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MINE ENGINEERING
MINE RECLAMATION
CIVIL ENGINEERING
CONST. MANAGEMENT

September 25, 2024

Rob Zuber
Division of Reclamation, Mining & Safety
1313 Sherman St., Room 215
Denver, CO 80203

Re: Bowie Resources, LLC, Bowie No. 1 Mine
MR-141, Sedimentation Control at the Loadout during
Removal a portion of the Farmers ditch culvert
Permit C-1981-038

Dear Mr. Zuber:

On behalf of Bowie Resources, LLC, (BRL), enclosed is an application for a minor revision for the design of the sedimentation control during the removal of the Farmers Culvert approved under Technical Revision No. 66. This revision will be followed up with a Technical Revision that will provide a design for the permanent sedimentation control that will be put in place after the removal of the first 300' if the Farmers Ditch Culvert.

Sedimentation control will be in place before removal of the culvert begins. Since this revision is part of reclamation, there is not an increase in the reclamation bond. The design incorporates 1) a small sediment basin with a berm that directs the flow into the basin, and 2) a silt fence or wattle to capture runoff from the lower ditch area.

Attachments for this revision include:

- Map-07B (Sedimentation control during Farmers Ditch Culvert Removal)
- SedCad design of Straw Wattle
- Sediment Basin Design

Please let me know if you have any questions.

Sincerely,

Tamme Bishop

Tamme Bishop, P.E.
Consulting Engineer

Cc: Basil Bear

Temporary Sediment Control

PROTECTION OF THE HYDROLOGIC BALANCE

BOWIE NO.1 MINE

Farmers Ditch Culvert Removal Area

Notes for Calculations:

1. Pages SAE 10 through 19 present a spread sheet calculation of the required capacity of the sediment basin based on the 10 year, 24-hour event as well as a SedCad design for the silt fence/straw wattle. Page SAE-16 is the SedCad structure summary for the sediment basin which verifies the runoff calculated on page SAE-12. The sediment basin shown on Figure-07B provides 0.3 acre-feet of water storage and 0.03 acre-feet of sediment storage for a total capacity of 0.33 acre-feet.
2. Design points are shown on Figure-07B.
3. Sediment Control structures (sediment basin and wattle/silt fence) will be installed before removal of the culvert begins.

ENGINEER'S CERTIFICATION

The calculations and information presented on the following pages were prepared by me during the month of September 2024 and the information presented is true and correct to the best of my knowledge and belief.

COLORADO LICENSED
TAMMERIN KAE STOVER-BISHOP
43402
REGISTERED PROFESSIONAL ENGINEER

9-25-24

Tammerin K. Stover-Bishop, P.E. — Date
Registered Professional Engineer
State of Colorado No. 43402

PROTECTION OF THE HYDROLOGIC BALANCE
TEMPORARY SEDIMENT BASIN
BOWIE LOADOUT

STORM EVENTS

10 YEAR 24 HOUR EVENT	1.8 INCHES
25 YEAR 24 HOUR EVENT	2.1 INCHES
100 YEAR 24 HOUR EVENT	2.6 INCHES

The runoff curve numbers are developed based upon vegetation and soil types. Vegetation data is shown in Volume 7, on Map-02, and Soils data are shown on Map-03.

CURVE NUMBERS

Undisturbed

Table 2-2d-Runoff curve numbers for arid and semiarid rangelands

Cover Type - Herbaceous-mixture of grass, weeds and brush	
Hydrologic Condition	Good
Soil Type - Loam	C
Curve Number	74

Disturbed-Poor

Table 2-2d-Runoff curve numbers for urban areas

Cover Type - Impervious, parking lots, roofs, driveways	
Hydrologic Condition	Poor
Soil Type - Loam	C
Curve Number	98

Disturbed-Poor

Table 2-2d-Runoff curve numbers for urban areas

Cover Type - Herbaceous-mixture of grass, weeds and brush	
Hydrologic Condition	Poor
Soil Type - Loam	C
Curve Number	87

RUN-OFF VOLUME - - Pond D (NRCS/SCS Runoff Equation)

Area	Acres	Curve #	Precip Amount	Direct Run-off	Run-off Vol A-F *
Disturbed-Poor	3.78	87	1.8	0.75	0.24
Undisturbed-Good	0.05	74	1.8	0.26	0.00
Disturbed-Poor	0.47	98	1.8	1.58	0.06
TOTAL	4.30				0.30

TOTAL REQUIRED WATER VOLUME - - A-F 0.30

*SedCad calculated 0.26

SEDIMENT VOLUME - Pond D

Use the universal soil loss equation.

A = R K L S C P

R = rainfall factor	30.00
K = soil erodibility factor	0.37
LS = combined length slope factor 1300' - 4%	0.89
C = cropping management factor	1.00
P = erosion control practice factor	1.00
A = sediment, tons/acre/year	9.88

Two Year Sediment Volume - Acre-Feet 0.03

4.30 ACRES - 115 #/CF

Total Required Sediment Pond Capacity - Acre-Feet 0.33

MR-141

Temporary Sediment Control during removal of Farmers Ditch Culvert

Tamme Bishop

J.E. Stover & Associates, Inc.
2352 N. 7th Street, Unit B
Grand Junction, CO 81501

Phone: 970-245-4101
Email: tamme.jestover@bresnan.net

General Information

Storm Information:

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

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	#2	0.000	0.000	Sediment Basin
Null	#2	==>	End	0.000	0.000	
Silt Fence	#3	==>	#2	0.000	0.000	Silt Fence/Straw Wattle

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#3	In	6.290	6.290	4.50	0.40
	Out			3.49	0.40
#1*	In	3.830	3.830	2.76	0.26
	Out			0.00	0.00
#2		0.000	10.120	5.51	0.40

**Denotes structures with incomplete design parameters. Results for these structures have not been evaluated, and may affect downstream structures.*

Structure Detail:

Structure #3 (Silt Fence)

Silt Fence/Straw Wattle

Silt Fence Inputs:

Fence Flow Rate (gpm/sq ft)	Width along contour (ft)	Height (ft)	Land Slope (%)	Tie-back distance (ft)
10.0	100.0	3.5	3.00	116.7

Silt Fence Results:

Peak Fence Stage:	1.14 ft
Peak Water Stage:	1.14 ft
Dewater Time:	0.51 days

Dewatering time is calculated from peak stage to lowest spillway

Stage-Capacity-Discharge Table

Fence Stage (ft)	Water Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
0.00	0.00	0.000	0.000	0.000		Top of Sediment
0.00	0.00	0.000	0.000	0.000		
0.10	0.10	0.008	0.000	0.230	9.00	
0.20	0.20	0.015	0.001	0.475	2.05	
0.30	0.30	0.023	0.003	0.735	0.40	
0.40	0.40	0.031	0.006	1.010	0.15	
0.50	0.50	0.038	0.009	1.300	0.10	
0.60	0.60	0.046	0.014	1.604	0.10	
0.70	0.70	0.054	0.019	1.924	0.05	
0.80	0.80	0.061	0.024	2.258	0.10	
0.90	0.90	0.069	0.031	2.607	0.05	
1.00	1.00	0.077	0.038	2.971	0.05	
1.10	1.10	0.084	0.046	3.350	0.10	
1.14	1.14	0.087	0.049	3.491	0.01	Peak Stage
1.20	1.20	0.092	0.055	3.743		
1.30	1.30	0.099	0.064	4.152		
1.40	1.40	0.107	0.075	4.575		
1.50	1.50	0.115	0.086	5.013		
1.60	1.60	0.122	0.098	5.466		
1.70	1.70	0.130	0.110	5.934		

Fence Stage (ft)	Water Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
1.80	1.80	0.138	0.124	6.417	
1.90	1.90	0.145	0.138	6.915	
2.00	2.00	0.153	0.153	7.427	
2.10	2.10	0.161	0.169	7.955	
2.20	2.20	0.168	0.185	8.497	
2.30	2.30	0.176	0.202	9.054	
2.40	2.40	0.184	0.220	9.626	
2.50	2.50	0.191	0.239	10.212	
2.60	2.60	0.199	0.258	10.814	
2.70	2.70	0.207	0.279	11.430	
2.80	2.80	0.214	0.300	12.062	
2.90	2.90	0.222	0.322	12.708	
3.00	3.00	0.230	0.344	13.369	
3.10	3.10	0.237	0.367	14.045	
3.20	3.20	0.245	0.392	14.736	
3.30	3.30	0.253	0.416	15.441	
3.40	3.40	0.260	0.442	16.162	
3.50	3.50	0.268	0.468	16.897	

Structure #1 (Pond)

Sediment Basin

Structure design parameters are not specified. No results to show.

Structure #2 (Null)

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#3	1	5.500	0.246	0.000	0.000	87.000	TR55	3.86	0.343
	2	0.790	0.246	0.000	0.000	89.000	TR55	0.64	0.056
	Σ	**6.290**						**4.50**	**0.399**
#1	1	3.310	0.182	0.000	0.000	87.000	F	2.26	0.199
	2	0.050	0.100	0.000	0.000	74.000	F	0.01	0.000
	3	0.470	0.062	0.000	0.000	98.000	F	0.63	0.060
	Σ	**3.830**						**2.76**	**0.259**
#2	Σ	**10.120**						**5.51**	**0.399**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	4.18	56.00	1,339.00	2.040	0.182
#1	**1**	**Time of Concentration:**					**0.182**
#1	3	5. Nearly bare and untilled, and alluvial valley fans	4.55	22.00	483.00	2.130	0.062
#1	**3**	**Time of Concentration:**					**0.062**
#3	1	5. Nearly bare and untilled, and alluvial valley fans	2.73	40.00	1,465.04	1.650	0.246
#3	**1**	**Time of Concentration:**					**0.246**
#3	2	5. Nearly bare and untilled, and alluvial valley fans	2.73	40.00	1,465.04	1.650	0.246
#3	**2**	**Time of Concentration:**					**0.246**