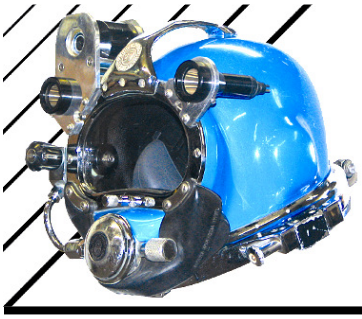
High Tank

Needles Water Department

Report of Findings
From the
Diving Operations
Conducted on

May 16, 2025

by

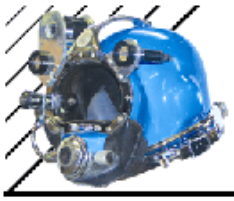


LiquiVision Technology

DIVING SERVICES

711 Market Street, Klamath Falls, OR 97601, (800) 229-6959 www.divingservices.com

This Page Intentionally Left Blank



LIQUIVISION TECHNOLOGY
DIVING SERVICES

Office/Mailing Address
711 Market Street
Klamath Falls, OR 97601
www.divingservices.com

Western Operations
835 Market Street
Klamath Falls, OR 97601
liquivision@divingservices.com

Toll Free: (800) 229-6959
Phone: (541) 883-6473
Fax: (541) 883-1361

Underwater Inspection of High Tank

May 16, 2025

Bryan Hickstein
Needles Water Department
817 3rd Street
Needles, CA 92363

Following is the report of findings during the underwater work conducted on your reservoir.

It will focus on issues of concern or areas that need attention. In order to see a complete and detailed inspection, please view each video.

Color images of all plumbing fixtures, components and areas of concern were taken via underwater digital camera. The images should give you a clear view of the conditions described. The video may give you another view and a clearer understanding of any area that you may wish to look at more closely.

METHODOLOGY:

Disinfection of All Equipment With 200ppm+ Chlorine Solution Immediately Prior to Entering System: This process prevents contamination of the water supply. All LVT equipment was properly disinfected prior to entering the potable water system.

Full-Time Voice Communication between surface and Diver: The system allowed for constant communication between the diver, and all surface personnel. In addition, customers were able to communicate with the diver at any time. For purposes of a more efficient inspection, cleaning, and repair program, that enabled the diver to immediately discuss any observations he made inside the reservoir.

Full-Time Live High Resolution Color Video: Allowed for constant viewing of the diver's work and observations. This also enabled the district personnel to view what the diver in the reservoir was witnessing.

High Tank

TERMINOLOGY:

When describing the features or areas of interest inside the reservoir, an image number is placed next to the description that corresponds with the inspection findings. The diagram is shown in a view looking from the top down. The entry hatch is referred to as the 12:00 o'clock position.

Following the diagram are pictures of the pertinent areas of the reservoir and the locations where the pictures were taken. Each picture is descript and numbered.

The standards used to evaluate the condition of the reservoir include: Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces – SSPC-Vis 2-82 & ASTM D 610-85 NACE Standard RP0196-96 & RP0388-2001 or Condition of Concrete In-service – ACI 201.1R-92.

High Tank

OVERVIEW OF RESERVOIR INSPECTED:

Customer Name:	Needles Water Department	**Reservoir Name:**	High Tank
Manager:	Bryan Hickstein	Construction:	OG Welded
Job Number:	CA38024R3T1	Capacity (gal.):	1,539,128
Date of Inspection:	May 16, 2025	Diameter or L x W:	79'
Report Writer:	Chris Holton	Height:	42'
Diver:	Jonny Gordon	Floor Square FT:	4,898.6
Tender:	Kirino Itilmwai	Date Built:	1990

N/A –not applicable **Excellent** (Ex.) –like new condition, no repairs needed. **Good** – Cosmetic only problems, repairs if wanted. **Fair**-Minor problems, repairs needed, not immediate. **Poor** –Major problems, structural or like, immediate repairs needed.

1. Rust Grades

Grades	% of Surface Rusted	Description
10	0% - 0.01%	No rusting or less than 0.01% of surface rusted
9	0.01% - 0.03%	Minute rusting, less than 0.03% of surface rusted
8	0.03% - 0.1%	Few isolated rust spots, less than 0.1% of surface rusted
7	0.1%- 0.3%	Less than 0.3% of surface rusted
6	0.3% - 1%	Extensive rust spots, but less than 1% of surface rusted
5	1% - 3%	Rusting to the extent of 3% of surface rusted
4	3% - 10%	Rusting to the extent of 10% of surface rusted
3	10% - 16%	Approximately one sixth of the surface rusted (16%)
2	16% - 33%	Approximately one third of the surface rusted (33%)
1	33% - 50%	Approximately one half of the surface rusted (50%)
0	50% - 100%	Approximately 100% of the surface rusted

2. Concrete Deformities

Unable to Evaluate	Good Condition	Cracks	Blistering	Chalking	De-Lamination	Pitting	Popouts	Scaling	Spalling	Warping
UE	GC	CK	BL	CH	DL	PT	PO	SC	SP	WA

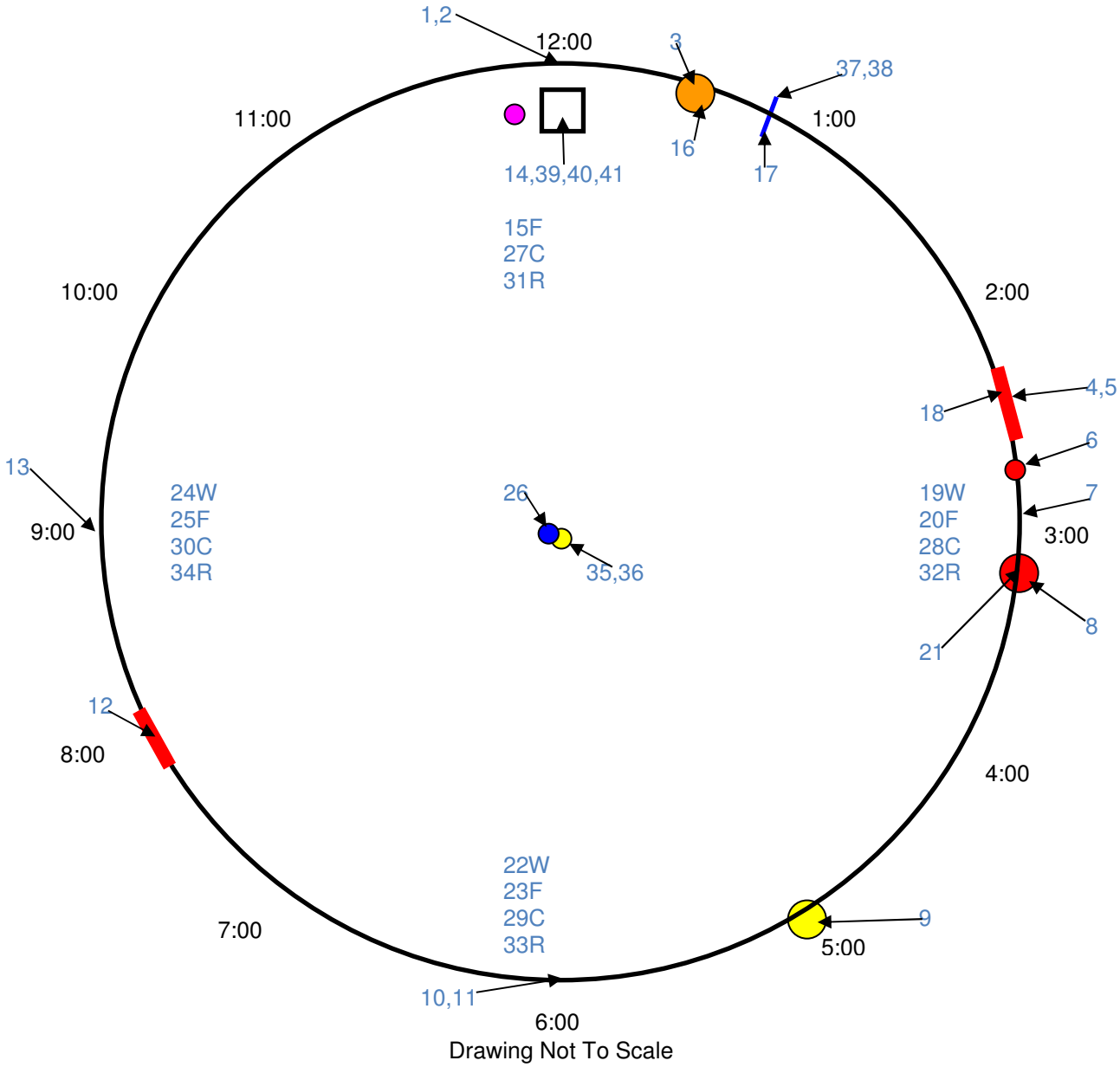
High Tank

RECOMMENDATIONS:

Recommendation	Estimated Time - Hrs.
Install weather stripping on entry hatch to limit the risk of bugs and other matter from entering the reservoir.	.50
Repair liquid level indicator by replacing the cable that attaches the float and tag. Consider replacing the indicator on the outside with a more legible one. If the liquid level indicator is not needed then you may want to consider removing it instead. Replace liquid level indicator float with a more durable stainless steel type float. Repair liquid level indicator by reattaching the cables that guide the float to the floor of the reservoir.	1.00
Perform a regular cleaning, inspection and repair cycle every 2-3 years in order to ensure superior water quality and proper maintenance of coating condition and appurtenances is performed.	Please contact our sales office for an estimate.
Total Estimated Hours	1.50

High Tank

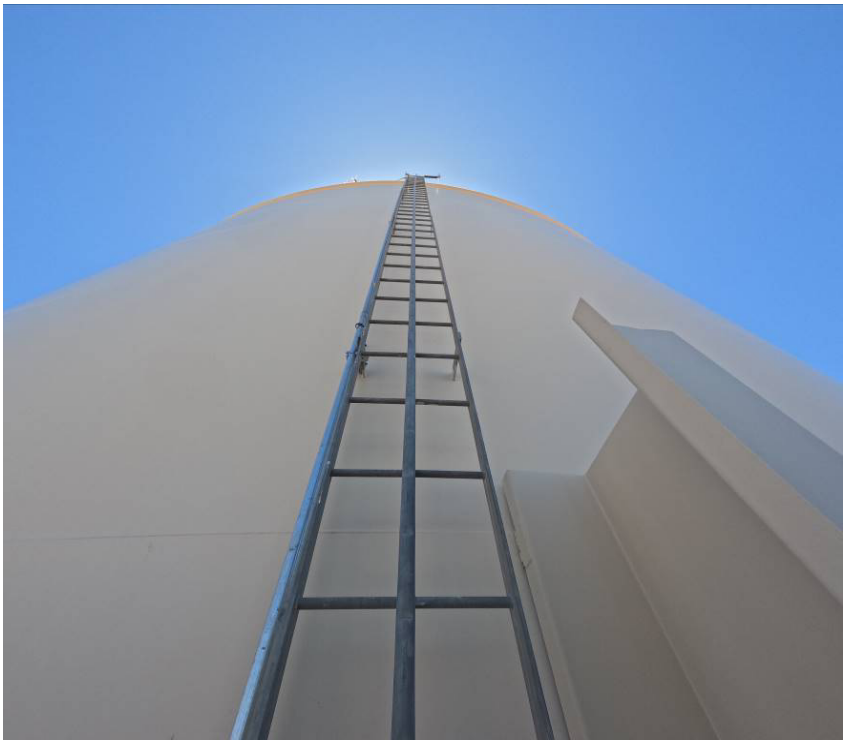
Reservoir Diagram



Drawing Not To Scale

	Entry Hatch		Overflow		Support Column
	Inlet/Outlet		Man Entry		Water Tap
	Capped-Off Penetration		Liquid Level Indicator		Air Vent
	Telemetry		Cathodic Protection Anode		

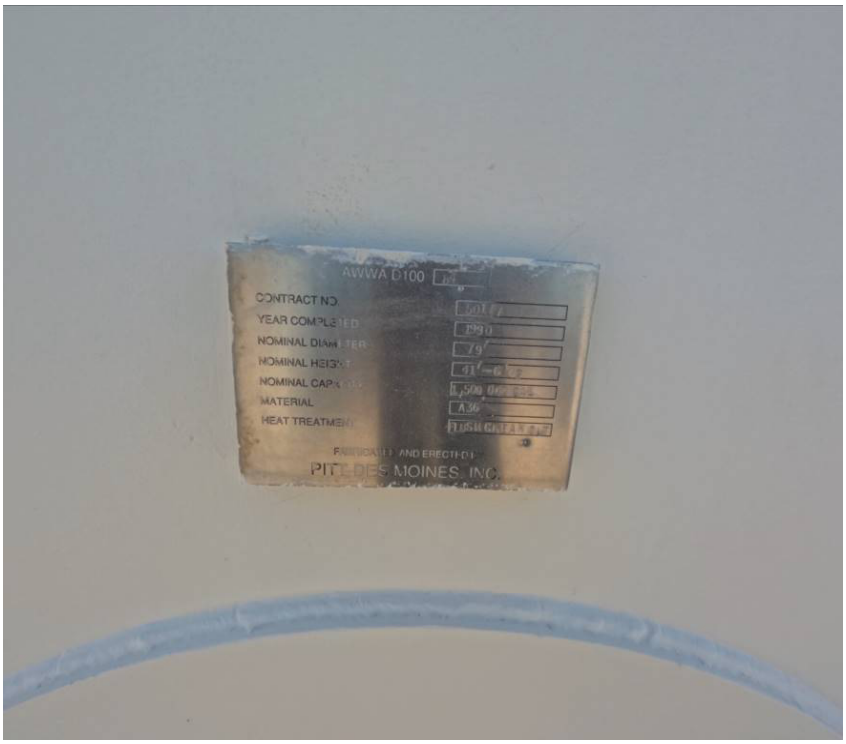
High Tank

Image #**1** *Exterior Wall 12:00* **Condition:** Rust Grade[1] **9.** **Description:** Exterior Wall appeared to be in good condition with a minor amount of corrosion.	
Image #**2** *Exterior Ladder 12:00* **Condition:** Rust Grade[1] **8.** **Description:** Exterior Ladder appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**3** *Inlet / Outlet 12:30* **Condition:** Rust Grade[1] **8.** **Description:** Inlet / Outlet appeared to be in good condition with a minor amount of corrosion.	
Image #**4** *Man Way 2:30* **Condition:** Rust Grade[1] **8.** **Description:** Man Way appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**5** *Nomenclature Plate 2:30* **Description:** Nomenclature Plate appeared to be in good condition and readable.	
Image #**6** *Water Tap 2:45* **Condition:** Rust Grade[1] **8.** **Description:** Water Tap appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**7** *Exterior Wall 3:00* **Condition:** Rust Grade[1] **8.** **Description:** Exterior Wall appeared to be in good condition with a minor amount of corrosion.	
Image #**8** *Capped-Off Penetration 3:15* **Condition:** Rust Grade[1] **7.** **Description:** Capped-Off Penetration appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**9** *Overflow 5:00* **Condition:** Rust Grade[1] **9.** **Description:** Overflow appeared to be in good condition with a minor amount of corrosion.	
Image #**10** *Exterior Wall 6:00* **Condition:** Rust Grade[1] **8.** **Description:** Exterior Wall appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**11** *Exterior Base 6:00* **Description:** Unable to evaluate Exterior Base due to gravel covering it.	
Image #**12** *Man Way 8:00* **Condition:** Rust Grade[1] **8.** **Description:** Man Way appeared to be in good condition with a minor amount of corrosion.	

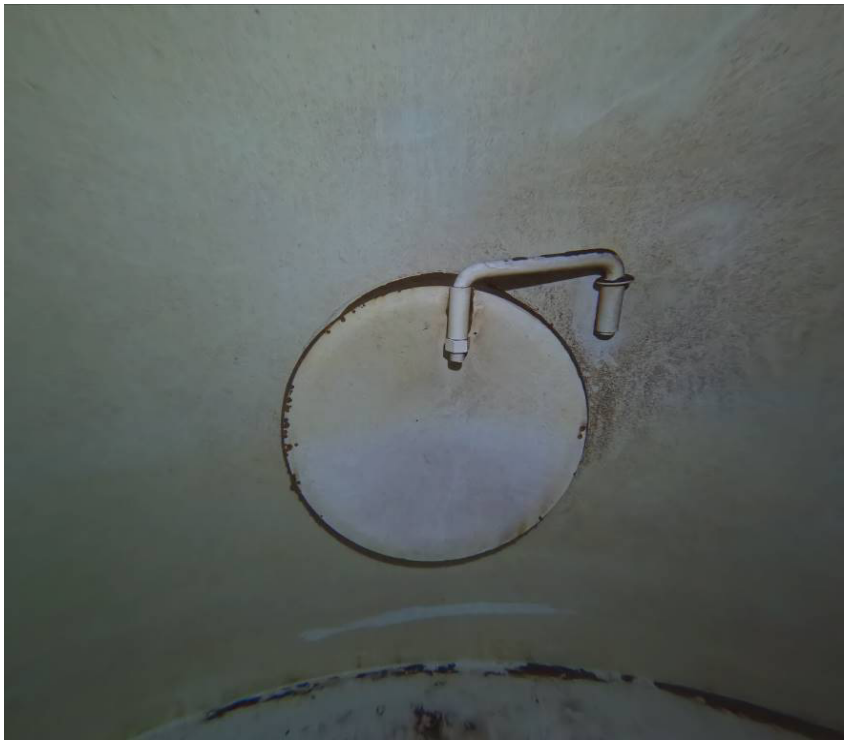
High Tank

Image #**13** *Exterior Wall 9:00* **Condition:** Rust Grade[1] **8.** **Description:** Exterior Wall appeared to be in good condition with a minor amount of corrosion.	
Image #**14** *Interior Ladderl 12:00* **Condition:** Rust Grade[1] **8.** **Description:** Interior Ladder appeared to be in good condition with a minor amount of corrosion.	

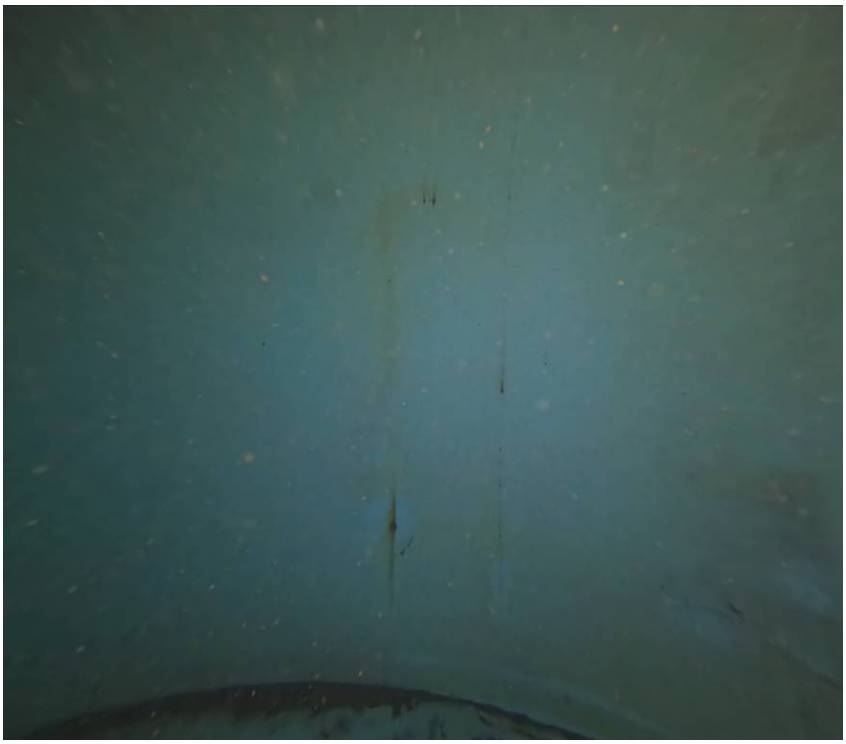
High Tank

Image #**15** *Floor 12:00* **Condition:** Rust Grade[1] **8.** **Description:** Floor appeared to be in good condition with a minor amount of corrosion.	
Image #**16** *Inlet / Outlet 12:30* **Condition:** Rust Grade[1] **8.** **Description:** Inlet / Outlet appeared to be in good condition with a minor amount of corrosion.	

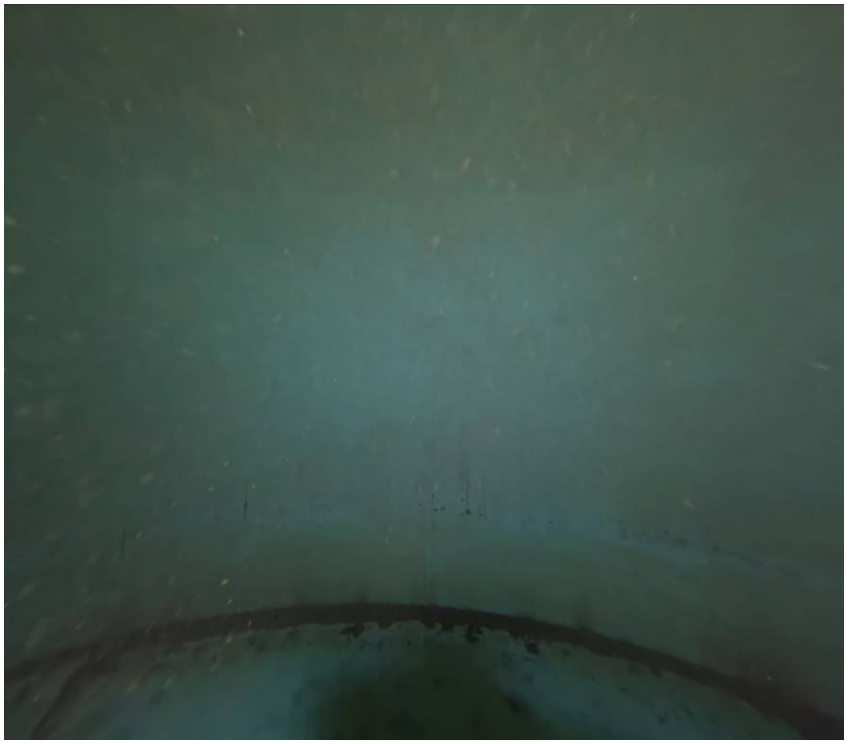
High Tank

Image #**17** *Liquid Level Indicator Base 12:45* **Condition:** Rust Grade[1] **8.** **Description:** Liquid Level Indicator Base appeared to be in good condition with a minor amount of corrosion. A cable appeared to be broken.	
Image #**18** *Man Way 2:30* **Condition:** Rust Grade[1] **8.** **Description:** Man Way appeared to be in good condition with a minor amount of corrosion.	

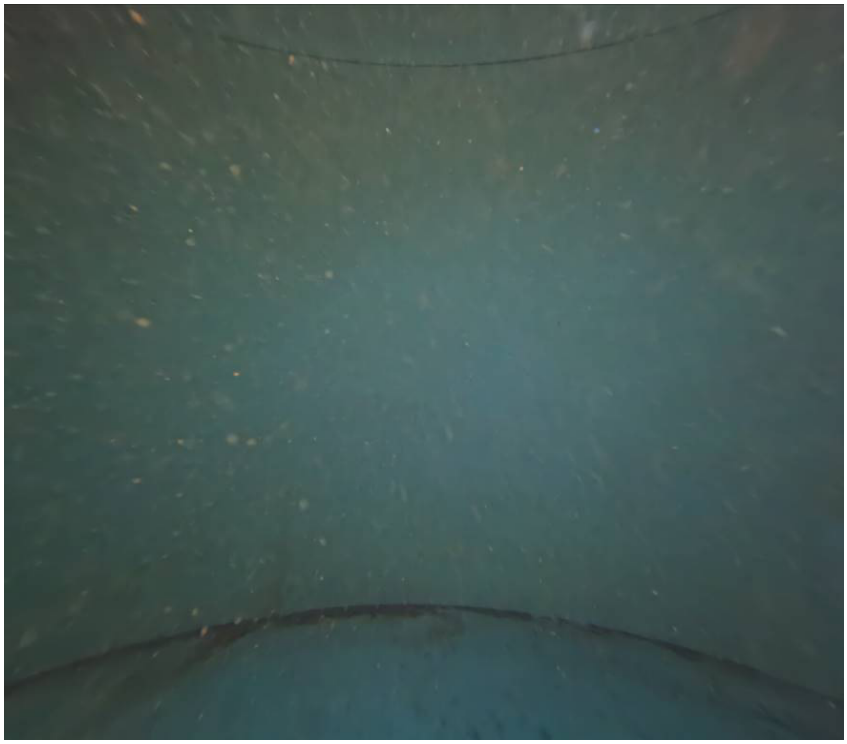
High Tank

Image #**19** *Wall 3:00* **Condition:** Rust Grade[1] **8.** **Description:** Wall appeared to be in good condition with a minor amount of corrosion.	
Image #**20** *Floor 3:00* **Condition:** Rust Grade[1] **8.** **Description:** Floor appeared to be in good condition with a minor amount of corrosion.	

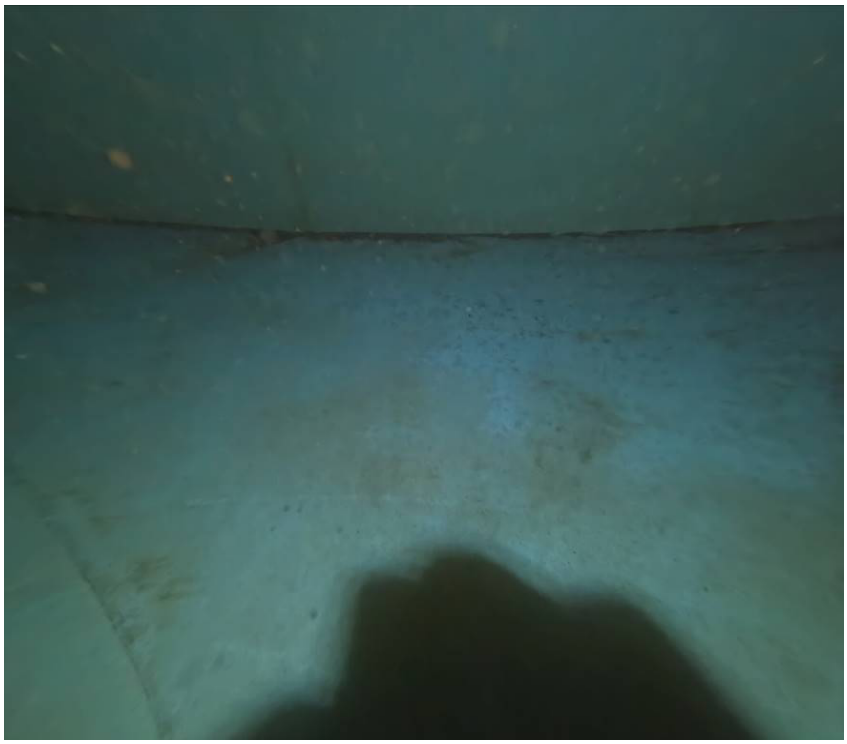
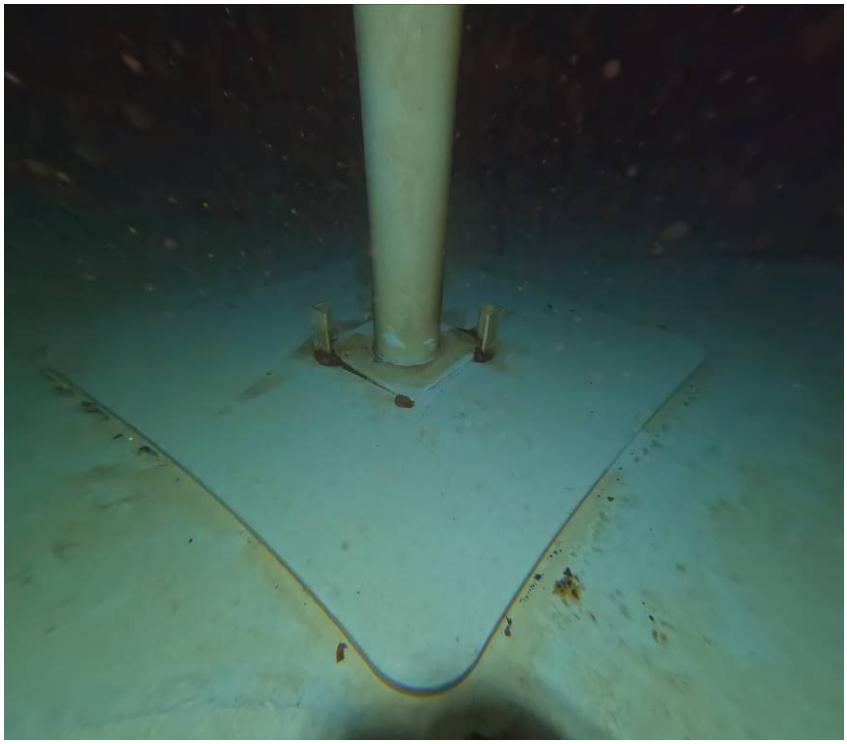
High Tank

Image #**21** *Capped-Off Penetration 3:15* **Condition:** Rust Grade[1] **8.** **Description:** Capped-Off Penetration appeared to be in good condition with a minor amount of corrosion.	
Image #**22** *Wall 6:00* **Condition:** Rust Grade[1] **8.** **Description:** Wall appeared to be in good condition with a minor amount of corrosion.	

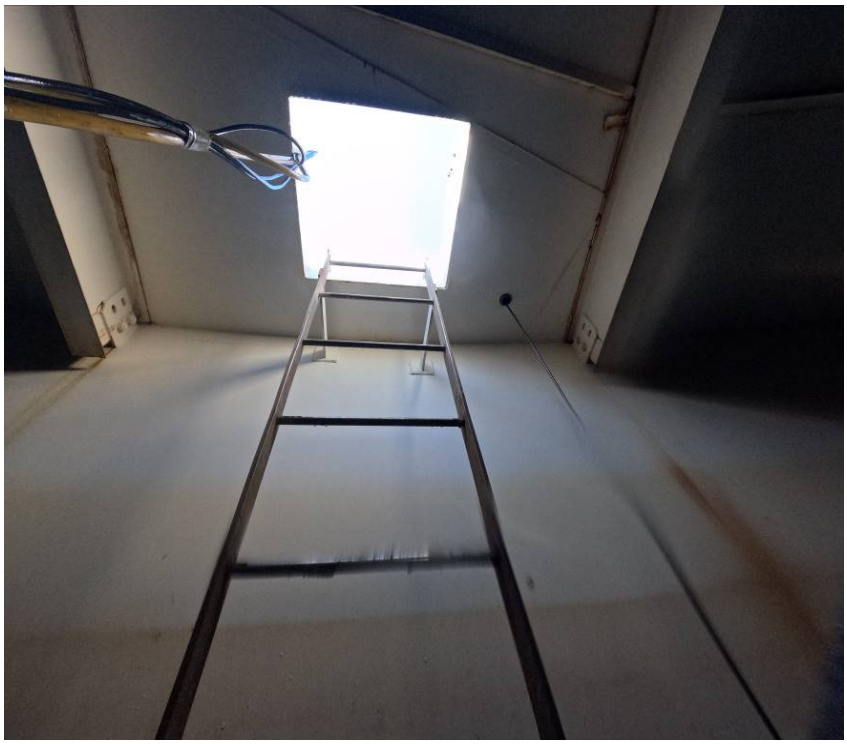
High Tank

Image #**23** *Floor 6:00* **Condition:** Rust Grade[1] **8.** **Description:** Floor appeared to be in good condition with a minor amount of corrosion.	
Image #**24** *Wall 9:00* **Condition:** Rust Grade[1] **8.** **Description:** Wall appeared to be in good condition with a minor amount of corrosion.	

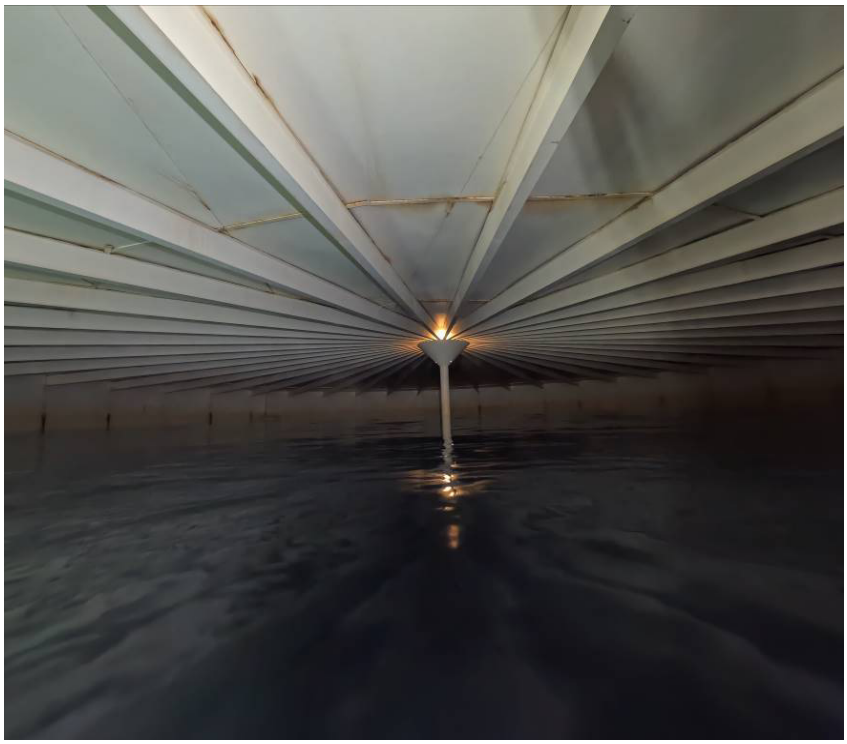
High Tank

Image #**25** *Floor 9:00* **Condition:** Rust Grade[1] **8.** **Description:** Floor appeared to be in good condition with a minor amount of corrosion.	
Image #**26** *Column Center* **Condition:** Rust Grade[1] **8.** **Description:** Column appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image **#27** *Ceiling 12:00* **Condition:** Rust Grade[1] **7.** **Description:** Ceiling appeared to be in good condition with a minor amount of corrosion.	
Image **#28** *Ceiling 3:00* **Condition:** Rust Grade[1] **7.** **Description:** Ceiling appeared to be in good condition with a minor amount of corrosion.	

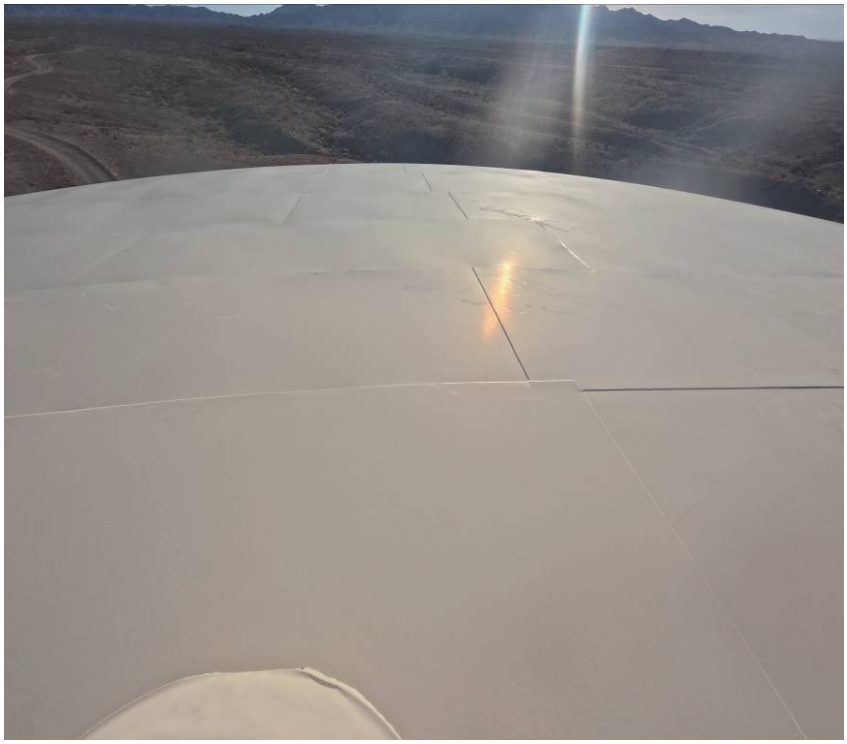
High Tank

Image #**29** *Ceiling 6:00* **Condition:** Rust Grade[1] **7.** **Description:** Ceiling appeared to be in good condition with a minor amount of corrosion.	
Image #**30** *Ceiling 9:00* **Condition:** Rust Grade[1] **8.** **Description:** Ceiling appeared to be in good condition with a minor amount of corrosion.	

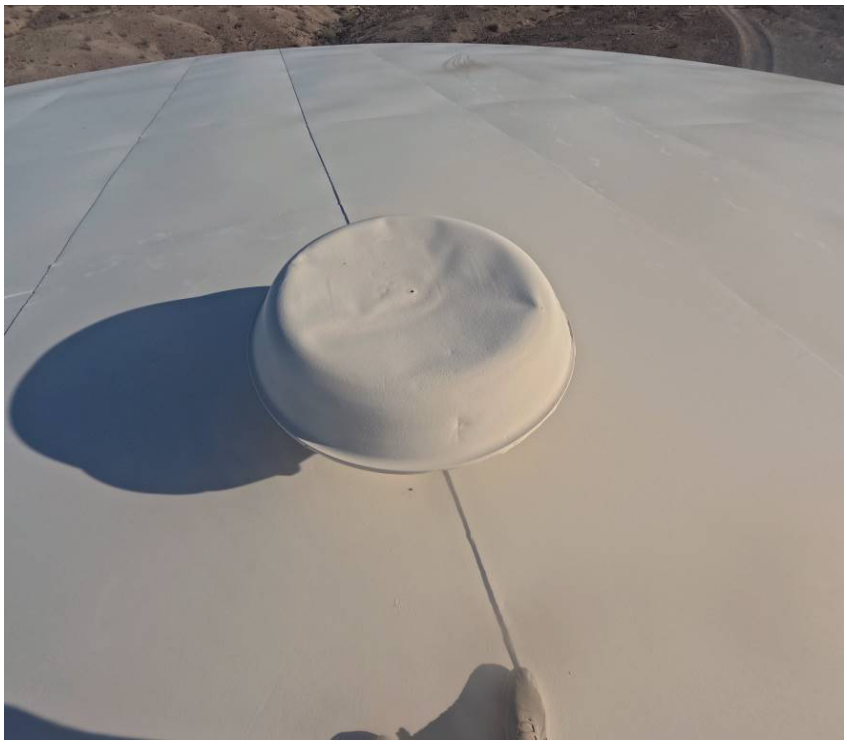
High Tank

Image #**31** *Roof 12:00* **Condition:** Rust Grade[1] **8.** **Description:** Roof appeared to be in good condition with a minor amount of corrosion.	
Image #**32** *Roof 3:00* **Condition:** Rust Grade[1] **8.** **Description:** Roof appeared to be in good condition with a minor amount of corrosion.	

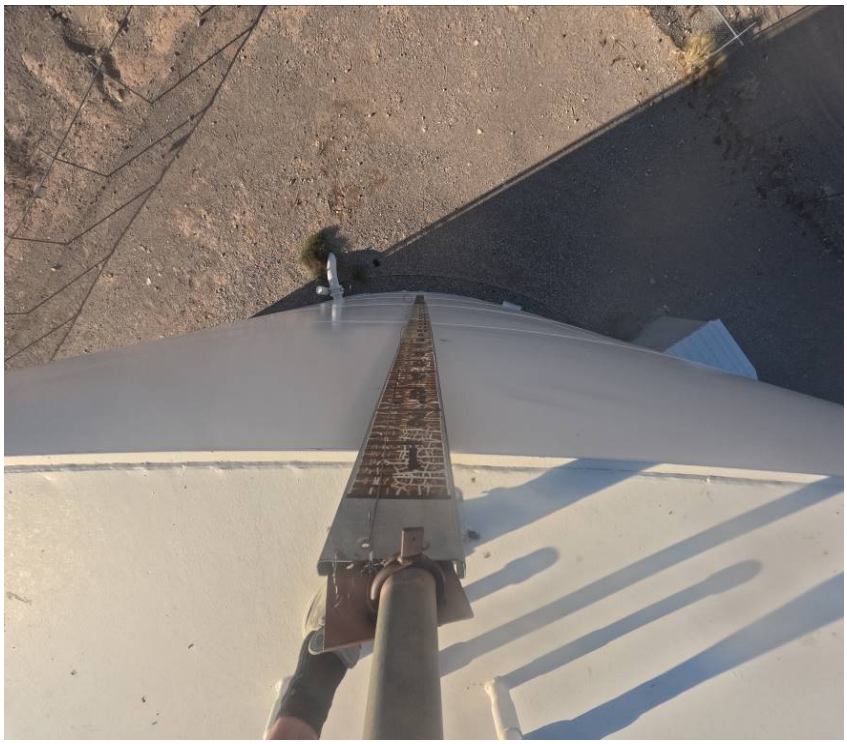
High Tank

Image #**33** *Roof 6:00* **Condition:** Rust Grade[1] **8.** **Description:** Roof appeared to be in good condition with a minor amount of corrosion.	
Image #**34** *Roof 9:00* **Condition:** Rust Grade[1] **8.** **Description:** Roof appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**35** *Vent Center* **Condition:** Rust Grade[1] **8.** **Description:** Vent appeared to be in good condition with a minor amount of corrosion.	
Image #**36** *Vent Screen Center* **Condition:** Rust Grade[1] **8.** **Description:** Vent Screen appeared to be in good condition with a minor amount of corrosion.	

High Tank

Image #**37** *Liquid Level Indicator Reader Board 12:45* **Condition:** Rust Grade[1] **6.** **Description:** Liquid Level Indicator Reader Board appeared to be in poor condition with a moderate amount of corrosion. An interior cable appeared to be broken.	
Image #**38** *Liquid Level Indicator Penetration 12:45* **Condition:** Rust Grade[1] **7.** **Description:** Liquid Level Indicator Penetration appeared to be in poor condition with a minor amount of corrosion. An interior cable appeared to be broken.	

High Tank

Image #**39** *Entry Hatch 12:00* **Condition:** Rust Grade[1] **8.** **Description:** Entry Hatch appeared to be in good condition with a minor amount of corrosion.	
Image #**40** *Entry Hatch 12:00* **Condition:** Rust Grade[1] **7.** **Description:** Entry Hatch appeared to be in good condition with a minor amount of corrosion. Weather stripping did not appear to be present.	

High Tank

Image **#41** *Interior Ladder 12:00* **Condition:** Rust Grade[1] **7.** **Description:** Interior Ladder appeared to be in good condition with a minor amount of corrosion.	

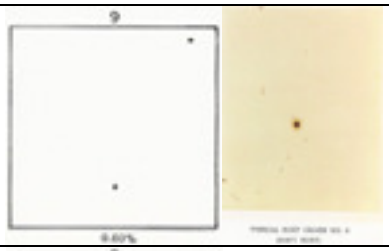
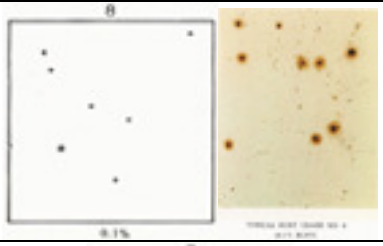
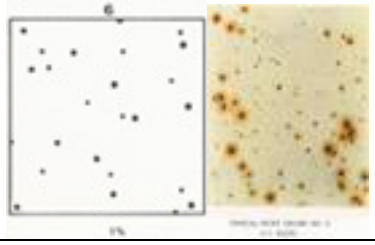
High Tank

REFERENCES:

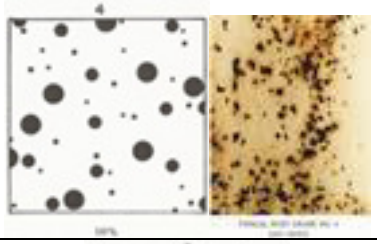
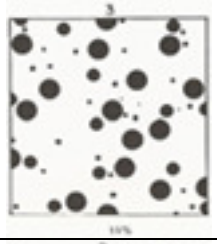
Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces – SSPC-Vis 2-82 & ASTM D 610-85 (1989)

The graphical representations show examples of area percentages, which may be helpful in rust grading. The use of photographical reference standards requires the following precautions:

1. Some finishes are stained by rust. This staining must not be confused with the actual rusting involved.
2. Accumulated dirt or other material may make accurate determination of the degree of rusting difficult.
3. Certain types of deposited dirt that contain iron or iron compounds may cause surface discoloration that should not be mistaken for corrosion.
4. It must be realized that failure may vary over a given area and discretion must therefore be used in applying these reference standards.
5. In evaluating surfaces, consideration shall be given to the color of the finish coating, since failures will be more apparent on a finish that shows color contrast with rust, such as white, than on a similar color, such as iron oxide finish.
6. The photographic reference standards are not required for use of the rust-grade scale since the scale is based upon the percent of the area rusted and any method of assessing area rusted may be used to determine the rust grade.

Rust Grades	Description	Graphical Representation
10	No rusting or less than 0.01% of surface rusted	Unnecessary
9	Minute rusting, less than 0.03% of surface rusted	
8	Few isolated rust spots, less than 0.1% of surface rusted	
7	Less than 0.3% of surface rusted	
6	Extensive rust spots, but less than 1% of surface rusted	

High Tank

5	Rusting to the extent of 3% of surface rusted	
4	Rusting to the extent of 10% of surface rusted	
3	Approximately one sixth of the surface rusted (16%)	
2	Approximately one third of the surface rusted (33%)	
1	Approximately one half of the surface rusted (50%)	
0	Approximately 100% of the surface rusted	Unnecessary