APPENDIX 11-II

HIGHWALL IMPOUNDMENT DESIGN AND AS-BUILT INFORMATION

MARCH 26, 1997

APPENDIX 11-II
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STANDARD DESIGN FOR HIGHWALL IMPOUNDMENTS

Objective

The objective is to develop a standard design that would allow the mine to construct highwall impoundments without site specific designs, using an approved standard design. The standard design would be incorporated into the mine's approved PAP. It would address only the impoundments with spillways and would comply with the applicable parts of CFR 30 Part 816.46.

The impoundments without a spillway or those relying on storage capacity to totally retain the runoff from the design storm event would not be included in the standard design. Site specific designs for these would be developed and submitted for approval prior to construction.

General Description

At Navajo Mine the mining pits are advancing in the upstream direction towards the east. The highwall impoundments are located upstream of the immediate mining area (IMA) on the highwall side of the pit. The primary function of these impoundments is to control or minimizes the inflow of the surface runoff into the IMA. The intent is to retain all or a portion of the smaller intensity but more frequently occurring precipitation events, thereby enhancing the safety of the work areas in the IMA (i.e., topsoil removal, truck/shovel, blasting, and mining operations).

These impoundments although not intended to protect the environment will retain some sediment. In the a event of a discharge, the water released along with any sediment generated will be retained in the pit downstream. The discharges from these impoundments have no chance of leaving the permit area. Discharge through the spillways would be very infrequent, since the annual rainfall for the area is 6 to 7 inches which generates infrequent surface runoff. The impoundment would be dry and empty a majority of the time.

The capacity of future highwall impoundments will be less than 10 acre-feet. The existing highwall impoundments are all less than 10 ac-ft, except for Sunflower #1 which has a capacity of 12.23 ac-ft. A watershed map and the stage storage tables for the existing impoundments are attached. These are small impoundments that will not constitute a hazard to the general public, mine employees, mine equipment and public transportation/utilities. The potential for loss of life and property damage is very low. They will all be classified as low hazard potential dams.

Design Approach and Application

The primary step in the design approach would be to establish a design criteria that would not be too overly conservative, yet simplify and reduce the number of analysis required. This was done by evaluating watersheds of existing impoundments and using the data to establish the design criteria. To demonstrate that the design criteria and assumptions made will give conservative results, the results of the hydrological analysis using actual conditions were compared to those using the established design criteria. The design criteria established for the standard design gave conservative results in almost all cases except for one. For more details on the comparison see discussion under Comparison of Actual vs Criteria for Standard Design.

Two drawings have been developed, one for the as-builts (Highwall Impoundments As-builts) and the other for the standard design (Highwall Impoundments Standard Design). The Highwall Impoundments As-builts drawing shows the as-built dimensions of all the existing highwall impoundments. This drawing will be updated as additional highwall impoundments are constructed. The updates will be submitted to OSM for review.

The Highwall Impoundments Standard Design drawing will be used to construct future highwall impoundments needed to meet operational needs. This exhibit was developed using the design criteria outlined below. The Highwall Impoundments Standard Design drawing shows a typical section for the spillway and embankment, and also a spillway schedule.
The spillway schedule shows the watershed sizes, the associated CN's, peak discharges and the required spillway size. After determining the watershed size and the CN the spillway schedule will be used to determine the spillway size required.

Design Criteria

The design criteria will address only impoundments with spillways. Site specific designs will be developed for impoundments without spillways and submitted to OSM for approval. To simplify and also narrow down the number of analysis required, conservative design parameters applicable to a range of conditions will be used. Listed below are the design criteria that would be used.

- The curve number (CN) will be selected based on the percentage of badlands (Ba) within the watershed. Refer to the discussion below on curve numbers. The criteria below will be used to select the curve number.

If Badlands ≥ 80%,	CN = 93
If Badlands ≥ 50% < 80%,	CN = 90
If badlands > 0% < 50%,	CN = 86
If Badlands = 0%,	CN = 83

- The criteria below will be used to determine the parameters needed to calculate the time of concentration (t_c). Refer to discussion below on the time of concentration.
  - ◊ The drainage length will be equal to 1.5 times the side distance of an equivalent square watershed area.
  - ◊ The slope of the drainage length will be equal to 4 percent.
  - ◊ The land use type/condition will be "nearly bare and untilled (overland flow) and alluvial valley fans".
- The spillway will safety pass the peak discharge from the 25 year - 6 hour precipitation event.
- The effect of routing the storm through the impoundment will not be considered for sizing the spillway (conservative).
- The spillway will have a one foot freeboard when flowing.
- The spillway will not have a protective lining for erosion. Refer to discussion below on spillway.
- Impoundment capacity will be less than 10 ac-ft.

Curve Number

The approach outlined below to arrive at a curve number for the undisturbed lands upstream of the IMA is only for the purpose of developing a standard design for highwall impoundments. The approach is based on the assumption that the soils upstream of the IMA have similar properties and distribution as the soils that would be salvaged for topdressing. The soils upstream of the IMA and within the permit area if deemed suitable will be salvaged for topdressing. The suitable topdressing material upstream of the highwall impoundments have not yet been removed, but have been analyzed and are included in the topsoil balance calculations. A weighted curve number will be calculated by using the percentage of Badlands making-up the watershed. The percent of the watershed that is other than Badlands will be assigned a curve number of 80 which is the curve number calculated for the reclaimed lands. The portion that is Badlands will be assigned a curve number of 93.

The curve number selected will be based on the percentage of badlands within the watershed. To simplify and yet be conservative the criteria below will be used for selecting the curve number.

If Badlands ≥ 80%, CN = 93
If Badlands ≥ 50% < 80%, CN = 90
If Badlands >0% < 50%, CN = 86
If Badlands = 0%, CN = 83

Time of Concentration

The time of concentration (t_c) is a function of the land use type/condition, the configuration of the watershed, and the slope and length of the drainage length. The discharge rate from a watershed is dependent on the magnitude of the t_c value, smaller values give higher discharge rates. Watersheds with short drainage lengths or steep slopes have smaller t_c values. A square watershed will have the shortest drainage length, however actual watershed configurations are more elongated. To establish a simplified but conservative method for calculating the t_c, the watersheds for the existing highwall impoundments were evaluated. The watershed map of the existing impoundments is attached. The configuration of the watersheds were compared to an equivalent square watershed. The side distance of an equivalent square area was determined for each watershed. Then a ratio between the drainage length and the side distance of the square was determined. The slopes of the drainage lengths were also determined. See TABLE A below for the values determined. The ratio of the drainage length to the side distance of an equivalent square area ranged from 1.2 to 3.8 with an average of 2.1. The slope of the drainage length ranged from 0.8 to 6.4 percent with an average of 3.3 percent. Using the data from TABLE A the criteria below was established to determine the parameters that will be used to calculate the t_c.

- The ratio of the drainage length to the side distance of an equivalent square area will be equal to 1.5 or the drainage length will be equal to 1.5 times the side distance of an equivalent square area. This ratio is less than the average value and is less than all values in the table except for one. It will in most cases give conservative t_c values.

- The slope of the drainage length will be equal to 4 percent. This slope is steeper than the average slope and is less than four of the slope values in the table. This coupled with a short or conservative drainage length, will in almost all cases give conservative t_c values.
- The land use type/condition will be "nearly bare and untilled (overland flow) and alluvial valley fans".

The procedure outlined above for determining the t_c is only for the purpose of developing a standard design for highwall impoundments.

TABLE A

Impoundment Id.	Watershed Area (acres)	Delta Elev. (ft)	Drainage Length (DL) (ft)	Side Dist. of Square (SS) (ft)	Ratio DL:SS	Slope of Drainage Length (%)
Yazzie Stockpond #1	125.5	210	5200	2338	2.2	4.0
Yazzie Stockpond #2	174.1	200	5652	2754	2.1	3.5
So. Hosteen Stockpond #1	80.1	155	3750	1868	2.0	4.1
So. Hosteen Stockpond #2	37.7	70	2250	1282	1.8	3.1
So. Hosteen Stockpond #3	157.3	249	4300	2618	1.6	5.8
Stub 16 Impoundment #2	20.2	103	2150	938	2.3	4.8
Stub 16 Impoundment #3	10.6	87	1350	680	2.0	6.4
Stub 18 Impoundment	103.4	135	3850	2122	1.8	3.5
Sunflower #1	24.6	17	1250	1035	1.2	1.4
Area 3 Temp. Div. Imp. #2	69.9	31	4100	1745	2.3	0.8
Area 3 Temp. Div. Imp. #3	20.8	35	1600	952	1.7	2.2
Area 3 Temp. Div. Imp. #5	11.6	46	2700	711	3.8	1.7
Area 3 Temp. Div. Imp. #7	55.5	59	3600	1555	2.3	1.6
				Average	2.1	3.3

Comparison of Actual vs Criteria for Standard Design

To demonstrate that the design criteria established for the highwall impoundments will give conservative results in almost all cases, the values for t_c , CN, and Q were determined for the actual conditions and compared to the values determined by applying the design criteria established. The watersheds for the existing highwall impoundments were used to make this demonstration. The Sedcad+ computer software was utilized to determine the values. The Sedcad+ computer runs for the hydrological analysis for both cases are attached . The CN derived by applying the design criteria established is in-line with the actual CN values. See TABLE C for derivation of the actual CN values. The t_c and Q values derived from the design criteria are in most cases conservative, except for South Hosteen Stockpond #3. See TABLE B for comparison of the derived values. The peak discharge (Q') for South Hosteen Stockpond #3 derived by applying the design criteria established is less than the actual discharge. The difference is 5.7 cfs or 4.0 percent of actual discharge. This difference is insignificant since other conservative assumptions are made for the design of the spillway. Spillway will be designed to pass the peak discharge with a one foot freeboard without considering the effect of routing through the impoundment. The peak stage in the impoundment will never rise above the one foot freeboard for the design storm event (25 year - 6 hour).

Spillway Design

The maximum discharge rate with one foot freeboard were determined for the standard spillway sizes shown on TABLE D. The Sedcad+ basin discharge utility was used to determined the maximum discharge rates. The Sedcad+ computer runs for the spillways are attached. TABLE D summarizes the maximum discharge rate for the standard spillway sizes. For watershed sizes ranging from 25 to 700 acres, TABLE D was used to select a spillway size that will pass the peak discharge from a 25 year - 6 hour storm event. Attached are the Sedcad+ computer runs or the hydrological analysis for determining the peak discharges for watershed sizes 25 to 700 acres. The design criteria established above was applied in the analysis. The Spillway Schedule on the Highwall Impoundments Standard Design drawing shows the spillway sizes that will pass the peak discharge (25 yr. - 6 hr) from selected watershed sizes ranging from 25 to 700 acres. The CN's associated with each watershed size are also shown. After determining the watershed size and the CN associated with the watershed, the Spillway Schedule on the Highwall Impoundments Standard Design drawing can be used the determine the spillway size required.

Discharge through the spillways are very infrequent since the annual rainfall for the area is only 6 to 7 inches. The existing spillways have no protective lining for erosion. Very minimal amount of erosion have occurred in the spillways during these overflows. The water discharged through the spillway and any sediment generated have been retained in the pits downstream. Adverse environmental impact to streamflow outside the permit area due to either discharge of pollutants or excessive sediment is not possible since the pit will intercept and retain the flow before it leaves the permit area. The spillways of the existing and future highwall impoundments will not be lined for erosion protection, since only minimal amount of erosion is anticipated and the potential of any water or sediment leaving the permit area is very unlikely. The spillway will be inspected, any damages identified will be repaired promptly.

The capacity of future highwall impoundments will be less than 10 ac-ft and classified as a low hazard potential dam. These impoundments are small, in the event of a failure they will not be an imminent danger to employees and equipment working in the pits. The potential for loss of life and property damage is very low.

As-builts

The dimensions of the existing highwall impoundments are shown on the Highwall Impoundments As-builts drawing. The spillways for the existing impoundments were checked to insure that they would pass the design storm event. The Sedcad+ computer runs are attached. The Highwall Impoundments As-builts drawing will be updated as additional impoundments are constructed. Updates will be submitted to OSM for review.

Inspection and Maintenance

The regular quarterly and annual inspections will be done for the highwall impoundments. Any maintenance items identified during these inspections will be corrected or repaired promptly.

TABLE B

HIGHWALL IMPOUNDMENTS
COMPARISON OF HYDROLOGICAL ANALYSIS
ACTUAL VS CRITERIA FOR STANDARD DESIGN

Impoundment Id:	Curve Number		Time of Concentration		Peak Discharge (25 yr - 6 hr)	
	CN (2)	CN' (1)	t_c	t_c' (1)	Q	Q' (1)
Yazzie Stockpond #1	93.0	93.0	0.718	0.487	92.8	118.1
Yazzie Stockpond #2	91.9	93.0	0.834	0.573	106.6	148.9
South Hosteen Stockpond #1	92.4	93.0	0.512	0.389	70.0	84.7
South Hosteen Stockpond #2	92.7	93.0	0.354	0.266	85.6	98.4
South Hosteen Stockpond #3	92.8	93.0	0.496	0.545	144.3	138.6
Stub 16 Impoundment #2	93.0	93.0	0.272	0.195	24.9	27.8
Stub 16 Impoundment #3	93.0	93.0	0.147	0.141	15.5	15.5
Stub 18 Impoundment	82.0	83.0	0.571	0.442	34.9	45.2
Sunflower #1	82.0	83.0	0.297	0.215	12.3	15.6
Area 3 Temp. Div. Imp. #2	81.6/89.0	83.0	1.251	0.363	15.6	34.3
Area 3 Temp. Div. Imp. #3	82.0/89.0	83.0	0.257	0.198	17.6	32.1
Area 3 Temp. Div. Imp. #5	89.0	90.0	0.556	0.133	18.9	29.6
Area 3 Temp. Div. Imp. #7	86.4/89.0	86.0	0.781	0.322	29.8	37.4

(1) CN', tc, and Q' were determined by applying the design criteria established for the standard design for highwall impoundment.

(2) Two curve numbers are indicated when a subwatershed having a different CN was routed via a channel.

TABLE C

CURVE NUMBERS
FOR WATERSHEDS OF EXISTING IMPOUNDMENTS

Impoundment Id	Watershed (ac)	Soil					Watershed CN
		Mapping Unit	Area (ac)	Hydrologic Group	CN	% of Watershed	
Yazzie Stockpond #1	125.5	Ba	125.5	D	93.0	100.0	93.0
Yazzie Stockpond #2	174.1	Ba	156.8	D	93.0	90.1	91.9
		Az	17.3	B	82.0	9.9	
South Hosteen Stockpond #1	80.1	Ba	75.2	D	93.0	93.8	92.4
		Fx	4.9	B	84.0	6.1	
South Hosteen Stockpond #2	37.7	Ba	36.7	D	93.0	97.3	92.7
		Az	1.0	B	82.0	2.7	
South Hosteen Stockpond #3	157.3	Ba	150.4	D	93.0	95.6	92.8
		Fx	3.5	B	84.0	2.2	
		Fa	3.4	D	93.0	2.2	
Stub 16 Impoundment #2	20.2	Ba	20.2	D	93.0	100.0	93.0
Stub 16 Impoundment #3	10.6	Ba	10.6	D	93.0	100.0	93.0
Stub 18 Impoundment	103.4	Da	103.4	B	82.0	100.0	82.0
Sunflower #1	24.6	Db	8.2	B	82.0	33.3	82.0
		Du	16.4	B	82.0	66.7	
Area 3 Temp. Div. Imp. #2	69.9	Db	14.4	B	82.0	20.5	81.6
		Du	36.2	B	82.0	51.8	
		Dw	12.4	B	80.0	17.7	
		Du	7.0	B (disturbed)	89.0	10.0	89.0
Area 3 Temp. Div. Imp. #3	20.8	Du	9.7	B	82.0	46.6	82.0
		Du	11.1	B (disturbed)	89.0	53.4	89.0
Area 3 Temp. Div. Imp. #5	11.6	Bb	6.0	D (disturbed)	89.0	51.7	89.0
		Du	5.6	B (disturbed)	89.0	48.3	
Area 3 Temp. Div. Imp. #7	55.5	Bb	20.8	D	93.0	37.5	86.4
		Du	31.5	B	82.0	56.8	
		Du	3.2	B (disturbed)	89.0	5.8	89.0

TABLE D

HIGHWALL IMPOUNDMENT
STANDARD SPILLWAY SIZES

Depth[1] (ft)	Width[2] (ft)	Discharge[3] (cfs)	Depth[1] (ft)	Width[2] (ft)	Discharge[3] (cfs)
2.00	10.0	25.5	3.25	10.0	119.0
	15.0	36.4		15.0	160.9
	20.0	47.3		20.0	202.9
	25.0	58.3		25.0	245.0
2.25	10.0	36.7		30.0	287.2
	15.0	51.9	3.50	10.0	153.3
	20.0	67.1		15.0	204.9
	25.0	82.3		20.0	256.8
2.50	10.0	56.9		25.0	308.7
	15.0	79.3		30.0	360.6
	20.0	101.8	3.75	10.0	179.3
	25.0	124.2		15.0	237.9
2.75	10.0	72.2		20.0	296.7
	15.0	99.7		25.0	355.7
	20.0	127.3		30.0	414.7
	25.0	154.9			
3.00	10.0	98.5			
	15.0	134.3			
	20.0	170.2			
	25.0	206.2			
	30.0	242.2			

(1) From top of embankment to bottom of spillway with 3:1 side slopes.
(2) With a crest length of 25 feet.
(3) Maximum discharge with a one foot freeboard.

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

EXISTING IMPOUNDMENTS
USING ACTUAL CONDITIONS

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

YAZZIE STOCKPOND #1

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\YSPD1

Date: 03-13-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD1 User: LR
Date: 03-13-1997 Time: 12:16:38
YAZZIE STOCKPOND #1
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	125.50	93	M	0.718	0.000	0.000	0.0	9.98	92.78
			Type: Null		Label: POND					
111	Structure	125.50							9.98	
111	Total IN/OUT	125.50							9.98	92.78

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD1 User: LR
Date: 03-13-1997 Time: 12:16:38
YAZZIE STOCKPOND #1
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	5200.00	4.04	2.01	0.72	0.718		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

YAZZIE STOCKPOND #2

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\YSPD2

Date: 03-13-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD2 User: LR
Date: 03-13-1997 Time: 12:22:14
YAZZIE STOCKPOND #2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	174.10	92	M	0.834	0.000	0.000	0.0	12.76	106.64
			Type: Null			Label: POND				
111	Structure	174.10							12.76	
111	Total IN/OUT	174.10							12.76	106.64

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD2 User: LR
Date: 03-13-1997 Time: 12:22:14
YAZZIE STOCKPOND #2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	5650.00	3.54	1.88	0.83	0.834		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SOUTH HOSTEEN STOCKPOND #1 AND 2

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SHSPD1

Date: 03-13-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD1 User: LR
Date: 03-13-1997 Time: 12:43:11
SOUTH HOSTEEN STOCKPOND #1 AND 2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	80.10	92	M	0.512	0.000	0.000	0.0	6.09	69.97
		Type: Null		Label: SO HOSTEEN STKPD #1						
111	Structure	80.10							6.09	
111	Total IN/OUT	80.10							6.09	69.97
112	1	37.70	93	M	0.354	0.000	0.000	0.0	2.93	40.75
		Type: Null		Label: SO HOSTEEN STKPD #2						
112	Structure	37.70							9.02	
112	Total IN/OUT	117.80							9.02	85.64
111 to 112	Routing					0.245	0.316			

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD1 User: LR
Date: 03-13-1997 Time: 12:43:11
SOUTH HOSTEEN STOCKPOND #1 AND 2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3750.00	4.13	2.03	0.51	0.512		
1	1	2	1	-a	5	2250.00	3.11	1.76	0.35	0.354		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SOUTH HOSTEEN STOCKPOND #3

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SHSPD3

Date: 03-13-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD3 User: LR
Date: 03-13-1997 Time: 12:16:45
SOUTH HOSTEEN STOCKPOND #3
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	157.30	93	M	0.496	0.000	0.000	0.0	12.32	144.33
			Type: Null			Label: POND				
111	Structure	157.30							12.32	
111	Total IN/OUT	157.30							12.32	144.33

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD3 User: LR
Date: 03-13-1997 Time: 12:16:45
SOUTH HOSTEEN STOCKPOND #3
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	4300.00	5.79	2.41	0.50	0.496		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 16 IMPOUNDMENT #2

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S16IMP2

Date: 03-13-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP2 User: LR
Date: 03-13-1997 Time: 12:31:58
STUB 16 IMPOUNDMENT #2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	20.20	93	M	0.272	0.000	0.000	0.0	1.61	24.85
			Type: Null			Label: POND				
111	Structure	20.20							1.61	
111	Total IN/OUT	20.20							1.61	24.85

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP2 User: LR
Date: 03-13-1997 Time: 12:31:58
STUB 16 IMPOUNDMENT #2
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2150.00	4.79	2.19	0.27	0.272		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 16 IMPOUNDMENT #3

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S16IMP3

Date: 03-13-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP3 User: LR
Date: 03-13-1997 Time: 13:11:43
STUB 16 IMPOUNDMENT #3
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	10.60	93	M	0.147	0.000	0.000	0.0	0.84	15.48
			Type: Null		Label: POND					
111	Structure	10.60							0.84	
111	Total IN/OUT	10.60							0.84	15.48

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP3 User: LR
Date: 03-13-1997 Time: 13:11:43
STUB 16 IMPOUNDMENT #3
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	1350.00	6.44	2.54	0.15	0.147		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 18 IMPOUNDMENT

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S18IMP

Date: 03-13-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S18IMP User: LR
Date: 03-13-1997 Time: 12:22:01
STUB 18 IMPOUNDMENT
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	103.40	82	M	0.571	0.000	0.000	0.0	3.46	34.87
		Type: Null			Label: POND					
111	Structure	103.40							3.46	
111	Total IN/OUT	103.40							3.46	34.87

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S18IMP User: LR
Date: 03-13-1997 Time: 12:22:01
STUB 18 IMPOUNDMENT
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3850.00	3.51	1.87	0.57	0.571		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SUNFLOWER #1

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SUNFL1

Date: 03-13-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SUNFL1 User: LR
Date: 03-13-1997 Time: 12:16:43
SUNFLOWER #1
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	24.60	82	M	0.297	0.000	0.000	0.0	0.82	12.29
			Type: Null			Label: POND				
111	Structure	24.60							0.82	
111	Total IN/OUT	24.60							0.82	12.29

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SUNFL1 User: LR
Date: 03-13-1997 Time: 12:16:43
SUNFLOWER #1
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	1250.00	1.36	1.17	0.30	0.297		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #2, 3, AND 5

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\A3TD235

Date: 03-13-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD235 User: LR
Date: 03-13-1997 Time: 12:16:32
AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #2, 3, AND 5
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	59.90	82	M	1.141	0.105	0.329	0.0	1.94	12.06
111	2	10.00	89	M	0.922	0.000	0.000	0.0	0.59	4.53
		Type: Null			Label: A3 TEMP DIV IMP 2					
111 Structure		69.90							2.53	
111 Total IN/OUT		69.90							2.53	15.61
112	1	10.00	82	M	0.187	0.070	0.359	0.0	0.33	6.18
112	2	10.80	89	M	0.453	0.000	0.000	0.0	0.64	7.72
		Type: Null			Label: A3 TEMP DIV IMP 3					
112 Structure		20.80							3.50	
112 Total IN/OUT		90.70							3.50	17.56
111 to 112 Routing						0.414	0.220			
113	1	11.60	89	M	0.556	0.000	0.000	0.0	0.68	7.35
		Type: Null			Label: A3 TEMP DIV IMP 5					
113 Structure		11.60							4.18	
113 Total IN/OUT		102.30							4.18	18.90
112 to 113 Routing						0.370	0.267			

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD235 User: LR
Date: 03-13-1997 Time: 12:16:32
AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #2, 3, AND 5
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3000.00	0.53	0.73	1.14	1.141		
1	1	1	1	-1	8	1250.09	1.20	3.29	0.11		0.105	0.32
1	1	1	2	-a	5	2850.00	0.74	0.86	0.92	0.922		
1	1	2	1	-a	5	900.00	1.78	1.33	0.19	0.187		
1	1	2	1	-1	8	1100.24	2.09	4.34	0.07		0.070	0.35
1	1	2	2	-a	5	2000.00	1.50	1.22	0.45	0.453		
1	3	1		-a	5	2700.00	1.81	1.35	0.56	0.556		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #7

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\A3TD7

Date: 03-13-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD7 User: LR
Date: 03-13-1997 Time: 12:21:50
AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #7
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	52.30	86	M	0.290	0.512	0.211	0.0	2.52	38.29
111	2	3.20	89	M	0.412	0.000	0.000	0.0	0.19	2.41
			Type: Null		Label: POND					
111	Structure	55.50							2.71	
111	Total IN/OUT	55.50							2.71	29.84

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD7 User: LR
Date: 03-13-1997 Time: 12:21:50
AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #7
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	1550.00	2.19	1.48	0.29	0.290		
1	1	1	1	-1	5	1650.10	1.09	1.04	0.44			
				-2	8	500.00	0.40	1.90	0.07		0.512	0.21
1	1	1	2	-a	5	1050.00	0.50	0.71	0.41	0.412		

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

EXISTING IMPOUNDMENTS
USING THE CRITERIA FOR STANDARD DESIGN

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

YAZZIE STOCKPOND #1 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\YSPD1A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD1A User: LR
Date: 03-13-1997 Time: 12:21:53
YAZZIE STOCKPOND #1 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	125.50	93	M	0.487	0.000	0.000	0.0	9.98	118.13
			Type: Null			Label: POND				
111	Structure	125.50							9.98	
111	Total IN/OUT	125.50							9.98	118.13

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD1A User: LR
Date: 03-13-1997 Time: 12:21:53
YAZZIE STOCKPOND #1 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3507.00	4.00	2.00	0.49	0.487		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

YAZZIE STOCKPOND #2 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\YSPD2A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD2A User: LR
Date: 03-13-1997 Time: 12:21:54
YAZZIE STOCKPOND #2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	174.10	93	M	0.573	0.000	0.000	0.0	13.84	148.87
			Type: Null		Label: POND					
111	Structure	174.10							13.84	
111	Total IN/OUT	174.10							13.84	148.87

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\YSPD2A User: LR
Date: 03-13-1997 Time: 12:21:54
YAZZIE STOCKPOND #2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	4130.00	4.00	2.00	0.57	0.573		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SOUTH HOSTEEN STOCKPOND #1 AND 2 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SHSPD1A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD1A User: LR
Date: 03-13-1997 Time: 12:21:56
SOUTH HOSTEEN STOCKPOND #1 AND 2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	80.10	93	M	0.389	0.000	0.000	0.0	6.37	84.66
		Type: Null		Label: SO HOSTEEN STKPD #1						
111	Structure	80.10							6.37	
111	Total IN/OUT	80.10							6.37	84.66
112	1	37.70	93	M	0.266	0.000	0.000	0.0	3.00	46.74
		Type: Null		Label: SO HOSTEEN STKPD #2						
112	Structure	37.70							9.37	
112	Total IN/OUT	117.80							9.37	98.37
111 to 112 Routing						0.245	0.316			

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD1A User: LR
Date: 03-13-1997 Time: 12:21:56
SOUTH HOSTEEN STOCKPOND #1 AND 2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2802.00	4.00	2.00	0.39	0.389		
1	1	2	1	-a	5	1922.00	4.00	2.00	0.27	0.266		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SOUTH HOSTEEN STOCKPOND #3 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SHSPD3A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD3A User: LR
Date: 03-13-1997 Time: 12:21:59
SOUTH HOSTEEN STOCKPOND #3 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	157.30	93	M	0.545	0.000	0.000	0.0	12.51	138.63
			Type: Null			Label: POND				
111	Structure	157.30							12.51	
111	Total IN/OUT	157.30							12.51	138.63

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SHSPD3A User: LR
Date: 03-13-1997 Time: 12:21:59
SOUTH HOSTEEN STOCKPOND #3 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3926.00	4.00	2.00	0.55	0.545		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 16 IMPOUNDMENT #2 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S16IMP2A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP2A User: LR
Date: 03-13-1997 Time: 12:22:03
STUB 16 IMPOUNDMENT #2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	20.20	93	M	0.195	0.000	0.000	0.0	1.61	27.75
			Type: Null			Label: POND				
111	Structure	20.20							1.61	
111	Total IN/OUT	20.20							1.61	27.75

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP2A User: LR
Date: 03-13-1997 Time: 12:22:03
STUB 16 IMPOUNDMENT #2 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	1407.00	4.00	2.00	0.20	0.195		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 16 IMPOUNDMENT #3 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S16IMP3A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP3A User: LR
Date: 03-13-1997 Time: 12:22:04
STUB 16 IMPOUNDMENT #3 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	10.60	93	M	0.141	0.000	0.000	0.0	0.84	15.48
			Type: Null			Label: POND				
111	Structure	10.60							0.84	
111	Total IN/OUT	10.60							0.84	15.48

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S16IMP3A User: LR
Date: 03-13-1997 Time: 12:22:04
STUB 16 IMPOUNDMENT #3 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	1019.00	4.00	2.00	0.14	0.141		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

STUB 18 IMPOUNDMENT - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\S18IMPA

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S18IMPA User: LR
Date: 03-13-1997 Time: 12:22:12
STUB 18 IMPOUNDMENT - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	103.40	83	M	0.442	0.000	0.000	0.0	3.77	45.24
			Type: Null			Label: POND				
111	Structure	103.40							3.77	
111	Total IN/OUT	103.40							3.77	45.24

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\S18IMPA User: LR
Date: 03-13-1997 Time: 12:22:12
STUB 18 IMPOUNDMENT - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3183.00	4.00	2.00	0.44	0.442		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

SUNFLOWER #1 - USING CRITERIA FOR STANDARD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\SUNFL1A

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SUNFL1A User: LR
Date: 03-13-1997 Time: 12:22:11
SUNFLOWER #1 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	24.60	83	M	0.215	0.000	0.000	0.0	0.90	15.62
			Type: Null		Label: POND					
111	Structure	24.60							0.90	
111	Total IN/OUT	24.60							0.90	15.62

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\SUNFL1A User: LR
Date: 03-13-1997 Time: 12:22:11
SUNFLOWER #1 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	1553.00	4.00	2.00	0.22	0.215		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

AREA 3 TEMP DIVERSION IMP #2, 3, AND 5 - USING CRITERIA FOR STD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\A3TD235A

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD345A User: LR
Date: 03-13-1997 Time: 12:22:06
AREA 3 TEMP DIVERSION IMP #2, 3, AND 5 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	69.90	83	M	0.363	0.000	0.000	0.0	2.55	34.34
111	2	0.00	0	M	0.000	0.000	0.000	0.0	0.00	0.00
		Type: Null			Label: A3 TEMP DIV IMP 2					
111 Structure		69.90							2.55	
111 Total IN/OUT		69.90							2.55	34.34
112	1	20.80	83	M	0.198	0.000	0.000	0.0	0.76	13.66
112	2	0.00	0	M	0.000	0.000	0.000	0.0	0.00	0.00
		Type: Null			Label: A3 TEMP DIV IMP 3					
112 Structure		20.80							3.31	
112 Total IN/OUT		90.70							3.31	32.08
111 to 112 Routing						0.414	0.220			
113	1	11.60	83	M	0.148	0.000	0.000	0.0	0.42	8.20
		Type: Null			Label: A3 TEMP DIV IMP 5					
113 Structure		11.60							3.73	
113 Total IN/OUT		102.30							3.73	29.61
112 to 113 Routing						0.370	0.267			

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD345A User: LR
Date: 03-13-1997 Time: 12:22:06
AREA 3 TEMP DIVERSION IMP #2, 3, AND 5 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2617.00	4.00	2.00	0.36	0.363		
1	1	1	2	-a	5	2850.00	0.74	0.86	0.92	0.000		
1	1	2	1	-a	5	1428.00	4.00	2.00	0.20	0.198		
1	1	2	2	-a	5	2000.00	1.50	1.22	0.45	0.000		
1	1	3	1	-a	5	1066.00	4.00	2.00	0.15	0.148		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

AREA 3 TEMP DIVERSION IMPOUNDMENT #7 - USING CRITERIA FOR STD DESIGN

by

Name: LR

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\A3TD7A

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD7A User: LR
Date: 03-13-1997 Time: 12:21:49
AREA 3 TEMP DIVERSION IMPOUNDMENT #7 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	55.50	86	M	0.323	0.000	0.000	0.0	2.59	37.38
111	2	0.00	0	M	0.000	0.000	0.000	0.0	0.00	0.00
			Type: Null		Label: POND					
111	Structure	55.50							2.59	
111	Total IN/OUT	55.50							2.59	37.38

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\A3TD7A User: LR
Date: 03-13-1997 Time: 12:21:49
AREA 3 TEMP DIVERSION IMPOUNDMENT #7 - CRITERIA FOR STANDARD DESIGN
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2332.00	4.00	2.00	0.32	0.323		
1	1	1	2	-a	5	1050.00	0.50	0.71	0.41	0.000		

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

EXISTING SPILLWAYS

SEDCAD+ BASIN DISCHARGE UTILITY

YAZZIE STOCKPOND #1 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.50
Crest Length	20.000 feet
Z:1 (Left)	1.50:1
Z:1 (Right)	3.00:1
Bottom Width	8.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.50	0.0	0.0
106.00	6.7	6.7
106.10	8.1	8.1
106.20	10.5	10.5
106.30	13.8	13.8
106.40	17.2	17.2
106.50	21.2	21.2
107.00	45.8	45.8

Existing spillway will not pass the peak discharge from the 25 yr - 6 hr storm event.

SEDCAD+ BASIN DISCHARGE UTILITY

YAZZIE STOCKPOND #2 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.30
Crest Length	23.000 feet
Z:1 (Left)	2.00:1
Z:1 (Right)	1.50:1
Bottom Width	12.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.30	0.0	0.0
105.50	4.2	4.2
106.00	14.7	14.7
106.10	19.1	19.1
106.20	23.6	23.6
106.30	28.9	28.9
106.50	40.7	40.7
106.80	61.3	61.3
107.00	77.0	77.0

Existing spillway will not pass the peak discharge from the 25 yr - 6 hr storm event.

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #1 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.90
Crest Length	27.000 feet
Z:1 (Left)	4.00:1
Z:1 (Right)	5.00:1
Bottom Width	5.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.90	0.0	0.0
104.00	0.1	0.1
104.50	0.8	0.8
104.60	7.4	7.4
104.70	9.9	9.9
104.80	12.7	12.7
104.90	16.0	16.0
105.00	20.0	20.0
105.40	40.6	40.6
105.50	46.6	46.6
105.90	75.5	75.5
106.00	84.3	84.3
106.40	125.6	125.6
106.50	137.8	137.8
106.90	193.2	193.2
107.00	208.7	208.7

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #2 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	30.000 feet
Z:1 (Left)	1.50:1
Z:1 (Right)	1.50:1
Bottom Width	13.700 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.20	0.0	0.0
103.30	0.0	0.0
103.40	0.0	0.0
103.50	0.0	0.0
104.00	11.1	11.1
104.20	15.5	15.5
104.30	20.0	20.0
104.40	24.9	24.9
104.50	30.2	30.2
105.00	66.3	66.3
105.50	107.7	107.7
106.00	160.7	160.7
106.50	225.7	225.7
107.00	300.5	300.5

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #3 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	30.000 feet
Z:1 (Left)	1.50:1
Z:1 (Right)	1.50:1
Bottom Width	13.700 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	11.1	11.1
104.20	15.5	15.5
104.30	20.0	20.0
104.40	24.9	24.9
104.50	30.2	30.2
105.00	66.3	66.3
105.50	107.7	107.7
106.00	160.7	160.7
106.50	225.7	225.7
107.00	300.5	300.5

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 16 IMPOUNDMENT #2 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.70
Crest Length	48.000 feet
Z:1 (Left)	1.90:1
Z:1 (Right)	1.80:1
Bottom Width	12.800 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.70	0.0	0.0
104.00	5.4	5.4
104.40	12.6	12.6
104.50	16.7	16.7
104.60	20.8	20.8
104.70	25.2	25.2
105.00	44.2	44.2
105.20	59.2	59.2
105.50	81.7	81.7
105.70	98.4	98.4
106.00	127.3	127.3
106.20	148.3	148.3
106.50	184.1	184.1
106.70	209.9	209.9
107.00	253.2	253.2

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 16 IMPOUNDMENT #3 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.50
Crest Length	36.000 feet
Z:1 (Left)	1.90:1
Z:1 (Right)	2.20:1
Bottom Width	11.500 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	9.0	9.0
105.20	12.6	12.6
105.30	16.4	16.4
105.40	20.7	20.7
105.50	25.3	25.3
106.00	56.9	56.9
106.50	95.8	95.8
107.00	143.8	143.8

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 18 IMPOUNDMENT - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	102.60
Crest Length	45.000 feet
Z:1 (Left)	2.30:1
Z:1 (Right)	2.50:1
Bottom Width	17.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
102.60	0.0	0.0
103.00	9.8	9.8
103.30	17.1	17.1
103.40	22.5	22.5
103.50	28.2	28.2
103.60	34.3	34.3
104.00	68.9	68.9
104.10	79.0	79.0
104.50	120.6	120.6
104.60	132.2	132.2
105.00	183.6	183.6
105.10	197.6	197.6
105.50	262.6	262.6
105.60	280.2	280.2
106.00	357.6	357.6
106.10	378.4	378.4
106.50	470.0	470.0
106.60	494.4	494.4
107.00	592.1	592.1

SEDCAD+ BASIN DISCHARGE UTILITY

SUNFLOWER #1 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.90
Crest Length	38.000 feet
Z:1 (Left)	4.30:1
Z:1 (Right)	5.20:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.90	0.0	0.0
104.00	2.4	2.4
104.50	14.4	14.4
104.60	16.8	16.8
104.70	22.1	22.1
104.80	28.1	28.1
104.90	34.7	34.7
105.00	42.5	42.5
105.40	81.0	81.0
105.50	91.8	91.8
105.90	141.6	141.6
106.00	155.4	155.4
106.40	217.3	217.3
106.50	236.1	236.1
106.90	319.8	319.8
107.00	342.9	342.9

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMP. #2 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.30
Crest Length	35.000 feet
Z:1 (Left)	1.50:1
Z:1 (Right)	1.50:1
Bottom Width	9.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.30	0.0	0.0
104.50	2.8	2.8
105.00	9.9	9.9
105.10	12.9	12.9
105.20	16.2	16.2
105.30	19.8	19.8
105.50	28.6	28.6
105.80	44.4	44.4
106.00	55.5	55.5
106.30	74.3	74.3
106.50	88.3	88.3
106.80	111.4	111.4
107.00	129.5	129.5

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMP. #3 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	102.00	
Crest Length	18.000	feet
Z:1 (Left)	2.00:1	
Z:1 (Right)	2.00:1	
Bottom Width	40.000	feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	32.4	32.4
102.60	38.9	38.9
102.70	50.2	50.2
102.80	64.9	64.9
102.90	79.6	79.6
103.00	96.4	96.4
103.50	195.7	195.7
104.00	321.9	321.9
104.50	470.8	470.8
105.00	640.9	640.9
105.50	831.5	831.5
106.00	1042.0	1042.0
106.50	1272.3	1272.3
107.00	1522.1	1522.1

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMP. #7 - EXISTING SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.90
Crest Length	50.000 feet
Z:1 (Left)	2.00:1
Z:1 (Right)	4.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.90	0.0	0.0
105.00	1.5	1.5
105.50	8.7	8.7
105.60	10.2	10.2
105.70	13.6	13.6
105.80	17.0	17.0
105.90	20.7	20.7
106.00	25.8	25.8
106.40	51.4	51.4
106.50	57.9	57.9
106.90	87.9	87.9
107.00	96.9	96.9

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

WATERSHED SIZES 25 TO 700 ACRES
USING THE CRITERIA FOR STANDARD DESIGN

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW25CN93

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN93 User: lr
Date: 03-14-1997 Time: 11:42:05
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	25.00	93	M	0.217	0.000	0.000	0.0	1.99	33.27
			Type: Null		Label: POND					
111	Structure	25.00							1.99	
111	Total IN/OUT	25.00							1.99	33.27

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN93 User: lr
Date: 03-14-1997 Time: 11:42:05
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	1565.00	4.00	2.00	0.22	0.217		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW25CN90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN90 User: lr
Date: 03-14-1997 Time: 11:01:09
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	25.00	90	M	0.217	0.000	0.000	0.0	1.59	27.04
			Type: Null			Label: POND				
111	Structure	25.00							1.59	
111	Total IN/OUT	25.00							1.59	27.04

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN90 User: lr
Date: 03-14-1997 Time: 11:01:09
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	1565.00	4.00	2.00	0.22	0.217		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW25CN86

Date: 03-14-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN86 User: lr
Date: 03-14-1997 Time: 11:01:13
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	25.00	86	M	0.217	0.000	0.000	0.0	1.17	20.17
			Type: Null		Label: POND					
111	Structure	25.00							1.17	
111	Total IN/OUT	25.00							1.17	20.17

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN86 User: lr
Date: 03-14-1997 Time: 11:01:13
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	1565.00	4.00	2.00	0.22	0.217		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW25CN83

Date: 03-14-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN83 User: lr
Date: 03-14-1997 Time: 11:01:11
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	25.00	83	M	0.217	0.000	0.000	0.0	0.91	15.81
			Type: Null		Label: POND					
111	Structure	25.00							0.91	
111	Total IN/OUT	25.00							0.91	15.81

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW25CN83 User: lr
Date: 03-14-1997 Time: 11:01:11
HIGHWALL IMPOUNDMENT - 25 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	1565.00	4.00	2.00	0.22	0.217		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW50CN93

Date: 03-14-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN93 User: lr
Date: 03-14-1997 Time: 11:01:16
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	50.00	93	M	0.307	0.000	0.000	0.0	3.98	58.67
			Type: Null			Label: POND				
111	Structure	50.00							3.98	
111	Total IN/OUT	50.00							3.98	58.67

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN93 User: lr
Date: 03-14-1997 Time: 11:01:16
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	2214.00	4.00	2.00	0.31	0.307		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW50CN90

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN90 User: lr
Date: 03-14-1997 Time: 11:01:14
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharg (cfs)
111	1	50.00	90	M	0.307	0.000	0.000	0.0	3.18	47.06
			Type: Null		Label: POND					
111	Structure	50.00							3.18	
111	Total IN/OUT	50.00							3.18	47.06

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN90 User: lr
Date: 03-14-1997 Time: 11:01:14
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2214.00	4.00	2.00	0.31	0.307		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW50CN86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN86 User: lr
Date: 03-14-1997 Time: 11:01:18
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	50.00	86	M	0.307	0.000	0.000	0.0	2.33	34.53
			Type: Null		Label: POND					
111	Structure	50.00							2.33	
111	Total IN/OUT	50.00							2.33	34.53

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN86 User: lr
Date: 03-14-1997 Time: 11:01:18
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2214.00	4.00	2.00	0.31	0.307		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW50CN83

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN83 User: lr
Date: 03-14-1997 Time: 11:01:20
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	50.00	83	M	0.307	0.000	0.000	0.0	1.82	26.87
			Type: Null		Label: POND					
111	Structure	50.00							1.82	
111	Total IN/OUT	50.00							1.82	26.87

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW50CN83 User: lr
Date: 03-14-1997 Time: 11:01:20
HIGHWALL IMPOUNDMENT - 50 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	2214.00	4.00	2.00	0.31	0.307		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW75CN93

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN93 User: lr
Date: 03-14-1997 Time: 11:01:21
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	75.00	93	M	0.376	0.000	0.000	0.0	5.96	80.52
			Type: Null		Label: POND					
111	Structure	75.00							5.96	
111	Total IN/OUT	75.00							5.96	80.52

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN93 User: lr
Date: 03-14-1997 Time: 11:01:21
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	2711.00	4.00	2.00	0.38	0.376		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW75CN90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN90 User: lr
Date: 03-14-1997 Time: 11:01:23
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	75.00	90	M	0.376	0.000	0.000	0.0	4.77	64.24
			Type: Null			Label: POND				
111	Structure	75.00							4.77	
111	Total IN/OUT	75.00							4.77	64.24

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN90 User: lr
Date: 03-14-1997 Time: 11:01:23
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	2711.00	4.00	2.00	0.38	0.376		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW75CN86

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN86 User: lr
Date: 03-14-1997 Time: 11:01:25
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	75.00	86	M	0.376	0.000	0.000	0.0	3.50	46.73
			Type: Null		Label: POND					
111	Structure	75.00							3.50	
111	Total IN/OUT	75.00							3.50	46.73

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN86 User: lr
Date: 03-14-1997 Time: 11:01:25
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	2711.00	4.00	2.00	0.38	0.376		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW75CN83

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN83 User: lr
Date: 03-14-1997 Time: 11:01:27
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	75.00	83	M	0.376	0.000	0.000	0.0	2.73	36.11
			Type: Null		Label: POND					
111	Structure	75.00							2.73	
111	Total IN/OUT	75.00							2.73	36.11

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW75CN83 User: lr
Date: 03-14-1997 Time: 11:01:27
HIGHWALL IMPOUNDMENT - 75 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	2711.00	4.00	2.00	0.38	0.376		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW100C93

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C93 User: lr
Date: 03-14-1997 Time: 11:01:28
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	100.00	93	M	0.434	0.000	0.000	0.0	7.95	100.17
			Type: Null		Label: POND					
111	Structure	100.00							7.95	
111	Total IN/OUT	100.00							7.95	100.17

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C93 User: lr
Date: 03-14-1997 Time: 11:01:28
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3131.00	4.00	2.00	0.43	0.434		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW100C90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C90 User: lr
Date: 03-14-1997 Time: 11:01:30
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	100.00	90	M	0.434	0.000	0.000	0.0	6.36	79.46
			Type: Null		Label: POND					
111	Structure	100.00							6.36	
111	Total IN/OUT	100.00							6.36	79.46

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C90 User: lr
Date: 03-14-1997 Time: 11:01:30
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3131.00	4.00	2.00	0.43	0.434		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW100C86

Date: 03-14-1997

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

Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C86 User: lr
Date: 03-14-1997 Time: 11:01:32
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	100.00	86	M	0.434	0.000	0.000	0.0	4.66	57.58
			Type: Null			Label: POND				
111	Structure	100.00							4.66	
111	Total IN/OUT	100.00							4.66	57.58

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C86 User: lr
Date: 03-14-1997 Time: 11:01:32
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3131.00	4.00	2.00	0.43	0.434		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW100C83

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C83 User: lr
Date: 03-14-1997 Time: 11:01:34
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	100.00	83	M	0.434	0.000	0.000	0.0	3.65	44.25
			Type: Null			Label: POND				
111	Structure	100.00							3.65	
111	Total IN/OUT	100.00							3.65	44.25

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW100C83 User: lr
Date: 03-14-1997 Time: 11:01:34
HIGHWALL IMPOUNDMENT - 100 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	3131.00	4.00	2.00	0.43	0.434		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW150C93

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C93 User: lr
Date: 03-14-1997 Time: 11:01:35
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	150.00	93	M	0.532	0.000	0.000	0.0	11.93	134.13
			Type: Null		Label: POND					
111	Structure	150.00							11.93	
111	Total IN/OUT	150.00							11.93	134.13

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C93 User: lr
Date: 03-14-1997 Time: 11:01:35
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3834.00	4.00	2.00	0.53	0.532		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW150C90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C90 User: lr
Date: 03-14-1997 Time: 11:01:37
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	150.00	90	M	0.532	0.000	0.000	0.0	9.53	105.70
			Type: Null		Label: POND					
111	Structure	150.00							9.53	
111	Total IN/OUT	150.00							9.53	105.70

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C90 User: lr
Date: 03-14-1997 Time: 11:01:37
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3834.00	4.00	2.00	0.53	0.532		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW150C86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C86 User: lr
Date: 03-14-1997 Time: 11:01:39
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	150.00	86	M	0.532	0.000	0.000	0.0	7.00	76.31
			Type: Null			Label: POND				
111	Structure	150.00							7.00	
111	Total IN/OUT	150.00							7.00	76.31

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C86 User: lr
Date: 03-14-1997 Time: 11:01:39
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3834.00	4.00	2.00	0.53	0.532		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW150C83

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C83 User: lr
Date: 03-14-1997 Time: 11:01:41
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	150.00	83	M	0.532	0.000	0.000	0.0	5.47	58.33
			Type: Null		Label: POND					
111	Structure	150.00							5.47	
111	Total IN/OUT	150.00							5.47	58.33

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW150C83 User: lr
Date: 03-14-1997 Time: 11:01:41
HIGHWALL IMPOUNDMENT - 150 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	3834.00	4.00	2.00	0.53	0.532		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW200C93

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C93 User: lr
Date: 03-14-1997 Time: 11:01:42
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	200.00	93	M	0.614	0.000	0.000	0.0	15.90	163.75
			Type: Null			Label: POND				
111	Structure	200.00							15.90	
111	Total IN/OUT	200.00							15.90	163.75

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C93 User: lr
Date: 03-14-1997 Time: 11:01:42
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	4427.00	4.00	2.00	0.61	0.614		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW200C90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C90 User: lr
Date: 03-14-1997 Time: 11:01:48
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	200.00	90	M	0.614	0.000	0.000	0.0	12.71	129.02
			Type: Null		Label: POND					
111	Structure	200.00							12.71	
111	Total IN/OUT	200.00							12.71	129.02

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C90 User: lr
Date: 03-14-1997 Time: 11:01:48
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	4427.00	4.00	2.00	0.61	0.614		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW200C86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C86 User: lr
Date: 03-14-1997 Time: 11:01:44
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	200.00	86	M	0.614	0.000	0.000	0.0	9.33	92.72
			Type: Null		Label: POND					
111	Structure	200.00							9.33	
111	Total IN/OUT	200.00							9.33	92.72

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C86 User: lr
Date: 03-14-1997 Time: 11:01:44
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	4427.00	4.00	2.00	0.61	0.614		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW200C83

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C83 User: lr
Date: 03-14-1997 Time: 11:01:46
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	200.00	83	M	0.614	0.000	0.000	0.0	7.29	70.70
			Type: Null		Label: POND					
111	Structure	200.00							7.29	
111	Total IN/OUT	200.00							7.29	70.70

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW200C83 User: lr
Date: 03-14-1997 Time: 11:01:46
HIGHWALL IMPOUNDMENT - 200 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Condition	Flow Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	4427.00	4.00	2.00	0.61	0.614		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW300C93

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C93 User: lr
Date: 03-14-1997 Time: 11:27:37
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	300.00	93	M	0.753	0.000	0.000	0.0	23.85	214.81
			Type: Null		Label: POND					
111	Structure	300.00							23.85	
111	Total IN/OUT	300.00							23.85	214.81

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C93 User: lr
Date: 03-14-1997 Time: 11:27:37
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	5422.00	4.00	2.00	0.75	0.753		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW300C90

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C90 User: lr
Date: 03-14-1997 Time: 11:27:38
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	300.00	90	M	0.753	0.000	0.000	0.0	19.07	169.35
			Type: Null		Label: POND					
111	Structure	300.00							19.07	
111	Total IN/OUT	300.00							19.07	169.35

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C90 User: lr
Date: 03-14-1997 Time: 11:27:38
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
DETAILED SUBWATERSHED INPUT/OUTPUT TABLE
==========

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	5422.00	4.00	2.00	0.75	0.753		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW300C86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C86 User: lr
Date: 03-14-1997 Time: 11:27:40
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	300.00	86	M	0.753	0.000	0.000	0.0	13.99	121.18
			Type: Null		Label: POND					
111	Structure	300.00							13.99	
111	Total IN/OUT	300.00							13.99	121.18

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C86 User: lr
Date: 03-14-1997 Time: 11:27:40
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	5422.00	4.00	2.00	0.75	0.753		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW300C83

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C83 User: lr
Date: 03-14-1997 Time: 11:27:42
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	300.00	83	M	0.753	0.000	0.000	0.0	10.94	92.22
			Type: Null		Label: POND					
111	Structure	300.00							10.94	
111	Total IN/OUT	300.00							10.94	92.22

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW300C83 User: lr
Date: 03-14-1997 Time: 11:27:42
HIGHWALL IMPOUNDMENT - 300 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	5422.00	4.00	2.00	0.75	0.753		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW400C93

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C93 User: lr
Date: 03-14-1997 Time: 11:27:44
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	400.00	93	M	0.869	0.000	0.000	0.0	31.80	259.47
			Type: Null		Label: POND					
111	Structure	400.00							31.80	
111	Total IN/OUT	400.00							31.80	259.47

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C93 User: lr
Date: 03-14-1997 Time: 11:27:44
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	6261.00	4.00	2.00	0.87	0.869		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW400C90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C90 User: lr
Date: 03-14-1997 Time: 11:27:46
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	400.00	90	M	0.869	0.000	0.000	0.0	25.42	204.67
			Type: Null		Label: POND					
111	Structure	400.00							25.42	
111	Total IN/OUT	400.00							25.42	204.67

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C90 User: lr
Date: 03-14-1997 Time: 11:27:46
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	6261.00	4.00	2.00	0.87	0.869		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW400C86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C86 User: lr
Date: 03-14-1997 Time: 11:27:47
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	400.00	86	M	0.869	0.000	0.000	0.0	18.65	146.21
			Type: Null		Label: POND					
111	Structure	400.00							18.65	
111	Total IN/OUT	400.00							18.65	146.21

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C86 User: lr
Date: 03-14-1997 Time: 11:27:47
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	6261.00	4.00	2.00	0.87	0.869		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW400C83

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C83 User: lr
Date: 03-14-1997 Time: 11:27:49
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharg (cfs)
111	1	400.00	83	M	0.869	0.000	0.000	0.0	14.58	111.64
			Type: Null			Label: POND				
111	Structure	400.00							14.58	
111	Total IN/OUT	400.00							14.58	111.64

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW400C83 User: lr
Date: 03-14-1997 Time: 11:27:49
HIGHWALL IMPOUNDMENT - 400 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	6261.00	4.00	2.00	0.87	0.869		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW500C93

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C93 User: lr
Date: 03-14-1997 Time: 11:27:51
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	500.00	93	M	0.972	0.000	0.000	0.0	39.75	300.19
			Type: Null			Label: POND				
111	Structure	500.00							39.75	
111	Total IN/OUT	500.00							39.75	300.19

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C93 User: lr
Date: 03-14-1997 Time: 11:27:51
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	7000.00	4.00	2.00	0.97	0.972		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW500C90

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C90 User: lr
Date: 03-14-1997 Time: 11:27:53
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	500.00	90	M	0.972	0.000	0.000	0.0	31.78	236.53
			Type: Null			Label: POND				
111	Structure	500.00							31.78	
111	Total IN/OUT	500.00							31.78	236.53

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C90 User: lr
Date: 03-14-1997 Time: 11:27:53
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	7000.00	4.00	2.00	0.97	0.972		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW500C86

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C86 User: lr
Date: 03-14-1997 Time: 11:27:55
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

==========
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
==========

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	500.00	86	M	0.972	0.000	0.000	0.0	23.32	**168.87**
			Type: Null		Label: POND					
111	Structure	500.00							23.32	
111	Total IN/OUT	500.00							23.32	**168.87**

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C86 User: lr
Date: 03-14-1997 Time: 11:27:55
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	7000.00	4.00	2.00	0.97	0.972		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW500C83

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C83 User: lr
Date: 03-14-1997 Time: 11:27:58
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	500.00	83	M	0.972	0.000	0.000	0.0	18.23	129.07
			Type: Null			Label: POND				
111	Structure	500.00							18.23	
111	Total IN/OUT	500.00							18.23	129.07

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW500C83 User: lr
Date: 03-14-1997 Time: 11:27:58
HIGHWALL IMPOUNDMENT - 500 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Condition	Flow Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	7000.00	4.00	2.00	0.97	0.972		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW600C93

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C93 User: lr
Date: 03-14-1997 Time: 11:27:56
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	600.00	93	M	1.065	0.000	0.000	0.0	47.70	337.42
			Type: Null		Label: POND					
111	Structure	600.00							47.70	
111	Total IN/OUT	600.00							47.70	337.42

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C93 User: lr
Date: 03-14-1997 Time: 11:27:56
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	7668.00	4.00	2.00	1.07	1.065		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW600C90

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C90 User: lr
Date: 03-14-1997 Time: 11:28:00
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	600.00	90	M	1.065	0.000	0.000	0.0	38.13	265.69
			Type: Null		Label: POND					
111	Structure	600.00							38.13	
111	Total IN/OUT	600.00							38.13	265.69

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C90 User: lr
Date: 03-14-1997 Time: 11:28:00
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	7668.00	4.00	2.00	1.07	1.065		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW600C86

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C86 User: lr
Date: 03-14-1997 Time: 11:28:02
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	600.00	86	M	1.065	0.000	0.000	0.0	27.98	189.64
			Type: Null		Label: POND					
111	Structure	600.00							27.98	
111	Total IN/OUT	600.00							27.98	189.64

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C86 User: lr
Date: 03-14-1997 Time: 11:28:02
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	7668.00	4.00	2.00	1.07	1.065		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW600C83

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C83 User: lr
Date: 03-14-1997 Time: 11:28:04
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	600.00	83	M	1.065	0.000	0.000	0.0	21.88	145.05
			Type: Null			Label: POND				
111	Structure	600.00							21.88	
111	Total IN/OUT	600.00							21.88	145.05

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW600C83 User: lr
Date: 03-14-1997 Time: 11:28:04
HIGHWALL IMPOUNDMENT - 600 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	7668.00	4.00	2.00	1.07	1.065		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 93

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW700C93

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C93 User: lr
Date: 03-14-1997 Time: 11:28:05
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	700.00	93	M	1.150	0.000	0.000	0.0	55.65	372.07
			Type: Null		Label: POND					
111	Structure	700.00							55.65	
111	Total IN/OUT	700.00							55.65	372.07

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C93 User: lr
Date: 03-14-1997 Time: 11:28:05
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 93
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	8283.00	4.00	2.00	1.15	1.150		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 90

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW700C90

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C90 User: lr
Date: 03-14-1997 Time: 11:28:07
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	700.00	90	M	1.150	0.000	0.000	0.0	44.49	292.85
		Type: Null			Label: POND				
111 Structure	700.00							44.49	
111 Total IN/OUT	700.00							44.49	292.85

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C90 User: lr
Date: 03-14-1997 Time: 11:28:07
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 90
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	X
1	1	1	1	-a	5	8283.00	4.00	2.00	1.15	1.150		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 86

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW700C86

Date: 03-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C86 User: lr
Date: 03-14-1997 Time: 11:28:13
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	700.00	86	M	1.150	0.000	0.000	0.0	32.64	209.05
			Type: Null		Label: POND					
111	Structure	700.00							32.64	
111	Total IN/OUT	700.00							32.64	209.05

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C86 User: lr
Date: 03-14-1997 Time: 11:28:13
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 86
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	8283.00	4.00	2.00	1.15	1.150		

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 83

by

Name: lr

Company Name: BHP MINERALS
File Name: C:\LR\HW_IMP\HYD\HW700C83

Date: 03-14-1997

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C83 User: lr
Date: 03-14-1997 Time: 11:28:11
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	700.00	83	M	1.150	0.000	0.000	0.0	25.52	159.97
			Type: Null			Label: POND				
111	Structure	700.00							25.52	
111	Total IN/OUT	700.00							25.52	159.97

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Company Name: BHP MINERALS
Filename: C:\LR\HW_IMP\HYD\HW700C83 User: lr
Date: 03-14-1997 Time: 11:28:11
HIGHWALL IMPOUNDMENT - 700 ACRE WATERSHED, CN = 83
Storm: 1.60 inches, 25 year- 6 hour, Type II-65
Hydrograph Convolution Interval: 0.1 hr

DETAILED SUBWATERSHED INPUT/OUTPUT TABLE

J	B	S	SWS	Seg. #	Land Flow Condition	Distance (ft)	Slope (%)	Velocity (fps)	Segment Time (hr)	Time Conc. (hr)	Muskingum K (hr)	Muskingum X
1	1	1	1	-a	5	8283.00	4.00	2.00	1.15	1.150		

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

STANDARD SPILLWAY SIZES

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.50	9.0	9.0
105.70	12.6	12.6
105.80	16.5	16.5
105.90	20.7	20.7
106.00	25.5	25.5
106.50	56.9	56.9
107.00	98.5	98.5

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.50	13.1	13.1
105.70	18.3	18.3
105.80	23.9	23.9
105.90	29.7	29.7
106.00	36.4	36.4
106.50	79.3	79.3
107.00	134.3	134.3

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.50	17.2	17.2
105.70	24.0	24.0
105.80	31.2	31.2
105.90	38.7	38.7
106.00	47.3	47.3
106.50	101.8	101.8
107.00	170.2	170.2

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	105.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
105.00	0.0	0.0
105.50	21.2	21.2
105.70	29.7	29.7
105.80	38.6	38.6
105.90	47.8	47.8
106.00	58.3	58.3
106.50	124.2	124.2
107.00	206.2	206.2

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	0.0	0.0
105.00	1.3	1.3
105.40	3.4	3.4
105.50	12.6	12.6
105.60	16.5	16.5
105.70	20.7	20.7
105.80	25.5	25.5
105.90	30.8	30.8
106.00	36.7	36.7
106.20	49.7	49.7
106.50	72.2	72.2
106.70	89.3	89.3
107.00	119.0	119.0

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	0.0	0.0
105.00	2.0	2.0
105.40	5.1	5.1
105.50	18.3	18.3
105.60	23.9	23.9
105.70	29.7	29.7
105.80	36.4	36.4
105.90	43.8	43.8
106.00	51.9	51.9
106.20	69.6	69.6
106.50	99.7	99.7
106.70	122.3	122.3
107.00	160.9	160.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	0.0	0.0
105.00	2.6	2.6
105.40	6.7	6.7
105.50	24.0	24.0
105.60	31.2	31.2
105.70	38.7	38.7
105.80	47.3	47.3
105.90	56.8	56.8
106.00	67.1	67.1
106.20	89.5	89.5
106.50	127.3	127.3
106.70	155.3	155.3
107.00	202.9	202.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	0.0	0.0
105.00	3.2	3.2
105.40	8.4	8.4
105.50	29.7	29.7
105.60	38.6	38.6
105.70	47.8	47.8
105.80	58.3	58.3
105.90	69.9	69.9
106.00	82.3	82.3
106.20	109.5	109.5
106.50	154.9	154.9
106.70	188.4	188.4
107.00	245.0	245.0

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	4.5	4.5
105.00	9.0	9.0
105.20	12.6	12.6
105.30	16.5	16.5
105.40	20.7	20.7
105.50	25.5	25.5
105.60	30.8	30.8
105.70	36.7	36.7
105.80	43.0	43.0
105.90	49.7	49.7
106.00	56.9	56.9
106.20	72.2	72.2
106.50	98.5	98.5
106.70	119.0	119.0
107.00	153.3	153.3

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	6.5	6.5
105.00	13.1	13.1
105.20	18.3	18.3
105.30	23.9	23.9
105.40	29.7	29.7
105.50	36.4	36.4
105.60	43.8	43.8
105.70	51.9	51.9
105.80	60.5	60.5
105.90	69.6	69.6
106.00	79.3	79.3
106.20	99.7	99.7
106.50	134.3	134.3
106.70	160.9	160.9
107.00	204.9	204.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	8.6	8.6
105.00	17.2	17.2
105.20	24.0	24.0
105.30	31.2	31.2
105.40	38.7	38.7
105.50	47.3	47.3
105.60	56.8	56.8
105.70	67.1	67.1
105.80	78.0	78.0
105.90	89.5	89.5
106.00	101.8	101.8
106.20	127.3	127.3
106.50	170.2	170.2
106.70	202.9	202.9
107.00	256.8	256.8

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.50	0.0	0.0
104.75	10.6	10.6
105.00	21.2	21.2
105.20	29.7	29.7
105.30	38.6	38.6
105.40	47.8	47.8
105.50	58.3	58.3
105.60	69.9	69.9
105.70	82.3	82.3
105.80	95.5	95.5
105.90	109.5	109.5
106.00	124.2	124.2
106.20	154.9	154.9
106.50	206.2	206.2
106.70	245.0	245.0
107.00	308.7	308.7

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	0.0	0.0
104.50	1.3	1.3
104.75	2.7	2.7
104.90	3.4	3.4
105.00	12.6	12.6
105.10	16.5	16.5
105.20	20.7	20.7
105.30	25.5	25.5
105.40	30.8	30.8
105.50	36.7	36.7
105.60	43.0	43.0
105.70	49.7	49.7
105.80	56.9	56.9
105.90	64.4	64.4
106.00	72.2	72.2
106.20	89.3	89.3
106.50	119.0	119.0
106.70	141.4	141.4
107.00	179.3	179.3

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	0.0	0.0
104.50	2.0	2.0
104.75	3.9	3.9
104.90	5.1	5.1
105.00	18.3	18.3
105.10	23.9	23.9
105.20	29.7	29.7
105.30	36.4	36.4
105.40	43.8	43.8
105.50	51.9	51.9
105.60	60.5	60.5
105.70	69.6	69.6
105.80	79.3	79.3
105.90	89.3	89.3
106.00	99.7	99.7
106.20	122.3	122.3
106.50	160.9	160.9
106.70	189.7	189.7
107.00	237.9	237.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	0.0	0.0
104.50	2.6	2.6
104.75	5.2	5.2
104.90	6.7	6.7
105.00	24.0	24.0
105.10	31.2	31.2
105.20	38.7	38.7
105.30	47.3	47.3
105.40	56.8	56.8
105.50	67.1	67.1
105.60	78.0	78.0
105.70	89.5	89.5
105.80	101.8	101.8
105.90	114.2	114.2
106.00	127.3	127.3
106.20	155.3	155.3
106.50	202.9	202.9
106.70	238.2	238.2
107.00	296.7	296.7

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	0.0	0.0
104.50	3.2	3.2
104.75	6.5	6.5
104.90	8.4	8.4
105.00	29.7	29.7
105.10	38.6	38.6
105.20	47.8	47.8
105.30	58.3	58.3
105.40	69.9	69.9
105.50	82.3	82.3
105.60	95.5	95.5
105.70	109.5	109.5
105.80	124.2	124.2
105.90	139.2	139.2
106.00	154.9	154.9
106.20	188.4	188.4
106.50	245.0	245.0
106.70	286.7	286.7
107.00	355.7	355.7

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	4.5	4.5
104.50	9.0	9.0
104.70	12.6	12.6
104.75	12.6	12.6
104.80	16.5	16.5
104.90	20.7	20.7
105.00	25.5	25.5
105.10	30.8	30.8
105.20	36.7	36.7
105.30	43.0	43.0
105.40	49.7	49.7
105.50	56.9	56.9
105.60	64.4	64.4
105.70	72.2	72.2
105.80	80.5	80.5
105.90	89.3	89.3
106.00	98.5	98.5
106.20	119.0	119.0
106.50	153.3	153.3
106.70	179.3	179.3
107.00	222.4	222.4

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	6.5	6.5
104.50	13.1	13.1
104.70	18.3	18.3
104.75	18.3	18.3
104.80	23.9	23.9
104.90	29.7	29.7
105.00	36.4	36.4
105.10	43.8	43.8
105.20	51.9	51.9
105.30	60.5	60.5
105.40	69.6	69.6
105.50	79.3	79.3
105.60	89.3	89.3
105.70	99.7	99.7
105.80	110.7	110.7
105.90	122.3	122.3
106.00	134.3	134.3
106.20	160.9	160.9
106.50	204.9	204.9
106.70	237.9	237.9
107.00	291.9	291.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	8.6	8.6
104.50	17.2	17.2
104.70	24.0	24.0
104.75	24.0	24.0
104.80	31.2	31.2
104.90	38.7	38.7
105.00	47.3	47.3
105.10	56.8	56.8
105.20	67.1	67.1
105.30	78.0	78.0
105.40	89.5	89.5
105.50	101.8	101.8
105.60	114.2	114.2
105.70	127.3	127.3
105.80	141.0	141.0
105.90	155.3	155.3
106.00	170.2	170.2
106.20	202.9	202.9
106.50	256.8	256.8
106.70	296.7	296.7
107.00	361.8	361.8

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	10.6	10.6
104.50	21.2	21.2
104.70	29.7	29.7
104.75	29.7	29.7
104.80	38.6	38.6
104.90	47.8	47.8
105.00	58.3	58.3
105.10	69.9	69.9
105.20	82.3	82.3
105.30	95.5	95.5
105.40	109.5	109.5
105.50	124.2	124.2
105.60	139.2	139.2
105.70	154.9	154.9
105.80	171.3	171.3
105.90	188.4	188.4
106.00	206.2	206.2
106.20	245.0	245.0
106.50	308.7	308.7
106.70	355.7	355.7
107.00	431.8	431.8

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SIZE SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	104.00
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	30.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
104.00	0.0	0.0
104.25	12.7	12.7
104.50	25.3	25.3
104.70	35.4	35.4
104.75	35.4	35.4
104.80	46.0	46.0
104.90	56.8	56.8
105.00	69.2	69.2
105.10	82.9	82.9
105.20	97.5	97.5
105.30	113.0	113.0
105.40	129.4	129.4
105.50	146.7	146.7
105.60	164.2	164.2
105.70	182.6	182.6
105.80	201.7	201.7
105.90	221.5	221.5
106.00	242.2	242.2
106.20	287.2	287.2
106.50	360.6	360.6
106.70	414.7	414.7
107.00	502.0	502.0

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	0.0	0.0
104.00	1.3	1.3
104.40	3.4	3.4
104.50	12.6	12.6
104.60	16.5	16.5
104.70	20.7	20.7
105.00	36.7	36.7
105.20	49.7	49.7
105.50	72.2	72.2
105.70	89.3	89.3
106.00	119.0	119.0
106.20	141.4	141.4
106.50	179.3	179.3
106.70	207.5	207.5
107.00	253.9	253.9

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	0.0	0.0
104.00	2.0	2.0
104.40	5.1	5.1
104.50	18.3	18.3
104.60	23.9	23.9
104.70	29.7	29.7
105.00	51.9	51.9
105.20	69.6	69.6
105.50	99.7	99.7
105.70	122.3	122.3
106.00	160.9	160.9
106.20	189.7	189.7
106.50	237.9	237.9
106.70	273.3	273.3
107.00	331.0	331.0

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	0.0	0.0
104.00	2.6	2.6
104.40	6.7	6.7
104.50	24.0	24.0
104.60	31.2	31.2
104.70	38.7	38.7
105.00	67.1	67.1
105.20	89.5	89.5
105.50	127.3	127.3
105.70	155.3	155.3
106.00	202.9	202.9
106.20	238.2	238.2
106.50	296.7	296.7
106.70	339.4	339.4
107.00	408.6	408.6

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	0.0	0.0
104.00	3.2	3.2
104.40	8.4	8.4
104.50	29.7	29.7
104.60	38.6	38.6
104.70	47.8	47.8
105.00	82.3	82.3
105.20	109.5	109.5
105.50	154.9	154.9
105.70	188.4	188.4
106.00	245.0	245.0
106.20	286.7	286.7
106.50	355.7	355.7
106.70	405.7	405.7
107.00	486.3	486.3

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.75
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	30.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	0.0	0.0
104.00	3.9	3.9
104.40	10.0	10.0
104.50	35.4	35.4
104.60	46.0	46.0
104.70	56.8	56.8
105.00	97.5	97.5
105.20	129.4	129.4
105.50	182.6	182.6
105.70	221.5	221.5
106.00	287.2	287.2
106.20	335.3	335.3
106.50	414.7	414.7
106.70	472.0	472.0
107.00	564.2	564.2

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	4.5	4.5
104.00	9.0	9.0
104.20	12.6	12.6
104.30	16.5	16.5
104.40	20.7	20.7
104.50	25.5	25.5
104.60	30.8	30.8
104.70	36.7	36.7
105.00	56.9	56.9
105.20	72.2	72.2
105.50	98.5	98.5
105.70	119.0	119.0
106.00	153.3	153.3
106.20	179.3	179.3
106.50	222.4	222.4
106.70	253.9	253.9
107.00	305.3	305.3

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	6.5	6.5
104.00	13.1	13.1
104.20	18.3	18.3
104.30	23.9	23.9
104.40	29.7	29.7
104.50	36.4	36.4
104.60	43.8	43.8
104.70	51.9	51.9
105.00	79.3	79.3
105.20	99.7	99.7
105.50	134.3	134.3
105.70	160.9	160.9
106.00	204.9	204.9
106.20	237.9	237.9
106.50	291.9	291.9
106.70	331.0	331.0
107.00	394.4	394.4

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	8.6	8.6
104.00	17.2	17.2
104.20	24.0	24.0
104.30	31.2	31.2
104.40	38.7	38.7
104.50	47.3	47.3
104.60	56.8	56.8
104.70	67.1	67.1
105.00	101.8	101.8
105.20	127.3	127.3
105.50	170.2	170.2
105.70	202.9	202.9
106.00	256.8	256.8
106.20	296.7	296.7
106.50	361.8	361.8
106.70	408.6	408.6
107.00	484.0	484.0

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	10.6	10.6
104.00	21.2	21.2
104.20	29.7	29.7
104.30	38.6	38.6
104.40	47.8	47.8
104.50	58.3	58.3
104.60	69.9	69.9
104.70	82.3	82.3
105.00	124.2	124.2
105.20	154.9	154.9
105.50	206.2	206.2
105.70	245.0	245.0
106.00	308.7	308.7
106.20	355.7	355.7
106.50	431.8	431.8
106.70	486.3	486.3
107.00	573.8	573.8

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.50
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	30.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.50	0.0	0.0
103.75	12.7	12.7
104.00	25.3	25.3
104.20	35.4	35.4
104.30	46.0	46.0
104.40	56.8	56.8
104.50	69.2	69.2
104.60	82.9	82.9
104.70	97.5	97.5
105.00	146.7	146.7
105.20	182.6	182.6
105.50	242.2	242.2
105.70	287.2	287.2
106.00	360.6	360.6
106.20	414.7	414.7
106.50	502.0	502.0
106.70	564.2	564.2
107.00	663.8	663.8

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	10.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.25	0.0	0.0
103.50	1.3	1.3
103.75	2.7	2.7
103.90	3.4	3.4
104.00	12.6	12.6
104.10	16.5	16.5
104.20	20.7	20.7
104.30	25.5	25.5
104.40	30.8	30.8
104.50	36.7	36.7
104.60	43.0	43.0
104.70	49.7	49.7
105.00	72.2	72.2
105.20	89.3	89.3
105.50	119.0	119.0
105.70	141.4	141.4
106.00	179.3	179.3
106.20	207.5	207.5
106.50	253.9	253.9
106.70	287.6	287.6
107.00	342.6	342.6

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.25	0.0	0.0
103.50	2.0	2.0
103.75	3.9	3.9
103.90	5.1	5.1
104.00	18.3	18.3
104.10	23.9	23.9
104.20	29.7	29.7
104.30	36.4	36.4
104.40	43.8	43.8
104.50	51.9	51.9
104.60	60.5	60.5
104.70	69.6	69.6
105.00	99.7	99.7
105.20	122.3	122.3
105.50	160.9	160.9
105.70	189.7	189.7
106.00	237.9	237.9
106.20	273.3	273.3
106.50	331.0	331.0
106.70	372.7	372.7
107.00	439.9	439.9

SEDCAD+ BASIN DISCHARGE UTILITY

HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.25	0.0	0.0
103.50	2.6	2.6
103.75	5.2	5.2
103.90	6.7	6.7
104.00	24.0	24.0
104.10	31.2	31.2
104.20	38.7	38.7
104.30	47.3	47.3
104.40	56.8	56.8
104.50	67.1	67.1
104.60	78.0	78.0
104.70	89.5	89.5
105.00	127.3	127.3
105.20	155.3	155.3
105.50	202.9	202.9
105.70	238.2	238.2
106.00	296.7	296.7
106.20	339.4	339.4
106.50	408.6	408.6
106.70	458.2	458.2
107.00	537.8	537.8

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	25.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.25	0.0	0.0
103.50	3.2	3.2
103.75	6.5	6.5
103.90	8.4	8.4
104.00	29.7	29.7
104.10	38.6	38.6
104.20	47.8	47.8
104.30	58.3	58.3
104.40	69.9	69.9
104.50	82.3	82.3
104.60	95.5	95.5
104.70	109.5	109.5
105.00	154.9	154.9
105.20	188.4	188.4
105.50	245.0	245.0
105.70	286.7	286.7
106.00	355.7	355.7
106.20	405.7	405.7
106.50	486.3	486.3
106.70	543.9	543.9
107.00	636.0	636.0

SEDCAD+ BASIN DISCHARGE UTILITY
HIGHWALL IMPOUNDMENT - STANDARD SPILLWAY SIZE
EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	103.25
Crest Length	25.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	30.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	0.0	0.0
103.25	0.0	0.0
103.50	3.9	3.9
103.75	7.7	7.7
103.90	10.0	10.0
104.00	35.4	35.4
104.10	46.0	46.0
104.20	56.8	56.8
104.30	69.2	69.2
104.40	82.9	82.9
104.50	97.5	97.5
104.60	113.0	113.0
104.70	129.4	129.4
105.00	182.6	182.6
105.20	221.5	221.5
105.50	287.2	287.2
105.70	335.3	335.3
106.00	414.7	414.7
106.20	472.0	472.0
106.50	564.2	564.2
106.70	629.8	629.8
107.00	734.4	734.4

HIGHWALL IMPOUNDMENTS

SEDCAD+ COMPUTER RUNS

AS-BUILT SPILLWAYS

AUGUST 27, 1997

SEDCAD+ BASIN DISCHARGE UTILITY

YAZZIE STOCKPOND #1 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	102.50
Crest Length	23.400 feet
Z:1 (Left)	1.80:1
Z:1 (Right)	3.00:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	0.0	0.0
103.00	17.2	17.2
103.20	24.1	24.1
103.30	31.4	31.4
103.40	38.8	38.8
103.50	47.3	47.3
104.00	100.0	100.0
104.50	166.9	166.9
105.00	249.9	249.9
105.50	348.9	348.9
106.00	463.0	463.0
106.50	592.3	592.3
107.00	737.3	737.3
107.50	898.1	898.1
108.00	1075.0	1075.0

SEDCAD+ BASIN DISCHARGE UTILITY

YAZZIE STOCKPOND #2 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.20
Crest Length	27.800 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	2.80:1
Bottom Width	24.500 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.20	0.0	0.0
101.50	12.2	12.2
101.90	28.4	28.4
102.00	36.7	36.7
102.10	45.6	45.6
102.20	55.5	55.5
102.50	92.0	92.0
102.70	120.3	120.3
103.00	164.8	164.8
103.20	197.6	197.6
103.50	254.3	254.3
103.70	295.6	295.6
104.00	365.0	365.0
104.20	414.9	414.9
104.50	495.2	495.2
104.70	552.4	552.4
105.00	643.9	643.9
105.20	708.6	708.6
105.50	811.3	811.3
105.70	883.6	883.6
106.00	997.7	997.7
106.20	1077.7	1077.7
106.50	1203.6	1203.6
107.00	1429.3	1429.3
107.20	1525.2	1525.2
107.50	1675.2	1675.2
108.00	1941.8	1941.8

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #1 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	102.00
Crest Length	29.700 feet
Z:1 (Left)	5.00:1
Z:1 (Right)	4.50:1
Bottom Width	5.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	0.0	0.0
102.50	5.2	5.2
102.70	7.3	7.3
102.80	9.8	9.8
102.90	12.6	12.6
103.00	15.8	15.8
103.50	41.1	41.1
104.00	75.8	75.8
104.50	126.5	126.5
105.00	195.9	195.9
105.50	283.5	283.5
106.00	390.6	390.6
106.50	518.1	518.1
107.00	667.3	667.3
107.50	839.0	839.0
108.00	1034.1	1034.1

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #2 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.10
Crest Length	33.000 feet
Z:1 (Left)	6.00:1
Z:1 (Right)	2.20:1
Bottom Width	20.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.10	0.0	0.0
101.50	13.0	13.0
101.80	22.7	22.7
101.90	29.6	29.6
102.00	37.1	37.1
102.10	45.3	45.3
102.50	89.5	89.5
102.60	102.5	102.5
103.00	156.8	156.8
103.10	172.1	172.1
103.50	242.0	242.0
103.60	261.2	261.2
104.00	351.1	351.1
104.10	375.6	375.6
104.50	482.1	482.1
104.60	510.9	510.9
105.00	637.2	637.2
105.10	671.0	671.0
105.50	810.5	810.5
105.60	847.5	847.5
106.00	1007.9	1007.9
106.10	1050.4	1050.4
106.50	1229.9	1229.9
107.00	1476.4	1476.4
107.10	1528.8	1528.8
107.50	1748.4	1748.4
108.00	2046.4	2046.4

SEDCAD+ BASIN DISCHARGE UTILITY

SOUTH HOSTEEN STOCKPOND #3 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.30
Crest Length	32.000 feet
Z:1 (Left)	1.50:1
Z:1 (Right)	1.50:1
Bottom Width	14.500 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.30	0.0	0.0
101.50	4.6	4.6
102.00	16.1	16.1
102.10	20.8	20.8
102.20	25.9	25.9
102.30	31.5	31.5
102.50	45.2	45.2
102.80	69.1	69.1
103.00	85.5	85.5
103.30	112.8	112.8
103.50	133.6	133.6
103.80	167.5	167.5
104.00	193.4	193.4
104.30	235.2	235.2
104.50	265.0	265.0
104.80	312.9	312.9
105.00	347.3	347.3
105.30	401.9	401.9
105.50	439.5	439.5
105.80	499.0	499.0
106.00	541.1	541.1
106.30	607.5	607.5
106.50	653.9	653.9
107.00	777.3	777.3
107.30	856.6	856.6
107.50	911.6	911.6
108.00	1056.9	1056.9

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 16 IMPOUNDMENT #2 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.00
Crest Length	45.000 feet
Z:1 (Left)	3.00:1
Z:1 (Right)	3.00:1
Bottom Width	12.500 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	9.2	9.2
101.70	12.9	12.9
101.80	17.2	17.2
101.90	21.6	21.6
102.00	26.4	26.4
102.50	62.4	62.4
103.00	106.9	106.9
103.50	163.2	163.2
104.00	236.2	236.2
104.50	325.2	325.2
105.00	432.7	432.7
105.50	549.3	549.3
106.00	685.6	685.6
106.50	838.9	838.9
107.00	1009.8	1009.8
107.50	1198.8	1198.8
108.00	1406.5	1406.5

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 16 IMPOUNDMENT #3 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.00
Crest Length	34.000 feet
Z:1 (Left)	2.20:1
Z:1 (Right)	3.20:1
Bottom Width	12.500 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	10.1	10.1
101.70	14.1	14.1
101.80	18.4	18.4
101.90	23.1	23.1
102.00	28.3	28.3
102.50	64.2	64.2
103.00	108.5	108.5
103.50	164.7	164.7
104.00	237.5	237.5
104.50	323.9	323.9
105.00	427.0	427.0
105.50	539.5	539.5
106.00	669.7	669.7
106.50	815.6	815.6
107.00	977.7	977.7
107.50	1156.3	1156.3
108.00	1352.1	1352.1

SEDCAD+ BASIN DISCHARGE UTILITY

STUB 18 IMPOUNDMENT - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.50
Crest Length	48.000 feet
Z:1 (Left)	3.40:1
Z:1 (Right)	3.30:1
Bottom Width	14.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
102.00	10.1	10.1
102.20	14.2	14.2
102.30	18.9	18.9
102.40	23.6	23.6
102.50	28.7	28.7
103.00	69.3	69.3
103.50	117.8	117.8
104.00	181.3	181.3
104.50	261.6	261.6
105.00	360.6	360.6
105.50	478.1	478.1
106.00	610.2	610.2
106.50	762.0	762.0
107.00	932.8	932.8
107.50	1123.3	1123.3
108.00	1333.9	1333.9

SEDCAD+ BASIN DISCHARGE UTILITY

SUNFLOWER #1 IMPOUNDMENT - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.90
Crest Length	38.000 feet
Z:1 (Left)	4.30:1
Z:1 (Right)	5.20:1
Bottom Width	15.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
101.90	0.0	0.0
102.00	2.4	2.4
102.50	14.4	14.4
102.60	16.8	16.8
102.70	22.1	22.1
102.80	28.1	28.1
102.90	34.7	34.7
103.00	42.5	42.5
103.40	81.0	81.0
103.50	91.8	91.8
103.90	141.6	141.6
104.00	155.4	155.4
104.40	217.3	217.3
104.50	236.1	236.1
104.90	319.8	319.8
105.00	342.9	342.9
105.40	444.0	444.0
105.50	472.8	472.8
105.90	598.4	598.4
106.00	629.2	629.2
106.40	761.3	761.3
106.50	798.3	798.3
106.90	956.6	956.6
107.00	998.7	998.7
107.50	1225.0	1225.0
107.90	1425.4	1425.4
108.00	1478.3	1478.3

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMPOUNDMENT #2 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.30
Crest Length	35.000 feet
Z:1 (Left)	2.10:1
Z:1 (Right)	1.80:1
Bottom Width	9.400 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.30	0.0	0.0
101.50	3.0	3.0
102.00	10.5	10.5
102.10	13.7	13.7
102.20	17.2	17.2
102.30	21.1	21.1
102.50	30.6	30.6
102.80	47.8	47.8
103.00	60.0	60.0
103.30	80.7	80.7
103.50	96.3	96.3
103.80	122.1	122.1
104.00	142.5	142.5
104.30	175.9	175.9
104.50	200.2	200.2
104.80	239.7	239.7
105.00	268.9	268.9
105.30	316.1	316.1
105.50	347.8	347.8
105.80	398.4	398.4
106.00	435.3	435.3
106.30	494.1	494.1
106.50	535.5	535.5
107.00	647.3	647.3
107.30	720.0	720.0
107.50	770.9	770.9
108.00	906.8	906.8

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMPOUNDMENT #3 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.00
Crest Length	18.000 feet
Z:1 (Left)	2.00:1
Z:1 (Right)	2.00:1
Bottom Width	40.000 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	32.4	32.4
101.60	38.9	38.9
101.70	50.2	50.2
101.80	64.9	64.9
101.90	79.6	79.6
102.00	96.4	96.4
102.50	195.7	195.7
103.00	321.9	321.9
103.50	470.8	470.8
104.00	640.9	640.9
104.50	831.5	831.5
105.00	1042.0	1042.0
105.50	1272.3	1272.3
106.00	1522.1	1522.1
106.50	1791.3	1791.3
107.00	2079.9	2079.9
107.50	2387.9	2387.9
108.00	2715.3	2715.3

SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMPOUNDMENT #5 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.80
Crest Length	25.000 feet
Z:1 (Left)	4.30:1
Z:1 (Right)	3.20:1
Bottom Width	10.400 feet

Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
101.80	0.0	0.0
102.00	3.8	3.8
102.50	13.4	13.4
102.60	17.6	17.6
102.70	22.1	22.1
102.80	27.2	27.2
103.00	39.5	39.5
103.30	61.8	61.8
103.50	78.8	78.8
103.80	108.2	108.2
104.00	131.2	131.2
104.30	170.1	170.1
104.50	199.7	199.7
104.80	248.9	248.9
105.00	285.1	285.1
105.30	344.5	344.5
105.50	387.6	387.6
105.80	457.7	457.7
106.00	508.1	508.1
106.30	589.4	589.4
106.50	647.4	647.4
106.80	740.4	740.4
107.00	806.4	806.4
107.50	985.7	985.7
107.80	1103.4	1103.4
108.00	1186.2	1186.2

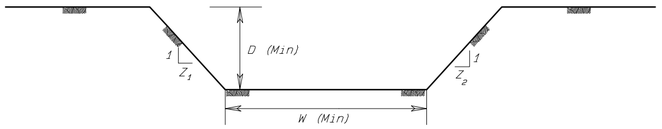
SEDCAD+ BASIN DISCHARGE UTILITY

AREA 3 TEMP. DIVERSION IMPOUNDMENT #7 - AS-BUILT SPILLWAY

EMERGENCY SPILLWAY INPUTS:

Emergency Spillway Elevation	101.90
Crest Length	50.000 feet
Z:1 (Left)	5.00:1
Z:1 (Right)	1.70:1
Bottom Width	12.600 feet

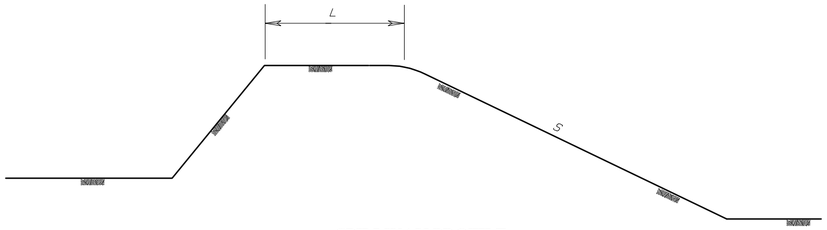
Elevation	Emergency Spillway (cfs)	Total Discharge (cfs)
100.00	0.0	0.0
100.50	0.0	0.0
101.00	0.0	0.0
101.50	0.0	0.0
101.90	0.0	0.0
102.00	1.8	1.8
102.50	10.9	10.9
102.60	12.7	12.7
102.70	16.9	16.9
102.80	21.1	21.1
102.90	25.7	25.7
103.00	32.0	32.0
103.40	63.2	63.2
103.50	71.2	71.2
103.90	107.5	107.5
104.00	118.3	118.3
104.40	167.1	167.1
104.50	181.0	181.0
104.90	241.9	241.9
105.00	259.3	259.3
105.40	335.2	335.2
105.50	355.9	355.9
105.90	445.1	445.1
106.00	469.1	469.1
106.40	572.2	572.2
106.50	599.7	599.7
106.90	717.1	717.1
107.00	748.3	748.3
107.50	915.7	915.7
107.90	1063.5	1063.5
108.00	1102.5	1102.5



D includes 1'-0" of Freeboard

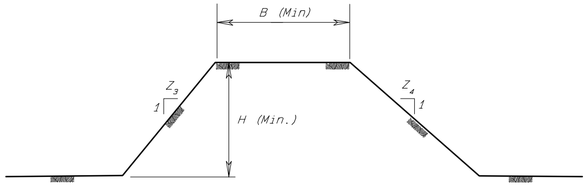
SPILLWAY SECTION

N.T.S.



SPILLWAY PROFILE

N.T.S.



H measured at the upstream toe of the embankment.

EMBANKMENT SECTION

N.T.S.

AS-BUILT DIMENSIONS

Impoundment Id.	Watershed Area (acres)	Peak Discharge (cfs)	Spillway (1)						Embankment (1)				
			W (ft)	D (ft)	Z_1	Z_2	L (ft)	S (%)	B (ft)	H (ft)	Z_3	Z_4	Comments:
Yazzie Stockpond #1	125.5	92.8	20.0	2.5	1.8	3.0	23.4	25.0	15.2	5.1	2.0	2.8	REMOVED BY MINING ADVANCEMENT
Yazzie Stockpond #2	174.1	116.2	24.5	2.8	3.0	2.8	27.8	16.0	15.1	4.7	2.6	2.2	REMOVED BY MINING ADVANCEMENT
South Hosteen Stockpond #1	80.1	73.3	5.0	3.0	5.0	4.5	29.7	6.0	16.5	4.6	2.1	2.0	REMOVED BY MINING ADVANCEMENT
South Hosteen Stockpond #2	37.7	89.3	20.0	3.9	6.0	2.2	33.0	4.5	14.2	6.2	2.0	2.0	REMOVED BY MINING ADVANCEMENT
South Hosteen Stockpond #3	157.3	115.7	14.5	3.7	1.5	1.5	32.0	12.0	18.0	4.5	2.3	2.0	REMOVED BY MINING ADVANCEMENT
Stub 16 Impoundment #2	20.2	24.9	12.5	4.0	3.0	3.0	45.0	7.0	38.0	8.1	2.8	3.6	REMOVED BY MINING ADVANCEMENT
Stub 16 Impoundment #3	10.6	15.5	12.5	3.0	2.2	3.2	34.0	15.0	36.0	6.1	2.2	2.0	REMOVED BY MINING ADVANCEMENT
Stub 18 Impoundment	103.4	69.8	14.0	4.5	3.4	3.3	48.0	7.0	12.5	10.0	2.0	2.0	REMOVED BY MINING ADVANCEMENT
Sunflower #1	24.6	17.3	15.0	3.1	4.3	5.2	38.0	2.2	9.0	7.5	4.2	3.9	REMOVED BY MINING ADVANCEMENT
Area 3 Temp. Div. Imp. #2	69.9	21.8	9.4	2.7	2.1	1.8	35.0	6.0	10.0	6.2	4.2	2.9	REMOVED BY MINING ADVANCEMENT
Area 3 Temp. Div. Imp. #3	20.8	23.9	40.0	20.0	2.0	2.0	18.0	2.5	18.0	5.8	4.0	40.0	REMOVED BY MINING ADVANCEMENT
Area 3 Temp. Div. Imp. #5	11.6	25.2	10.4	2.2	4.3	3.2	25.0	1.5	20.0	9.5	2.0	1.5	REMOVED BY MINING ADVANCEMENT
Area 3 Temp. Div. Imp. #7	55.5	21.9	12.6	2.1	5.0	1.7	50.0	0.5	73.0	8.5	2.9	4.0	REMOVED BY MINING ADVANCEMENT
Area 3 Highwall Pond 303	155.9	136.2	15.0	2.4	3.0	3.0	30.0	0.5	15.0	8.4	2.0	2.5	

(1) The data under each impoundment are the current dimensions of the structure
These indicate that the existing structures are adequate.

Note: For supporting design data refer to Appendix 11-II "Highwall Impoundment Design and As-Built Information" in the Mine Permit.

CERTIFICATION STATEMENT

I, Ron C. Van Valkenburg, hereby certify that this drawing was reviewed by me and that the information shown is complete and accurate to the best of my knowledge.

RON C. VAN VALKENBURG
NEW MEXICO
9263
LICENSED PROFESSIONAL ENGINEER

REV. No.	DATE	DRAFT. BY	REVISION DESCRIPTION	ENG.	E.G.	P.E.	P.S.	CHIEF ENG.
10-A	7-21-10	PJF	ADDED A3 HIGHWALL POND 303 TO AS-BUILT DIMENSIONS TABLE AND SUBMITTED TO OSM FOR REIVEW.	RY	YB	RCV		
C	10-30-97	PJF	REMOVED EXHIBIT No.	LR	PS	LR		
B	08-27-97	FTJ	REVISED TABLE					
A	03-27-97	PJF	SUBMITTED TO OSM FOR APPROVAL					

APPROVALS

BHP NAVAJO COAL COMPANY

NAVAJO MINE
SAFETY PAYS

P.O. BOX 1717 FRUITLAND, NEW MEXICO 87416

HIGHWALL IMPOUNDMENTS
"AS BUILT"

PREPARED BY LR	DRAWN BY PJF	SCALE AS NOTED
APPROVED BY LR	DATE 03-25-97	

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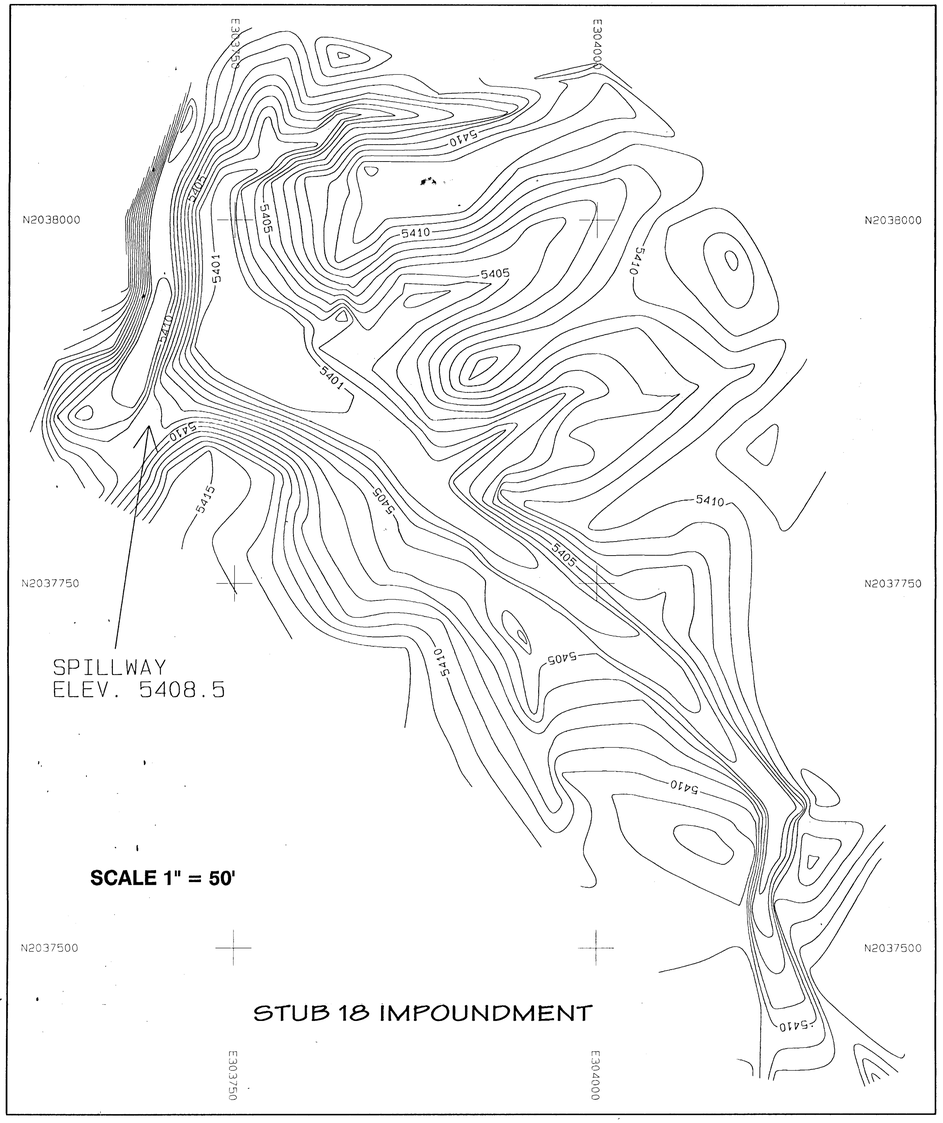

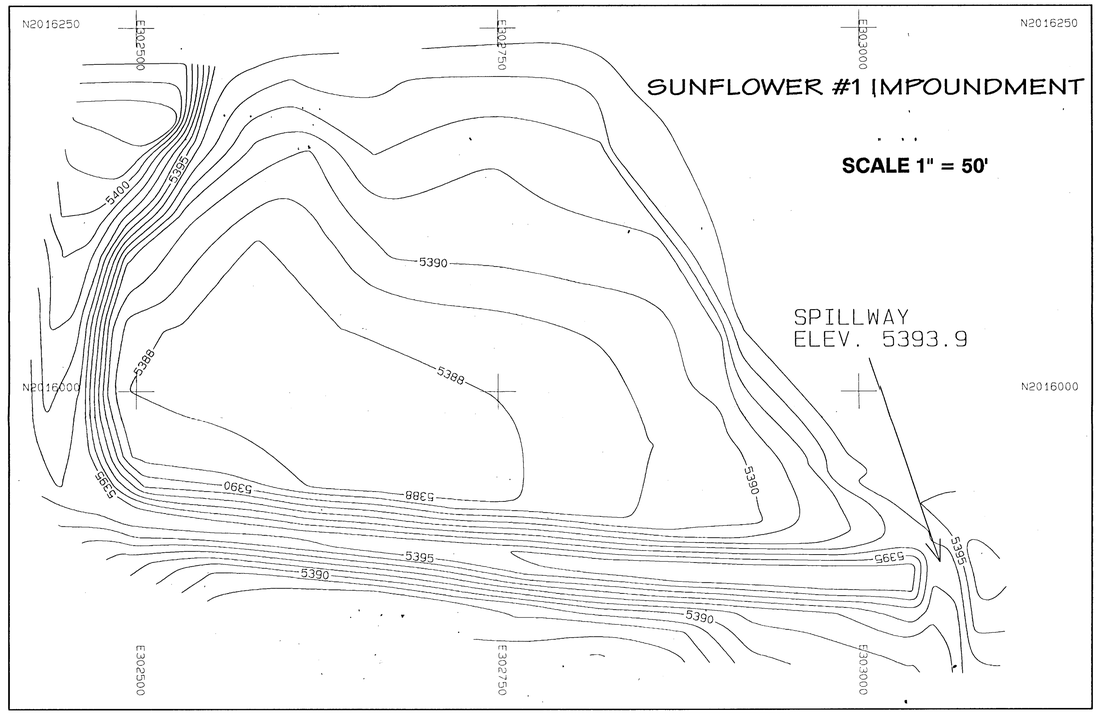

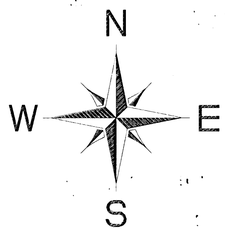

STUB 18 IMPOUNDMENT
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5401	0.15	0.00	0.00
5402	0.31	0.23	0.23
5403	0.47	0.40	0.63
5404	0.70	0.59	1.22
5405	0.98	0.85	2.07
5406	1.33	1.17	3.24
5407	1.74	1.55	4.79
5408	2.21	1.99	6.78
5408.5	2.44	1.22	8.00

SUNFLOWER #1
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5388	0.58	0.00	0.00
5389	1.19	0.89	0.89
5390	1.69	1.45	2.34
5391	2.16	1.94	4.28
5392	2.54	2.37	6.65
5393	2.86	2.72	9.37
5393.9	3.18	2.86	12.23

CERTIFICATION STATEMENT
I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

LEONARD RAYMOND
NEW MEXICO
6600
REGISTERED PROFESSIONAL ENGINEER

5-5-97

REVIEWED
JUN 1997
RECEIVED

DATE	REVISION
05-05-97	1 FOR OSM REVIEW

PROJECT MANAGER: GREG PERKINS
ENGR. of RECORD: LEONARD RAYMOND
REG. NO: 6600
SRVYR of RECORD:
REG. NO:

BHP-NAVAJO COAL CO.
PO BOX 155, FRUITLAND, NEW MEXICO, 87416

LOCKNAME: PRJD_15SW/NBN
DATE: MAY 05, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

HIGHWALL IMPOUNDMENTS
SUNFLOWER #1 AND STUB 18
(PRJD_proj_name2)

DRAWING

SHEET
OF 0

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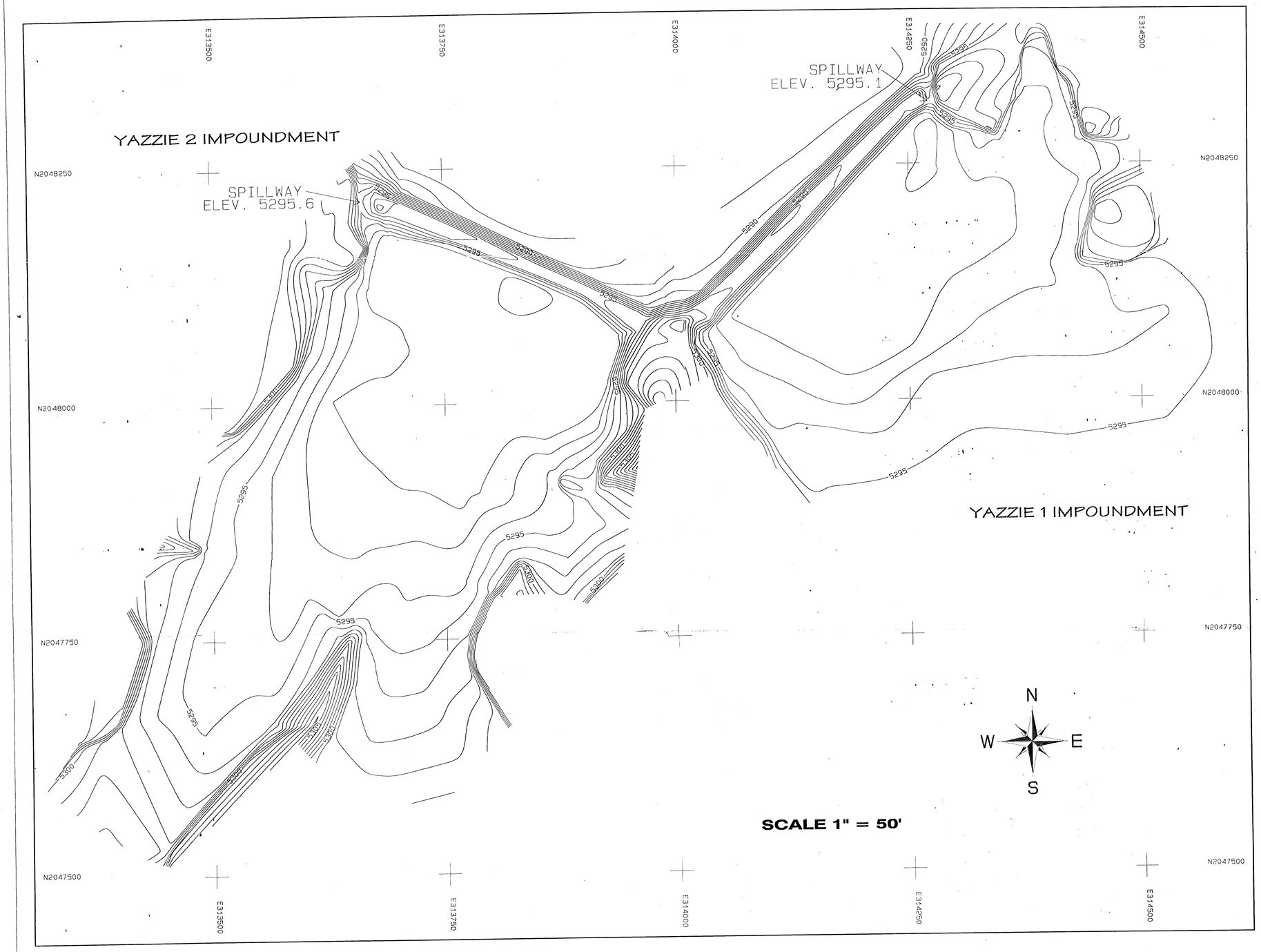

YAZZIE 1 IMPOUNDMENT STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5291	0.04	0.00	0.00
5292	0.98	0.52	0.52
5293	1.60	1.30	1.82
5294	2.30	1.96	3.78
5295	3.31	2.82	6.60
5295.1	3.41	0.34	6.94

YAZZIE 2 IMPOUNDMENT STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5291	0.04	0.00	0.00
5292	1.21	0.63	0.63
5293	1.80	1.52	2.15
5294	2.36	2.10	4.25
5295	3.10	2.75	7.00
5295.6	3.54	2.12	9.12

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

LEONARD RAYMOND NEW MEXICO 6900 REGISTERED PROFESSIONAL ENGINEER

5-2-97

JUN 1997 RECEIVED

PROJECT MANAGER: GREG PERKINS
ENGR. of RECORD: LEONARD RAYMOND
REG. NO: 6900
SRVYR of RECORD:
REG. NO:

BHP-NAVAJO COAL CO.

PO BOX 155, FRUITLAND, NEW MEXICO, 87416

ACCOUNT: PRJD_251N/185W
DATE: MAY 05, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

HIGHWALL IMPOUNDMENTS

YAZZIE 1 AND YAZZIE 2

(PRJD_proj_name2)

DRAWING

SHEET OF 0

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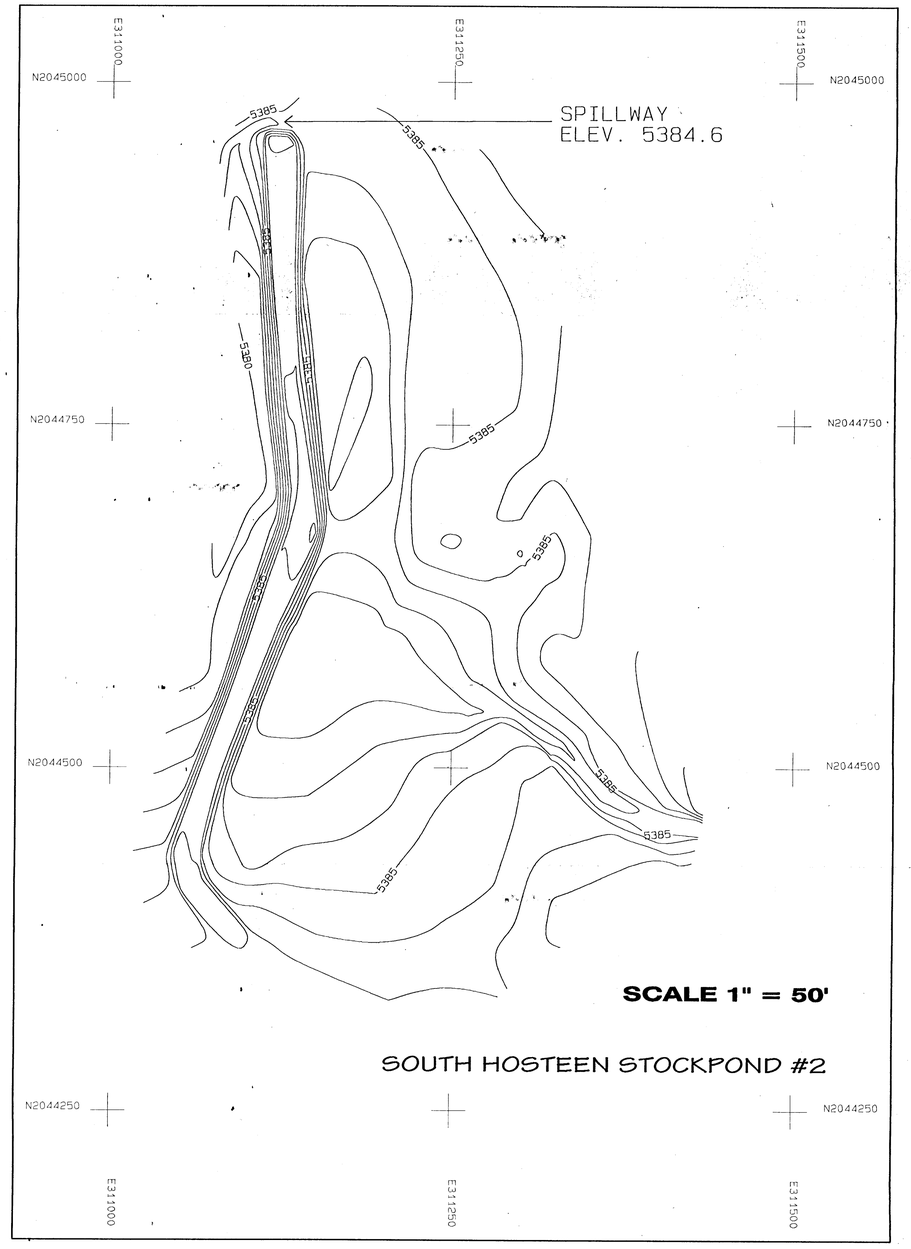

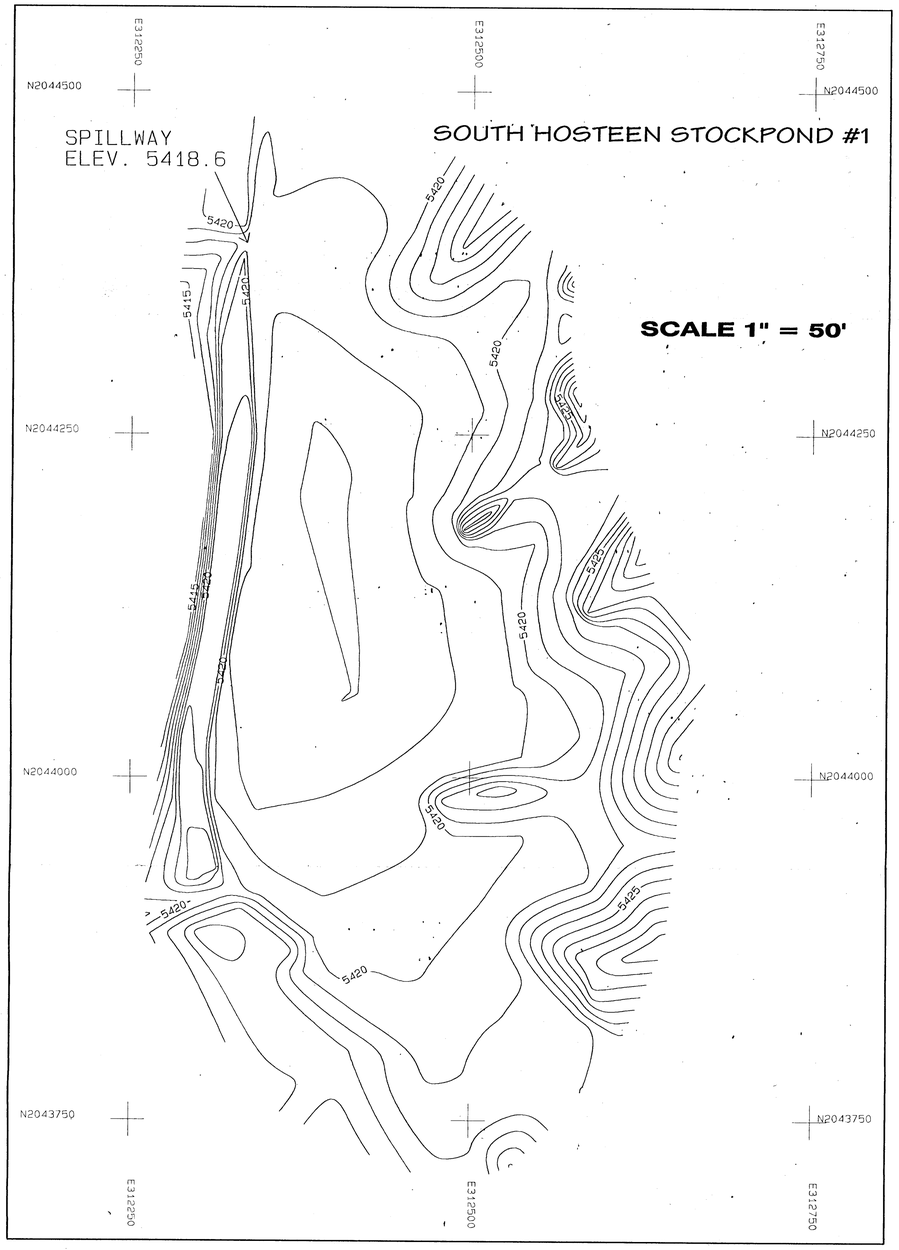

SOUTH HOSTEEN #1
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5417	0.10	0.00	0.00
5418	0.96	0.53	0.53
5418.6	1.48	0.89	1.42

SOUTH HOSTEEN #2
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5382	0.24	0.00	0.00
5383	0.69	0.47	0.47
5384	1.12	0.69	1.16
5384.6	1.38	0.83	1.99

CERTIFICATION STATEMENT
I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

LEONARD RAYMOND
NEW MEXICO
9600
REGISTERED PROFESSIONAL ENGINEER

APPROVED
JUN 1997

5-8-97

REVISION | DATE
1 FOR 60% REVIEW | 05-05-97
2
3
4
5

PROJECT MANAGER: GREG PERKINS
ENGR. of RECORD: LEONARD RAYMOND
REG. NO. 9600
SRVYR of RECORD:
REG. NO.

BHP-NAVAJO COAL CO.
PO BOX 150, FRUITLAND, NEW MEXICO, 87416

ACCOUNT: PROJ. 25.1%/100%
DATE: MAY 5, 1997
REVISED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

HIGHWALL IMPOUNDMENTS
SOUTH HOSTEEN STOCKPONDS
(PROJ_proj_name2)

DRAWING
SHEET
OF 0

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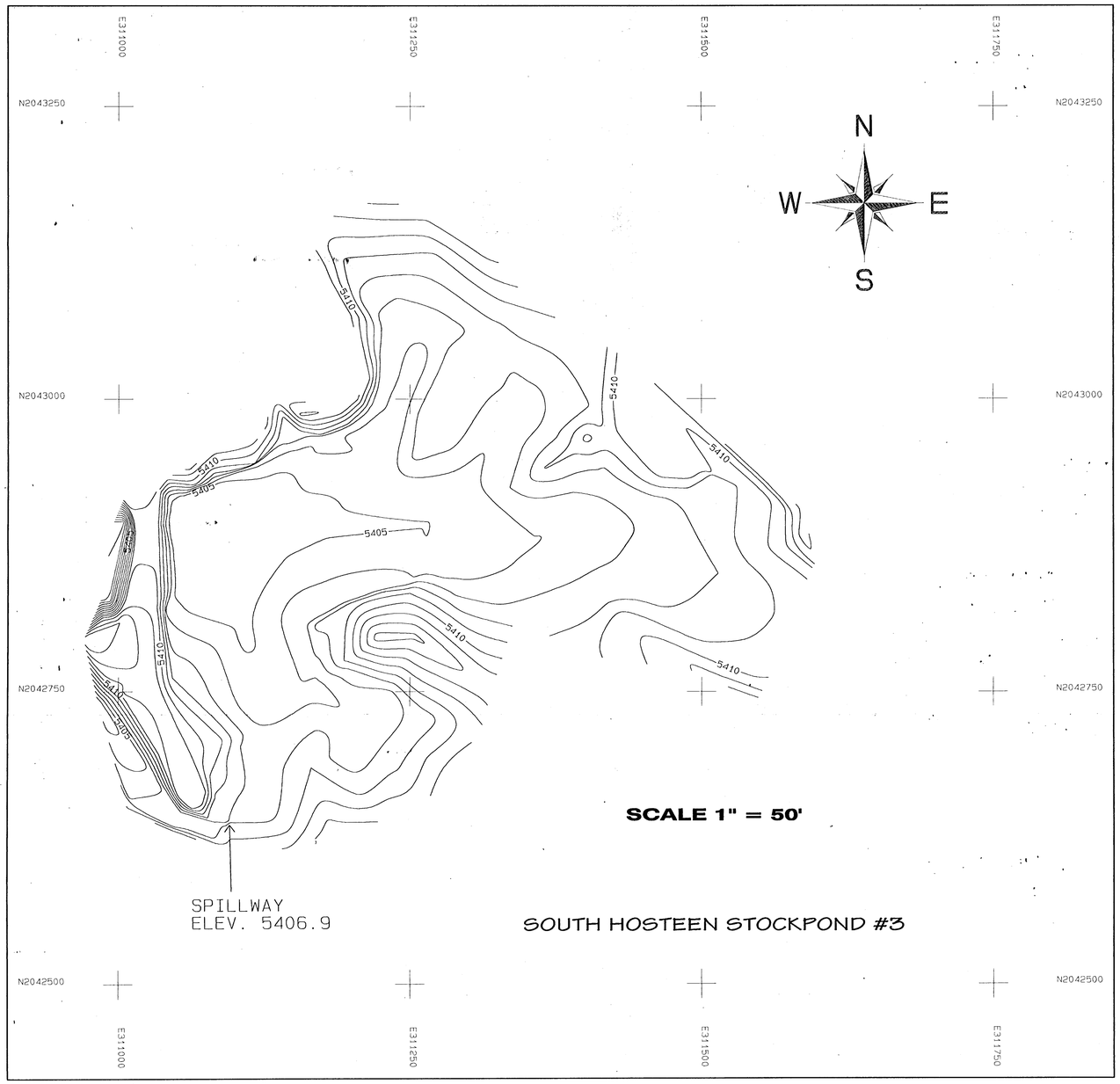

SOUTH HOSTEEN #3
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5405	0.32	0.00	0.00
5406	0.91	0.62	0.62
5406.9	1.44	1.30	1.92

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

LEONARD RAYMOND WEBSTER
NEW MEXICO
6600
REGISTERED PROFESSIONAL ENGINEER

APPROVED
JUN 1997

BHP-NAVAJO COAL CO.
PO BOX 105, FRUITLAND, NEW MEXICO, 87416

PROJECT MANAGER: GREG PERKINS
ENGR. OF RECORD: LEONARD RAYMOND
REG. NO: 6600
SURVR OF RECORD:
REG. NO:

	REVISION	DATE
1	FOR CGM REVIEW	05-05-97
2		
3		
4		
5		

ACCOUNT: PRJD 151N/16N
DATE: MAY 05, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

HIGHWALL IMPOUNDMENTS
SOUTH HOSTEEN STOCKPONDS
(PRJD_pro)_pae2)

DRAWING

SHEET
OF 0

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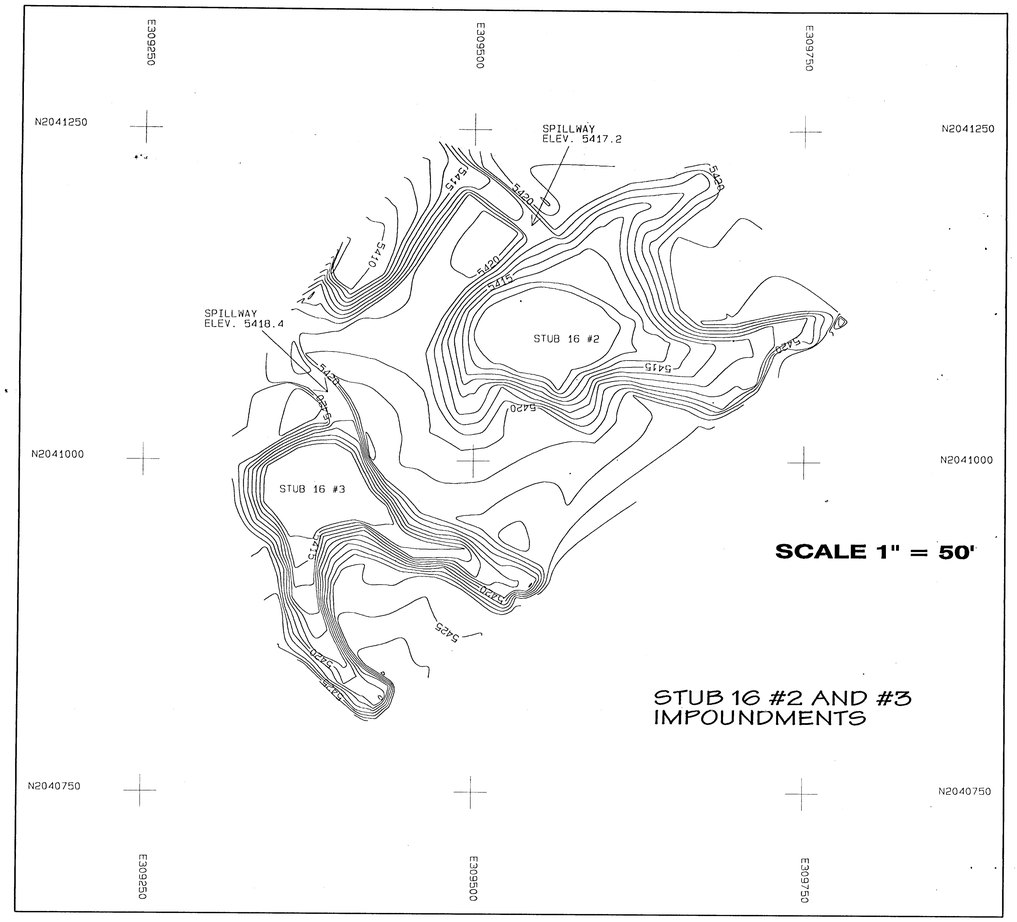

STUB 16 #2 AND #3
IMPOUNDMENTS

STUB 16 #2
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5411	9.2E-06	0.00	0.00
5412	0.13	0.06	0.06
5413	0.17	0.15	0.21
5414	0.24	0.21	0.42
5415	0.30	0.27	0.69
5416	0.37	0.34	1.03
5417	0.46	0.42	1.45
5417.2	0.48	0.10	1.55

STUB 16 #3
STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5414	0.11	0.00	0.00
5415	0.14	0.12	0.12
5416	0.17	0.16	0.28
5417	0.21	0.19	0.47
5418	0.25	0.23	0.70
5418.4	0.27	0.11	0.81

APPROVED
JUN 1997

CERTIFICATION STATEMENT
I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge

LEONARD RAYMOND
NEW MEXICO
6800
REGISTERED PROFESSIONAL ENGINEER

5-2-97

REVISION		DATE
1	FOR CDM REVIEW	05-05-97
2		
3		
4		

PROJECT MANAGER: GREG PERKINS
ENGR. of RECORD: LEONARD RAYMOND
REG. NO. 6800
SRVYR of RECORD:
REG. NO.

BHP-NAVAJO COAL CO.
PO BOX 155, FRUITLAND, NEW MEXICO, 87416

ACCOUNT: PROJ. STN/YISON
DATE: MAY, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

HIGHWALL IMPOUNDMENTS
STUB 16 #2 AND #3
(PROJ_proj_name2)

DRAWING

SHEET
OF 0

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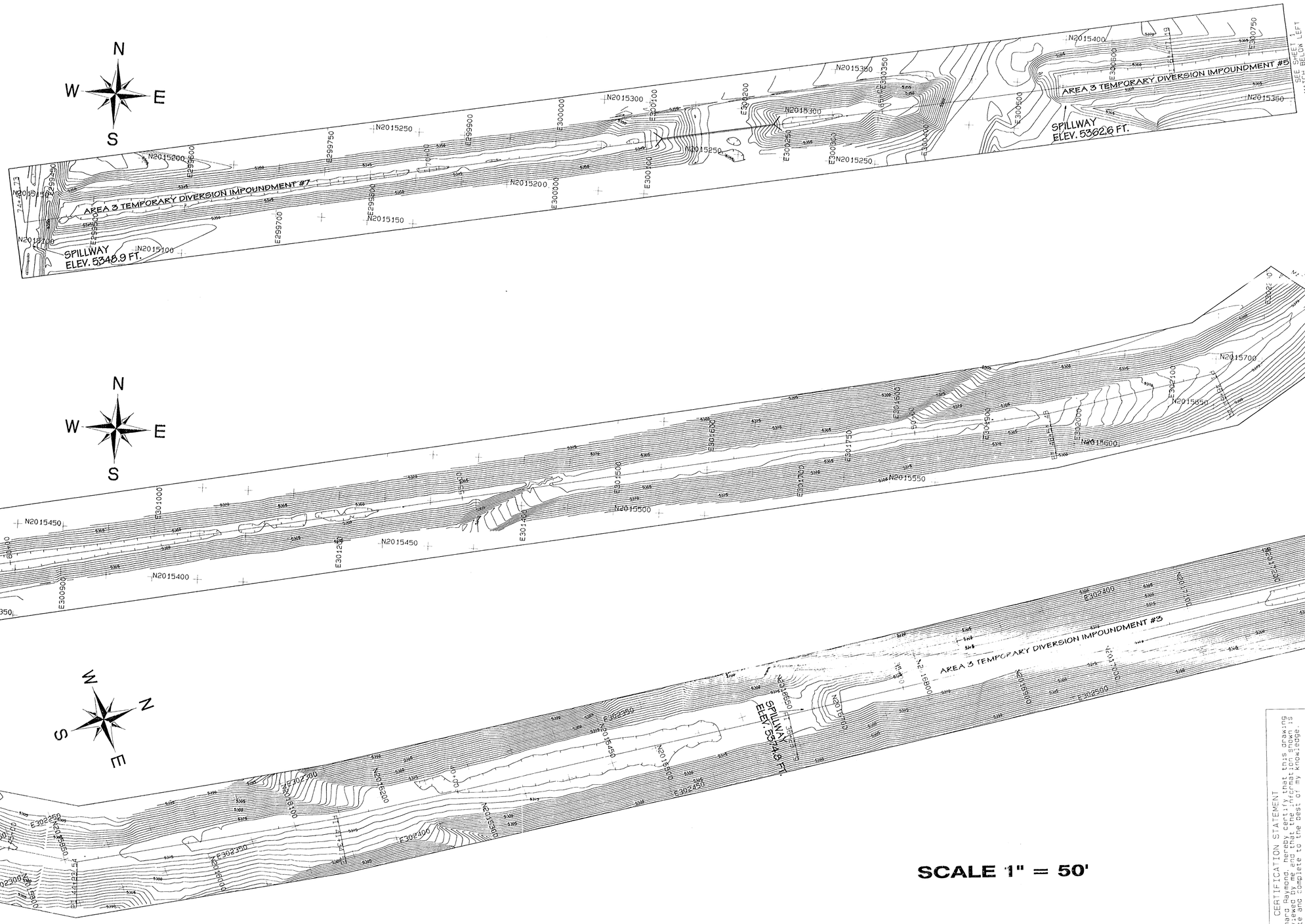


SCALE 1" = 50'

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

APPROVED

LEONARD RAYMOND
NEW MEXICO
6600
REGISTERED PROFESSIONAL ENGINEER

FOR GSM REVIEW	06-11-97

PROJECT MANAGER: GREG PERKINS
ENGR. OF RECORD: LEONARD RAYMOND
REG. NO. 6600
SRVYR. OF RECORD:
REG. NO.

BHP-NAVAJO COAL CO.

PO BOX 155, FRUITLAND, NEW MEXICO, 87416

ACCOUNT: PROJ. 151N/165A
DATE: JUNE 13, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

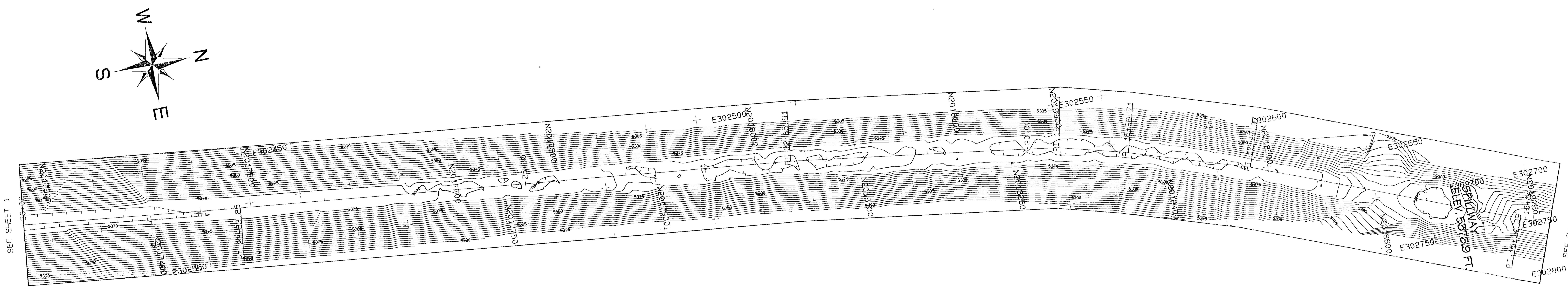
HIGHWALL IMPOUNDMENTS

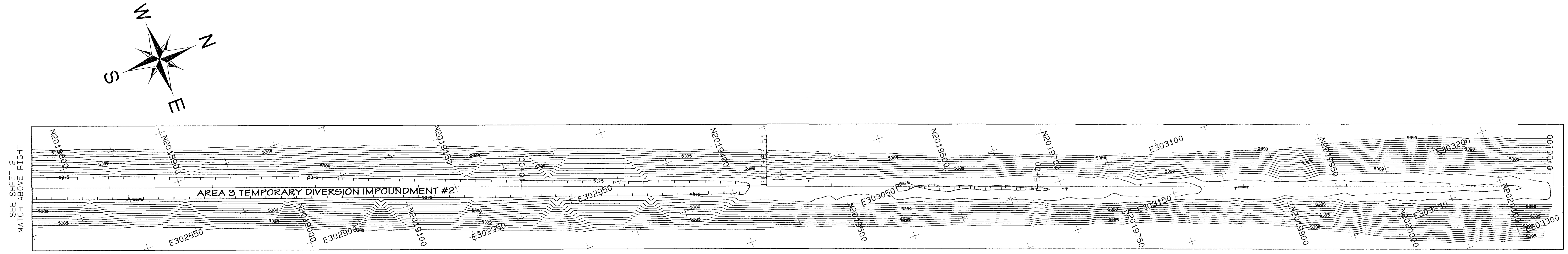
AREA 3 TEMPORARY DIVERSION IMPOUNDMENTS

DRAWING P-1

SHEET 0 OF 2

PATH: G:\USERVF.DWF\TMODEL\HIGHWALL\AREA3IMP.DWG Plot time: Wed Jun 11 16:19:46 1997





AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #2 STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5375	0.31	0.00	0.00
5376	0.59	0.45	0.45
5376.9	0.84	0.76	1.21

AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #3 STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5370	0.55	0.00	0.00
5371	0.74	0.65	0.65
5372	1.02	0.89	1.54
5373	1.41	1.22	2.76
5374	1.62	1.52	4.28
5374.8	1.79	1.43	5.71

AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #5 STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5359	0.21	0.00	0.00
5360	0.40	0.31	0.31
5361	0.49	0.45	0.76
5362	0.79	0.64	1.40
5362.6	0.97	0.58	1.98

AREA 3 TEMPORARY DIVERSION IMPOUNDMENT #7 STAGE STORAGE DATA

ELEV feet	AREA acres	VOLUME ac-ft	CUM. VOLUME ac-ft
5343	0.09	0.00	0.00
5344	0.26	0.18	0.18
5345	0.37	0.32	0.50
5346	0.44	0.40	0.90
5347	0.55	0.73	1.63
5348	0.65	0.86	2.49
5348.9	0.74	0.67	3.16

JUL 1997 APPROVED

SCALE 1" = 50'

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

JUL 1997 APPROVED

LEONARD RAYMOND NEW MEXICO 6600 REGISTERED PROFESSIONAL ENGINEER

6-27-97

REVISION	DATE
1 FOR OSM REVIEW	06-11-97

PROJECT MANAGER: GREG PERKINS
ENGR. of RECORD: LEONARD RAYMOND
REG. NO: 6600
SRVYR of RECORD:
REG. NO:

BHP-NAVAJO COAL CO.

PO BOX 155, FRUITLAND, NEW MEXICO, 87416

ACCOUNT: PRJD_151N/185N
DATE: JUNE 11, 1997
DESIGNED BY: F.T. JOHNSON
DRAWN BY: F.T. JOHNSON
CHECKED BY: LEONARD RAYMOND
APPROVED BY: LEONARD RAYMOND

PLAN

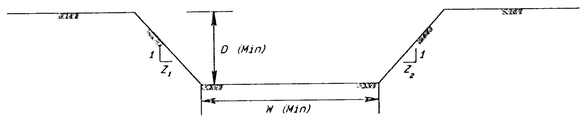
HIGHWALL IMPOUNDMENTS

AREA 3 TEMPORARY DIVERSION IMPOUNDMENTS

Path: G:\USER\KFJOHFT\MODEL\HIGHWALL\AREA3IMP.PRO Plot time: Thu Jun 12 06:58:40 1997

DRAWING P-2

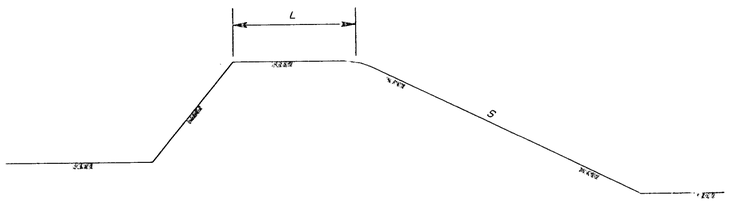
SHEET 0 OF 2



D includes 1'-0" of Freeboard

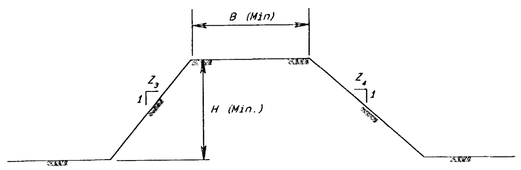
SPILLWAY SECTION

N.T.S.



SPILLWAY PROFILE

N.T.S.



H measured at the upstream toe of the embankment.

EMBANKMENT SECTION

N.T.S.

AS-BUILT DIMENSIONS

Impoundment Id	Watershed Area (Acres)	Peak Discharge (cfs)	Spillway (1)						Embankment (1)					
			W (ft)	L (ft)	Z_1	Z_2	L (ft)	S (%)	B (ft)	H (ft)	Z_3	Z_4	Comments
Hazzie Stockpond #1	125.5	92.8	20.0	4.0	1.8	3.0	29.4	25.0	15.2	5.1	2.0	2.8	
Hazzie Stockpond #2	174.1	116.2	24.5	2.8	3.0	2.8	27.6	16.0	15.1	4.7	2.6	2.2	
South Hostetler Stockpond #1	80.1	73.3	5.0	3.0	5.0	4.5	29.7	6.0	16.5	4.6	2.1	2.0	
South Hostetler Stockpond #2	37.7	89.3	20.0	3.0	6.0	2.2	33.0	4.5	14.2	6.2	2.0	2.0	
South Hostetler Stockpond #3	157.3	115.7	14.5	3.7	1.5	1.5	82.0	12.0	18.0	4.5	2.3	6.0	
Stub 16 Impoundment #6	20.2	24.3	12.5	4.0	3.0	3.0	45.0	7.0	38.0	8.1	2.8	3.6	
Stub 16 Impoundment #8	17.6	15.5	12.5	3.1	2.2	3.2	34.0	15.0	36.0	6.1	2.2	2.0	
Stub 16 Impoundment	103.4	69.8	14.0	4.5	3.4	2.3	48.0	7.0	12.5	10.0	2.0	2.0	
Sunflower #1	24.6	17.3	15.0	3.1	4.3	5.2	38.0	2.2	9.0	7.5	4.2	3.9	
Area 4 Temp. Div. Imp. #2	69.9	21.9	9.4	2.7	2.1	1.8	56.0	6.0	10.0	6.2	4.2	2.9	
Area 3 Temp. Div. Imp. #3	20.9	23.9	40.0	20.0	2.0	2.0	18.0	2.5	19.0	5.8	4.0	40.0	
Area 3 Temp. Div. Imp. #4	11.4	25.7	10.4	2.2	4.3	3.2	25.0	1.5	20.0	9.5	2.0	3.4	
Area 3 Temp. Div. Imp. #7	66.5	21.9	12.5	2.1	5.0	1.7	50.0	0.5	73.0	8.5	2.9	4.0	

(1) The data under each impoundment are the current dimensions of the structure
These indicate that the existing structures are adequate

Note: For supporting design data refer to Appendix III-II "Highwall Impoundment Design and As-Built Information" in the Mine Permit

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

LEONARD RAYMOND NEW MEXICO 6603 REGISTERED PROFESSIONAL ENGINEER

11-21-97

APPROVED DEC 1997

REV. No.	DATE	DRAFT. BY	REVISION DESCRIPTION	ENG.	E.G.	P.E.	P.S.	CHIEF ENG.
C	10-30-97	PJF	REMOVED EXHIBIT No.		PS			
B	08-27-97	FTJ	REVISED TABLE					
A	03-27-97	PJF	SUBMITTED TO OSM FOR APPROVAL					

APPROVALS

BHP NAVAJO COAL COMPANY

NAVAJO MINE

SAFETY PAYS

P.O. BOX 155 FRUITLAND, NEW MEXICO 87416

HIGHWALL IMPOUNDMENTS
"AS BUILT"

PREPARED BY LR	DRAWN BY PJF	SCALE AS NOTED
APPROVED BY LR	DATE 03-25-97	MYLAR LOC. A13-2

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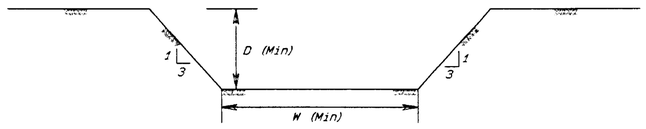
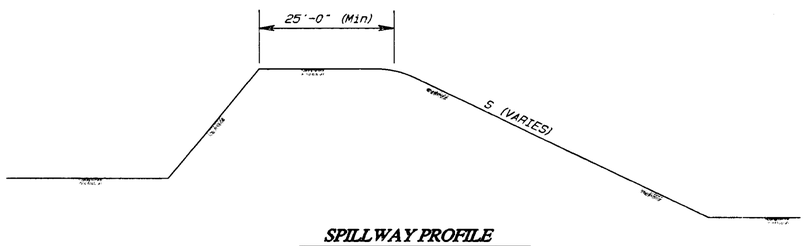


D includes 1'-0" of Freeboard

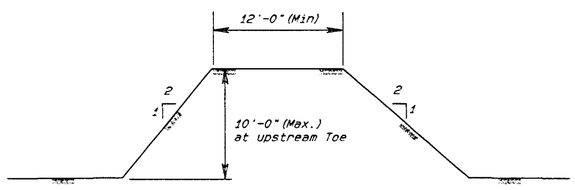
SPILLWAY SECTION

N.T.S.



SPILLWAY PROFILE

N.T.S.



EMBANKMENT SECTION

N.T.S.

SPILLWAY SCHEDULE

Watershed Area (acres)	CN	Discharge Peak (cfs)	Spillway D (ft)	Spillway W (ft)
25.0	93.0	33.3	2.00	15.00
	90.0	27.0	2.00	15.00
	86.0	20.2	2.00	10.00
	83.0	15.8	2.00	10.00
50.0	93.0	58.7	2.25	20.00
	90.0	47.1	2.00	20.00
	86.0	34.5	2.00	15.00
	83.0	26.9	2.00	15.00
75.0	93.0	80.5	2.25	25.00
	90.0	64.2	2.25	20.00
	86.0	46.7	2.00	20.00
	83.0	36.1	2.00	15.00
100.0	93.0	100.2	2.50	20.00
	90.0	79.5	2.25	25.00
	86.0	57.6	2.25	20.00
	83.0	44.3	2.00	20.00
150.0	93.0	134.1	2.75	25.00
	90.0	105.7	2.50	25.00
	86.0	76.3	2.25	25.00
	83.0	58.3	2.00	25.00
200.0	93.0	163.8	3.00	20.00
	90.0	129.0	2.75	20.00
	86.0	92.7	2.50	20.00
	83.0	70.7	2.25	20.00
300.0	93.0	214.6	3.00	30.00
	90.0	169.4	3.00	20.00
	86.0	121.2	2.50	25.00
	83.0	92.2	2.50	20.00
400.0	93.0	259.5	3.25	30.00
	90.0	204.7	3.00	25.00
	86.0	146.2	2.75	25.00
	83.0	111.6	2.50	25.00
500.0	93.0	300.2	3.50	25.00
	90.0	236.5	3.25	25.00
	86.0	168.9	3.00	20.00
	83.0	129.1	2.75	20.00
600.0	93.0	337.4	3.50	30.00
	90.0	265.7	3.25	30.00
	86.0	189.6	3.00	25.00
	83.0	145.1	2.75	25.00
700.0	93.0	372.1	3.75	30.00
	90.0	292.9	3.50	25.00
	86.0	209.1	3.00	25.00
	83.0	160.0	3.00	20.00

Note: For supporting design data refer to Appendix 11-II "Highwall Impoundment Design and As-built Information" in the Mine Permit.

CERTIFICATION STATEMENT

I, Leonard Raymond, hereby certify that this drawing was reviewed by me and that the information shown is accurate and complete to the best of my knowledge.

APPROVED DEC 1997

LEONARD RAYMOND NEW MEXICO 6600 PROFESSIONAL ENGINEER

11-24-97

REV. No.	DATE	DRAFT. BY	REVISION DESCRIPTION	ENG	E.Q.	P.E.	P.S.	CHIEF ENG.
B	10-30-97	PJF	REMOVED EXHIBIT No.		PS			
A	03-27-97	PJF	SUBMITTED TO OSM FOR APPROVAL					

APPROVALS

BHP NAVAJO COAL COMPANY

NAVAJO MINE

SAFETY PAYS

P.O. BOX 155 FRUITLAND, NEW MEXICO 87416

HIGHWALL IMPOUNDMENTS

STANDARD DESIGN

PREPARED BY LR	DRAWN BY PJF	SCALE AS NOTED
APPROVED BY LR	DATE 03-25-97	MYLAR LOC. A13-2

PATH: J:\OSM_SUBM\PER_PROG\CH_11\HWSTR\HGWLIMP.PRO