



Lake Shastina Community Services District Field Report

25-Apr-17

Underwater Cleaning & Inspection
250,000 Gallon
Tank 4
Potable Water Storage Tank

Submitted To:

Lake Shastina Community Services District
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David Harvey Dive Supervisor

EXTERIOR ROOF

Safety Rail			
Satisfactory	Fair	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating	Good needs touch up		
Welds	Good		
Corrosion	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Satisfactory	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Corrosion	<2%	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>
Seams/Welds	Good		
Low Spots	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Cathodic Protection Plates	Good		



Conclusion/Discrepancies: A few low spots around the outer edges
 Coating is oxidized but in good condition needs minor touch up work
 around the entry hatch

ACCESS HATCH

Satisfactory	Fair	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Corrosion	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Proper Design	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Locked	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Gasket	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Hinge	Good		
Hatch Size	2 FT	X	2 FT



Conclusion/Discrepancies Needs new gasket
 present one is broken and missing parts.
 Corrosion on the underside of the lid

VENTS

Satisfactory	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Corrosion	% Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Proper Design	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Screens	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Sealed Edges & Seams	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Cap/Cover	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>



Conclusion/Discrepancies Screen in place and
 well secured Vent is in good condition
 no problematic concerns

EXTERIOR SHELL

Rings			
Chime	Good		
2nd Weld Ring	Good		
3rd Weld Ring	Good		
4th Weld Ring	Good		
5th Weld Ring	Good		
Ring(s) 5 in all	Good		
Wall to Roof Seam	Good		
Coating			
Satisfactory	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosion <2%	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Conclusion/Discrepancies Nicks and scratches that need touch up. Many areas already corrected and appears to be holding up with no corrosion present

EXTERIOR LADDER

Construction	Coated Steel		
Satisfactory	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Coating			
Satisfactory	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosion 2%	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Welds/Joints	Good		
Supports	Good		
Safety Cage/Climb	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Conclusion/Discrepancies Ladder, cage and braces all in working condition, minor rust noted

OVERFLOW STRUCTURE

Coating			
Satisfactory	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosion <1%	Y	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Welds/Joints	Good		
Supports	Good		
Screens	Y	<input type="checkbox"/>	<input type="checkbox"/>



Attachments In ground
Foundation Good
Conclusion/Discrepancies Pipe and braces are in good condition with minor rust that needs touched up

FOUNDATION

Concrete Slab/Ring Retention

Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Spalling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Exposed Aggregate	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Erosion Undermining	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>

Seismic Restraints

None

Corrosion	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Tight	Y	<input type="checkbox"/>	N	<input type="checkbox"/>

Conclusion/Discrepancies Minor superficial cracks noted in the concrete. No undermining or erosion noted overall satisfactory



MANWAY ENTRIES

Coating

Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>	
Oxidized	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>	
Delamination	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Corrosion	5%	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Welds/Joints Fair

Conclusion/Discrepancies Needs touch up work around the edges of the doorway as the coating is peeling



MANUAL LEVEL INDICATOR

Float	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Guide Wires	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Guide Wire Anchors	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Cable / Hardware	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Corrosion	%	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Operation	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	

Conclusion/Discrepancies: Indicator appears to be in good condition



INTERIOR ROOF

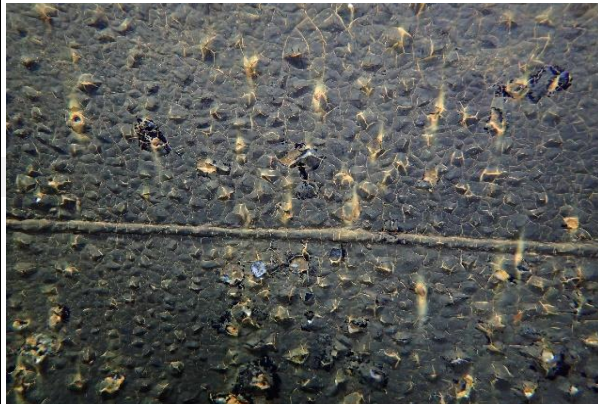
Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	35%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			
Trusses				
Gussets	Fair			
Coating				
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	20%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Vent Penetration	Good			
Roof Hatch	Fair			



Conclusion/Discrepancies: Surface corrosion covers the plates as well as the trusses and hardware. Coating has failed and needs to be sandblasted and recoated

INTERIOR SHELL

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	35%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			
Rings				
Chime	Fair			
2nd Weld Ring	Fair			
3rd Weld Ring	Fair			
4th Weld Ring	Fair			
5th Weld Ring	Fair			
Ring(s)	5 in all	Fair		
Wall to Roof Seam	Fair			
Baffle/Support Walls	None			



Conclusion/Discrepancies: Coating is severely blistered, most of which have cracked open and corrosion is forming. Sandblast and recoat in the immediate future

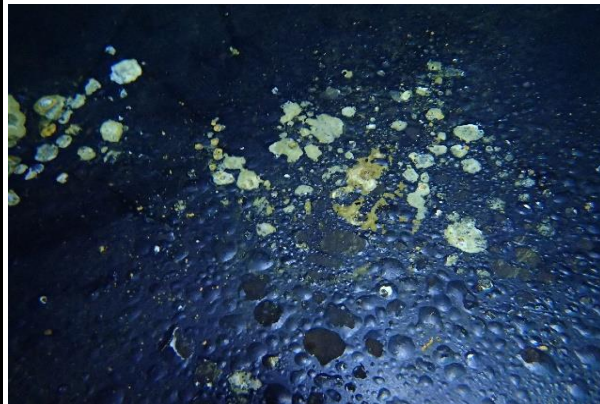
SUPPORT COLUMNS

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Floor/Base Plates	Fair			
Construction	Coated steel			
Conclusion/Discrepancies:	Blistering and surface corrosion noted from exposed steel. Coating has failed sandblast and recoat			



FLOOR

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	10%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Conclusion/Discrepancies:	Large areas of bare steel, minimal corrosion cathodic protection is working properly coating has failed			
Sediment Depth	1/8 of an inch			



MANWAY ENTRIES

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Conclusion/Discrepancies:	Blistering and surface corrosion noted around the outer edges			
Hanger and hardware also exhibit corrosion and blistering				



LADDER

Construction	None			
Satisfactory	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Corrosion	%	Y <input type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds				
Safety Cage/Climb	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Conclusion/Discrepancies:				
No interior ladder				



OVERFLOW

Coating				
Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	%	Y <input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Seams/Welds	Good			
Conclusion/Discrepancies:				
pipe and welds are in good condition				



MANUAL LEVEL INDICATOR

Float	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wires	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wire Anchors	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cable / Hardware	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Corrosion	15%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Operation	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Conclusion/Discrepancies:				
Corrosion on the guide wire anchors, system is in working condition, float has some water on the interior and is losing buoyancy				



APPURTENANCES

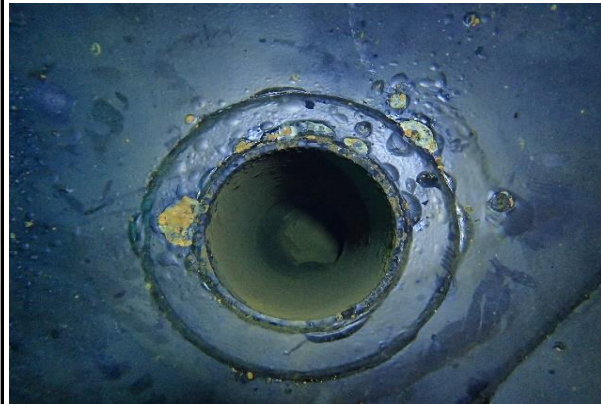
Influent

Coating

Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Seams/Welds Fair

Conclusion/Discrepancies: Blistering and corrosion noted around the weld seam



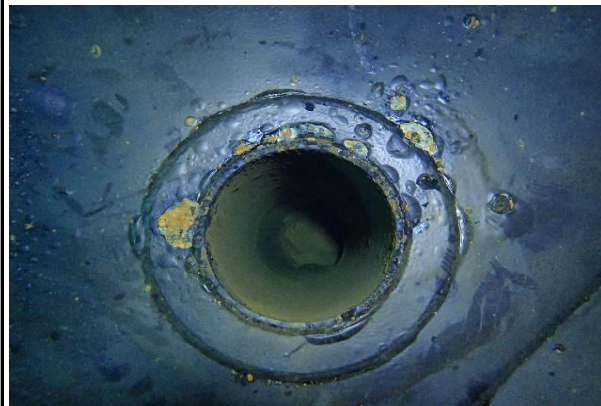
Effluent

Coating

Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Seams/Welds Fair

Conclusion/Discrepancies: Blistering and corrosion noted around the weld seam



Drain

Coating

Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	15% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Seams/Welds Fair

Conclusion/Discrepancies: Corrosion around the weld seam and on the interior of the pipe



Conclusion

Based on the results of this underwater inspection and the cleaning which took place, it appears this tank is in operational condition and should continue to provide a reliable water storage capacity for potable water use with and after proper maintenance. Interior coating is at the end of its service life, the tank needs to be sandblasted and recoated in the immediate future.

Recommendations

PDI concurs with the recommendations of AWWA that all potable water reservoirs or storage tanks be cleaned and inspected at least every five years and in some cases, depending upon source waters, type and quantities of sediment, and presence (or lack thereof) of cathodic protection systems, more frequently.

The following recommendations are made to provide continued, uninterrupted service of your water storage tank:

- 1 Your tank should be inspected and cleaned every five years, as suggested by the AWWA. Routine inspections and cleanings provide ample time to perform remedial repairs to abnormalities discovered before having a chance to become problematic.
- 2 The entry hatch needs a new gasket put in place as the current one is cracked and not all there.
- 3 The exterior roof needs touch up work done around the entry way, numerous nicks and scratches with minor corrosion are present.
- 4 The interior coating on the floor, shell, and roof, in addition to all the appurtenances need to be sandblasted and recoated as the coating has exceeded its useful service life. Blisters, and corrosion are present with some bare steel exposed as well. Sandblast and recoat the interior in the immediate future.
- 5 The float for the level indicator system needs to be replaced. The float has water inside and is losing buoyancy.