Water Tank Research

January 2023

Outline

1. Five Tank Options
2. Need for Second Tank
3. Tank Size Requirement
4. Tank Considerations
5. Tank Comparisons
6. Tank Installation Steps
7. Pictures

Five Tank Options

1. **Repair Existing Tank #2** - NSF 61 reseal coating, reinforce/fix walls, upgrade roof
2. **Polyethylene** - a plastic tank, material is potable
3. **Stainless Steel** - welded stainless steel 316 (high grade), material is potable
4. **Carbon Steel** - welded carbon steel, potable NSF 61 liner, galvanized exterior sealer to prevent rust
5. **Fiberglass** - single weld fiberglass, not bolted, material is potable

Need for Second Tank

1. **Redundancy** - backup for Tank 1
2. **Multi-Purpose** - drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, watering lawns and gardens, and fire truck resource.
3. **Improve Aging System** - Tank 1 was sandblasted and resprayed with 2 part epoxy in 2008 by Hydrodynamics with estimated a 15-20 years at cost of ~$20k.

Tank Size Requirement - What size tank do we need?

Considerations

- **Pump Usage** - how long do the pumps operate to keep up with consumption
- **Cost** - the larger the tank the more expensive to buy and deliver
- **Water Without Power** - more water available with larger tanks even without electricity
- **Multi-Purpose** - used for other purposes like fires, projects, etc

Operations

1. **Tank Capacities**
    a. Steel Tank - 40k gallons.
    b. Concrete Tank - 20k gallons.
2. **Average Winter Water Usage** - 60 active customers consume ~3,000 gallons per day.
3. **Winter Pump Usage** - Mooney & Peterson pump 2 hours per day totaling 3000 gallons. 98% of the time this pump schedule is sufficient to keep up with consumption.
4. **One Pump at a Time** - Both pumps cannot operate simultaneously because they will conflict the flow to the tanks.
5. **Pump Rates**
    a. Mooney pump - 550 gallons per hour
    b. Peterson pump - 975 gallons per hour
6. **No Water Without a Working Tank** - at least one tank need to turn on pumps because the pressure generated will damage the connections in the pipe infrastructure.
7. **One Tank Did It All** - in the past, Canebrake water system had one tank

Tank Considerations

Cost

- Cost
- Delivery Cost
- Repair Costs
- Accessory Costs (ladder, flanges, etc)

Quality

- Lifespan
- Warranty
- Proven and Common Solution
- Safe for drinking (potable)
- Size

Maintainable

- Available Replacement Parts
- Cleanable
- Possible to Augment (add another tank)
- Repairable
- Difficult to Vandalize

Installable

- Less Obtrusive to the Whiteley property
- Possible to install up the Canyon
- Reuse of existing location

Tank Comparisons

Type	Cost	Warranty	Lifespan	Delivery Cost	Size (gallons)	Vendor
Repair Tank 2	$46,000	10 yr	TBD	$3000	20,000	GC
Polyethylene	$11,750	3 yr	40+ yrs	$600	10,000	TS
Polyethylene	$10,000	3 yr	20 yrs	TBD	8,000	NST
Stainless Steel	$30,000	5 yr	60+ yrs	TBD	8,000	NST
Stainless Steel	$25,000	1 yr	60+ yrs	$3800	8,000	SRSS
Carbon Steel	$20,000	5 yr	40 yrs	TBD	8,000	NST
Carbon Steel	$18,650	20 yr	TBD	$1525	12,000	AM
Fiberglass	$20,000	3 yr	60+ yrs	TBD	8,000	NST

Vendors: GC - General Coatings, TS - thetanksource.com, NST - National Storage Tanks, AM Aquamate, SRSS Santa Rosa Stainless Steel

Stainless Steel

- Very Long lasting
- Hard to move once placed
- Quality varies (70 welded yards for 6k tank)
- Hard to Rust but welds can rust
- Needs dry area (no sitting in water)
- Installation difficult
- Need Concrete Base
- Hard to get pumper to site
- No High Mineral (arsenic, iron, chlorine)

Carbon Steel

- Long lasting
- Polyethylene liner
- Horizontal or vertical size options
- Moveable

Polyethylene

- Long lasting
- Longevity not proven but looks like 40+ years
- No seams (one piece)
- Durable, Impact resistant
- Moveable, Light
- Rust free
- Can sit in water
- Easy to Install
- Easy Self Cleaning
- Prefers shade
- Any Solid Level Ground sufficient for support

Fiberglass

- Very Long lasting, easier to make then Stainless
- Moveable
- Rust Free

Resurface Tank 2

- Reuse of existing asset
- Aged solution
- Inner size 20’ x 20 x 10’ high
- Cracks present
- Rusty rebar present
- Pending inspection if feasible to reuse concrete blocks

Tank Installation Steps

1. **Research**
   a. Site Inspection
   b. Research Tank Options
   c. Board Meeting to Discuss Research
   d. Inform Community of Decision
2. **Preparation**
   a. Whiteley Acceptance of Use of Land
   b. Community Fundraiser
   c. Establish Volunteer Schedule
   d. Permitting
   e. Seismic Engineering Preparation
   f. Purchase
3. **Delivery**
   a. Delivery to Site
   b. Offload Tank
   c. Inspect and Assemble Tank
   d. Crane Tank into Place (Terex 3470 Crane)
4. **Installation**
   a. Connect to Infrastructure
   b. Build Roof covering and manhole
   c. Environmental Removal of Old Roof
   d. Connect Accessories (level floater, lock, stairwell, anchors)
5. **Test & Train**
   a. Test Installation
   b. Maintenance Training
   c. Update Water System documentation

Stainless Steel
(Santa Rosa brand)

Polyethylene
Norwesco brand
thetanksource.com

Carbon Steel
National Storage Tanks

Polyethylene
Synder brand
National Storage Tanks

Terex BT 3470 17-ton Boom Truck Crane

Desert Hills Crane Service LLC from El Centro

Tank #2 Surroundings

Tank #2 Inside

Tank #2 Inside

Tank #2 Inside Roof

References

Poly vs Stainless #1

Poly vs Stainless #2

Poly vs Stainless #3

nationalstoragetank.com

thetanksource.com

srss.com

Desert Hills Crane Service LLC