2	4. Cultivated, straight row	59.00	176.40	299.00	6.860	0.012
#3	**2**	**Time of Concentration:**					**0.012**
#5	1	3. Short grass pasture	16.00	276.63	1,729.00	3.200	0.150
#5	**1**	**Time of Concentration:**					**0.150**
#5	2	3. Short grass pasture	19.00	25.46	134.00	3.480	0.010
#5	**2**	**Time of Concentration:**					**0.010**
#6	1	3. Short grass pasture	26.00	76.18	293.00	4.070	0.019
#6	**1**	**Time of Concentration:**					**0.019**
#6	2	3. Short grass pasture	10.00	26.40	264.00	2.520	0.029
#6	**2**	**Time of Concentration:**					**0.029**
#6	3	3. Short grass pasture	30.00	226.20	754.00	4.380	0.047
#6	**3**	**Time of Concentration:**					**0.047**
#6	4	3. Short grass pasture	38.00	174.04	458.00	4.930	0.025
#6	**4**	**Time of Concentration:**					**0.025**
#6	5	3. Short grass pasture	18.00	296.28	1,646.00	3.390	0.134
#6	**5**	**Time of Concentration:**					**0.134**
#6	6	3. Short grass pasture	12.00	280.07	2,334.00	2.770	0.234
#6	**6**	**Time of Concentration:**					**0.234**
#7	1	3. Short grass pasture	22.00	277.63	1,262.00	3.750	0.093
#7	**1**	**Time of Concentration:**					**0.093**
#7	2	3. Short grass pasture	16.00	355.52	2,222.00	3.200	0.192
#7	**2**	**Time of Concentration:**					**0.192**
#7	3	3. Short grass pasture	12.00	75.24	627.00	2.770	0.062
#7	**3**	**Time of Concentration:**					**0.062**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#7	4	3. Short grass pasture	6.00	25.85	431.00	1.950	0.061
#7	**4**	**Time of Concentration:**					**0.061**
#9	2	3. Short grass pasture	14.00	121.38	867.00	2.990	0.080
#9	**2**	**Time of Concentration:**					**0.080**
#11	1	3. Short grass pasture	14.00	48.58	347.00	2.990	0.032
#11	**1**	**Time of Concentration:**					**0.032**
#11	2	3. Short grass pasture	12.00	49.44	412.00	2.770	0.041
#11	**2**	**Time of Concentration:**					**0.041**
#11	3	3. Short grass pasture	1.50	6.57	438.00	0.970	0.125
#11	**3**	**Time of Concentration:**					**0.125**
#11	4	3. Short grass pasture	1.50	3.44	230.00	0.970	0.065
#11	**4**	**Time of Concentration:**					**0.065**
#12	1	3. Short grass pasture	19.00	174.04	916.00	3.480	0.073
#12	**1**	**Time of Concentration:**					**0.073**
#12	2	3. Short grass pasture	12.00	145.08	1,209.00	2.770	0.121
#12	**2**	**Time of Concentration:**					**0.121**
#12	3	3. Short grass pasture	13.00	24.31	187.00	2.880	0.018
#12	**3**	**Time of Concentration:**					**0.018**
#12	4	3. Short grass pasture	38.00	150.48	396.00	4.930	0.022
#12	**4**	**Time of Concentration:**					**0.022**
#14	1	3. Short grass pasture	39.00	176.67	453.00	4.990	0.025
#14	**1**	**Time of Concentration:**					**0.025**
#14	2	3. Short grass pasture	26.00	148.20	570.00	4.070	0.038
#14	**2**	**Time of Concentration:**					**0.038**
#16	1	3. Short grass pasture	21.00	99.32	473.00	3.660	0.035
#16	**1**	**Time of Concentration:**					**0.035**
#18	1	3. Short grass pasture	15.00	122.70	818.00	3.090	0.073
#18	**1**	**Time of Concentration:**					**0.073**
#18	2	3. Short grass pasture	13.00	77.35	595.00	2.880	0.057
#18	**2**	**Time of Concentration:**					**0.057**
#20	1	3. Short grass pasture	11.00	243.87	2,217.00	2.650	0.232
#20	**1**	**Time of Concentration:**					**0.232**
#20	2	3. Short grass pasture	11.00	126.61	1,151.00	2.650	0.120
#20	**2**	**Time of Concentration:**					**0.120**
#21	1	3. Short grass pasture	3.00	7.58	253.00	1.380	0.050
#21	**1**	**Time of Concentration:**					**0.050**
#23	1	3. Short grass pasture	15.00	123.90	826.00	3.090	0.074
#23	**1**	**Time of Concentration:**					**0.074**
#25	1	3. Short grass pasture	15.00	179.85	1,199.00	3.090	0.107
#25	**1**	**Time of Concentration:**					**0.107**
#27	1	5. Nearly bare and untilled, and alluvial valley fans	13.00	24.96	192.00	3.600	0.014

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#27	**1**	**Time of Concentration:**					**0.014**
#27	2	3. Short grass pasture	8.00	154.39	1,930.00	2.260	0.237
#27	**2**	**Time of Concentration:**					**0.237**
#28	1	3. Short grass pasture	4.00	26.00	650.00	1.600	0.112
#28	**1**	**Time of Concentration:**					**0.112**
#28	2	3. Short grass pasture	8.00	25.43	318.00	2.260	0.039
#28	**2**	**Time of Concentration:**					**0.039**
#28	3	3. Short grass pasture	10.00	201.90	2,019.00	2.520	0.222
#28	**3**	**Time of Concentration:**					**0.222**
#28	4	3. Short grass pasture	22.00	74.14	337.00	3.750	0.024
#28	**4**	**Time of Concentration:**					**0.024**
#28	5	3. Short grass pasture	16.00	269.12	1,682.00	3.200	0.146
#28	**5**	**Time of Concentration:**					**0.146**
#28	6	3. Short grass pasture	20.00	24.60	123.00	3.570	0.009
#28	**6**	**Time of Concentration:**					**0.009**
#29	1	3. Short grass pasture	33.00	225.39	683.00	4.590	0.041
#29	**1**	**Time of Concentration:**					**0.041**
#30	1	3. Short grass pasture	18.00	197.46	1,097.00	3.390	0.089
#30	**1**	**Time of Concentration:**					**0.089**
#30	2	3. Short grass pasture	37.00	200.17	541.00	4.860	0.030
#30	**2**	**Time of Concentration:**					**0.030**
#30	3	3. Short grass pasture	2.50	3.55	142.00	1.260	0.031
#30	**3**	**Time of Concentration:**					**0.031**
#31	1	3. Short grass pasture	16.00	249.60	1,560.00	3.200	0.135
#31	**1**	**Time of Concentration:**					**0.135**
#32	1	3. Short grass pasture	22.00	253.22	1,151.00	3.750	0.085
#32	**1**	**Time of Concentration:**					**0.085**
#33	1	3. Short grass pasture	24.00	122.64	511.00	3.910	0.036
#33	**1**	**Time of Concentration:**					**0.036**
#34	1	5. Nearly bare and untilled, and alluvial valley fans	2.00	2.00	100.00	1.410	0.019
#34	**1**	**Time of Concentration:**					**0.019**

Appendix Exh. 7-14PP

Prospect Pond

25- Year 24-Hour Storm Event

Emergency Spillway Deomonstration

General Information

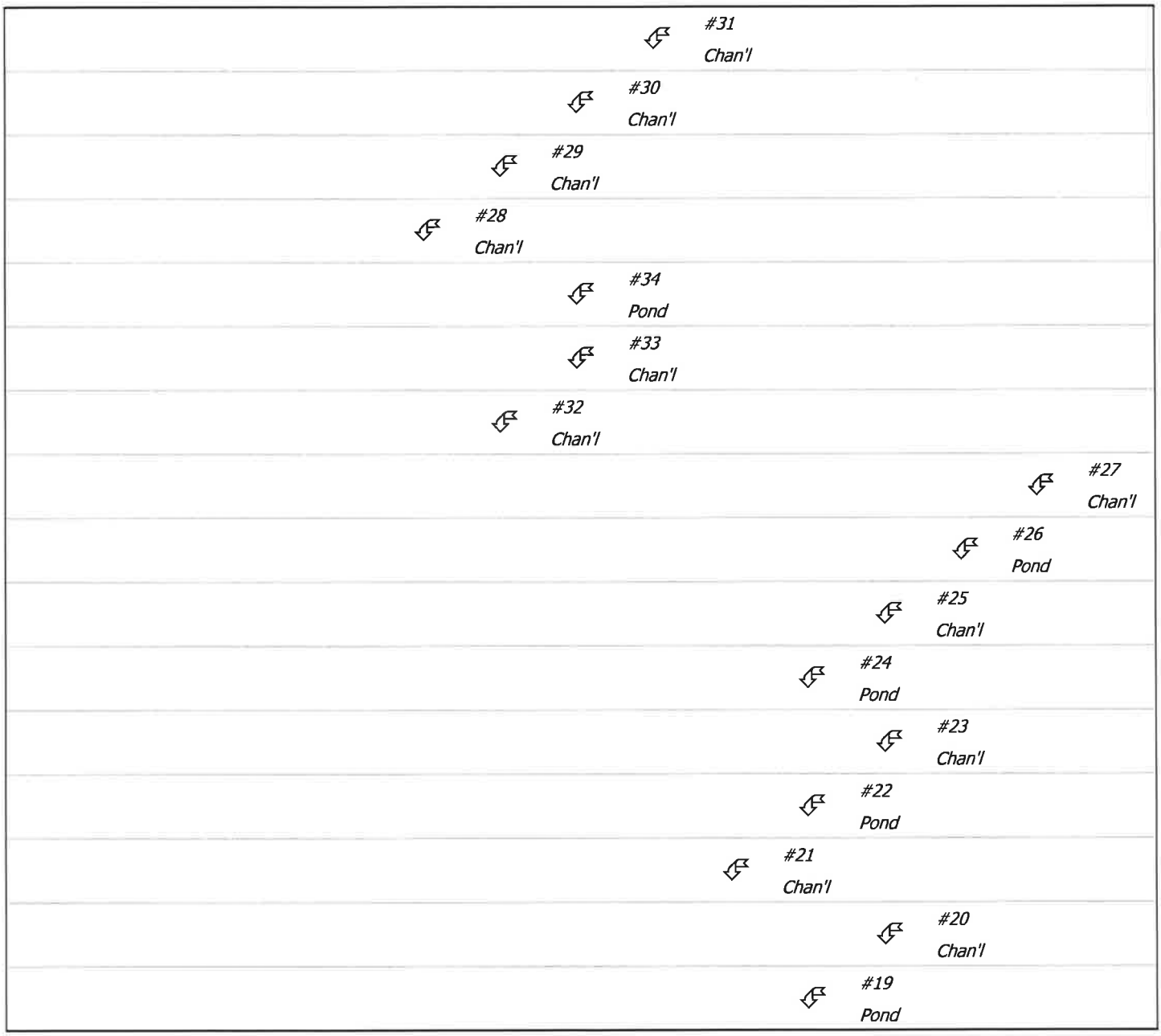
Storm Information:

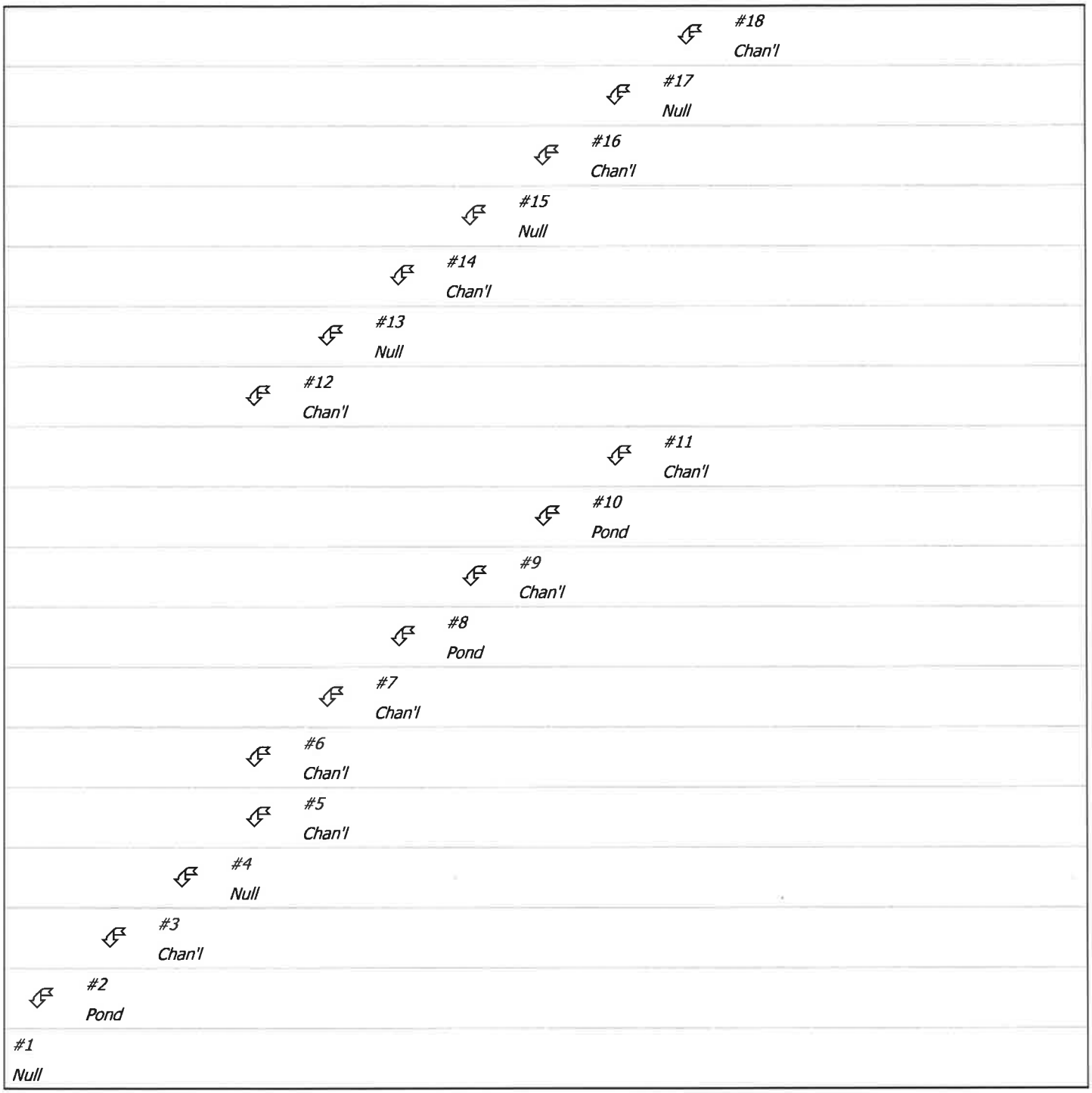
Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	2.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null Below Prospect Pond
Pond	#2	==>	#1	0.000	0.000	Prospect Pond
Channel	#3	==>	#2	0.000	0.000	Natural Channel Above Prospect Pond
Null	#4	==>	#3	0.000	0.000	Confluence Prospect & South Collection Ditches
Channel	#5	==>	#4	0.000	0.000	Prospect Collection Ditch
Channel	#6	==>	#4	0.000	0.000	Natural Channel Below Reach 1 Prospect Ditch
Channel	#7	==>	#6	0.000	0.000	Prospect Ditch Reach 1
Pond	#8	==>	#7	0.000	0.000	PD1 Stockpond
Channel	#9	==>	#8	0.000	0.000	Prospect Ditch Reach 2
Pond	#10	==>	#9	0.000	0.000	PD2 Stockpond
Channel	#11	==>	#10	0.000	0.000	Prospect Ditch Reach 3
Channel	#12	==>	#4	0.000	0.000	South Collection Ditch Station 0+00 to 30+00
Null	#13	==>	#12	0.000	0.000	Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00
Channel	#14	==>	#13	0.000	0.000	Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch
Null	#15	==>	#14	0.000	0.000	Confluence Final East Pit Ditch and North Tributary East Pit Ditch
Channel	#16	==>	#15	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch
Null	#17	==>	#16	0.000	0.000	Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch
Channel	#18	==>	#17	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1
Pond	#19	==>	#18	0.000	0.000	NTEP1 Stockpond
Channel	#20	==>	#19	0.000	0.000	North Tributary Final East Pit Ditch Reach 2
Channel	#21	==>	#17	0.000	0.000	EP3 Stockpond Outlet Ditch
Pond	#22	==>	#21	0.000	0.000	EP3 Stockpond
Channel	#23	==>	#22	0.000	0.000	EP3 Stockpond Inlet Ditch
Pond	#24	==>	#21	0.000	0.000	EP1 Stockpond (to EP3 Stockpond)
Channel	#25	==>	#24	0.000	0.000	Final East Pit Ditch Reach 2
Pond	#26	==>	#25	0.000	0.000	EP2 Stockpond
Channel	#27	==>	#26	0.000	0.000	Final East Pit Ditch Reach 3
Channel	#28	==>	#13	0.000	0.000	South Collection Ditch 30+00 to 90+00
Channel	#29	==>	#28	0.000	0.000	South Collection Ditch 90+00 to 92+68

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#30	==>	#29	0.000	0.000	Natural Channel from Section 16 Fill Ditch to South Collection Ditch
Channel	#31	==>	#30	0.000	0.000	Section 16 Fill Ditch
Channel	#32	==>	#14	0.000	0.000	Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06
Channel	#33	==>	#32	0.000	0.000	Final East Pitch Ditch Reach 1 from Station 8+06 to EP1
Pond	#34	==>	#32	0.000	0.000	EP1 Stockpond (to Final East Pit Ditch) Reach 1




#18
Chan'l
#17
Null
#16
Chan'l
#15
Null
#14
Chan'l
#13
Null
#12
Chan'l
#11
Chan'l
#10
Pond
#9
Chan'l
#8
Pond
#7
Chan'l
#6
Chan'l
#5
Chan'l
#4
Null
#3
Chan'l
#2
Pond
#1
Null

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#31		21.500	21.500	0.64	0.19
#30		19.600	41.100	0.65	0.19
#29		2.400	43.500	0.65	0.19
#28		181.700	225.200	1.40	0.31
#34	In	5.000	5.000	1.54	0.12
	Out			0.36	0.12
#33		3.000	3.000	0.41	0.04
#32		12.300	20.300	2.42	0.32
#27		69.700	69.700	5.43	1.06
#26	In	0.000	69.700	5.43	1.06
	Out			1.05	1.06
#25		22.300	92.000	3.47	1.36
#24	In	0.000	92.000	3.47	1.36
	Out			2.59	1.36
#23		4.900	4.900	0.68	0.07
#22	In	0.000	4.900	0.68	0.07
	Out			0.20	0.07
#21		1.300	98.200	2.93	1.44
#20		44.500	44.500	1.28	0.31
#19	In	0.000	44.500	1.28	0.31
	Out			0.00	0.00
#18		11.200	55.700	0.88	0.09
#17		0.000	153.900	3.81	1.52
#16		1.900	155.800	4.07	1.55
#15		0.000	155.800	4.07	1.55
#14		6.100	182.200	7.02	1.92
#13		0.000	407.400	8.42	2.23
#12		59.000	466.400	11.35	2.51
#11		18.300	18.300	1.23	0.12
#10	In	0.000	18.300	1.23	0.12
	Out			0.73	0.12
#9		21.400	39.700	1.45	0.19
#8	In	0.000	39.700	1.45	0.19
	Out			1.08	0.19
#7		59.200	98.900	3.93	0.48
#6		56.600	155.500	4.65	0.56
#5		28.300	28.300	0.59	0.22

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#4		0.000	650.200	16.06	3.29
#3		16.300	666.500	17.03	3.40
#2	In	0.000	666.500	17.03	3.40
	Out			0.52	1.47
#1		0.000	666.500	0.52	1.47

Structure Detail:

Structure #31 (Riprap Channel)

Section 16 Fill Ditch

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	17.8	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.64 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.11 ft	29.99 ft
Velocity*:		
X-Section Area:	0.23 sq ft	
Hydraulic Radius:	0.019 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 #30 (Erodible Channel)

Natural Channel from Section 16 Fill Ditch to South Collection Ditch

Parabolic Erodible Channel Inputs:

Material: Shales and hardpans

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
22.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.65 cfs	
Depth:	0.19 ft	
Top Width:	0.78 ft	
Velocity:	6.46 fps	
X-Section Area:	0.10 sq ft	
Hydraulic Radius:	0.111 ft	
Froude Number:	3.16	

Structure #29 (Vegetated Channel)

South Collection Ditch 90+00 to 92+68

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	3.0	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.65 cfs		0.65 cfs	
Depth:	0.26 ft		0.59 ft	
Top Width:	4.07 ft		6.69 ft	
Velocity:	0.83 fps		0.26 fps	
X-Section Area:	0.79 sq ft		2.55 sq ft	
Hydraulic Radius:	0.190 ft		0.373 ft	
Froude Number:	0.33		0.07	
Roughness Coefficient:	0.1024		0.5194	

Structure #28 (Vegetated Channel)

South Collection Ditch 30+00 to 90+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	4.0	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	1.40 cfs		1.40 cfs	
Depth:	0.32 ft		0.66 ft	
Top Width:	4.58 ft		7.31 ft	
Velocity:	1.32 fps		0.45 fps	
X-Section Area:	1.06 sq ft		3.09 sq ft	
Hydraulic Radius:	0.228 ft		0.414 ft	
Froude Number:	0.48		0.12	
Roughness Coefficient:	0.0842		0.3652	

Structure #34 (Pond)

EP1 Stockpond (to Final East Pit Ditch) Reach 1

Pond Inputs:

Initial Pool Elev:	7,376.00 ft
Initial Pool:	0.39 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	100.00	4.00	0.0150	7,376.00	0.90	0.00

Pond Results:

Peak Elevation:	7,376.17 ft
Dewater Time:	0.54 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)	
7,370.00	0.000	0.000	0.000		
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		Spillway #2
7,376.17	0.107	0.411	0.356	12.95	Peak Stage
7,377.00	0.118	0.504	2.094		
7,378.00	0.140	0.633	4.414		
7,379.00	0.165	0.786	5.883		Spillway #1
7,380.00	0.165	0.951	55.203		
7,381.00	0.166	1.116	174.677		
7,382.00	0.166	1.282	352.543		
7,383.00	0.167	1.449	585.314		
7,384.00	0.167	1.616	873.793		
7,385.00	0.168	1.783	1,219.515		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000	0.000
7,371.00	0.000	0.000	0.000
7,372.00	0.000	0.000	0.000
7,373.00	0.000	0.000	0.000
7,374.00	0.000	0.000	0.000
7,375.00	0.000	0.000	0.000
7,376.00	0.000	0.000	0.000
7,377.00	0.000	(3)>2.094	2.094
7,378.00	0.000	(5)>4.414	4.414
7,379.00	0.000	(5)>5.883	5.883
7,380.00	48.400	(5)>6.803	55.203
7,381.00	167.398	(6)>7.279	174.677
7,382.00	344.812	(6)>7.732	352.543
7,383.00	577.178	(6)>8.136	585.314
7,384.00	865.254	(6)>8.540	873.793

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,385.00	1,210.609	(6)>8.906	1,219.515

Structure #33 (Riprap Channel)

Final East Pitch Ditch Reach 1 from Station 8+06 to EP1

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	2.0:1	2.0:1	15.7	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.41 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.08 ft	24.00 ft
Velocity*:		
X-Section Area:	0.25 sq ft	
Hydraulic Radius:	0.020 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 #32 (Nonerodible Channel)

Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	18.0	0.0170	2.99		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.42 cfs	
Depth:	0.04 ft	3.03 ft
Top Width:	12.17 ft	24.13 ft
Velocity:	4.58 fps	
X-Section Area:	0.53 sq ft	
Hydraulic Radius:	0.043 ft	
Froude Number:	3.88	

Structure #27 (Riprap Channel)

Final East Pit Ditch Reach 3

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	2.0:1	2.0:1	6.4	2.93		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.43 cfs	
Depth:	0.09 ft	3.02 ft
Top Width:	12.37 ft	24.09 ft
Velocity*:		
X-Section Area:	1.12 sq ft	
Hydraulic Radius:	0.091 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #26 (Pond)

EP2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,500.00 ft
Initial Pool:	4.26 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,505.00	60.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	160.00	9.00	0.0150	7,500.00	0.50	0.00

Pond Results:

Peak Elevation:	7,500.50 ft
Dewater Time:	1.22 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)	
7,492.00	0.385	0.000	0.000		
7,493.00	0.419	0.402	0.000		
7,494.00	0.454	0.839	0.000		
7,495.00	0.491	1.311	0.000		
7,496.00	0.529	1.821	0.000		
7,497.00	0.568	2.370	0.000		
7,498.00	0.609	2.958	0.000		
7,499.00	0.651	3.588	0.000		
7,500.00	0.694	4.260	0.000		Spillway #2
7,500.50	0.718	4.618	1.045	29.25	Peak Stage
7,501.00	0.741	4.978	2.094		
7,502.00	0.787	5.741	4.414		
7,503.00	0.834	6.552	5.883		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,504.00	0.884	7.411	7.060		
7,505.00	0.932	8.319	8.069		Spillway #1
7,506.00	0.933	9.251	45.188		
7,507.00	0.934	10.185	151.737		
7,508.00	0.935	11.119	305.349		
7,509.00	0.936	12.055	524.315		
7,510.00	0.937	12.991	798.632		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,492.00	0.000	0.000	0.000
7,493.00	0.000	0.000	0.000
7,494.00	0.000	0.000	0.000
7,495.00	0.000	0.000	0.000
7,496.00	0.000	0.000	0.000
7,497.00	0.000	0.000	0.000
7,498.00	0.000	0.000	0.000
7,499.00	0.000	0.000	0.000
7,500.00	0.000	0.000	0.000
7,501.00	0.000	(3)>2.094	2.094
7,502.00	0.000	(5)>4.414	4.414
7,503.00	0.000	(5)>5.883	5.883
7,504.00	0.000	(5)>7.060	7.060
7,505.00	0.000	(5)>8.069	8.069
7,506.00	36.222	(5)>8.966	45.188
7,507.00	142.050	(5)>9.687	151.737
7,508.00	295.305	(5)>10.045	305.349
7,509.00	513.913	(6)>10.402	524.315
7,510.00	787.934	(6)>10.698	798.632

Structure #25 (Riprap Channel)

Final East Pit Ditch Reach 2

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	2.0:1	2.0:1	10.0	2.97		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.47 cfs	
Depth:	0.05 ft	3.02 ft
Top Width:	12.21 ft	24.09 ft
Velocity*:		
X-Section Area:	0.65 sq ft	
Hydraulic Radius:	0.053 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #24 (Pond)

EP1 Stockpond (to EP3 Stockpond)

Pond Inputs:

Initial Pool Elev:	7,379.00 ft
Initial Pool:	0.79 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,379.05 ft
Dewater Time:	1.34 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)	
7,370.00	0.000	0.000	0.000		
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		
7,377.00	0.118	0.504	0.000		
7,378.00	0.141	0.633	0.000		
7,379.00	0.165	0.786	0.000		Spillway #1
7,379.05	0.154	0.795	2.592	32.10	Peak Stage
7,380.00	0.165	0.951	48.400		
7,381.00	0.166	1.117	167.398		
7,382.00	0.166	1.283	344.812		
7,383.00	0.167	1.449	577.178		
7,384.00	0.167	1.616	865.254		
7,385.00	0.168	1.784	1,210.609		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000
7,371.00	0.000	0.000
7,372.00	0.000	0.000
7,373.00	0.000	0.000
7,374.00	0.000	0.000
7,375.00	0.000	0.000
7,376.00	0.000	0.000
7,377.00	0.000	0.000
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	48.400	48.400
7,381.00	167.398	167.398
7,382.00	344.812	344.812
7,383.00	577.178	577.178
7,384.00	865.254	865.254
7,385.00	1,210.609	1,210.609

Structure #23 (Riprap Channel)

EP3 Stockpond Inlet Ditch

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	2.0:1	2.0:1	4.8	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.68 cfs	
Depth:	0.05 ft	3.04 ft
Top Width:	12.22 ft	24.18 ft
Velocity:	1.02 fps	
X-Section Area:	0.66 sq ft	
Hydraulic Radius:	0.054 ft	
Froude Number:	0.77	
Manning's n:	0.0279	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #22 (Pond)

EP3 Stockpond

Pond Inputs:

Initial Pool Elev:	7,357.00 ft
Initial Pool:	2.90 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,357.00	216.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	7,357.01 ft
Dewater Time:	0.52 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)	
7,340.00	0.032	0.000	0.000		
7,341.00	0.045	0.038	0.000		
7,342.00	0.060	0.091	0.000		
7,343.00	0.077	0.159	0.000		
7,344.00	0.095	0.245	0.000		
7,345.00	0.115	0.350	0.000		
7,346.00	0.129	0.472	0.000		
7,347.00	0.144	0.608	0.000		
7,348.00	0.160	0.760	0.000		
7,349.00	0.176	0.928	0.000		
7,350.00	0.192	1.112	0.000		
7,351.00	0.210	1.313	0.000		
7,352.00	0.227	1.531	0.000		
7,353.00	0.246	1.768	0.000		
7,354.00	0.264	2.023	0.000		
7,355.00	0.284	2.297	0.000		
7,356.00	0.304	2.591	0.000		
7,357.00	0.322	2.904	0.000		Spillway #1
7,357.01	0.314	2.909	0.199	12.45	Peak Stage
7,358.00	0.322	3.226	14.150		
7,359.00	0.323	3.549	61.776		
7,360.00	0.324	3.873	147.685		
7,361.00	0.325	4.197	264.762		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,340.00	0.000	0.000
7,341.00	0.000	0.000
7,342.00	0.000	0.000
7,343.00	0.000	0.000
7,344.00	0.000	0.000
7,345.00	0.000	0.000
7,346.00	0.000	0.000
7,347.00	0.000	0.000
7,348.00	0.000	0.000

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	0.000	0.000
7,357.00	0.000	0.000
7,358.00	14.150	14.150
7,359.00	61.776	61.776
7,360.00	147.685	147.685
7,361.00	264.762	264.762

Structure #21 (Riprap Channel)

EP3 Stockpond Outlet Ditch

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	2.0:1	2.0:1	3.6	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.93 cfs	
Depth:	0.08 ft	3.07 ft
Top Width:	12.31 ft	24.27 ft
Velocity*:		
X-Section Area:	0.94 sq ft	
Hydraulic Radius:	0.076 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #20 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 2

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	2.0:1	2.0:1	12.2	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.28 cfs	
Depth:	0.03 ft	3.01 ft
Top Width:	12.13 ft	24.05 ft
Velocity*:		
X-Section Area:	0.39 sq ft	
Hydraulic Radius:	0.032 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #19 (Pond)

NTEP1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,385.00 ft
Initial Pool:	0.92 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,389.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,386.29 ft

Dewater Time:	0.00 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)	
7,378.00	0.041	0.000	0.000		
7,379.00	0.071	0.055	0.000		
7,380.00	0.096	0.138	0.000		
7,381.00	0.119	0.245	0.000		
7,382.00	0.143	0.376	0.000		
7,383.00	0.168	0.531	0.000		
7,384.00	0.194	0.712	0.000		
7,385.00	0.220	0.919	0.000		
7,386.00	0.247	1.152	0.000		
7,386.29	0.255	1.228	0.000	0.00	Peak Stage
7,387.00	0.275	1.413	0.000		
7,388.00	0.304	1.702	0.000		
7,389.00	0.338	2.023	0.000		Spillway #1
7,390.00	0.400	2.392	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	0.000	0.000
7,381.00	0.000	0.000
7,382.00	0.000	0.000
7,383.00	0.000	0.000
7,384.00	0.000	0.000
7,385.00	0.000	0.000
7,386.00	0.000	0.000
7,387.00	0.000	0.000
7,388.00	0.000	0.000
7,389.00	0.000	0.000
7,390.00	48.400	48.400

Structure #18 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1

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	2.0:1	2.0:1	7.2	2.96		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.88 cfs	
Depth:	0.05 ft	3.01 ft
Top Width:	12.19 ft	24.03 ft
Velocity*:		
X-Section Area:	0.56 sq ft	
Hydraulic Radius:	0.046 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #17 (Null)

Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch

Structure #16 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch

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	2.0:1	2.0:1	21.5	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.07 cfs	
Depth:	0.03 ft	3.02 ft
Top Width:	12.13 ft	24.09 ft
Velocity*:		
X-Section Area:	0.40 sq ft	
Hydraulic Radius:	0.033 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 #15 (Null)

Confluence Final East Pit Ditch and North Tributary East Pit Ditch

Structure #14 (Nonerodible Channel)

Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	21.1	0.0170	4.00		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.02 cfs	
Depth:	0.08 ft	4.08 ft
Top Width:	12.32 ft	28.32 ft
Velocity:	7.32 fps	
X-Section Area:	0.96 sq ft	
Hydraulic Radius:	0.078 ft	
Froude Number:	4.63	

Structure #13 (Null)

Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00

Structure #12 (Vegetated Channel)

South Collection Ditch Station 0+00 to 30+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	5.0	D, B	0.87			7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	11.35 cfs		11.35 cfs	
Depth:	0.67 ft	1.54 ft	1.09 ft	1.96 ft
Top Width:	7.37 ft	14.33 ft	10.69 ft	17.65 ft
Velocity:	3.61 fps		1.65 fps	
X-Section Area:	3.14 sq ft		6.89 sq ft	
Hydraulic Radius:	0.417 ft		0.629 ft	
Froude Number:	0.97		0.36	
Roughness Coefficient:	0.0514		0.1484	

Structure #11 (Vegetated Channel)

Prospect Ditch Reach 3

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	12.0	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	1.23 cfs		1.23 cfs	
Depth:	0.11 ft		0.26 ft	
Top Width:	12.42 ft		13.03 ft	
Velocity:	0.95 fps		0.38 fps	
X-Section Area:	1.29 sq ft		3.22 sq ft	

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Hydraulic Radius:	0.104 ft		0.245 ft	
Froude Number:	0.52		0.14	
Roughness Coefficient:	0.1183		0.5263	

Structure #10 (Pond)

PD2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,565.00 ft
Initial Pool:	1.49 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,565.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,565.02 ft
Dewater Time:	0.50 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)	
7,556.00	0.054	0.000	0.000		
7,557.00	0.086	0.069	0.000		
7,558.00	0.106	0.165	0.000		
7,559.00	0.127	0.282	0.000		
7,560.00	0.150	0.420	0.000		
7,561.00	0.175	0.582	0.000		
7,562.00	0.200	0.770	0.000		
7,563.00	0.227	0.983	0.000		
7,564.00	0.253	1.222	0.000		
7,565.00	0.280	1.489	0.000		Spillway #1
7,565.02	0.277	1.493	0.731	12.10	Peak Stage
7,566.00	0.300	1.779	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,556.00	0.000	0.000
7,557.00	0.000	0.000
7,558.00	0.000	0.000
7,559.00	0.000	0.000
7,560.00	0.000	0.000
7,561.00	0.000	0.000
7,562.00	0.000	0.000
7,563.00	0.000	0.000
7,564.00	0.000	0.000
7,565.00	0.000	0.000
7,566.00	48.400	48.400

Structure #9 (Vegetated Channel)

Prospect Ditch Reach 2

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	13.0	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	1.45 cfs		1.45 cfs	
Depth:	0.11 ft		0.26 ft	
Top Width:	12.44 ft		13.05 ft	
Velocity:	1.07 fps		0.44 fps	
X-Section Area:	1.36 sq ft		3.29 sq ft	
Hydraulic Radius:	0.109 ft		0.250 ft	
Froude Number:	0.57		0.15	
Roughness Coefficient:	0.1125		0.4823	

Structure #8 (Pond)

PD1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,355.00 ft
Initial Pool:	0.88 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,355.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,355.02 ft
Dewater Time:	0.51 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)	
7,348.00	0.031	0.000	0.000		
7,349.00	0.074	0.051	0.000		
7,350.00	0.097	0.136	0.000		
7,351.00	0.120	0.244	0.000		
7,352.00	0.140	0.374	0.000		
7,353.00	0.159	0.523	0.000		
7,354.00	0.180	0.692	0.000		
7,355.00	0.201	0.882	0.000		Spillway #1
7,355.02	0.202	0.887	1.079	12.20	Peak Stage
7,356.00	0.223	1.094	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	48.400	48.400

Structure #7 (Riprap Channel)

Prospect Ditch Reach 1

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	2.0:1	2.0:1	23.6			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.93 cfs	
Depth:	0.03 ft	
Top Width:	12.11 ft	
Velocity*:		
X-Section Area:	0.34 sq ft	
Hydraulic Radius:	0.028 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 #6 (Erodible Channel)

Natural Channel Below Reach 1 Prospect Ditch

Parabolic Erodible Channel Inputs:

Material: Coarse gravel noncolloidal

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
21.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.65 cfs	
Depth:	0.41 ft	
Top Width:	1.64 ft	
Velocity:	10.38 fps	
X-Section Area:	0.45 sq ft	
Hydraulic Radius:	0.234 ft	
Froude Number:	3.50	

Structure #5 (Vegetated Channel)

Prospect Collection Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
12.00	2.0:1	2.0:1	11.9	D, B				5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.59 cfs		0.59 cfs	
Depth:	0.08 ft		0.21 ft	
Top Width:	12.31 ft		12.83 ft	
Velocity:	0.62 fps		0.23 fps	
X-Section Area:	0.95 sq ft		2.58 sq ft	
Hydraulic Radius:	0.077 ft		0.200 ft	
Froude Number:	0.40		0.09	
Roughness Coefficient:	0.1475		0.7669	

Structure #4 (Null)

Confluence Prospect & South Collection Ditches

Structure #3 (Erodible Channel)

Natural Channel Above Prospect Pond

Parabolic Erodible Channel Inputs:

Material: Asphaltic Concrete, Machine Placed

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
20.0	0.0140				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	17.03 cfs	
Depth:	0.54 ft	
Top Width:	2.17 ft	
Velocity:	21.79 fps	
X-Section Area:	0.78 sq ft	
Hydraulic Radius:	0.310 ft	
Froude Number:	6.39	

Structure #2 (Pond)

Prospect Pond

Pond Inputs:

Initial Pool Elev:	6,744.00 ft
Initial Pool:	2.18 ac-ft

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
12.00	8.70	12.00	129.00	9.70	0.0150	6,750.30	2

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
6,752.00	20.00	1.50:1	1.50:1	12.00

Pond Results:

Peak Elevation:	6,750.12 ft

Dewater Time:	4.04 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)	
6,734.00	0.029	0.000	0.000		
6,735.00	0.088	0.056	0.000		
6,736.00	0.117	0.158	0.000		
6,737.00	0.149	0.291	0.000		
6,738.00	0.185	0.457	0.000		
6,739.00	0.225	0.662	0.000		
6,740.00	0.269	0.909	0.000		
6,741.00	0.293	1.190	0.000		
6,742.00	0.317	1.495	0.000		
6,743.00	0.341	1.823	0.000		
6,744.00	0.365	2.176	0.000		Low hole SPW #1
6,745.00	0.390	2.554	0.210	21.74*	
6,746.00	0.418	2.958	0.297	16.45*	
6,747.00	0.448	3.391	0.364	14.40*	
6,748.00	0.478	3.854	0.420	13.33*	
6,749.00	0.509	4.347	0.470	12.71*	
6,750.00	0.542	4.872	0.515	14.45	
6,750.12	0.545	4.938	0.520	3.95	Peak Stage
6,750.30	0.551	5.036	0.527		Spillway #1
6,751.00	0.572	5.429	3.164		
6,752.00	0.604	6.017	4.931		Spillway #2
6,753.00	0.633	6.636	35.637		
6,754.00	0.664	7.284	110.493		
6,755.00	0.695	7.964	223.581		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Perf. Riser (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
6,734.00	0.000	0.000	0.000
6,735.00	0.000	0.000	0.000
6,736.00	0.000	0.000	0.000
6,737.00	0.000	0.000	0.000
6,738.00	0.000	0.000	0.000
6,739.00	0.000	0.000	0.000
6,740.00	0.000	0.000	0.000
6,741.00	0.000	0.000	0.000
6,742.00	0.000	0.000	0.000
6,743.00	0.000	0.000	0.000
6,744.00	2.00>0.000	0.000	0.000
6,745.00	0.210	0.000	0.210
6,746.00	0.297	0.000	0.297
6,747.00	0.364	0.000	0.364
6,748.00	0.420	0.000	0.420
6,749.00	0.470	0.000	0.470
6,750.00	0.515	0.000	0.515
6,750.30	0.527	0.000	0.527
6,751.00	3.164	0.000	3.164
6,752.00	4.931	0.000	4.931
6,753.00	6.214	29.423	35.637
6,754.00	7.274	103.218	110.493
6,755.00	8.199	215.382	223.581

Structure #1 (Null)

Null Below Prospect Pond

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)
#31	1	21.500	0.135	0.000	0.000	62.000	S	0.64	0.194
	Σ	**21.500**						**0.64**	**0.194**
#30	1	12.500	0.089	0.000	0.000	47.000	S	0.00	0.000
	2	6.800	0.030	0.000	0.000	47.000	S	0.00	0.000
	3	0.300	0.031	0.000	0.000	62.000	F	0.04	0.001
	Σ	**41.100**						**0.65**	**0.194**
#29	1	2.400	0.041	0.000	0.000	47.000	S	0.00	0.000
	Σ	**43.500**						**0.65**	**0.194**
#28	1	2.200	0.112	0.000	0.000	62.000	M	0.30	0.029
	2	1.400	0.039	0.000	0.000	62.000	M	0.19	0.018
	3	23.000	0.222	0.000	0.000	47.000	S	0.00	0.000
	4	5.100	0.024	0.000	0.000	62.000	M	0.70	0.068
	5	149.700	0.146	0.000	0.000	47.000	S	0.02	0.001
	6	0.300	0.009	0.000	0.000	62.000	F	0.04	0.001
	Σ	**225.200**						**1.40**	**0.312**
#34	1	5.000	0.019	0.000	0.000	67.000	F	1.54	0.115
	Σ	**5.000**						**1.54**	**0.115**
#33	1	3.000	0.036	0.000	0.000	62.000	F	0.41	0.040
	Σ	**3.000**						**0.41**	**0.040**
#32	1	12.300	0.085	0.000	0.000	62.000	F	1.70	0.164
	Σ	**20.300**						**2.42**	**0.319**
#27	1	6.000	0.014	0.000	0.000	80.000	F	5.12	0.376
	2	63.700	0.237	0.000	0.000	62.000	M	2.79	0.684
	Σ	**69.700**						**5.43**	**1.060**
#26	Σ	**69.700**						**5.43**	**1.060**
#25	1	22.300	0.107	0.000	0.000	62.000	M	3.08	0.297
	Σ	**92.000**						**3.47**	**1.357**
#24	Σ	**92.000**						**3.47**	**1.357**
#23	1	4.900	0.074	0.000	0.000	62.000	M	0.68	0.065
	Σ	**4.900**						**0.68**	**0.065**
#22	Σ	**4.900**						**0.68**	**0.065**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#21	1	1.300	0.050	0.000	0.000	62.000	M	0.18	0.014
	Σ	**98.200**						**2.93**	**1.436**
#20	1	28.800	0.232	0.000	0.000	62.000	M	1.28	0.309
	2	15.700	0.120	0.000	0.000	47.000	S	0.00	0.000
	Σ	**44.500**						**1.28**	**0.309**
#19	Σ	**44.500**						**1.28**	**0.309**
#18	1	6.400	0.073	0.000	0.000	62.000	M	0.88	0.085
	2	4.800	0.057	0.000	0.000	47.000	S	0.00	0.000
	Σ	**55.700**						**0.88**	**0.085**
#17	Σ	**153.900**						**3.81**	**1.522**
#16	1	1.900	0.035	0.000	0.000	62.000	M	0.26	0.025
	Σ	**155.800**						**4.07**	**1.547**
#15	Σ	**155.800**						**4.07**	**1.547**
#14	1	2.300	0.025	0.000	0.000	47.000	S	0.00	0.000
	2	3.800	0.038	0.000	0.000	62.000	M	0.52	0.051
	Σ	**182.200**						**7.02**	**1.917**
#13	Σ	**407.400**						**8.42**	**2.228**
#12	1	36.000	0.073	0.000	0.000	47.000	S	0.00	0.000
	2	19.400	0.121	0.000	0.000	62.000	M	2.68	0.258
	3	1.200	0.018	0.000	0.000	47.000	S	0.00	0.000
	4	2.400	0.022	0.000	0.000	61.000	F	0.26	0.028
	Σ	**466.400**						**11.35**	**2.515**
#11	1	2.600	0.032	0.000	0.000	47.000	S	0.00	0.000
	2	8.900	0.041	0.000	0.000	62.000	M	1.23	0.119
	3	5.900	0.125	0.000	0.000	47.000	S	0.00	0.000
	4	0.900	0.065	0.000	0.000	47.000	S	0.00	0.000
	Σ	**18.300**						**1.23**	**0.119**
#10	Σ	**18.300**						**1.23**	**0.119**
#9	1	5.400	0.042	0.000	0.000	62.000	M	0.75	0.072
	2	16.000	0.080	0.000	0.000	47.000	S	0.00	0.000
	Σ	**39.700**						**1.45**	**0.191**
#8	Σ	**39.700**						**1.45**	**0.191**
#7	1	12.100	0.093	0.000	0.000	62.000	M	1.67	0.161
	2	34.400	0.192	0.000	0.000	47.000	S	0.00	0.000

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	3	9.800	0.062	0.000	0.000	62.000	M	1.35	0.131
	4	2.900	0.061	0.000	0.000	47.000	S	0.00	0.000
	Σ	**98.900**						**3.93**	**0.482**
#6	1	1.200	0.019	0.000	0.000	62.000	M	0.17	0.012
	2	1.100	0.029	0.000	0.000	47.000	S	0.00	0.000
	3	5.200	0.047	0.000	0.000	61.000	S	0.55	0.061
	4	4.800	0.025	0.000	0.000	47.000	S	0.00	0.000
	5	17.400	0.134	0.000	0.000	47.000	S	0.00	0.000
	6	26.900	0.234	0.000	0.000	47.000	S	0.00	0.000
	Σ	**155.500**						**4.65**	**0.556**
#5	1	27.800	0.150	0.000	0.000	61.000	S	0.59	0.220
	2	0.500	0.010	0.000	0.000	47.000	S	0.00	0.000
	Σ	**28.300**						**0.59**	**0.220**
#4	**Σ**	**650.200**						**16.06**	**3.290**
#3	1	7.200	0.036	0.000	0.000	47.000	S	0.00	0.000
	2	9.100	0.012	0.000	0.000	61.000	S	0.97	0.106
	Σ	**666.500**						**17.03**	**3.396**
#2	**Σ**	**666.500**						**17.03**	**3.396**
#1	**Σ**	**666.500**						**0.52**	**1.465**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	2. Minimum tillage cultivation	45.00	198.90	442.00	3.350	0.036
#3	**1**	**Time of Concentration:**					**0.036**
#3	2	4. Cultivated, straight row	59.00	176.40	299.00	6.860	0.012
#3	**2**	**Time of Concentration:**					**0.012**
#5	1	3. Short grass pasture	16.00	276.63	1,729.00	3.200	0.150
#5	**1**	**Time of Concentration:**					**0.150**
#5	2	3. Short grass pasture	19.00	25.46	134.00	3.480	0.010
#5	**2**	**Time of Concentration:**					**0.010**
#6	1	3. Short grass pasture	26.00	76.18	293.00	4.070	0.019
#6	**1**	**Time of Concentration:**					**0.019**
#6	2	3. Short grass pasture	10.00	26.40	264.00	2.520	0.029
#6	**2**	**Time of Concentration:**					**0.029**
#6	3	3. Short grass pasture	30.00	226.20	754.00	4.380	0.047

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#6	**3**	**Time of Concentration:**					**0.047**
#6	4	3. Short grass pasture	38.00	174.04	458.00	4.930	0.025
#6	**4**	**Time of Concentration:**					**0.025**
#6	5	3. Short grass pasture	18.00	296.28	1,646.00	3.390	0.134
#6	**5**	**Time of Concentration:**					**0.134**
#6	6	3. Short grass pasture	12.00	280.07	2,334.00	2.770	0.234
#6	**6**	**Time of Concentration:**					**0.234**
#7	1	3. Short grass pasture	22.00	277.63	1,262.00	3.750	0.093
#7	**1**	**Time of Concentration:**					**0.093**
#7	2	3. Short grass pasture	16.00	355.52	2,222.00	3.200	0.192
#7	**2**	**Time of Concentration:**					**0.192**
#7	3	3. Short grass pasture	12.00	75.24	627.00	2.770	0.062
#7	**3**	**Time of Concentration:**					**0.062**
#7	4	3. Short grass pasture	6.00	25.85	431.00	1.950	0.061
#7	**4**	**Time of Concentration:**					**0.061**
#9	2	3. Short grass pasture	14.00	121.38	867.00	2.990	0.080
#9	**2**	**Time of Concentration:**					**0.080**
#11	1	3. Short grass pasture	14.00	48.58	347.00	2.990	0.032
#11	**1**	**Time of Concentration:**					**0.032**
#11	2	3. Short grass pasture	12.00	49.44	412.00	2.770	0.041
#11	**2**	**Time of Concentration:**					**0.041**
#11	3	3. Short grass pasture	1.50	6.57	438.00	0.970	0.125
#11	**3**	**Time of Concentration:**					**0.125**
#11	4	3. Short grass pasture	1.50	3.44	230.00	0.970	0.065
#11	**4**	**Time of Concentration:**					**0.065**
#12	1	3. Short grass pasture	19.00	174.04	916.00	3.480	0.073
#12	**1**	**Time of Concentration:**					**0.073**
#12	2	3. Short grass pasture	12.00	145.08	1,209.00	2.770	0.121
#12	**2**	**Time of Concentration:**					**0.121**
#12	3	3. Short grass pasture	13.00	24.31	187.00	2.880	0.018
#12	**3**	**Time of Concentration:**					**0.018**
#12	4	3. Short grass pasture	38.00	150.48	396.00	4.930	0.022
#12	**4**	**Time of Concentration:**					**0.022**
#14	1	3. Short grass pasture	39.00	176.67	453.00	4.990	0.025
#14	**1**	**Time of Concentration:**					**0.025**
#14	2	3. Short grass pasture	26.00	148.20	570.00	4.070	0.038
#14	**2**	**Time of Concentration:**					**0.038**
#16	1	3. Short grass pasture	21.00	99.32	473.00	3.660	0.035
#16	**1**	**Time of Concentration:**					**0.035**
#18	1	3. Short grass pasture	15.00	122.70	818.00	3.090	0.073
#18	**1**	**Time of Concentration:**					**0.073**
#18	2	3. Short grass pasture	13.00	77.35	595.00	2.880	0.057

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#18	**2**	**Time of Concentration:**					**0.057**
#20	1	3. Short grass pasture	11.00	243.87	2,217.00	2.650	0.232
#20	**1**	**Time of Concentration:**					**0.232**
#20	2	3. Short grass pasture	11.00	126.61	1,151.00	2.650	0.120
#20	**2**	**Time of Concentration:**					**0.120**
#21	1	3. Short grass pasture	3.00	7.58	253.00	1.380	0.050
#21	**1**	**Time of Concentration:**					**0.050**
#23	1	3. Short grass pasture	15.00	123.90	826.00	3.090	0.074
#23	**1**	**Time of Concentration:**					**0.074**
#25	1	3. Short grass pasture	15.00	179.85	1,199.00	3.090	0.107
#25	**1**	**Time of Concentration:**					**0.107**
#27	1	5. Nearly bare and untilled, and alluvial valley fans	13.00	24.96	192.00	3.600	0.014
#27	**1**	**Time of Concentration:**					**0.014**
#27	2	3. Short grass pasture	8.00	154.39	1,930.00	2.260	0.237
#27	**2**	**Time of Concentration:**					**0.237**
#28	1	3. Short grass pasture	4.00	26.00	650.00	1.600	0.112
#28	**1**	**Time of Concentration:**					**0.112**
#28	2	3. Short grass pasture	8.00	25.43	318.00	2.260	0.039
#28	**2**	**Time of Concentration:**					**0.039**
#28	3	3. Short grass pasture	10.00	201.90	2,019.00	2.520	0.222
#28	**3**	**Time of Concentration:**					**0.222**
#28	4	3. Short grass pasture	22.00	74.14	337.00	3.750	0.024
#28	**4**	**Time of Concentration:**					**0.024**
#28	5	3. Short grass pasture	16.00	269.12	1,682.00	3.200	0.146
#28	**5**	**Time of Concentration:**					**0.146**
#28	6	3. Short grass pasture	20.00	24.60	123.00	3.570	0.009
#28	**6**	**Time of Concentration:**					**0.009**
#29	1	3. Short grass pasture	33.00	225.39	683.00	4.590	0.041
#29	**1**	**Time of Concentration:**					**0.041**
#30	1	3. Short grass pasture	18.00	197.46	1,097.00	3.390	0.089
#30	**1**	**Time of Concentration:**					**0.089**
#30	2	3. Short grass pasture	37.00	200.17	541.00	4.860	0.030
#30	**2**	**Time of Concentration:**					**0.030**
#30	3	3. Short grass pasture	2.50	3.55	142.00	1.260	0.031
#30	**3**	**Time of Concentration:**					**0.031**
#31	1	3. Short grass pasture	16.00	249.60	1,560.00	3.200	0.135
#31	**1**	**Time of Concentration:**					**0.135**
#32	1	3. Short grass pasture	22.00	253.22	1,151.00	3.750	0.085
#32	**1**	**Time of Concentration:**					**0.085**
#33	1	3. Short grass pasture	24.00	122.64	511.00	3.910	0.036
#33	**1**	**Time of Concentration:**					**0.036**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#34	1	5. Nearly bare and untilled, and alluvial valley fans	2.00	2.00	100.00	1.410	0.019
#34	**1**	**Time of Concentration:**					**0.019**

Appendix Exh. 7-14S15
Section 15 Pond

The location of the Section 15 Pond is presented on Map 12, and the design configuration of the pond is presented on Figure Exh. 7-15S-1. Figure Exh. 7-15S-2 provides the breakdown of drainage areas and hydrologic conditions for this sediment pond. The profile of the associated permanent channel associated with the Section 15 Pond (Section 15 Ditch) is presented on Map 33. This design information for the Section 15 Ditch is presented in this appendix.

Exhibit 7, Item 14 in Volume 2D describes the hydrologic methodology used in sediment pond and post mine channel assumptions. Runoff curve numbers assigned to the undisturbed and reclaimed lands in various stages of reclamation have been selected in accordance with Table 1 in the Introductory Text for Exhibit 7 in Volume 2D. For channels protected by a riprap liner, selection of minimum riprap size is done using the Simons/OSM method in SEDCAD^{TM}. For channels to be protected by a vegetative liner, the permissible velocities are also determined using SEDCAD^{TM} routines.

Section 15 Pond

The following pages present the results of the SEDCAD^{TM} models for the post mining condition. At this stage the oldest reclamation is on the eastern extent of the watershed, and the younger (topsoil and seeded) reclamation is the western portion of the Section 15 Pond watershed.

The SEDCAD^{TM} model herein provides the results of the 100-year, 24-hour design storm and demonstrates the Section 15 Pond will fully contain the modeled event.

The final post mining topographic surface and the final locations of the permanent drainage channels as presented on Map 12 were used to model the watershed for the post-mining condition.

In summary, for the post mining case, the 100-year, 24-hour storm produces 35.46 acre-feet of runoff, and the storm is contained below the emergency spillway elevation 7,567'.

Section 15 Post Mine Channel

The Section 15 Pond watershed includes one post-mining channel. The location of channel is presented on Map 12, Figure Exh. 7-15S-2, and the channel profile is presented on Map 33.

The Section 15 channel has been designed in accordance with Rule 4.05.4(2)(b) for the 100-year, 24-hour storm event even though the reporting watershed is less than one square mile.

A SEDCAD^{TM} model has been included which evaluates the peak flow and total runoff volume for the channel for the 100 year, 24-hour storm event. The channel configurations for the Section 15 Ditch is summarized below.