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VIA EMAIL

Ms. Victoria Rutson
Director, Office of Environmental Analysis
Surface Transportation Board
395 E Street, SW
Washington, DC 20423-0001

Re: Finance Docket No. 36284 - Seven County Infrastructure Coalition - Uinta Basin Railway Project - Response to Information Request No. 4

Dear Ms. Rutson:

I am enclosing Seven County Infrastructure Coalition's Response to OEA's Information Request No. 4. If there are any questions regarding this response, please do not hesitate to contact me.

Sincerely,

Kathryn K. Floyd

Encl.

cc: Joshua Wayland
Danielle Gosselin
Debra Rogers
Mike McKee
Kevin Keller
Eric Johnson

Seven County Infrastructure Coalition's Response to the
STB Office of Environmental Analysis October 30, 2019
Request for Information No. 4

November 20, 2019

1. **OEA Request: The Evaluation of Potential Route Alternatives report that the Coalition provided to OEA on March 13, 2019 and the revision to that report that the Coalition provided to OEA on May 31, 2019 state that the Coalition evaluated the feasibility of potential routes by applying specific design criteria from the Operational Basis of Design. The Operational Basis of Design, which the Coalition has not provided to OEA, establishes parameters for the operations of trains on the proposed railway. Please provide the specific engineering standards from the Operational Basis of Design that the Coalition used to evaluate the feasibility of alternatives, including the maximum acceptable ruling grade for the safe and efficient operation of the proposed rail line.**

   Coalition Response: The feasibility of alternatives was evaluated using a maximum gradient of 2.5%, which is approximately the same as the 2.4% maximum gradient on Union Pacific Railroad's main line between Helper and Soldier Summit, Utah (ascending westward). A maximum gradient of 2.5% was chosen (1) to enable the Uinta Basin Railway to connect to the UP/BSNF lines using the same locomotives, which will maximize operational efficiency and reduce operational costs, (2) because the additional construction cost necessary to achieve a maximum gradient below 2.4% would not provide a commensurate reduction in operating cost, and (3) because a maximum gradient below 2.4% would require a longer and more circuitous route, and greater disturbances on slopes and in valleys, which would increase the potential for environmental impact.

   Based on conceptual engineering, construction costs necessary to achieve a maximum gradient below 2.4% on any proposed route other than the Craig Route would be overwhelmingly high. Conceptual engineering also indicated that a minor increase in maximum gradient from 2.4% to 2.5% (an additional 5.28 feet of rise per mile of track) would better match the actual terrain in the Uinta Basin, with very little impact on operating costs. Based on sound engineering, operating criteria, and construction cost considerations, a maximum gradient below 2.4% was not practical and a 2.5% maximum grade was preferable for the safe and efficient operation of the proposed rail line.

2. **OEA Request: Please provide additional information requested below regarding the Avintaquin Canyon Route that was evaluated in the Evaluation of Potential Route Alternatives report.**

   a. **Please confirm that the Avintaquin Canyon Route would not be economically feasible due to the construction costs required to meet engineering standards established in the Operational Basis of Design.**

   Coalition Response: The estimated cost of the Avintaquin Canyon Route is $2.18 billion, which is significantly higher than, for example, the $1.29 billion estimate for the Indian Canyon Route.

   In addition, engineering analysis of the Avintaquin Canyon Route indicated that engineering and operational challenges would make this route infeasible for multiple

reasons. First, the Avintaquin Canyon Route, whose summit lies at a higher altitude than the Indian Canyon, Wells Draw, and Whitmore Park routes, has substantially greater exposure to heavy snowfall and drifting snow that would likely make operation of this route infeasible during winter months. In order to reduce the altitude of the Avintaquin Canyon Route summit to an altitude comparable to the Indian Canyon, Wells Draw, and Whitmore Park route summits, an approximately 11-mile tunnel would be required. A tunnel of this length is unlikely to be economically and/or operationally feasible. In fact, an 11-mile tunnel would be longer than any heavy-haul freight railway tunnel in the world.

Additionally, unlike the Indian Canyon, Wells Draw, and Whitmore Park routes, the Avintaquin Canyon Route would require substantial amounts of the embankment to be supported on "angle of repose" mountain slopes, which is not technically feasible for a heavy-haul railroad. To insert an embankment of sufficient width for a railway line on an angle-of-repose slope, the cut line must be taken upward to the top of the ridge above, and the fill material will spill to the bottom of the drainage at the base of the mountain slope. Such a railway would be at extreme risk for frequent rock slides, slope failures, and embankment slips, with high potential for derailment of trains or loss of the embankment altogether.

b. Please provide a total cost estimate for the construction of the Avintaquin Canyon Route.

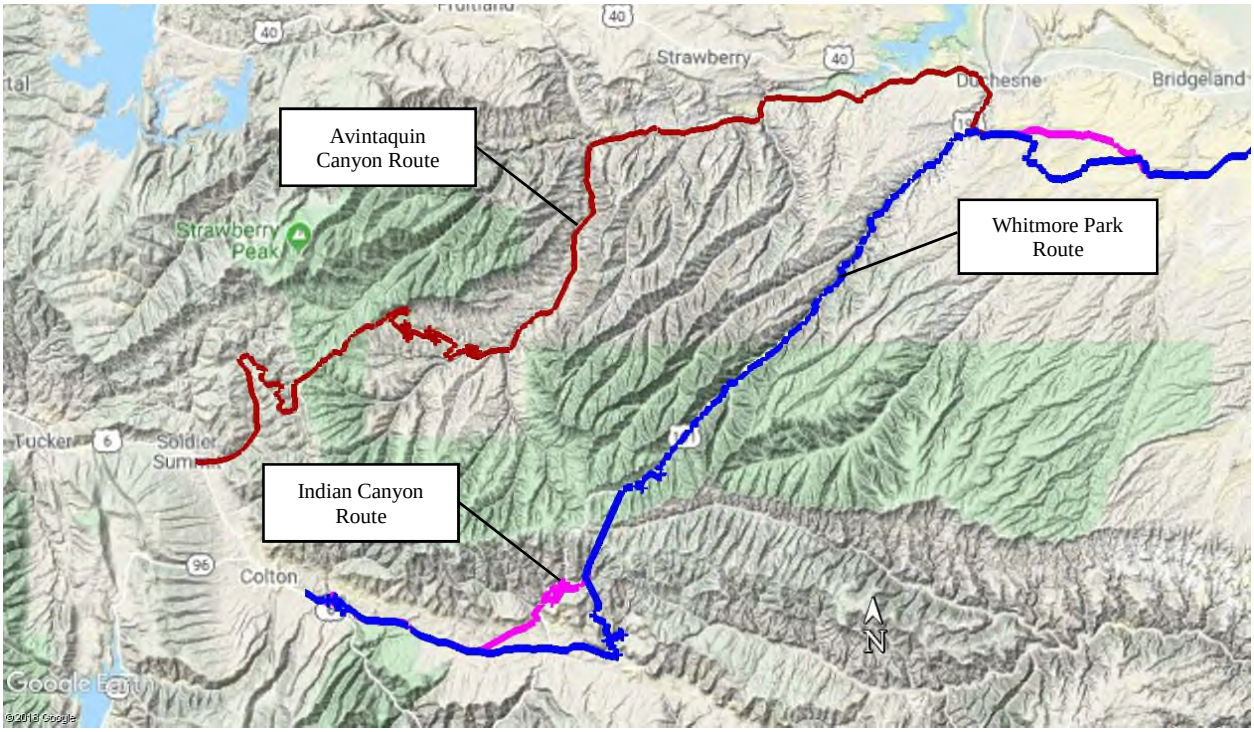
Coalition Response: The total cost of construction for the Avintaquin Canyon Route is estimated to be approximately $2.18 billion.

c. Please provide any additional information (such as ruling grade, curve radius, cut-and-fill volumes, or tunnel design details) that the Coalition considered in evaluating the feasibility of the Avintaquin Canyon Route.

Coalition Response: The Avintaquin Canyon Route was based on a route surveyed, but never constructed, by the D&RGW Railway in 1925. The D&RGW Railway route was used as a starting point and modified as appropriate to achieve proposed design standards for the Uinta Basin Railway. A map of the Avintaquin Canyon Route, identified by the red route line, is provided in Figure 1. In order to achieve the maximum gradient established for the Uinta Basin Railway, the route follows a circuitous path that lies on angle-of-repose mountain slopes. This circuitous path is necessary both to avoid areas of great relief and tunneling, as well as to meet maximum grade requirements.

Figure 1: Map of Avintaquin Canyon Route

(Not-to-Scale)



The Avintaquin Canyon Route was thoroughly evaluated and withdrawn from further consideration in the spring of 2019. The decision to remove this route from further consideration was based primarily on the considerable engineering challenges associated with the extremely rugged topography along the Avintaquin Canyon Route.

Rail lines that cross rugged terrain and require more tunnels are generally less economical to construct and operate. Rail lines crossing steep, rugged terrain require additional earthwork in order to construct track roadbeds and may also require construction of:

- Tunnels—the most expensive element to construct—in order to avoid gradients in excess of operational maximums; and
- High bridges and a substantial number of large retaining walls in order to manage cuts and fills on mountain slopes.

In order for rail construction, operation, and maintenance to be economical, gentle terrain and modest grade variation are preferable, and the need for tunnel construction should be avoided wherever practical.

In addition to the construction challenges mentioned above, the steep grades and long tunnels along the Avintaquin Canyon Route pose operational challenges. These features would require much higher fuel consumption and result in inefficient and costly operation of the diesel-electric locomotives anticipated to be used on the Uinta Basin Railway.

The steep tunnels needed along the Avintaquin Canyon Route would also present substantial "track creep" challenges. "Track creep" is the action of track sliding downhill as the locomotives of uphill-moving trains place longitudinal loads on the rail. Overcoming "track creep" on the Avintaquin Canyon Route would be particularly difficult due to the relatively thin ballast section, which has poor adhesion to the solid rock floor of the tunnel beneath the track structure. Prevention of track creep and maintenance of the track would also be particularly challenging given the confined space of the tunnel. If track creep issues are not fixed, track creep often results in concrete tie ablation and seat failure and may also accelerate failure of rail-to-tie fasteners. Other rail lines experiencing similar challenges have yet to find sustainable solutions to this issue.

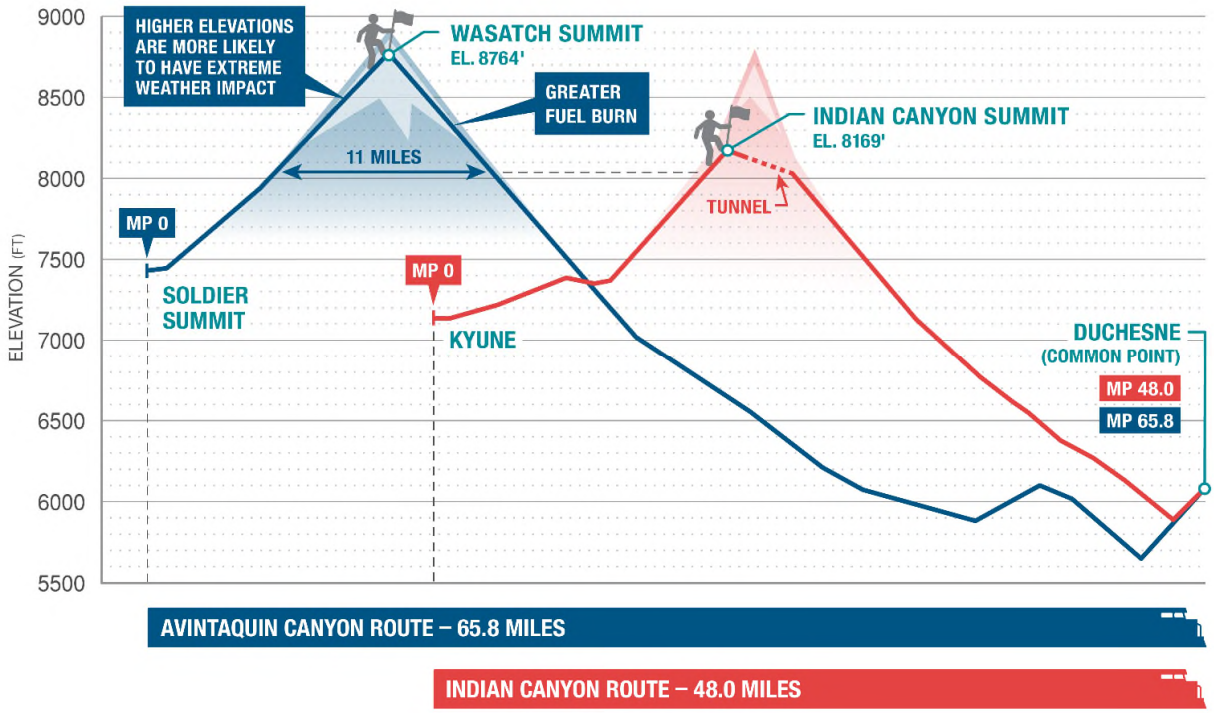
While steeper grades are often utilized to minimize construction costs and reduce project footprints, increasing the maximum grade for the Avintaquin Canyon Route in order to avoid tunneling would not be feasible. Grades steeper than 2.5% on existing railroads pose severe operational limitations. Steeper grades not only increase the number of locomotives required to power a train but may also require separating long unit trains into multiple, smaller trains in order to safely ascend or descend the grades. This significantly increases the operating costs and reduces the capacity of a railroad, hindering its economic feasibility by requiring additional locomotives, and additional double or passing tracks, which increase both construction costs and the project footprint. Rail lines with lower grades are also generally safer and have less risk of derailment.

Furthermore, the maximum operational train speed achievable along the Avintaquin Canyon Route would be much lower than that for other routes due to the circuitous nature of the route. Specifically, trains would be required to slowly traverse the combination of curves and steep ascent on the approach to Helper, which would reduce operational efficiency.

The Avintaquin Canyon Route is also longer than other routes, requiring an estimated 62 miles of construction in rugged terrain, and is anticipated to have equivalent or increased environmental impacts as compared with other routes. The additional length of the Avintaquin Canyon Route requires additional curves, meaning the route will be more expensive to construct and maintain and that operational efficiencies will be limited. Moreover, the overall area of potential impact associated with the Avintaquin Canyon Route will be greater than other routes analyzed due to the need for extensive cut and fill, retaining walls, and bridges.

Summit height for the Avintaquin Canyon Route also makes this alternative less feasible than other alternatives under consideration. The highest elevation of the Avintaquin Canyon Route is nearly 500 feet higher than the Indian Canyon Route's highest summit (see Figure 2 below). Furthermore, the Avintaquin Canyon Route has an additional summit located near Starvation Reservoir. As a result, maintaining operations on the Avintaquin Canyon Route would require heavier snow removal efforts during winter, and the Avintaquin Canyon Route is more likely than other routes to experience service interruptions caused by severe weather.

Figure 2: Select Avintaquin Canyon and Indian Canyon Terrain Profile Comparison



Additional geographical challenges unique to the Avintaquin Canyon Route include:

- As a result of backwater from Starvation Reservoir, the Avintaquin Canyon Route may need to be built at a higher elevation in steep side hill terrain, which would further increase construction costs.
- Additionally, as shown in Table 1 below, the Avintaquin Canyon Route has potential to impact a greater amount of wetland acres as compared to other alternatives under consideration.

Table 1: Results of Environmental Screening

Route	Land Ownership (acres)			Parks, Refuges and Recreational Areas (acres)	Number of Waterbody Crossings	Wetlands (acres)	Wetland Banks (acres)	Number of Historic Properties	Limiting Soils (Prime Farmland)[a] (acres)
	Federal	Sate	Tribal						
Indian Canyon	3,620	950	2,230	2,850[b]	157	200	0	1	1,016
Craig	19,880	3,900	0[c]	520	300	235	0	0	3,375
Wells Draw	13,570	2,000	0[c]	620	171	160	0	3	10,130
Avintaquin Canyon	3,760	418	5,420	355	185	310	0	1	1,135
East Rifle	20,480	1,523	0	600	375	561	.16	5	13,775
West Rifle	22,360	2,480	0	1,910	370	776	.16	5	13,270
Mack	18,622	2,336	0	461	260	326	.16	2	7,580
Westwater	22,480	4,700	0	1,866	287	252	0	2	6,660

a- Including Farmland of Statewide Importance and Farmland if Irrigated
b- Including U.S. Forest Service Ashley National Forest Lands
c- Corridor was clipped to remove Tribal lands

Finally, the Avintaquin Canyon Route would cross tribal lands owned by the Ute Tribe. While the Ute Tribe has expressed support for the Uinta Basin Railway project generally, the Coalition understands that the Tribe does not support the Avintaquin Canyon Route. This route would impact more than double the acreage of tribal lands affected, for example, by the Indian Canyon Route.[1] As a result, the Avintaquin Canyon Route could potentially result in greater impacts to cultural resources, wildlife, natural resources, wetlands, and tribal uses as compared to other alternatives. Moreover, the Avintaquin Canyon Route would have higher construction costs, and thus, has less potential to provide economic value to the Ute Tribe. As a result, the Coalition understands that the Ute Tribe does not support the Avintaquin Canyon Route, meaning that the Uinta Basin Railway is unlikely to receive the required approvals and authorizations necessary for portions of this route that cross tribal lands.

3. **OEA Request: Please confirm that the following alternatives discussed in the Evaluation of Potential Route Alternatives report would not be economically feasible due to construction costs that would be significantly higher than the Avintaquin Canyon Route and the routes that were recommended as alternatives in the Board's EIS:**

   - **East Rifle Route;**
   - **West Rifle Route;**
   - **Mack Route; and**
   - **Westwater Route.**

   Coalition Response: The Coalition confirms that the alternatives referenced above would not be economically feasible. As noted above, the total cost of construction for the Avintaquin Canyon Route is estimated to be approximately $2.18 billion. Projected construction costs for each of the above-listed alternatives would exceed the estimated cost

[1] Specifically, the Avintaquin Canyon Route would impact approximately 5,420 acres of tribal land as compared to approximately 2,230 acres of tribal land impacted by the Indian Canyon Route.

to construct the Avintaquin Canyon Route by approximately $0.5 billion. Specifically, projected construction costs for these alternatives are as follows:

- Projected construction costs for the East Rifle Route: $2.63 billion;
- Projected construction costs for the West Rifle Route: $2.67 billion;
- Projected construction costs for the Mack Route: $2.78 billion; and
- Projected construction costs for the Westwater Route: $2.84 billion.

The cost estimate for each of these routes is more than double the estimated construction cost for the least-cost route. As a result, these routes were found not to be economically feasible.

4. **OEA Request: The Indian Canyon, Wells Draw, and Whitmore Park Route would all pass through the Emma Park, Utah area in order to connect to an existing Union Pacific Railroad (UP) rail line near Kyune, Utah. This area contains Bureau of Land Management (BLM) land that is designated as Priority Habitat Management Area (PHMA) for Greater Sage Grouse. Please provide the information below regarding the Emma Park area:**

    a. **Please indicate whether the engineering standards established in the Operating Basis of Design would permit a rail alignment through or around the Emma Park area that would avoid BLM-managed lands and provide relevant engineering details (ruling grade, curvature, etc.).**

    Coalition Response: The Coalition has extensively studied the area in and around Emma Park to determine whether it would be possible to avoid BLM-managed land, while balancing engineering standards and other constraints. As detailed in the Coalition's Evaluation of Potential Route Alternatives report provided to OEA on May 31, 2019, the proposed alignments involve some BLM-managed land. While the Coalition will continue to work with BLM as a cooperating agency, based on recent analysis, the Coalition believes that it may be possible to locate an alignment through the Emma Park area that avoids BLM-managed lands while still adhering to the engineering standards for the Uinta Basin Railway. It is anticipated that this could be achieved by shifting the alignment north of Emma Park Road onto privately owned land. The engineering details of this potential alignment have not yet been fully established but are currently under development by the Coalition. An updated kmz file reflecting this alignment will be provided to OEA.

    b. **Please indicate whether the engineering standards established in the Operating Basis of Design would permit an alignment through or around the Emma Park area that would avoid PHMA for Greater Sage Grouse and provide relevant engineering details (ruling grade, curvature, etc.).**

    Coalition Response: Taking into consideration the engineering standards established for the Uinta Basin Railway, it is not anticipated that PHMA for Greater Sage Grouse in the Emma Park area can be avoided. PHMA for the Greater Sage Grouse extends into the high mountains north of the PHMA. Thus, any alternatives north of the PHMA would be unable to meet the criteria established for the Uinta Basin Railway, including the maximum 2.5% gradient. Any alternatives south of the PHMA would cross over the rim of the Price River Canyon, which would require massive viaduct structures

approaching 500 feet in height to support the railway. This would significantly increase construction costs and would not be economically feasible. Tall viaduct structures for heavy-haul railways cost in excess of $250,000/mile.

c. Please indicate whether the engineering standards established in the Operating Basis of Design would permit an alignment that would avoid the Emma Park area by following Route 191 south to a connection with the UP rail line near Helper, Utah and provide relevant engineering details (ruling grade, curvature, etc.).

Coalition Response: An alignment that would avoid the Emma Park area by following Route 191 southward (through Willow Creek Canyon) to a connection with the UP rail line near Helper, Utah would not satisfy the engineering standards established for the Uinta Basin Railway. Based on conceptual engineering analysis, any alignment along this route would exceed the maximum 2.5% gradient established for the Uinta Basin Railway. Specifically, a maximum gradient of 5-8% would be required for the rail line to remain on the canyon floor. Moreover, in many areas, the canyon is too narrow and too circuitous to provide space for both a railway and the existing highway. The Coalition considered whether it would be possible to use spiral tunnels in Willow Creek Canyon to "loop" down the canyon. However, these were found to be impractical due to (a) the narrowness of the canyon; (b) the need to avoid existing highway and several high-voltage transmission lines; (c) the presence of a historic cemetery at Castle Gate; (d) the presence of extensive, large-scale underground coal mining activity in Willow Creek Canyon on multiple seams ranging from 8 feet to over 20 feet in thickness; and (e) other unknown and uncertain underground conditions.

Kyune, Utah, is the most practical selected location for a connection between the Uinta Basin Railway and the existing UP rail line. Potential connection points located east of Kyune would not comply with the maximum grade requirements established for the Uinta Basin Railway due to the narrow, steep walls of the Price River Canyon in which the existing UP rail line lies, and the geography of the Price River Canyon as described above. Connection points east of Kyune also would not comply with functional criteria established by Class I railroads, which must be satisfied to allow for acceptable operations at connection points. These criteria include, for example, requirements to comply with track and signal standards and additional requirements determined based on local conditions and site-specific considerations. Kyune is the only known location where the grade along the existing UP main line satisfies the functional criteria established for Class I railroad connections. Potential connection points located west of Kyune would increase the total length of the railroad resulting in a greater overall project footprint, greater project cost, and greater potential for environmental, cultural, and infrastructure impacts. The closest possible connection point west of Kyune, located at Colton, would increase the total length of the railroad by approximately 5 miles, cross additional sage grouse habitat, cross additional wetlands along the Price and White Rivers, require relocations of U.S. 6 and Utah State Route 96 along with large overpass structures to carry both highways over the railway, and require relocations of several transmission lines.