



Cistern Discussion

July 15th, 2019

Roosevelt Ridge HOA

Presented to Timberline Fire Protection District



- “The Owners will construct two 30,000-gallon community water cisterns to be used for fire suppression. The first cistern shall be constructed prior to the completion of 25% of the homes on the Property and the second cistern shall be constructed upon completion of 50% of the homes on the Property. The location of the cisterns shall be pre-approved by the Fire Protection District.”
 - Order for Inclusion of Real Property in the Colorado Sierra Fire Protection District, January 29, 2006
 - Roosevelt Ridge has 7 completed homes, one unit is under construction
 - Final buildout is limited to 27 units (resolution 10-31), 25% is 6.75 units

Roosevelt Ridge HOA is working to meet the initial cistern requirement by providing a project plan with milestones to allow owners to continue building while ensuring our obligations are being met.



- Requirements
 - ISO rating mandates 30,000 gallons minimum
 - 6 in NST attachment fitting
 - Freeze protection of tank and lines
 - Vehicle Access
 - County documents mandate a 30k gal cistern after 25% occupancy (6 units)
 - Additional 30k gal at 50% occupancy (13 units)
 - Buried below frost line or heated tank
 - Others?
- Desirements (RR or TFPD)
 - Below ground (RR)
 - Gravity assist flow (TFPD)
 - Others?
- Other Discussions
 - TFPD not party to sprinkler requirements
 - TFPD not interested in a fire structure at RR, not a good location and an existing structure exists just down the road
 - TFPD is in the process of evaluating the need for a second 30K cistern



3:08 PM
05/31/19
Cash Basis

Roosevelt Ridge Homeowners Association
Balance Sheet
As of May 31, 2019

	May 31, 19
ASSETS	
Current Assets	
Checking/Savings	
1st Bank HOA Checking	11,203.36
1st Bank HOA Savings	6,540.64
Total Checking/Savings	17,744.00
Accounts Receivable	
Accounts Receivable	-910.00
Total Accounts Receivable	-910.00
Total Current Assets	16,834.00
TOTAL ASSETS	16,834.00
LIABILITIES & EQUITY	
Equity	
Retained Earnings	11,577.05
Net Income	5,256.95
Total Equity	16,834.00
TOTAL LIABILITIES & EQUITY	16,834.00

- Cistern funding will require a Special Assessment
- Vote for Special Assessment in October 2019 after final quotes received
- Actual funding may be delayed for litigation
- Goal to have available funds by late 2021 or early 2022



Task Description	2019								2020				2021			
	May	June	July	August	Sep	Oct	Nov	Dec	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase I - Definition																
Notice	█															
Bidding	█	█	█													
Fire Chief Meeting		X														
Requirements Definition		█	█	█	█											
County Meeting			X													
Phase II - Project Funding																
Final Requirements					█	█										
Final Bids					█	█										
Selection						█										
Members Meeting (vote)						X										
Assessment Period						█	█	█	█	█	█	█	█	█		
Litigation & Collections						█	█	█	█	█	█	█	█	█		
Percent Funded										50%	X		100%	X		
Phase III - Execution																
Engineering / Permits									█	█						
Site Surveys			█							█						
Excavation										█		Winter Season	Winter Season	█		
Concrete work														█	█	
Piping														█	█	
Inspection															█	
Filling															█	
Test															█	
Certification															█	
Build Permit Schedule																
Cistern Threshold	7												14			
Completed Homes	7								8 (GL)				9 (MB)			
Active building permits	1 (GL)				2 (MB GL)				4+ (MW LM MB EA CN TB)				5+ (MW LM MB EA CN TB)			

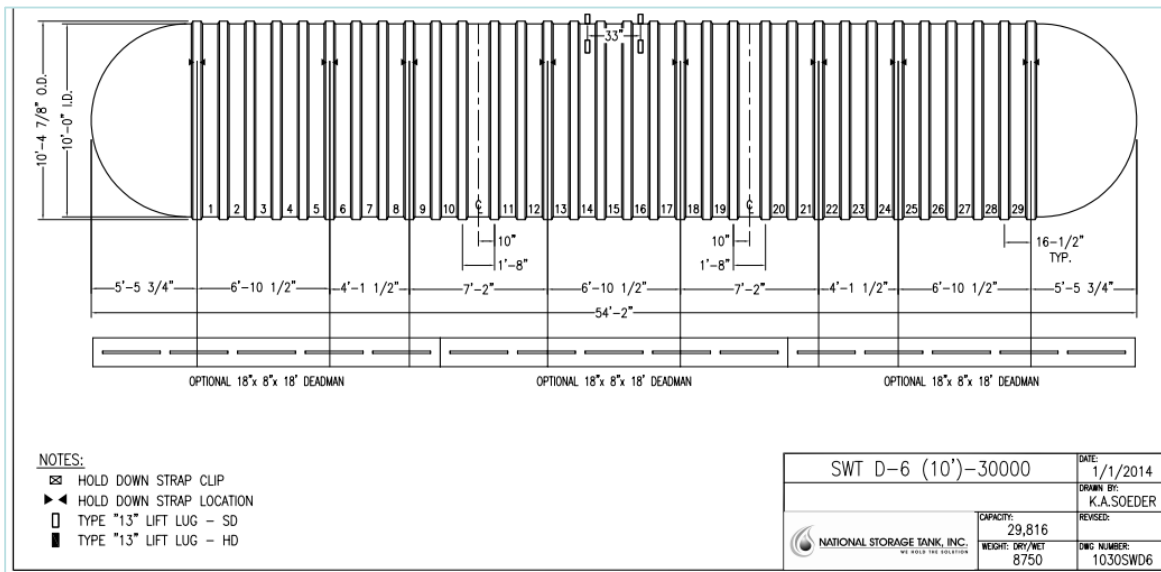
X - Milestone Deliverable



Buried Tank: \$126k

- Tank Supplier – National Storage Tank, Inc.
 - 10' 30,000 gallon tank
 - Fire set up with dry hydrant assembly and vent - \$48k to \$52k
 - Anchoring - \$13,500
 - Shipping (2 trucks) - \$8,400
 - Delivery est, 10 weeks ARO (EOM August)
 - Subtotal: \$71,900

- Installation estimate via Black Diamond
 - Excavation (12w x 14D x 48L / 300 yds) \$24K
 - Blasting or rock breaking \$10k (+/- \$5k)
 - 70+ yards of sand or other material sourced and delivered \$8k
 - Excavated Material Hauling (250 yds) \$6k
 - Road work to access site \$4k
 - Subtotal: \$52k



Water delivery 0.085 / gallon = \$2,550



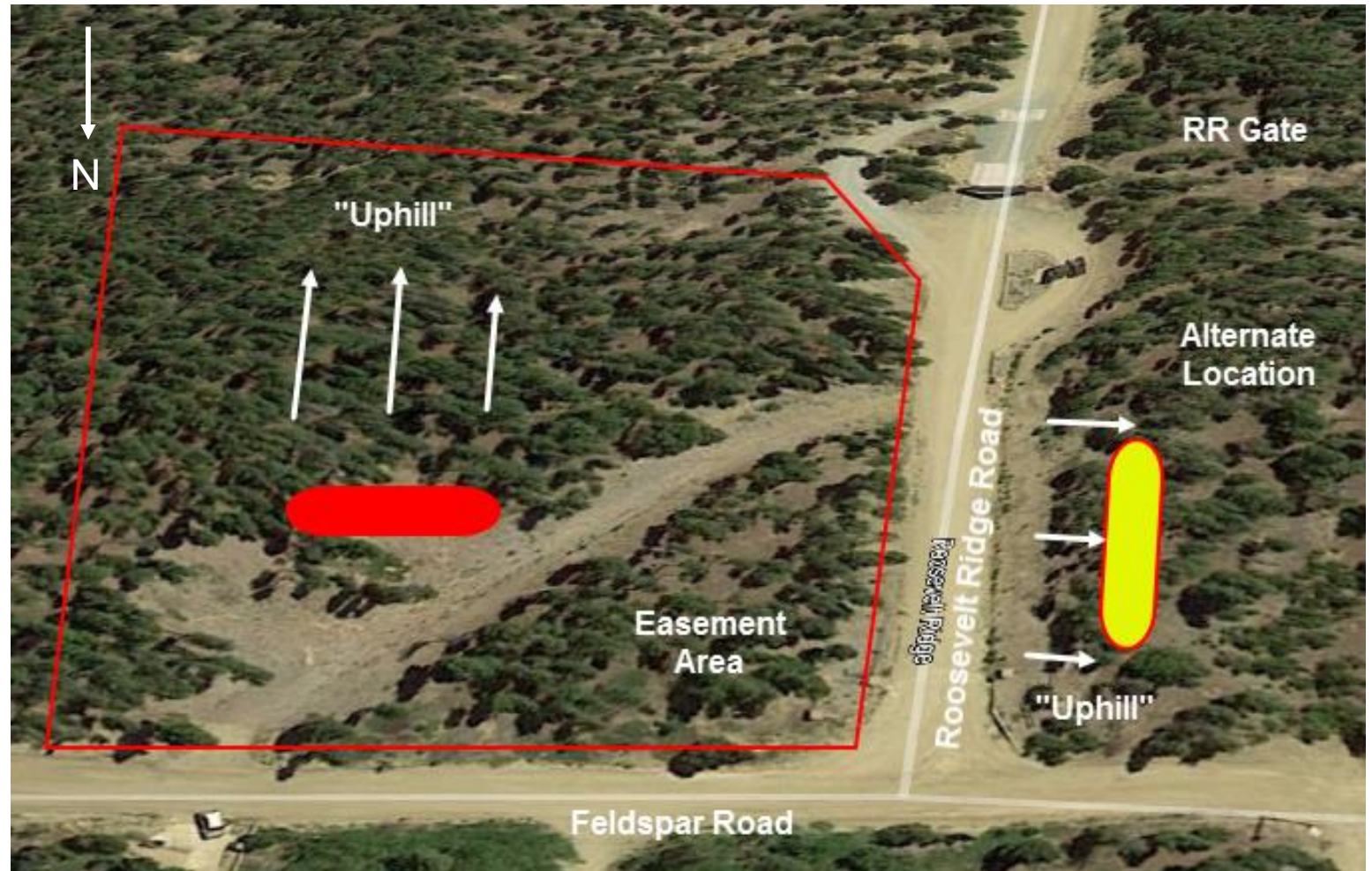


- Pat Thomas Tcs-Toma Construction Services Inc
 - \$40k for 30,000-gal tank (estimate)
 - Previous projects include
 - Sunshine Canyon Fire Station cistern
 - Coyote Hotel, Black Hawk
 - Concrete forms, 12 in tank walls and lid
- Connections included
- Additional Items
 - Plumbing / Fixtures (\$tbd)
 - Liner or coating (\$tbd)
- Tank interior is 8 x 35 x 15ft (est)
 - 4,200 cuft
 - 31,500 gal
 - Can modify depth / dimensions based on topography and difficulty in excavation (rock...)
- 70 yards of concrete, 8-10 truckloads (est)
- Rebar, wire mesh, ect
- Excavation \$45K
 - Identical to previous approach
 - More flexible, as the container can be modified to fit the topography



Proposed Cistern Locations

- Easements in place to support fire fighting equipment at this location
- Good access that includes a turn around
- Tank could be placed into the hill providing gravity assist flow to a hydrant further below
- Alternate location on the West side of RR Rd
- Additional consideration given to placement further up RR Rd, (centralized)





ROOSEVELT RIDGE

PRIVATE RESERVE

Backup Slides



- Fire Protection Cistern Primer
 - Tanks are typically Steel or Fiberglass / Plastic, concrete can be used as well.
 - Buried below the frost line or above ground and insulated with an immersion heater
 - May or may not require a manhole, will require access / inspection port
 - 6 in NST dry hydrant, gravity feed preferred
 - Not required to have a pump
 - Vented
 - 30K gal tank is 12 ft diameter x 40 ft
 - Smaller tanks chained together can be more economical (3x 10k gal)

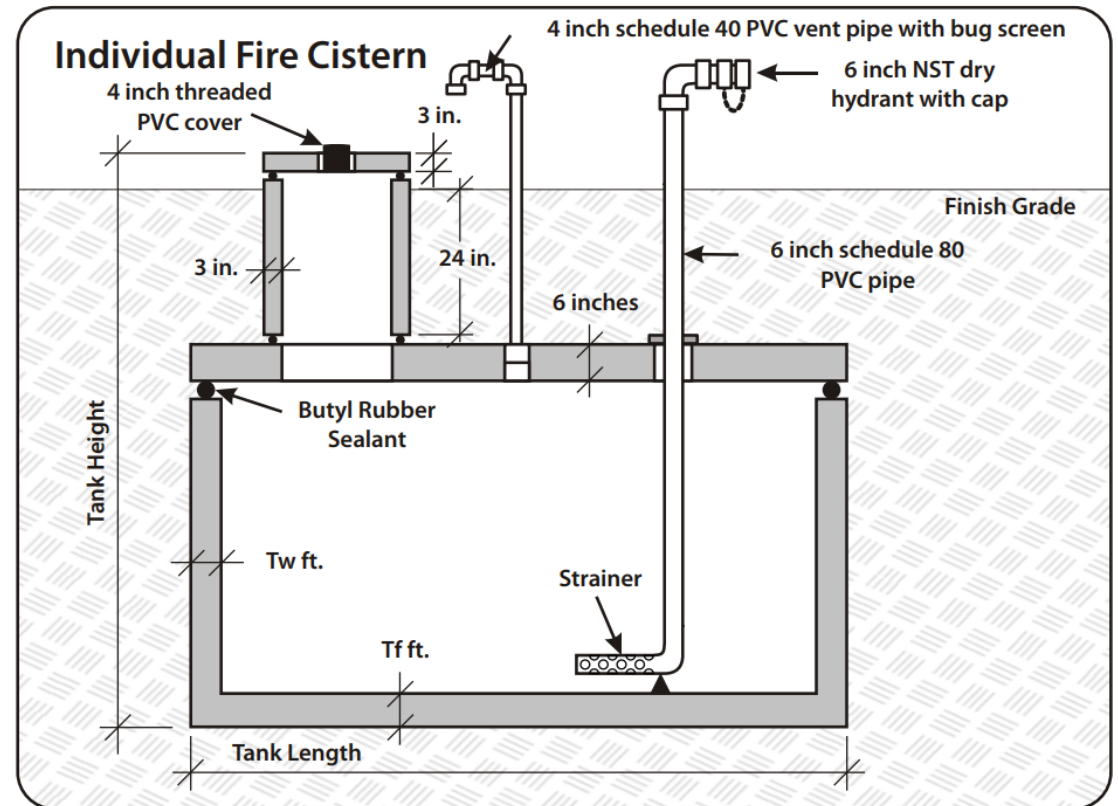


Figure 3: Individual Fire Cistern Elevation Drawing.

This is more applicable to a single home cistern consisting of a tank and lid, but close enough



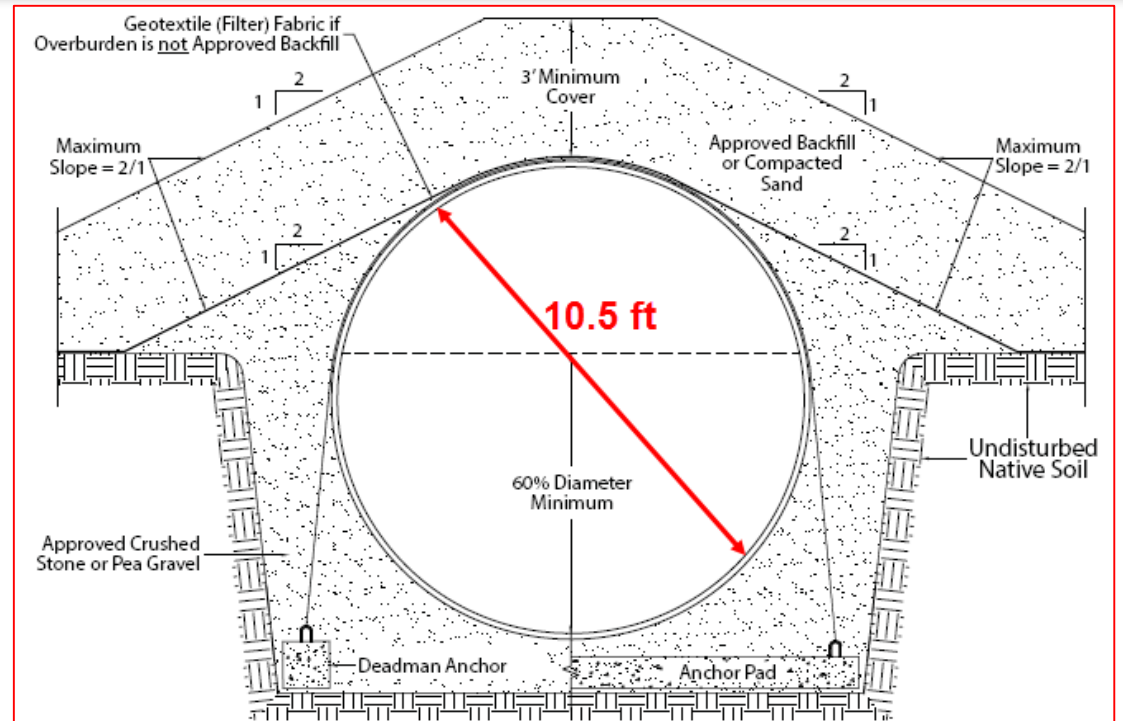
Typical Tank Installation



Gravel / Sand,
typically 1 ft
buffer around



Desert / warm
climate install,
frost line
requirements not
identical



National Storage Tank Recommendations

1. NOTES

- 1.1. The tank must be buried a minimum of 60% of the tank diameter.
- 1.2. There can be no traffic loads over the tank.
- 1.3. Anchoring requirements are the same as gravel installation. Water to grade, 3' of cover, and mechanical anchoring, the factor of safety is over 1.2.
- 1.4. Approved backfill must be used to at least the top of the tank and then the slope a maximum 2:1 grade from the tank top.
- 1.5. There must be a minimum of 3' of cover over the tank.
- 1.6. If the overburden over the tank is not approved backfill, a geotextile (filter) fabric separator must be placed over the backfill.



Used Tank Options

- Used frack water tank (22k gal) \$10-22K
 - Weldments and modifications (\$4,000)
 - Transport (\$2,000)
 - Need two to meet capacity requirements
- Used underground fuel tanks
 - Up to 30k gal
 - \$8-12K plus transport
 - Generally fiberglass / plastic
 - Harder to install than steel tanks, difficult to



- 50,000 gal used JetA tank, \$32k
- Details pending



Precast Concrete Cisterns

Oldcastle Precast tanks \$15k / 10k gal tank plus transport and crane

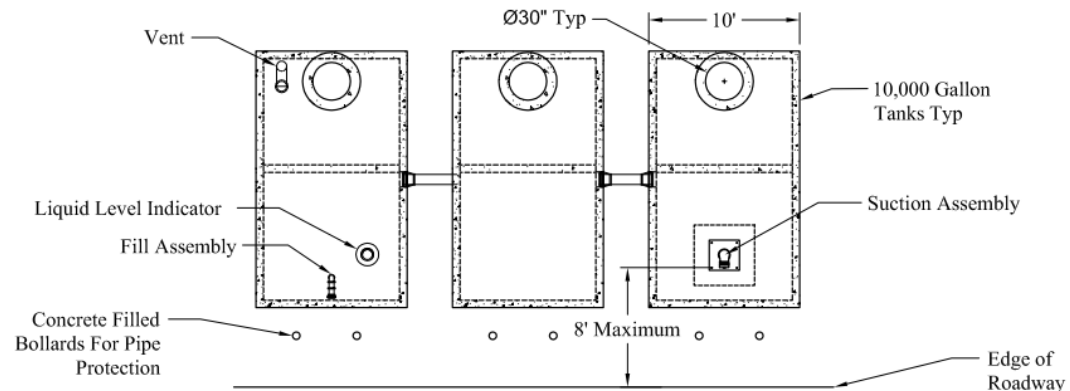


General Notes:

1. Concrete: $f_c = 5,000$ psi @ 28 Days Minimum Type III Cement
2. Reinforcing Steel: ASTM-A615 Grade 60 Black Deformed Bars
3. Design Loading: AASHTO-HS20-44, ASTM C-890-06
Design Specified As: ASTM C-1227-08, ASTM C-913-08
4. Butyl Rubber Joint Sealant Provided
5. Includes Exterior Dampproofing
6. Detail Drawings Provided Upon Request

Foundation And Backfill Notes:

1. Foundation Material Shall Be $\frac{3}{4}$ " Crushed stone, Minimum 12" Thick, Compacted.
2. $1\frac{1}{2}$ " Bank Run Gravel Shall Be Used For Backfill Operations Surrounding Tank. Backfill Shall Be Placed in Loose Lifts. All Compaction Shall Be Done With Hand Operated Equipment.
3. Tank Excavation Shall Be Kept Dewatered Throughout Installation and Backfill Operations.
4. All Area Between Tanks Shall Be Filled To A Minimum Of 12" Above Crown Of Interconnection Pipe With $\frac{3}{4}$ " Crushed Stone. $1\frac{1}{2}$ " Bank Run Gravel May Be Used Above This Elevation.



Liquid Level:

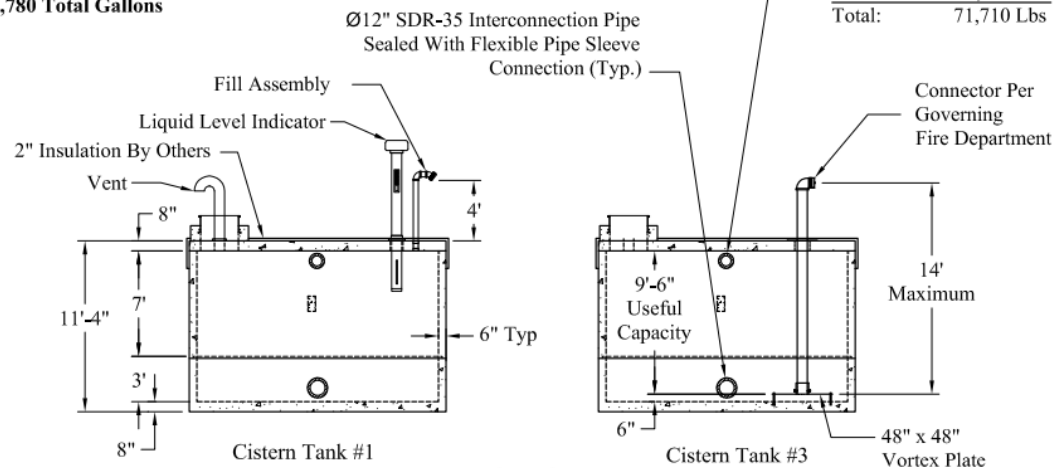
9' x 16' = 1,080 Gals/VF
9.5' = 10,260 Gallons Per Tank

30,780 Total Gallons

Ø8" SDR-35 Vent Sealed With Flexible Pipe Sleeve Connection (Typ.)

Est Weights: (Each Tank)

Top Slab:	16,400 Lbs
7' Riser:	26,960 Lbs
Base:	28,350 Lbs
Total:	71,710 Lbs



Note: Dimensions Typical For All Tanks



Estimated maximum draft (head)

- Suction Lift with no losses

Elevation (ft)	Atmospheric pressure (PSI)
0	14.696
500	14.43
1000	14.16
1500	13.91
2000	13.66
2500	13.41
3000	13.17
3500	12.93
4000	12.69
4500	12.46
5000	12.23
6000	11.78
7000	11.34
8000	10.91
9000	10.5
10,000	10.1

- Taking into consideration the surrounding atmospheric pressure and friction loss in the intake hose, every fire pump in good repair should be able to lift water at least 15 feet (at sea level).
- Ratio $10.5/14.7 = .71$
- $15 \times .71 = 10.7$ ft (estimate for RR)

Suction Lift at Various Elevations

Altitude:	Suction Lift In Feet
Sea Level	25.0
2,000 ft.	22.0
4,000 ft.	19.5
6,000 ft.	17.3
8,000 ft.	15.5
10,000 ft.	14.3



Roosevelt Ridge Density  Inbox x



← **Daniel Horn**

Tue, May 14, 3:05 PM



to me, Stephen ▾

Hello Scott,

I received your voicemail from last week and spoke to Stephen about your inquiry regarding the lot sizes in Roosevelt Ridge. Just to clarify, there is no condition anywhere that states each lot in Roosevelt Ridge must be 20 acres minimum. The only reference to 20 acre lot averages is the first condition under Resolution SBE 05-01 which states "Phase 1 shall include 17 parcels averaging 20 acres as shown on approved preliminary plat."

When Resolution SBE 05-01 was amended on 10/19/10 under Resolution 10-31 the condition I referenced above has actually been deleted in its entirety. "...Resolution 05-01 is hereby amended deleting Conditions 1 and 2 and replacing them in their entirety with the following: "Roosevelt Ridge final build out shall include a maximum of 20 parcels which may be increased to 27 parcels by transferring the development rights from any of the California or Iron Cross mining claim parcels or as the County may otherwise approve at the County's sole discretion."

We completed the TDR proposals correctly and within the guidelines and conditions set forth in the various resolutions and covenants pertaining to Roosevelt Ridge Subdivision.

Sincerely,

Daniel Horn

Community Development Planner

Gilpin County

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SBE 05-01 Fire District Code Improvements

BEFORE THE BOARD OF COUNTY COMMISSIONERS
COUNTY OF GILPIN

RESOLUTION NUMBER SBE 05-01

Lone Pine Real Estate L.L.C. (applicant)

**RESOLUTION APPROVING ROOSEVELT RIDGE RURAL DEVELOPMENT EXEMPTION
PRELIMINARY PLAT ON 550 ACRES IN SECTION 18, T2S, R72W**

WHEREAS, Gilpin County is a rural county that encourages large-lot development and open space preservation as a strategy to develop in a manner consistent with Master Plan and Open Space Plan goals; and,

WHEREAS, incentives for such development include exemptions from subdivision as defined in C.R.S. 30-28-101(10); and,

WHEREAS, the Board of County Commissioners may, pursuant to rules and regulations or resolution, exempt from this definition of the terms "subdivision" and "subdivided land" any division of land if the Board of County Commissioners determines that such division is not within the purposes of C.R.S. 30-28-101, Part 1; and,

WHEREAS, the Board of County Commissioners has determined that the above referenced land division is consistent with Gilpin County Rural Development Exemption regulations and therefore not within the purpose of C.R.S. 30-28-101;

NOW THEREFORE, be it resolved by the Board of County Commissioners of the County of Gilpin that Roosevelt Ridge Rural Development Exemption Preliminary Plat, dated 7/26/05 prepared by Winston Associates (attached) is hereby approved subject to the following conditions:

1. Phase 1 shall include 17 parcels averaging 20 acres as shown on approved preliminary plat.
2. Phase 2 shall include a maximum of 10 additional parcels calculated as follows: 3 parcel base with 1 additional parcel earned for each development right transferred from existing alienated lands.
3. A conservation easement over the entire project site shall be granted to Gilpin County assuring conservation goals including no further subdivision.
4. Building Envelopes shall not exceed 2 acres and shall be located in areas of low visibility. Building envelope location shall be approved by Community Development Department before final platting.
5. Existing interior switchbacks shall be brought up to County standards as per Road & Bridge Department specifications.
6. Building envelope access roads shall be built to standards that include 16' minimum widths with limited 12' wide sections as topography dictates. All roads shall be approved by Community Development and Road & Bridge Departments.
7. Off-site road improvements to portions of Gold, Feldspar and Quartz roads shall be completed by the developer as per Road & Bridge Department specifications within 1 year of Phase 1 Final Plat approval.
8. Language that requires County approval before any amendments to Covenants, Conditions and Restrictions (CCR) sections addressing design guidelines requiring an architectural style and materials consistent with mountain living shall be added to the CCR and on the final exemption plat.
9. Applicant shall be required to petition for annexation into a fire district and the applicant must complete any code improvements required by the district