

Dixon Engineering, Inc.

Preliminary Maintenance Inspection
25,000 Gallon Elevated Legged Tank

Buyse Water Association
Coal Valley, Illinois

Inspection Performed: September 19, 2018
Reviewed by Joseph T. Hoban P.E.: October 19, 2018

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EXECUTIVE SUMMARY

The tank has many safety and operational deficiencies and several potentially dangerous climbing and access issues. The overall recommendation of this report is to continue using the tank and demolish it when the tank is in need of any major repairs. Repair and maintenance costs have risen a great deal in the past 5 years. The costs to bring this tank up to OSHA and AWWA standards as well as repainting the tank are high enough to consider replacing the tank. The cost to make all the recommended repairs and repainting is estimated at \$288,000 (plus engineering and contingencies). Old riveted, lattice legged tanks are very difficult to rig and work on. Painter's bid much higher to do this work in comparison to modern style tanks. With a new tank the future maintenance costs would be considerably less. Also, changes to the location, capacity, and elevation of a new tank may better suit long term system needs. We recommend you discuss the feasibility of a new storage tank with your consulting engineers prior to starting any major maintenance work on this tank. New tanks are also more likely to qualify for long term loan or grant financing through traditional water system funding sources.

The estimated cost to demolish the existing tank is \$30,000 and an estimated cost to construct a new elevated 50,000 gallon tank is \$600,000.

CONCLUSIONS:

1. The exterior coating is an acrylic overcoat system that is in fair to poor condition overall. The coating is moderately faded. Coating deterioration includes spot failures to the substrate with rust undercutting, delamination, and erosion. The coating has poor adhesion and there are numerous spot failures throughout.
2. The wet interior coating is an epoxy overcoat system that is in fair to poor condition overall. Below the high-water level the coating deterioration includes spot failures on the bowl and sidewall. Above the high-water level the coating is deteriorating to the steel substrate at the roof panels and open lap seam.
3. One exterior and one wet interior coating samples were taken and analyzed for heavy metal content. Test results indicated the exterior is a lead and chrome bearing coating and the wet interior coating contains trace levels of lead and chrome.

RECOMMENDATIONS:

1. Complete the recommended work in one to two years. The coating work is the greatest cost and largest part of the recommendations. The repairs and upgrades should be completed during the next major tank rehabilitation project when coating repairs are made.
2. Abrasive blast clean the exterior to a commercial (SSPC-SP6) condition inside a dust tight flexible containment system and repaint with a polyurethane coating system. The estimated cost is \$120,000 plus \$60,000 for containment.
3. Abrasive blast clean the entire wet interior to a near-white metal (SSPC-SP10) condition and repaint with a three coat epoxy system with a zinc primer. The estimated cost is \$30,000.
4. After coating the wet interior, seal the roof lap joints with urethane caulk. The estimated cost is \$1,000.
5. Remove soil on the foundations to expose the top 3 inches of the foundations. Work can be performed by in-house personnel.
6. Coat the foundation to help prevent further deterioration. The cost would be incidental to exterior coating.

7. Install an opening in the balcony railing at the leg ladder connection and install a swing gate. The estimated cost is \$5,000.
8. Install a kick plate on the balcony railing. The estimated cost is \$4,000.
9. Install a handrail on the roof. The estimated cost is \$10,000.
10. Install rigging couplings on the roof for temporary fall prevention of workers in the wet interior. The cost would be incidental to the next coating project.
11. Install rigging couplings under the bowl, halfway between each leg and the riser. The couplings would be used by contractors for rigging safety lines during exterior work. The cost would be incidental to recoating costs.
12. Replace the PVC overflow pipe with a steel pipe and install a flap gate at the discharge. The estimated cost is \$8,000.
13. Install a concrete splash pad under the discharge end of the overflow pipe to prevent soil erosion and possible undermining of the foundation. The estimated cost is \$2,000.
14. Replace the wet interior roof hatch with a 30 inch diameter hatch. The estimated cost is \$3,000.
15. Install a roof vent with a new frost-free pressure vacuum vent. The estimated cost is \$6,000.
16. Install a step-off platform at the top of the sidewall and install a new sidewall ladder. The estimated cost is \$10,000.
17. Replace the exterior leg ladder with a new ladder with a fall prevention device. The estimated cost is \$10,000.
18. Install a vandal guard on the exterior leg ladder to prevent access. The estimated cost is \$2,000.
19. Remove the damaged ladder from the wet interior and replace with a new ladder equipped with a fall prevention device. The estimated cost is \$10,000.
20. Install vandal plates on the front and back of the lattice legs to prevent access to the tank. The estimated cost is \$6,000.

21. Install a deflector plate or bar on the fill/draw pipe. The estimated cost is \$1,000.

A DISCUSSION ON RESCUE AND RETRIEVAL OPERATIONS FROM ELEVATED LEG STORAGE TANKS

A series of accidents involving falls from or in water tanks has highlighted inadequacies in water tower design and a potentially greater problem. The rescue may be more dangerous, with potential for more loss of life or injury, than the original accident. Contractors and engineers are responsible for their own employees, but even with safety training and proper equipment, accidents can occur. Most rescue squads are local or neighboring fire departments, with some departments having more practice than others. Water storage tanks are designed to store water and are not suited for rescue or retrieval convenience. This discussion is offered as a starting point. We recommend that you meet with your rescue personnel and draft a rescue plan. A copy of the plan should be kept at the tank and with the rescue crew.

OSHA may soon require 30 inch manways and hatches with fall prevention on all ladders. Dixon Engineering has always objected to replacement of ladders especially on retrofit of existing tanks as new regulations are passed on a relatively frequent basis. We recommend the changes for the convenience and safety of your employees, rescue personnel, and others working on the structure. As far as we know, none of these conversion items recommended are required or mandated by any government agency for retrofits.

DIXON recommends these changes be made during the next major tank coating project.

RETRIEVAL FROM INTERIOR:

Current Access:

Access to the roof is from the lattice leg and the sidewall ladder. There is not a usable ladder in the wet interior from the roof hatch to the bowl area. The leg, sidewall, and wet interior ladders are not equipped with fall prevention devices. The roof has an 18 inch square hatch for the wet interior. There is no handrail on the roof.

Procedure:

1. There is no riser, so retrieval must be to the roof and over the side or by helicopter. Rescue personnel would gain access to the roof using the new ladders equipped with new fall prevention devices. Access to the bowl would be through the new roof hatch and on the new wet interior ladder. The crew would remove the new vent from the top center of the tank and attach a winch or pulley system to a tripod set-up over the opening. On the

roof, personnel would be working from inside the security of a roof railing around the center attachment area and the roof hatch.

2. The crew would raise the basket to the roof and out the new 30 inch roof hatch. From the roof it is possible to lower the basket over the side to ground level, but that would require a very large winch and increased loading on the attachment point. On a rainy, windy, or snowy day, the objective would be to get rescue personnel off the roof as soon as possible. A helicopter rescue from the roof would be required.

Modifications Necessary (As stated in the recommendations):

1. Install a new sidewall ladder with a step-off platform.
2. Install a new 30 inch roof hatch.
3. Install a 42 inch high railing on the roof.
4. Install a new wet interior ladder.
5. Install a new leg ladder.

Equipment:

Winch or pulley system and a tripod
Tag line
Basket

COST SUMMARY:

Exterior recoat repaint with containment	\$180,000
Wet interior repaint	30,000
Caulk roof lap seams	1,000
Balcony opening	5,000
Balcony kick plate	4,000
Roof handrail	10,000
Overflow pipe	8,000
Overflow splash pad	2,000
30 inch roof hatch	3,000
Frost-free roof vent	6,000
Step-off platform and sidewall ladder	10,000
Leg ladder	10,000
Wet interior ladder	10,000
Vandal guard on leg ladder	2,000
Vandal plates on double lattice legs	6,000
Fill pipe deflector plate	<u>1,000</u>
Sub Total	\$288,000
Engineering and Contingencies	<u>\$42,000</u>
Total	\$330,000

Notes: Exterior coating is primarily for aesthetics and can be delayed as long as desired. While the appearance of the tank will worsen the structural integrity should not be impacted.

The cost estimate for exterior painting is 50% higher than that of modern style tanks of the same size due to the lattice design on the legs and struts. The lattices create several hard to reach areas, making blast cleaning and painting much more time consuming and difficult.

INSPECTION:

On September 19, 2018 Dixon Engineering Inc. performed a preliminary maintenance inspection on the 25,000 gallon legged elevated water storage tank owned by the Buysse Water Association in Coal Valley, Illinois. Purposes of the inspection were to evaluate the interior and exterior coating's performance and life expectancy, assess the condition of metal surfaces and appurtenances, review safety and health aspects and make budgetary recommendations for continued maintenance of the tank. All recommendations with budgeting estimates for repairs are incorporated in this report. The inspection was performed by Josh Grover, Assistant Project Manager. The inspector was assisted by Lane Tremblay, ROV Operator, and Mike Pickett, Staff Technician.

The wet interior inspection was completed with a remotely operated vehicle (ROV). Video of the inspection and still photos are included with this report. No cleaning was performed in the wet interior during the ROV inspection.

TANK INFORMATION:

The tank was built with an estimated height to low-water level of 80 feet. The tank is riveted construction. The exterior and wet interior were last coated in 2013 by Putnam County Painting Inc.

CONDITIONS AND RECOMMENDATIONS:

EXTERIOR COATING CONDITIONS:

Information provided by the Buysse Water Association to DIXON indicated the exterior was repainted in 2013. The exterior was pressure washed and spot power tool cleaned to SSPC-SP11 condition. The coating applied was an acrylic system. The coating was applied over an aluminum alkyd system.

The coating is in fair to poor condition overall. The coating is beginning to chalk and fade and there is loss of gloss. Surfaces have faded due to exposure to ultraviolet light, which is a normal occurrence for an exterior coating system. There are numerous coating failures throughout. Coating failures include spot failures to the substrate with rust undercutting, delaminated topcoat and erosion.

The bowl and sidewall is covered with moderate mildew growth.

Poor adhesion was noted on the ASTM X-cut test areas, with nearly complete loss of topcoat to the substrate in areas tested. The tank is not a candidate for overcoating.

The coating was tested at 0.98 percent (9,800 ppm) lead by weight, 0.21 percent (2,100 ppm) chromium by weight, and less than the reporting limit of cadmium by weight. Special considerations will be needed during maintenance to avoid contamination of workers and prevent generation of a hazardous waste.

EXTERIOR COATING RECOMMENDATIONS:

Remove the existing coating by dry abrasive blast cleaning the steel to a commercial (SSPC-SP6) condition and apply a polyurethane system. All blast work would be performed inside a dust tight containment system using negative air pressure.

Total removal is recommended because the coating failures are extensive, and it is not practical to attempt to spot repair. The tank no longer has proper adhesion. The exterior has been overcoated at least once and cannot support additional coats.

Since the existing coating contains heavy metals, during abrasive blast cleaning procedures the waste generated may be considered hazardous waste and groundwater leachable. In addition, the airborne particulate of spent abrasive and heavy metal bearing coating may be considered a threat to public health, not only to workers, but also to pedestrians, houses and business owners in the immediate vicinity. Special provisions in project specifications will be necessary to address hazardous waste, worker safety and environmental concerns.

We recommend the exterior and the wet interior be completed at the same time because the wet interior also has a heavy metal bearing coating. There would be some economy-of-scale to remove all heavy metal bearing coating at the same time. If the wet interior heavy metal content were high enough to trigger OSHA compliance rules, decontamination and air filtration would already be on-site to deal with the exterior.

The coating system would consist of a full prime coat on the bare metal, a full coat of epoxy, followed by two full coats of polyurethane. The polyurethane system offers excellent abrasion resistance with high gloss and sheen retention. The expected life of this system is fifteen years. The system can be recoated again in fifteen years, and a second time approximately fifteen years after the first recoating, extending the total life of the coating to approximately forty-five years before total removal would be necessary. The tank would be removed from service during the coating project. This is necessary to reduce condensation on the tank's surface. Polyurethane coatings have a minimum

temperature requirement for application and are sensitive to moisture during the curing process. If moisture is present during the curing process, the appearance will become cloudy with little or no gloss. The estimated cost to abrasive blast clean and recoat with an epoxy polyurethane system is \$120,000 plus \$60,000 for containment.

WET INTERIOR COATING CONDITIONS:

Information provided by the Buisse Water Association to DIXON indicated the wet interior was repainted in 2013. The wet interior was spot abrasive blast cleaned to SSPC-SP10 near-white condition. The coating applied was an epoxy overcoat system.

The roof coating is in poor condition overall with the primary areas of deterioration along the lap seam and in the crevices. The roof contains open lap seams that have started to rust and streak. Staining is typical for a tank of this construction where the lap seams are open and not seal welded or caulked. Staining in the lap seams is not a concern but should be monitored during future inspections for corrosion growth. There are also spot failures and rust undercutting on roof panels.

The sidewall coating is in fair condition with several small failures. Primary method of deterioration is spot failures to the steel substrate. There is not any significant damage at the high-water level which would be the area most affected by ice pressures and ice movement. There was pitting prior to the application of the previous coating system on the sidewall.

The bowl was covered with approximately ½ inch of sediment that limited the amount of surface visible with the ROV.

The surfaces below the normal operating water level are covered with mineral staining which does not affect the integrity of the coating system.

The coating was tested at 0.0038 percent (38 ppm) lead by weight, 0.022 percent (220 ppm) chromium by weight, and less than the reporting limit of cadmium by weight. There are trace levels that should not generate hazardous waste during future abrasive blast cleaning.

WET INTERIOR COATING RECOMMENDATIONS:

Remove the coating system by abrasive blast cleaning the metal to a near-white metal (SSPC-SP10) condition and apply an epoxy coating system with a zinc primer. Wet interior coating systems are to be approved for potable water storage tanks contingent upon meeting requirements of NSF/ANSI 61.

DIXON recommends application of epoxy coating systems in most applications because they have good adhesion and abrasion resistant qualities. Their drawbacks include a minimum application temperature of 50°F (35°F for fast cure) and long cure times. A typical cure time can be seven days at 70°F and up to twenty-eight days at 35°F. The estimated cost to apply the three-coat epoxy system is \$30,000.

After coating the roof, use a urethane caulk to fill gaps between roof sheets. The caulk will fill open joints and seal edges, extending the life of the wet interior coating. The estimated cost is \$1,000.

PIPING CONDITIONS: (IN BUILDING)

There is a pump house adjacent to the tank that contains piping and valves. The piping is in good condition. The piping is covered with insulation and plastic jacketing.

SITE CONDITIONS:

The tank is located on a small fenced site. The tank is adjacent to residential development.

FOUNDATION CONDITIONS:

The foundations are covered with soil and were unable to be inspected.

There are two anchor bolts on each leg. The anchor bolts are in good condition. The anchor bolts are mostly covered in soil and were unable to be inspected.

FOUNDATION RECOMMENDATIONS:

Remove soil at the foundation to expose the top 3 inches of the foundations. Work can be performed by in-house personnel. After soil is removed the foundations can be properly inspected.

Coat the foundation to help prevent further deterioration. The cost would be incidental to exterior coating.

BALCONY CONDITIONS:

The exterior balcony is a walkway that surrounds the sidewall that is in fair condition. The balcony is 16 inches wide with a 31 inch high handrail. The handrail consists of vertical posts with diagonal angles. There is no kick plate at the balcony floor. The balcony and railing do not conform to current OSHA requirements.

There is not an opening in the balcony or balcony railing for leg ladder access. Personnel are required to climb from the ladder over the railing to access the balcony walkway.

BALCONY RECOMMENDATIONS:

OSHA currently requires railings to be 42 inches tall. Unless we feel balconies are unsafe, it is our opinion that if the balconies were built to code at the time of construction including the railing height and style, they do not require replacement. Codes can change regularly making compliance expensive and impractical. It is, however, our responsibility to inform you of this possible deficiency.

Install an opening at the balcony railing at the leg ladder connection and install a swing gate. The opening allows the climber to transition from the ladder to the balcony without climbing over the balcony. The estimated cost is \$5,000.

Install a kick plate around the balcony railing. The estimated cost is \$4,000.

ROOF HANDRAIL AND PAINTER'S RAILS:

There are no roof rigging couplings for safety and staging lines during wet interior coating work.

The tank does not have a roof handrail or a painter's rigging rail.

ROOF HANDRAIL AND PAINTER'S RAIL RECOMMENDATIONS:

Install an OSHA compliant railing on the roof. The railing would allow tie off locations during routine vent screen inspections and would provide a safe work area for retrieval personnel performing a roof extraction. The estimated cost is \$10,000.

Install rigging couplings on the roof for fall prevention of workers in the wet interior. The couplings would allow a contractor working in the wet interior to be tied-off to a fall prevention device at all times. The cost would be incidental to the recoating.

SWAY ROD/BOWL SAFETY CONDITIONS:

The tank has sway rods and struts that connect between legs. The rods are intended to keep the legs in alignment. The sway rods and struts are in good condition. Because of the inaccessibility of the upper sway rods the tension could not be determined at every bay. However, based on the accessible bay it appears that the rods are in proper tension as designed.

The tank has tie cables that extend from the leg columns to the fill/draw pipe with fixed lug connections. The rods help keep the fill/draw pipe in alignment. The tie cables are in good condition.

There are no rigging couplings under the bowl for safety line attachments during exterior coating.

SWAY ROD/BOWL SAFETY RECOMMENDATIONS:

Install rigging couplings on the bowl halfway between each leg and the fill/draw pipe. The couplings would be used by contractors for rigging safety lines. Currently the contractor does not have a separate independent tie off location for safety lines. The rigging and safety lines would be tied to the same location. The cost would be incidental to exterior painting.

OVERFLOW PIPE CONDITIONS:

The tank has a 3.5 inch diameter overflow pipe that exits the upper sidewall, extends down along the sidewall, over the balcony and down along a leg to ground level. The pipe is constructed of PVC from the sidewall down. The discharge end of the overflow pipe is screened. The screen is in good condition.

The pipe discharges to a plastic splash pad without the required air gap. The discharge area is in good condition.

OVERFLOW PIPE RECOMMENDATIONS:

Replace the PVC overflow pipe with a steel pipe and install a flap gate at the discharge. The estimated cost is \$8,000.

Level the area of the overflow discharge. Install a concrete splash pad to prevent any further soil erosion. The estimated cost is \$2,000.

HATCH AND MANWAY CONDITIONS:

There is an 18 inch square, flip-top roof hatch to the wet interior that is in poor condition. There is no handhold next to the hatch to aid in entering and exiting the opening. The wet interior roof hatch was not secured with a padlock.

HATCH AND MANWAY RECOMMENDATIONS:

Replace the wet interior roof access hatch with a new 30 inch hatch. The estimated cost is \$3,000.

VENT CONDITIONS:

The roof does not contain a vent.

VENT RECOMMENDATIONS:

Install a screened frost-free pressure vacuum vent. The new vent would have a movable plate that would allow air to flow in and out of the tank even if the screens become plugged or frosted over. The vent can be removed during coating or rescue operation for additional light and ventilation. The estimated cost is \$6,000.

LADDER CONDITIONS:

The tank has an exterior leg ladder that starts approximately 6 feet below the balcony. The lattice leg can be climbed from the ground to the ladder.

There are no vandal plates on any of the lattice legs.

The tank has a fixed sidewall ladder. The sidewall ladder is not equipped with a fall prevention device.

The wet interior contains a ladder from the roof to the bowl that is in poor condition. The ladder is not equipped with a fall prevention device.

LADDER RECOMMENDATIONS:

Install a step-off platform at the top of the sidewall and install a new sidewall ladder. The estimated cost is \$10,000.

Install a new leg ladder with a fall prevention device. The estimated cost is \$10,000.

Install a vandal guard on the leg ladder to prevent access. The estimated cost is \$2,000.

Install vandal plates on the double lattice legs. The estimated cost is \$6,000.

Replace the damaged ladder in the wet interior with a new fall prevention device. The estimated cost is \$10,000.

FILL/DRAW PIPE CONDITIONS:

The tank fills and draws from a single pipe. The fill/draw pipe is routed through the wet interior into the bottom of the bowl and extends approximately one foot into the bottom of the tank. There is not a deflector plate or bar over top of the pipe in the wet interior.

FILL/DRAW PIPE RECOMMENDATIONS:

Install a deflector plate or bar over the end of the fill/draw pipe to prevent debris or ice from plugging the opening. The estimated cost is \$1,000.

INSULATION CONDITIONS:

The fill/draw pipe is covered with rigid foam insulation that is in fair condition and an aluminum jacket.

INSULATION RECOMMENDATIONS:

Remove the insulation from the fill/draw pipe, during the abrasive blast clean and coat the pipe, and then reinstall the existing insulation and jacketing. The cost would be incidental to exterior painting.

WET INTERIOR METAL CONDITIONS:

The steel structure is in fair condition above and below the high-water level. No active pitting was observed at the coating failures.

Minor pitting had occurred on the sidewall prior to the last coat project.

ANALYTICAL LABORATORY REPORT

Friday, September 28, 2018

Page 1 of 2

CUSTOMER: Dixon Engineering - WI
5307 S. 92nd St. Suite 125
Hales Corners, WI 53130

DATE RECEIVED: Tuesday, September 25, 2018
PO/PROJECT #:
SUBMITTAL #: 2018-09-25-007

LAB NUMBER: AC63124

Sampled By: Tom Van Gemert

Date Sampled: September 19, 2018

Job Location: Buysse Water Assoc. 25M Toro 13-37-66-01

Sample Description: Paint Chips

Sample Identification: 1 - Exterior Leg Lead, Cad, Chrome

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)

Analysis Method: EPA 6010C-M (ICP-AES Method for Determination of Metals)

Date Analyzed: Thursday, September 27, 2018

<u>ELEMENT</u>	<u>RESULT (by dry weight)</u>	<u>REPORTING LIMIT (RL)</u>
Cadmium	< RL	0.00075 %
Chromium	0.21 %	0.0013 %
Lead	0.98 %	0.0025 %

LAB NUMBER: AC63125

Sampled By: Tom Van Gemert

Date Sampled: September 19, 2018

Job Location: Buysse Water Assoc. 25M Toro 13-37-66-01

Sample Description: Paint Chips

Sample Identification: 2 - Wet Interior roof Lead, Cad, Chrome

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)

Analysis Method: EPA 6010C-M (ICP-AES Method for Determination of Metals)

Date Analyzed: Thursday, September 27, 2018

<u>ELEMENT</u>	<u>RESULT (by dry weight)</u>	<u>REPORTING LIMIT (RL)</u>
Cadmium	< RL	0.00075 %
Chromium	0.022 %	0.0013 %
Lead	0.0038 %	0.0025 %

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DIXON ENGINEERING, INC.
STEEL TANK FIELD INSPECTION REPORT
LEGGED TANK

DATE: September 19, 2018

OWNER: Buyse Water Association
 CLIENT CODE: 13-37-66-01
 LOCATION: Street: 19295 Buyse Road
 City: Coal Valley
 State: Illinois

TANK SIZE: Capacity: 25,000 gallons
 Height to bottom (LWL): 80 feet
 Height to overflow (HWL): 100 feet
 Head range: 20 feet

CONSTRUCTION: Riveted
 Type: Flat Roof

COATING HISTORY	<u>EXTERIOR</u>	<u>WET INTERIOR</u>
DATE LAST COATED	<u>2013</u>	<u>2013</u>
CONTRACTOR	<u>Putman County Painting</u>	<u>Putman County Painting</u>
COATING SYSTEM	<u>Acrylic over aluminum</u>	<u>Epoxy</u>
SURFACE PREPARATION	<u>SSPC-SP11</u>	<u>SSPC-SP11</u>
COATING MANUFACTURER	<u>Tnemec</u>	<u>Tnemec</u>
HEAVY METAL COATING SAMPLES	<u>Yes</u>	<u>Yes</u>
HEAVY METAL BEARING	<u>Yes 0.98% lead 0.21% chrome</u>	<u>Yes 0.0038% lead 0.022% chrome</u>

PERSONNEL: Inspector Josh Grover, Top person Mike Pickett,
 ROV operator Lane Tremblay
 TYPE OF INSPECTION: Preliminary Maintenance
 METHOD OF INSPECTION: ROV
 DATE LAST INSPECTED: Unknown

SITE CONDITIONS

Fenced: **Yes**
Site large enough for contractor's equipment: **Yes**
Control building: **Yes**
Antenna control site: **No**
Neighborhood: **Residence**
Power lines within 50 feet: **No**
Site drainage: **Away from tank**
Indications of underground leakage: **No**
Shrub, tree, etc. encroachment: **No**

EXPOSED PIPING:

Location: **Adjacent to tank (in control building)**
Condition of structure: **Good**
 Structure is: **Dry**
 Pump present: **No**
Door condition: **Good**
 Locked: **Yes**
Altitude valve: **No**
Pipe coating condition: **Unknown**
Condition of metal: **Good**
Piping comments: **The piping is covered with insulation and jacketing.**

FOUNDATION

Fill pipe:

Riser foundation comments: **The fill pipe runs directly into the ground. There is no concrete foundation.**

Legs:

Foundations exposed: **No**
Undermining of foundation: **N/A**

EXTERIOR COATING

Legs:

Number: **4**
Type: **Double lattice**
 Dimensions: **6 x 9 inches**
Topcoat condition: **Fair**
Previous system condition: **Fair**
Describe coating: **Fading, delaminating, spot coating failures to substrate, rust undercutting, erosion, micro-cracking**

EXTERIOR COATING

Dry film thickness: **18-21 mils**

Coating adhesion: **0A**

Metal condition: **Good**

Leg comments: **There are one hundred plus spot coating failures mainly at the crevices.**

Fill pipe:

Type: **Wet**

Diameter: **6 inches**

Topcoat condition: **Fair**

Describe coating: **Fading, delaminating, spot coating failures to substrate**

Mildew growth: **No**

Metal condition: **Good**

Riser comments: **Covered in insulation and aluminum jacketing. There was only a small section visible for coating inspection.**

Bowl:

Topcoat condition: **Poor**

Previous system condition: **Poor**

Describe coating: **Fading, delaminating, spot coating failures to substrate, rust undercutting**

Mildew growth: **Yes - moderate**

Metal condition: **Good**

Bowl comments: **There are fifty plus spot coating failures.**

Sidewall:

Lettering: **No**

Logo: **No**

Topcoat condition: **Fair**

Previous system condition: **Fair**

Describe coating: **Fading, spot coating failures to substrate, rust undercutting, erosion**

Dry film thickness: **14-20 mils**

Metal condition: **Good**

Sidewall comments: **There are fifty plus spot coating failures with moderate mildew growth.**

EXTERIOR COATING

Roof:

Topcoat condition: **Poor**

Previous system condition: **Poor**

Describe coating: **Fading, spot coating failures to substrate, rust undercutting, erosion**

Dry film thickness: **14-18 mils**

Metal condition: **Good**

Roof comments: **There are pinholes in the roof to the wet interior at electrical junction and hatch. The roof holds water.**

EXTERIOR APPURTENANCES

Anchor bolts:

Number of bolts per leg: **2**

Diameter: **1 inch**

Coating condition: **Fair**

Metal condition: **Good**

Number of riser bolts: **0**

Bolt comments: **Only the top is exposed.**

Overflow pipe:

Diameter: **3 ½ inches**

Coating condition: **Fair**

Metal condition: **N/A**

Condition of screen: **Good**

Percent of screen open: **99**

Mesh size: **24**

Flap gate: **No**

Air gap: **Yes**

Highest part of discharge to the ground distance: **3 inches**

Splash pad: **Yes**

Type: **Plastic pad**

Condition: **Fair**

Overflow comments: **The overflow is constructed of PVC pipe.**

Mud valve:

N/A

Sample Tap:

Location: **In building**

Pipe diameter greater than ¼ inch: **Yes**

EXTERIOR APPURTENANCES

12 inches or more above the ground/floor: **Yes**

Down Turned: **Yes**

Smooth end: **Yes**

In heated box/room: **Yes**

Condition: **Good**

Leg ladder:

Height to start of ladder: **6 feet below balcony**

Toe clearance: **Less than 7 inches**

Width of rungs: **10 inches**

Thickness of rungs: **1/2 inch**

Shape of rungs: **Round**

Coating condition: **Poor**

Metal condition: **Good**

Fall prevention device: **No**

Cage: **No**

Vandal guard: **No**

Step off platform: **No**

Struts and rods:

Number of bays: **3**

Sway rod coating condition: **Fair**

Metal condition: **Good**

Loose Rods: **No**

Strut coating condition: **Fair**

Metal condition: **Good**

Fill pipe cable coating condition: **Fair**

Metal condition: **Good**

Connection to riser: **Lugs**

Comments: **The fill pipe is supported by cables.**

Bowl rigging couplings:

N/A

Balcony:

Balcony width: **16 inches**

Railing height: **31 inches**

Midrail style: **Diagonals**

Kickplate height: **N/A**

Top Rail Type: **Angle**

EXTERIOR APPURTENANCES

Size: **1 ½ x 1 ½ inches**

Midrail/Diagonal Type: **Plate**

Size: **¼ x 1 ½ inches**

Opening for access: **No**

Missing any bolts or rivets: **Yes (# missing 3)**

Penetrations reinforced: **N/A**

Coating condition: **Poor**

Describe coating: **Fading, delaminating, rust undercutting, erosion, micro-cracking, clear coat skips**

Metal condition: **Fair**

Evidence of water pooling: **No**

Balcony comments: **There are holes through the balcony at the sidewall and tank connection.**

Sidewall manway:

N/A

Antennas:

N/A

Sidewall ladder:

Design: **Fixed**

Coating condition: **Poor**

Metal condition: **Good**

Toe clearance: **Less than 7 inches**

Width of rungs: **10 inches**

Thickness of rungs: **½ inch**

Shape of rungs: **Round**

Fall prevention device: **No**

Cage: **No**

Step-off platform:

N/A

Roof ladder:

N/A

Roof handrail:

N/A [Proposed diameter 10 feet]

EXTERIOR APPURTENANCES

Painter's rail:

N/A

Roof rigging couplings:

N/A

Removable cathodic caps:

N/A

Wet Interior Roof Hatch:

Neck size: **18 inches**

Distance from center of the tank (to outer edge): **2 feet**

Shape: **Square**

Handhold at opening: **No**

Hatch security: **None**

Outside coating condition: **Poor**

Inside coating condition: **Poor**

Metal condition: **Poor**

Hatch comments: **The lip of the hatch is deteriorated with holes that go through to the wet interior.**

Bolted ventilation hatch:

N/A

Roof vent:

N/A

Aviation lights:

N/A

Electrical:

N/A

WET INTERIOR COATING

Roof:

Topcoat condition: **Fair**

Primer coating condition: **Fair**

Describe coating: **Spot coating failures to substrate, rust undercutting**

Metal condition: **Fair**

WET INTERIOR COATING

Lap seams: Open

Condition of laps: Fair

Sidewall:

Topcoat condition: Fair

Primer coating condition: Fair

Describe coating: Spot coating failures to substrate

Mineral deposits: Light

Metal condition: Good

Active pitting: No

Previous pitting: Yes

Sidewall comments: There are one hundred plus small spot coating failures. There are a few thick coating patches on the sidewall.

Tank bottom:

Covered in sediment could not inspect with ROV

Type: Bowl

WET INTERIOR APPURTENANCES

Tank ladder:

Location: Roof to bowl

Toe clearance: Less than 7 inches

Width of rungs: 10 inches

Thickness of rungs: 5/8 inch

Shape of rungs: Rectangular

Shape of side rails: Flat

Coating condition: Poor

Metal condition: Poor (steel loss on top 3 rungs)

Fall prevention device: No

Ladder comments: This ladder is unsafe to climb.

Cathodic protection:

N/A

Clips: No

Pressure fitting: No

Roof stiffeners:

N/A

Sidewall stiffeners:

WET INTERIOR APPURTENANCES

N/A

Overflow pipe:

Type: Stub

Coating condition: Fair

Metal condition: Good

Fill pipe:

Diameter: 4 inches (estimated)

Height above riser bowl: 1 foot (estimated)

Deflector over end: No

Coating condition: Fair

Metal condition: Fair

Separate draw pipe:

N/A

Mixer:

N/A

Field Inspection Report is prepared from the contractor's viewpoint. It contains information the contractor needs to prepare his bid for any repair or recoating. The engineer uses it to prepare the engineering report. Cost estimates are more accurate if the contractor's problems can be anticipated. While prepared from the contractor's viewpoint, the only intended beneficiary is the owner. These reports are completed with diligence, but the accuracy is not guaranteed. The contractor is still advised to visit the site.



25,000 gallon elevated legged water storage tank located on Buysse Road in Coal Valley, Illinois.



1) The fill/draw pipe routes into the ground.

2) The fill/draw pipe is covered in insulation and aluminum jacketing.



3) The leg foundations are covered with dirt and gravel.



4) The anchor bolts are mostly covered in soil and gravel. The exposed coating is in fair condition.

5) The overflow pipe is constructed of PVC. The PVC is in good condition.



6) The overflow screen is in good condition.



7) There is a build-up of tar that was overcoated in the bottom of the lattice legs.

8) The leg coating is in fair condition overall with several spot coating failures.



9) Spot coating failures on a leg.



10) Same.

11) The ladder extends down approximately 6 feet from the balcony. The coating is in poor condition.



12) The coating on the struts is in fair condition.



13) The sway rod coating is in fair condition.

14) The bowl coating is in poor condition.



15) Spot coating failures on the bowl.



16) Same.

17) The balcony coating is in poor condition. There is no kickplate on the balcony railing.



18) Spot coating failures on the balcony.



19) Coating delamination on the balcony.

20) The sidewall coating is in fair condition overall.



21) Spot coating failures on the sidewall.



22) Same.

23) The sidewall ladder coating is in poor condition.



24) The roof coating is in poor condition overall.



25) Topcoat delamination on the roof.

26) Coating failures on the roof. There are small holes through the roof at the penetrations.

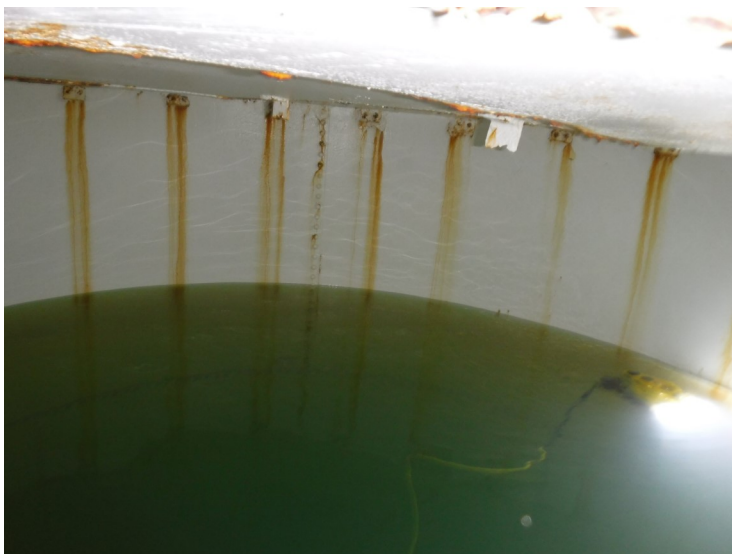
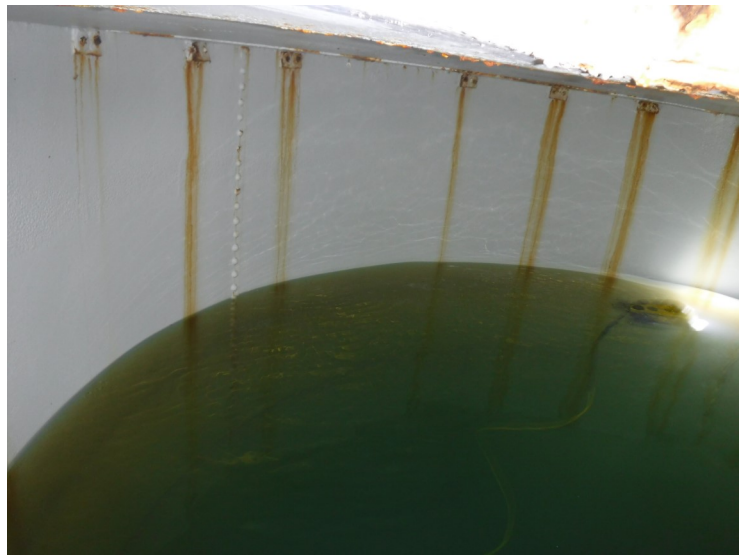


27) There is a clip in the center of the roof.



28) The roof hatch neck is severely deteriorated and the cover is no longer attached to the hinge.

29) Coating failures on the roof.



30) Same.



31) Overflow pipe penetration through the sidewall.



32) Coating failures on the upper sidewall.



33) Spot coating failures on the sidewall.



34) Same.



35) Same.



36) The top rungs are missing on the wet interior ladder.

9/19/2018 9:49:55 AM



37) Wet interior ladder rung below the high water line.

H: 148.8 °
D: 6.72 ft
Temp: 66.5 °F

9/19/2018 9:53:37 AM



38) The bowl is covered in sediment.

H: 123.1 °
D: 12.73 ft
Temp: 64.1 °F

9/19/2018 9:53:08 AM



39) Same.

H: 315.1 °
D: 12.99 ft
Temp: 64.2 °F



40) Fill pipe extension above the bowl.

41) Piping located in the adjacent building.



42) The piping is covered in insulation.

