PROPOSED 110d PERMIT BOUNDARY

CURRENT PROJECTED UNDERGROUND (UG) MINE WORKINGS IMPACT ZONE

PRINCE ALBERT DECLINE

PRINCE ALBERT UNDERGROUND WORKINGS

CURRENT FACE

PROPOSED WATER DROP LOCATION

PROPOSED VENT HOLE LOCATION

PROPOSED DEVELOPMENT

PROPOSED DEVELOPMENT

BETTER BE DUMP

HISTORIC BETTER BE DECLINE

PROJECTED INACTIVE HISTORIC WORKINGS

BLM

A

A

317.7

105.8

363.8

4.42%

S 37D 59' 05" E

DH 035 5993.82 DRY

DH 041 5973.15 DRY

DH 037 5993.82 DRY

DH - ORE 5980.69 DRY

DH 036 5947.28 DRY

DH 034 5973.64 DRY

DH 5959.38 DRY

DH 5978.06 DRY

DH - WET 5967.27 WET - H2O @ 5836 - 5843

DH 5972.79 DRY

DH 5984.10 DRY

DH 027 5946.48 DRY

DH 001 5950.55 DRY

DH 002 5953.44 DRY

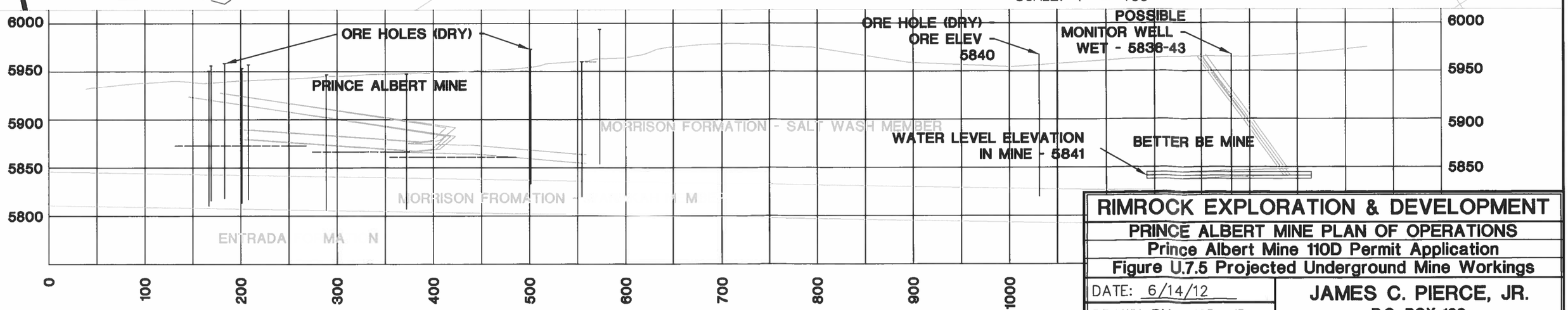
DH 004 5956.06 DRY

DH 003 5957.21 DRY

DH 005 5958.46 DRY

100 50 0 100

SCALE: 1" = 100'



RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE PLAN OF OPERATIONS

Prince Albert Mine 110D Permit Application

Figure U.7.5 Projected Underground Mine Workings

DATE: 6/14/12

DRAWN BY: JCP, JR.

SHEET 1 OF 1

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LEGEND

- EPHEMERAL STOCK POND
- EPHEMERAL STREAM
- SECTION CORNER
- SECTION LINE
- SECONDARY ROAD
- MAJOR ROAD
- REFERENCE LINE FOR HYDROLOGIC SECTION (H — H)

URANIUM RESERVE

DOLOUR

DEPARTMENT OF ENERGY

PRINCE ALBERT MINE SITE PROPOSED 110D BOUNDARY

PRINCE ALBERT POO PROJECT BOUNDARY

URAVAN WEATHER STATION

2mi RADIUS

SCALE: 1" = 2000'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE 110d PERMIT

FIGURE A.1

GENERAL LOCATION MAP

DATE: 6/14/12

DRAWN BY: JCP, JR.

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LEGEND

RIM

EXISTING CONTOURS 5920

RIM

BLM

BLM

BLM

EXISTING CONTAINMENT BERM

EXISTING SEDIMENT BASIN

EXISTING WASTE DUMP
Area = 8,932 sq.ft.
0.205 Acres.

FAN

EXISTING CONTAINER

EXISTING ORE PAD
Area is = 6,084 sq.ft. = 0.140 Acres.

EXISTING DIVERSION BERM

EXISTING TRUCK LOADING POINT

EXISTING PORTAL

MAGAZINES

EXISTING SEDIMENT BASIN

MONITOR WELL

EXISTING ROAD

EXISTING ROAD

EXISTING DRILL/ACCESS ROAD

MINE ACCESS ROAD - Area is = 16,780 sq.ft. = 0.385 Acres.

EXISTING DRILL ROAD

EXISTING DRILL ROAD

EXISTING DRILL ROAD

PRINCE ALBERT NO. 1

PRINCE ALBERT NO. 2

COUNTY ROAD U16

5920 5925 5930 5935 5940 5945 5950 5955 5960 5965 5970 5975 5980 5985 5990 5995

N

80 40 0 80

SCALE: 1" = 80'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT C, FIGURE C.1 - EXISTING SITE MAP

DATE: 6/14/12

DRAWN BY: JCP, JR.

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LEGEND

RIM

EXISTING CONTOURS — 5920

PROPOSED CONTOURS –
WASTE DUMPS — 5920

STORMWATER STRUCTURES — 5920 — 5920

LAND OWNERSHIP — BLM

BLM

RIM

Area is – 359505.283 sq.ft. – 8.253 Acres.

COLLECTION SWALE
Area is – 5,177.5 sq.ft. –
0.119 Acres.

COLLECTION SWALE
Area is –
10,550 sq.ft. –
0.242 Acres.

ORE PAD POND
Area is
3,990 sq.ft. –
0.092 Acres.

EXISTING CONTAINER

EXISTING ORE PAD
Area is –
9,084 sq.ft. –
0.140 Acres.

FAN

12% DECLINE

SOUTH POND
Area is –
15,958 sq.ft. –
0.366 Acres.

EQUIPMENT SERVICE AREA

PRIMARY WASTE DUMP
Area is – 49,214 sq.ft. –
1.130 Acres.

CENTRAL POND
Area is –
3,645 sq.ft. –
0.084 Acres.

NORTH POND
Area is –
14,391 sq.ft. –
0.330 Acres.

MAGAZINES

EXISTING PORTAL

PORTAL AND SERVICE AREA
Area is – 34655.377 sq.ft. –
0.796 Acres.

MONITOR WELL

SECONDARY DUMP
Area is – 18,123 sq.ft. –
0.416 Acres.

COMPRESSOR/
AIR DROP

EXISTING ROAD

POSSIBLE FUTURE MAINTENANCE AND TOPSOIL STORAGE AREA
Area is – 17,280 sq.ft. –
0.397 Acres.

COLLECTION SWALE
Area is –
6,590 sq.ft. –
0.151 Acres.

110D PERMIT BOUNDARY

EXISTING DRILL ACCESS ROAD

MINE ACCESS ROAD – Area is – 16,782 sq.ft. – 0.385 Acres.

PRINCE ALBERT NO. 1

PRINCE ALBERT NO. 2

110D PERMIT BOUNDARY

EXISTING DRILL ROAD

EXISTING DRILL ROAD

BLM

FUTURE VENT HOLE LOCATION
Area is – 3,288 sq.ft. –
0.076 Acres.

SERVICE DROP
Area is –
1,765 sq.ft. –
0.041 Acres.

EXISTING DRILL ROAD

COUNTY ROAD U16

80 40 0 80

SCALE: 1" = 80'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT E, FIGURE E.1 - MINE PLAN SITE MAP

DATE: 6/14/12

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BLM

BLM

BLM

PRINCE ALBERT NO. 1

PRINCE ALBERT NO. 2

COUNTY ROAD U16

MONITOR WELL

LEGEND

RIM

PROPOSED FINAL CONTOURS – 5920

5910
5915
5920
5925
5930
5935
5940
5945
5950

2.00%
2.0%
5.90%
8.60%
8.03%
6.47%
10.02%
10.05%
5.10%
10.20%
5.69%
3:1
4:1

80 40 0 80

SCALE: 1" = 80'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE 110D PERMIT APPLICATION
EXHIBIT E, FIGURE E.2 - RECLAMATION PLAN MAP

DATE: 6/14/12

DRAWN BY: JCP, JR.

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MINE ROADS/YARD AREA
TR 55 – HSG D –
DEVELOPED AREA –
DIRT ROAD

UNDISTURBED SITE AREA
TR 55 – HSG D –
PINYON JUNIPER RANGELAND –
POOR VEGETATION

LEGEND

RIM

CURRENT WASTE DUMP
TR 55 – HSG A –
FALLOW AG/NEWLY GRADED

TOPSOIL STOCKPLE
TR 55 – HSG C –
VEGETATION ESTABLISHED

BLM

BLM

Area is – 16709.780 sq.ft. – 0.384 Acres.

Area is – 919.285 sq.ft. – 0.021 Acres.

PA-N1

Area is – 7516.179 sq.ft. – 0.010.172 Acres.

Area is – 25609.188 sq.ft. – 0.588 Acres.

Area is – 4441.168 sq.ft. – 0.102 Acres.

Area is – 14158.503 sq.ft. – 0.325 Acres.

PA-1

PA-N2

Area is – 23963.361 sq.ft. – 0.550 Acres.

PA-C

Area is – 1311.452 sq.ft. – 0.030 Acres.

Area is – 71808.807 sq.ft. – 1.649 Acres.

Area is – 752.530 sq.ft. – 0.017 Acres.

Area is – 1790.738 sq.ft. – 0.041 Acres.

Area is – 1969.917 sq.ft. – 0.025 Acres.

PA-H3L

Area is – 1328.591 sq.ft. – 0.031 Acres.

PA-S

Area is – 3095.738 sq.ft. – 0.071 Acres.

Area is – 3882.455 sq.ft. – 0.089 Acres.

Area is – 1711.222 sq.ft. – 0.039 Acres.

LAND OWNERSHIP

BLM

Area is – 471.861 sq.ft. – 0.011 Acres.

PA-H1

PA-H4

PRINCE ALBERT NO.

PRINCE ALBERT NO.

Area is – 2944.533 sq.ft. – 0.068 Acres.

Area is – 2628.421 sq.ft. – 0.060 Acres.

PA-H3U

Area is – 2385.681 sq.ft. – 0.055 Acres.

PA-V

Area is – 7434.090 sq.ft. – 0.171 Acres.

BLM

Area is – 585.263 sq.ft. – 0.013 Acres.

PA-2

Area is – 3430.964 sq.ft. – 0.079 Acres.

Area is – 887.656 sq.ft. – 0.020 Acres.

Area is – 413.698 sq.ft. – 0.009 Acres.

PA-H2

80 40 0 80

SCALE: 1" = 80'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT U, FIGURE U.1 - TR-55 CN REFERENCE

DATE: 6/14/12

DRAWN BY: JCP, JR.

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BASIN	AREA (AC.)	CN	D10	VOL-10 (CF)	FLOW 100(CFS)
PA-S	1.749	89	1.003	6369	5.01
PA-1	0.365	91	1.137	1507	1.11
PA-C	1.277	90	1.069	4650	3.82
PA-N1	0.41	88	1.003	1041	1.13
PA-N2	0.56	89	0.941	2039	1.62

PA-N(N1+N2) Totals – 3080, 2.75

BASIN	AREA (AC.)	CN	D10	FLOW 100(CFS)
PA-H1	2.91	89	1.003	8.35
PA-H2	1.03	89	1.003	2.96
PA-H3	0.31	89	1.003	0.88
PA-H4	1.77	89	1.003	5.08

LEGEND

- FLOW ARROW
- RIM
- DRAINAGE SWALE (DS)
- RIPRAP (RP)
- DIVERSION DIKE (DD)
- WATER BAR (WB)
- CHECK DAM (CD)
- SILT FENCE (SF)
- EXISTING CONTOURS 5920
- BASIN LABEL PA-N1
- BASIN BOUNDARY

BLM

RIM

PA-S

PA-1

PA-C

PA-N1

PA-N2

PA-H1

PA-H2

PA-H3I

PA-H3U

PA-H4

SOUTH POND

CENTRAL POND

NORTH POND

OREPAD POND

PRIMARY DUMP

SECONDARY DUMP

EXISTING CONTAINER

VENTILATION FAN

EXISTING ORE PAD

12% DECLINE

EQUIPMENT MAINTENANCE AREA

EXISTING PORTAL

PORTAL AND SERVICE AREA

MAGAZINES

MONITOR WELL

TOPSOIL STOCKPILE

POSSIBLE FUTURE MAINTENANCE AREA

EXISTING MINE ACCESS ROAD

EXISTING DRILL/ACCESS ROAD

EXISTING ROAD

EXISTING DRILL ROAD

PRINCE ALBERT NO. 1

PRINCE ALBERT NO. 2

FUTURE SERVICE DROP SITE

COUNTY ROAD U16

80 40 0 80

SCALE: 1" = 80'

RIMROCK EXPLORATION & DEVELOPMENT

PRINCE ALBERT MINE - 110D PERMIT APPLICATION

EXHIBIT U-1 - OVERALL PLAN

Surface Water Control and Containment Facilities

DATE: 6/14/12

DRAWN BY: JCP, JR.

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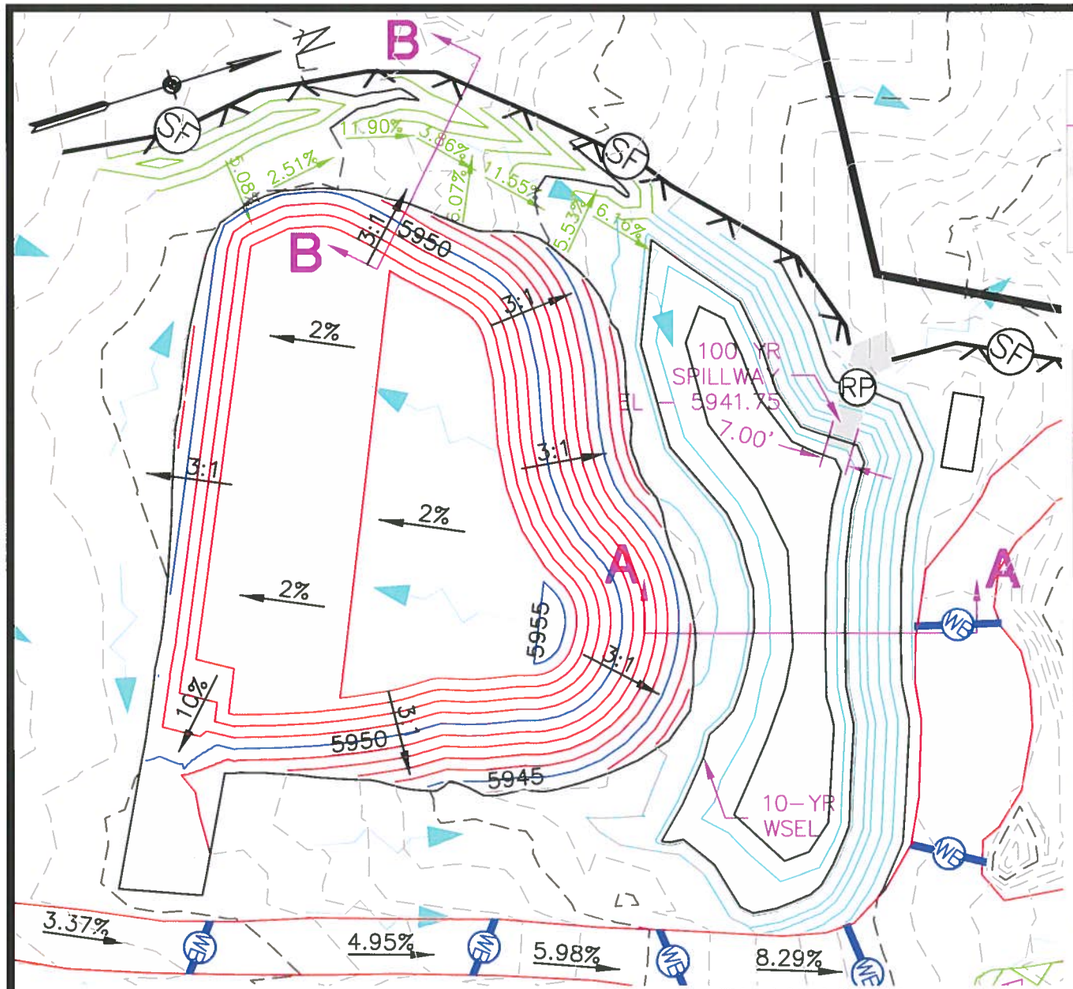
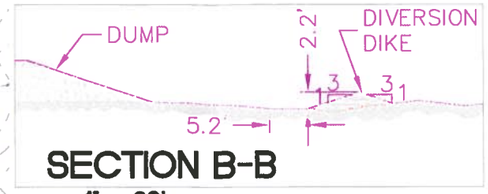


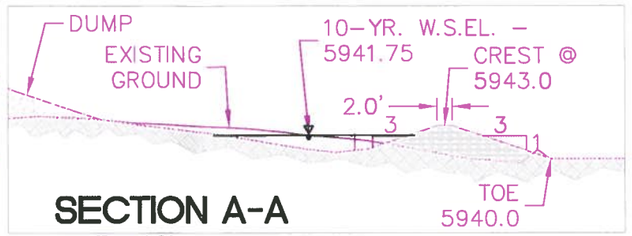
PLAN VIEW
1" = 40'

DIVERSION DIKE

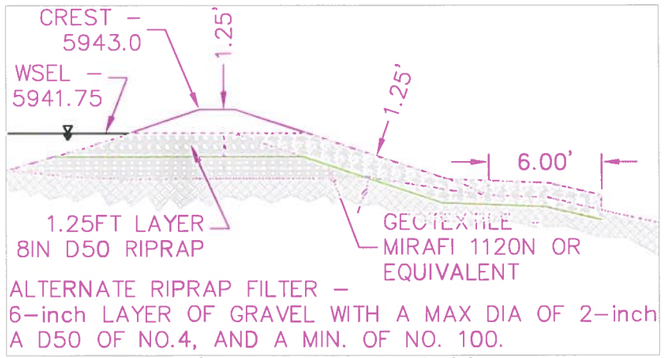


SECTION B-B
1" = 20'

SOUTH DETENTION



SECTION A-A
1" = 20'



SECTION THRU SPILLWAY
1/8" = 1'

100–YR/24HR PEAK DESIGN FLOW – 5.01 CFS

Channel Data	Maximum		Minimum
Slope	0.1155 ft/ft	–	0.025 ft/ft
Manning's n	0.0280		
Height	24.0 in		
Width	62.0 in		0.0 in
Left slope	0.333 ft/ft (V/H)	–	0.052 ft/ft
Right slope	0.050 ft/ft (V/H)	–	0.333 ft/ft

Computed Results:

Depth	1.91 in	–	4.8 in
Velocity	4.54 fps	–	2.8 fps
Percent full	7.9 %	–	19.9 %

DETENTION POND 10–YR/24 HR DESIGN VOLUME –

BASIN	AREA	CN	D10	VOLUME
PA–S	1.749	89	1.003	6,369

VOLUME PROVIDED @ ELEVATION (MODIFIED SPILLWAY) –

ELEV	AREA	CONIC
5943.0	8304.86	15,009.2
5942.0	5973.22	7,902.1
5941.75	5520.33	6,517.7
5941.0	3897.19	3,003.7
5940.0	2191.55	0.0

DETENTION POND 100–YR/24 HR DESIGN VOLUME –

BASIN	AREA	CN	D100	VOLUME
PA–S	1.749	89	1.873	11,890

SPILLWAY RIPRAP DESIGN
100–YR/24HR PEAK DESIGN FLOW – 5.01 CFS

Height of flow (Broad Crested Weir) – H=(Q/CL)^2/3

For C = 2.84, Q = 5.01 cfs, L = 84 in

H = 4.79 in, Spillway Elevation @ 5941.75, Crest @ 5943.0

RIPRAP DESIGN – FROM PAP–0790 – SIMPLIFIED DESIGN GUIDELINES
FOR RIPRAP SUBJECTED TO OVERTOPPING FLOW (BuRec, CSU)

D50 Cu^1/4=0.55(qf^0.52/S^3/4)(sin a/(Gs cos a–1)(cos a tan phi–sin a))^1.11
D50=(0.55(qf^0.52/S^3/4)(sin a/(Gc cos a–1)(cos a tan phi–sin a))^1.11)/Cu^1/4

FOR SOUTH POND –
D50 = median stone size (m)
Cu = coefficient of uniformity = 1.95, qf = unit discharge (m3/m/s) = 0.066
S = embankment slope (unitless) = 0.333, a = embankment slope (degrees) = 18.43
Gs = specific gravity of riprap = 2.24, phi = angle of repose of the riprap = 42

D50 = 0.126M or 5.0in

For interstitial flow, Vi (flow velocity) = (gD50)^0.5*2.48s^0.58*CU^–2.22
where s = slope in ft per ft = 0.333
Vi = (32.16x(5/12))^0.5x(2.48x(0.333)^0.58)x(1.95^–2.22) = 1.090 fps
Average velocity is the interstitial velocity multiplied by the porosity (Np) of the riprap – Vav = Vi x Np.

for Np = 0.45, Vav = 1.090x0.45 = 0.49 fps.
Depth of flow is the flow quantity divided by the average velocity – Y = Q/Vav, Y = (5.01/7ft.)/0.49fps = 1.46 ft. or 17.5 in., using an integer multiple of D50 for thickness gives 4xD50 for 20 inches of 5 in. D50 riprap.

To provide a safety factor use a riprap with a D50 of 7.5 in.

Vi = (32.16x(7.5/12))^0.5x(2.48x(0.333)^0.58)
x(1.95^–2.22) = 1.33 fps
Vav = 1.19x0.45 = 0.60 fps.
Y = (5.01cfs/7ft)/0.60fps = 1.19 ft or 14.3 in, using an integer multiple of D50 for thickness gives 2xD50 for 15 inches of 7.5 in D50 riprap.

NOTE –

SEE SHEET U–5 FOR TYPICAL SETIONS (LATERAL) THRU SPILLWAY.

RIMROCK EXPLORATION & DEVELOPMENT
PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT U-2 - STRUCTURES
Surface Water Control and Containment Facilities

DATE: 6/14/12
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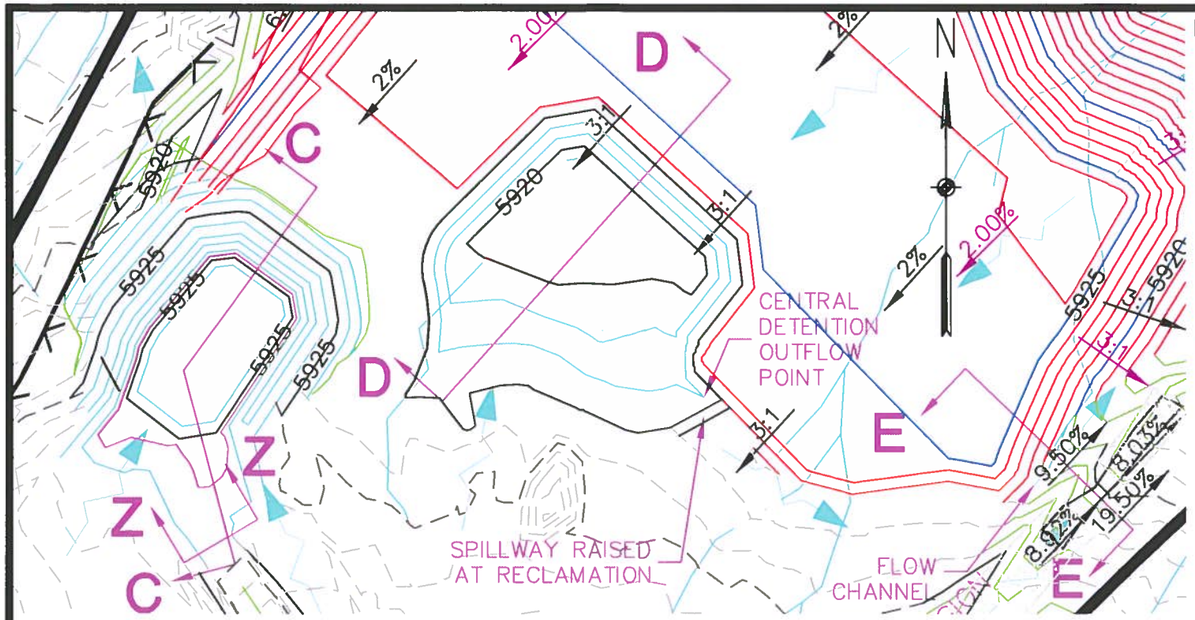
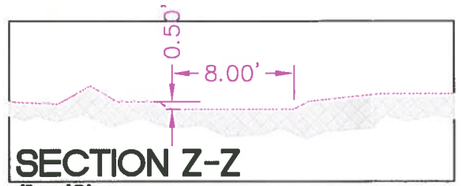


OREPAD DETENTION

SECTION C-C
1" = 20'



SECTION Z-Z
1" = 10' SEE SHEET U-5 FOR CALCULATIONS

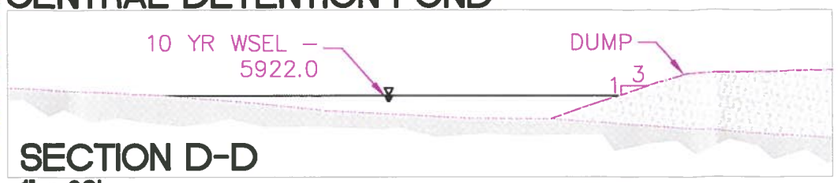
DETENTION POND 10-YR/24 HR DESIGN VOLUME –

BASIN	AREA	CN	D10	VOLUME
PA-C	1.277	90	1.069	4,650

DETENTION POND 100-YR/24 HR DESIGN VOLUME –

BASIN	AREA	CN	D10	VOLUME
PA-C	1.277	90	1.957	8,681

CENTRAL DETENTION POND



SECTION D-D
1" = 20'

DETENTION POND 24 HR/10/100 – YR DESIGN VOLUME –

BASIN	AREA	CN	D10	VOLUME
PA-1	0.365	92	1.210	1,603

BASIN	AREA	CN	D100	VOLUME
PA-1	0.365	92	2.133	2,826

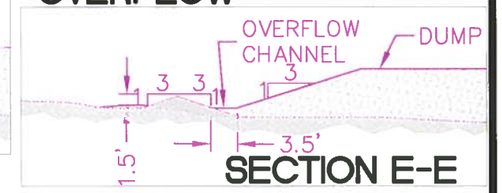
VOLUME PROVIDED –

ELEV	AREA	VOL (CONIC)
5926.0	2273.78	2768.8
5925.5	1616.33	1800.9
5925.0	1234.64	1090.3
5924.0	952.06	0.0

VOLUME PROVIDED @ ELEVATION 5922.0 – 5837 CU.FT.

ELEV	AREA	VOL (CONIC)
5923.0	5060	9254.6
5922.0	3646	4921.2
5921.0	2459	1888.3
5920.0	1370	0.0

CENTRAL DETENTION OVERFLOW

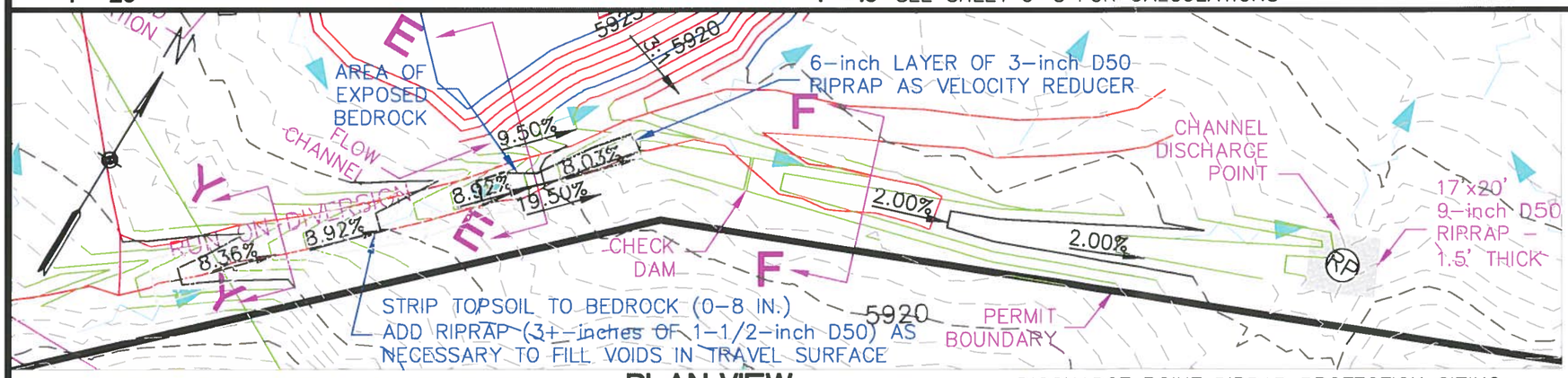


SECTION E-E
1" = 20'

100-YR PEAK DESIGN FLOW – 3.82 CFS

Channel Data

Flowrate	3.82 cfs
Slope	0.095 ft/ft
Height	18.0 in
Bottom Width	42.0 in
Left slope	0.33 ft/ft (V/H)
Right slope	0.33 ft/ft (V/H)
Manning's n	0.0280
Depth	2.10 in
Velocity	4.73 fps
Percent full	8.76 %



PLAN VIEW
1" = 40'

100-YR PEAK DESIGN FLOW – RUN ON DIVERSION –

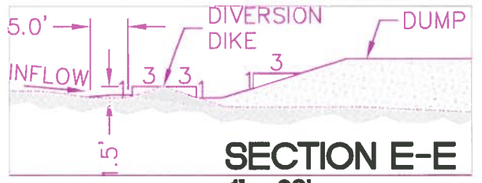
	SECTION Y-Y	SECTION E-E		SECTION F-F
Flow	8.35 cfs	8.35 cfs	–	11.31 cfs
Slope	0.089 ft/ft	0.195 ft/ft	–	0.020 ft/ft
Depth	18.0 in			
Bottom width	60.0 in	60.0 in		60.0 in
Left slope	0.33 ft/ft (V/H	0.33 ft/ft (V/H)	–	0.33 ft/ft (V/H)
Right slope	0.133 ft/ft (V/H)	0.133 ft/ft (V/H)	–	0.33 ft/ft (V/H)
Manning's n	0.0390	0.0350	–	0.028
Depth	3.52 in	2.67 in	–	5.9 in
Velocity	4.34 fps	6.10 fps	–	4.0 fps
Percent full	19.6 %	14.8 %	–	32.8 %

DISCHARGE POINT RIPRAP PROTECTION SIZING –

Slope	0.05 ft/ft
Manning's n	0.0352
Depth	5.33 in
Velocity	4.90 fps

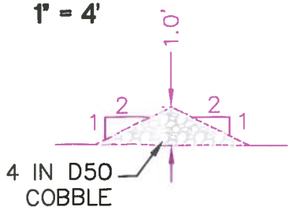
Using the Shear Stress design formula – ST=62.4xdxs, where d is depth (ft) and s is slope (ft/ft) yields a ST of 1.4 which equates to a 6-inch d50 RIPRAP.
As an additional safety factor upsize to a 9-inch D50. Thickness is 2 x d50 or 1.5 ft.

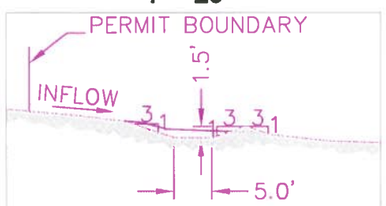
EAST RUN ON DIVERSION SWALE



SECTION E-E
1" = 20'

CHECK DAM
1" = 4'





SECTION F-F
1" = 20'

RIMROCK EXPLORATION & DEVELOPMENT
PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT U-3 - STRUCTURES 2
Surface Water Control and Containment Facilities

DATE: 6/14/12
DRAWN BY: JCP, JR.
SHEET 3 OF 5

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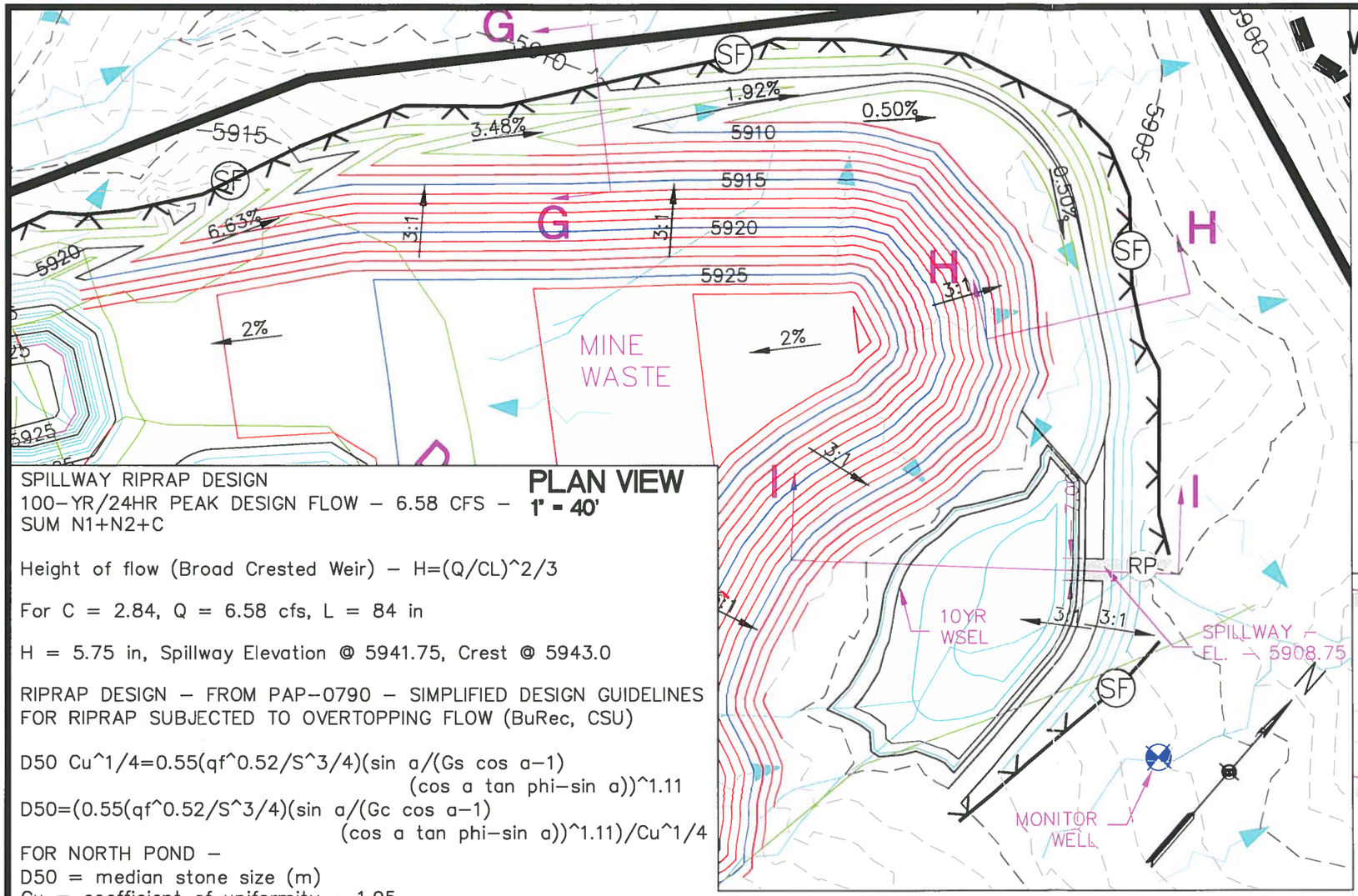


PLAN VIEW
1" = 40'

SPILLWAY RIPRAP DESIGN
100-YR/24HR PEAK DESIGN FLOW - 6.58 CFS - SUM N1+N2+C

Height of flow (Broad Crested Weir) - H=(Q/CL)^2/3

For C = 2.84, Q = 6.58 cfs, L = 84 in

H = 5.75 in, Spillway Elevation @ 5941.75, Crest @ 5943.0

RIPRAP DESIGN - FROM PAP-0790 - SIMPLIFIED DESIGN GUIDELINES FOR RIPRAP SUBJECTED TO OVERTOPPING FLOW (BuRec, CSU)

D50 Cu^1/4=0.55(qf^0.52/S^3/4)(sin a/(Gs cos a-1)
(cos a tan phi-sin a))^1.11
D50=(0.55(qf^0.52/S^3/4)(sin a/(Gc cos a-1)
(cos a tan phi-sin a))^1.11)/Cu^1/4

FOR NORTH POND -
D50 = median stone size (m)
Cu = coefficient of uniformity = 1.95,
qf = unit discharge (m3/m/s) = 0.087
S = embankment slope (unitless) = 0.333,
a = embankment slope (degrees) = 18.43
Gs = specific gravity of riprap = 2.24,
phi = angle of repose of the riprap = 42

D50 = 0.145M use 6.0in

For interstitial flow, Vi (flow velocity) = (gD50)^0.5*2.48s^0.58*CU^-2.22 where s = slope in ft per ft = 0.333
Vi = (32.16x(6/12))^0.5x(2.48x(0.333)^0.58)x(1.95^-2.22) = 1.194 fps
Average velocity is the interstitial velocity multiplied by the porosity (Np) of the riprap - Vav = Vi x Np.

for Np = 0.45, Vav = 1.194x0.45 = 0.537 fps.
Depth of flow is the flow quantity divided by the average velocity - Y = Q/Vav, Y = (6.58/7ft.)/0.537fps = 1.75 ft. or 21.0 in., using an integer multiple of D50 for thickness gives 4xD50 for 24 inches of 6 in. D50 riprap.

To provide a safety factor use a riprap with a D50 of 9.0 in.

Vi = (32.16x(9/12))^0.5x(2.48x(0.333)^0.58)x(1.95^-2.22) = 1.46 fps
Vav = 1.46x0.45 = 0.66 fps.
Y = (6.58cfs/7ft)/0.66fps = 1.43 ft or 17.15 in, using an integer multiple of D50 for thickness gives 2xD50 for 18 inches of 9 in D50 riprap.

DETENTION POND 10 YR/24-HR DESIGN VOLUME -

BASIN	AREA	CN	D10	VOLUME	
PA-N1	0.41	88	0.941	1,402	
PA-N2	0.56	89	1.003	2,039	TOTAL - 3,441

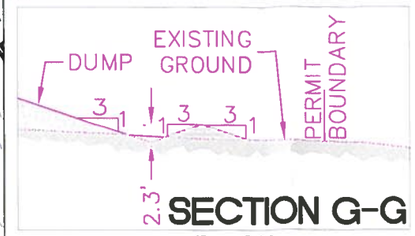
VOLUME PROVIDED @ ELEVATION 5908.75 - 3926.5

DETENTION POND 100 YR/24-HR DESIGN VOLUME - (RAISED SPILLWAY)

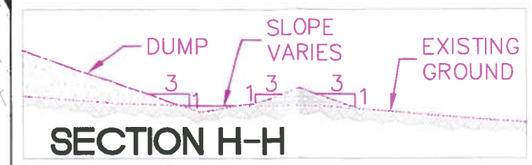
BASIN	AREA	CN	D10	VOLUME	
PA-N1	0.41	88	1.792	2,666	
PA-N2	0.56	89	1.873	3,807	TOTAL - 6,473

VOLUME PROVIDED @ ELEVATION 5909.33 - 6370.0

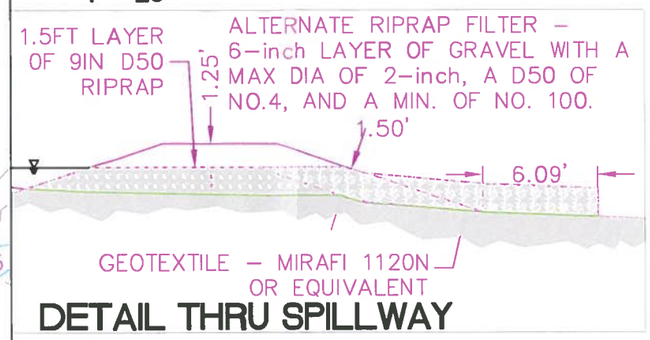
WEST DIVERSION SWALE



SECTION G-G
1" = 20'



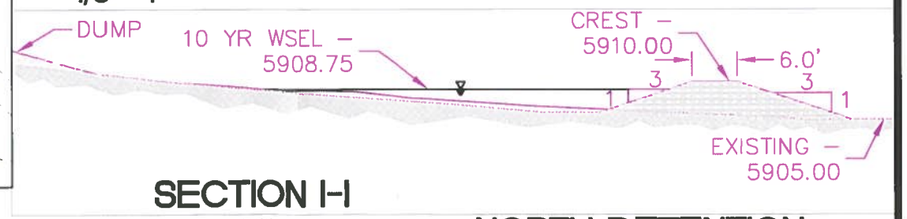
SECTION H-H
1" = 20'



DETAIL THRU SPILLWAY
1/8" = 1'

NOTE -

SEE SHEET U-5 FOR TYPICAL SETIONS (LATERAL) THRU SPILLWAY



SECTION I-I
1" = 20'

NORTH DETENTION

NORTH DETENTION POND DESIGN VOLUMES -

ELEVATION	AREA	VOLUME (CONIC)
5909.33	4506.63	6370.0
5909.0	4221.22	4915.6
5908.75	3697.25	3926.5
5908.0	2371.78	1668.9
5907.0	1053.97	0.0

100-YR PEAK DESIGN FLOW
SUB-BASIN PA-N1 - 1.13 CFS
Channel Data:

Flowrate	1.13 cfs
Manning's n	0.0280
Slope	0.0663 ft/ft
Height	24.0 in
Left slope	0.33 ft/ft (V/H)
Right slope	0.33 ft/ft (V/H)
Depth	3.76 in
Velocity	3.83 fps
Percent full	15.67 %

RIMROCK EXPLORATION & DEVELOPMENT
PRINCE ALBERT MINE - 110D PERMIT APPLICATION
EXHIBIT U-4 - STRUCTURES 3
Surface Water Control and Containment Facilities

DATE: 6/14/12
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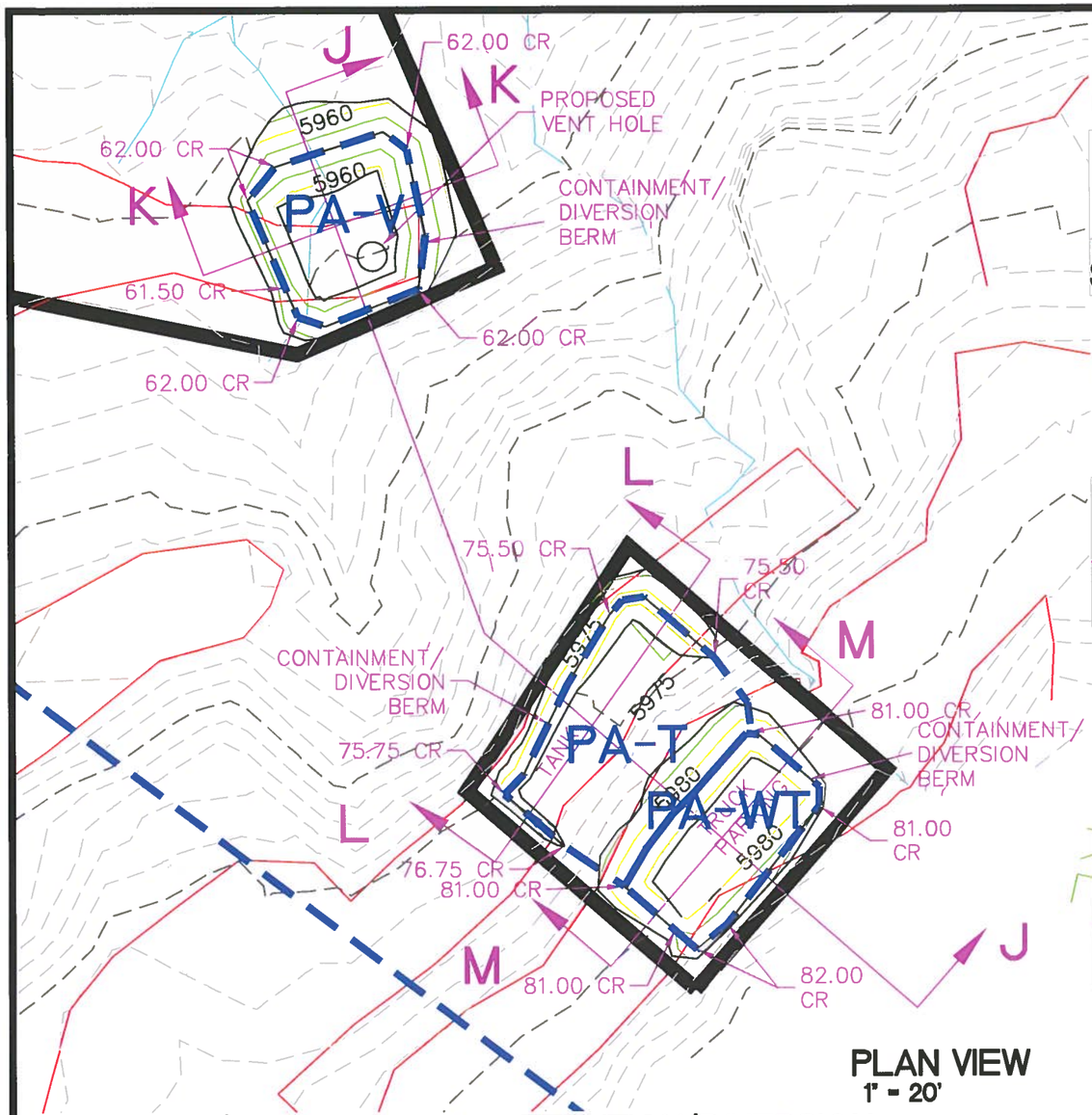
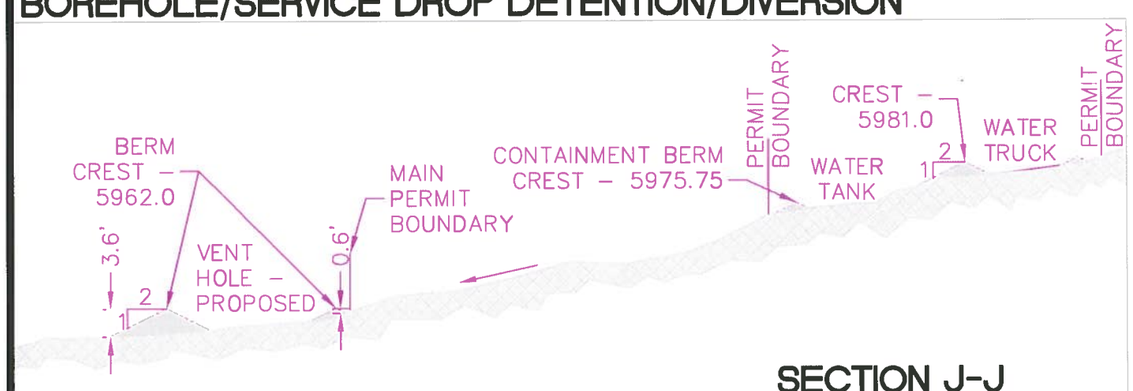


PLAN VIEW
1" = 20'

BOREHOLE/SERVICE DROP DETENTION/DIVERSION



SECTION J-J
1" = 20'

VENT BORE HOLE DETENTION DESIGN VOLUME –

BASIN	AREA	C10	D10	VOLUME
PA–V	0.010	0.63	1.97	46.6

SECTION K-K
1" = 20'

VOLUME PROVIDED @ ELEVATION –

ELEVATION	AREA (SF)	VOLUME (CF)
5961.5	392.0	411.0
5961.0	322.3	233.2
5960.0	156.8	0.0

WATER TANK BASIN 10–YR/24 HR DESIGN VOLUME –

BASIN	AREA	C10	D10	VOLUME
PA–T	0.016	0.63	1.97	74.3

SECTION L-L
1" = 20'

VOLUME PROVIDED @ ELEVATION –

ELEVATION (FT)	AREA (SF)	VOLUME (CF)
5975.5	321.2	194.4
5975.0	143.9	81.1
5974.5	93.7	22.1
5974.0	9.4	0.0

WATER TRUCK DUMP STATION 10–YR/24 HR DESIGN VOLUME –

BASIN	AREA	C10	D10	VOLUME
PA–WT	0.009	0.63	1.97	41.5

SECTION M-M
1" = 20'

VOLUME PROVIDED @ ELEVATION –

ELEVATION (FT)	AREA (SF)	VOLUME (CF)
5981.0	369.00	339.2
5980.5	293.28	174.0
5980.0	225.46	44.6
5979.5	5.90	0.0

RIPRAP SPECIFICATION –

1. Riprap is to be well cemented sandstone or conglomerate with a minimum Specific Gravity of 2.24 (139 pcf).
2. Riprap will be free of shale or shale inclusions or visible fractures.
3. Maximum riprap stone size will be 2xD50.
4. For riprap embankment protection the porosity of the layer will be 0.45.
5. Riprap shall be angular with approximately equal Length, Width, and Depth dimensions – maximum ratio of any dimension to another shall not exceed 3.0.
6. Stones selected for riprap will produce a 'ring' when struck by a hammer, break with difficulty, and have a dense appearance.

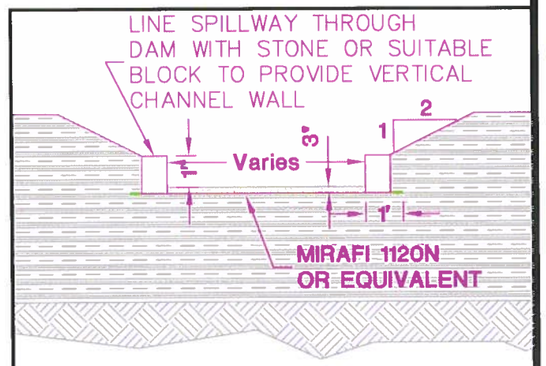
OREPAD POND OVERFLOW TO PORTAL

Given Input Data:

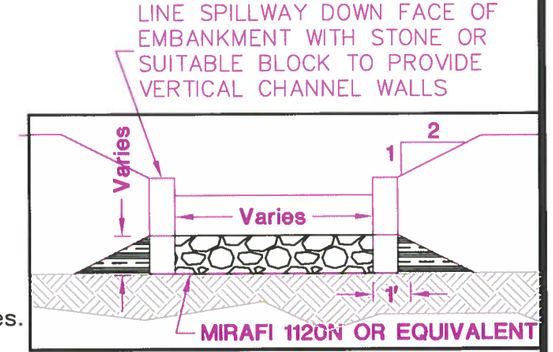
Flowrate	1.11 cfs
Slope	0.005 ft/ft
Manning's n	0.0300
Height	6.0 in
Bottom width	96.0 in
Left slope	0.50 ft/ft (V/H)
Right slope	0.50 ft/ft (V/H)

Computed Results:

Depth	1.72 in
Velocity	0.93 fps
Percent full	28.70 %



LATERAL SPILLWAY SECTION (typ.,) 1/4" = 1'



LATERAL SPILLWAY SECTION AT TOE (typ.,) 1/4" = 1'

RIMROCK EXPLORATION & DEVELOPMENT
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EXHIBIT U-5 - STRUCTURES 4
Surface Water Control and Containment Facilities

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