COLD SPRING RANCH AREA PLAN
CULINARY WATER

Introduction

Lehi City conducted a water model analysis of the region which included the Cold Spring Ranch properties. This document represents a water system analysis specific to the Cold Spring Ranch Area plan. For this analysis the following assumptions have been made:

1. Water source from connection to existing Lehi City water system on west side of the Jordan River
2. Future water source of Lehi City connection to CWP pipeline.
3. Tank elevation of 4752

Design Criteria

Minimum Pipe Size	6"
Pipe Roughness Coefficient	0.85
Maximum Pipe Velocity	5 feet per second
Capita per Unit	3.8
Average Flow	100 gallons per day per person
Peak Instantaneous Flow	400 gallons per day per person (Peaking Factor = 4)
Peak Hourly Flow	0.8 GPM/ERU
Storage	400 gallons per day per connection ERU
Source	800 gallons per day per connection or ERU
Minimum Pressure	50 psi at peak flow
	50 psi at peak flow with fire flow
	Interior Sprinklers 750 GPM at Junction 60

Summary of Results

Peak Hourly Flow	1,030 gallons per minute
Source Required	716 gallons per minute

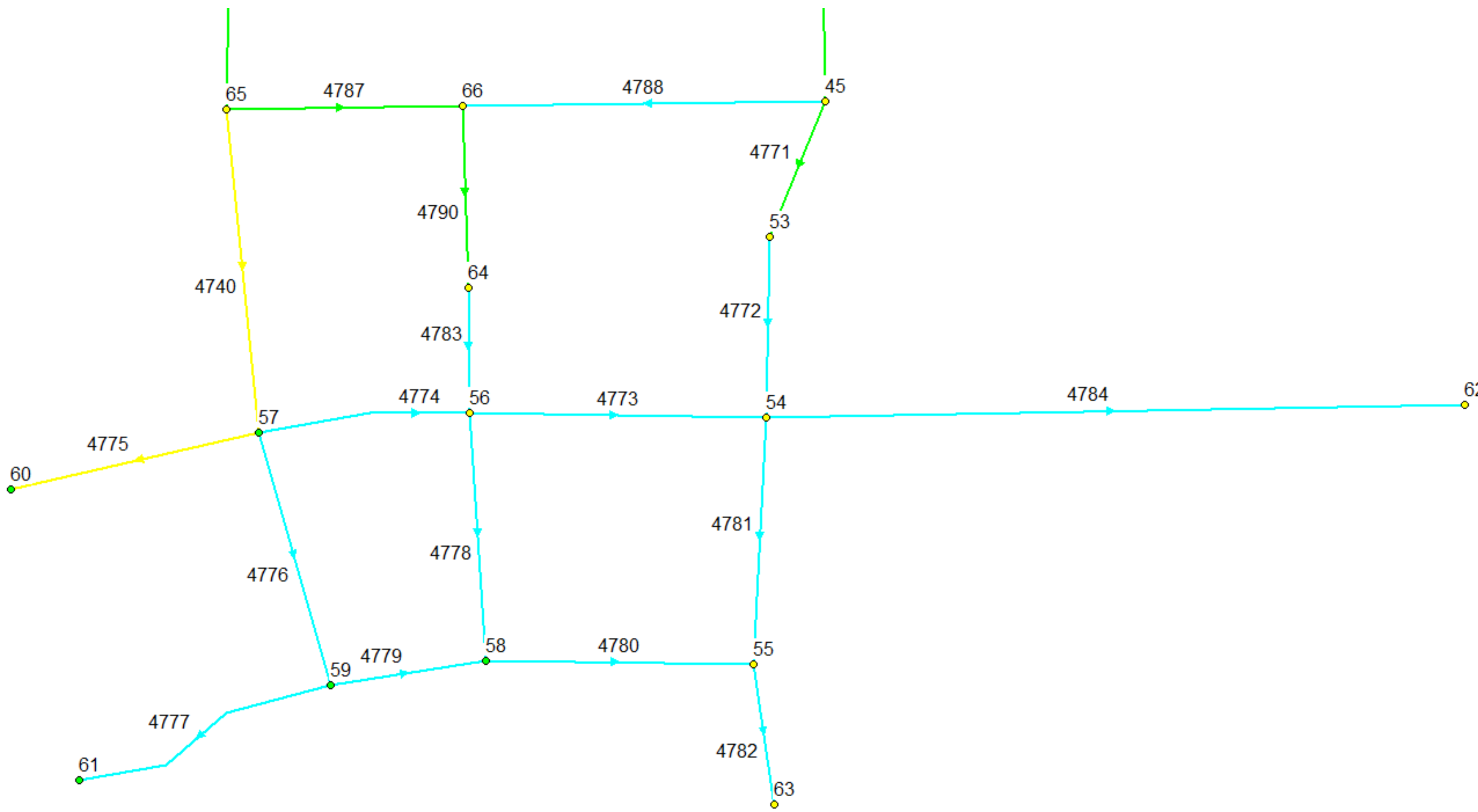
Storage Required
Tank 515,200 gallons + 45,000 gallons fire storage = 560,200 gallons (1.71 ac-ft)

Case 1: Peak Instantaneous (no fire flow)
    Minimum Pressure 64.0 psi @ Junction 60
Case 2: Peak Hourly + 750 GPM Fire Flow for Commercial
    Minimum Pressure 50.1 psi @ Junction 60

Cold Spring Ranch Area Plan
Culinary Water

Area	Land Use	Approx. Acres	Units per Acre (Density)	Estimated Units	Capita/Unit	No. Capita	Flow/Capita (gal/day)	Average Flow (gal/day)	Peak Factor	Peak Inst. Flow (gal/day)	Peak Inst. Flow (gpm)	Peak Hourly Flow (0.8 gpm/unit)	Storage Required (400 gal/unit)	Storage Required (Ac-ft)	Source Required (800 gpd/unit)	Source Required (gpm)
1	Commercial	19.97	3	60	19	1140	20	22,800	4	91,200	63.33	48	24,000	0.07	48,000	33
2	Commercial	23.12	3	69	19	1311	20	26,220	4	104,880	72.83	55	27,600	0.08	55,200	38
3	Commercial	8.4	3	25	19	475	20	9,500	4	38,000	26.39	20	10,000	0.03	20,000	14
4	Very High Density Residential	12.76	15	191	3.8	726	100	72,580	4	290,320	201.61	153	76,400	0.23	152,800	106
5	Very High Density Residential	4.71	15	71	3.8	270	100	26,980	4	107,920	74.94	57	28,400	0.09	56,800	39
6	High Density Residential	12.21	10	122	3.8	464	100	46,360	4	185,440	128.78	98	48,800	0.15	97,600	68
7	High Density Residential	8.66	10	87	3.8	331	100	33,060	4	132,240	91.83	70	34,800	0.11	69,600	48
8	High Density Residential	4.64	10	46	3.8	175	100	17,480	4	69,920	48.56	37	18,400	0.06	36,800	26
9	High Density Residential	10.7	10	107	3.8	407	100	40,660	4	162,640	112.94	86	42,800	0.13	85,600	59
10	High Density Residential	8.2	10	82	3.8	312	100	31,160	4	124,640	86.56	66	32,800	0.10	65,600	46
11	Medium Density Residential	5.05	6	30	3.8	114	100	11,400	4	45,600	31.67	24	12,000	0.04	24,000	17
12	Medium Density Residential	20.43	5	102	3.8	388	100	38,760	4	155,040	107.67	82	40,800	0.13	81,600	57
13	Medium Density Residential	7.49	5	37	3.8	141	100	14,060	4	56,240	39.06	30	14,800	0.05	29,600	21
14	Medium Density Residential	16.51	5	83	3.8	315	100	31,540	4	126,160	87.61	66	33,200	0.10	66,400	46
15	Medium Density Residential	21.49	5	107	3.8	407	100	40,660	4	162,640	112.94	86	42,800	0.13	85,600	59
16	Low Density Residential	22.85	3	69	3.8	262	100	26,220	4	104,880	72.83	55	27,600	0.08	55,200	38
17	Open Space	60.2														
	Totals	267.39		1,288		7,235		489,440		1,957,760	1,360	1,030	515,200	1.58	1,030,400	716
	Total Approved ERUs	1288														

Cold Spring Ranch Area Plan (Hydraulic Model Nodes and Pipes Labeled)



Cold Spring Ranch Area Plan
Culinary Water Model
Static Pressures with No Demands

Node ID	Static Pressure (psi)
45	98.1
53	97.1
54	96.9
55	98.2
56	89.5
57	75.2
58	82.0
59	79.6
60	70.1
61	77.5
62	107.5
63	94.4
64	89.4
65	84.9
66	89.0

Cold Spring Ranch Area Plan
Culinary Water Model
Peak Hour with 750 GPM Sprinkler Flow

Node Report

	Elevation	Demand	Head	Pressure
Node ID	ft	GPM	ft	psi
45	4520.6	0.0	4719.2	86.1
53	4522.9	79.4	4715.9	83.7
54	4523.4	79.4	4713.7	82.5
55	4520.4	79.4	4712.9	83.4
56	4540.6	79.4	4714.0	75.2
57	4573.5	116.1	4714.2	61.0
58	4557.6	79.4	4713.4	67.5
59	4563.4	116.1	4713.6	65.1
60	4585.3	840.0	4700.9	50.1
61	4568.2	116.1	4713.3	62.9
62	4499.0	55.9	4712.8	92.7
63	4529.1	79.4	4712.6	79.5
64	4540.7	79.4	4715.4	75.7
65	4551.2	0.0	4726.6	76.0
66	4541.7	0.0	4719.5	77.1

Link Report

	Diameter	Roughness	Flow	Velocity	Status
Link ID	in		gpm	fps	
4787	6.0	0.85	297	3.4	Open
4788	6.0	0.85	42	0.5	Open
4790	6.0	0.85	255	2.9	Open
4740	10.0	0.85	1291	5.3	Open
4771	6.0	0.85	255	2.9	Open
4772	6.0	0.85	175	2.0	Open
4783	6.0	0.85	-175	2.0	Open
4775	8.0	0.85	840	5.4	Open
4774	6.0	0.85	-40	0.5	Open
4773	6.0	0.85	-52	0.6	Open
4784	6.0	0.85	56	0.6	Open
4776	10.0	0.85	294	1.2	Open
4778	6.0	0.85	84	1.0	Open
4781	6.0	0.85	92	1.1	Open
4777	8.0	0.85	116	0.7	Open
4779	6.0	0.85	62	0.7	Open
4780	6.0	0.85	66	0.8	Open
4782	6.0	0.85	79	0.9	Open

Cold Spring Ranch Area Plan
Culinary Water Model
Peak Instantaneous – No Fireflow

Node Report

	Elevation	Demand	Head	Pressure
Node ID	ft	GPM	ft	psi
45	4520.6	0.0	4733.0	92.0
53	4522.9	101.6	4730.4	89.9
54	4523.4	101.6	4729.3	89.2
55	4520.4	101.6	4728.8	90.3
56	4540.6	101.6	4730.9	82.5
57	4573.5	148.6	4733.5	69.4
58	4557.6	101.6	4730.5	74.9
59	4563.4	148.6	4732.1	73.1
60	4585.3	148.6	4733.1	64.0
61	4568.2	148.6	4731.6	70.8
62	4499.0	71.5	4727.9	99.2
63	4529.1	101.6	4728.2	86.3
64	4540.7	101.6	4731.3	82.6
65	4551.2	0.0	4740.4	82.0
66	4541.7	0.0	4733.9	83.3

Link Report

	Diameter	Roughness	Flow	Velocity	Status
Link ID	in		gpm	fps	
4787	6.0	0.85	283	3.2	Open
4788	6.0	0.85	83	0.9	Open
4790	6.0	0.85	200	2.3	Open
4740	10.0	0.85	953	3.9	Open
4771	6.0	0.85	224	2.5	Open
4772	6.0	0.85	122	1.4	Open
4783	6.0	0.85	-99	1.1	Open
4775	8.0	0.85	149	1.0	Open
4774	6.0	0.85	-187	2.1	Open
4773	6.0	0.85	-122	1.4	Open
4784	6.0	0.85	71	0.8	Open
4776	10.0	0.85	468	1.9	Open
4778	6.0	0.85	63	0.7	Open
4781	6.0	0.85	71	0.8	Open
4777	8.0	0.85	149	1.0	Open
4779	6.0	0.85	171	1.9	Open
4780	6.0	0.85	132	1.5	Open
4782	6.0	0.85	102	1.2	Open

NOTES:

1. ALL CULINARY LINES WITHIN PROJECT BOUNDARY ARE TO BE 6" UNLESS NOTED OTHERWISE.
2. MASTER PLAN AND PROJECT PLAN SIZES WERE PROVIDED BY OTHERS

LEGEND

- MASTER PLAN LINE
- PROJECT LINE
- EXISTING WATER LINES

LEI

- A Utah Corporation -

ENGINEERS

SURVEYORS

PLANNERS

3302 N. Main Street
Spanish Fork, UT 84660
Phone: 801.798.0555
Fax: 801.798.9393
office@lei-eng.com
www.lei-eng.com

NOT FOR CONSTRUCTION

COLD SPRING RANCH

LEHI, UTAH

CULINARY MASTER PLAN

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #: 2015-0125

DRAWN BY: BAP

CHECKED BY: BTG

SCALE: 1" = 500'

DATE: 1/17/2018

SHEET

W-9

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