APPENDIX D

Coal Bed Methane Parameters Used to Evaluate Potential Impacts to Surface Water Quality

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			Wyoming Input									ana Input		
Sub-watershed	Stream Guage Location	Alternative	WY Number of CBM Wells	Average CBM Well Discharge Rate (gpm)	Managed Water Loss (percent)	Channel Loss (percent)	CBM Produced Water EC (uS/cm)	CBM Produced Water SAR	MT Number of CBM Wells	Average CBM Well Discharge Rate (gpm)	Managed Water Loss (percent)	Channel Loss (percent)	CBM Produced Water EC (uS/cm)	CBM Produced Water SAR
Wyoming Streams	s													
Upper Belle	Belle Fourche	1			49.0									
Fourche	River below	2A	7,630	7.0	35.5	20	070					274		
	Moorcroft, WY	2B			35.5	20	970	8.2	NA	NA	NA	NA	NA	NA
		3	6,160	6.2	49.0	-								
Antelope Creek	Antelope Creek	1	.,		39.8				1					
	near Teckla, WY	2A	925	11.9	35.5									
		211 2B	120	11.5	36.3	20	905	7.1	NA	NA	NA	NA	NA	NA
		3	561	11.9	39.8									
Upper Chevenne	Cheyenne River	1	501	11.7	39.8				-					-
opper cheyenne	near Riverview,	2A	546	9.6	39.8	-						1		
	WY	2A 2B	540	9.0	35.5	20	599	6.4	NA	NA	NA	NA	NA	NA
	vv 1		4.40											
		3	469	9.1	39.8							-		
Upper Powder River	Powder River near	1			22.8	_								
	Arvada, WY	2A	15,822	6.2	61.0	20	2163	19.5	NA	NA	NA	NA	NA	NA
		2B			64.0									
		3	5,322	6.2	22.8									
Clear Creek	Clear Creek near	1			59.0									
	Arvada, WY	2A	2,257	6.2	84.5	20	3022	29.2	NA	NA	NA	NA	NA	NA
		2B			87.5	20	5022	29.2	na -	na -	nn	nn a	na	na -
		3	1,705	6.2	59.0									
Crazy Woman	Crazy Woman	1			29.3									
Creek	Creek near	2A	1,853	6.2	84.5	20	2120	24.0						
	Arvada, WY	2B			88.3	20	3129	24.8	NA	NA	NA	NA	NA	NA
		3	606	6.2	29.3	-								
Salt Creek	Salt Creek near	1			39.8				1					
	Sussex, WY	2A	37	6.2	89.5									
		2B		0.2	92.5	20	1415	9.7	NA	NA	NA	NA	NA	NA
		3	19	6.2	39.8	-								
Wyoming/Montar	na Streame	5	17	0.2	57.0	l	ļ	1	Į				I	
Upper Tongue	Tongue River at	1			58.3							1		
River	Stateline near	2A	1,948	6.2	85.3	-						1		
111701	Decker, MT	2A 2B	1,740	0.2	85.3	20	2406	38.7	530	6.2	71.0	20	2406	47
	1500K01, 1911		1 707	6.2		-			1			1		
	D 1 D'	3	1,786	6.2	58.3			-			100	+		
Middle Powder	Powder River near	1	21.047		28.1	4			1		100	4		
	Moorhead, MT	2A	21,047	6.2	65.9	20	2370	21.8	568	6.2	0	20	3042	41.9
		2B			68.9	-					0	4		
		3	8,469	6.2	28.1						0			
Little Powder	Little Powder	1			33.5							1		
River	River near Weston,	2A	2,543	6.2	53.3	20	1271	11.1	0	NA	NA	NA	NA	NA
	WY	2B			56.3	20	12/1	11.1	U	INA	INA	INA	INA	INA
		3	2,093	6.2	33.5	7	1	1	1	1	1	1	1	1

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			Wyoming Input						Montana Input						
Sub-watershed	Stream Guage Location	Alternative	WY Number of CBM Wells	Average CBM Well Discharge Rate (gpm)		Channel Loss (percent)	CBM Produced Water EC (uS/cm)	CBM Produced Water SAR	MT Number of CBM Wells	Average CBM Well Discharge Rate (gpm)		Channel Loss (percent)	CBM Produced Water EC (uS/cm)	CBM Produced Water SAR	
Montana Streams															
Upper Tongue River	Tongue River at Stateline near Decker, MT	A C D E	1,948	6.2	85.3	20	2406	38.7	120 530 530 120	6.2	0.0 0 0.0	20	2207 - 2406	38.7 - 47.0	
	Tongue River at Birney Day School, near Birney, MT	A C D E	1,948	6.2	85.3	20	2406	38.7	2,424	6.2	87.7 0 0 87.7	20	2207 - 2406	38.7 - 47.0	
Lower Tongue River	Tongue River below Brandenberg Bridge near Ashland, MT	A C D E	1,948	6.2	85.3	20	2406	38.7	4,935	6.2	93.9 0 0 93.9	20	2207 - 2406	38.7 - 47.0	
Middle Powder River	Powder River at Moorhead, MT	A C D E	21,047	6.2	65.9	20	2370	21.8	568	6.2	100 0 0	20	2077 - 3042	24.8 - 41.9	
Lower Powder River	Powder River at Locate, MT	A C D E	21,047	6.2	65.9	20	2370	21.8	1,308	6.2	100 0 0	20	2077 - 3042	24.8 - 41.9	
Mizpah Creek	Mizpah Creek at Mizpah, MT	A C D E	NA	NA	NA	NA	NA	NA	66	6.2	100 0 0 0	20	1271 - 2077	11.1 - 24.8	
Little Bighorn River	Little Bighorn River at Stateline near Wyola, MT	A C D E	NA	NA	NA	NA	NA	NA	472	6.2	100 0 0 0	20	2207 - 2406	38.7 - 47.0	
	Little Bighorn River near Hardin, MT	A C D E	NA	NA	NA	NA	NA	NA	944	6.2	100 0 0	20	2207 - 2406	38.7 - 47.0	
Bighorn River	Bighorn River at Bighorn, MT	A C D E	NA	NA	NA	NA	NA	NA	1,737	6.2	100 0 0	20	2207 - 2406	38.7 - 47.0	
Rosebud Creek	Rosebud Creek at Reservation boundary, near Kirby, MT	A C D E	NA	NA	NA	NA	NA	NA	1,821	6.2	100 0 100	20	2207 - 2406	38.7 - 47.0	
	Rosebud Creek at mouth, near Rosebud, MT	A C D E	NA	NA	NA	NA	NA	NA	3,642	6.2	100 0 0 100	20	2207 - 2406	38.7 - 47.0	

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					Wyomi	ng Input		Montana Input						
Sub-watershed	Stream Guage	Alternative	WY Number	Average CBM	Managed	Channel Loss	CBM	CBM	MT Number	Average CBM	Managed	Channel Loss	CBM	CBM
	Location		of CBM Wells	Well	Water Loss	(percent)	Produced	Produced	of CBM Wells	Well	Water Loss	(percent)	Produced	Produced
				Discharge Rate (gpm)	(percent)		Water EC (uS/cm)	Water SAR		Discharge Rate (gpm)	(percent)		Water EC (uS/cm)	Water SAR
Lower	Yellowstone River	А									100			
Yellowstone-	at Forsyth, MT	С	NIA	NA	NA	NA	NA	NA	2,756	6.2	0	20	2207 - 2406	38.7 - 47.0
Sunday		D	NA	NA	NA	NA	NA	INA	2,730	0.2	0	20	2207 - 2406	38.7 - 47.0
		E									0			
Lower	Yellowstone River	Α									100			
Yellowstone	near Sidney, MT	С	25,538 6.2	()	83.9	20	2406	38.7	4,064	6.2	0	20	2207 - 2406	38.7 - 47.0
		D		0.2							0			
		E									0			