

**TOWN OF COLUMBINE VALLEY**  
**BOARD OF TRUSTEES REGULAR MEETING**  
October 15, 2019

**A G E N D A**

1. ROLL CALL 6:30PM
2. PLEDGE OF ALLEGIANCE
3. APPROVAL OF AGENDA
4. PUBLIC COMMENT  
Each speaker will be limited to three minutes. The Board of Trustees is not authorized by the Colorado Open Meetings Law to discuss comment or take action at the meeting on any issue raised by public comment. The Mayor may refer the matter to staff to obtain additional information and report back to the Board as appropriate.
5. CONSENT AGENDA Mayor Champion  
Approval of Meeting Minutes for September 17, 2019  
Approval of Meeting Minutes for September 30, 2019
6. REPORTS
  - A. Mayor
  - B. Trustees
  - C. Town Administrator
  - D. Chief of Police
  - E. Finance Report
7. OLD BUSINESS Mr. McCrumb
  - A. Discussion of 2020 Town Budget Draft
8. NEW BUSINESS Mr. Carmann
  - A. Nevada Ditch Demobilization Study Presentation Mr. Schiller
  - B. Trustee Bill #10 Series 2019 – Weeds (1<sup>st</sup> Reading) Mr. Schiller
  - C. Trustee Bill #11 Series 2019 – Xcel (1<sup>st</sup> Reading) Mr. Schiller
  - D. Trustee Bill #12 Series 2019 – Asbestos Regulations (1<sup>st</sup> Reading) Mr. Schiller
  - E. Contract with CRS of Colorado Mr. McCrumb
9. ADJOURNMENT

**TOWN OF COLUMBINE VALLEY**

**BOARD OF TRUSTEES**

Minutes

September 17, 2019

Mayor Champion called the Regular Meeting of the Trustees to order at 5:00 p.m., in the Conference Room at the Town Hall at 2 Middlefield Road, Columbine Valley, Colorado. Roll call found the following present:

Trustees: Richard Champion, Bruce Menk, Kathy Boyle, Bill Dotson, Gary Miles and Roy Palmer

Also present: Lee Schiller, J.D. McCrumb, Bret Cottrell, and Aaron Boussetot

**EXECUTIVE SESSION:** Upon a motion by Trustee Menk and a second by Trustee Boyle the Board of Trustees entered executive session at 5:02 p.m. to confer with the Town Attorney pursuant to CRS Section 24-6-02(4)(b) regarding Wilder Lane. The Trustees came out of Executive Session at 6:04 p.m.

Mayor Champion called the Public Hearing on **Trustee Bill #9, 2019 Short Term Rentals** to order at 6:15 p.m., in the Conference Room at the Town Hall at 2 Middlefield Road, Columbine Valley, Colorado.

**CITIZEN COMMENTS:** There were no public comments.

**ACTION: upon a motion by Trustee Dotson and a second by Trustee Miles, the Board of Trustees unanimously approved closing the Public Hearing at 6:16 p.m.**

Mayor Champion called the Regular Meeting of the Trustees to order at 6:30 p.m., in the Conference Room at the Town Hall at 2 Middlefield Road, Columbine Valley, Colorado.

**APPROVAL OF AGENDA:** Upon a motion by Trustee Dotson and a second by Trustee Palmer, the Board of Trustees unanimously approved adding **Wilder Lane Agreement** to the agenda between items 5 and 6.

**CITIZEN COMMENTS:** There were no public comments.

**CONSENT AGENDA:** The minutes of the August 20, 2019 meeting were approved.

**ADDED BUSINESS:**

**Wilder Lane Agreement:** Mr. Schiller presented background and a status update to the Trustees regarding an agreement made with Platte Canyon Partners (Wilder Lane developer) to repair the street and drainage infrastructure on Wilder Lane in February of 2019. Representing Platte Canyon Partners were Stephanie Stewart, Tom Bradbury, Mark Cleveland, and Don Slack. Ms. Stewart also reviewed the background of the development and repair agreement and discussed additional details of the work. She also proposed an amendment to the agreement, altering the scope of work and allowing the developer more time to complete the repairs.

Trustee Menk asked clarifying questions and reviewed his understanding of the situation, and had Ms. Stewart confirm that there was a current agreement between the Town and Platt Canyon Partners concerning completion of the repairs by Platte Canyon Partners.

Mr. Bradbury offered additional comments and information.

Mr. Cleveland offered additional comments and information.

Mayor Champion and Trustee Menk asked additional questions.

Mayor Champion asked the developer to propose in the form of a letter an update to the February 2019 agreement for the Trustees to consider.

**REPORTS:**

- A. Mayor Champion had no report
- B. There were no Trustee reports.
- C. Mr. McCrumb presented the attached report including an update on Wild Plum and Fairway Lane.
- D. Chief Cottrell presented the attached report.
- E. Mrs. Taylor presented the attached financials and discussed variances. Mrs. Taylor has submitted her resignation to the Town Administrator and this will be her last meeting.

**OLD BUSINESS:**

**Trustee Bill #8, 2019 – Urban Camping Ban:** Mr. Schiller presented the ordinance to ban urban camping in Columbine Valley. The Trustees asked clarifying questions and had a brief discussion.

**ACTION: upon a motion by Trustee Palmer and a second by Trustee Menk, the Board of Trustees unanimously approved Trustee Bill #8, 2019 on 2<sup>nd</sup> Reading.**

**Trustee Bill #9, 2019 – Short Term Rental:** Mr. Schiller presented the ordinance to ban short term rentals in Columbine Valley. A Public Hearing has occurred. The Trustees asked clarifying questions and had a brief discussion.

**ACTION: upon a motion by Trustee Dotson and a second by Trustee Miles, the Board of Trustees unanimously approved Trustee Bill #9, 2019 on 2<sup>nd</sup> Reading.**

**NEW BUSINESS:**

**Presentation of Draft 2020 Town Budget:** Mr. McCrumb presented the Trustees with a draft of the 2020 Town Budget. Mrs. Taylor and Mr. McCrumb answered preliminary questions and will set up one-on-one meetings with interested trustees to discuss questions and concerns. Another draft will be discussed in October, with 1<sup>st</sup> Reading and a public hearing to occur in November and 2<sup>nd</sup> reading to occur in December.

**ACTION: no action was taken or required.**

**ADJOURNMENT:** There being no further business, the meeting was adjourned at 9:16 p.m.

Submitted by,  
J.D. McCrumb, Town Administrator

*\* All reports and exhibits listed "as attached" are available on the Columbine Valley web site and by request at Town Hall, 2 Middlefield Road.*

*\*\* All minutes should be considered to be in DRAFT form until approved by the Board of Trustees at the next regular meeting.*

**TOWN OF COLUMBINE VALLEY**  
**BOARD OF TRUSTEES**  
Minutes  
September 30, 2019

Mayor Champion called the Regular Meeting of the Trustees to order at 3:00 p.m., in the Conference Room at the Town Hall at 2 Middlefield Road, Columbine Valley, Colorado. Roll call found the following present:

Trustees: Richard Champion, Bruce Menk, Kathy Boyle, Bill Dotson, and Gary Miles

Also present: Lee Schiller, J.D. McCrumb, and Jim Thelen

**OLD BUSINESS:**

**Wilder Lane Agreement:** Mr. Schiller presented the letter received from Stephany Stewart outlining an update to the February 2019 agreement for repairs to Wilder Lane. The Trustees asked clarifying questions, and discussed accepting the proposal with a final date certain of June 1, 2021 and the \$96k security held until completion.

**ACTION: upon a motion by Trustee Miles and a second by Trustee Boyle, the Board of Trustees unanimously empowered the Town Attorney with oversight provided by Trustee Menk, to respond.**

**NEW BUSINESS:**

**Asbestos Abatement Requirement Changes:** Mr. Thelen shared with the Trustees a situation through which the State is not inspecting asbestos removal from single family home demolitions. He recommended the Town adopt standards to enforce abatement. The Trustees directed staff to present an ordinance for consideration in October.

**ACTION: no action was taken or required.**

**ADJOURNMENT:** There being no further business, the meeting was adjourned at 3:35 p.m.

Submitted by,  
J.D. McCrumb, Town Administrator

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# Town Administrator's Report

*October 2019*



Town of Columbine Valley  
2 Middlefield Road  
Columbine Valley, CO 80123

Tel: 303-795-1434  
Fax: 303-795-7325  
[jdmccrumb@columbinevalley.org](mailto:jdmccrumb@columbinevalley.org)





## Communications & Administration

- 63 citizens participated in this year's flu shot clinic on October 7 which is a 50% increase over last year; the provider was very pleased with the results.
- Three new trees were planted in Columbine Park this month. Eventually these will provide wonderful shade for participants of the concerts in the park and Independence day activities. Thank you to Stan Brown of Alameda Nursery for the donation of the trees and delivery.
- In September town admin, police and contract staff participated in a volunteer opportunity at Gracefull Café in downtown Littleton. Several residents stopped by to say hello and enjoy a meal.
- The Planning and Zoning Commission has concluded its year-long update to the Town's master plan; adopting the final version at the October meeting and forwarding it on to the Board for consideration in November. Staff estimates more than 450 unique citizen involvement touchpoints throughout the process.

### Town Website Sept Statistics

3,517

Total Visits

3,896

August Page Views

### Top Pages

Calendar

This Week

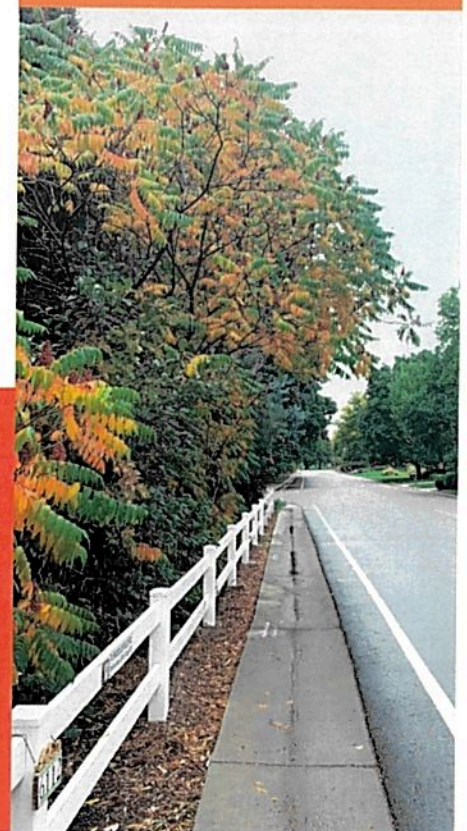
Events/Services

Dumpsters

### Citizen Contacts:

*Staff has fielded calls, emails or walk-ins on the following topics in September*

- ⇒ Building Department: 154
- ⇒ Comm. Development: 81
- ⇒ Public Works: 187
- ⇒ Municipal Court: 53
- ⇒ Other: 309





# Building Department

## Monthly Stats

### 7 Permits Issued

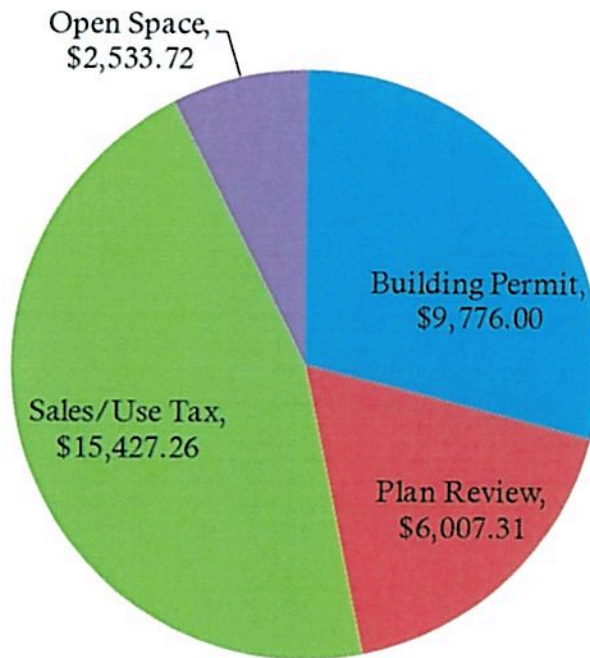
- New SFR: 1
- Major Remodel: 1
- New Roofs: 0
- Other/Misc.: 5

### 35 Inspections

### 7 Licenses Issued

- General: 2
- Electrician: 2
- Plumbers: 2
- Mechanical: 1
- Roofer: 0

Sept. Permit Rev.: \$33,744.29



## Wild Plum

95 Total Lots

0 SFR Permits Issued

0 Permits Pending

1 Grading Permit

## Wilder Lane

24 Total Lots

4 Permits Active

0 Permit Pending

17 Completed Homes

17 Occupied Homes



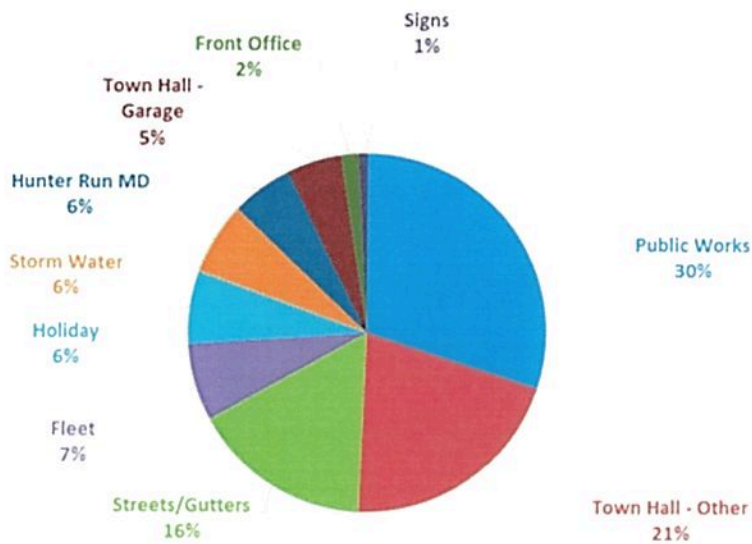
## Building Department Revenue by Month

	<u>2018</u>	<u>2018 YTD</u>	<u>2019</u>	<u>2019 YTD</u>
January	\$33,481.56	\$33,481.56	\$23,584.77	\$23,584.77
February	\$15,406.51	\$48,888.16	\$12,990.46	\$36,575.23
March	\$57,032.86	\$105,921.02	\$64,334.11	\$100,909.34
April	\$13,164.99	\$119,086.01	\$55,497.63	\$156,406.97
May	\$17,214.40	\$136,300.41	\$5,595.22	\$162,002.19
June	\$35,176.96	\$171,477.37	\$46,632.58	\$208,634.77
July	\$55,551.95	\$227,029.32	\$7,113.45	\$215,748.22
August	\$53,573.29	\$280,602.61	\$8,432.54	\$224,180.76
September	\$80,807.31	\$361,409.92	\$33,744.29	\$257,924.29
October	\$43,243.16	\$404,653.08		
November	\$30,518.62	\$435,171.70		
December	\$28,949.58	\$464,121.28		



# Public Works Department

## September Staff Time Allocation (including contractors)



*AN ASIDE: Emerald Ash Borer has been detected in Berthoud. This detection represents the third confirmation of EAB in Colorado outside of a federal quarantine in the last six weeks (Broomfield and Westminster).*

*The Town has a written EAB policy, adopted in November of 2017. The ash trees in front of Town Hall receive yearly injections. The trees along Hunter Run have not been treated at this time.*



- Staff is excited to welcome Dinea Dreessen as the new Public Works contractor. She will be taking over from Dave, being the main caretaker of Hunter Run. She will also be working around Town Hall helping with the upkeep both inside and out, as well as some additional public works projects around town.
- After initially sinking more than two inches, the sinking at the entrance to Par Circle has appeared to slow down. The interior of the pipe has been explored and photographed multiple times to try to help determine the cause of the issue. While a permanent solution is being investigated, a temporary cold patch has been placed at the entrance. This will be monitored but should hold up until the permanent fix is implemented.
- A new electrical circuit was installed running from the rear of the building to the brick wall on the NW corner of the lawn. This new 80 amp circuit will be able to supply the needed power to the performers at the summer concert series as well as during the 4th of July festivities. This is a major upgrade from the old 30 amp circuit that had been used, causing occasional tripping of the breaker.
- September saw some progress on the Wilder Lane pavement issues. Thorough deflection testing was performed to determine the integrity of the asphalt layer. Dozens of test were performed along the full length of the street. Addition core samples of the subgrade were also taken at this time. The larger "bird baths" were filled with cold asphalt patches to help smooth out the street until a final repair can be performed.

## September Weather Report

- High of 98
- Low of 43
- .92" of precipitation



## Municipal Court

	<u>2018 YTD</u>	<u>2019</u>	<u>2019 YTD</u>
Jan	\$10,400.00	\$6,287.00	\$6,287.00
Feb	\$20,026.87	\$3,130.00	\$9,147.00
Mar	\$25,871.12	\$4,433.25	\$13,580.25
Apr	\$30,716.12	\$2,422.75	\$16,003.00
May	\$37,901.12	\$2,490.00	\$18,493
June	\$44,161.12	\$2,815.00	\$46,976.12
July	\$49,965.59	\$3,232.48	\$53,198.07
Aug	\$63,683.59	\$4,448.01	\$57,646.08
Sept	<b>\$79,049.59</b>	<b>\$5,160.00</b>	<b>\$62,806.08</b>
Oct	\$93,721.59		
Nov	\$101,094.59		
Dec	\$102,154.59		

### September Total Stats

- Total paid before Court: 32
- Total on docket: 22
- Cases heard by Judge: 13
- Continuances: 0
- Failure to Appear: 7
- Stay of Executions: 0
- Classes Ordered: 0
- Bench Warrants 0
- Trials 1



## Community Development

### Wild Plum Farm

Lennar's schedule indicates that they are "full speed ahead" with construction of homes anticipated to begin in early 2020. Two or three of the custom lots along Fairway are expected to close in the next several weeks with permit applications to follow soon after. Construction is anticipated late this year or very early next.

In the coming weeks on-site items for completion include the upper detention pond, site irrigation, fine grading and reseeding, installation of feature walls, mail kiosks, finishing up fire pit and plaza, finishing up retaining walls, finishing crusher fines trail by the ditch, finishing fence across rundowns, revegetation on Cooley Lake open space areas, bollard installation, finishing signs and installing the boardwalk. Repairs are also scheduled for Hunter Run and there remains finish work along Platte Canyon Road.

### Wild Plum Schedule—as of September 2019

Grading	Complete
Pipe & Sewer	Complete
Concrete & Asphalt	Complete
Fairway Widening	Complete
Platte Canyon	Complete
Landscape	Complete by late October
Model Homes	Early 2020

*\* This schedule will not appear in future TA Reports*





# Columbine Valley Police Department

Serving Bow Mar

2 Middlefield Rd. Columbine Valley, Colorado 80123

www.columbinevalley.org

(303) 795-1434 Fax (303) 795-7325

## Columbine Valley P.D. Monthly Report For September 2019

Full Time Positions	5 of 6
Part Time Positions	4 of 4
Regular hours	1116
OT hours worked	25.75
Off Duty	34 (Barn Party)
PTO	39

### September 2019 Violations

Charges For the Date Range 9/1/2019 Thru 9/30/2019

Qty	Charge
17	703(3) FAIL TO STOP AT A STOP SIGN:
15	1101(2)(H) SPEEDING 10 - 19 MPH OVER:
3	1210(A) ON STREET PARKING PROHIBITED (3-6 AM) 1210(A) ON STREET PARKING PROHIBITED (3-6 AM):
3	1204(3)(B) STOPPING, STANDING OR PARKING PROHIBITED IN SPECIFIED PLACE 1204(3)(B) STOPPING, STANDING OR PARKING PROHIBITED IN SPECIFIED PLACE (OFFICIAL SIGNS PROHIBIT):
2	603 TRAFFIC CONTROL DEVICE:
1	604 TRAFFIC CONTROL SIGNAL:
1	1409 COMPULSORY INSURANCE:
1	208 BRAKE LIGHT 208 BRAKE LIGHT:
1	217(1) FAILED TO DIM HEADLIGHTS 217(1) FAILED TO DIM HEADLIGHTS:
1	1008(1) FOLLOWING TOO CLOSELY:
<b>45</b>	<b>Total Number of Violations Issued</b>

## Monthly Call Report

Case Number	Event Date	Situation Reported
BM19-0000031	2019-09-09T12:21:00	Theft from Motor Vehicle
BM19-0000032	2019-09-19T07:20:00	Auto Theft
BM19-0000033	2019-09-19T07:38:00	Auto Theft
BM19-0000034	2019-09-19T07:48:00	Trespass to Vehicle
BM19-0000035	2019-09-19T09:24:00	Theft from Motor Vehicle
BM19-0000036	2019-09-20T11:42:00	TRAFFIC STOP IP
BM19-0000037	2019-09-21T10:05:00	Trespass to Vehicle
BM19-0000038	2019-09-21T11:28:00	INFORMATION IP
BM19-0000039	2019-09-21T11:46:00	WARRANT ARREST IP
BM19-0000040	2019-09-30T14:56:00	Theft
CV19-0000098	2019-09-01T01:46:00	MESSAGE FOR DEPUTY IP
CV19-0000099	2019-09-03T03:41:00	ELUDING IP
CV19-0000100	2019-09-03T23:44:00	TRAFFIC ARREST IP
CV19-0000101	2019-09-05T15:39:00	UNKNOWN INJURY ACCIDENT IP
CV19-0000102	2019-09-11T19:01:00	VEHICLE LOCKOUT IP
CV19-0000103	2019-09-12T11:05:00	INFORMATION IP
CV19-0000104	2019-09-19T07:38:00	Auto Theft
CV19-0000105	2019-09-20T11:42:00	TRAFFIC STOP IP
CV19-0000106	2019-09-21T10:05:00	Trespass to Vehicle
CV19-0000107	2019-09-21T10:05:00	Trespass to Vehicle
CV19-0000108	2019-09-21T11:46:00	WARRANT ARREST IP
CV19-0000109	2019-09-22T02:11:00	DUI IP
CV19-0000110	2019-09-25T16:00:00	Injury Accident
CV19-0000111	2019-09-29T07:56:00	Criminal Mischief

### Problem Type Summary

12:25 PM 10/10/2019

Data Source: Data Warehouse

<b>Agency:</b>	ACSO
<b>Division:</b>	Bow Mar, Bow Mar Inactive Personnel, Columbine Valley, Columbine Valley Inactive Pers
<b>Time Range:</b>	Date From 9/1/2019 To 9/30/2019
<b>Conclusion:</b>	<ul style="list-style-type: none"> <li>• Calls canceled before first unit assigned</li> <li>• Calls canceled before first unit at scene</li> </ul>

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TRAFFIC STOP IP		<u>50</u>							<u>50</u>
TRANSPORT IP									
Trespass to Property									
TRESPASS TO PROPERTY IP									
Trespass to Vehicle			<u>2</u>						<u>2</u>
TRESPASS TO VEHICLE IP									
UNKNOWN INJURY ACCIDENT IP		<u>1</u>							<u>1</u>
UNLAWFUL ACTS IP									
Unwanted Subject									
UNWANTED SUBJECT IP		<u>1</u>							<u>1</u>
VEHICLE LOCKOUT IP			<u>1</u>						<u>1</u>
WARRANT ARREST IP			<u>1</u>						<u>1</u>
WARRANT PICKUP IP									
Weapons Violation									
WEAPONS VIOLATION IP									
WELFARE CHECK IP		<u>4</u>							<u>4</u>
ZONING IP									
<b>Total</b>	<u>1</u>	<u>78</u>	<u>62</u>	<u>30</u>					<u>171</u>

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TOWN OF COLUMBINE VALLEY  
 COMBINED BALANCE SHEET - ALL FUND TYPES AND ACCOUNT GROUPS  
 AUGUST 31, 2019

Assets	Totals	
	August 31, 2019	December 31, 2018
Cash and investments	\$ 1,915,986	1,759,694
Other receivables	90,268	153,015
Property taxes receivable	4,047	371,144
Property and equipment, net	2,530,173	2,530,172
	\$ 4,540,474	4,814,025
<u>Liabilities and Equity</u>		
Liabilities:		
Accounts payable	\$ 43,554	57,421
Accrued liabilities	47,357	41,923
Deferred property tax revenue	4,047	371,144
Fund balance:		
Reserved - TABOR emergency	54,042	54,042
Conservation Trust	18,306	13,094
Arapahoe County Open Space	420,719	397,342
Unavailable - Fixed assets net of outstanding long term debt	2,530,173	2,530,172
Reserved - Capital Improvements	489,742	489,742
Nonspendable		9,269
Unreserved	932,534	849,876
Total equity	4,445,516	4,343,537
	\$ 4,540,474	4,814,025

TOWN OF COLUMBINE VALLEY  
 COMBINED STATEMENT OF REVENUE, EXPENDITURES AND CHANGES IN FUND BALANCE  
 ALL GOVERNMENTAL FUND TYPES  
 BUDGET AND ACTUAL  
 EIGHT MONTHS ENDED AUGUST 31, 2019 AND 2018

Revenue	August Totals		Eight Months Ended August 31, 2019		
	2019	2018	Budget	Actual	Variance
<b>Taxes:</b>					
Property taxes	\$ 1,331	8,958	324,751	367,097	42,346
Specific ownership taxes	2,689	1,963	15,640	19,085	3,445
Sales and use tax	34,508	54,919	463,664	349,446	(114,218)
Utility franchise fees	-	5,511	30,664	33,874	3,210
Cable television	-	-	16,000	17,984	1,984
<b>Permits and fines:</b>					
Permits, fees and services	7,159	28,932	236,664	139,503	(97,161)
Fines	4,448	12,969	50,000	31,974	(18,026)
<b>Intergovernmental:</b>					
Bow Mar IGA	-	79,133	232,577	232,577	-
State highway user's tax	4,541	17,005	30,664	41,188	10,524
County highway tax revenue	7,374	-	10,800	12,067	1,267
Motor vehicle registration fees	588	-	4,000	3,452	(548)
State cigarette tax apportionment	77	40	536	365	(171)
Conservation Trust Fund entitlement	-	-	3,000	4,806	1,806
Arapahoe County Open Space shareback	(7,374)	-	36,000	38,625	2,625
Interest income	-	2,671	19,000	15,599	(3,401)
Other	169	119	18,336	16,273	(2,063)
<b>Total revenue</b>	<b>55,510</b>	<b>212,220</b>	<b>1,492,296</b>	<b>1,323,915</b>	<b>(168,381)</b>
<b>Expenditures</b>					
<b>Current:</b>					
Public safety	45,438	61,509	471,843	418,215	53,628
Sanitation	7,332	6,756	56,000	57,354	(1,354)
Administration	40,378	69,072	499,797	421,217	78,580
Planning and zoning	26,777	539	45,000	97,352	(52,352)
Public works	15,876	17,154	171,672	83,220	88,452
Other - rounding	-	6	-	1	(1)
<b>Capital outlay</b>					
Capital expenditures	-	-	150,000	124,578	25,422
Arapahoe County Open Space expenditures	-	-	12,000	20,000	(8,000)
Conservation Trust Fund expenditures	-	-	20,000	-	20,000
<b>Total expenditures</b>	<b>135,801</b>	<b>155,036</b>	<b>1,426,312</b>	<b>1,221,937</b>	<b>204,375</b>
<b>Excess of revenue over expenditures</b>	<b>(80,291)</b>	<b>57,184</b>	<b>65,984</b>	<b>101,978</b>	<b>35,994</b>
<b>Major projects</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Excess of revenue over (under) expenditures and major projects</b>	<b>(80,291)</b>	<b>57,184</b>	<b>65,984</b>	<b>101,978</b>	<b>35,994</b>
<b>Fund balance - beginning of period</b>	<b>1,995,634</b>	<b>1,870,450</b>	<b>1,732,963</b>	<b>1,813,365</b>	<b>80,402</b>
<b>Fund balance - end of period</b>	<b>\$ 1,915,343</b>	<b>1,927,634</b>	<b>1,798,947</b>	<b>1,915,343</b>	<b>116,396</b>

TOWN OF COLUMBINE VALLEY  
GENERAL FUND  
SCHEDULE OF EXPENDITURES - BUDGET AND ACTUAL  
EIGHT MONTHS ENDED AUGUST 31, 2019 AND 2018

	August 2019	August 2018	Eight Months Ended August 31, 2019		
			Budget	Actual	Variance
Public safety:					
Automotive expenses	1,916	3,717	25,250	15,466	9,784
Salaries and benefits	39,124	52,390	380,797	332,958	47,839
Municipal court	2,923	3,885	28,336	29,957	(1,621)
Other	1,475	1,517	37,460	39,834	(2,374)
	<u>45,438</u>	<u>61,509</u>	<u>471,843</u>	<u>418,215</u>	<u>53,628</u>
Sanitation	7,332	6,756	56,000	57,354	(1,354)
Administration:					
Legal	3,578	3,128	32,000	28,800	3,200
Accounting and audit	2,200	750	20,500	24,436	(3,936)
Inspection	-	11,340	106,504	66,000	40,504
Town administration	25,300	28,834	247,385	216,164	31,221
Insurance and bonds	581	1,383	20,000	13,076	6,924
Office supplies and miscellaneous	6,928	9,776	51,992	43,303	8,689
County Treasurer's collection fees	13	91	3,248	3,671	(423)
Rent and building occupancy costs	1,778	13,770	18,168	25,767	(7,599)
	<u>40,378</u>	<u>69,072</u>	<u>499,797</u>	<u>421,217</u>	<u>78,580</u>
Planning and zoning					
Planner and Engineering	26,777	539	45,000	97,352	(52,352)
Public works:					
Street repairs and maintenance	163	2,806	141,000	11,039	129,961
Street lighting	928	908	10,000	7,095	2,905
Weed and tree removal	7,598	10,215	12,336	19,488	(7,152)
Other	7,187	3,225	8,336	45,598	(37,262)
	<u>15,876</u>	<u>17,154</u>	<u>171,672</u>	<u>83,220</u>	<u>88,452</u>
Other - rounding	-	6	-	1	(1)
Capital expenditures:					
Public safety	-	-	142,000	114,727	27,273
Administration	-	-	8,000	9,851	(1,851)
Public works	-	-	-	-	-
	-	-	150,000	124,578	25,422
Arapahoe Open Space expenditures	-	-	12,000	20,000	-
Conservation Trust Fund expenditures	-	-	20,000	-	20,000
	<u>-</u>	<u>-</u>	<u>182,000</u>	<u>144,578</u>	<u>37,422</u>
Total expenditures	<u>135,801</u>	<u>155,036</u>	<u>1,414,312</u>	<u>1,201,937</u>	<u>212,375</u>
Major projects:					
Town Hall remodel	-	-	-	-	-
	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total expenditures and major projects	<u>135,801</u>	<u>155,036</u>	<u>1,414,312</u>	<u>1,201,937</u>	<u>212,375</u>



TOWN OF COLUMBINE VALLEY  
 SUPPLEMENTAL SCHEDULE OF GENERAL FUND EXPENDITURES - BUDGET AND ACTUAL  
 EIGHT MONTHS ENDED AUGUST 31, 2019 AND 2018

	August 2019	August 2018	Eight Months Ended August 31, 2019		
			Budget	Actual	Variance
<b>Public Safety:</b>					
<b>Automotive expenses:</b>					
Cruiser gas/oil/maintenance	1,916	3,717	20,000	12,341	7,659
Cruiser insurance	-	-	5,250	3,125	2,125
	<u>1,916</u>	<u>3,717</u>	<u>25,250</u>	<u>15,466</u>	<u>9,784</u>
<b>Salaries and benefits:</b>					
Salaries	29,805	47,217	297,692	263,445	34,247
Pension plan	3,025	4,982	29,769	24,004	5,765
Health/workman's comp insurance	6,294	191	53,336	45,509	7,827
	<u>39,124</u>	<u>52,390</u>	<u>380,797</u>	<u>332,958</u>	<u>47,839</u>
<b>Municipal court:</b>					
Municipal court - judge	750	750	6,000	7,500	(1,500)
Municipal court - legal	1,958	2,805	18,336	20,165	(1,829)
Municipal court - other	215	330	4,000	2,292	1,708
	<u>2,923</u>	<u>3,885</u>	<u>28,336</u>	<u>29,957</u>	<u>(1,621)</u>
<b>Other:</b>					
Uniforms	211	-	5,336	2,586	2,750
Education/training	-	752	6,000	1,276	4,724
Arapahoe County dispatch fee	-	-	14,628	7,314	7,314
Supplies/miscellaneous	1,264	765	11,496	28,658	(17,162)
	<u>1,475</u>	<u>1,517</u>	<u>37,460</u>	<u>39,834</u>	<u>(2,374)</u>
<b>Administration:</b>					
<b>Town administration:</b>					
Salaries - administration	15,812	20,980	175,846	137,163	38,683
FICA/Medicare - administration	1,579	2,227	16,615	14,447	2,168
Health insurance - administration	2,887	7	21,336	26,945	(5,609)
Pension - administration	1,012	1,362	10,385	8,635	1,750
Telephone/communications	308	299	3,336	3,281	55
Computer expense	3,557	1,454	14,667	20,614	(5,947)
Election expense	-	-	-	-	-
Dues and publications	145	2,505	5,200	5,079	121
	<u>25,300</u>	<u>28,834</u>	<u>247,385</u>	<u>216,164</u>	<u>31,221</u>
<b>Office supplies and miscellaneous:</b>					
Advertising/notices	27	-	336	85	251
Miscellaneous	4,771	9,506	44,992	29,680	15,312
Supplies - administration	2,130	270	6,664	13,538	(6,874)
	<u>6,928</u>	<u>9,776</u>	<u>51,992</u>	<u>43,303</u>	<u>8,689</u>
<b>Legal</b>					
Accounting and audit	3,578	3,128	32,000	28,800	3,200
Inspection	2,200	750	20,500	24,436	(3,936)
Insurance and bonds	-	11,340	106,504	66,000	40,504
County Treasurer's collection fees	581	1,383	20,000	13,076	6,924
Building occupancy costs	13	91	3,248	3,671	(423)
	<u>1,778</u>	<u>13,370</u>	<u>18,168</u>	<u>25,767</u>	<u>(7,599)</u>

TOWN OF COLUMBINE VALLEY  
 SUPPLEMENTAL SCHEDULE OF GENERAL FUND EXPENDITURES - BUDGET AND ACTUAL  
 EIGHT MONTHS ENDED AUGUST 31, 2019 AND 2018

	August 2019	August 2018	Eight Months Ended August 31, 2019		
			Budget	Actual	Variance
Public works:					
Street repairs and maintenance:					
Street/gutter maintenance	90	1,419	133,336	90	133,246
Snow removal	-	-	1,000	1,016	(16)
Striping	-	-	664	-	664
Signs maintenance	-	1,169	664	(1,394)	2,058
Vehicle maintenance	73	118	1,000	11,327	(10,327)
Other drainage	-	100	3,336	-	3,336
Street cleaning	-	-	1,000	-	1,000
	163	2,806	141,000	11,039	129,961
Street lighting	928	908	10,000	7,095	2,905
Ground maintenance	7,598	10,215	12,336	19,488	(7,152)
Other:					
Miscellaneous minor public works	7,187	269	-	40,633	(40,633)
Storm water permit process	-	909	3,336	4,965	(1,629)
Professional fees	-	2,047	5,000	-	5,000
	7,187	3,225	8,336	45,598	(37,262)
Capital and Conservation Trust Fund:					
Capital expenditures:					
Administration	-	-	8,000	9,851	(1,851)
Public safety	-	-	142,000	114,727	27,273
Public works	-	-	-	-	-
	-	-	150,000	124,578	25,422
Conservation Trust Fund expenditures:					
Miscellaneous	-	-	20,000	-	20,000
	-	-	20,000	-	20,000



## **Request for Board of Trustee Action**

**Date:** October 15, 2019

**Title:** 2020 Draft Town Budget

**Presented By:** J.D. McCrumb, Town Administrator

**Prepared By:** J.D. McCrumb, Town Administrator

**Background:** This is a second draft of the 2020 Town Budget presented for review and discussion. It has been drafted by Town staff. Several Trustees have met with staff individually and changes have been made to the draft presented in September accordingly.

The 2020 budget will be presented for a public hearing on November 19, 2019 and the budget will be presented for 1<sup>st</sup> Reading on that night.

The budget is scheduled for 2<sup>nd</sup> Reading on Tuesday, December 10, 2019.

**Attachments:** 2020 Draft Town Budget

**Recommended Motion:** "I move to set a public hearing on the 2020 town budget for Tuesday, November 19, 2019 at 6:15 p.m."



**TOWN OF COLUMBINE VALLEY  
2020 BUDGET  
FINANCIAL PORTION**

**SUMMARY**

**General Fund Activity**

Revenues		
Operating	\$ 1,969,639	
From Reserve	-	\$ 1,969,639
Expenditures		
Operating	\$ 1,895,192	
To Reserve	74,447	1,969,639

Reserve Activity

Additions		
2020 Budget (Above)	\$ 74,447	
Impact fees WPF	\$ 190,500	
Arapahoe County Open Space Shareback	38,625	
Conservation Trust Fund	6,000	\$ 309,572

Expenditures		
2020 Budget (Above)	-	
Capital Expenditures	55,000	
Major Capital Projects	-	
Arapahoe County Open Space Shareback	-	
Conservation Trust Fund	6,000	61,000

Net Increase (Decrease) in Reserves		248,572
Reserves at Beginning of Year		1,670,410
Reserves at End of Year		<u>\$ 1,918,982</u>

**TOWN OF COLUMBINE VALLEY**  
**General Fund Revenues & Expenditures**  
**2020 Budget**

	Actual 2018	Budget 2019	Projected 2019	Budget 2020
<b>Revenues</b>				
Taxes				
Property Taxes	\$ 347,824	371,144	371,144	358,412
Specific Ownership Taxes	27,124	23,454	23,454	23,454
Sales and Use Taxes	538,553	695,500	596,000	691,625
Utility Franchise Fees	47,632	46,000	46,000	50,000
Cable Television Fees	36,811	32,000	32,000	36,000
Permits and Fines				
Permits, Fees and Services	243,759	355,000	248,000	288,000
Fines	102,146	75,000	75,000	75,000
Intergovernmental				
Town of Bow Mar Police	276,530	285,102	285,102	290,091
Town of Bow Mar Admin	40,000	25,000	25,000	25,000
State Highway User's Tax	58,245	46,000	55,890	56,000
County Highway Tax Revenue	12,133	12,000	13,407	13,407
Motor Vehicle Registration Fees	3,446	6,000	6,000	6,000
State Cigarette Tax Apportionment	234	800	800	800
Interest	31,808	28,500	28,500	30,850
Other	18,963	27,500	27,500	25,000
From General Reserve	-	-	-	-
	<u>\$ 1,785,208</u>	<u>2,029,000</u>	<u>1,833,797</u>	<u>1,969,639</u>
<b>Expenditures</b>				
Public Safety	\$ 651,990	696,000	712,144	724,461
Sanitation	80,659	84,000	84,000	86,520
Administration	591,772	722,000	634,965	727,771
Planning and Zoning	55,902	67,500	67,500	71,500
Public Works	163,531	294,500	308,500	284,940
To General Reserve	241,354	165,000	26,688	74,447
	<u>\$ 1,785,208</u>	<u>2,029,000</u>	<u>1,833,797</u>	<u>1,969,639</u>
<b>Reserve Additions</b>				
From General Fund	\$ 241,354	165,000	26,688	74,447
Impact fees WPF	\$ -	254,000	38,100	190,500
Arapahoe County Open Space Shareback	35,823	36,000	38,625	38,625
Conservation Trust Fund	7,128	6,000	6,000	6,000
	<u>\$ 284,305</u>	<u>\$ 461,000</u>	<u>\$ 109,413</u>	<u>\$ 309,572</u>
<b>Reserve Expenditures</b>				
To General Fund	-	-	-	-
Capital Expenditures	8,748	219,500	219,078	55,000
Arapahoe County Open Space Shareback	7,500	12,000	20,000	-
Conservation Trust Fund Expenditures	18,419	6,000	6,000	6,000
	<u>34,667</u>	<u>237,500</u>	<u>245,078</u>	<u>61,000</u>
Net Increase (Decrease) in Reserves	249,638	223,500	(135,665)	248,572
Beginning Reserves Balance	1,556,437	1,806,075	1,806,075	1,670,410
Ending Reserves Balance	<u>\$ 1,806,075</u>	<u>2,029,575</u>	<u>1,670,410</u>	<u>1,918,982</u>

**TOWN OF COLUMBINE VALLEY**  
**General Fund Operating Expenditure Detail**  
**2020 Budget**

	Actual 2018	Budget 2019	Projected 2019	Budget 2020
<b>Public Safety</b>				
Cruiser Gas, Oil and Maintenance	\$ 25,863	30,000	30,000	30,000
Cruiser Insurance	8,000	7,000	7,000	7,000
Salaries	425,649	430,000	430,000	444,000
FFPA Pension	42,479	43,000	43,000	44,400
Health Insurance	44,764	52,000	52,000	52,000
Workers Comp Insurance	19,037	28,000	28,000	28,000
Uniforms	4,643	8,000	8,000	10,000
Education and Training	3,397	9,000	9,000	9,000
Supplies and Other	13,085	17,244	33,388	26,988
Arapahoe County dispatch fees	27,781	29,256	29,256	30,573
Municipal Court Judge	8,250	9,000	9,000	9,000
Municipal Court Legal	25,403	27,500	27,500	27,500
Municipal Court Supplies	1,514	2,000	2,000	2,000
Municipal Court Administration	2,125	4,000	4,000	4,000
	<u>\$ 651,990</u>	<u>696,000</u>	<u>712,144</u>	<u>724,461</u>
<b>Administration</b>				
Advertising	\$ 117	500	500	500
Legal	43,722	48,000	48,000	48,000
Accounting and Audit	24,300	20,500	32,118	61,795
Building Inspection	100,229	159,750	111,600	129,600
Building Maintenance and Utilities	39,984	27,250	27,250	41,568
Salaries	186,611	254,000	210,000	240,000
Payroll Taxes	21,230	24,000	22,000	26,000
Health Insurance	35,431	32,000	32,000	32,000
Pension	11,910	15,000	10,500	14,985
Telephone	4,730	5,000	5,000	5,500
Printing and Supplies	10,282	10,000	10,000	13,000
Insurance and Bonds	30,393	30,000	30,000	30,000
Education and Training	9,046	5,500	5,500	5,500
Community Activities	7,188	36,500	36,500	34,500
Miscellaneous	30,494	12,492	12,489	12,489
Master plan/survey	-	13,000	13,000	-
County Treasurer's Fees	3,483	3,708	3,708	3,584
Computer Expense	22,280	17,000	17,000	18,100
Election Expense	-	-	-	2,000
Dues and Publications	10,342	7,800	7,800	8,650
	<u>\$ 591,772</u>	<u>722,000</u>	<u>634,965</u>	<u>727,771</u>
<b>Public Works</b>				
Street and Gutter Maintenance	\$ 78,918	200,000	200,000	160,000
Snow Removal	1,707	2,000	2,000	2,100
Striping	326	1,000	1,000	1,020
Signs Maintenance	3,980	1,000	1,000	1,020
Vehicle Maintenance	5,804	1,500	1,500	4,000
Other Drainage/Water	251	5,000	5,000	5,000
Street Cleaning	225	2,000	2,000	-
Street Lighting	25,139	15,000	15,000	15,000
Ground and Other Maintenance	2,194	3,500	3,500	7,300
Other Maintenance/Homeowner Funds	10,000	9,000	9,000	5,000
NPDES Expense	6,878	5,000	5,000	7,500
Salaries	21,968	42,000	56,000	69,500
Mosquito Control	6,141	7,500	7,500	7,500
	<u>\$ 163,531</u>	<u>294,500</u>	<u>308,500</u>	<u>284,940</u>

**TOWN OF COLUMBINE VALLEY**  
**Reserve Account Detail**  
**2020 Budget**

	Balance	Projected	Projected	Projected	Budget	Budget	Projected
	2018	Increases	Decreases	Balance	Increases	Decreases	Balance
		2019	2019	2019	2020	2020	2020
Restricted Reserves							
Emergency reserves	\$ 56,362	-	-	56,362	-	-	56,362
Capital reserves	\$ -	500,000	219,078	280,922	-	55,000	225,922
Impact fees WPF		38,100	-	38,100	190,500	-	228,600
Conservation Trust	13,095	6,000	6,000	13,095	6,000	6,000	13,095
Arapahoe Open Space	397,342	38,625	20,000	415,965	38,625	-	454,590
	466,799	582,725	245,078	804,444	235,125	61,000	978,569
Unrestricted Reserves	1,339,278	1,833,797	2,307,109	865,966	1,969,639	1,895,192	940,413
Total Reserves	\$ 1,806,077	2,416,522	2,552,187	1,670,410	2,204,764	1,956,192	1,918,982
					\$	-	shld be zero

**TOWN OF COLUMBINE VALLEY**  
**Capital and Reserve Expenditure Detail**  
**2020 Budget**

	Actual 2018	Budget 2019	Projected 2019	Budget 2020
<b>Capital Expenditures</b>				
Public Safety				
Vehicle		90,000	87,309	
APX Radio Upgrade		52,000	52,418	
Police Vehile Laptops				20,000
Miscellaneous	\$ 8,748			
Administration				
Server		8,000	9,851	
Columbine Park Stage				25,000
Public Works				
Lightpole replacement		8,000	8,000	10,000
Village Drainage improvements		55,000	55,000	
Other Tahoe replacement		6,500	6,500	-
	<u>8,748</u>	<u>219,500</u>	<u>219,078</u>	<u>55,000</u>
<b>Major Capital Projects</b>				
	<u>\$ -</u>	<u>-</u>	<u>-</u>	<u>-</u>
<b>Arapahoe County Open Space Shareback Expenditures</b>				
Chatfield Dam Water Enhancement	\$ -	12,000	20,000	-
Master plan public outreach	7,500	-	-	-
	<u>\$ 7,500</u>	<u>12,000</u>	<u>20,000</u>	<u>-</u>
<b>Conservation Trust Fund Expenditures</b>				
Parks	\$ 18,419	6,000	6,000	6,000

TOWN OF COLUMBINE VALLEY  
REVENUE PROJECTIONS

COMPLETE  
PRELIM

	2016	2017	2018	2019	2019	2019	2020	2020 BUDGET NOTES
	Actual	Actual	Actual	Budget	6 Mo Actual	Estimate	Budget	
<b>Revenues</b>								
<b>Taxes</b>								
Property Taxes	312,222	328,363	347,824	371,144	359,926	371,144	358,412	CALCULATED
Specific Ownership Taxes	23,983	28,145	27,124	23,454	14,147	23,454	23,454	SAME AS 2019 BUDGET
Sales and Use Taxes - Total	710,552	645,017	538,553	695,500	271,053	596,000	691,625	
Sales and Use Taxes - Retail	98,061	122,570	165,984	145,000	89,496	145,000	152,250	INCREASE 5% from 2019 Estimate
Sales Taxes - Motor Vehicles	161,709	184,407	169,844	147,500	85,204	147,500	154,875	INCREASE 5% - MORE HOMES
Sales Tax - Remodels	109,626	144,745	126,287	75,000	64,382	75,000	75,000	SAME AS 2019 BUDGET
Sales Tax - New Construction	341,156	193,295	76,438	328,000	31,971	228,500	309,500	See Revenues - Attachment 1
Utility Franchise Fees	44,652	46,319	47,632	46,000	26,499	46,000	50,000	SMALL INCREASE - NEW HOMES
Cable Television Fees	30,568	34,394	36,811	32,000	17,871	32,000	36,000	SMALL INCREASE - NEW HOMES
<b>Permits and Fines</b>								
Permits, Fees and Services - Total	359,835	329,409	243,759	355,000	124,064	248,000	288,000	
Permits, Fees and Services - Remodels	121,097	133,030	128,505	75,000	68,906	75,000	75,000	HISTORICAL
Permits, Fees and Services - New Const	238,738	196,379	115,254	280,000	55,158	173,000	213,000	See Revenues - Attachment 1
Fines	62,268	71,077	102,146	75,000	24,293	75,000	75,000	NO CHANGE ANTICIPATED
<b>Intergovernmental</b>								
Town of Bow Mar Police	260,910	268,216	276,530	285,102	213,827	285,102	290,091	2019 PLUS CPI INCREASE
Town of Bow Mar Admin	6,685	40,000	40,000	25,000	18,750	25,000	25,000	NO CHANGE ANTICIPATED
State Highway User's Tax	44,051	45,981	58,245	46,000	19,110	55,890	56,000	CML ESTIMATE
County Highway Tax Revenue	11,668	13,092	12,133	12,000	4,693	13,407	13,407	EQUAL TO 2019 ESTIMATE
Motor Vehicle Registration Fees	6,046	5,843	3,446	6,000	2,419	6,000	6,000	EQUAL TO 2019 ESTIMATE
State Cigarette Tax Apportionment	755	-	234	800	241	800	800	EQUAL TO 2019 ESTIMATE
Interest	6,657	17,751	31,808	28,500	15,599	28,500	30,850	EST CSAFE 18,700 + VECTRA 12,150
Other	14,389	15,127	18,963	27,500	33,373	27,500	25,000	25K Estimated private donations for TCV Stage
	<u>1,895,241</u>	<u>1,888,734</u>	<u>1,785,208</u>	<u>2,029,000</u>	<u>1,145,865</u>	<u>1,833,797</u>	<u>1,969,639</u>	
Impact fees WPF				254,000	-	38,100	190,500	See Revenues - Attachment 1
Atapahoe County Open Space Shareback	33,737	33,238	35,823	36,000	38,625	38,625	38,625	EQUAL TO 2019 ESTIMATE
Conservation Trust Fund	8,648	6,724	7,128	6,000	4,806	6,000	6,000	EQUAL TO 2019 ESTIMATE

Town of Columbine Valley  
Public Safety

	2016	2017	2018	2019	2019	2019	2019	2020	2020	
	Actual	Actual	Actual	Budget	6 Mo Act	Estimate	Budget	Budget	Budget	2020 BUDGET NOTES
<b>Operations</b>										
Cruiser gas/oil/maintenance	10,258	26,179	25,863	12,000	8,871	12,000	12,000	12,000	12,000	
Cruiser gas	10,717			18,000		18,000	18,000	18,000	18,000	
Cruiser insurance	8,125	4,876	8,000	7,000	3,125	7,000	7,000	7,000	7,000	ALLOCATION
Salaries	445,367	399,482	425,649	430,000	203,297	430,000	430,000	444,000	444,000	BOARD
FFPA/Medicare/SUTA	38,557	40,626	42,479	43,000	17,934	43,000	43,000	44,400	44,400	
Health insurance	38,786	36,124	44,764	52,000	30,574	52,000	52,000	52,000	52,000	PER QUOTE
Workers Comp and Liab Insuran	18,219	16,493	19,037	28,000	6,975	28,000	28,000	28,000	28,000	REVIEW/AUDIT
Uniforms	9,245	5,571	4,643	8,000	1,705	8,000	8,000	10,000	10,000	
Education & training	2,727	3,630	3,397	9,000	768	9,000	9,000	9,000	9,000	FIREARMS TRAINING/AMMO
Supplies & miscellaneous	31,639	24,799	13,085	17,244	18,688	33,388	26,988	26,988	26,988	DETAIL BELOW
Telephones										
Equipment expensed										
Arapahoe County Dispatch	26,380	26,380	27,781	29,256	14,628	29,256	30,573	30,573	30,573	NEW RATE PLUS SOFTWARE CHARGE
	640,020	584,160	614,698	653,500	306,565	669,644	681,961	681,961	681,961	
<b>Municipal Court</b>										
Judge	9,000	8,250	8,250	9,000	6,000	9,000	9,000	9,000	9,000	EST UNCHANGED
Legal	23,606	24,889	25,403	27,500	16,333	27,500	27,500	27,500	27,500	EST UNCHANGED
Administration				2,000		2,000	2,000	2,000	2,000	Combine Admin and Supplies category
Supplies	1,805	1,875	1,514	2,000	677	2,000	2,000	2,000	2,000	EST UNCHANGED
Interpreter	1,500	1,375	2,125	2,000	1,200	2,000	2,000	2,000	2,000	EST UNCHANGED
	35,911	36,389	37,292	42,500	24,210	42,500	42,500	42,500	42,500	
<b>Capital</b>										
Vehicles		41,007		90,000	87,309	87,309	87,309	87,309	87,309	
Miscellaneous			8,748							
Radio system upgrade				52,000	52,418	52,418	52,418	52,418	52,418	
Video system										
Police Vehicle Laptops										
	-	41,007	8,748	142,000	139,727	139,727	139,727	20,000	20,000	SEE 2020 CIP BUDGET
	675,931	620,549	651,990	696,000	330,775	712,144	724,461	724,461	724,461	
<b>SUPPLIES &amp; MISC</b>										
				17,244	18,688	33,388	26,988	26,988	26,988	
<b>MISCELLANEOUS</b>										
SUPPLIES				1,856	14,618	18,000	9,000	9,000	9,000	includes hiring expenses for new officers
EQUIP/REPAIRS				5,000	952	5,000	5,000	5,000	5,000	
TELEPHONE				4,800	1,498	4,800	4,800	4,800	4,800	
DUES/SUBSCRIPTIONS				4,500	320	4,500	4,500	4,500	4,500	
TRI-TECH SOFTWARE				1,088		1,088	1,088	1,088	1,088	



TOWN OF COLUMBINE VALLEY  
Administrative Expenditures

	0.40	0.44	0.41	0.45	0.49	0.45	0.45	0.45	0.45
	2016	2017	2018	2019	2019	2019	2019	2019	2020
	Actual	Actual	Actual	Budget	6 Mo Act	Estimate	Estimate	Budget	Budget
Advertising	378	527	117	500	12	500	500	500	500
Legal Fees	36,378	46,523	43,722	48,000	19,778	48,000	48,000	48,000	48,000
Accounting & Audit Fees	22,085	26,500	24,300	20,500	22,071	32,118	61,795	61,795	61,795
Building Inspection	143,576	143,515	100,229	159,750	60,613	111,600	129,600	129,600	129,600
Salaries	149,333	184,737	186,611	254,000	106,495	210,000	240,000	240,000	240,000
Payroll Taxes	15,930	19,222	21,230	24,000	11,255	22,000	26,000	26,000	26,000
Health Insurance	17,842	38,285	35,431	32,000	20,353	32,000	32,000	32,000	32,000
Pension	8,618	11,424	11,910	15,000	6,610	10,500	14,985	14,985	14,985
Telephone	6,893	4,287	4,730	5,000	2,663	5,000	5,000	5,000	5,000
Printing, supplies and postage	10,512	11,067	10,282	10,000	10,989	10,000	13,000	13,000	13,000
Insurance and Bonds	34,452	23,773	30,393	30,000	11,914	30,000	30,000	30,000	30,000
Miscellaneous	80,411	43,400	30,494	12,492	8,976	12,489	12,489	12,489	12,489
County Treasurer's Fees	3,125	3,287	3,483	3,708	3,599	3,708	3,584	3,584	3,584
Computer expense	10,762	9,153	22,280	17,000	16,302	17,000	18,100	18,100	18,100
Community activities		7,188		36,500	3,630	36,500	34,500	34,500	34,500
Office Utilities - elect and water		7,004		9,000	3,876	9,000	9,000	9,000	9,000
Office maintenance/janitorial	34,444	43,572	32,980	18,250	13,566	18,250	32,568	32,568	32,568
Election Expense	35						2,000	2,000	2,000
Dues and publications	5,591	5,612	10,342	7,800	4,472	7,800	8,650	8,650	8,650
Continuing Education		9,046		5,500	389	5,500	5,500	5,500	5,500
Master Plan/survey				13,000		13,000			
Economic Incentive	104,930								
	685,295	614,884	591,772	722,000	327,563	634,965	727,771	727,771	727,771
Sanitation - Allied Waste	71,010	76,924	80,659	84,000	42,689	84,000	86,520	86,520	86,520
<b>Capital:</b>									
Town Administration Building	62,947								
Office Renovation		8,750		8,000	9,851	8,000	25,000	25,000	25,000
Computers and Peripherals		8,750		8,000	9,851	8,000	25,000	25,000	25,000
Other									
	62,947	8,750		8,000	9,851	8,000	25,000	25,000	25,000
				18,250		18,250	32,568	32,568	32,568
				5,000		5,000			
				2,000		2,000			
				600		600			
				5,900		5,900	6,018	6,018	6,018

2020 BUDGET NOTES

EST SAME AS 2019 BUDGET

WILD PLUMMILDER - MUCH REBILLED

Audit 16,500 + Payroll Svc 2,295 + CRS \$43,000

CALCULATION (45% of Permits, Fees & Services)

ROUGH ESTIMATE (subject to Board review and approval)

JCT - CALCULATED

PER QUOTE

EST 5% OF SAL INCL HOBBS

COMCAST + DPC NETWORKS

EST INCLUDES HANSEN

EST SAME AS 2019 BUDGET

SEE DETAIL BREAKDOWN

JCT - 1% of Property taxes

INCLUDE NEW SOFTWARE

SEE DETAIL BREAKDOWN

EST SAME AS 2017 BUDGET

SEE DETAIL BREAKDOWN

APRIL ELECTION

SEE DETAIL BREAKDOWN

Columbine Park Stage( contingent on private donations)

move to Public Works Expense in 2020 7.5K (300HRS@\$25)

move to Public Works Expense in 2020

move to Public Works Expense in 2020

2% INCREASE BUDGETED

OFFICE MAINTENANCE:

PUBLIC WORKS PART TIME HELP

MOWING - MR THAN

AERATION/FERTILIZER

JANITORIAL



TOWN OF COLUMBINE VALLEY  
Administrative Expenditures

	2016	2017	2018	2019	2019	2019	2019	2020	2020	2020 BUDGET NOTES
	Actual	Actual	Actual	Budget	6 Mo Act	Estimate	Budget	Budget	Budget	
	0.40	0.44	0.41	0.45	0.49	0.45	0.45	0.45	0.45	
FOOTHILLS CONTRACT				1,200		1,200		-		move to Public Works Expense in 2020
CLEANING SUPPLIES				750		750		750		
TOWN HALL (PAINT, STUCCO, STAIN)								23,000		See 2020 CIP Budget
CONTINGENCY/MISCELLANEOUS				2,800		2,800		2,800		
MISCELLANEOUS:				12,492		12,489		12,489		Dana to check any increase for 2020
BANK SVC CHARGES				2,100		2,100		2,100		
CREDIT CARD FEES				3,000		3,000		3,000		
SOFTWARE				1,200		1,200		1,200		
MAYOR				1,000		1,000		1,000		
TONER				500		500		500		
WEB HOSTING				1,500		1,500		1,500		
MONTHLY B-FASTS				900		900		900		
CONTINGENCY				2,292		2,289		2,289		
COMMUNITY ACTIVITIES:				36,500		36,500		34,500		
60TH ANNIV CELEBRATION				1,000		1,000		-		
SAFETY PROGRAM (RING)				5,000		5,000		-		
SHRED EVENT(S)				1,800		1,800		2,000		
4TH OF JULY, NET OF 2.5K DONATION				15,000		15,000		15,000		
HOLIDAY DINNER				10,000		10,000		10,000		
CONCERTS AT THE PARK, NET OF 3.5K DONATION				3,700	3,630	3,700		7,500		
DUES/SUBSCRIPTIONS:				7,800		7,800		8,650		
COLORADO MUNICIPAL LEAGUE				1,250	1,223	1,250		1,250		
COSTCO				120	120	120		120		
MCCMA				75	75	75		75		
CO COMM & UTIL ALLIANCE				550	550	550		550		
DRCOG				600	600	600		600		
EMPLOYERS COUNCIL				1,400	1,400	1,400		1,400		
S METRO CHAMBER				600	600	600		600		
METRO MAYORS CAUCUS				115	113	115		115		
SOC FOR HUM RES				210	209	210		210		
ICMA MEMBERSHIP				-	-	-		850		
MISC				2,880		2,880		2,880		

**TOWN OF COLUMBINE VALLEY  
Detail and Support for Planning and Zoning Expense Projections**

	2016	2017	2018	2019	2019	2019	2019	2020
	Actual	Actual	Actual	Budget	6 Mo Act	Estimate	Budget	Budget
Town planner	38,438	37,208	41,574	52,545	46,078	52,545	56,545	56,545
Town engineers	12,668	8,172	14,328	13,455	4,392	13,455	13,455	13,455
Miscellaneous				1,500		1,500		1,500
	51,106	45,380	55,902	67,500	50,471	67,500	71,500	71,500
PHIL:								
Planning - no reimb	37,208	37,208	37,208	52,545		52,545	56,545	56,545
Planning Asst Planner	37,208	37,208	37,208	34,545		34,545	34,545	34,545
Platte Canyon Road	-	-	-	12,000		12,000	12,000	12,000
Traffic study/studies	-	-	-	5,000		5,000	-	-
Contingency	-	-	-	1,000		1,000	1,000	1,000
Platte Canyon Sidewalk- Design							9,000	9,000
TROY:								
Planning assistance	8,172	8,172	8,172	13,455		13,455	13,455	13,455
Platte Canyon Road	8,172	8,172	8,172	5,000		5,000	5,000	5,000
Urban Drainage	-	-	-	1,500		1,500	1,500	1,500
Contingency	-	-	-	5,000		5,000	5,000	5,000
	-	-	-	1,955		1,955	1,955	1,955

**Town of Columbine Valley  
Public Works**

	2016 Actual	2017 Actual	2018 Actual	2019 Budget	2019 6 Mo Act	2019 Estimate	2020 Budget	2020 BUDGET NOTES
Street/Gutters	232,260	402,368	78,918	200,000	-	200,000	160,000	Note A
Snow Removal	9,484	2,798	1,707	2,000	1,016	2,000	2,100	Note B
Striping	4,707	2,628	326	1,000	-	1,000	1,020	2% Inc. from 2019
Signs	1,340	2,293	3,980	1,000	(1,524)	1,000	1,020	2% Inc. from 2019
Vehicle Maintenance	7,624	3,580	5,804	1,500	11,196	1,500	4,000	Annualize 6 mo. Actual (1,998/6 x 12 )
Other	4,195	5,312	251	5,000	-	5,000	5,000	Note C
Maint/Water - Hunter Run	9,190	7,058	-	-	-	-	-	Budgeted under Ground Maintenance
Street Cleaning	-	-	225	2,000	-	2,000	-	Same as 2019
Street Lighting	13,031	12,393	25,139	15,000	4,861	15,000	15,000	Note 1
Ground Maintenance	2,680	877	2,194	3,500	1,207	3,500	7,300	Note 1
Storm water permit activity	4,864	4,524	6,878	5,000	4,840	5,000	7,500	Note 2
Homeowner Assn subsidy	10,000	10,000	10,000	9,000	-	9,000	5,000	Note 4
Salaries	15,528	15,528	21,968	42,000	25,242	56,000	69,500	Note 4
Mosquito Control	7,675	6,020	6,141	7,500	3,419	7,500	7,500	Note 3
	<b>307,050</b>	<b>475,379</b>	<b>163,531</b>	<b>294,500</b>	<b>50,257</b>	<b>308,500</b>	<b>284,940</b>	
<b>Conservation Trust</b>	6,000	6,000	18,419	6,000	-	6,000	6,000	Same as 2019
<b>Arapahoe County Open Space</b>								
			7,500	12,000	20,000	20,000	-	2019 Expenses of 20K for Nevada Ditch
			7,500	12,000	20,000	20,000	-	
<b>Capital</b>								
Town-wide Lightpole Replacement				8,000	-	8,000	10,000	See 2020 CIP Budget
Columbine Lane/Village Drive				55,000	-	55,000	-	
Tahoe Replacement				6,500	6,028	6,500	-	2019 Snow Plow on Expedition
Other				-	-	-	-	
				69,500	6,028	69,500	10,000	

2020 Notes:

- Note A: Includes 60K annual maintenance, Drainage Rehab Spyglass/Fairway 20K , Platte Canyon Right Turn Lane 40K + Contingency 40K
- Note B: Includes cost of xtra police drivers (70 hrs) - @ 30/hr
- Note C: Contingency
- Note 1: Mr Than- Mowing, aeration/fertilizer, Trees maint(this includes 3.8K budgeted under Admin in prior years) 3.5K + 3.8K
- Note 2: 7 entrances @ 2,000 per - (Polo Res, BT, Village, Brookhaven, CV, Willowcroft, Wilder Lane)
- Note 3: Mosquito Control (7,000); Contingency - (500)
- Note 4: Hobbes + Part time help (300 hrs@ 25/hr)+7500



**Request for Board of Trustee Action**

**Date:** October 15, 2019

**Title:** Nevada Ditch Demobilization Study Report

**Presented By:** Troy Carmann, Town Engineer

**Prepared By:** Dewberry Engineers Inc. and Mile High Flood District

**Background:** In anticipation of the Nevada Ditch being decommissioned by Denver Water in the future, the Town ordered a study in early 2019 to understand the implications of decommissioning and the role the ditch plays in the Towns current stormwater system.

**Attachments:** Nevada Ditch Demobilization Plan

**Recommended Motion(s):** No action is required at this time.

**DATE:** September 23, 2019  
**TO:** Bryan Kohlenberg, P.E., CFM  
Mile High Flood District  
**FROM:** Danny Elsner, P.E., CFM  
Dewberry | J3

**SUBJECT:** Nevada Ditch Demobilization Plan

## **EXECUTIVE SUMMARY**

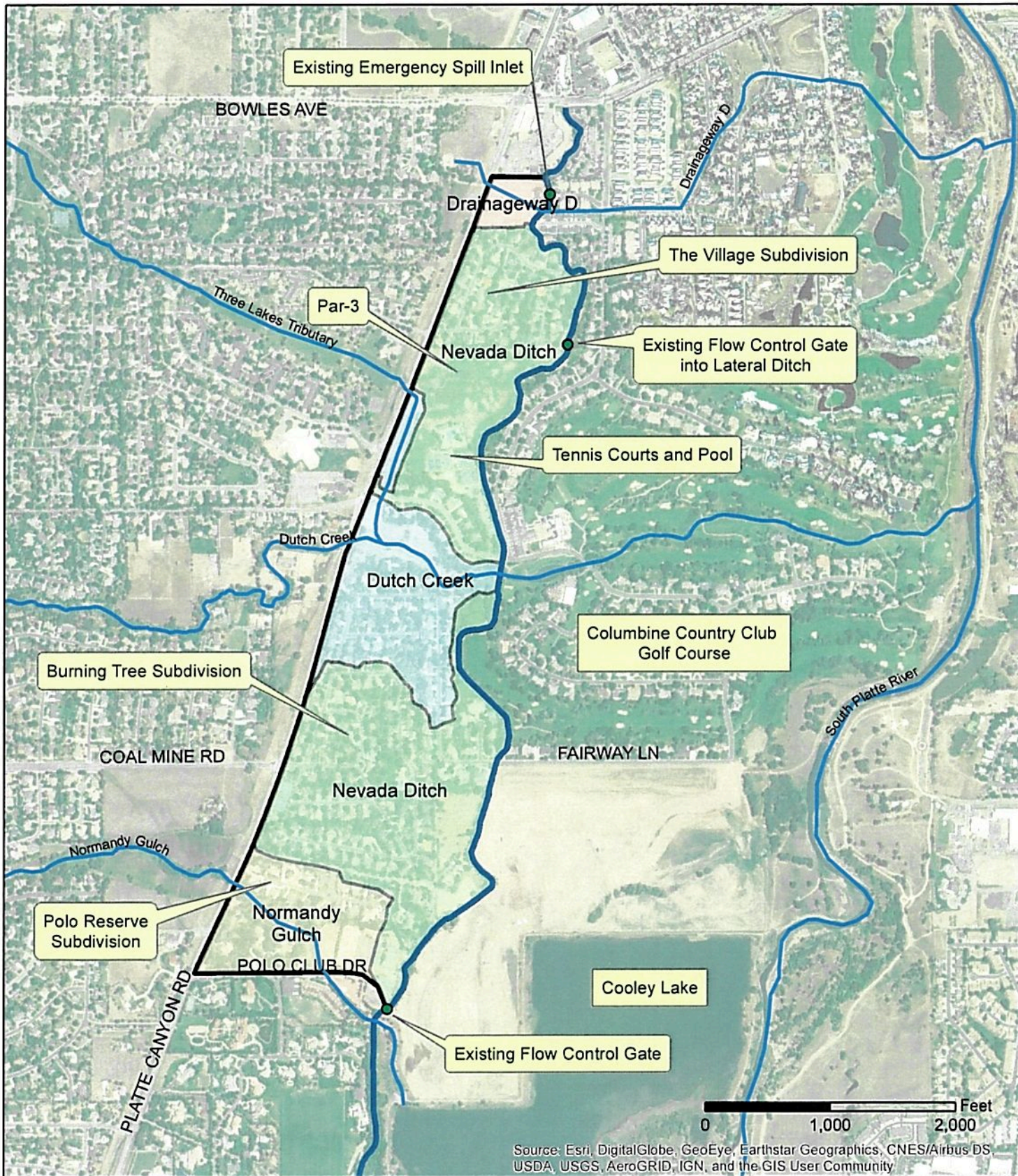
The purpose of this project was to create an Outfall Systems Plan (OSP) for Nevada Ditch in preparation for potential decommissioning at the behest of Denver Water. This OSP will assist Columbine Valley in future decision-making efforts for use and maintenance of the ditch. This includes designating portions of the ditch that should be reclaimed by nature and portions of the ditch that should receive stormwater for water quality purposes and maintaining trees. Mile High Flood District (MHFD), formally known as Urban Drainage and Flood Control District (UDFCD), authorized the work for this project.

From the baseline hydrology study and the alternative analysis, it was found that the ditch is capable of holding the water quality capture volume (WQCV) and the 10-year storm runoff volume with minor hydraulic modifications to the ditch, such as adding gates to increase the capacity. It is recommended to further study these options in the next steps, since conceptual designs for each reach on inlets and structures that would capture the stormwater is required. It is also recommended to complete a tree survey and analysis of the yearly water consumption versus the yearly stormwater available. This volume calculation could help decide if additional water, above the WQCV, should be detained or captured. If this volume is higher than the WQCV, an optimization of this yearly water consumption and the possibility of detention up to the 10-year storm event would be recommended, with corresponding conceptual design of the inlets/structures to route flow and allow for overflow.

## **INTRODUCTION**

Nevada Ditch is an active, irrigation ditch that flows south to north through Columbine Valley. Denver Water currently owns and maintains this ditch and may terminate their use due to recent changes to ditch water rights. Columbine Valley wants to ensure there will be an adequate amount of water to maintain existing trees along the ditch, provide water treatment, and maintain aesthetics valued by their residents. This OSP examined local drainage basins that flow to Nevada Ditch. The area included in this study are basins bounded by South Platte Canyon Road to the west and Nevada Ditch to the east, and does not include Dutch Creek, Drainageway D, or SJCD (N) (known as Normandy Gulch). While Normandy Gulch is located outside of the study limits, there is an existing flow control gate located at the south end of the study limits that controls stormwater entering Nevada Ditch from Normandy Gulch. There are also two other existing structures along Nevada Ditch that are in the study area: an existing flood control gate into a lateral ditch and an existing emergency spill inlet. Nevada Ditch was broken into four reaches to be studied separately, per conversation with Columbine Valley. Refer to Figure 1 for the site map.





**Legend**

- Existing Structures
- Streams
- Nevada Ditch
- ▭ Study Area

**FIGURE 1 - SITE MAP**



1 inch = 1,000 feet



## **METHODS AND ANALYSIS**

### **Reach Identification**

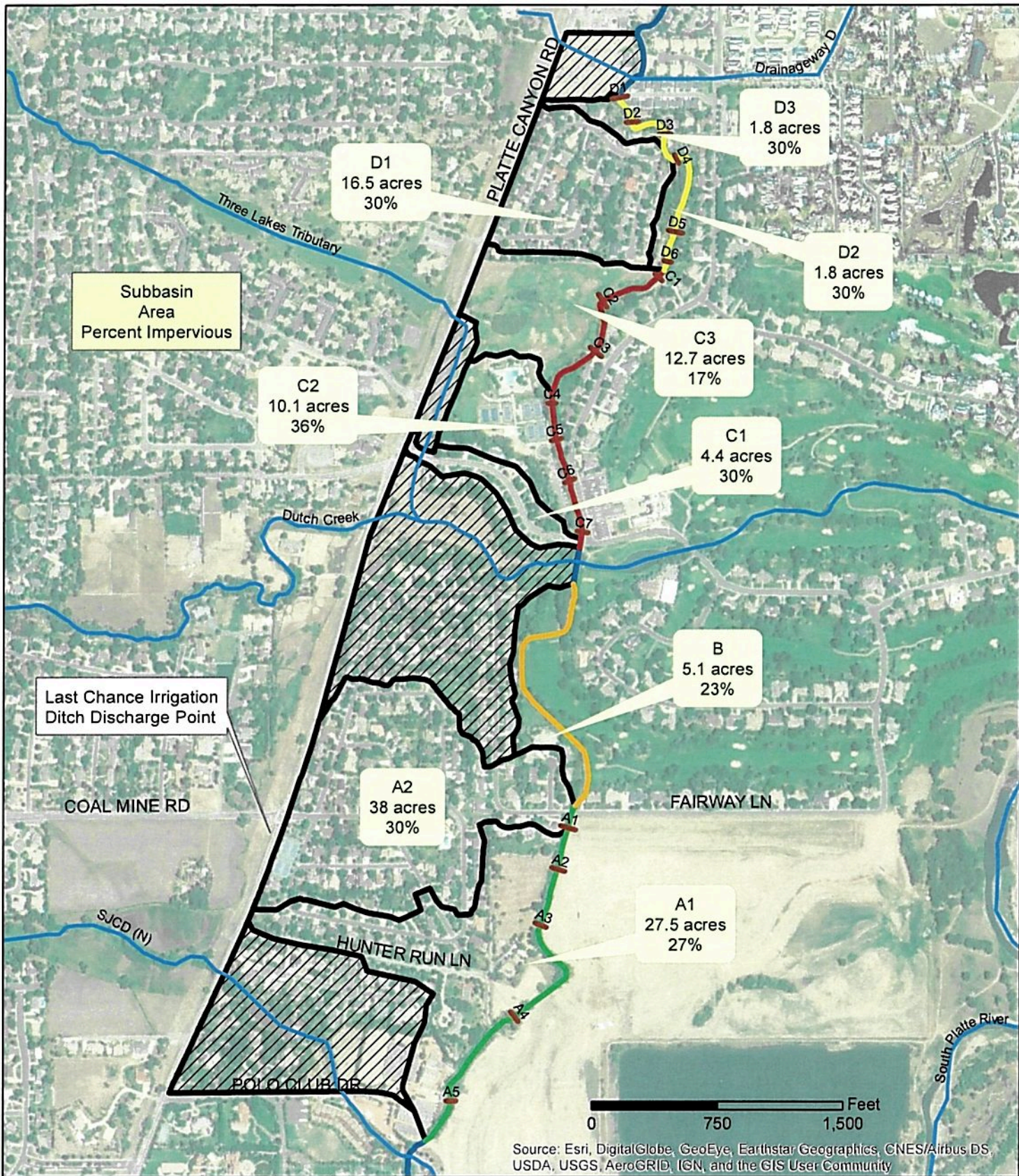
Four reaches along Nevada Ditch were identified based on contributing area and use. Overland flow and channelized flow were also considered when identifying the separate reaches. Overland flow is the flow of water over the land towards the receiving body of water, i.e. Nevada Ditch. Channelized flow is the flow of water through direct routing, such as curb and gutter, to the receiving body of water. Reach A is the furthest reach south and has stormwater contributions from the Burning Tree Subdivision and the Polo Reserve subdivision as channelized flow. This is the only reach with a recreational trail system aligned with the ditch. There is an existing flow control gate located at the south end of Reach A that is currently operated by Nevada Ditch as a means of controlling stormwater entering the ditch from Normandy Gulch. Reach B is assumed to have existing, supplemental irrigation since it is along the Columbine Country Club golf course. In between Reach B and Reach C, Nevada Ditch is routed through a pipe over Dutch Creek. Reach C begins on the north side of Dutch Creek with a piped section of the ditch under Fairway Lane and continues downstream along the Columbine Valley Par-3. The piped section under Fairway Lane is also used to convey storm water from the north flowline of Fairway Lane. There is mostly overland flow from the Par-3 with channelized flow from Fairway Lane and the adjacent parking lot. Reach D is along The Village subdivision and has mostly overland flow from behind the houses in this subdivision with some channelized flow from Village Drive. There is an existing, privately owned ditch lateral to Nevada Ditch in the backyard of the home at 13 Middlefield Road. This existing, lateral pipe infrastructure is a potential location for future spill, maintenance release, or emergency release functionality in the repurposed system. Refer to Figure 2 for reach locations.

### **Basin Delineation**

Basin delineation was completed to calculate the runoff volumes using the rational method. Basins corresponding to the reach lengths of interest were delineated using contour data provided by MHFD, and yielded the four main Basins A, B, C, and D. It is assumed that there is no stormwater flow from west of South Platte Canyon Road, except from the storm drain that goes under South Platte Canyon Road at Coal Mine Avenue and the storm drain that goes under South Platte Canyon Road near Three Lakes Tributary. All the stormwater that has the potential to flow into Nevada Ditch is from the ditch west to South Platte Canyon Road.

There are also three adjacent subbasins that are excluded from the study area which are areas that drain to Normandy Gulch, Dutch Creek, and Drainageway D. Based on local knowledge, flow from Normandy Gulch to Nevada Ditch only occurs during large storm events and is minimized by the in-ditch flow control gate, which spills excess stormwater over the crest of the drop structure and into Cooley Lake. The grade control structure for Normandy Gulch, located south of the study limits, generally permits base flow along the gulch and under the ditch through an 18 inch steel pipe. Flow adjacent to the areas flow to Dutch Creek are separate by a pipe that conveys water above the creek to Nevada Ditch, and thus flows do not intermingle. And Drainageway D basin (separate from the adjacent Basin D) does not contribute to Nevada Ditch, per the Drainage Report which shows that all stormwater is directed into storm drains which area separated from Nevada Ditch by an underpass (Lund Partnership, Inc., 2015) Refer to Figure 2 for the Basin Hydrology Map.





**Legend**

- |                       |                             |
|-----------------------|-----------------------------|
| Cross Sections        | <b>Nevada Ditch Reaches</b> |
| Streams               | A                           |
| Subbasins             | B                           |
| Noncontributing Areas | C                           |
|                       | D                           |

**FIGURE 2 -  
BASIN HYDROLOGY MAP**



1 inch = 750 feet



## TECHNICAL MEMORANDUM

Basin A was delineated into two subbasins: A1 and A2. Subbasin A1 is mostly residential and has some light industrial and grass land cover. This subbasin has channelized flow from Hunter Run Lane and overland flow that goes directly to Nevada Ditch. Subbasin A2 is all residential and the entire subbasin has channelized flow that is routed to Fairway Lane either through curb and gutter or by storm sewer pipes. The flow then passes over Nevada Ditch on Fairway Lane. There is an 18 inch storm drain located at the southwest quadrant of the South Platte Canyon Road and Coal Mine Avenue intersection. The majority of flow from Coal Mine Avenue is intercepted by Last Chance Irrigation Ditch located on the west side of Platte Canyon Road (Matrix Design Group, 2015). Approximately 3 cfs (minor storm) and 10 cfs (major storm) is currently being routed through the Burning Tree Subdivision from the storm drain. This flow is routed to Fairway Lane.

Basin B is behind residential houses that are in the Dutch Creek subbasin. This basin is all overland flow that goes directly into Nevada Ditch. The land cover for this basin is residential and grass. It is assumed that since this section is along the golf course, enough water from the irrigation system will make it to Nevada Ditch and will be able to maintain the trees. Therefore, no further calculations were done on Basin B. Between this basin and Basin C, Nevada Ditch is routed through a pipe over Dutch Creek. Therefore, no flow from Dutch Creek goes to Nevada Ditch.

Basin C was delineated into three subbasins: C1, C2, and C3. Subbasin C1 is comprised of residential areas and it is all channelized flow that is routed down Fairway Lane and into storm drains located just west of Nevada Ditch. Subbasin C2 is along the back of the houses in Subbasin C1 and also includes the pool, tennis courts, and a small parking lot. There is some overland flow that goes directly into Nevada Ditch, however most of the subbasin is channelized flow that drains to a cobble bed form channel near Fairway Lane and Nevada Ditch. Subbasin C3 covers the Columbine Valley Par-3 and includes two small ponds. There is a storm drain under South Platte Canyon Road that discharges into these ponds and is routed to Nevada Ditch. There is also overland flow from this subbasin into Nevada Ditch.

Basin D was delineated into three subbasin: D1, D2, and D3. Subbasin D1 is a residential area and is channelized flow that is routed down Village Drive where there are storm sewer inlets just before Nevada Ditch. Subbasins D2 and D3 are behind the houses of Subbasin D1 and were assumed to have the same percent impervious as Subbasin D1. These subbasins have overland flow directly into Nevada Ditch.

### Hydrology

The Rational Method was selected to calculate the peak flows of each basin due to the small area of each basin (less than 90 acres). The UD Rational 2.00 Workbook was used to complete these calculations on the individual subbasins and the overall basins (UDFCD, 2018), and Columbine Valley – Town Hall was selected as the location for the 1-hour rainfall depths. The area of each basin, overland and channelized flow lengths, and elevations were obtained from ArcGIS. The hydrologic soil group (HSG) for each basin was obtained from the USDA NRCS Web Soil Survey (Appendix B). The majority of the basins were HSG C which indicates moderately high runoff potential when thoroughly wet. Soils along the southern end of Nevada Ditch were generally HSG A which indicates very low runoff potential when thoroughly wet.

The land cover layer was generated using an aerial image in ArcGIS and categorized the land into residential, industrial, park, grass, pond, or asphalt. This layer was used to correlate land cover to percent impervious using Table 6-3 in the UD Rational Workbook (UDFCD, 2018). The percent imperviousness

for each subbasin was calculated using an area weighted average. In addition, the NRCS Conveyance Factor K for each flowpath was calculated using ArcGIS and Table 6-2 in the UD Rational Workbook, which correlates land use to conveyance factors. Refer to Appendix C for reference tables and corresponding maps of land cover, imperviousness, and conveyance factors. Area weighted calculations for percent imperviousness and conveyance factors are included in Appendix D and results from the rational method are included in Appendix E.

The Water Quality Capture Volume (WQCV) and the 10-year runoff volume were calculated to compare against the ditch capacity. The UD Detention v3.07 Workbook was used to calculate the WQCV and the 10-year runoff volume for each overall basin (UDFCD, 2018). It is assumed the ditch acts as an extended detention basin with a WQCV drain time of 40 hours. The same hydrologic data used for the UD Rational Workbook was used for the runoff volume calculations, including precipitation, watershed characteristics, hydrologic soil groups, and imperviousness. Refer to Appendix F for the UD Detention calculation spreadsheets.

## Hydraulics

Channel characteristics were evaluated to calculate the capacity of the ditch along the identified reaches based on a number of proposed alternatives that include hydraulic modifications. MHFD provided Light Detection and Ranging (LIDAR) data as .LAS files, which were then converted to a 1' by 1' cell Digital Elevation Model (DEM) using ArcGIS. This DEM was used to cut several cross sections in each reach of Nevada Ditch and the cross sectional data from ArcGIS was exported to Excel. This data was used in FlowMaster to get the cross sectional area of each cross section and was used to calculate the capacity of each ditch section.

Profiles of the ditch centerline were generated using LiDAR data for reaches A, C, and D. These profiles are only for reference and are to understand the average slope and length of each reach. Further survey will be needed. These profiles are included in Appendix A.

Roughly six cross sections were taken for each reach of Nevada Ditch. The cross sections were drawn based on locations along the ditch that were unimpeded by roads, driveways, and other streams. The ditch is roughly three feet deep and when spill occurs, it generally happens on the right bank. The cross sections and the ditch capacity calculations are included in Appendix G. Refer to Figure 3 for a general cross section of Nevada Ditch.

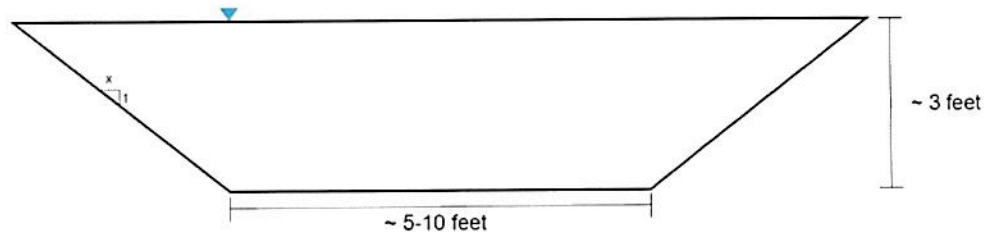


Figure 3 – General Cross Section



## RESULTS

The UD Rational 2.0 Workbook was used to calculate the peak flows for each basin and is included in Appendix E. Refer to Table 1 for the peak flows of each basin. These peak flows are solely from what was calculated using the workbook and do not include the additional flows from the storm sewer pipes that go under South Platte Canyon Road to Subbasin A and C. Basin B is not included in these calculations since it is assumed the trees along this reach will be maintained from the adjacent golf course’s irrigation system.

Table 1 – Peak Flow Rates, Q (cfs)

Basin	Peak Flow Rates, Q (cfs)					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	16.1	26.3	40.5	69.1	90.0	118.2
C	8.3	14.8	23.8	43.1	56.9	74.4
D	6.4	11.1	17.1	29.8	38.9	50.4

The WQCV and 10-year runoff volume for Basins A, C, and D were calculated using the UD Detention v3.07 Workbook and is included in Appendix F. The 10-year runoff volume was selected because all of the reaches could contain that volume with one of the proposed alternatives, which are discussed in the following paragraphs. For these alternatives, it is assumed that all runoff volume from surrounding streets is diverted into Nevada Ditch.

If no action is taken after Nevada Ditch is decommissioned, the ditch will continue to receive storm water as it does now. However, irrigation flows are currently the primary water source and its removal will impact the trees. It is most likely that the existing trees would be stressed and not survive from the lack of water, even with the storm water continuing to discharge. These trees are an amenity to the town by providing privacy, shade and aesthetics, and their loss is undesirable. Additionally, the storm water discharge from properties in Columbine Valley should have not been comingled with Nevada Ditch, but this solution was common at the time of this subdivision’s development. Subsequent to the decommission of Nevada Ditch, Columbine Valley will need a master plan for stormwater discharges from tributary properties. This is most likely achieved either through Nevada Ditch and a proper outfall, or through the possible alternatives described below.

### Reach A

Three (3) alternatives were identified for Reach A. Alternative No. 1 for Reach A is to install a gate at the most downstream end of the reach to detain water along the reach. This alternative gives the ditch the capacity to hold the WQCV, but does not allow for the 10-year runoff volume to be captured. Alternative No. 2 is to install a gate at the most downstream end and another near the middle of the reach to detain more water upstream. This alternative detains the WQCV and the 10-year runoff volume. Alternative No. 3 includes installing the two gates from Alternative No. 2 and building up the right bank on the upstream end of the reach by two feet to further increase the capacity of the ditch. Refer to Table 2 for the Reach A alternatives analysis results.

Table 2 – Reach A alternatives analysis results, based on storage capacity (ft<sup>3</sup>)

Runoff Volumes		Channel Storage Capacity		
WQCV	10-year	Alternative 1	Alternative 2	Alternative 3
35,200	117,000	52,800	144,000	228,000

### Reach C

Two (2) alternatives were identified for Reach C. Alternative No. 1 for Reach C is to install a gate at the most downstream end of the reach to detain water along the reach. This alternative detains the WQCV and the 10-year runoff volume. Alternative No. 2 is to install a gate along the middle of the reach in addition to the most downstream end of the reach to detain more water upstream. This alternative only increases the capacity 5,000 ft<sup>3</sup> from the first alternative. In addition, a third alternative could include building up the berm along the entire length of Reach C if it is found that more water needs to be captured for other purposes such as maintaining the trees. This alternative can be studied further in the next steps. Refer to Table 3 for the Reach C alternatives analysis results.

Table 3 – Reach C alternatives analysis results, based on storage capacity (ft<sup>3</sup>)

Runoff Volumes		Channel Storage Capacity	
WQCV	10-year	Alternative 1	Alternative 2
13,600	48,000	78,800	83,500

### Reach D

Two (2) alternatives were identified for Reach D. Alternative No. 1 for Reach D is to install a gate at the most downstream end of the reach to detain water along the reach. This alternative gives the ditch the capacity to hold the WQCV, but does not allow the 10-year runoff volume to be captured. Alternative No. 2 is to install a gate along the middle of the reach in addition to the most downstream end of the reach to detain more water upstream. This alternative allows for the ditch to detain the WQCV and the 10-year runoff volume. Refer to Table 4 for Reach D alternatives analysis results.

Table 4 – Reach D alternatives analysis results, based on storage capacity (ft<sup>3</sup>)

Runoff Volumes		Channel Storage Capacity	
WQCV	10-year	Alternative 1	Alternative 2
11,100	38,900	31,500	52,900



## **CONCLUSIONS**

The purpose of this initial study was to see if there are opportunities to repurpose Nevada Ditch after it is decommissioned by Denver Water. The main reason for repurposing the ditch would be to maintain the existing trees within the ditch corridor and continue to provide habitat and shelter to the neighborhood. Though environmental survey of the trees, and ultimately the annual uptake volume, were not part of this scope, this discussion should continue in the next steps of the study to compare the total annual uptake volume for tree survival to the total annual volume that is captured in each reach.

Given the uniqueness of the location of the irrigation ditch compared to the receiving waters of the South Platte River, a goal would be to capture the upstream WQCV within each ditch reach. Additional volume detention should be considered if this helps delay peak flow downstream and/or reduce storm sewer sizes downstream.

Nevada Ditch, through Columbine Valley, was divided into the 4 reaches based on upstream watersheds as described in the text. Reach B, given its location within the Columbine Country Club Golf Course, was found to have little to no impact on water quality. Given the private irrigation of the golf course, the existing trees should remain whether the ditch remains or is filled in by the golf course. Reach A, C, and D were found to have possible locations to divert storm water and have enough capacity to capture the water quality capture volume. Each reach could also detain the 10-year storm event, with some modifications to Reach A and Reach D (gates placed within the reaches to divide the volume). It also appears that there is no further impact north of Bowles Avenue due to Nevada Ditch given no physical improvements within the area.

## **RECOMMENDATIONS AND NEXT STEPS**

The decommissioning of Nevada Ditch gives Columbine Valley an opportunity to capture local stormwater for water quality purposes and at a minimum should be explored on Reach A, C, and D. For this study, it is recommended to choose the alternative for each reach that allows the WQCV and 10-year runoff volume to be detained. The recommendation for Reach A is Alternative No. 2 which is to install two (2) gates: one at the downstream end of the reach at Fairway Lane, and another in the middle of the reach. For Reach C, Alternative No. 1 is recommended which is to only install one (1) gate at the downstream end. And for Reach D, Alternative No. 2 is recommended to install two (2) gates: one at the downstream end and one downstream of Village Drive. Refer to Figure 3 on the following page for conceptual locations of the gates and for the direction of stormwater flow into the ditch.

These alternatives are a starting point for the next study, during which the annual required storage volume would be determined to maintain the trees. We are recommending a tree survey and analysis of yearly water consumption versus yearly stormwater available. This volume calculation will more precisely determine what volume of additional water above the WQCV should be detained or captured, which may be different than the conceptual recommendation of 10-year detention volumes. This study also would include more detailed conceptual designs to collect and convey stormwater upstream to the reaches (i.e. inlets and conveyance structures), gates at specific points for detention, and overflow locations and structures to convey overflow volumes.

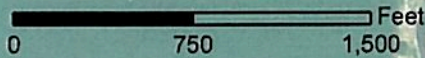
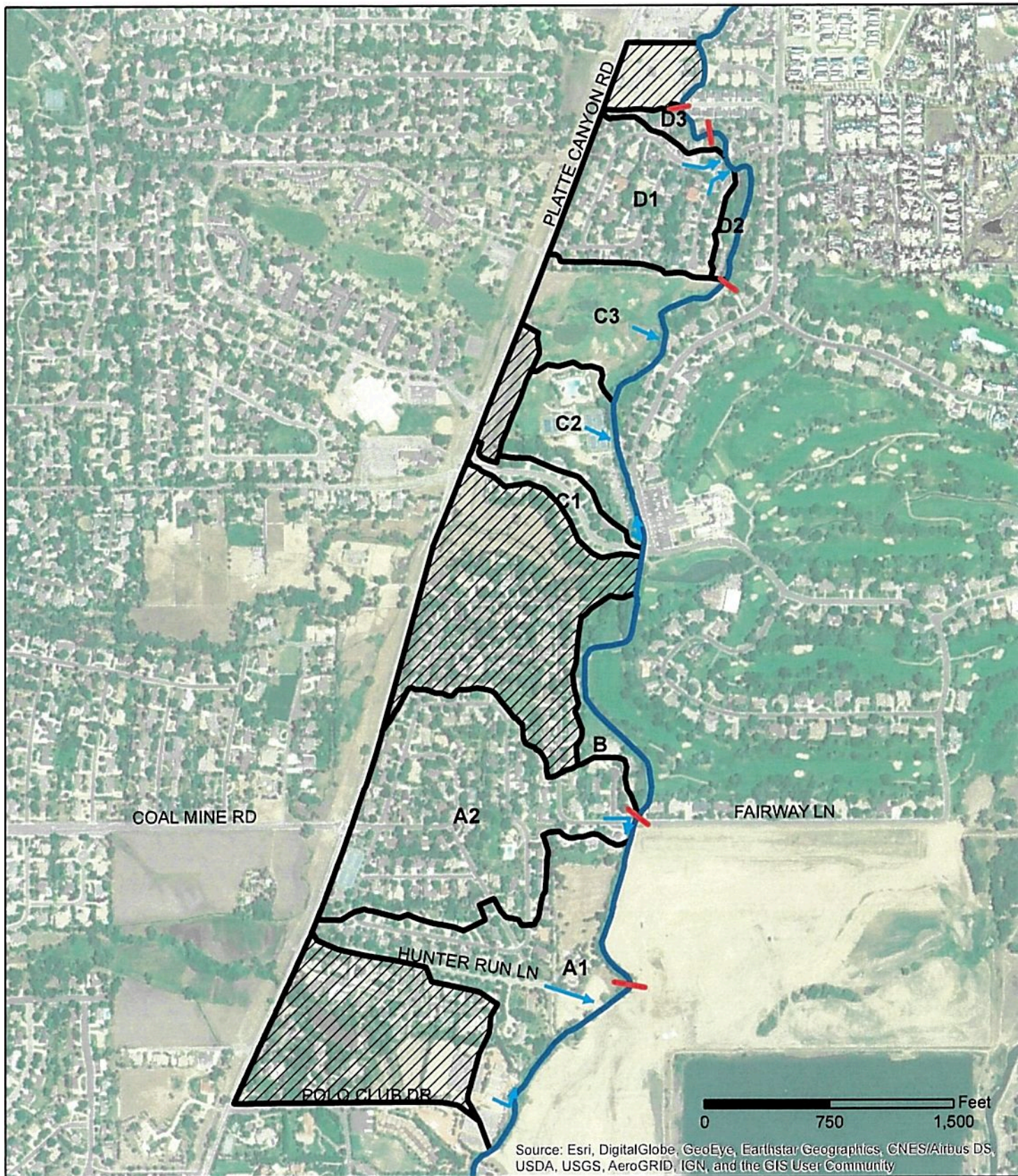


## TECHNICAL MEMORANDUM

In summary, we recommend the following next steps:

- Environmental survey of valuable trees.
- Calculation of yearly volume of water to support these trees.
- Calculation of yearly volume of stormwater captured based on limits of proposed volume and rainfall amounts of a nearby gage.
- Optimization of detention (up to the 10-year) to maximize captured water for tree consumption and downstream runoff reduction.
- Conceptual design of hydraulic components, including inlets/structures for capture of stormwater and gates for ditch detention.
- Analysis of overflow locations.





Legend	
	Gates
	Nevada Ditch
	Flow
	Subbasins
	Noncontributing Areas

**FIGURE 3 -  
RECOMMENDED  
GATE LOCATIONS**



1 inch = 750 feet





## TECHNICAL MEMORANDUM

### Appendices:

1. **Appendix A: Centerline Profiles**
2. **Appendix B: Soil Map and Report**
3. **Appendix C: Land Cover and NRCS Conveyance Factor K Map**
4. **Appendix D: Area-Weighted Calculations**
5. **Appendix E: UD Rational Workbook**
6. **Appendix F: UD Detention Workbook**
7. **Appendix G: Cross Sections and Ditch Capacity Calculations**



## TECHNICAL MEMORANDUM

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Lund Partnership, Inc. (2015). *Phase III Drainage Report for Wilder Lane 6000 S. Platte Canyon Road*.  
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Matrix Design Group. (2015). *Coal Mine Avenue at Platte Canyon Road Outfall System Plan*.

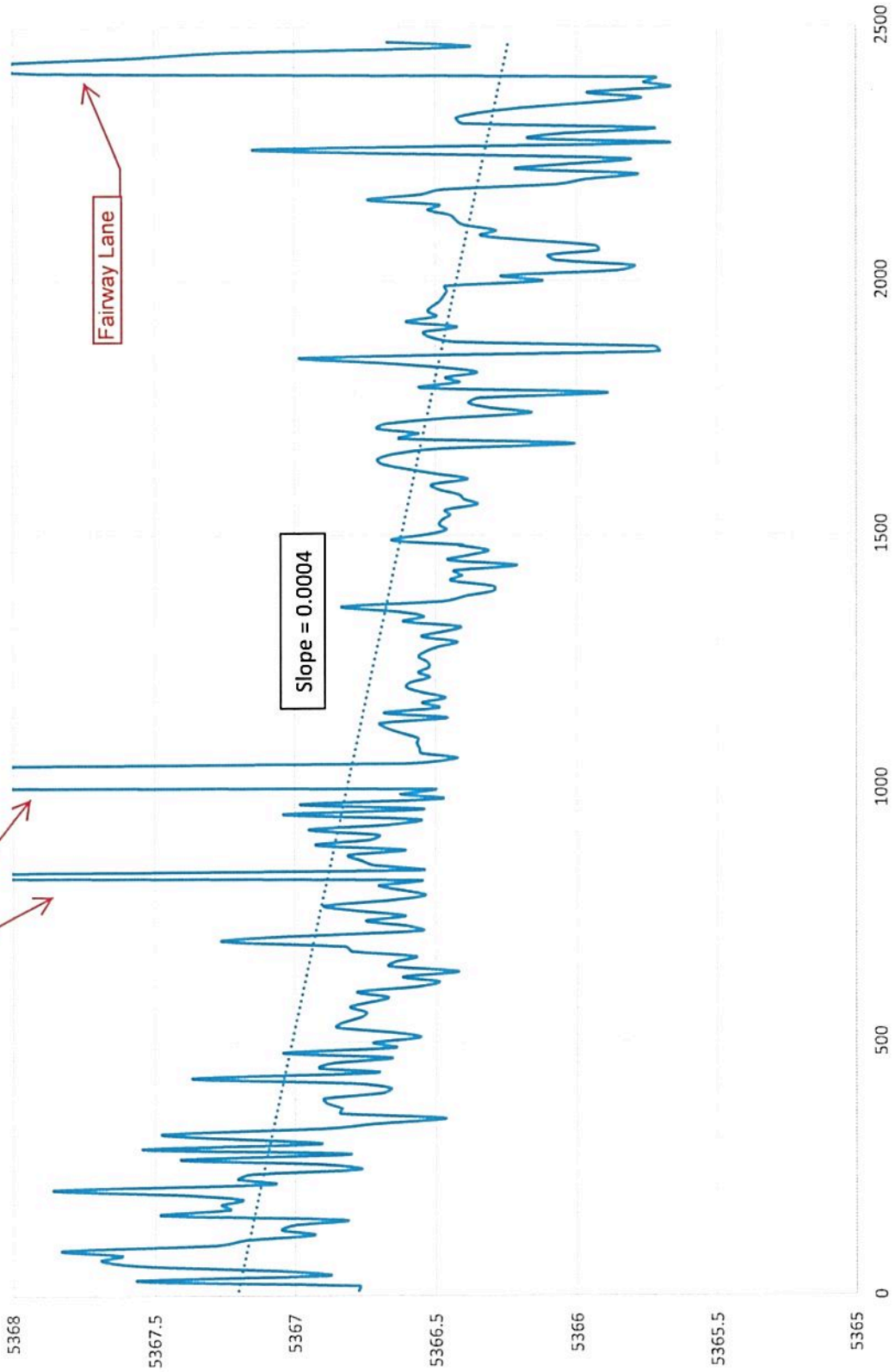
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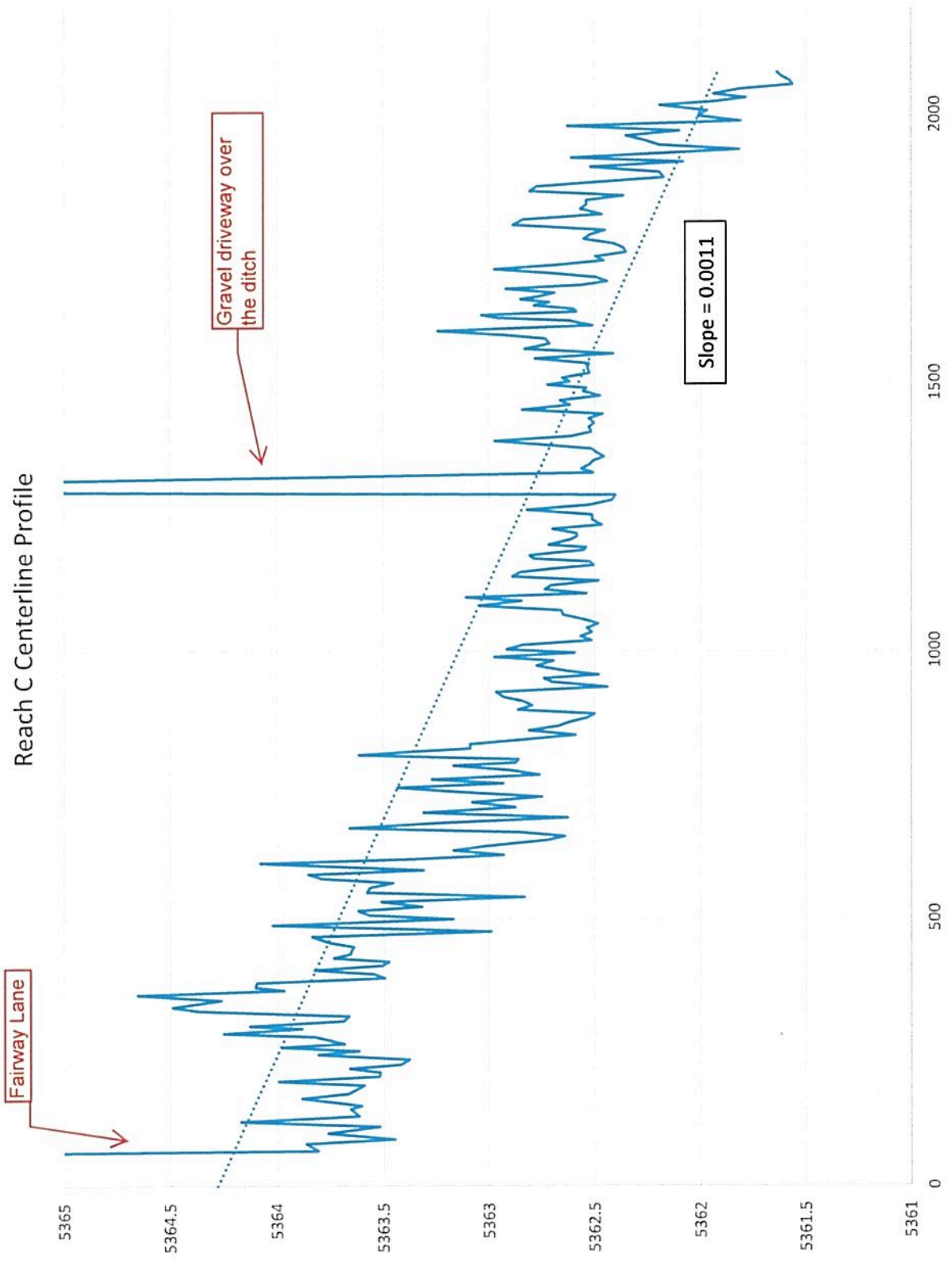
UDFCD. (2018). *Urban Storm Drainage Criteria Manual Volume 1*.

**Appendix A –  
Centerline Profiles**

Small dirt paths over the ditch

Reach A Centerline Profile



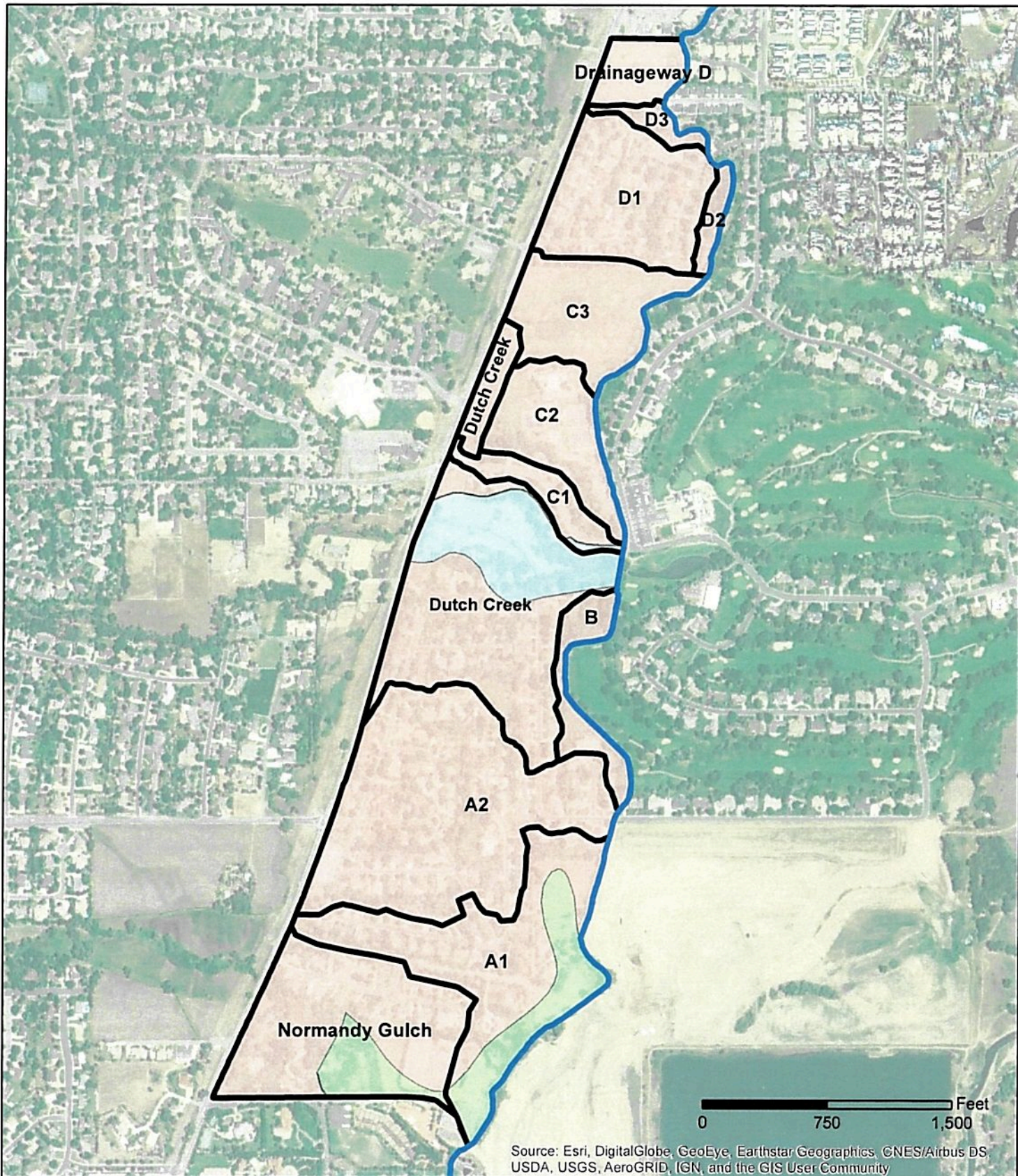











**Appendix B –  
Soil Map and Report**





**Legend**

-  Nevada Ditch
-  Subbasins
- HSG**
-  A
-  C
-  D

**APPENDIX B: SOIL MAP**



1 in = 750 feet





United States  
Department of  
Agriculture

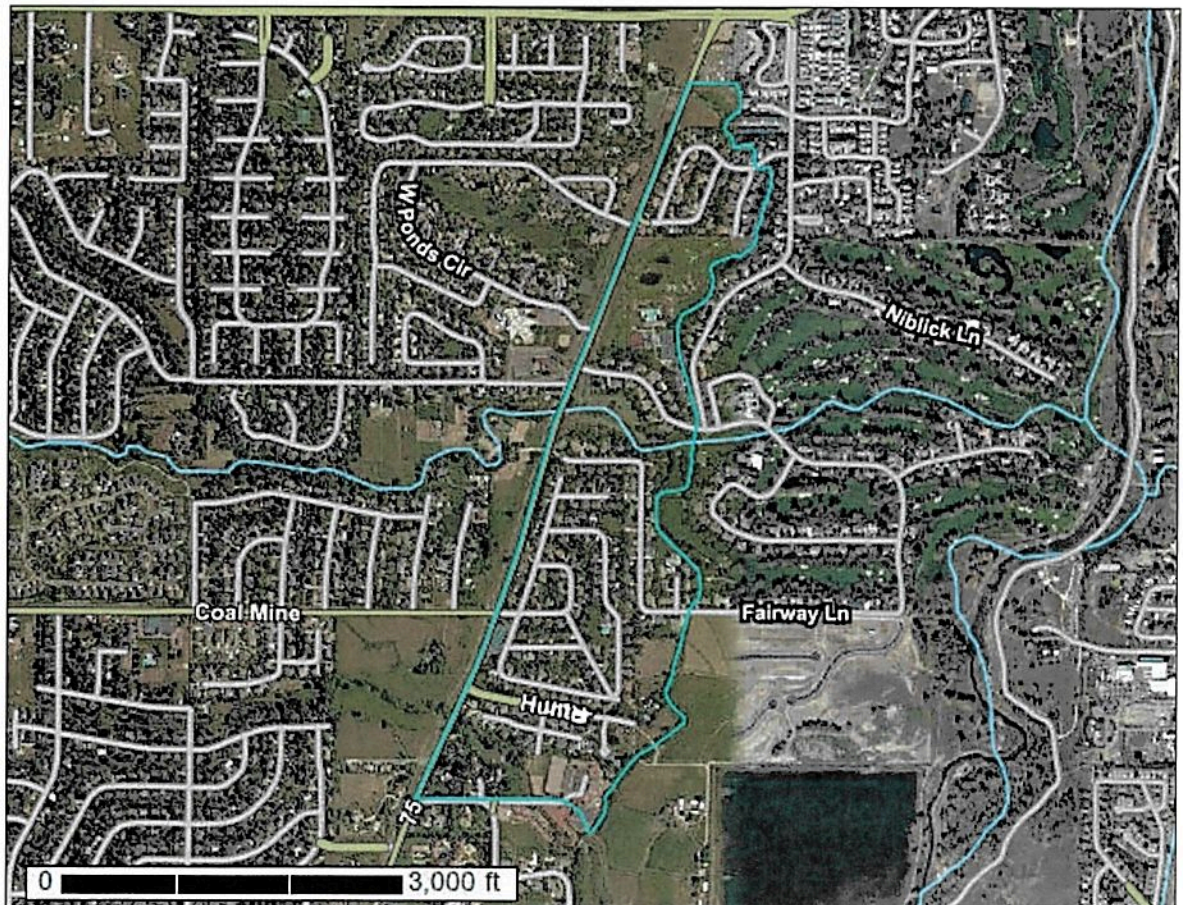
NRCS

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Arapahoe County, Colorado

## Nevada Ditch



July 24, 2019



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and



## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Map Scale: 1:11,700 if printed on A portrait (8.5" x 11") sheet.

0 150 300 600 900 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84



### MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Soils		Stony Spot
	Soil Map Unit Polygons		Very Stony Spot
	Soil Map Unit Lines		Wet Spot
	Soil Map Unit Points		Other
	Special Point Features		Special Line Features
	Blowout		Water Features
	Borrow Pit		Streams and Canals
	Clay Spot		Transportation
	Closed Depression		Rails
	Gravel Pit		Interstate Highways
	Gravelly Spot		US Routes
	Landfill		Major Roads
	Lava Flow		Local Roads
	Marsh or swamp		Background
	Mine or Quarry		Aerial Photography
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Arapahoe County, Colorado  
 Survey Area Data: Version 14, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2014—Oct 26, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FgD	Fondis-Ascalon, gravelly subsoil variant, complex, 1 to 9 percent slopes	79.1	43.5%
Gr	Gravelly land	12.7	7.0%
HIB	Heldt clay, 0 to 3 percent slopes	53.7	29.6%
NIB	Nunn loam, 1 to 3 percent slopes	24.4	13.5%
Tc	Terrace escarpments	11.8	6.5%
<b>Totals for Area of Interest</b>		<b>181.6</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

## Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.



## Arapahoe County, Colorado

### FgD—Fondis-Ascalon, gravelly subsoil variant, complex, 1 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 34yk  
*Elevation:* 4,500 to 6,500 feet  
*Mean annual precipitation:* 14 to 17 inches  
*Mean annual air temperature:* 48 to 52 degrees F  
*Frost-free period:* 150 to 170 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Fondis and similar soils:* 55 percent  
*Ascalon, gravelly subsoil variant and similar soils:* 35 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Fondis

##### Setting

*Landform:* Drainageways  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Silty and/or loamy

##### Typical profile

*H1 - 0 to 8 inches:* loam  
*H2 - 8 to 17 inches:* clay  
*H3 - 17 to 32 inches:* silty clay loam  
*H4 - 32 to 46 inches:* silt loam, loam  
*H4 - 32 to 46 inches:* clay loam  
*H5 - 46 to 84 inches:*

##### Properties and qualities

*Slope:* 1 to 9 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 15 percent  
*Available water storage in profile:* Very high (about 12.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4c  
*Hydrologic Soil Group:* C  
*Ecological site:* Loamy Foothill (R049BY202CO)  
*Hydric soil rating:* No

## Custom Soil Resource Report

### Description of Ascalon, Gravelly Subsoil Variant

#### Setting

*Landform:* Knobs  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Reworked by wind outwash

#### Typical profile

*H1 - 0 to 6 inches:* loam  
*H2 - 6 to 17 inches:* sandy clay loam  
*H3 - 17 to 30 inches:* gravelly sandy loam  
*H4 - 30 to 60 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 1 to 9 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 10 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water storage in profile:* Low (about 5.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* B  
*Ecological site:* Loamy Foothill (R049BY202CO)  
*Hydric soil rating:* No

#### Minor Components

##### Heldt

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

##### Ascalon

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

### Gr—Gravelly land

#### Map Unit Setting

*National map unit symbol:* 34yn

## Custom Soil Resource Report

*Elevation:* 4,700 to 6,200 feet  
*Mean annual precipitation:* 12 to 14 inches  
*Mean annual air temperature:* 46 to 52 degrees F  
*Frost-free period:* 150 to 170 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Gravelly land:* 83 percent  
*Minor components:* 17 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gravelly Land

#### Setting

*Landform:* Drainageways, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Sandy or gravelly loamy

#### Typical profile

*H1 - 0 to 4 inches:* very gravelly sandy loam  
*H2 - 4 to 60 inches:* gravelly loamy sand, very gravelly sand, gravelly sand  
*H2 - 4 to 60 inches:*  
*H2 - 4 to 60 inches:*

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* A  
*Hydric soil rating:* No

### Minor Components

#### Thedalund

*Percent of map unit:* 10 percent  
*Hydric soil rating:* No

#### Ascalon

*Percent of map unit:* 7 percent  
*Hydric soil rating:* No

## HIB—Heldt clay, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 34yp  
*Elevation:* 4,000 to 6,200 feet  
*Mean annual precipitation:* 11 to 15 inches  
*Mean annual air temperature:* 46 to 59 degrees F  
*Frost-free period:* 110 to 150 days



## Custom Soil Resource Report

*Farmland classification:* Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

### Map Unit Composition

*Heldt and similar soils:* 90 percent

*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Heldt

#### Setting

*Landform:* Stream terraces, flood plains, drainageways

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Eolian deposits

#### Typical profile

*H1 - 0 to 4 inches:* clay

*H2 - 4 to 60 inches:* silty clay, clay

*H2 - 4 to 60 inches:*

#### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 10 percent

*Gypsum, maximum in profile:* 1 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 10.0

*Available water storage in profile:* Very high (about 17.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3c

*Hydrologic Soil Group:* C

*Ecological site:* Clayey Plains (R067BY042CO)

*Hydric soil rating:* No

### Minor Components

#### Nunn

*Percent of map unit:* 7 percent

*Hydric soil rating:* No

#### Beckton

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

## **NIB—Nunn loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2tln2  
*Elevation:* 3,900 to 6,250 feet  
*Mean annual precipitation:* 13 to 16 inches  
*Mean annual air temperature:* 46 to 54 degrees F  
*Frost-free period:* 135 to 160 days  
*Farmland classification:* Prime farmland if irrigated

### **Map Unit Composition**

*Nunn and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Nunn**

#### **Setting**

*Landform:* Terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Pleistocene aged alluvium and/or eolian deposits

#### **Typical profile**

*Ap - 0 to 6 inches:* loam  
*Bt1 - 6 to 10 inches:* clay loam  
*Bt2 - 10 to 26 inches:* clay loam  
*Btk - 26 to 31 inches:* clay loam  
*Bk1 - 31 to 47 inches:* loam  
*Bk2 - 47 to 80 inches:* loam

#### **Properties and qualities**

*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 7 percent  
*Salinity, maximum in profile:* Nonsaline (0.1 to 1.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 0.5  
*Available water storage in profile:* High (about 9.2 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* 3e  
*Land capability classification (nonirrigated):* 4e

## Custom Soil Resource Report

*Hydrologic Soil Group:* C  
*Ecological site:* Loamy Plains (R067BY002CO)  
*Hydric soil rating:* No

### Minor Components

#### Wages

*Percent of map unit:* 8 percent  
*Landform:* Alluvial fans, terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* Loamy Plains (R067BY002CO)  
*Hydric soil rating:* No

#### Fort collins

*Percent of map unit:* 5 percent  
*Landform:* Terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* Loamy Plains (R067BY002CO)  
*Hydric soil rating:* No

#### Haverson, very rarely flooded

*Percent of map unit:* 2 percent  
*Landform:* Terraces, drainageways, alluvial fans  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear, concave  
*Ecological site:* Overflow (R067BY036CO)  
*Hydric soil rating:* No

## Tc—Terrace escarpments

### Map Unit Setting

*National map unit symbol:* 34zj  
*Elevation:* 3,500 to 6,500 feet  
*Mean annual precipitation:* 12 to 15 inches  
*Mean annual air temperature:* 46 to 55 degrees F  
*Frost-free period:* 120 to 150 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Terrace escarpments:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Terrace Escarpments

#### Setting

*Landform:* Terraces, cliffs, drainageways, streams



## Custom Soil Resource Report

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Calcareous, stratified clayey and/or stratified, calcareous sandy

### Typical profile

*H1 - 0 to 3 inches:* variable

*H2 - 3 to 19 inches:* sandy loam, loam, gravelly loam

*H2 - 3 to 19 inches:* weathered bedrock

*H2 - 3 to 19 inches:*

*H3 - 19 to 24 inches:*

### Properties and qualities

*Slope:* 10 to 60 percent

*Depth to restrictive feature:* 10 to 30 inches to paralithic bedrock

*Natural drainage class:* Well drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.06 to 2.00 in/hr)

*Calcium carbonate, maximum in profile:* 5 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0  
mmhos/cm)

*Available water storage in profile:* Low (about 5.2 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* D

*Hydric soil rating:* No

# **Soil Information for All Uses**

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## **Soil Properties and Qualities**

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## **Soil Qualities and Features**

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

## **Hydrologic Soil Group**

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

**Group A.** Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

**Group B.** Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

## Custom Soil Resource Report

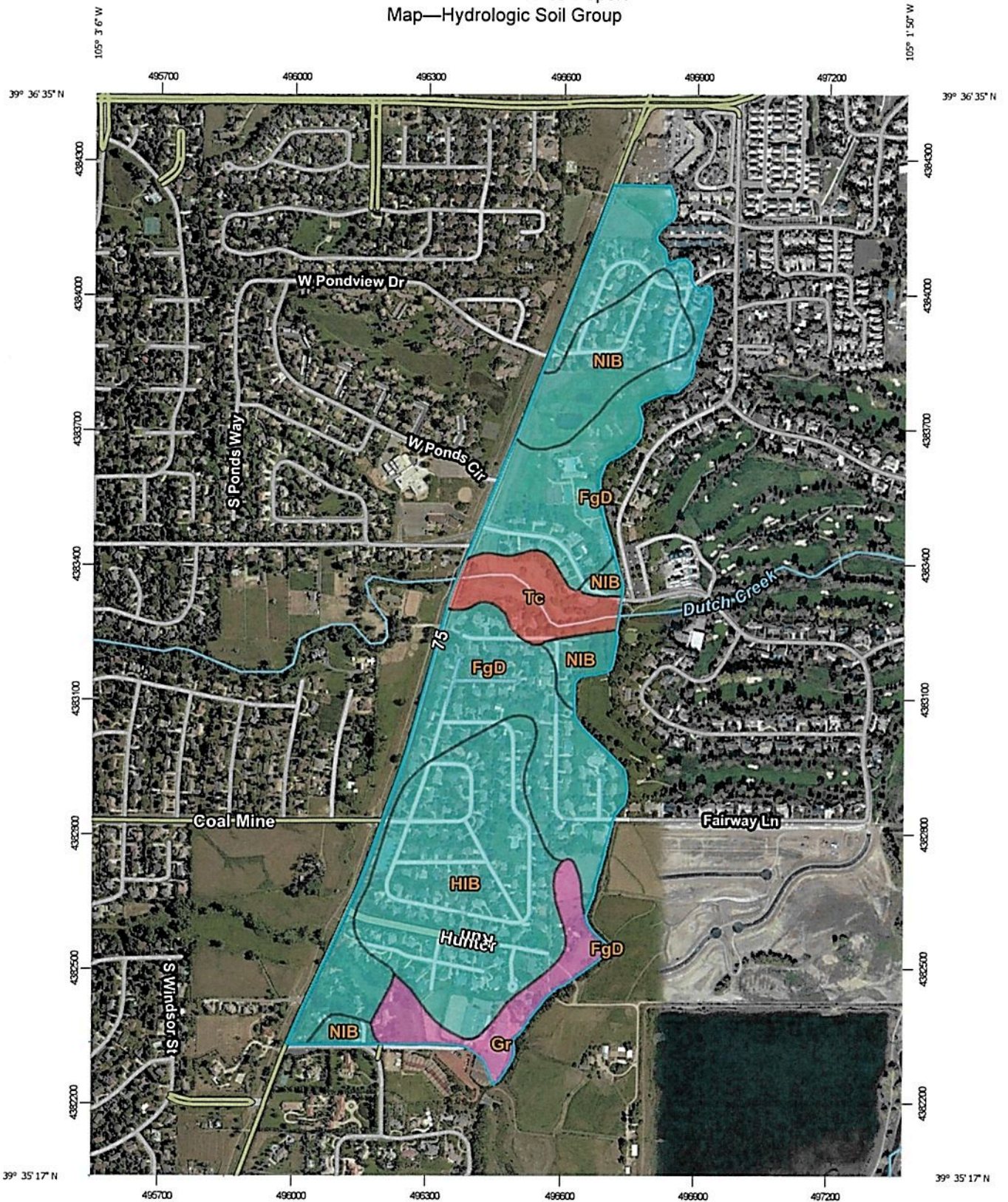
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

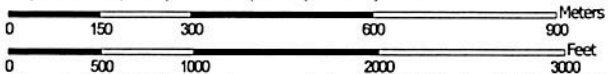
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



# Custom Soil Resource Report Map—Hydrologic Soil Group




Map Scale: 1:11,700 if printed on A portrait (8.5" x 11") sheet.












Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84









## MAP LEGEND









**Area of Interest (AOI)**  
 Area of Interest (AOI) 





**Soils**  
 Soil Rating Polygons  
 A  A/D  B  B/D  C  C/D  D  Not rated or not available 

Water Features  
 Streams and Canals 

Transportation  
 Rails  Interstate Highways  US Routes  Major Roads  Local Roads 

**Background**  
 Aerial Photography 

**Soil Rating Lines**  
 A  A/D  B  B/D  C  C/D  D  Not rated or not available 

**Soil Rating Points**  
 A  A/D  B  B/D 

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Arapahoe County, Colorado  
 Survey Area Data: Version 14, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2014—Oct 26, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

**Table—Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FgD	Fondis-Ascalon, gravelly subsoil variant, complex, 1 to 9 percent slopes	C	79.1	43.5%
Gr	Gravelly land	A	12.7	7.0%
HIB	Heldt clay, 0 to 3 percent slopes	C	53.7	29.6%
NIB	Nunn loam, 1 to 3 percent slopes	C	24.4	13.5%
Tc	Terrace escarpments	D	11.8	6.5%
<b>Totals for Area of Interest</b>			<b>181.6</b>	<b>100.0%</b>

**Rating Options—Hydrologic Soil Group**

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

*Tie-break Rule: Higher*



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United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

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**Appendix C –  
Land Cover and  
NRCS Conveyance Factor K Map**



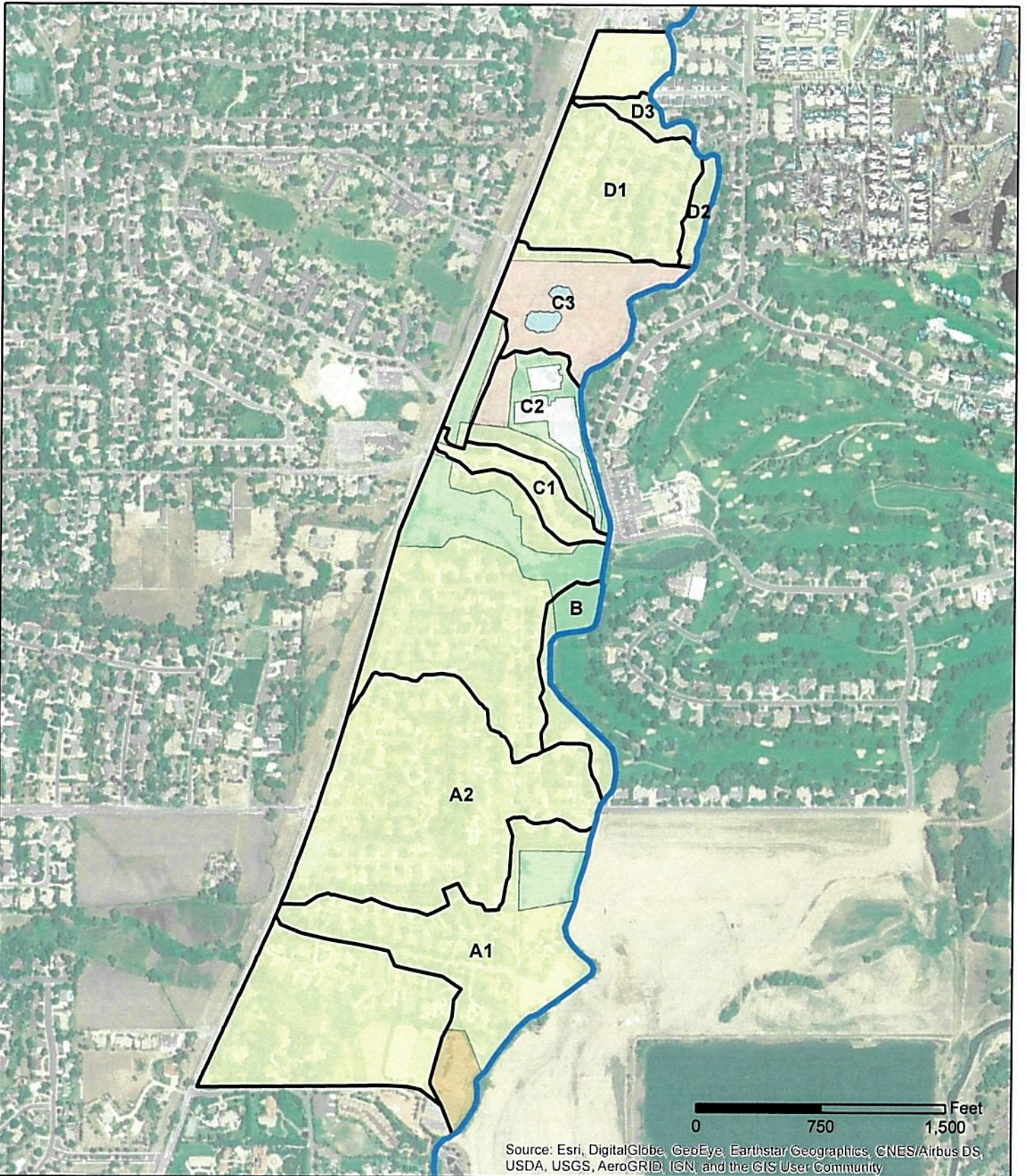
**Table 6-2. NRCS Conveyance factors, K**

Type of Land Surface	Conveyance Factor, K
Heavy meadow	2.5
Tillage/field	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

**Table 6-3. Recommended percentage imperviousness values**

Land Use or Surface Characteristics	Percentage Imperviousness (%)
<b>Business:</b>	
Downtown Areas	95
Suburban Areas	75
<b>Residential lots (lot area only):</b>	
Single-family	
2.5 acres or larger	12
0.75 – 2.5 acres	20
0.25 – 0.75 acres	30
0.25 acres or less	45
Apartments	75
<b>Industrial:</b>	
Light areas	80
Heavy areas	90
<b>Parks, cemeteries</b>	10
<b>Playgrounds</b>	25
<b>Schools</b>	55
<b>Railroad yard areas</b>	50
<b>Undeveloped Areas:</b>	
Historic flow analysis	2
Greenbelts, agricultural	2
Off-site flow analysis (when land use not defined)	45
<b>Streets:</b>	
Paved	100
Gravel (packed)	40
Drive and walks	90
Roofs	90
Lawns, sandy soil	2
Lawns, clayey soil	2





**Legend**

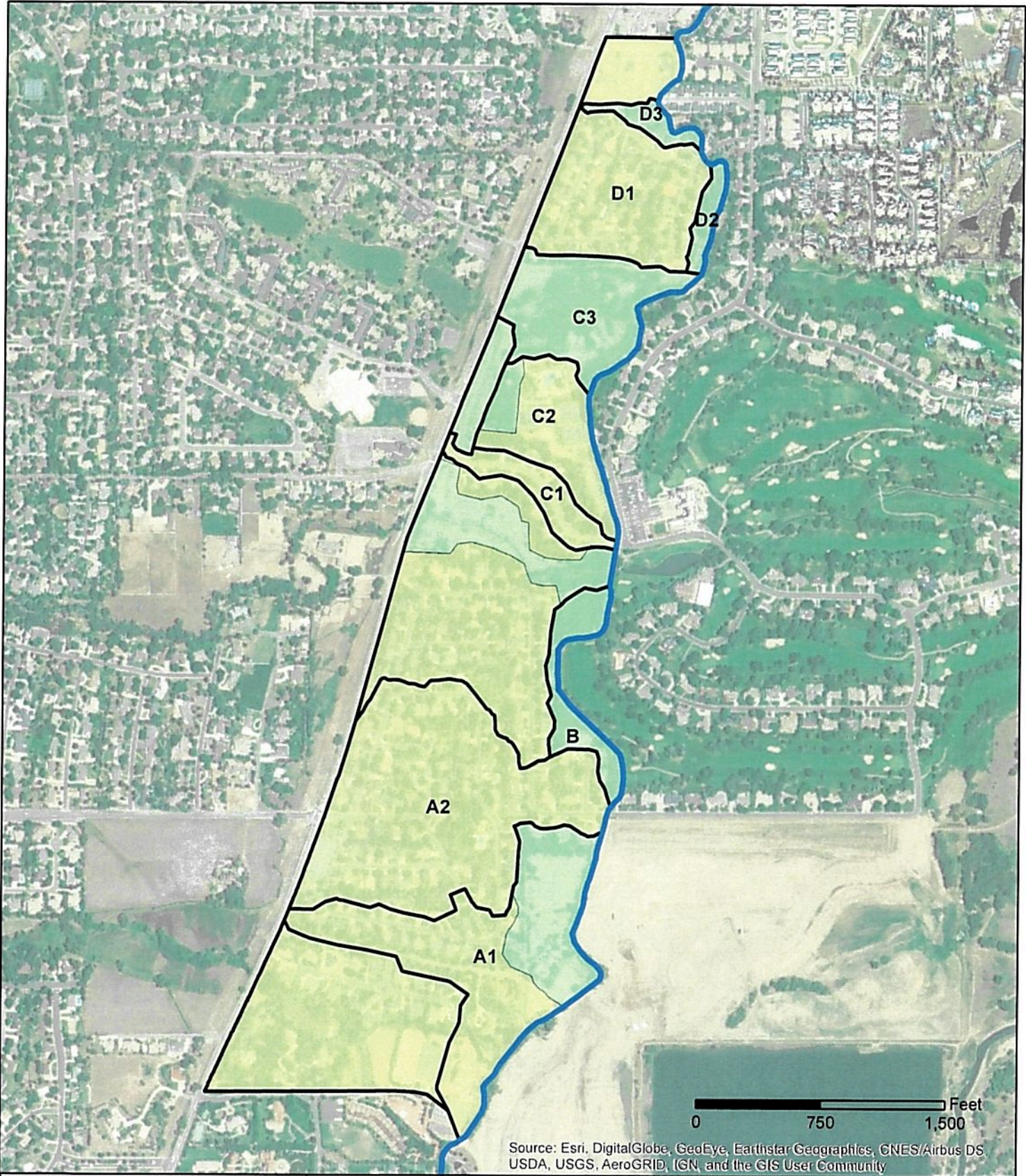
- |              |                   |       |             |
|--------------|-------------------|-------|-------------|
| Nevada Ditch | <b>Land Cover</b> | Grass | Park        |
| Subbasins    | Impervious        | Pond  | Residential |
|              | Light Industrial  |       |             |

**APPENDIX C:  
LAND COVER**



1 in = 750 feet





**Legend**

-  Nevada Ditch **K Factor**
-  Subbasins
-  7
-  20

**APPENDIX C: K FACTOR**



1 in = 750 feet



**Appendix D –  
Area-Weighted Calculations**

### AREA WEIGHTED CALCULATIONS FOR RATIONAL METHOD

#### Subbasin A1

Subbasin A1 - Percent Impervious			
Land	Area	% Imp	Area * % Impr
Light Ind.	2.87	80	229.6
Resid.	9	12	108
Grass	2.77	10	27.7
Resid.	12.88	30	386.4
Area Weighted			27.3

Subbasin A1 - K Factor		
K Factor	Area	Area * K Factor
7	9.95	69.65
20	17.57	351.4
Area Weighted		15.3

#### Basin A

Basin A - Percent Impervious			
Subbasin	Area	% Imp	Area * % Imp
A1	27.52	27.3	751.296
A2	37.99	30	1139.7
Area Weighted			28.9

Basin A - K Factor			
Subbasin	Area	K Factor	Area * K Factor
A1	27.52	15.3	421.056
A2	37.99	20	759.8
Area Weighted			18

#### Subbasin C2

Subbasin C2 - Percent Impervious			
Land	Area	% Imp	Area * % Impr
Paved	3.01	100	301
Grass	7.13	10	71.3
Resid.	2.34	30	70.2
Area Weighted			35.5

Subbasin C2 - K Factor		
K Factor	Area	Area * K Factor
7	1.52	10.64
20	8.62	172.4
Area Weighted		18.1

#### Subbasin C3

Subbasin C3 - Percent Impervious			
Land	Area	% Imp	Area * % Impr
Pond	0.72	100	72
Grass	10.82	10	108.2
Resid.	1.15	30	34.5
Area Weighted			16.9

**Basin C**

<b>Basin C - Percent Impervious</b>			
<b>Subbasin</b>	<b>Area</b>	<b>% Imp</b>	<b>Area * % Imp</b>
C1	4.41	30	132.3
C2	10.14	35.5	359.97
C3	12.69	16.9	214.461
<b>Area Weighted</b>			<b>25.9</b>

<b>Basin C - K Factor</b>			
<b>Subbasin</b>	<b>Area</b>	<b>K Factor</b>	<b>Area * K Factor</b>
C1	4.41	20	88.2
C2	10.14	18	182.52
C3	12.69	7	88.83
<b>Area Weighted</b>			<b>13.2</b>

**Basin D**

<b>Basin D - K Factor</b>			
<b>Subbasin</b>	<b>Area</b>	<b>K Factor</b>	<b>Area * K Factor</b>
D1	16.51	20	330.2
D2	1.78	7	12.46
D3	1.83	7	12.81
<b>Area Weighted</b>			<b>17.7</b>



**Appendix E –  
UD Rational Workbook**

Calculation of Peak Runoff using Rational Method

Version 2.00 (Revised May 2011)  
 Date: 5/2/2019  
 Project: [Project Name]  
 Location: [Location]  
 User: [User Name]

Subcatchment Name: [Name]  
 Area (Ac): [Area]  
 Percent Impervious: [Percentage]  
 NRCS Hydrologic Soil Group: [Group]

Runoff Coefficient, C  
 2-yr: [Value] 5-yr: [Value] 10-yr: [Value] 25-yr: [Value] 50-yr: [Value] 100-yr: [Value] 500-yr: [Value]

Overland (Initial) Flow Time  
 US Elevation (ft): [Value] US Elevation (ft): [Value]  
 Channelize Length (ft): [Value] Channelize Length (ft): [Value]  
 Overland Flow Length (ft): [Value] Overland Flow Length (ft): [Value]

Channelized (Travel) Flow Time  
 Channelize Slope (ft/ft): [Value] Channelize Slope (ft/ft): [Value]  
 US Elevation (ft): [Value] US Elevation (ft): [Value]  
 Channelize Length (ft): [Value] Channelize Length (ft): [Value]

Channelize Velocity (ft/sec): [Value] Channelize Velocity (ft/sec): [Value]  
 NRCS Flow Concentration Factor K: [Value] NRCS Flow Concentration Factor K: [Value]

Time of Concentration  
 Computed Tc (min): [Value] Computed Tc (min): [Value]  
 Regional Tc (min): [Value] Regional Tc (min): [Value]

Peak Intensity, I (in/hr)  
 2-yr: [Value] 5-yr: [Value] 10-yr: [Value] 25-yr: [Value] 50-yr: [Value] 100-yr: [Value] 500-yr: [Value]

Peak Flow, Q (cfs)  
 2-yr: [Value] 5-yr: [Value] 10-yr: [Value] 25-yr: [Value] 50-yr: [Value] 100-yr: [Value] 500-yr: [Value]

Subcatchment Name	Area (Ac)	NRCS Hydrologic Soil Group	Percent Impervious (%)	Runoff Coefficient, C	Overland (Initial) Flow Time	Channelized (Travel) Flow Time	Channelize Velocity (ft/sec)	NRCS Flow Concentration Factor K	Time of Concentration	Peak Intensity, I (in/hr)	Peak Flow, Q (cfs)
A1	27.52	C	27.3	0.19	0.26	0.33	0.47	0.53	0.60	0.67	0.82
A2	37.89	C	30.0	0.22	0.27	0.32	0.42	0.47	0.54	0.62	0.89
B1	5.08	C	23.4	0.18	0.23	0.30	0.45	0.51	0.58	0.66	0.89
C1	4.41	C	30.0	0.22	0.28	0.35	0.49	0.54	0.61	0.68	0.95
C2	10.14	C	35.5	0.28	0.32	0.39	0.52	0.57	0.63	0.70	0.95
C3	12.89	C	16.9	0.11	0.17	0.26	0.41	0.48	0.55	0.64	0.84
D1	18.51	C	30.0	0.22	0.28	0.35	0.49	0.54	0.61	0.68	0.95
D2	1.78	C	30.0	0.22	0.28	0.35	0.49	0.54	0.61	0.68	0.95
D3	1.83	C	30.0	0.22	0.28	0.35	0.49	0.54	0.61	0.68	0.95
A	65.51	C	28.9	0.21	0.27	0.34	0.48	0.54	0.60	0.68	0.95
C	27.24	C	25.9	0.11	0.15	0.21	0.34	0.41	0.48	0.56	0.75
D	20.12	C	30.0	0.22	0.28	0.35	0.49	0.54	0.61	0.68	0.95

**Appendix F –  
UD Detention Workbook**





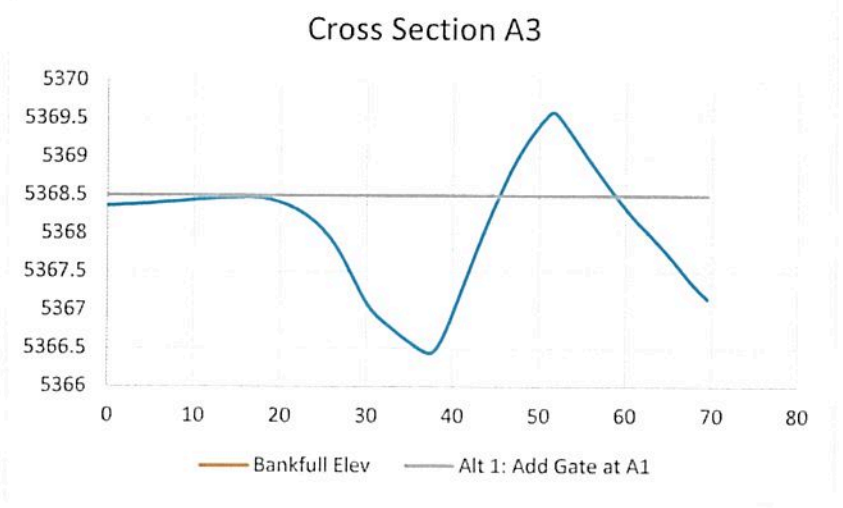
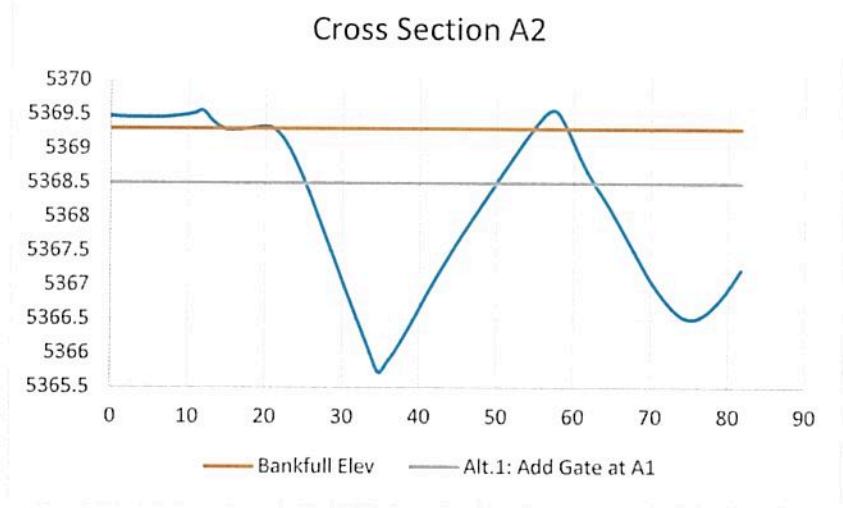
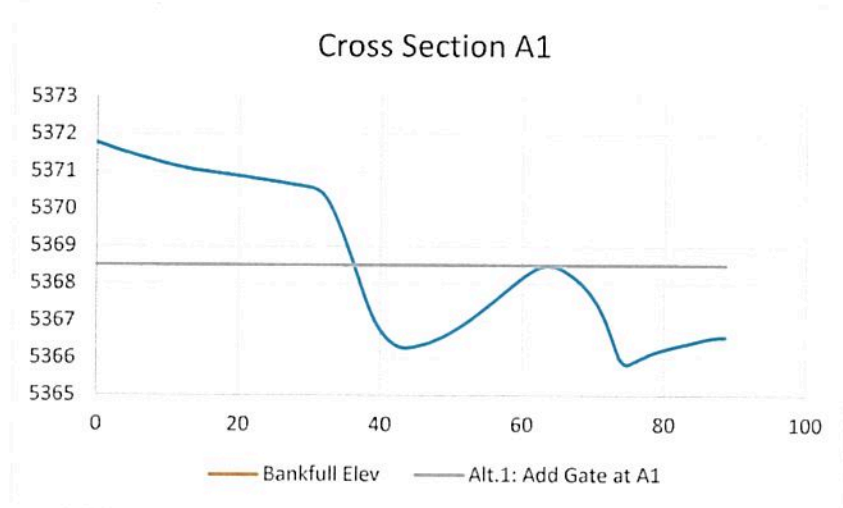


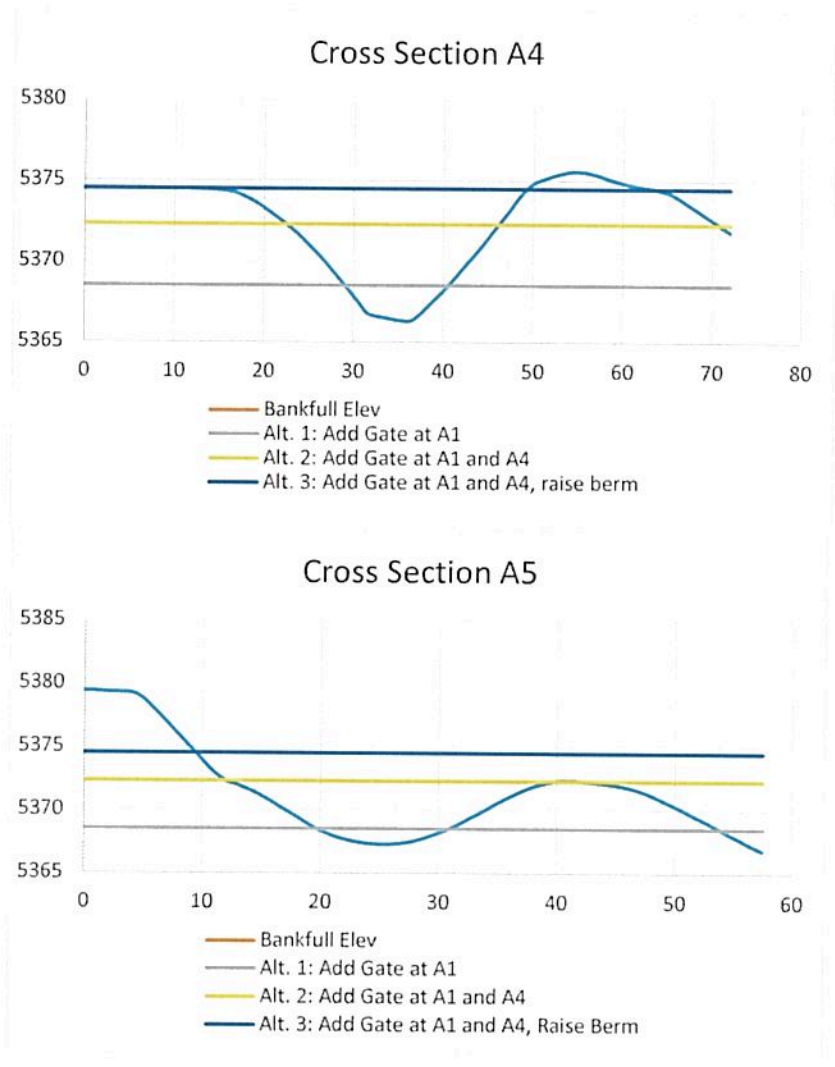




**Appendix G –  
Cross Sections and  
Ditch Capacity Calculations**

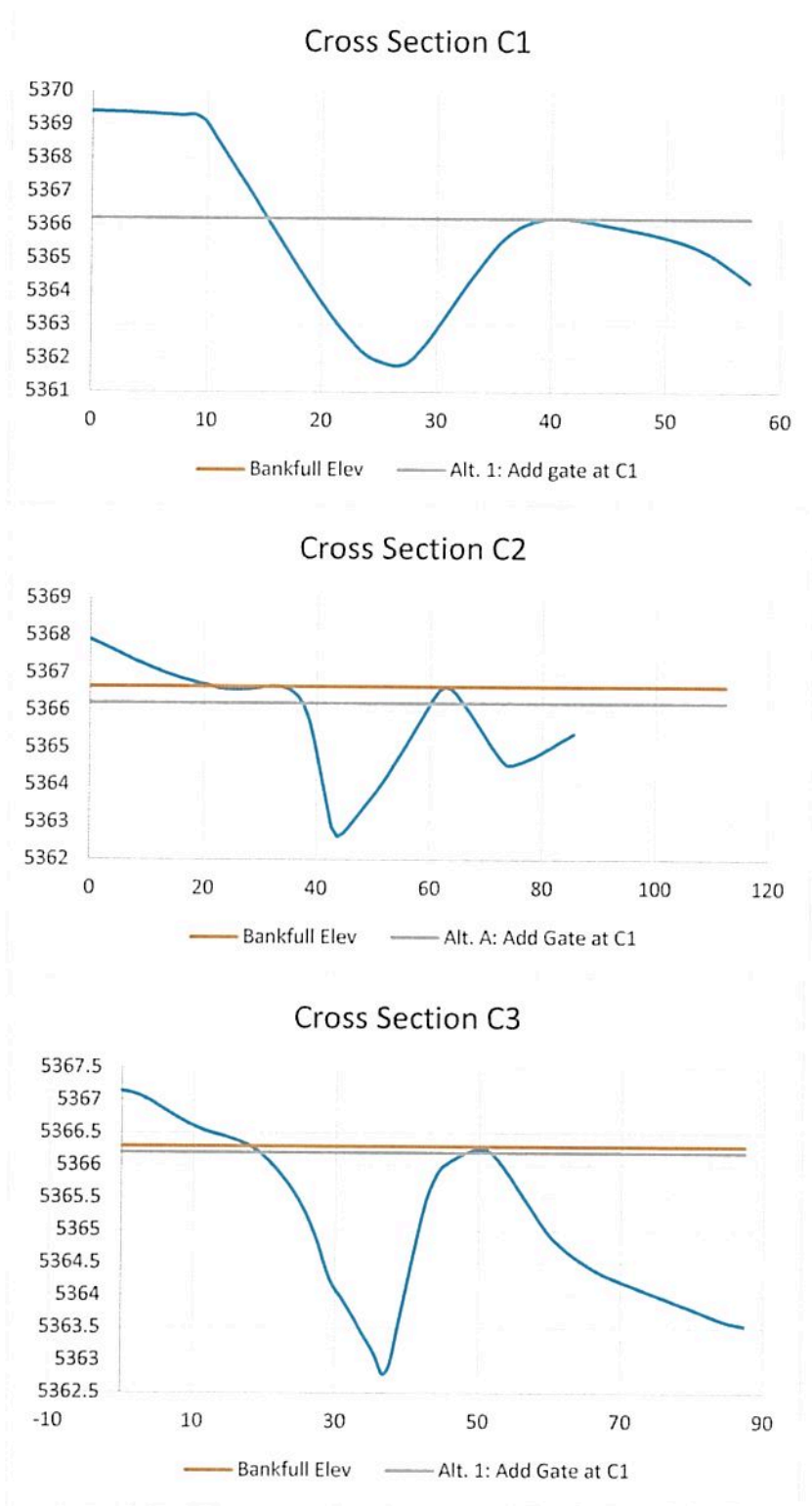
Reach A:



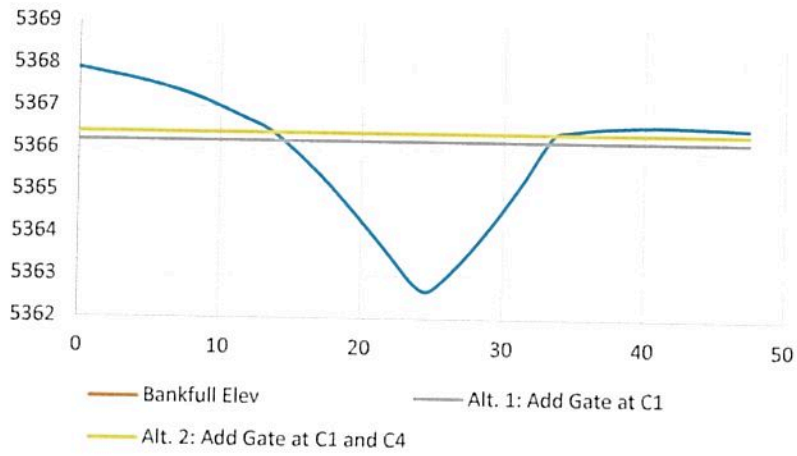




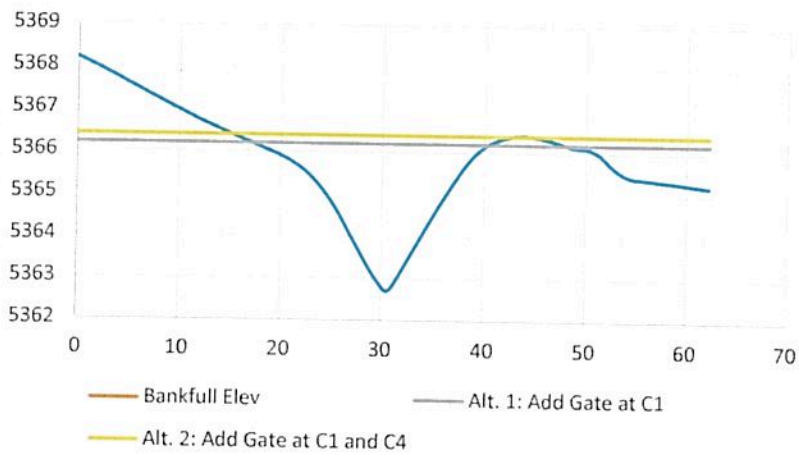
Reach C:



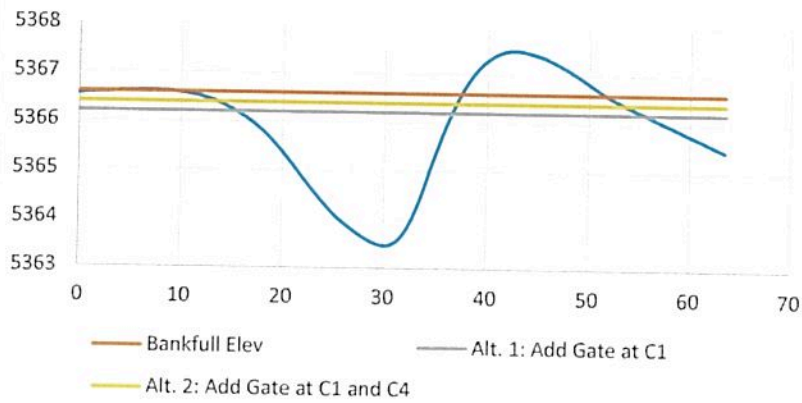
### Cross Section C4

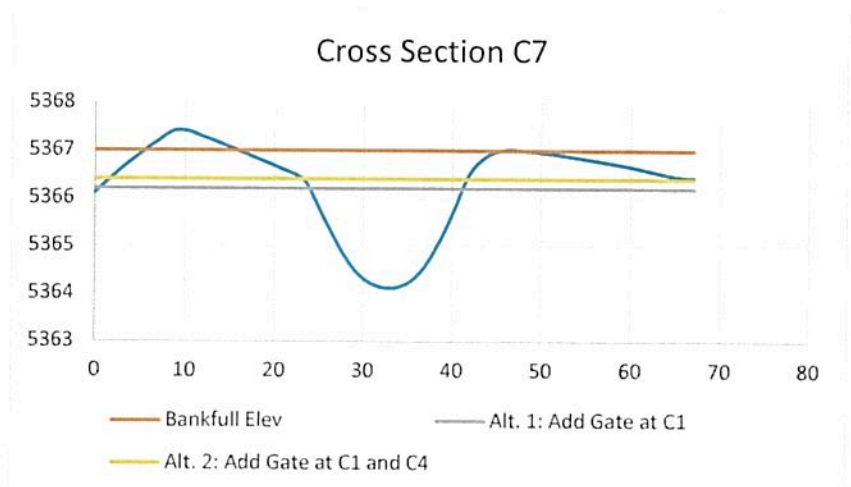


### Cross Section C5



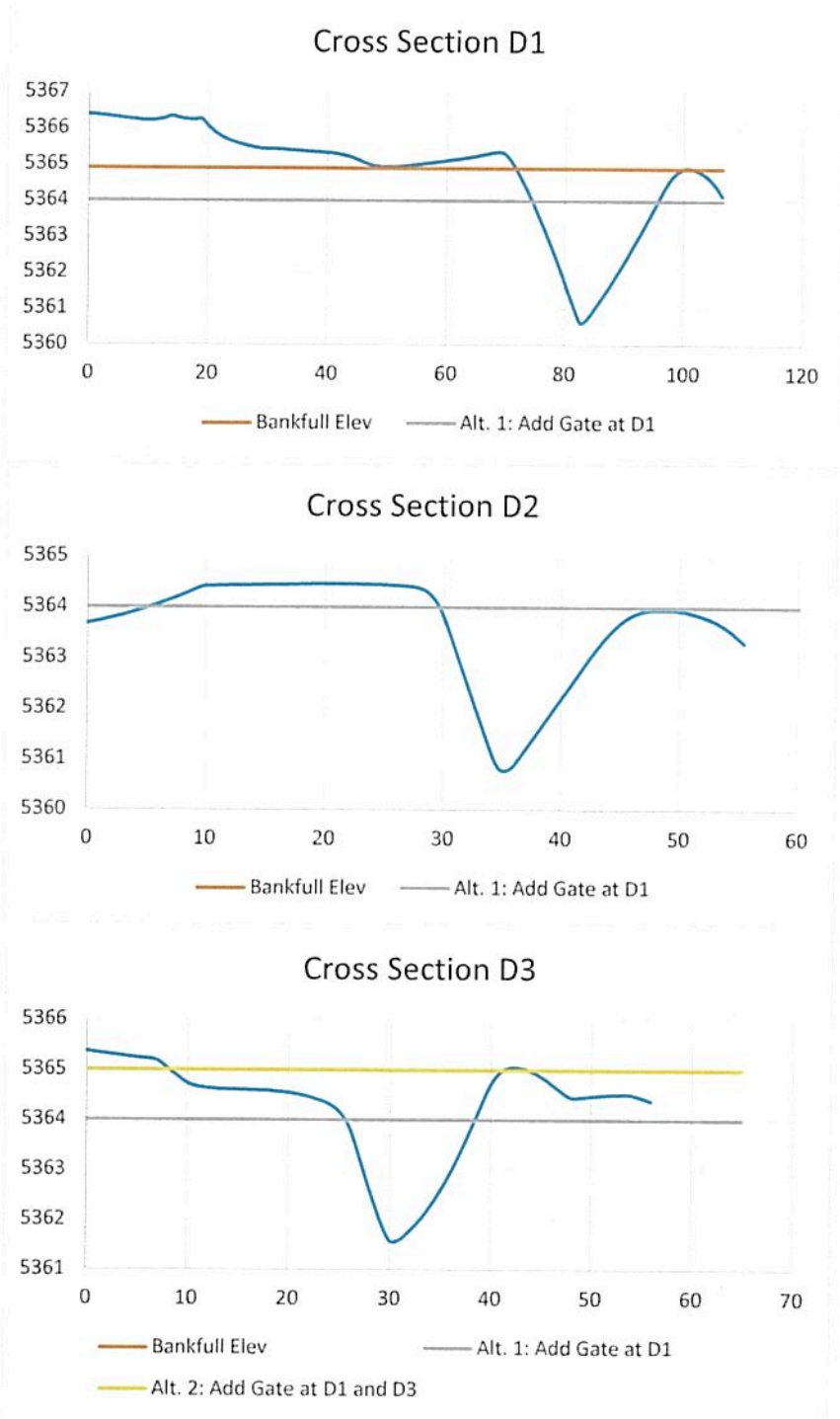
### Cross Section C6



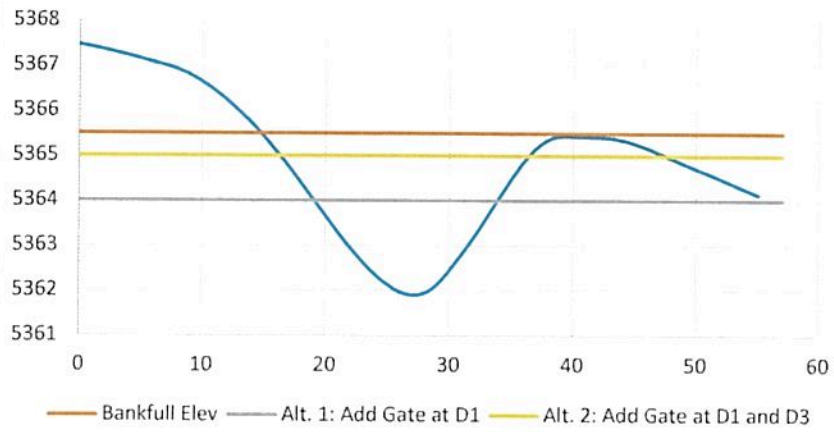




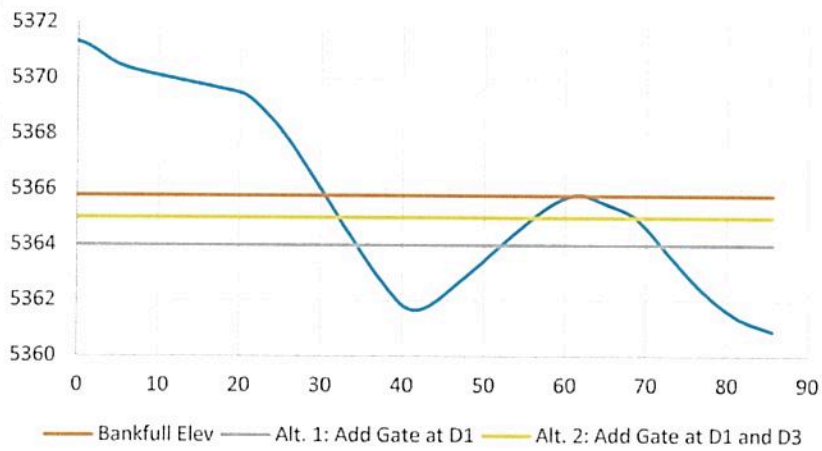
Reach D:



Cross Section D4



Cross Section D5



Cross Section D6

