NPS Form 10-900 OMB No. 1024-0018 (Expires 5/31/2012)



**United States Department of the Interior**
National Park Service

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

## 1. Name of Property

historic name Montezuma Valley Irrigation Company Flume No. 6

other names/site number McElmo Creek Flume, 5MT.20000

## 2. Location

street & number Approximately 4 miles east of Cortez on Hwy. 160, near mile marker 43 | N/A not for publication | x vicinity

city or town Cortez

state Colorado code CO county Montezuma code 083 zip code 81321

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _x_ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _x_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

__ national __x_ statewide __local

Edward C Nichols State Historic Preservation Officer 1/31/12
Signature of certifying official/Title Date

Office of Archaeology and Historic Preservation, History Colorado
State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

## 4. National Park Service Certification

I hereby certify that this property is:

✓ entered in the National Register

__ determined eligible for the National Register

__ determined not eligible for the National Register

__ removed from the National Register

__ other (explain:)

for Edson N. Beall
Signature of the Keeper Date of Action

Montezuma Valley Irrigation Company Flume No. 6
Name of Property

Montezuma County, Colorado
County and State

## 5. Classification

**Ownership of Property**
(Check as many boxes as apply.)

- [ ] private
- [x] public - Local
- [ ] public - State
- [ ] public - Federal

**Category of Property**
(Check only **one** box.)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] object

**Number of Resources within Property**
(Do not include previously listed resources in the count.)

| Contributing | Noncontributing | |
|---|---|---|
| | | buildings |
| | | sites |
| 1 | | structures |
| | | objects |
| 1 | | **Total** |

**Name of related multiple property listing**
(Enter "N/A" if property is not part of a multiple property listing)

N/A

**Number of contributing resources previously listed in the National Register**

N/A

## 6. Function or Use

**Historic Functions**
(Enter categories from instructions.)

AGRICULTURE/SUBSISTENCE/Irrigation facility

**Current Functions**
(Enter categories from instructions.)

VACANT/NOT IN USE

## 7. Description

**Architectural Classification**
(Enter categories from instructions.)

OTHER/Creo-Wood Flume

**Materials**
(Enter categories from instructions.)

foundation: N/A
walls: N/A
roof: N/A
other: WOOD, STEEL, CONCRETE

## Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

### Summary Paragraph

The flume is located approximately 4 miles east of Cortez on Hwy 160, near mile marker 43, just west of the Montezuma County Fairgrounds. The flume is situated approximately southeast-northwest across the McElmo Creek; measuring roughly 100' in length. This flume, constructed in ca. 1921, replaced an 1896 flume. It is constructed using wood, with a concrete and steel substructure, and steel hardware. The McElmo Creek Flume is an excellent example of a "Creo-Wood" flume designed and manufactured by the Continental Pipe Manufacturing Company of Seattle, Washington. As it is no longer in operation and has not received maintenance, the flume does not have the capacity to convey water and no longer has any associated water rights.

## Narrative Description

**Montezuma Valley Irrigation Company Flume No. 6 (contributing structure, 1921, 1955)**

The original construction of the ca. 1921 staves of the Continental Creo-Wood Flume, manufactured by the Continental Pipe Manufacturing Company, were specially "planed" so that when they fit together they would form a semi-circular trough for the water to run through. These flumes consisted of wood spreaders, angle washers, round milled steel rods, staves, a cradle consisting of two struts, two segments, and one base. The sill or cap is not considered a part of the cradle and the rods were spaced apart to that it was consistent with the diameter of the flume. The wood spreaders were made out of selected lumber of a suitable size and may or may not have been creosoted. The dimensions of the angle washers were carefully selected so that they would resist being pressed into the wood. Because of the nature of this type of resource, it was common to regularly replace the materials that were in contact with water, especially if the material was not creosoted and therefore would have deteriorated more quickly (Figure 1).

Continental Creo-Wood Flumes could be made in any diameter desired, however they were readily produced in standard sizes, and intermediate dimensions. The dimensions of the McElmo Creek Flume match the dimensions found in a table of standard sizes and areas. The diameter of the flume measures 120", with an area of 3,927 square feet. The wood cradles that were used are also of a standard construction, one of four options.[1]

The flow of water through the McElmo Creek Flume can be determined using a chart calculated in the Continental Pipe Manufacturing Company's Catalog No. 18. The McElmo Flume, when at capacity, supplied 100 cubic feet per second of water.[2]

The McElmo Creek Flume's spreader measures 132" across. The width of the trough, constructed out of staves, is 120 inches, with the individual staves measuring 1 ½" x 5 ¼". The trough measures 59" deep with ½" diameter rod wound from one end of the spreader, around the outside of the tough, to the other end of the spreader. The ends of the staves have a small slit, cut crosswise, that are joined together with a small piece of flat metal (similar to a biscuit joint in woodworking). In the center of the flume there are flood gates that could be opened manually, in event that the water was running too high.

The flume measures roughly 100'-long with twelve steel I-beams used as part of the substructure at 8' centers. The wood base of the flume rests across the steel I-beams. The I-beams are then supported off the ground and over the arroyo by a system of reinforced concrete piers, composed of steel incased in concrete that are braced on either side. The piers are then cross-braced to each other, underneath the flume, using steel. The original cross-sectional thickness of the steel plus concrete was necessary to carry the weight of the flume when it was filled with water. There is a central stringer that runs the length of the flume, composed of four timbers. The north and south ends have a single timber, while the central portion of the flume has two timbers (Figures 2-3).[3]

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[1] J. D. Goale, *Catalog No. 18: Continental Wire Wound Wood Pipe, Continental Continuous Stave Wood Pipe, Continental Creo-Wood Flume* (Seattle: Continental Pipe Manufacturing Co., 1923), 9, 125.
[2] Les Nunn, personal interview with author, July 6, 2011.
[3] Ibid, 4-6.

**Alterations**

When the first flume at this location was constructed in ca. 1896, the McElmo Creek Flume was most likely a 4'x18' wood box flume, supported by a wood substructure, on the main canal (Canal #2), and that flume was in service from ca. 1896 to 1921. The ca. 1921 Creo-Wood Flume completely replaced this earlier flume. A flume was the most common form of open conduit at the time, and the wooden box flume, or rectangular flume, was a popular choice in the West. Covering the surfaces with either paint, hot asphalt, or tar was encouraged in order to delay decay, and creosoting was noted as being able to add life to the timber but was generally too expensive in the late nineteenth century.[4] The flume was originally supported by timber trestles, which were replaced by reinforced concrete piers with diagonal braces in the 1950s.[5]

**Integrity**

The McElmo Flume, located four miles east of Cortez on Hwy. 160, was damaged in 2006 when heavy runoff clogged and overtopped the flume, causing the north half, particularly the spreaders, to collapse. In 2010 heavy winds damaged the southern portion of the flume. Extreme weather events have resulted in the banks of the arroyo that runs underneath the flume to erode, resulting in the diagonal concrete supports hanging free. Despite the damage, the integrity of feeling for the Flume remains largely intact. The original materials are largely still extant, and those materials that have been replaced were replaced with in-kind materials while it was in operation. The setting and location are very much intact, as the flume has not been moved, and the arroyo it was built over to divert water across is still extant. Evidence of the abandoned ditch that carried the water to and away from the flume partially remains. The workmanship is evident in the planed timbers used to create the semi-circular channel and precision in the construction of the materials to create the semi-circular flume. The design of the McElmo flume is identical to the wood semi-circular flumes produced by the Continental Pipe Manufacturing Company, and is the last remaining example of a wood flume constructed by the Montezuma Valley Irrigation Company. The McElmo Creek Flume represents the last available opportunity to interpret the association between this style of flume and the vast irrigation system that allowed the development and settlement of the Montezuma Valley.

[4] Amory Prescott Folwell, *Water Supply Engineering: The Designing, Construction, and Maintenance of Water-Supply Systems, Both City and Irrigation* (New York: John Wiley & Sons, 1899), 405-407.
[5] Preston Fisher, Structural Engineer, National Park Service, *Initial Structural Observations and Recommendations for McElmo Flume* (Cortez, CO: Mesa Verde National Park, March 23, 2011), 1.

Montezuma Valley Irrigation Company Flume No. 6
Name of Property

Montezuma County, Colorado
County and State

## 8. Statement of Significance

### Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [ ] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [x] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

### Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

### Areas of Significance
(Enter categories from instructions.)

Engineering

### Period of Significance
1921-1955

### Significant Dates
N/A

### Significant Person
(Complete only if Criterion B is marked above.)

N/A

### Cultural Affiliation
N/A

### Architect/Builder
Montezuma Canal Company

Continental Pipe Manufacturing Company

Montezuma Valley Irrigation Company

### Period of Significance (justification)
The period of significance covers the significant dates of construction, including construction of the current Creo-Wood Flume in 1921 and the replacement of the wood trestle for reinforced concrete piers in 1955, as the concrete piers are a contributing engineering feature of the extant flume.

### Criteria Considerations (explanation, if necessary)
N/A

**Statement of Significance Summary Paragraph** (Provide a summary paragraph that includes level of significance and applicable criteria.)

The Montezuma Valley Irrigation Company Flume No. 6 is eligible to the National Register under Criterion C in the area of Engineering for 1921 and 1955 at the state level of significance. When the first flume was constructed on this location ca. 1896, pipe for irrigation practices was not a common practice, though finding a means to deliver water was crucial for the prosperity of the Montezuma Valley. The McElmo Creek Flume was a part of a large irrigation system that aimed to deliver water to arid areas of the Valley. The irrigation system allowed agriculture and ranching to become a major economic component in the area. In 1921, the flume was upgraded from what was most likely a box flume to a semi-circular flume. In 1955, the original wood cradles were made more stable by the installation of a steel and concrete substructure. Not only does the McElmo Creek Flume serve as the only remaining wood flume from the Montezuma Valley Irrigation Company to represent irrigation practices throughout the West during the late nineteenth century, but it also represents many themes that are commonly present on the American frontier, such as: technological innovation, cooperation, and self-reliance. It is the only surviving flume from the Montezuma Valley irrigation system, which arose as a technological innovation in response to a practical necessity, water. Cooperation can be seen throughout nearly every working part of the irrigation system, while self-reliance can be examined through the unwillingness of the company to accept federal aid throughout much of its history, a departure from other irrigation systems that were being built at the time.[6]

**Narrative Statement of Significance** (Provide at least **one** paragraph for each area of significance.)

In much of the western United States, securing an adequate water supply can be a struggle; this remains true for the Montezuma Valley. Evidence of this struggle can be seen throughout the area including the early efforts for water irrigation in the nearby Mesa Verde National Park, providing a vivid example. The ancestral Puebloans, who resided in the area from about 400 to 1300 A.D., eventually abandoned it because of the lack of water due to prolonged drought. In 1776, the Spanish Fathers Dominguez and Escalante envisioned an irrigated Montezuma Valley, writing in their journals: "that if the water of the river below could be brought to the vast area to the south, a culture could be sustained."[7]

In the early 1880s, James W. Hanna founded the Town of Cortez in the process of developing irrigation in the Montezuma Valley. Hanna formed a private company, Canal Co. No. 1, to trans-basin divert water from the Dolores River to the San Juan River drainage. Once the water was in the San Juan basin, a system of distribution canals were constructed to serve land that was being sold to individuals. Many natural drainages traversed these lands, leading to and including McElmo Creek. However, the company went bankrupt shortly after its conception, halting further work on the rest of the system. Hanna then organized the Montezuma Water Supply Company, where the profits came almost entirely through the Cortez Land and Investment Company, both of which Hanna controlled at the time. However, the Company did not last long and the Dolores No. 2 Land and Canal Company was formed in 1887, also by Hanna. The Canal Company began digging out the tunnel through the divide in 1887, a distance of 5,400 feet, which was considered "one of the greatest irrigation enterprises, not only in the state, but in the West."[8] This was the largest single task that needed to be completed. When the construction of the canal system, as well as the tunnel was assured, many of the men who had been working on the irrigation system, and their families, homesteaded in the valley.[9] However, because the ranchers had failed to prepare their lands for irrigation, the irrigation company had few customers.[10]

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[6] Ibid, 15.
[7] Less Nunn, Former Executive Director of the Montezuma Valley Irrigation Company, personal interview with author, 6 July 2011.
[8] Mareen Gerhold, "Eastern Capital and Frontier Initiative: The History of the Montezuma Valley Irrigation System," in *The River of Sorrows: The History of the Lower Dolores River Valley,* ed. by Gregory D. Kendrick (Washington, DC: U.S. Department of the Interior, 1981).
[9] Ira S. Freeman, *A History of Montezuma County Colorado: Land of Promise and Fulfillment* (Boulder, CO: Johnson Publishing Company, 1958), 96-97.
[10] Mareen Gerhold, *The History of the Montezuma Valley Irrigation System,* Survey Number: HAER No. CO-4, Call Number: HAER COLO, 42-DOL.V,G- (Washington D.C.: Historic American Engineering Record, National Park Service, Department of the Interior, 1981), 3.

In a letter dating from November 4, 1887, the Secretary of the Interior discussed the irrigation of the Montezuma Valley lying within the boundaries of the Southern Ute Indian Reservation in a report. This report highlighted the fact that the Montezuma Valley Supply Company had appropriated all water from the Dolores Divide. However, the company submitted a proposition, through United States Indian Inspector Wright, offering to furnish water to the part of the valley lying within the Southern Ute Indian Reservation along the north line during the irrigating season (April 1-November 1). The report stated that the amount of water furnished would be enough to irrigate 10,000 acres, at the rate of $900 per cubic foot, each foot constituting one perpetual water right. The proposition also outlined that there would be water sufficient enough for domestic purposes during the entire year, subject to an annual fee or assessment for maintenance of the company's ditches, guaranteed not to exceed $1 per acre. The company's liability for the delivery of water, condition of laterals, etc. was to end at the north line of the reservation.

The report stated that the proposition was accepted and the company agreed to furnish the quantity of water within one year, though it is unclear if this proposition ever was implemented by the Montezuma Valley Supply Company. [11]

In May of 1889, the Dolores No. 2 Land and Canal Company and the Colorado Water Supply Company decided to merge, forming the Colorado Consolidated Land and Water Company. This company continued the tradition of administrative and financial mismanagement of Montezuma Valley irrigation, and after 1894, they passed on the tradition to the next company, the Montezuma Water and Land Company.[12] Under their organization canals were dug, flumes were built, and by 1889, the tunnel was complete.

This tunnel diverted water from the Dolores River to the San Juan River Basin. The Montezuma Valley, where Cortez and the McElmo Creek Flume are located, is the divide between the Dolores and San Juan River watersheds, and the McElmo carried water out of the valley out north of Ute Peak to the San Juan River. The initial construction of the canal system was characterized by the construction of wood flumes at each crossing of natural drainage. The area of the Montezuma Valley, which is better adapted to agriculture, is the area where the McElmo Creek and flume are situated. The creek winds its way between rocky walls, carrying a small stream containing the surplus water of irrigation ditches. Prior to irrigation efforts, it was a dry streambed most of the year, prone to intermittent raging waters from rainfall or snow melts. The McElmo Creek Flume worked to transport irrigation water across McElmo Creek, on its way from the Dolores River to the Lower Montezuma Valley irrigators.

A contract, signed in late 1906 between the Montezuma Valley Irrigation District and Empire Construction Company, bonded the construction company to overhaul the existing system, and construct two large reservoirs. Another change in the system was that the Montezuma Water and Land Company leased the High Line or Mesa Verde Lateral in 1912 to the U. S. Government to supply the Southern Ute Indian Tribe with water. While the first large reservoir was under construction, it washed out and was not reconstructed until the 1930s by the Montezuma Valley Irrigation Company.[13]

The Montezuma Valley Irrigation Company formed in 1920 and pulled water rights owners out of debt by giving citizens incentives to meet their financial obligations. As a result, the Montezuma Valley Irrigation Company has continued successfully operations up to the present time. Along with the entire irrigation system that was developed during the late nineteenth century, the McElmo Creek Flume aided in the agricultural and urban settlement of the valley.[14] Because the venture of irrigation was so exploratory the profits came almost entirely through the Cortez Land and Investment Company, a private funding source. In April of 1888, the *Montezuma Journal* called the system "one of the greatest irrigation enterprises, not only in the state, but in the West." Though the construction of railroad tunnels was common throughout the nineteenth century the construction of irrigation tunnels was rare. This, paired with the fact that irrigation

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[11] The President of the Senate, Document No. 124, *To the Irrigation of that Part of the Montezuma Valley Lying Within the Boundaries of the Southern Ute Indian Reservation* (Washington D.C.: Department of the Interior, The Secretary of the Interior, February 7, 1898), 1-2.
[12] Ibid, 8.
[13] Ibid, 9-10
[14] Frank Hall, *History of the State of Colorado: Embracing Accounts of the Pre-Historic Races and their Remains; the Earliest Spanish, French and American Explorations; the Lives of the Primitive Hunters, Trappers and Traders; the Commerce of the Prairies; the First American Settlements Founded; the Original Discoveries of Gold in the Rocky Mountains; the Development of Cities and Towns, With the Various Phases of Industrial and Political Transition, From 1858 to 1890*, Vol. IV (Chicago: The Blakely Printing Company, 1895), 226-228.

engineering was in its infancy, served to make the Montezuma Valley Irrigation Company Tunnel one of the first in the West. [15]

Between 1907 and 1912, there were various investigations made by private interests for the development of approximately 200,000 acres of land in Montezuma and Dolores Counties in Colorado as well as San Juan County in Utah. However, no construction work was executed and funds were not able to be secured by these private interests. In 1918, the Durango Exchange called to the attention of the U.S. Reclamation Service the possibilities of development and preliminary surveys were made.[16] By 1920, due to the fact that the private ditch companies had run out of money, the Montezuma Valley Irrigation Company was formed in order to consolidate several systems, and rehabilitate, operate and maintain them. The Montezuma Valley Irrigation System included more than 100 wooden flumes and 150 miles of canals.

In 1920, C. D. Brooks, representing the Continental Pipe Manufacturing Company, proposed to furnish approximately 4,300' of 10' diameter Creo-Wood Stave Flume at a price of $7.35 per lineal foot. The Montezuma Valley Irrigation Company considered the bid and ultimately accepted it.[17]

In 1921, the Continental Pipe Manufacturing Company, based out of Seattle, Washington, built 4,301' of semicircular wood-stave flume, to replace the original box flume design of McElmo Flume as well as the others. The flumes were most likely constructed out of Douglas fir, known as the Continental Creo-Wood Flume. The new flume was described by the Company as follows:

> ...spans ravines on wooden trestles and passes over low land on ground timbers, has an average grade of 0.5 ft. per 1000 ft. and carries 180 sec.-ft. of water at the velocity of 6.5 ft. per second. It was designed for a carrying capacity of 225 sec.-ft., if that volume should be required. There are numerous curves on the flume line, the sharpest of which is on a 250-ft. radius.[18]

A special "planer" beveled the edges of 2' x 4' lumber so that they formed a semi-circle. In 1922, the International Trade Press reported that Creo-Wood Flumes and siphons replaced seventy box flumes on the several laterals. At that time the system supplied water for irrigating 18,000 acres of land.[19]

The Continental Pipe Manufacturing Company was the world's largest manufacturer of wood pipe, making deliveries and carrying out contracts in any part of the world.[20] The use of wood for transporting water had many advantages, it was very durable, easily adapted and transported, efficient, had a capacity greater than those made out of steel or cast iron, fire resistant, and resistant to freezing.[21] A book published by the Continental Pipe Manufacturing Company outlined the features of the Continental Creo-Wood Flume that made it superior to other types of flumes. The list claimed that the flume would:

> ...carry more water for a given diameter than any other type of flume; because made of Creosoted material, last indefinitely; preserve its semi-circular shape, will NOT sag between supports and therefore will discharge continuously at full capacity; permit of reasonably sharp curvature without special construction or increase of frictional resistance to the flow of water (the curves are gradual bends, NOT sharp angles); not crack, disintegrate nor rust; not leak, a short turn on one of the nuts will immediately correct any leakage that may show signs of development; not require an annual overhauling and painting; not so readily overflow, for the inward curve above the center line will direct the water toward the center

[15] "The History of the Montezuma Valley Irrigation System," 3.
[16] Arthur P. Davis, *Eighteenth Annual Report of the U.S. Reclamation Service, 1918-1919* (Washington D.C.: Government Printing Office, 1919), 387.
[17] Montezuma Valley Irrigation Company, *Record of Minutes*, No. 1, from October 26, 1920-March 14, 1922, p. 44.
[18] International Trade Press, Inc., 1.
[19] Ibid.
[20] *Catalog No. 18: Continental Wire Wound Wood Pipe, Continental Continuous Stave Wood Pipe, Continental Creo-Wood Flume*, 17-23.
[21] Ibid, 51-63.

> of the channel; not require the use of battens at any time, whether new or old; not expand in hot weather nor contract in cold; not be damaged by scouring.[22]

The Continental Pipe Manufacturing Company appears to have formed in the spring of 1918, after consolidating several pipe companies throughout the Northwest. Their new headquarters was based in Seattle, taking over the pipe department of the National Tank & Pipe Co., of Portland; the Pacific Coast Pipe Co., of Seattle; the Washington Pipe & Foundry Co., of Tacoma; and the Portland Pipe Co., of Portland. Factories operated in Portland, Tacoma, and Seattle, and while the National Tank & Pipe Co. carried on their business in tanks, cross arms, silos, and mill work, the Continental company used the same location as the National Tank & Pipe Co. for its Portland office at 275 Oak Street.[23]

During this time, the industry of pipe manufacturing in the Northwest was expanding rapidly in order to meet the increasing demands for penstocks, conduits, and distribution lines. One of the most important moves in the direction of expansion was the organization of the Continental Pipe Manufacturing Company and its consolidation of the various factories in the region, which had previously engaged as competitors in the manufacture of wood pipe.[24] *Cement World*, a magazine based out of Chicago, reported: "Since the date of the new arrangement, pipe manufacturing has progressed with renewed speed, under one general management."[25]

A 1919 article in the *Seattle Daily Times* announced the formation of the Wood Pipe Export Company. This company was to be made up of several companies, including the Continental Pipe Manufacturing Company. The new organization was to develop and extend the use of wood pipe internationally:

> Seeing the big opportunity in the export field for a more extensive use of wood pipe, the product of Pacific slope forests from Canada down beyond Central California, and which, by the way, are the only forests in the world which supply the proper wood for pipe-making, the Continental Pipe Manufacturing Company, with headquarters here; the Redwood Manufacturers Company, of San Francisco; the Pacific Tank & Pipe Company, San Francisco, and the American Wood Pipe Company, of Tacoma, recently took advantage of the recommendation of governmental agencies and joined forces, as encouraged under the Webb-Pomerene act, and formed the Wood Pipe Export Company, with Seattle as the home office and E. J. Bartells, consulting engineer, formerly of the Continental Pipe Manufacturing Company, as secretary and manager. The functions of the new organization will be to develop and extend the use of wood pipe in the foreign field...[26]

A large percentage of the Continental Pipe Manufacturing Company's capacity was devoted to orders from the War and Navy departments. Many orders for wire-wound pipe, estimated at 75% of that class of the company's product for the year 1918, were for government work on the Atlantic and Gulf coasts. Also, among other orders in that year, were several for water conduits on irrigation projects of the United States Reclamation Service in the states of Idaho, Montana, and Washington.[27]

The Continental Pipe Manufacturing Company was one of the few Pacific Northwest institutions taking full advantage of its opportunity to sell Pacific Northwest Products on a global scale. For example, they exhibited at the Women's Educational Exhibit for Washington Manufacturers in 1921. Their exhibit consisted of a water supply and distribution system in operation, involving a supply flume, storage tank, and distribution pipe. After the Women's Exhibit, the company shipped the exhibit to Peru, South America, for the Peruvian Centennial Exposition in Lima, that same year.[28]

The Continental Creo-Wood Flume was the latest development of a means of carrying water without waste in the 1920s. The McElmo Creek Flume is an example of the semi-circular type of Continental Creo-Wood Flume and

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[22] Ibid, 103.
[23] "Pipe Companies Consolidate," in *The Timberman: An International Lumber Journal*, Vol. XIX, No. 7 (Portland, OR: May 1918), 32.
[24] W.A. Scott, "Wood Pipe: Demands for Supply Lines Have Stimulated the Manufacture," in *Engineering and Cement World: A Consolidation of Cement World-Cement Era-International Trade* (Chicago, IL: November 1, 1918), 25.
[25] "Pipe: Demands for Supply Lines Have Stimulated the Manufacture," 25.
[26] "For the Exportation of Wood Pipe," in *The Seattle Daily Times* (Seattle, Washington: November 13, 1919), 22.
[27] "Wood Pipe: Demands for Supply Lines Have Stimulated the Manufacture," 25.
[28] "See the Continental Exhibit," in *The Seattle Sunday Times* (Seattle, Washington: April 17, 1921), 21.

was considered to be thoroughly successful by the United States Reclamation Service and individuals who used it. The design of this flume served to direct the flow of water toward the center of the channel, which helped to prevent any tendency to overflow. Because of the use of creosoted fir lumber they are not dependent on any other type of surface protection such as paint, pitch, or galvanizing which would have to be annually renewed.

It appears as though the Montezuma Valley Water and Supply Company used the Continental Pipe Manufacturing Company to complete some of the initial construction of flumes in the early 1920s. In April of 1921 a meeting was held between the Montezuma Valley Water Company and the Continental Pipe Manufacturing Company to accept a flume that had been recently erected by the Continental Pipe Manufacturing Company. It also appears that after the first flume was constructed by the Continental Pipe Manufacturing Company, Montezuma Valley Irrigation Company may have been constructing their own wooden flumes. A representative from the Gibson Lumber and Coal Co. appeared before the board to determine the company's needs regarding Oregon fir lumber. The board then requested that a list of dimensions be compiled and a quote to be made by the Continental Pipe Manufacturing Company.[29] It is difficult to determine exactly which flumes were constructed by the Montezuma Valley Irrigation Company, using materials directly from the Continental Pipe Manufacturing Company as differentiated from those constructed by the Montezuma Valley Irrigation Company. However, it is likely that the McElmo Creek Flume was among those constructed by the Continental Pipe Manufacturing Company when they were doing business with the Montezuma Valley Irrigation Company in 1921.

On March 5, 1955, the Montezuma Valley Irrigation Company contracted to the sale of 200 shares of stock at $50.00 per share to supply the Ute Mountain Ute Tribe. The Highline Lateral, on which the McElmo Flume is situated, directly supplied the main village, Towaoc.[30] A reservoir still exists near the northern border of the Ute Mountain Ute Reservation, which had previously supplied potable water to the village through a water treatment plant (no longer extant).

Not only does the McElmo Creek Flume serve to represent irrigation practices throughout the West during the late nineteenth century, but it also represents many themes that are commonly present on the American Frontier: technological innovation, cooperation, and self-reliance. It is the only surviving flume from the Montezuma Valley irrigation system (that at one time contained more than 100 such flumes), which arose as a technological innovation as a response to a practical necessity, water. Cooperation can be seen throughout nearly every working part of the irrigation system, while self-reliance can be examined through the unwillingness of the company to accept federal aid throughout much of its history, unlike other irrigation systems that were being built at the time.[31]

**Developmental history/additional historic context information** (if appropriate)

At the time of completion of the Montezuma Valley Irrigation Company Tunnel in 1889, Colorado ranked second in irrigation development.[32] In 1921, 105 wood flumes were extant, only 43 existed by 1936, 7 by 1972, 3 by 1981, and now only 1 wood flume, the McElmo Creek Flume, which remains as of 2011.[33] The McElmo Flume was Flume No. 6 on the Highline Lateral.[34] The use of this flume was discontinued by the Montezuma Valley Irrigation Company in 1992, when an inverted siphon, constructed as part of the Dolores River Reclamation Project, was put into service.[35] Because the McElmo Creek Flume was no longer being used or maintained by the Company it started to deteriorate.

The historical significance of irrigation practices in the dry West can be illustrated by the Montezuma Valley irrigation system. Through the complex system of tunnels, headgates, canals, and flumes the system stimulated agricultural and urban settlement of the valley, becoming a major economic component in the area and in the sustainability of the City of Cortez. Agriculture in the area did not become significant until after 1890, when irrigation water was first delivered into the

[29] Montezuma Valley Irrigation Company Archives, No. 1, from October 26, 1920-March 14, 1922, p. 31.
[30] Montezuma Valley Irrigation Company Archives, *Record of Minutes*, No. 10, September 11, 1951-April 10, 1956.
[31] Ibid, 15.
[32] Maureen Gerhold, "Eastern Capitol and Frontier Initiative: The History of the Montezuma Valley Irrigation System," in *The River of Sorrows: The History of the Lower Dolores River Valley*, Ed. by Gregory D. Kendrick (Washington, DC: U.S. Department of the Interior: 1981), 3.
[33] Ibid, 12.
[34] Les Nunn, personal interview with author, July 6, 2011.
[35] As such, this water-related resource is considered abandoned and no longer has water rights associated with it. Mike Sullivan, Deputy State Engineer, personal communication with Heather L. Bailey, History Colorado, Denver, CO.

valley. According to Les Nunn, manager of the Montezuma Valley Irrigation Company from 1978-2006, "The lower valley, as we called it, everything south of Cortez, and probably 2/3 of that, was irrigated through the McElmo Creek flume. That is almost 1/3 of the acres that are in the Montezuma Valley Irrigation system south of Cortez."[36] Until 1950, most of the population growth was a result of the expanding agricultural industry.[37] The system allowed farmers to diversify their crops while at the same time increasing their productivity, which in turn helped to stabilize farm incomes.[38]

The Continental Pipe Manufacturing Company had two forms providing quotations on Creo-Wood Flumes located at the back of their catalog. By filling out Form 1, the company would contract to manufacture and ship, disassembled, complete material and erect the flume in place, covering the cost of labor of erection, filling and testing to the purchaser's satisfaction. The material that was to be furnished under the terms of this proposal were: spreaders, washers, rods, staves and cradles, the staves only with the option of creosoting. Under the terms of this proposal the purchaser was responsible for unloading, tallying, sorting, hauling and distributing the material on top of the substructure, and was required to furnish water for the test upon the completion of the installation. By filling out Form 2 the furnishing of the material would be the same as in Form 1, except all of the parts would be subjected to the creosoting process.[39]

Accurate prices and estimates on the Continental Creo-Wood Flume could be made providing that the purchaser sent in the following information:

1. The diameter of the flume, or if a replacement state kind and size of old flume
2. Length of flume
3. Quantity of water to be delivered
4. Total fall from water surface at intake to water surface at outlet
5. If there will be any angles or sharp curves in the line? If possible state the degree of the angles and the minimum radii of the curves
6. Velocity of water in ditch at intake
7. Velocity of water in ditch at discharge end
8. The name of the railroad station or point on common carrier to which it is desired that material shall be delivered
9. The commencement and completion of the installation
10. The average wage for common labor applying at the site of the proposed installation
11. The legal limit of working hours, if any
12. If they wished for preliminary prices to aid in making approximate estimates, or if they intended in placing the order immediately.[40]

[36] Ibid.
[37] Soil Conservation Service assisted by Agricultural Stabilization and Conservation Service and Agricultural Research Service of the United States Department of Agriculture, *Environmental Assessment for Onfarm Irrigation Improvements: McElmo Creek Unit Salinity Control Study: Colorado River Basin Salinity Control Program* (Denver: United States Soil Conservation Service, 1986), III-25.
[38] Mareen Gerhold, 14.
[39] *Catalog No. 18: Continental Wire Wound Wood Pipe, Continental Continuous Stave Wood Pipe, Continental Creo-Wood Flume*, 245.
[40] Ibid, 246.

## 9. Major Bibliographical References

**Bibliography** (Cite the books, articles, and other sources used in preparing this form.)

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Montezuma Valley Irrigation Company Archives, *Record of Minutes*, No. 1, October 26, 1920-March 14, 1922, Cortez, CO.

Montezuma Valley Irrigation Company Archives, *Record of Minutes*, No. 10, September 11, 1951-April 10, 1956, Cortez, CO.

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The President of the Senate, Document No. 124, *To the Irrigation of that Part of the Montezuma Valley Lying within the Boundaries of the Southern Ute Indian Reservation.* Washington D.C.: Department of the Interior, Secretary of the Interior, February 7, 1898.

**Previous documentation on file (NPS):**

___ preliminary determination of individual listing (36 CFR 67 has been requested)
___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey #_____
___ recorded by Historic American Engineering Record # _____
___ recorded by Historic American Landscape Survey # _____

**Primary location of additional data:**

x State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository: **History Colorado**

Historic Resources Survey Number (if assigned): 5MT.20000

## 10. Geographical Data

**Acreage of Property** Less than one acre
(Do not include previously listed resource acreage.)

The UTM reference point was derived from heads up digitization on Digital Raster Graphic (DRG) maps provided to OAHP by the U.S. Bureau of Land Management.

**UTM References** (NAD 27)
(Place additional UTM references on a continuation sheet.)

| | Zone | Easting | Northing | | Zone | Easting | Northing |
|---|---|---|---|---|---|---|---|
| 1 | 12 | 721258 | 4136187 | 3 | | | |
| 2 | | | | 4 | | | |

**Verbal Boundary Description** (Describe the boundaries of the property.)
The boundary includes only the flume as it is located at the given UTM coordinates.

**Boundary Justification** (Explain why the boundaries were selected.)
The boundary encompasses the full extent of the historic resource associated with this nomination.

**11. Form Prepared By**

name/title Rachel Parris, Endangered Places Intern; Patrick Eidman, Endangered Places Manager (for property owner)

organization Colorado Preservation, Inc. date September 2011

street & number 2100 Downing Street, Suite 300 telephone 303-893-4260

city or town Denver state CO zip code 80205

e-mail peidman@coloradopreservation.org

**Additional Documentation**

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

**Photographs:**

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: McElmo Creek Flume
City or Vicinity: Cortez
County: Montezuma State: Colorado
Photographer: Patrick Eidman
Date Photographed: May 2011
Description of Photograph(s) and number:

Photo #0001
Northwest end (left) looking towards the southeast end (right), camera facing east.

Photo #0002
Detail showing how each stave is joined with another.

Photo #0003
Underneath the flume, showing the substructure, camera facing southeast.

Photo #0004
Center of flume showing the substructure as well as the headgates that could manually be opened in event the water rose too high, camera facing northeast.

Photo #0005
The southwest portion of the flume, camera facing southeast.

Photo #0006
Northwest end looking towards the southeast end, camera facing southeast.

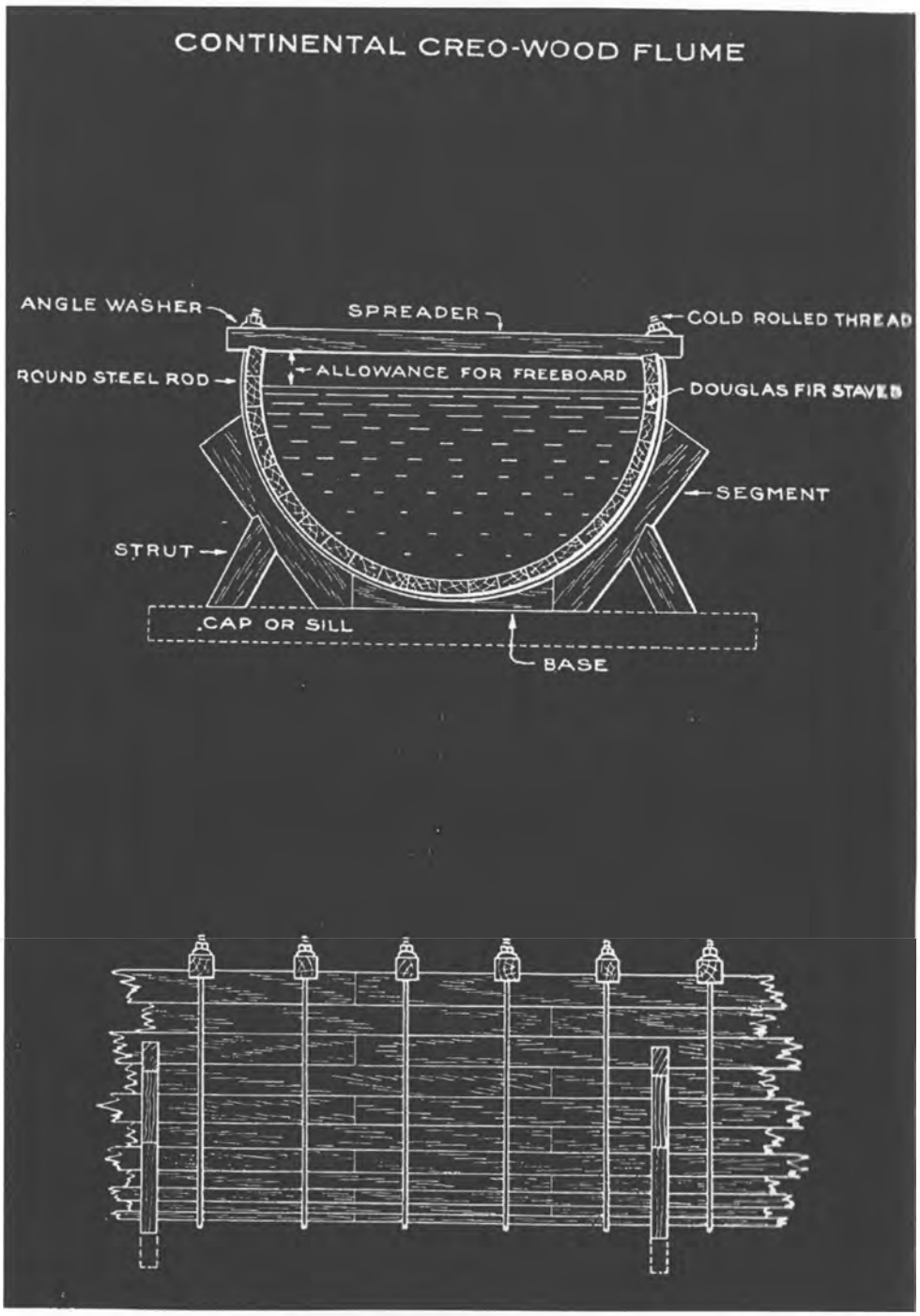
**Figures**

Figure 1- Diagram showing the parts of a Continental Creo-Wood Flume, such as the McElmo Creek Flume. (Diagram taken from *Catalog No. 18: Continental Wire Wound Wood Pipe, Continental Continuous Stave Wood Pipe, Continental Creo-Wood Flume).*

Figure 2- Map of the Montezuma Valley showing the irrigation system as it existed in 1898. The blue line indicates the McElmo Creek, while the brown indicates the High Line, Mesa Verde or U Lateral on which the McElmo Creek flume is situated. The flume is located where the two intersect. (Map taken from the Denver Public Library).

Figure 3- McElmo Creek Flume sketch (Colorado Preservation, Inc.)

**Figures**

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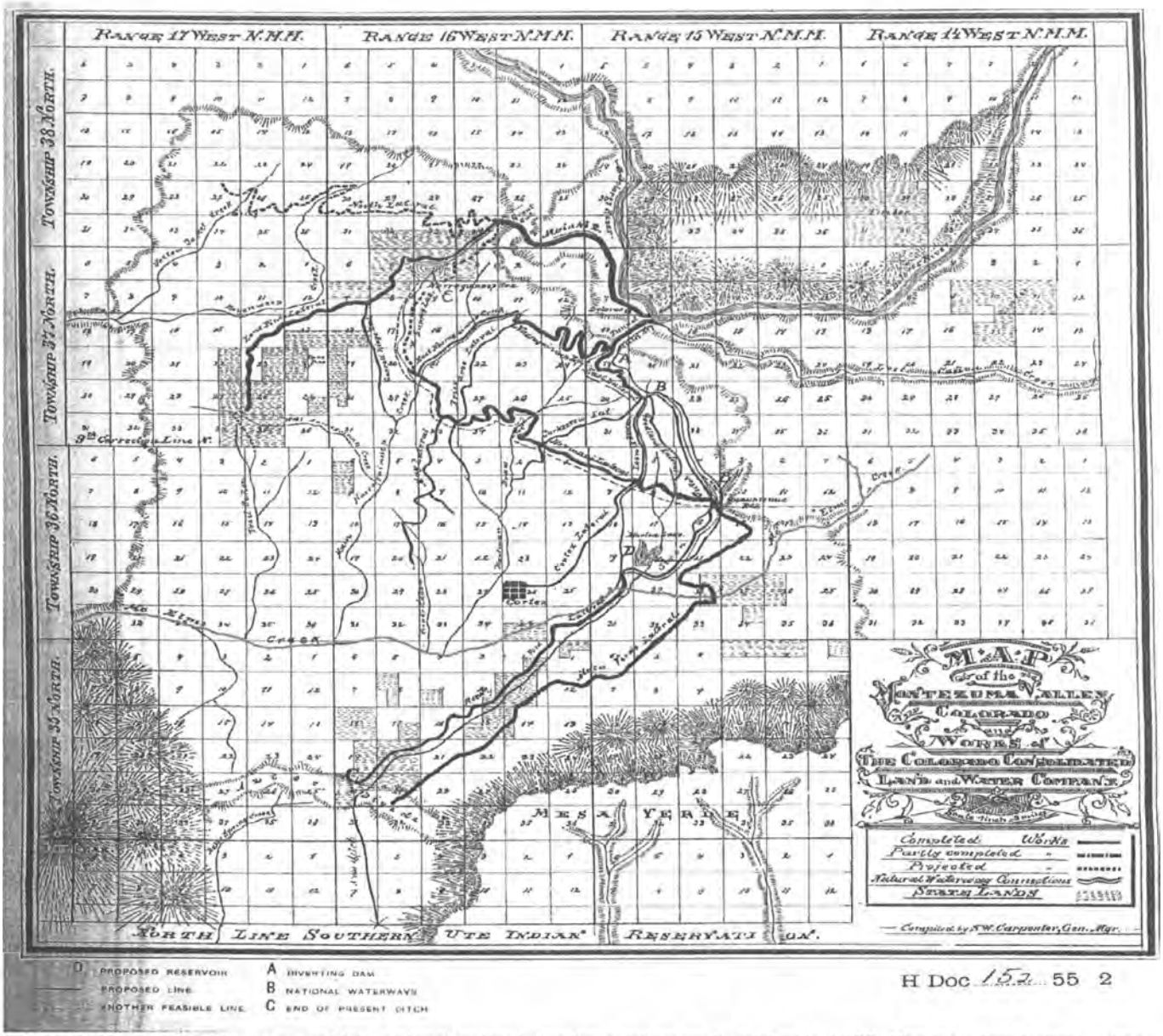


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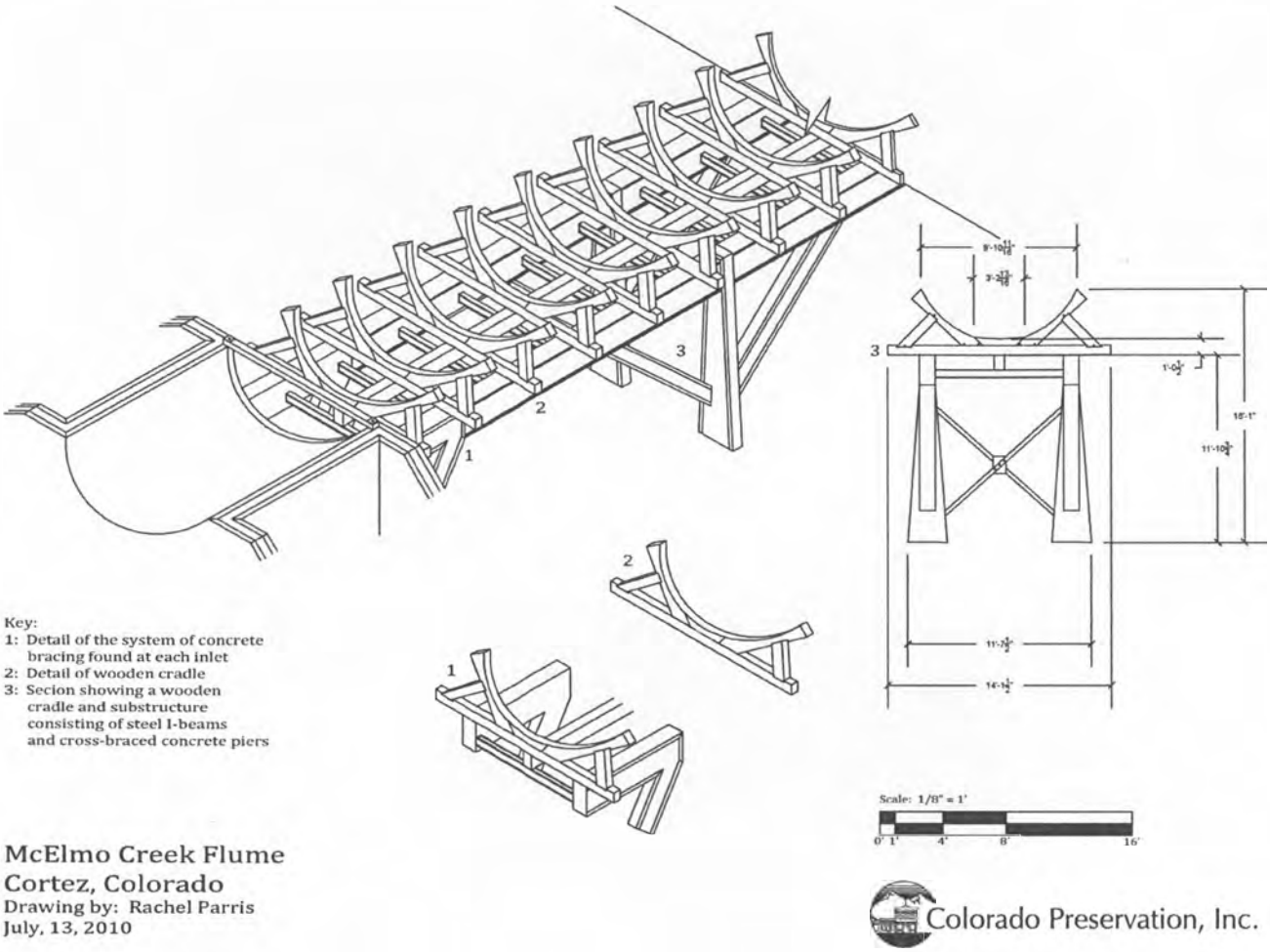


Figure 3- McElmo Creek Flume sketch (Colorado Preservation, Inc.)

Montezuma Valley Irrigation Company Flume No. 6
Name of Property

Montezuma County, Colorado
County and State

**Property Owner:**

(Complete this item at the request of the SHPO or FPO.)

name County of Montezuma (contact: Ashton Harrison, County Administrator)

street & number 109 West Main Street telephone

city or town Cortez state CO zip code 81321

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Montezuma Valley Irrigation Company Flume No. 6

MULTIPLE NAME:

STATE & COUNTY: COLORADO, Montezuma

DATE RECEIVED: 2/10/12 DATE OF PENDING LIST: 3/02/12
DATE OF 16TH DAY: 3/19/12 DATE OF 45TH DAY: 3/28/12
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 12000146

REASONS FOR REVIEW:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| APPEAL: | N | DATA PROBLEM: | N | LANDSCAPE: | N | LESS THAN 50 YEARS: | N |
| OTHER: | N | PDIL: | N | PERIOD: | N | PROGRAM UNAPPROVED: | N |
| REQUEST: | N | SAMPLE: | N | SLR DRAFT: | N | NATIONAL: | N |

COMMENT WAIVER: N

✓ ACCEPT ___ RETURN ___ REJECT 3.27.12 DATE

ABSTRACT/SUMMARY COMMENTS:

Entered in
The National Register
of
Historic Places

RECOM./CRITERIA_____

REVIEWER_____ DISCIPLINE_____

TELEPHONE_____ DATE_____

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

CO_Montezuma County_McElmoCreekFlume_0001

CO_MontezumaCounty_McElmoCreekFlume_0002

CO_Madezuma County_McElmoCreek
Flume_0003

CO_Montezuma County_McElmo Creek Flume_0004

CO_Montezuma County – McElmoCreek Flume_0005

CO_Montezuma County_McElmoCreekFlume_0006

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

# CORTEZ QUADRANGLE
COLORADO – MONTEZUMA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

4258 I NW (ARRIOLA)
4358 IV NW (DOLORES EAST)
4258 I SW (MUD CREEK)
4358 IV SW (POINT LOOKOUT)
(TOWAOC) 4258 II NW
(MOCCASIN MESA) 4358 III NW
(WETHERILL MESA) 4258 II NE
SHIPROCK N. MEX. 36 MI.
N. MEX.-STATE LINE 20 MI.
DOVE CREEK 35 MI.
LEWIS 10 MI.
DOLORES 9 MI.
MANCOS 13 MI.
DURANGO 41 MI.

Montezuma Valley Irrigation Company Flume No. 6
Cortez vicinity, Montezuma County
5 MT. 20000
UTM: (NAD27)
12/721258/4136187

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1964. Field checked 1965

Polyconic projection. 1927 North American Datum
10,000-foot grid based on Colorado coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

Red tint indicates areas in which only landmark buildings are shown

Fine red dashed lines indicate selected fence lines

To place on the predicted North American Datum 1983 move the projection lines 3 meters north and 57 meters east as shown by dashed corner ticks

UTM GRID AND 1965 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
(GN 1°29′ 26 MILS; MN 14° 249 MILS)

There may be private inholdings within the boundaries of the National or State reservations shown on this map

SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

COLORADO
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U.S. Route
State Route

Map photoinspected 1979
No major culture or drainage changes observed

CORTEZ, COLO.
37108-C5-TF-024

1965
PHOTOINSPECTED 1979
DMA 4258 I SE–SERIES V877

ISBN 0-607-11581-5
9 780607 115819

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1984

HISTORY Colorado



January 31, 2012

Carol D. Shull
Keeper of the National Register
National Register of Historic Places
1201 Eye "I" Street, N.W., 8th Floor (MS 2280)
Washington, D.C. 20005-5905

Dear Ms. Shull:

We are pleased to submit for your review the enclosed National Register of Historic Places nomination for the Montezuma Valley Irrigation Company Flume No. 6, Montezuma County (5MT.20000).

The State Review Board reviewed the nomination at its meeting on January 20, 2012. The board voted unanimously to recommend to the State Historic Preservation Officer that the property met the criteria for listing in the National Register.

We look forward to the formal listing of this property. If you have any questions, please do not hesitate to contact me.

Sincerely,

Heather L. Bailey
National & State Register Historian
(303) 866-4683
heather.bailey@state.co.us

Enclosures
- Registration forms
- USGS map
- CDR
- Photographs