



## Lake Shastina Community Services District Field Report

25-Apr-17

Underwater Cleaning & Inspection  
300,000 Gallon  
Tank 3  
Potable Water Storage Tank

Submitted To:

Lake Shastina Community Services District  
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David Harvey Dive Supervisor

## EXTERIOR ROOF

Safety Rail	None			
Satisfactory	<input type="checkbox"/>	N	<input type="checkbox"/>	
Coating				
Welds				
Corrosion	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Coating				
Satisfactory	Fair	<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
Seams/Welds	Good			
Low Spots	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cathodic Protection Plates	Good			
Conclusion/Discrepancies:	The coating is oxidized and thin, the primer is exposed with indications of corrosion starting to form.			
Plan for a new coating in the near future				



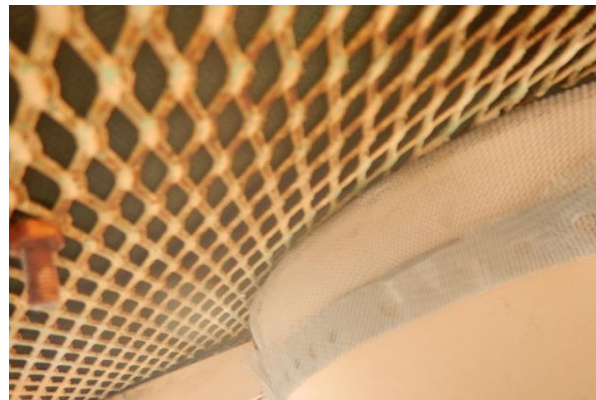
## ACCESS HATCH

Satisfactory	Y	<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 type="checkbox"/>	N	<input checked="" type="checkbox"/>
Hinge	Good			
Hatch Size	2	FT	X	FT
Conclusion/Discrepancies	Needs a gasket put in place, minor corrosion where gasket should be			



## 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	
Ring(s) 4 in all	Good
Wall to Roof Seam	Good

### 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	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>

Conclusion/Discrepancies      Coating is oxidized but holding up well  
no discrepancies noted



## EXTERIOR LADDER

Construction	Coated Steel
Satisfactory	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"/>
Welds/Joints	Good
Supports	Good
Safety Cage/Climb	Y <input checked="" type="checkbox"/> N <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"/> 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	1% Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
Welds/Joints	Good
Supports	Good
Screens	Y <input type="checkbox"/> N <input type="checkbox"/>

Attachments      In ground  
Foundation      Good  
Conclusion/Discrepancies      Pipe and braces are in  
good condition.



## 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** Concrete support ring has minor superficial cracking. No undermining or erosion noted overall satisfactory



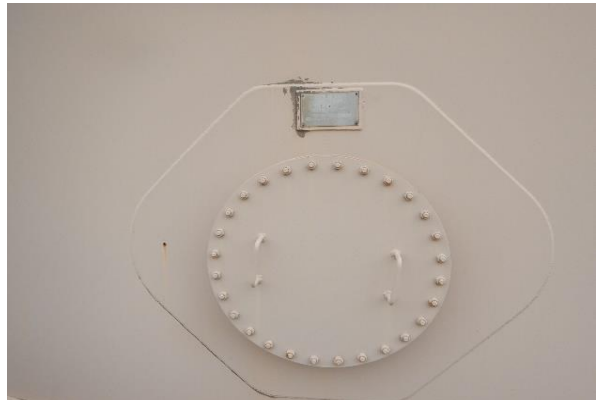
## MANWAY ENTRIES

### 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	<1%	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

**Welds/Joints** Fair

**Conclusion/Discrepancies** Man way entry is in satisfactory condition with no discrepancies



## MANUAL LEVEL INDICATOR

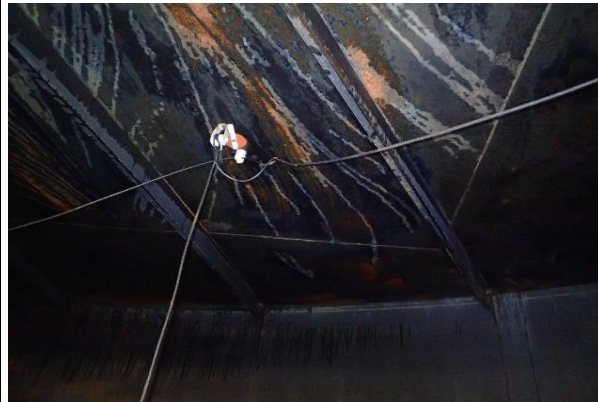
Float	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Guide Wires	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Guide Wire Anchors	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>	
Cable / Hardware	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>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

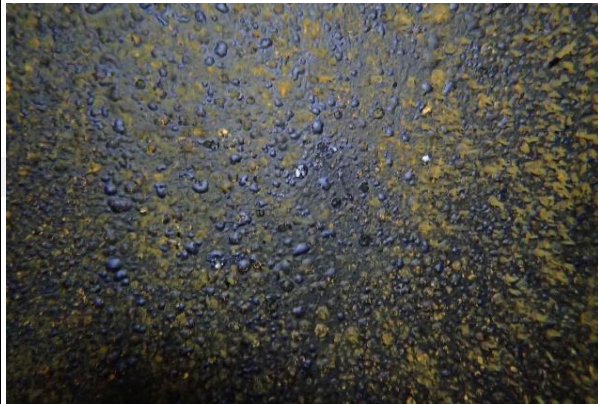
Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	20%	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	5%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Vent Penetration	Good			
Roof Hatch	Fair			



Conclusion/Discrepancies: Surface corrosion covers the plates, minor corrosion on the trusses and hardware. Coating is at the end of its service life and needs redone

## 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	15%	Y <input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Poor heavily blistered			
Rings				
Chime	Fair			
2nd Weld Ring	Poor heavily blistered			
3rd Weld Ring	Poor heavily blistered			
4th Weld Ring	Fair			
5th Weld Ring				
Ring(s)	4 in all	Fair		
Wall to Roof Seam	Fair			
Baffle/Support Walls	None			



Conclusion/Discrepancies: Weld seams are heavily blistered with corrosion present above the water line corrosion and cracking more extensive

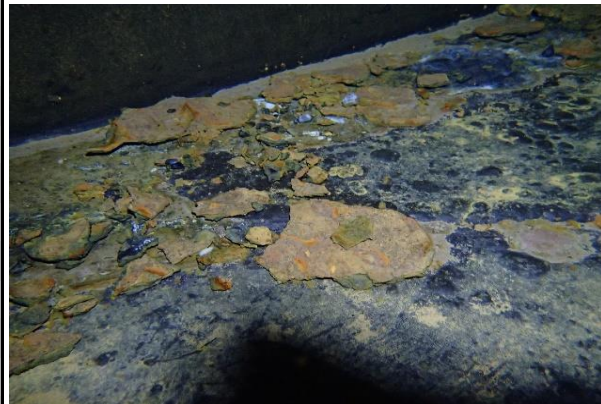
## SUPPORT COLUMNS

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	10%	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 checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input checked="" type="checkbox"/>	N	<input 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:	Coating is at the end of its service life with mineral build up and corrosion noted, recoat in the near future			
Sediment Depth	1/4 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 and interior of the doorway extension			



## LADDER

Construction	Coated Steel			
Satisfactory	Fair	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
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	20%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Safety Cage/Climb	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>



Conclusion/Discrepancies: Coating has failed blistering and bare steel present. Little to no coating present

## 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
Seams/Welds	Good			

Conclusion/Discrepancies: funnel 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	5%	Y	<input checked="" type="checkbox"/>	N
Operation	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Conclusion/Discrepancies: Corrosion on the floor anchor where the guide wires connect



## APPURTENANCES

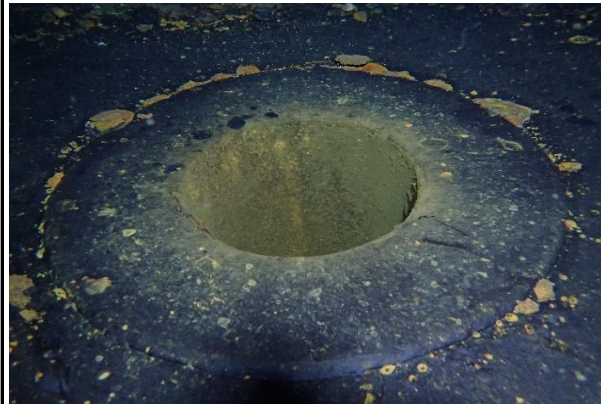
Influent

Coating

Satisfactory	Fair	<input checked="" type="checkbox"/>	N	<input 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	<input type="checkbox"/>
Seams/Welds	Fair			

Conclusion/Discrepancies: Blistering and corrosion

noted around the weld seam, minor corrosion on the interior of the e pipe



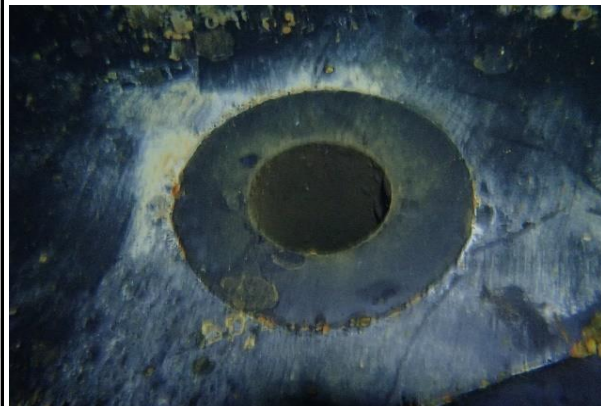
Effluent

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



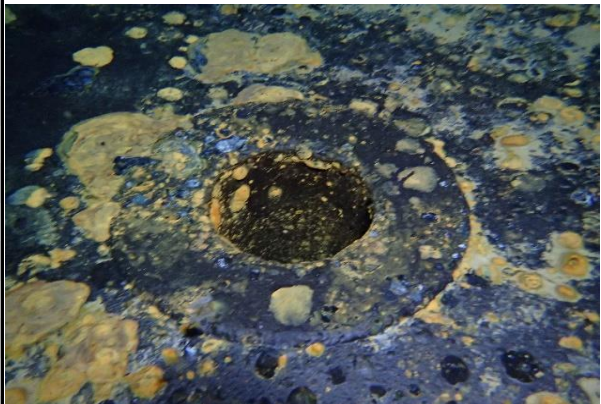
Drain

Coating

Satisfactory	Y	<input 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	20% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			

Conclusion/Discrepancies: Corrosion on the

interior of the pipe and the weld seam coating in poor condition





## 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 near 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 gasket put in place to create a good seal and minimize the corrosion on the underside of the lid.
- 3 The exterior roof coating is very thin and the primer layer is visible. Plan for a new top coat in the near future.
- 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 near future.