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cover: Garden bridge over Farmers Ditch at I. N. Fields house, 603 Spruce. Joseph Sturtevant photo, c. 1900.



Boulder Valley Ditches:
Farmers Ditch
A History and Guide

This booklet is one of three: Anderson Ditch
 Farmers Ditch
 Silver Lake Ditch

Michael Holleran

The first half of this booklet appears in identical form in all three; the second half in this one alone.



Farmers Ditch north of the city, 1999

Irrigation in Boulder

“In the many ... irrigating channels which traverse the city in so many quarters Boulder has what seems like a veritable treasure of municipal decorations, ... all retaining their essential elements unspoiled and ready to shed beauty all about them if only given a proper setting.”

-- Frederick Law Olmsted, Jr., 1910

Within the city of Boulder, Colorado, in addition to two year-round creeks and a handful of intermittent ones, there are twenty-three other waterways that flow half the year. These are irrigation ditches, bringing water through the city on its way to fields, pastures, orchards and gardens. The 30 miles of ditches make up most of the system of watercourses in Boulder.

The ditches are old. Raising food in this semi-arid region required irrigation, so Boulder’s first ditch was dug in the city’s first year, and most were finished by the 1870s. Cottonwoods and willows have grown over more than a century and the ditches now seem more natural than artificial. The rest of the city has grown around them, sometimes forming itself around the ditches, sometimes ignoring and swallowing them.

In 1859, two of Boulder’s first residents, Marinus Smith & William Pell, sold a load of hay to miners in Black Hawk for \$400, an amount of money that could then buy a house. Boulder pioneers didn’t always know where to find gold, but they knew how to make hay. Smith and Pell dug Boulder’s first irrigation ditch - now known as Smith-Goss Ditch - in 1859. It still runs under the Arapahoe Avenue sidewalk and appears briefly in front of the old Lincoln School, now Naropa University. Less than a year later, water began flowing through the more ambitious Anderson Ditch, another project of Marinus Smith, together with Jonah Anderson and others on the south side of the creek.

Pioneers could find irrigation precedents in the Hispanic systems of southern Colorado, pueblo systems before that in New Mexico, and Mormon irrigation in Utah. The most direct ancestors of Boulder ditches were probably mining districts in California; hydraulic mining techniques were brought back east to Colorado goldfields and then down to the plains. Several of Boulder’s pioneer ditch-builders - Frederick Kohler, Marinus Smith, and Henry and Luther Wellman - had prospected in California before coming to Colorado. From mining camps also came the basic concept behind Colorado water rights: like a vein of ore, whoever used it first gained a right to it. “First in time, first in right” - history is at the very foundation of Colorado water law.

Ditches did not just serve farmland; they were also Boulder’s first domestic water system. *Laterals* - little side ditches - carried water to every house in many neighborhoods: from Anderson Ditch to Highland Lawn, from Farmers Ditch to downtown, and later from Silver Lake Ditch to Mapleton Avenue and North Boulder. In 1872, the Boulder Aqueduct Company was organized to distribute Farmers Ditch water through wooden pipes; it is not clear whether the company ever delivered any water. The aqueduct company was superseded a few years later by a municipal system, but the street laterals continued alongside it for decades.

The street laterals were formalized in 1883 with cobblestone channels, two feet wide and eight inches deep. Little stone bridges crossed the little stone ditches. Twenty-five years later, a real estate promoter touted Boulder for its “streams of clear, cold water coursing through the



Downtown Boulder street lateral, c. 1896

streets in stone gutters.” One Boulder resident remembered from her turn-of-the-century childhood that “there was always a little ditch water running up and down the streets, you know. It was a lot of fun to make dams and put boats on them and so forth. I don’t know now where all that water came from, but it ran down every street that I can remember - had a little ditch running down the side of it and it was so much fun to play in.”

Households needed water all the time, so in early years the ditches ran year-round, except a brief spring shut-off for cleaning and an occasional winter cold spell when the channels froze solid. At those times, Mapleton Hill children used Farmers Ditch for ice skating. During cold months, the laterals froze first, and then some Boulderites had to carry household water from the main ditches.

Ditch technology

The **headgate** controls the amount of water entering the ditch, protects it from floods, and removes as much as possible of the creek’s sediment and debris. The first headgates were built of wood; all of Boulder’s

ditches now have concrete and steel headgates, some of them built early in the twentieth century.



White Rock Ditch headgate and diversion dam, on whose design Frederick Law Olmsted, Jr. consulted. Photo 1921

Diversion dams are little dams (not big dams for storage; those came later) that in times of low flow direct the stream toward the headgate. While these are now engineered structures designed to survive most floods, early diversion dams were often made of brush and stone and rebuilt every year or so.

Ditching - digging the channel - was usually done by a team of oxen using either “ditchers” or ordinary plows. Grade could be regulated with levels attached to the plows. Ditch builders aimed for a drop of one inch per 20 feet; they measured distance by the turns of wagon wheel. Little ditches might be dug by farmers; big ones (such as Boulder’s White Rock Ditch) were sometimes built by railroad contractors, because the large labor force required and some of the engineering was similar.

Flood irrigation of pastures was first controlled by shoveling earth to open one channel and close another. Later wooden boxes controlled the flow to each lateral. Starting in the 1920s, these boxes were in turn superseded with concrete boxes and steel gates. On the laterals, irrigators used movable canvas “tappoons” to block the lateral where water was wanted on the field (until recent years this system could be seen watering the CU campus).

Measurement was a part of the system that grew in importance. Ditch flow was first measured in “miner’s inches”; a term that attested to the Gold Rush origins of Colorado irrigation practice. Ralph Parshall, a professor at Colorado State, in 1937 invented the *Parshall flume*, a standardized sheet-metal channel in which flow can be measured accurately. Near the head of each ditch, and sometimes at other important division points, instruments provide a continuous record of flow, inside a small *recording house* (often a round sheetmetal silo about as tall as a person).



The Parshall flume and recording house for Silver Lake Ditch, 1999

Storage: Ditches often delivered water to small-scale farm ponds. Sometimes they filled larger reservoirs on the plains for later redistribution. Eventually some relied on high-watershed storage such as Silver Lake, to release water into the creek above the ditch.

Ditches as amenities

“When Boulder is visited by an eastern stranger who has an eye for beauty,” wrote one such easterner, “and some acquaintance with the use to which water is put in the gardens and cities of older countries he cannot fail to be strikingly impressed with the neglect of what seems to him an extraordinary opportunity for civic beauty.” That “east ern stranger” was Frederick Law Olmsted, Jr., Professor of Landscape Architecture at Harvard University and one of the founders of the profession of city planning. In 1910, at the invitation of a group of Boulder citizens, Olmsted prepared a pamphlet of suggestions for the city’s “improvement.” In addition to proposing the greenway ultimately realized decades later as the Boulder Creek Path, he suggested a promenade along Whiterock (then called Beasley) Ditch through the center of town, and a parkway following it beyond Folsom, then the eastern edge of Boulder. He also proposed a park and trail along Farmer’s Ditch below Red Rocks Park:

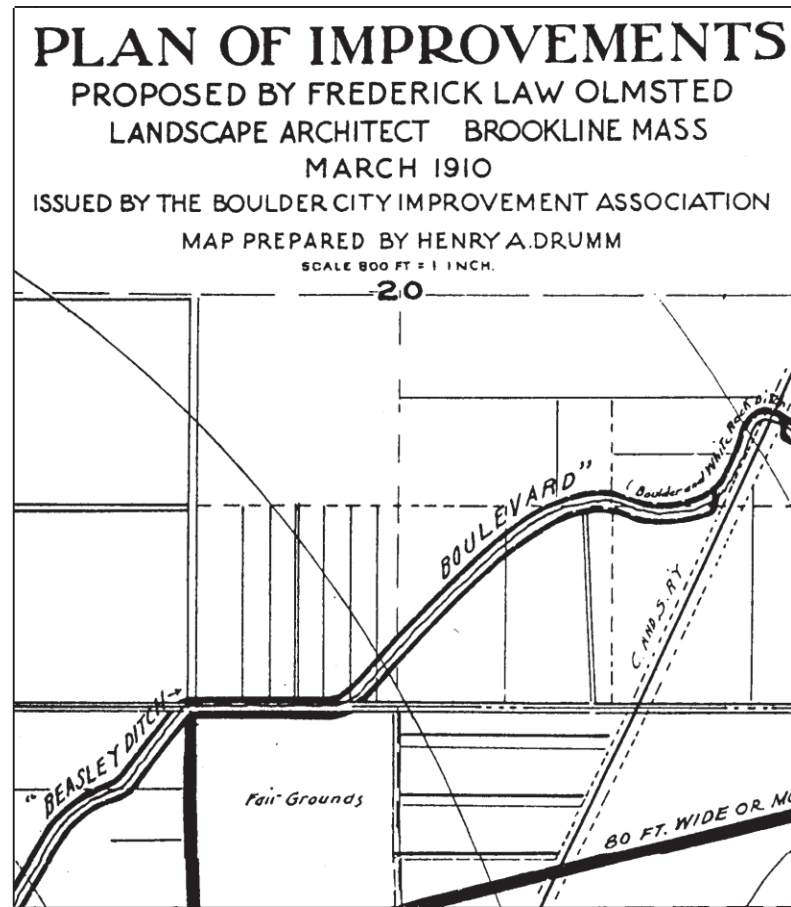
Given sunshine and breeze and the wonderful plunging view across the valley to rugged mountains bathed in sunlight; given shade from the direct glare of the sun and sky, easily to be obtained by planting; the one thing wanted to complete the situation is water, and the quiet flowing canal on its way to irrigate the fields beyond the city gives the very note that is needed. To be sure its banks are here shabby and neglected, the vegetation is weedy and an appearance of squalor is more or less in evidence, so that a superficial observer might turn away without feeling the least interest in the ditch. But all the essential elements of the most beautiful scenes of Italy are here, waiting only a little patient, skillful care to unite them into a little picture of paradise.

Olmsted devoted several pages to ditches throughout Boulder. They clearly charmed him.

If the inherent beauty of the water of the irrigating channels were supplemented by such treatment of their immediate borders as would remove the unpleasant associations that now in many places attach to them, such treatments as would bring out and enhance the natural associations of refreshment and abundance that are inseparable from them and would re-enforce their intrinsic charm, these channels alone would serve to make Boulder a place of high civic beauty.

Olmsted collaborated on the design of one ditch headgate in Boulder -

Whiterock Ditch, whose Olmsted-designed headgate still operates in Central Park (photo page 4). His advice on the design is a remarkable early statement of the philosophy that would later become 20th-century architectural Modernism: “The entire construction should be kept very simple and straightforward, with no applied ornaments or unnecessary complications of form. Any distinctive quality in appearance should be sought by making the work thoroughly substantial and durable and by avoiding awkward and ugly lines rather than by making a special effort at beauty or ornamentation for its own sake.”



Safety and the battle against ditches

In the last hundred and forty years at least fourteen people have drowned in Boulder ditches, mostly very small children (in recent decades for which figures are available, about three times as many have died in Boulder Creek). These tragedies have become less frequent in the past fifty years, even with the growth of population and of the mileage of ditches within the expanding city limits. Boulder’s ditches have become safer. Some of that is because ditch companies have installed improvements such as safety grates. Urban growth has also probably helped solve the problem: as streets became busier, parents were less likely to let small children play outside unsupervised. Ditches remain potentially dangerous, and small children should be supervised near them.

Accidents produced several efforts to eliminate Boulder’s ditches by putting them underground. The first of these movements originated after two drownings in 1929. Alarmed Boulder citizens called for piping or covering all the ditches, but the cost of this solution would have been enormous. Fencing the ditches was rejected as a safety hazard in itself; children who managed to get into the ditch could not be easily discovered or rescued. Ditch companies did begin installing safety grates, and cooperated with the city in keeping them clear of debris.

Community concern was prompted again in the early 1950s when one drowning was followed by three close calls. A citizen initiative in 1951 would have required ditch companies to cover or fence all ditches within the city at their own expense within 60 days.

This initiative was opposed by some people who valued the open water, such as Mrs. Harry Ohling, who wrote to the *Daily Camera* that “it will break my heart if the ditch company is forced to cover the stream that flows through my property. I have beautified the banks” near Walnut Street. “The ditch and the garden I have developed around it is enjoyed by all of my tenants.” There was also a great deal of opposition from those who felt the proposal was unreasonable or unworkable. The referendum failed 1606 to 907 at the polls. The same day the ditch companies pledged “to work toward a fair and safe solution” to ditch safety problems.

The new approach, during these postwar years of rapid development, was to get developers to foot the bill by undergrounding the ditch through their subdivisions. A siphon built in 1953 carried the Farmers Ditch under North Boulder Park; the Hudson Construction Company was able to build 16 houses on lots where the ditch once ran. The siphon itself claimed a life when an excavation collapsed during construction. More Boulder ditches were undergrounded at Table Mesa in the late 1950s, and Wonderland Hills in North Boulder in the 1970s.

The city no longer encourages covering ditches. The Boulder Valley Comprehensive plan calls for keeping the historic ditch system as part of the valley’s agricultural heritage and as neighborhood amenities, and managing them safely.



Anderson Extension Ditch (top) on its way into pipe (middle) under Martin Acres neighborhood (bottom), 1958

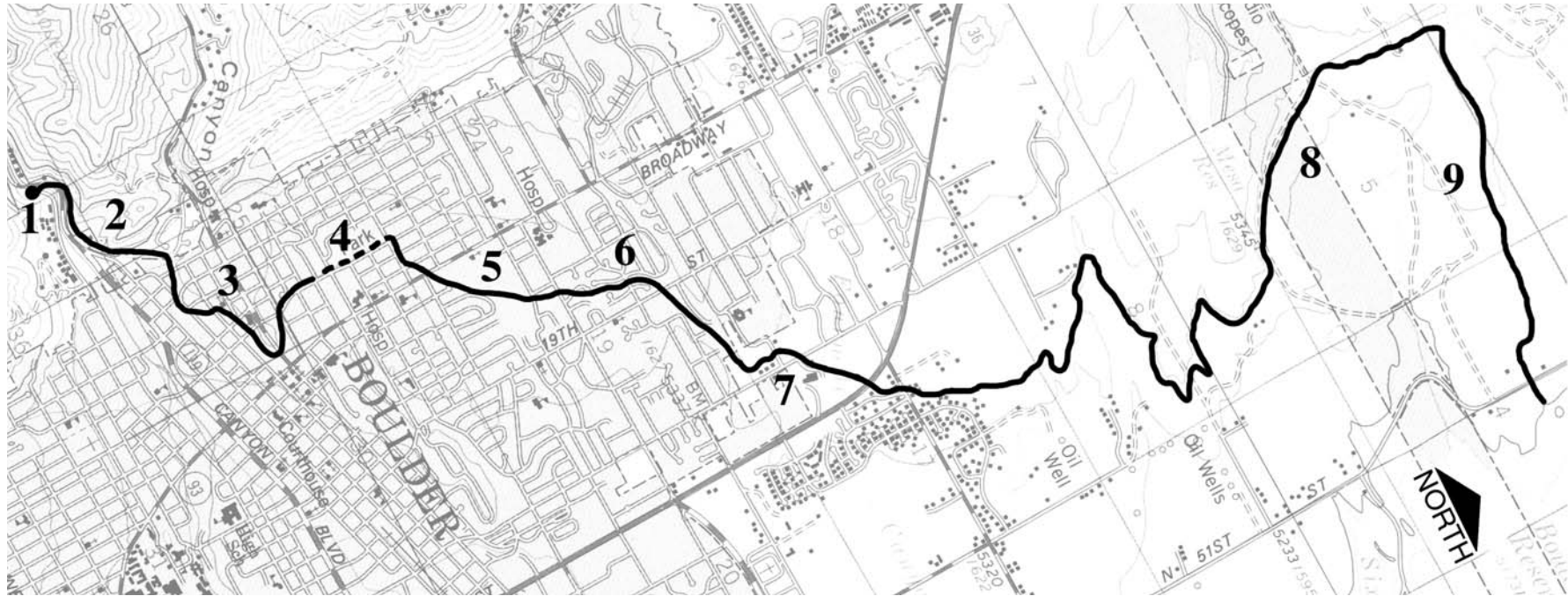


Postcard, c. 1912: “A Boulder Back Yard” (this bridge replaced the one shown on the cover)

Farmers Ditch takes its water from the north side of Boulder Creek as the creek leaves Boulder Canyon. It was the second ditch in the Boulder Valley on the north side of the creek; the first, Smith-Goss, was only about a mile long and watered a small amount of river bottom (including what are now the Boulder High School fields, which it still waters). Farmers Ditch was a more ambitious undertaking, heading seven miles out onto the plains toward what is now Boulder Reservoir, potentially watering three thousand acres. It also brought water immediately above the new town of Boulder, where it could be used to water street trees and the streets themselves, which could get mighty dusty.

Three miles were “about completed” by February, 1862, at a cost of \$2500, and the remaining four miles were then estimated at \$3000 by directors J. A. Tourtellot and Jerome Thomas. These were princely sums of money, though easily justified when divided by three thousand acres. “Work of construction necessarily took considerable time,” according to the ditch’s priority filing. By 1872, the company was out of debt.

Where you can see Farmers Ditch



1. The headgate on the north side of Boulder Creek can be seen from the bike path on the other side.

2. In Settlers Park, Farmers Ditch runs along the bike path. You can see the measuring weir and spillway back to the creek. The ditch powered Yount Mill from here.

3. In Mapleton Hill, Farmers Ditch makes lush alley landscapes

meanders across most of the streets.

4. At North Boulder Park, the ditch is not visible because it runs in a 1953 siphon. It daylights again along Dellwood.

5. Behind Long's Iris Gardens, a bike path follows Farmers ditch.

6. The ditch disappears into private yards, but plays connect the dots with Pine View and Catalpa Parks

7. At Norwood the ditch emerges into a new concrete channel to cross Wonderland drainage. Just west of U.S. 36 it is accessible again in more sympathetic landscaping.

8. At Boulder Valley Ranch Open Space, the Sage Trail follows Farmers Ditch. Laterals still irrigate the pastures here. From Jay Road to here, the ditch has delivered most of its water to working farms, some of them Open Space and some

privately owned. Many are more than a mile east on the extensive lateral system.

9. From North Rim Trail, you can see the last stretch of Farmers Reservoir. The line of trees north of the ditch is an old waste channel that spilled water into Dry Creek before the reservoir was built.

Farmers Ditch was the first source of water for most of Boulder. During a cold spell in 1869, a newspaper complained that “there’s no water running in the farmer’s ditch, which should supply the tidy housewives of Boulder who are grumbling considerably thereat.” The Boulder Aqueduct Company was incorporated in 1872 with the aim of distributing Farmers Ditch water more efficiently. One of its organizers was James P. Maxwell, who would later lay out the first municipal water system, and then the Silver Lake Ditch.



Laterals along Pearl Street, looking west from 17th Street, c. 1902



Mapleton School children plant a Victory garden next to the ditch, c. 1918

The city of Boulder bought eight Farmers Ditch shares (of 100) in 1880 to supplement the still-unreliable municipal system. In 1942, the city began transferring its shares (15 of them in that year) into the municipal pipeline below Silver Lake.



A remnant headgate in the Newlands neighborhood, 1998



Remnant street lateral along Broadway, 1998

At least seven remnant headgates before Broadway give evidence of Farmers Ditch’s role in watering the center of town. One is visible from the bike path at Settler’s Park at the west end of Pearl Street. A remnant street lateral is still visible along the east side of Broadway just south of Elder.

Joseph Wolff, an abolitionist writer from Ohio, began farming in 1864 on land now bounded by Broadway and 19th, from Alpine to Grape Street. Before irrigation the place was called “Rattlesnake Ranch.” After irrigation it became **Orchard Grove Fruit Farm**, a name change that well explains the point of building ditches. Wolff experimented with raising fruit, and turned his writing talents to publicizing the results and promoting Colorado and Boulder agriculture. Like other parts of North Boulder, Wolff’s farm eventually produced houselots, beginning in 1875 with a plat of one-acre lots, enough when irrigated to raise fruits and vegetables.

The District 6 Water Commissioner’s Report in 1890 gave a statistical picture of Farmers Ditch:

length in miles	8
number of days run	200
acres can irrigate	2500
acres irrigated, alfalfa	600
acres irrigated, seeded grasses other than alfalfa	300
acres irrigated, natural grasses	900
acres irrigated, other crops	600



Flood irrigation of chard on Joseph Wolff’s Orchard Grove Fruit Farm

Farmers Ditch supplied water to power a flour mill at the mouth of the canyon (the site is now under Canyon Boulevard between Eben Fine and Settlers’ Parks). The mill was built by Andrew Douty in 1866. It became known as **Yount Mill**, operated by Mrs. E. B. Yount after 1877. She also served as president of Anderson Ditch in 1881.



Yount Mill, 1900

The lands north of Boulder (now North Boulder) grew up as a lush district of small farms, market gardens, intensive agriculture (and scattered suburban development such as Wolff's). One attractive example that still remains is **Long's Iris Gardens**, founded after the turn of the century by J. D. Long, operated for many years by his son Everett Long, and continuing in business now run by his daughter, Catherine Long Gates. Long's Gardens took its water from both Farmers and Silver Lake Ditches, and Everett Long served as president of both.

Farmers Ditch in the Newlands neighborhood

A proposed "Newlands Addition Park" site was laid out in 1923 by Frederick Law Olmsted, Jr., to include the ditch along the west and the north side of the park (a block west and half a block north of North Boulder Park's present boundaries): "Clearly the northern and western boundaries of the park should include enough land beyond and above the



Dellwood Avenue, looking east from Sixth Street, c. 1950. In the foreground is the part of Farmers Ditch that would soon be moved to a siphon under North Boulder Park

Farmer's Ditch so that this stream of water will flow through the park and be one of its features. There ought to be space for a continuous park path and planting on the upper side of the ditch, preferably more than fifty feet. ... Fourth Avenue [now Dellwood] if opened through ought to be deflected slightly northward around the northward bend of Farmer's Ditch." East of Ninth Street, he suggested that Dellwood ought to be laid out "with two roadways, with the ditch in the middle."

North Boulder Park as built does include Farmers Ditch, but not as "one of its features." After defeat of the 1951 initiative to require undergrounding by the ditch companies, Farmers Ditch was the first to be piped by a developer. William J. Hudson, then about to build in part of the Newlands Addition, replaced a 3300-foot loop of the ditch with a 2200-foot siphon along Ninth Street. His Hudson Construction Company gained 16 lots. The city contributed \$8,000 that it would have had to spend building eight bridges. The ditch company contributed

\$10,000 because this was a leaky and troublesome stretch of ditch responsible for a disproportionate share of maintenance costs - but also because it was important to respond somehow to safety concerns, and this way was practical.

The Ninth Street siphon was designed by the U.S. Soil Conservation Service, and it inaugurated a series of modernizations in the 1950s. Two more siphons were built north of the city, at Sixmile Creek and at Boulder Valley Ranch. Sixmile Creek had previously been crossed by an open flume on a high wooden trestle, some of which can still be seen as ruins on City Open Space. The siphon that replaced it in 1955 did not work properly, and a new one was built alongside it in 1960. The new siphon has been tested more rigorously than most: in 1964, someone (evidently as a prank) tried to blow it up. After some repairs, it is still functioning today.



Ruins of the Farmers Ditch flume that crossed Six Mile Creek

Farmers Ditch remains an agricultural ditch, irrigating hundreds of acres of farms and open space north of the city.

A guide for people who live along the ditch

Don't block ditch company access to the ditch. Ditch companies have a need and a right to access all along the ditch to maintain it, even in places such as backyards where construction over the years may have made access difficult.

Do consult the ditch company before placing any structure in, across, or next to the ditch. The company must review structures to be sure they won't block maintenance access; bridges and even crossings for electrical or irrigation lines must be reviewed to be sure they will not trap debris. Retaining walls must be reviewed to ensure that they will not present maintenance problems or disrupt flow. The ditch company has the right to remove unapproved structures, even if they have been in place several years. The company may charge a fee to offset future maintenance.

Do not dump anything in the ditch. It carries clean water for parks, for irrigating crops for human consumption, and even for drinking. No drainage should be directed into a ditch, except for clean ground runoff that has historically flowed into it. Rubbish and debris in the channel - even leaves or grass clippings - can clog the ditch and cause dangerous overflows.

Do not take water from the ditch. It belongs to shareholders in the ditch company, who have rights to specific amounts of water at specific times, and who pay for the ditch's upkeep. Water is extremely valuable in Colorado, and taking water to which you're not entitled is theft.

Do watch children and pets around the ditch. Flows may change dramatically in just a few hours; tonight's slow and safe-looking ditch may be full, fast, and hazardous tomorrow morning.

Do call with any problems or questions. For general questions call Joanna Tisdale (City of Boulder Water Resources Specialist) 303-441-3115. In an emergency dial **911**.

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Research assistants:

Debbie Fuller Penn, Manish Chalana

Associate Professor Michael Holleran
College of Architecture & Planning
University of Colorado, Denver, Colorado 80217
303-556-3688
michael.holleran@cudenver.edu