

WEB SUPPORT SERVICES, LLC

Cost Estimate For Conductor Replacement and Transmission Services January 18, 2010

Prepared by R. Mark Clements on behalf of

**Blanca Ranch Holdings, LLC and
Trinchera Ranch Holdings, LLC**

Introduction

Blanca Ranch Holdings, LLC and Trinchera Ranch Holdings, LLC (collectively, "*Trinchera*") engaged me, through my company, Web Support Services, LLC ("*WSS*"), to conduct a contract path analysis regarding the export of potential generation from the San Luis Valley to loads east of the Front Range. I completed a Technical Report on Contract Path Issues on January 18, 2010 (the "*Contract Path Report*"), which found feasible ways exist to export power from the San Luis Valley to the Front Range in connection with the transmission alternatives described in the Brubaker & Associates, Inc. Transmission Study Report (the "*BAI Report*")¹. Mr. Dauphinais identified three transmission alternatives which entail the construction of transmission from San Luis Valley Substation to Western's Poncha 230 kV Substation (TR1A and TR2A) or to the West Canon 230 kV Substation (TR3A). *BAI Report*, page 6. In response to PSCo claims that these three alternatives are not expandable, Mr. Dauphinais in his Surrebuttal Testimony illustrates how to expand TR1A to transmit additional capacity out of the San Luis Valley. The extended alternative TR1AE, entails construction of a 230 kV line from Poncha Substation to Malta Substation. The Contract Path Report supplements the *BAI Report* and Mr. Dauphinais' Surrebuttal Testimony by quantifying existing and potentially available transmission capacity that could be used to contractually move power from these transmission alternatives to PSCo's loads along the Colorado Front Range. This Cost Estimate supplements the Contract Path Report by evaluating the likely cost of such options.

Summary of Conclusions

In connection with TR1A, TR2A and TR3A, PSCo could purchase transmission service from Poncha Substation to transmit 380 MW east to the Front Range loads for \$2,913,000 per year. This annual transmission service cost is equivalent to new transmission facilities having a capital cost of \$19.4 million. If \$19.4 million is added to the estimated cost of each Trinchera Alternative set forth in the *BAI Report*, the total cost of each of those alternatives is still lower than the cost of the PSCo/Tri-State Proposal.

¹ The *BAI Report* is dated October 28, 2009 and submitted as Exhibit JRD-1 to the testimony of James R. Dauphinais on behalf of Trinchera in Docket Nos. 09-324A and 09-325A.

Additional transmission capacity beyond 380 MW is also not difficult to obtain. For example, contract path capacity of 461 MW (an additional 81 MW) should be available at low cost and by taking transmission service from Western over its Poncha-Midway 230 kV line.

The 461 MW of contract path capacity can also be increased to 904 MW if needed (an increase of 443 MW) by replacing the existing Aluminum Conductor Steel Reinforced ("ACSR") conductors with Aluminum Conductor Composite Reinforced ("ACCR") conductors on Western's Poncha-Midway 230 kV line. This would increase the rating of this line to as much as 885 MVA at a cost of approximately \$17,141,000. PSCo would pay Western for this uprate and take transmission service from Western. However, PSCo would not incur any additional costs for this transmission service during the initial years, because it would be entitled to a transmission service credit equal to the cost of uprating the line.

Even including the cost of an ACCR uprate to the Poncha-Midway 230 kV line, each of the Trinchera Alternatives, based on the cost estimates in the BAI study, is still less expensive than the PSCo/Tri-State Proposal.

The generation which can be installed in the San Luis Valley can also be vastly expanded without purchasing any transmission service. As shown in the Contract Path Report, if the 230 kV line from San Luis Valley to Poncha (Alternative TR1A) is extended to Malta (TR1AE), then PSCo's existing system could transmit up to 755.2 MW of renewable generation from the San Luis Valley to PSCo's loads along the Front Range. In this case, PSCo would not need to purchase any transmission service.

Increasing the Capacity of the Poncha – Midway Transmission Line

Based upon conversations with and literature from 3M, replacing the existing 1272 ACSR conductor on Western's Poncha – Midway 230 kV line with 1272 ACCR conductor could increase the capacity of this line to as much as 885 MVA, the continuous rating of the 3M manufactured conductor. Below is a planning level estimate of the cost of replacing the existing conductor with 3M's 1272 ACCR conductor.

ACSR Costs. Public Service Company of Colorado's ("*PSCo*") estimate of the cost of using 1272 ACSR conductor on its proposed San Luis Valley – Calumet 230 kV double circuit transmission line (the "*PSCo/Tri-State Proposal*") is attached to this Cost Estimate as **Confidential Exhibit A**. PSCo appears to have used a line length of [REDACTED] miles for both circuits. As Exhibit A shows, PSCo estimates the relevant costs to install ACSR conductor on the PSCo/Tri-State Proposal as follows:

Labor	[REDACTED]
Conductor	[REDACTED]

I have assumed for purposes of this report that PSCo's cost estimate for installing ACSR conductor is accurate, and no attempt was made to verify such estimate.

ACCR Labor Costs - Poncha – Midway. The length of Western's Poncha – Midway line is 87.5 miles,² which is approximately [REDACTED] percent of the length of the lines used in the PSCo/Tri-State Proposal. Accordingly, the labor to pull new conductor should be [REDACTED] percent of the PSCo cost. In response to an inquiry by WSS, Mr. Pat Ferguson, North American Sales Manager of 3M, stated that the cost of pulling in ACCR conductor by attaching it to the existing ACSR conductor is equivalent in costs to pulling in ACSR conductor on a new transmission line. Accordingly, the estimated labor cost for installing the ACCR conductor along the entire 87.5-mile Poncha-Midway line is:

Labor	\$1,525,000	[REDACTED]
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If Alternative TR3A is built, then a smaller distance (West Canon to Midway) would be reconducted, and the reconducting cost would be proportionately less.

ACCR Conductor Costs - Poncha – Midway. Although the actual cost of ACCR conductor is not stated on 3M's website, Mr. Ferguson stated in response to a WSS inquiry that the current cost of ACCR is 4.5 to 6 times the current cost of ACSR conductor. For purposes of this report, I have assumed that ACCR conductor could be purchased for the average cost within this range (i.e., 5.25 times the cost of ACSR). Accordingly, the cost of ACCR conductor is estimated to be (5.25 * [REDACTED] times PSCo's cost estimate for the PSCo/Tri-State Proposal.

Conductor	\$15,616,000	(5.25 * [REDACTED])
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No Salvage Value. To be conservative I did not include the salvage value of the old conductors in this line reconducting cost estimate, although under standard utility practices some revenue from salvaged conductor could be obtained which would reduce total cost.

Total Cost of Reconducting the Poncha – Midway Line (rounded)

Conductor	\$15,616,000
<u>Labor</u>	<u>\$ 1,525,000</u>
Total	\$17,141,000

² In a response to a Freedom of Information Act Request, Mr. Bob Easton of Western, on November 13, 2009, supplied the email correspondence attached as Exhibit F to the Contract Path Report, which email contains handwritten mileage estimates showing a distance from Poncha to Canon West of [REDACTED] miles, and a distance from Canon West to Midway of [REDACTED] miles, for a total mileage of 87.5 from Poncha to Midway.

Black Hills Energy Transmission Service

Black Hills Energy Rates. I calculated the costs of 99 MW of transmission service from Black Hills Energy. Based upon Exhibit IGD-11 to the Cross-Answer Testimony of Public Utilities Commission Staff Witness Inez G. Dominguez, Black Hills Energy's Point-to-Point Transmission Service rate is \$0.454/kW-month, with a Voltage Support ancillary (Schedule 2) rate of \$0.06/kW-month. In addition one tag per day would be charged for Scheduling, System Control and Dispatch. This cost would be \$6,345/month. Accordingly, the cost associated with 99 MW of transmission service from Black Hills Energy is \$689,000.³

Table 1

Black Hills Energy Transmission Service Costs for 99 MW				
	Capacity	Rate	Monthly	Annual
	(MW)	\$/kW-mo.	Cost	Cost
Firm Point-to-Point Transmission Service	99	0.454	44,946	
Schedule 2 Voltage Support	99	0.06	6,039	
Monthly Scheduling Charge	99		6435	
Total Monthly Cost			57,420	
Total Annual Cost				689,040

Western Transmission Service

PSCo's Requirements Beyond Poncha. PSCo can use its 170 MW of Poncha-Junction to Malta transmission capacity and also buy transmission service of 99 MW from Black Hills Energy. This is 269 MW available to PSCo. As discussed in the Contract Path Report, the maximum contract path required out of San Luis Valley for PSCo's existing and for the maximum PUC authorized level for future solar resources is 380 MW. Thus, PSCo's maximum additional transmission capacity requirements are only 111 MW. As discussed in the Contract Path Report, this transmission capacity should be available along Western's Poncha – Midway 230kV line following the minimal cost uprate assumed in TWG-1 that increases the line capacity to 442 MW.

Western's Rates. Also based on Exhibit IGD-11, Western's Firm Point-to-Point Transmission Service rate is \$1.478/kW-month, with a Voltage Support ancillary (Schedule 2) rate of \$0.18/kW-month. In addition, one tag per day would be charged for Scheduling, System Control and Dispatch. This cost would be \$1260/month.

Applying Western's current transmission service rates, the costs for 111 MW transmission service on an annual basis are approximately \$2,224,000, as outlined in the chart below:

³ This is consistent with Mr. Taylor's approximate cost estimate of \$670,000 for the 99 MW of transmission service from Black Hills, as set forth on Page 11 of his Surrebuttal Testimony.

Table 2

Western Transmission Service Costs for 111 MW				
	Capacity	Rate	Monthly	Annual
	(MW)	\$/kW-mo.	Cost	Cost
Firm Point-to-Point Transmission Service	111	1.478	164,058	
Schedule 2 Voltage Support	111	0.18	19,980	
Monthly Scheduling Charge	111		1260	
Total Monthly Cost			185,298	
Total Annual Cost				2,223,576

Furthermore, if PSCo were to reductor the existing 1272 ACSR conductor on Western's Poncha – Midway 230 kV line with 1272 ACCR conductor in the manner discussed above, PSCo would be entitled to a transmission service credit in an amount equal to its total cost of funding Western expenditures for reducting its line. PSCo would obtain these credits year for year as it subsequently took transmission service from Western over the reductored line.

Total Cost of Transmission Service

The total cost of transmission service required attendant to Alternatives TR1A, TR2A and TR3A to allow PSCo to export 380 MW of generation in the San Luis Valley is \$2,913,000 per year. However, the TR1AE extension would provide 585 MW of contract path capacity, for which no ongoing cost of transmission service would be required.

Equivalent Capital Cost of Transmission

In transmission system planning, a useful methodology has been used to select among transmission alternatives when there is a mix of capital expenditures and annual expenses, such as transmission service charges. Mr. Inez Dominguez uses this methodology in his analysis.⁴ This methodology relies on the Levelized Fixed Charge Rate (LFCR). The LFCR is calculated as follows: The Net Present Value of the utility's annual revenue requirements is determined for each year of an asset's economic life using as a discount rate the weighted average cost of capital, usually net of taxes. Then the Net Present Value of costs is amortized like a mortgage is at the same interest rate over the same economic life. For transmission projects, this levelized annual expense is generally 15 percent of the capital cost, as used by Mr. Dominguez.

Based upon this concept, system planners convert constant annual expenditures into an equivalent capital cost of transmission. In this case \$2.913 million divided by 0.15 is equivalent on a Net Present Value basis to a transmission project that costs \$19.4 million. Mr. Dominguez in the footnote on page 8 of his Cross Answer Testimony gets \$34.7 million because he uses a larger amount of transmission service than the 111 MW of transmission service that would be required as shown above.

⁴ Cross Answer Testimony of Inez G. Dominguez, December 2, 2009, page 8, line 11 and footnote.

In order to compare BAI's Alternative TR1A to the costs of the San Luis Valley-Calumet portion of the PSCo/Tri-State Proposal, the equivalent capital costs of wheeling from both Western and BHE would be \$19.4 million. Adding the \$19.4 million to the estimated cost of TR1A from the BAI Report, which is \$39 million, produces a total cost of \$58.4 million. This is less than the \$90 million estimate for the San Luis Valley – Calumet portion of the PSCo/Tri-State Proposal.

If more generation in the SLV were to be installed, then the ACSR conductor could be replaced with ACCR conductor at PSCo's expense and PSCo could take transmission service from Western. However, the cost of transmission service would be initially covered by the transmission service credits to which PSCo would be entitled.

Confidential Exhibit A