October 27th, 2014,
Benchmark Land Surveying
Attn: T. Drew Meppen
789 N 450 E
Firth, ID 83236

RE: Teton Valley Scenic Byway Hydrology Amendment

Epic Engineering is pleased to submit the revised storm water calculations for the proposed Teton Valley Scenic Byway located in Teton County, Idaho. The storm water runoff calculations were performed using the TR-55 method, Manning's equations with entrance effects, and the guidelines set forth in the Highway and Street Guidelines for Design and Construction in Teton County, Idaho. Therefore, the flow rates calculated were for the 10 year storm for all of the culverts except Culvert 9 which used the 25 year due to it having the largest contributing area.

The proposed byway was divided into contributing basins and locations for culverts along the roadway were evaluated as seen in the attached hydrology map. The area naturally drains from the west to the east along natural drainages and creeks. Table 1, below, shows the calculated peak flow rates of the delineated basins along the byway based on fair soil conditions for Juniper Pinyon with grass understory.

Table 1. Peak flow rates of storm water runoff generated by the 10 year, 25 year, 50 year and 100 year 24 hour storm events.

				Storm Event			
				10	25	50	100
Basin	Area (acres)	Slope	C Values	Flow (cfs)			
1A	13.92	11%	76	3.94	7.78	11.28	15.28
1B	133.09	9%	73	10.86	30.08	48.78	70.37
1C	50.78	6%	74	5.94	15.05	23.64	33.28
Packsaddle Rd	N/A	N/A	N/A	Roadside swale pass through			
2A	727.35	8%	63	2.16	12.77	34.32	66.86
2B	99.14	14%	74	14.73	36.44	56.24	78.3
3	48.25	7%	79	17.64	32.49	45.05	58.56
4	123.32	5%	77	27.97	57.8	84.15	112.57
5	11.95	9%	85	3.1	4.53	5.65	6.78
6	945.90	7%	69	18.29	70.37	129.92	204.71
Moonglade Dr.	N/A	N/A	N/A	Roadside swale pass through			
8A	24.98	7%	78	9.11	16.85	23.96	31.66
8B	161.20	7%	74	15	38.11	60.17	85.42
9	1820.74	7%	63	5.28	26.78	64.21	118.31
N. Hoopes Rd	N/A	N/A	N/A	Roadside swale pass through			
11A	579.48	9%	69	11.95	47.37	88.61	139.86
11B	150.87	9%	77	32.84	68.52	99.27	133.16
12	468.80	10%	76	60.34	134.75	202.21	278.17

Once culvert locations were selected they were sized for the 10 year, 25 year, 50 year, and 100 year 24 hour storm events. The minimum allowable culvert size for Teton County is 18 inches. The proposed byway will cross over 3 existing roads, Packsaddle Road, Moonglade Drive, and N. Hoopes Road. At these intersections 18" diameter road side swale pass through culverts will need to be installed. Table 2, below, shows the recommended culvert sizes for each respective 24 hour storm event.

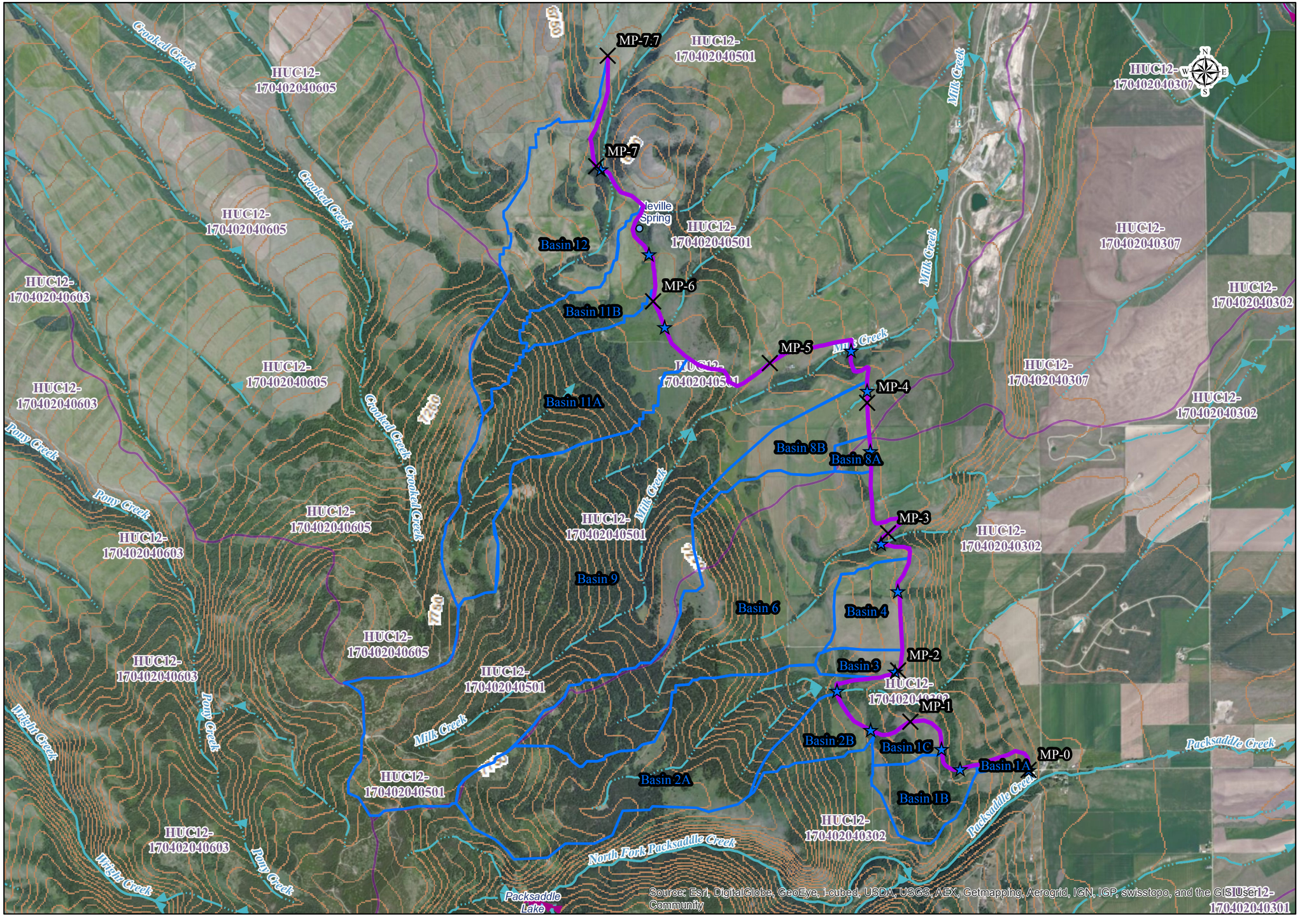
Table 2. Recommended culvert sizing for each culvert

	Recommended Sizing and Flows for Respective Storm Events					
	10 Year Storm Flow			25 Year Storm Flow		
Culvert	Flow Needed (CFS)	Size (in)	Flared End (CFS)	Flow Needed (CFS)	Size (in)	Flared End (CFS)
1A	3.94	18	11.2	-	-	-
1B	10.86	24	22.9	-	-	-
1C	5.94	18	11.2	-	-	-
2A	2.16	18	11.2	-	-	-
2B	14.73	36	63.2	-	-	-
3	17.64	24	22.9	-	-	-
4	27.97	30	40.1	-	-	-
5	3.1	18	11.2	-	-	-
6	18.29	48	129.7	-	-	-
7	-	18	11.2	-	-	-
8A	9.11	24	29.9	-	-	-
8B	15	36	63.2	-	-	-
9	-	-	-	26.78	54	174.1
10	-	18	11.2	-	-	-
11A	11.95	48	129.7	-	-	-
11B	32.84	36	63.2	-	-	-
12	60.34	36	63.2	-	-	-

Please see the attached edited plan set for culvert placement recommendations along the proposed Teton Valley Scenic Byway.

If you have any further questions or concerns, please do not hesitate to contact me.

Adam Huff, P.E.
Idaho P.E. #12136
Epic Engineering P.C.
435-654-6600
AHuff@epiceng.net



LEGEND

- CULVERTS
- STATIONS
- DELINATED BASINS
- WATERSHED
- PROPOSED ROAD
- STREAM
- CONTOUR

DATE
10/24/14

epic ENGINEERING

REVISIONS
1.

DRAWN: KMC
DESIGNER: KRT
REVIEWED: AJH

PROJECT # 14SM1988

SCALES
HORIZ: 1"=3000' (11"X17")
0 1/2"

PROJECT NAME:
TETON SCENIC BYWAY

SHEET TITLE:
DERIVED HYDOLOGY

PLAN SET:	SHEET:
PRELIMINARY	-