

**Fort Benton Water Treatment Plant**  
Lots 9-13 of Block 7  
Fort Benton Original Townsite (at the Missouri River)  
Fort Benton, Chouteau County, Montana

HAER No. MT-113

HAER  
MT-113

**Written Historical and Descriptive Data**  
**Photographs**

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
Rocky Mountain System Support Office  
P.O. Box 25287  
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD  
Fort Benton Water Treatment Plant

- Location: Lots 9-13 of Block 7, Fort Benton Original Townsite, Chouteau County, Montana, on the Missouri River.
- Quad: Fort Benton, Montana 7.5'
- UTM: Zone 12 524, 550.3mE 5, 295, 056.5mN
- Date of Construction: 1934
- Fabricator: Lease & Leigland, general contractor; F.F. Palmer, consulting engineer
- Present Owner: United States Department of the Interior, Bureau of Land Management
- Original/Present Use: Water Treatment Plant/abandoned
- Significance: The Fort Benton Water Treatment Plant is significantly associated with the modernization and improvement of civic infrastructure that occurred in Fort Benton during the 1930s, under the auspices of federal Depression-era work programs (National Register Criterion A). Fort Benton was the first city in Montana to have electrical lighting and the first to have a civic water treatment facility. Because its municipal infrastructure was the state's oldest, it was also the most outdated and obsolete by the 1930s. The availability of federal funding during the Great Depression of the 1930s enabled the City of Fort Benton to modernize its water treatment plant and to improve other public facilities, including roads, schools, and the city swimming pool. The plant is not an outstanding representation of industrial architecture and is not significantly associated with advances in water treatment technological innovations (National Register Criterion C).
- Project Information: In January 2002, the Bureau of Land Management (BLM), Lewistown Field Office, contracted with Historical Research Associates, Inc. and A&E Architects to complete HAER documentation of the water treatment plant, in anticipation of adaptive reuse/reconstruction as a Visitor Center and Museum. Drawings of the Filtration Plant were compiled for the Bureau of Land Management (BLM) in 2001. James R. McDonald, A&E Architects field staff verified the overall measurements. Paul Fillicetti, A&E Architects completed the measured drawing of the pumphouse.
- Historians: Ann Emmons and Delia Hagen, Historical Research Associates, Inc., July 2002

## Description

The Fort Benton Water Treatment Plant complex (HAER No. MT-113) consists of a three-story concrete-block and brick filtration plant (HAER No. MT-113-A) and a small pumphouse (HAER No. 113-B) located on four lots at the south end of the town of Fort Benton, Montana, immediately adjacent to the north bank of the Missouri River. The plant was constructed with a treatment capacity of approximately 800 gallons per minute (gpm) and is equipped with settling tanks, gravel filters, chemical feeders, chlorination equipment, and distribution pumps. It is not equipped with facilities for recycling backwash water, a feature of construction reflecting the era in which the system was constructed and a feature leading ultimately to the plant's abandonment. As described by Fort Benton City Engineer Tim Farwick, the plant's design was one of simple filtration: Missouri River water gravity flowed into the pumphouse where it was then pumped into settling tanks, buried under the high embankment on the west side of the filtration plant. From the settling tanks, water was pumped into one of two filter "tanks" (or "beds") where alum coagulant was added (enhancing the size of dirt/mineral particles). Water was then run through filter media (gravel and charcoal), into the clear well where it was chlorinated and then pumped to the city water mains. Maximum capacity approached 800 gallons per minute, pumped through a Fairbanks-Morse Duplex Electric Pump and a Deane Triplex Elec. Pump (Farwick 2002). Water backwashed through the filter beds to clear foreign particles was conveyed back to the river via a ditch running near the pumphouse.

A dirt and gravel drive encircles the filtration plant, and separates it from the pumphouse that stands to the south. Mature trees grow to the east of the plant. The remainder of the property has bare areas and piles of debris and building supplies. A man-made dirt berm is built up around part of the filtration plant, covering the first story on the west and south elevations and the south half of the east elevation. The berm reflects the function of the water plant: it covers the concrete settling tanks into which river water was pumped, via 10" flow line, for settling. After sediments settled out of the river water it was piped into the plant for treatment. Four iron-lidded hatches are set in the top of the berm, providing exterior access to the buried tanks when they were in use.

## History

Fort Benton's original water treatment plant, the first such facility in Montana, was constructed in 1884. After some fifty years of use, population growth and technological change rendered the original facility obsolete and federal funds, associated with Depression-era make-work programs, made construction of a new facility possible. The historic plant was torn down and this current facility was built on the same site in 1934 as Federal Public Works Project #559. The general contracting firm of Lease & Leigland spearheaded the construction effort for the new City Water Department with the help of consulting engineer F. F. Palmer. The north elevation addition was constructed in 1965. This water treatment plant served the Fort Benton community until 1987. The city abandoned the water mains to the plant in 2001.

In his recent history of urban infrastructure in America, environmental historian Martin Melosi writes "service delivery is a hidden function largely because it often blends so invisibly into the urban landscape; it is part of what we expect a city to be." Though "largely invisible," Melosi continues, service systems "shape [urban] infrastructure and define quality of life. . . ."

They have been and remain indispensable for the functioning and growth of cities" (Melosi 2000:1). Prosaic, utilitarian and often-overlooked and overshadowed by more glamorous or aesthetically pleasing examples of community life, they are therefore intrinsically bound to community development and are historically significant. Moreover, to the extent that service systems are government funded and publicly owned, they also demonstrate the federal government's evolving responsibility for public health and welfare and - more specifically- the changing role of the federal government during the Great Depression when local demand for the repair or replacement of antiquated systems coincided with empty local coffers and with rising unemployment.

In 1932, Congress passed the Emergency Relief and Construction Act (RCA), an act that "marked the beginning of significant involvement of the federal government in local public works" (Melosi 2000: 209). By 1934, Civil Engineer I. W. Mendelsohn would report:

A review of world achievements in water supply and purification in 1934 discloses several outstanding developments in the economic and structural aspects and emphasizes certain significant trends in purification practice. . . . *By far the most striking feature is the impetus furnished by the government to water works installations and improvements in the United States.* When the Emergency Relief and Construction Act (RFC) was passed in 1932 to extend federal aid to general construction for states, municipalities and even private corporations – an unprecedented event in American history – waterworks were prominently mentioned as one of the few types of self-liquidating projects eligible for RFC loans. With the passage of the National Industrial Recovery Act (NIRA) of 1933 and the subsequent establishment of the Federal Emergency Administration of Public Works (PWA) the immediate response lifted the volume of water works contracts let from the low of 35 million dollars in 1932 to 67 million dollars in 1933 (Mendelsohn 1935:1. Emphasis added).

Fort Benton's historic water treatment facilities are representative of these significant national trends in public works development: Fort Benton entrepreneurs financed the city's first facility (also the first in Montana Territory) in 1884 as a reflection of the port city's rapid growth and as prelude to continued growth. Need for the second-facility, built on the site of the first in 1934, was inspired in part by depression-era immigration from Montana's drought-stricken farming communities to its urban centers, overwhelming the antiquated 1884 plant. This need was met by the federal government, using Public Works funds.

While historically significant for its association with community growth and with federal public works programs, the water treatment facility does not demonstrate significant engineering innovations and is not considered eligible for listing in the National Register of Historic Places under Criterion C. Melosi writes: "from the end of World War I until the end of World War II, neither the quality nor the character of sanitary services underwent substantial change compared to the period that preceded it . . . . Compared to the late nineteenth and early twentieth centuries, technological innovation (and some environmental considerations) played a less significant role in the evolution of water and wastewater systems than financing and the nature of expansion." (Melosi: 205). Fort Benton Utilities Superintendent Tim Farwick confirms: "there was nothing terribly interesting about [the water treatment plant]. It was just a simple filtration system," as

demanded by the low pollution load and the high mud content of the Missouri River (Farwick 2002). Depression-era trends in water purification practices, as described by Sanitary Engineer Harry E. Jordan in September 1934, included pre-conditioning of water prior to filtration,<sup>1</sup> improvements in coagulation process, including the use of flucculators<sup>2</sup> and of two-story coagulation basins rather than the traditional single-story deep basins; and development of surface settlers – settling tanks set at 45 degree slopes to accumulate sludge. None of these trends was exhibited at the Fort Benton facility. Technological innovations – and environmental considerations – did, however, play a significant role in the system's ultimate abandonment in 1997. Under the terms of the federal Clean Water Act, Fort Benton could no longer return untreated filter backwater into the river. The costs of retrofitting the 1934 system to include a backwater filter were enormous "and so Fort Benton to a well" (Farwick 2002).

## Sources

Farwick, Tim

2002 Telephone interview with Ann Emmons, Historical Research Associates, June.

Jordan, H.E.

1934 "Progress in American Water Supply and Purification Practices during 1933," in *Water Works and Sewerage*. Vol. LXXXI, No. 1. pp. 1-6.

Jordan, H.E.

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Lepley, John G.

2001 *Birthplace of Montana: A History of Fort Benton*. Missoula: Pictorial Histories Publishing Company.

Melosi, Martin V.

2000 *The Sanitary City. Urban Infrastructure in America from Colonial Times to the Present*. Baltimore: The Johns Hopkins University Press.

Mendelsohn, I.W., C.E.

1935 "Water Supply and Purification Developments during 1934," in *Water Works and Sewerage*, Vol. LXXXII, No. 1 (January), pp. 1-7.

Palmer, F. F., Consulting Engineer

1933 Filtration Plant, City of Fort Benton, Montana. Sheets 55-60. On file with the City of Fort Benton, Engineering Division.

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<sup>1</sup> Further described as less dependence upon settling tanks and filter beds and greater dependence on improved coagulation, pre-chlorination, algae control, and carbon treatment "with the filters and post ammonia-chlorine treatment as the final lines of defense." H. E. Jordan, "Recent Trends in Water Purification Practice," *Water Works and Sewerage*, Vol. LXXXI, No. 3 (September 1934), p. 307.

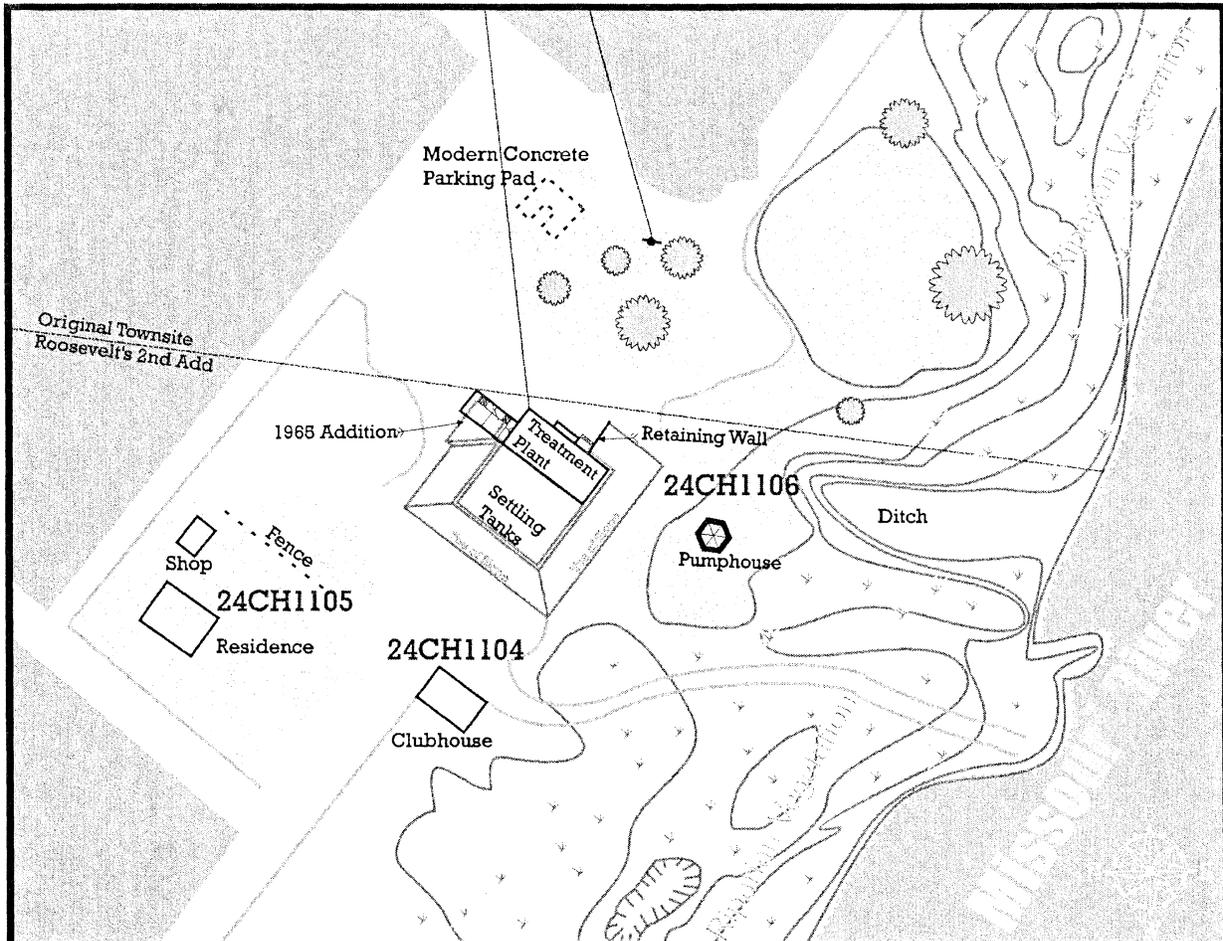
<sup>2</sup> Mechanical conditioning devices that rolled up small particles into rapidly subsiding flocs and thereby reduced coagulant consumption. H. E. Jordan, "Recent Trends in Water Purification Practice," *Water Works and Sewerage*, Vol. LXXXI, No. 3 (September 1934), p. 307.

Sanborn Fire Insurance Company

1939 Fort Benton, Montana. Maps on file at the Montana Historical Society, Helena, Montana

Smith, Clyde

2001 Structural Inspection Fort Benton Water Plant. Memorandum to File, December 20, 2001. On file at Fort Benton Public Works Department, Fort Benton, Montana (h:08\M152120\memo01.doc).



**Legend**

**Fort Benton Water Treatment Plant**  
 HAER No. MT-113-4

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|--|--|--|---|
|  Building       |  Power line         |  Trash area |  Cultivated tree       |
|  Un-inventoried |  1m contour         |  Grass      |  Riparian tree or bush |
|  Foundation     |  Driveway/Road edge |  |   |

\*Image was created from a digital orthophoto; no scale