TENSLEEP CANYON & SWEET 16

Wow Factor (4 out of 5 stars):

★★★★

Geologist Factor (4 out of 5 stars):

★★★★

Attraction

This area has it all if you like scenery, outdoor activity and rocks! A curving road from the basin to the top of the Bighorn Mountains with faults, canyons, cliffs, creeks, water falls,
Geology of Tensleep Canyon

U.S. Highway 16 through the southern portion of the Bighorn Mountains is a passage marked by those who travelled this way in the past. The rocks underfoot record the evolution of Wyoming geology over 3.8 billion years. The highway was nicknamed “Sweet 16” because it presents the modern traveler with a scenic and safe route across this 90 mile long and 30 mile wide mountain range. Of the three highways over the Bighorns, U.S. 16 has the lowest grade and gentlest curves. You might also hear the highway from Tensleep to Buffalo called the Cloud Peak Skyway Scenic Byway. By whatever name you call it, the route remains an awe inspiring journey.

“Sweet 16” highway area from Ten Sleep (green star) to Meadowlark Lake Ski Area (red star) shown by dark blue line. Tensleep Fault shown by red dashed line. Other locations mark locations discussed in text.

Image: Google Earth

During the last Ice Age (Pinedale 110,000-11,700 BP), glacial ice formed at the crest of the
Bighorn Mountains centered on Cloud Peak (13,167 feet ASL). Ice moved from the high mountains down through established stream valleys. The valleys shapes were modified from their “V” profile to the “U” profile by glacial erosion. Evidence also exists for the earlier Bull Lake (200,000-130,000 BP) and pre-Bull Lake Glaciation (1,200,000-200,000 B.P.) in some of these same valleys.

Global sea level dropped more than 300 feet during the ice ages and a land bridge called Beringia formed across the Bering Strait. This was an important gateway for migration of land animals such as bear, elk and bighorn sheep into North America. The abundance of the latter in the area is why Lewis and Clark named the range the Bighorn Mountains. Humans followed the game after 17,000 years BP. Beringia disappeared beneath the sea as the climate warmed at the end of the Ice Age about 11,000 years ago. DNA testing indicates that up to 80% of Native Americans today are direct descendants from Beringia Clovis people (Hogenboom, M., 2017, BBC Earth News).
Beringia land bridge between Russia and Alaska at its maximum extent. This was an important migration path for mammals and plants between the continents. The red dot in top image is Sarah Palin's home town of Wasilla.


About the same time as Beringia was swallowed by the rising sea, Paleoamericans were hunting mammoths in the Bighorn Mountain area. The Colby Mammoth site (discovered in 1962) contained the remains of at least eight mammoths. A radiocarbon date of 11,200 + 250 years B.P. was obtained from this Clovis culture (~11,500-10,900 B.P.) kill site. Other mammoth remains had been found in the same area near Worland in 1907. The first trails through the range were made by animals as they traveled the stream valleys and connecting ridges in which glacial ice moved. Natural Trap Cave (see Geowyo Bighorn River Area Caves page) in the northern Bighorns contains the remains of animals from 25,000 years ago. Archaeologists have dated human presence in the vicinity over the last 10,000 to 12,000 years. The hunter gatherers followed the game trails through the mountains.
In 1811, the Astorian Overland party of the Pacific Fur Company travelled through Powder River Pass (9,666 feet ASL) and down Tensleep Canyon in crossing the Bighorn Mountains on the second continental passage across America to Oregon territory. This expedition of 65 members was seeking a shorter, safer path to Fort Astoria that would avoid the aggressive Blackfeet Indians on Lewis and Clark’s Missouri River water route. Their path from the Pass to
Ten Sleep closely followed the route of Highway 16.

People began to settle in Ten Sleep between 1880 and 1890. The Post Office was established in 1891 and serviced by a “Star Route” carrier. Army teamster Sam Stringer had the contract to deliver the post between Buffalo and Ten Sleep. His crossing of the Bighorns in the spring of 1892 is recorded in Marshall Cushing’s 1893 book *The Story of Our Post Office: The Greatest Government Department in all its Phases* ([https://archive.org/details/storyofourpostof00cush](https://archive.org/details/storyofourpostof00cush)). The winter of ’92 was particularly harsh and slow to end. Deep snow, frigid temperatures, stubborn mules, broken snow shoe, lack of provisions and sickness made this trek a testament to his loyalty to the unofficial Postal Creed: "*Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds.*" Postman Stringer’s bag contained one letter on his return trip. Sam not only survived this ordeal but he continued as a postal carrier for the rest of his life.

What follows is a 21 mile Roadlog from Ten Sleep to Meadowlark Lake along US Highway 16. Both the geology and history of this historic passage through the Bighorns will be noted. The US Forest Service designated this roadway a scenic byway in 1989. The state of Wyoming added the same designation in 1995.

*Ten Sleep, Wyoming aerial image.*

*Image: Google Earth*
West edge of Ten Sleep, Wyoming at intersection of 2nd Street (US 16) and Cottonwood Street (WY 434). Town lies in the valley of Tensleep Creek near the confluence with the Nowood River. Population 257. Elevation 4,426'. Road to north (L/R) is 18 miles to Hyattville. Road to south (R/L) is 21 miles to Big Trails. Head east (straight ahead). If you were looking for the Ten Sleep Brewing Company (http://tensleepbrewingco.com/), it is located about 1 mile west of town on the north side of the highway. The brewery is located at the foot of an east facing scarp of red beds of the Chugwater and Gypsum Spring Formations. The Tensleep Fault trace is located in front of the Brewery. The offset on the fault is up to the north with left lateral motion. The outcrops to the south of the highway are brown shales and tan sandstones of the Cretaceous Frontier, Mowry and Thermopolis Formations. The small anticlinal structure nearby is David Dome. Two exploration wells drilled in the early 1950s tested wet in the Tensleep Formation.

*Image: Google Earth Street View*

Tensleep Mercantile. Left: 1920s, Right: 2012

Images: Left: [http://www.wyomingtalesandtrails.com/worland2.html](http://www.wyomingtalesandtrails.com/worland2.html), Right: Google Earth Street View

Pioneer Museum on south (R/L). The adjacent city Vista Park hosts the Nowoodstock Music Festival in the summer (details: [http://www.nowoodstock.com/](http://www.nowoodstock.com/))

The origin of the town name.


Bluff to the south (R/L) is Standish Ridge. The Tensleep Fault trace follows this ridge.

Rome Hill Road (WY 436) to the south (R/L). Road leads to the Nature Conservancy Tensleep Preserve turnoff in about 11 miles. This beautiful area used to be the Girl Scout National Center West from 1968 to 1991. The Indian Pow-Wow Caverns is located on the site. This is a rock shelter developed in the Tensleep Formation that was a gathering/shelter site for the Crow and Sioux tribes. The shelter is 50 feet tall at the mouth and 900 feet wide by 300 feet deep. Pictographs on the walls and ceiling are a record of the native peoples history in this area.
Left: Former Girl Scout National Center West area highlighted in green, now Nature Conservancy Tensleep Preserve.  
https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/wyoming/placeswe protect/tensleep-preserve.xml
(https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/wyoming/placeswe protect/tensleep-preserve.xml) . Red Dashed line shows location of the Tensleep Fault.

Right: Crow Sioux rock shelter.
Images: Left: Google Earth. Right: Image: Red Dirt in my Soul website, 2009,  
(http://reddirtinmysoul.com/2009/09/01/fifteen-years-ago-and-a-few-days/)

Tensleep Sandstone at the mouth of the canyon is exposed on both sides of the highway. This is the type section area for the formation named by Darton in 1906.

Wigwam Rearing Station (https://wgfd.wyo.gov/About-Us/Offices-and-Facilities/Wigwam-Rearing-Station) access area pullout. Trail leads 145 feet north to an excellent view of contact between the crossbedded upper and the thin, horizontal bedded lower Tensleep Formation exposed on cliff face across Tensleep Creek.
Tensleep Formation exposed along Tensleep Creek at Wigwam Rearing Station access pullout.

*Image: Steele, K.K., 2007, Tensleep Creek*
Regional Upper Paleozoic outcrop cross section.

Wigwam Road turn off (L/R) leads to Wigwam Rearing Station. Facility was opened in 2005 and is the third most productive fish hatchery operated by the Wyoming Game and Fish. The station mainly raises rainbow and cutthroat trout, but also splake, salmon, tiger, brown and brook trout. The parasite that causes whirling disease was discovered here and at the Ten Sleep Hatchery, five miles east, in 2008. Renovation of the water treatment system were completed in 2012 to eliminate the problem. The name of the station comes from the original dude ranch located here. Milo Burke’s Wigwam Resort opened here in 1915.
Aerial view of Wigwam Rearing Station grounds.

Image: https://wgfd.wyo.gov/WGFD/media/content/About%20Us/Hatcheries/hatchery_wigwam_pic1.jpg

0.8 5.6 0.5 15.6  
Road to the south (R/L) heads into Sand Draw. Fertig Draw is to the north of the highway (L/R).

0.5 6.1 0.3 15.1  
Bridge over Tensleep Creek. Now travelling on north side of stream.

0.3 6.4 1.1 14.8  
Salt Lick Trailhead and parking lot to the north (L/R). This is a 3.5-mile hike with 800 feet of elevation gain that takes about 2-3 hours to complete. It begins in the Upper Madison Formation and climbs up section into the Tensleep Sandstone.

1.1 7.5 0.1 13.7  
Childs Creek to the south (R/L).
Tensleep Fish Hatchery on Old US 16 is the third oldest and one of the smallest stations operated by Wyoming Game and Fish. The facility renovation and rehabilitation was
Tensleep Canyon Mine is located at the top of the ridge to the north (L/R). The mine contains an unknown volume of Magnesite (MgCO3) that has never been exploited.

Leigh Creek Canyon to south (R/L).

Scenic pullout on south side of highway (R/L) with interpretive sign on Bighorn Sheep. Excellent, often photographed view of the Lower Paleozoic section exposed on the south canyon wall. The lowest carbonate ledge in the cliff is the Bighorn Dolomite which weathers to a darker grey than the overlying two ledges of Madison Limestone. The Devonian rocks are located on the treed slope between. The steep scarp face of the Madison Formation is Leigh Monument. Gilbert E. Leigh was an English member of Parliament who fell to his death while hunting Bighorn Sheep from this ridgeline in 1884. The monument was placed in 1889 at the top of the ridge with a memorial plaque beneath a cross. The creek, campground, canyon, cave and the entire mountain (Leigh Creek Vee) carry his name.
East view of Lower Paleozoic rocks in a 1,040 foot cliff face near Leigh Creek on the south side of Tensleep Creek. Note unpaved 1930s Old Hwy 16 roadway. Geologic notation: Mm: Mississippian Madison Formation, Dd: Devonian Darby Formation, Ob: Ordovician Bighorn Formation, Cu: Cambrian Gallatin and Gros Ventre Formations undifferentiated.


0.8 9.8 0.4 11.5 Scenic pullout on south side of highway (R/L) with interpretive sign on Leigh Creek Monument.
Leigh Monument interpretive sign.

Image: https://media-cdn.tripadvisor.com/media/photo-s/05/1b/a7/62/us-highway-16.jpg

Contact of Cambrian Gallatin Formation limestones with Cambrian Gros Ventre Formation green, micaceous shales in road cut to north (L/R). Behind on the skyline is a natural arch developed in the Madison Limestone.
Gallatin/Gros Ventre Formations contact. Black rectangle shows area of natural arch developed in Madison Limestone (see image below). Geologic notation: Mm: Mississippian Madison Formation, Ob: Ordovician Bighorn Formation, Cg: Cambrian Gallatin Formation, Cgv: Cambrian Gros Ventre Formation.

*Image: Google Earth Street View*
Aerial view of Dry Tensleep Creek intermittent drainage highlighted in blue. Locations of the Cambrian Formations contact and Leigh Monument are also displayed.

Image: Google Earth Street View

Roadway switchback climb of about 350 feet across covered slope of Cambrian rocks. Pinedale glaciation outwash deposits along Tensleep Creek in the valley below.

Outcrop of Bighorn Dolomite to north (L/R).
Ordovician Bighorn Dolomite along north (L/R) side of road.

*Image: Google Earth Street View*

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- Truck escape ramp to north (L/R).
- Early Pinedale terminal moraine.
- Middle Pinedale terminal moraine.
- Bridge over Tensleep Creek. Now travelling on east side of stream.
- Junction with Forest Service Road 18 (Old Hwy 16) on east (R/L). Roadway landscape is dominated by glacial features and a Douglas-fir, Ponderosa and Limber pine forest.
North aerial view of glacial features from the last ice age (Pinedale) along Tensleep Creek.
*Image: Google Earth*

Deer Haven Lodge Road turnoff to the west (L/R). Road leads to Forest Road 27 into Cloud Peak Wilderness. Ridgeline in distance to west is Madison Limestone overlying Devonian Darby. The glacial deposits along the roadway are deposited on Ordovician through Cambrian units. The hills to the east (R/L) are mainly Cambrian units. Remnant carbonates of Madison through Ordovician units are capping the hill.

Forest Road 438 to the southwest (R/L) connects with Forest Road 437 (0.15 mi). A turn to the east (L/R) leads to the Meadow Lake Dam (0.88 mi). The dam was constructed by the Civilian Conservation Corps in 1936 to create the current Meadow Lake (aka Tensleep Reservoir). The reservoir is primarily used for recreation, irrigation and fire control. Originally this was a glacial lake carved out of Cambrian units and Precambrian gneiss by the East Tensleep glacier and dammed by morainal deposits. The moraine was breeched sometime after 12,000 years ago.
Upstream view of the 30-foot embankment of the Meadowlark Dam. The primary spillway is on the left.

North aerial View of Meadowlark Lake with Cloud Peak on the skyline right of center.


Civilian Conservation Corps Company 841 marker for dam construction workers, and memorial to their casualties in fighting the Blackwater Fire of 1937 that was west of Cody (R/L). Across the highway is an outcrop of Cambrian Flathead Sandstone. The Great Unconformity contact between the Precambrian igneous/metamorphic rocks and the Cambrian Flathead Sandstone is along the highway 0.1 miles towards Ten Sleep.
Company 841 Marker and Memorial.
marker=97888&Result=1 (http://www.hmdb.org/marker.asp?marker=97888&Result=1)

Turnoff to west (R/L) for Meadowlark Ski Lodge Resort (0.68 mi). Ski slope has a 1,000 foot vertical drop and is developed on Cambrian units with a small cliff of Ordovician Bighorn at the top.


End of Road Log

One last story from the Bighorns...

Bomber Mountain

As an Air Force brat, whose father flew in bombers in WWII, I was intrigued by the topographic featured name Bomber Mountain. This is what I learned.

In June 1943, a B-17 Flying Fortress nicknamed “Scharazad” disappeared on the second leg of a flight to Grand Island, Nebraska for deployment to the European theater during WWII. Two years later, about 100 days after the victory in Europe (VE day, 8 May 1945), two local cowboys found the crash site. It was located on a 12,480 foot, unnamed mountain ridge in the Bighorn Mountains, 1.5 miles south of Cloud Peak. The ridge was christened Bomber Mountain by the US Forest Service in 1946. A plaque was placed at the base of the mountain along the shore of Florence Lake in honor of the ten crew members who perished that summer night.
Scharazad crash site on Bomber Mountain.

Scharazad crash remains on Bomber Mountain.
(http://images.summitpost.org/original/334302.jpg)
Memorial plaque for the crew of Scharazad. Note that the mountain was still unnamed when the plaque was installed.

Things to do in Tensleep area

**Camping** – Along FS 27 (West Tensleep Creek corridor) that starts at the Deer Haven turnoff 17.6 miles from Ten Sleep, there is Boulder Park CG, Island Park CG, Deer Park CG and West Tensleep Lake CG. There is also non-campground camping along FS 27 in numbered spots (you must have a port-a-potty). Near Meadowlark Lake, there is Lakeview CG, Sitting Bull CG and Willow Park Group CG. In the canyon near the Ten Sleep Fish Hatchery is the Leigh Creek CG on Wyoming 435/FS 18 at 7.6 miles from Ten Sleep. Forest Service campsite reservations (https://www.recreation.gov/recreationalAreaDetails.do?contractCode=NRSO&recAreaId=1058) can be made on-line. A lot of primitive camping by the rock climbing community occurs along FS 18 that parallels Highway 16. There is a horse friendly commercial RV park in Ten Sleep called Ten Broek. There is the Circle J retreat camp (https://www.circlejretreatcamp.com/home.html) in the lower Tensleep Canyon that has camping and cabins.

The Black Tooth Brewing Company memorializes the peak with an Irish Red Ale.

*If you spend any time in Sheridan County someone local will tell you a different story about “Bomber Mountain”. The flavors present in this medium bodied Irish Red Ale vary as widely as the tales, from biscuits and caramel, to cotton candy there is something for everyone to enjoy and more importantly to remember, about this sacred ground at 12,887 ft above sea level.*

*The Beer Advocate Comment*
**Fishing** – In addition to the stream fishing in Tensleep Creek, there is lake fishing at Meadowlark Lake and West Tensleep Lake and of course high country fishing in the lakes and streams of the Cloud Peak Wilderness. Here is the Wyoming Game & Fish (https://wgfd.wyo.gov/fishing-and-boating) website.

**Hiking** – There are stunning day, overnight and multi-day hikes into the Cloud Peak Wilderness. Two recommended hikes start at West Tensleep Lake. The first is up Middle Tensleep Creek to Mirror Lake & Lost Twin Lakes. The second is the gentle, but long trail up West Tensleep Creek to Lake Helen, Lake Marion, Mistymoon Lake, Gunboat Lake and Florence Pass. The West Tensleep Creek trail is also the popular starting route to Cloud Peak (2 to 3 day trip or one very long day if you are extreme). The website Summitpost (http://www.summitpost.org/big-horn-range/170884) gives details on numerous peaks in the Bighorns. A shorter hike to West Tensleep Falls starts in the same parking lot as the longer hikes, but heads south on trail 065. Take bug spray if you are hiking the high country in July or August. I have seen vortexes of mosquitoes looking for blood. **Directions** – coming 17.6 miles from Ten Sleep, turn left on FS 27 which is also the Deer Haven Lodge turnoff, continue 7.1 miles on FS 27 to West Tensleep Lake campground and trailhead.

A hike closer to Ten Sleep is the Salt Lick Trail. It is a moderate 2 to 3 hour loop hike of 3.5 miles and 800 foot elevation gain that climbs out of the canyon with great views. **Directions** – turnoff on left at 6.4 miles from Ten Sleep for trailhead parking.

**John Sabin Lookout (High Park Lookout)** – a kid friendly walk of 15 minutes, 200 vertical feet and 0.3 mile each way to the old fire lookout with great views of the Bighorn Mountains & Cloud Peak Wilderness to the north, Meadowlark Lake to northwest, the Bighorn Basin to west, Powder River Pass to the east and the plunge of the Bighorn Mountains to the south. It is a short scenic walk among trees, boulders and outcrops of the Bighorn Formation. These carbonates, some with fossil shells were deposited in a shallow sea on the west coast of the North American continent. **Directions** - coming 22.3 miles from Ten Sleep, turn right on FS 429, a dirt road that is OK for passenger cars. The turnoff is just 1.1 miles east of the turnoff for Meadowlark ski area. Once on the dirt road, 0.1 mile St Christopher's of the Bighorns outdoor chapel on right (my daughter got married here), 0.4 mile cattle guard and side road intersection, go straight, 0.9 miles road splits, take right fork, 1.3 miles arrive at parking area. The covered slope from US 16 to the parking lot is Cambrian Shales.

**Mountain Biking** – Many of the trails open to mountain bikes are two tracks also open to ORVs. MTB Project (https://www.mtbproject.com/?x=-11938459&y=5486931&z=5) shows a mountain bike trail near Meadowlark Lake. There is also a non-motorized trail taking off from Willow Park CG, Tyrell Work Center and Island Park CG toward East Tensleep Lake that I have not taken.

**Nature Conservancy Tensleep Preserve**
is a beautiful area for hiking, geology and bird watching tucked in the southeast corner of the Bighorn Basin on the flanks of the Bighorns. Visitors are welcome Thursday through Sunday, May through mid-October, weather permitting. Recommended is a 3 mile round trip hike to Dedication Point at the edge of Canyon Creek Canyon with impressive Tensleep outcrops. Contact the Preserve for more information at 307-366-2671.

**Directions** – Coming from Ten Sleep at 3.6 miles, turn right on WY 436, 4.1 miles anticline or geologic fold on left, Canyon Creek flowing from open meadows into a tight canyon of Tensleep Sandstone, 5.9 miles pavement ends, cattle guard, end WY 436 and start Washakie County 56, 7.1 miles pink and white rocks of Permian Goose Egg Formation, 14.2 miles entrance on left to Nature Conservancy Tensleep Preserve.

**Off-Road Vehicles (ORVs)** – The west flank of the Bighorns is ORV heaven with endless miles of dirt roads and two-track trails on Forest Service and BLM land. For information, check out the Bighorn National Forest ORV webpage and the Wyoming State Trails Program webpage with ORV maps.

**Rock Climbing** - Tensleep Canyon is a premier rock climbing destination known for single-pitch sport climbing (permanent anchors) on limestone and dolomite. The Bighorn Climbers Coalition is a local source of information. Mountain Project website can get you oriented with over 500 listed climbing routes in the canyon, or you can buy the climbing guidebook “Holy Ten Sleep: Electric Koolaide 3-D Acid Test” at http://extremeangles.com/

**Ten Sleep Fish Hatchery and Wigwam Rearing Station** – Two separate, but similar facilities run by the Wyoming Game & Fish that are open to visitors and kid friendly. Both are neat and it is hard to recommend one over the other. Wigwam is in a pretty spot with Cottonwood trees, Tensleep Sandstone outcrops and old outdoor fish raceways, whereas the Ten Sleep Hatchery is in a gorgeous and peaceful location in the canyon just upstream of where Leigh Creek joins Tensleep Creek. **Directions** - Wigwam coming 4.8 miles from Ten Sleep, turn left on entrance road; Ten Sleep Fish Hatchery coming 7.6 miles from Ten Sleep, turn right on Wyoming 435/FS 18, go 1.1 miles. Look for the guys and gals in the red G&F shirts if you have questions.