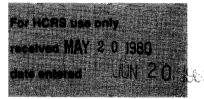
United States Department of the Interior Heritage Conservation and Recreation Service

National Register of Historic Places Inventory—Nomination Form



See instructions in *How to Complete National Register Forms* Type all entries—complete applicable sections

1. Name

historic	Mountain Dell Dam							
and/or common								
2. Loca	ation /	Val.	Salt	hake	City			
street & number	Parleys Can Lake City's	yon, ⁰ abou business	ut 13 mil s distric	les southw ct	est of Salt		_ not for publ	ication
city, town Sa	alt Lake City	mi.	vi	cinity of	congressional	listrict ()	2	
state Uta	ah	code	049	county	Salt Lake		code	035
3. Clas	sificati	on						
Category district building(s) _X_ structure site object	Ownership _X_ public private both Public Acquis in process being cons		Accessib	upied n progress le	Present Use agricultur commerc educatior entertainn governme industrial military	re ial nal ment ent	museun park private religious scientifi transpo X other:	residence s c
4. Own	ner of Pi	opert	t y					storage
name Salt	Lake City Co	rp.						
street & number	Salt Lak	e City ar	nd County	7 Bldg.				
city, town Sa	alt Lake City		vi	cinity of		state	UT 84111	
5. Loca	ation of	Lega	l Des	criptie	on			
courthouse, regi	istry of deeds, etc	: Salt	Lake Cit	v and Cou	nty Building	<u> </u>		
street & number	Fourth S	outh and						
	lt Lake City					stato	UT	
		tion i	n Exi	stina 9	Surveys	state	01	
title Historic	e American En	gineering	r Record	has this pro	perty been detern	nined eleg	ible? <u>X</u> ye	es no
date Summer	r, 1971				<u> </u>	state	county	
depository for s	urvey records	Historic	American	n Engineer	ing Record, N	ational	Park Serv	ice

city, town Washington, DC 20240

7. Description

Condition		Check one
<u>X</u> excellent	deteriorated	— unaltered
good	ruins	altered
fair	unexposed	

Check one _X_ original site ____ moved date

Describe the present and original (if known) physical appearance

The Mountain Dell Dam is a reinforced concrete multiple-arch dam of Eastwood Design with a total length of 565 feet and a maximum height of 145 feet from bedrock foundation to the top of the structure. The dam was built in two stages, and as originally constructed in 1916-17 rose to a height of 105 feet above bedrock. The additional 40 feet was added in 1924.

A series of 16 reinforced concrete cylindrical arch rings comprise the dam's water face or upstream face.¹ Originally, there were eleven arches. The cylinders vary in thickness from four feet at the bottom upstream "heel" of the dam to 1 1/4 feet at the top and slant at an angle slightly greater than 50 degrees. The dam is 145 feet in height, but only the arch rings in the middle have this depth because the canyon walls are sloped. Thus, the arch rings at the end of the dam are only about 20 feet in height. Each of the arches has a span width of about 35 feet and encompasses a 120 degree circular arc.

"Vaults formed by these arches are supported by trapezoidal shaped buttresses firmly anchored into bedrock. The buttresses vary in thickness from eight feet at the foundation to two feet at the top and carry the thrust of the water loading to the dams foundation. When the reservoir is filled with water the hydrostatic pressure is exerted directly on the cylindrical vaults. Through their 'arch' action the pressure is concentrated on the buttresses which support them. Because the spans of the arches are all equal, their respective sideward thrusts, due to water loadings, cancel one another out and the only forces the buttresses are required to sustain are those perpendicular to their upstream faces. Due to the upstream inclination of the dams facings, the resultant of the water pressure combined with the structives weight passes almost directly through the center of the dams foundation."

"Though some struts have required patchings due to deterioration, the concrete in the structure has weathered well. Only a small amount of efflorescence, a phenomena frequently effecting concrete, has occurred on the dam. This is evident in the whitish patches of calcium carbonate which have formed on the downstream face of the arch rings." This efflorescence is very slight and does not affect Mountain Dell Dam's integrity in any way.

Salt Lake City decided to complete the final 40 feet of the dam in 1924. Eastwood died earlier in the year and without his supervision an alteration to his design was made. In other Eastwood dams the upper 15 to 20 feet of the ustream face is vertical. However, in the Mountain Dell Dam the Salt Lake City Engineers Office, having no one to consult and being unfamilar with the design, decided to continue the inclined facing to the top of the dam.

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The present capacity of the dam is 1,145 million gallons, which represents approximatey 65% of Salt Lake City's water storage capacity. In 1938 and again in 1959, gunite, a water-proofing agent, was applied to the upstream face of the dam, particularly to the joint between the 1916 and 1924 pours.

 1 Much of the description is taken from Donald C. Jackson, "John S. Fastwood and the Mountain Dell Dam" a paper presented at the Society for the History of Technology, 1976.

8. Significance

1400–1499 1500–1599 1600–1699 1700–1799 1800–1899	Areas of Significance—C archeology-prehistoric archeology-historic X agriculture architecture art commerce communications		g landscape architectur law literature military music	e religion science sculpture social/ humanitarian theater transportation other (specify)
Specific dates	1916-17/1924	Builder/Architect J	ohn S. Eastwood	

Statement of Significance (in one paragraph)

Constructed in 1916-17, with an addition in 1924, the Mountain Dell Dam is significant in the history of U.S. technological development and in the vital development of Salt Lake City's water resources. The dam was designed by John S. Eastwood, considered one of American's most important and innovative hydraulic engineers of the early 20th century. Eastwood, the man most responsible for the development and utilization of the multiple-arch dam, built the first reinforced concrete multiple-arch dam with bedrock foundations in 1908-09; and in the following years that structural form was employed throughout America, Canada, Europe, and Asia. The multiple-ach dam was selected over other design concepts for Salt Lake City's storage reservoir in Parley's Canyon because the bedrock there is a calcareous shale which is not waterlight and tends to decompose, requiring a structure that would not be susceptible to overturning or sliding. John Eastwood was internationally recognized as the most prolific designer of multiple-arch dams in the world, having built 17 of his dams before his death in August, 1924, at the age of 67.

Salt Lake City, located in the Great Basin of the American West, is dependent upon adequate supplies of water. As with other western regions, water conservation and use is of vital concern. In the early years of the 1910's Salt Lake City found itself in a serious condition for the need of a sufficient water supply during certain seasons of the year, primarily in the late summer and mid-winter. A bond issue of 1914 resulted in a program of improvements which included plans to build a dam in Parley's Canyon. In the field of community planning the location of the Mountain Dell Dam was significant because it's location was so near the city (13 miles) that it could serve as an equalizing as well as a storage reservoir.

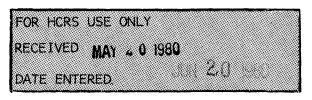
Three dam designs were considered, but the reinforced concrete multiple-arch dam by John S. Eastwood was chosen primarily becasue it was not susceptible to sliding or overturning in the bedrock of the Mountain Dell site. Eastwood's design is important as one of the world's first to realize the actual potential of reinforced concrete in the construction of dams and other structures which would have been difficult or impossible to build with other kinds of materials. "In the early 20th century, dam design was still dictated by principles essentially traditional in nature rather than scientific. In developing his multiple-arch dams, Eastwood employed a rigorous, scientific analysis in studying the problem of dam design and, consequently, he derived the reinforced concrete multiple-ach dam as the safest, most practical, most materially conservant and most economical design for almost all dam sites."¹ The material economics inherent in the design rendered the multiple-arch dam as significant in the development of the world's water

9. Major Bibliographical References

See continuation sheet

10. Geograp	10	UTM NOT		
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Verbal boundary descrip	ntion and justification	I a control in Day	leve General shout 12 miles	~~~+1
of Salt Lake City dam, including sp	's business district pillway.	t. Nominated p	leys Canyon, about 13 miles a property to consist of the en	
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organization Utah Sta	Notarianni, Historia ute Historical Socie ⁻ West 200 South	ty da	te January 1980 ephone (801) 533–6017	
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resources, and "more importantly, it demonstrated the capabilities and potential of reinfored concrete construction to engineers and industrial designers involved in all phases of structural technology".²

Actual work on the dam began in 1916 by the Parrot Bros. Company. In August, 1917, the partial height of the dam was completed to 105 feet above bedrock. Late in 1924 Salt Lake City decided to complete the final 40 feet of the dam, with the construction firm of Lynch Cannon Engineering being employed. Eastwood had drowned tragically in August, 1924, and as mentioned in Item 7, his design was somewhat altered by Salt Lake City engineers.

Mountain Dell Dam, when evaluated by the Historic American Engineering Record Survey in 1971, had a capacity of 1,145 million gallons, representing 65% of Salt Lake City's water storage capacity. As with other Eastwood dams, the safety factors contended have been proven sound; and all of John Eastwoods 17 dams, though some alterations have occurred, remain intact and functioning.

¹Quoted from "Little Rock Creek Dam" National Register of Historic Places Inventory Nomination Form.

²Jackson, "John S. Eastwood and the Mountain Dell Dam", p. 1.

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