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503-226-4211
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September 17, 2020

Mr. Randall Bailey
Oregon Department of Environmental Quality
Northwest Region
700 NE Multnomah St.
Suite 600
Portland, OR 97232

Subject: Groundwater Treatment System Outfall Structural Inspection, Cleaning and Corrosion Protection

NW Natural Source Control Groundwater Treatment Facility,
7900 NW St. Helens Road, Portland, OR
NPDES Permit Number 103061 (permit renewal pending with DEQ)

Dear Mr. Bailey:

As indicated in our March 2, 2020 Flow Meter and Outfall Report letter, we had a Diving company (Advanced American Construction, Inc.) conduct a structural/corrosion inspection and cleaning of the NW Natural Groundwater Treatment System outfall/diffuser. The Advanced American Construction, Inc. report of its findings and corrective measures taken is included with this letter and summarized below. In addition, a video of the work performed is available at the Groundwater Treatment Facility if you wish to view it.

Outfall Inspection Findings

On July 9, 2020, a dive team from Advanced American Construction, Inc. (AAC) inspected the outfall and diffuser. The inspectors found that, although marine growth was prevalent on the underwater portions of the outfall and diffuser, both the outfall and diffuser were securely attached to the dock structure, were in good condition and operating normally.

After their annual February 2020 inspection, the dive team recommended replacement of some corroded flanges and the installation of a sacrificial anode on the diffuser to reduce future corrosion potential.

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Our consultants at Sevenson Environmental Services, Inc. (SES) prepared a work plan for AAC to address these issues, specifically:

1. To clean the complete surface of the outfall pipe and diffusers;
2. To check thickness of the pipe in the corroded and pitted areas to determine how much life is left in the structure;
3. To install the sacrificial anode.
4. To measure the outfall diffuser in order to construct a spare outfall structure that could quickly replace the existing structure should that prove necessary.

Dive Team Actions

1. The dive team inspected the entire outfall structure and diffuser and verified that the structure and diffusers were intact and functioning as intended;
2. The outfall and diffuser were cleaned with a pressure washer to remove the attached marine growth;
3. The thickness of the steel outfall and diffuser pipes were checked and found to be sound;
4. An 8-pound zinc sacrificial anode was welded between diffusers 2 and 3 to reduce continued corrosion to the outfall pipe and diffuser to extend its useful life;
5. Measured the size of the outfall diffuser in the event that a spare outfall diffuser may be created to quickly replace the existing diffuser should that be necessary.

Conclusions

The outfall and diffusers were found to be structurally sound and operating normally. As a result of the steps taken by the dive team, the outfall pipe and diffuser have now been cleaned of marine growth and outfitted with a sacrificial anode to reduce the corrosion effects of the marine environment on the steel pipe.

The next annual inspection of the outfall and diffuser will be conducted in mid 2021 and annually thereafter. The inspection is a condition of the NPDES Permit to verify the continued performance of the outfall and to make any necessary adjustments to the outfall as a result of those inspections. The cleaning of the pipe and installation of the sacrificial anode will greatly extend the life of the existing structure.

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Certification

I certify under penalty of law that this document and all documents were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

If you have any questions about If this package, please contact Terry Driscoll at Aponowich, Driscoll & Associates, Inc., at (404) 641-8107, tpdriscoll@mindspring.com.

Very truly yours,

Kathryn Williams
Vice President of Public Affairs
NW Natural

Attachments:

- Dive Inspection Report from Advanced American Construction, Inc. dated July 14, 2020

Advanced American Construction
Advanced-American.com

DIVE INSPECTION REPORT

NW Natural - Gasco Willamette River Outfall Diffuser Inspection

Sevenson Environmental Services, Inc

REPORT DATE: **July 14, 2020**

PREPARED FOR: **William "Chip" Byrd**

PREPARED BY: **Scott Miller**
Advanced American Construction

AAC Job Number: 1120-042/01110

July 14, 2020

William "Chip" Byrd
Sevenson Environmental Services, Inc
2749 Lockport Rd
Niagara Falls, NY 14305

Phone: 716-583-2754
Email : wbyrd@sevenson.com

Diving Inspection Report

NW Natural Gasco Willamette River Outfall Diffuser Inspection

Inspection Date July 9th, 2020

Job Location: 7900 NW Saint Helens Rd, Portland, OR / Willamette RM 6

On July 9th, 2020, Advanced American Construction, Inc. (AAC) supplied a three-man dive crew for inspection at the NW Natural Gasco Willamette River Outfall Diffuser. The dive team was equipped with a surface supplied air dive system, underwater video and topside communication, a pressure washer, a zinc anode, and UT measuring tool. The crew was staged from a 26' dive boat and secured to the dock. Crew launched the dive boat at AAC's shop and traveled to the site. A 21' skiff was used for the additional tools.

Background: The outfall consists of an 8" diameter steel pipe that extends downward into the water. A flange connection then directs the pipe 90 degrees to the horizontal direction inshore. Four - 2" diffuser ports are attached to the crown of the main outfall pipe and have a 24" spacing, extending 22" vertically with a 45-degree bend at the top pointing downstream. At the end of the outfall pipe is a blind flange bolted to the pipe. The main pipe is welded to a horizontal member above surface for support. Additionally, a piece of vertical channel extends down into the water and is welded to the main outfall pipe between diffusers #3 and #4.

Scope of Work:

AAC dive crew performed an inspection of the outfall piping to determine current conditions and functionality

- Main 8" outfall pipe condition
- All flange connections and hardware conditions
- Diffusers #'s 1, 2, 3, and 4 conditions
- Welded supports conditions
- Pressure wash entire diffuser section and UT test for material thickness
- Underwater weld on a sacrificial anode
- Field measure the diffuser section so a replacement can be fabricated

Conditions Found

Main 8" outfall pipe:

- Pipe had both minor corrosion and marine growth build up present. Pitting was also present on pipe after it was cleaned off.
- Overall integrity of the pipe was determined to be good with no discrepancies noted.
- Pipe was securely hanging in water column with very little movement when checked by the diver.

Flange connections:

- Both the vertical flange that was installed prior to the 8" main pipe turns horizontal in water and the blind flange had all hardware present and tight. Hardware and flange highly corroded and marine growth build-up present.

Diffusers:

- Diffuser #1 – Welded connection to crown of main 8" pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. Pitting was present on pipe. Diffuser was not obstructed, and no cover or screen was present.
- Diffuser #2 - Welded connection to crown of main 8" pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. Pitting was present on pipe. Diffuser was not obstructed, and no cover or screen was present.
- Diffuser #3 - Welded connection to crown of main 8" pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. Pitting was present on pipe. Diffuser was not obstructed, and no cover or screen was present.
- Diffuser #4 - Welded connection to crown of main 8" pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. Pitting was present on pipe. Diffuser was not obstructed, and no cover or screen was present.

Welded metal supports:

- Above surface horizontal support welded to 8" outfall pipe was in good working order with no broken welds present. (Figure 10)
- Below water vertical channel that is welded to 8" outfall pipe was in good working order with no broken welds present. Below water section was heavily corroded with marine growth and minor pitting is present. (Figures 11 and 12)

Effluent Flow:

- Diver noted that diffuser #1 had the strongest flow and it began tapering down as he moved down to each diffuser with #4 being the weakest.

UT Thickness Testing:

- After cleaning the diffuser section with a pressure washer, periodic wall thickness measurements were taken. Results varied between .19" and .33". (See attached drawing for detail)

Sacrificial Anode:

- An 8 pound sacrificial zinc anode was welded to the 8" mainline between diffusers #2 and #3.

A link for the final inspection video will be provided by email.

Thank you for the opportunity to work with you on this project. If you have questions, please contact me directly at 503-445-9000.

Sincerely,

Scott Miller
Advanced American Construction, Inc.

DIAGRAMS & PICTURES

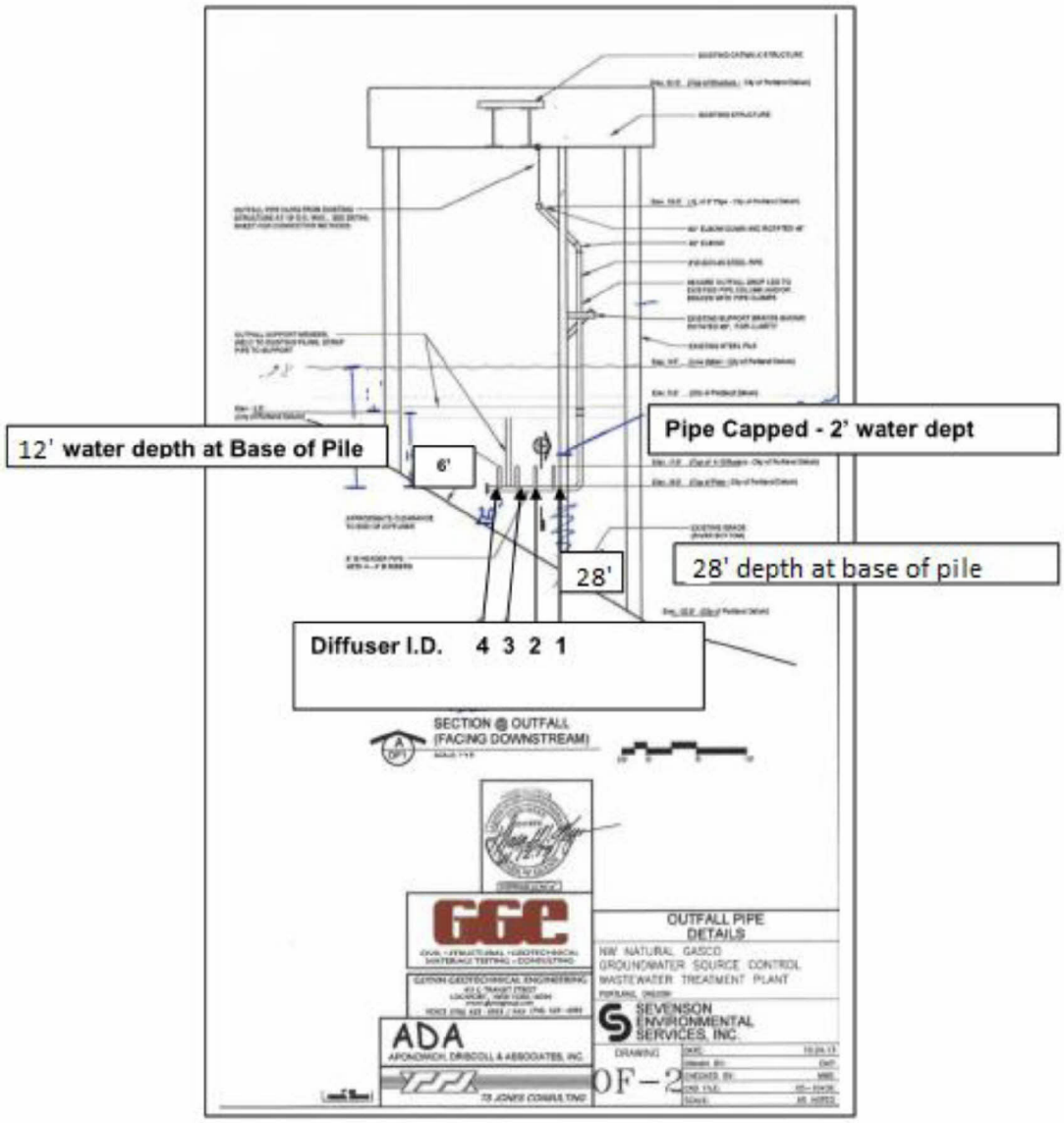

Figure 1- Sevenson Environmental Services, Inc Outfall Pipe Details. Dwg. No. OF-2 Section A

Figure 2 – 8" Outfall pipe flange connection, clean and in good condition

Figure 3- 8" Outfall weld connection in good condition

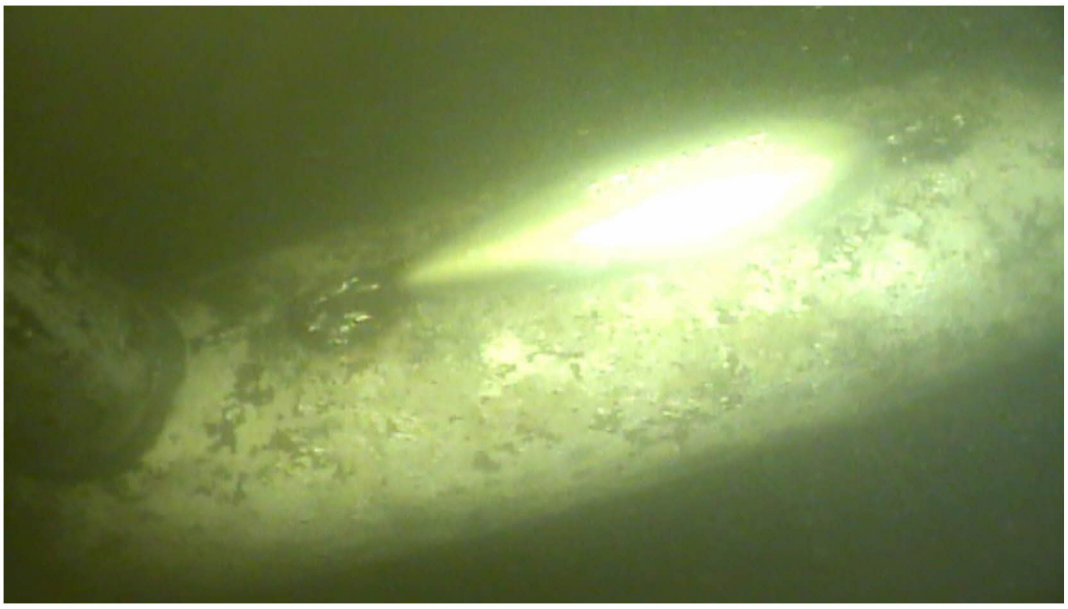

Figure 4- Sacrificial Zinc Anode Welded Between Diffusers #2 and #3

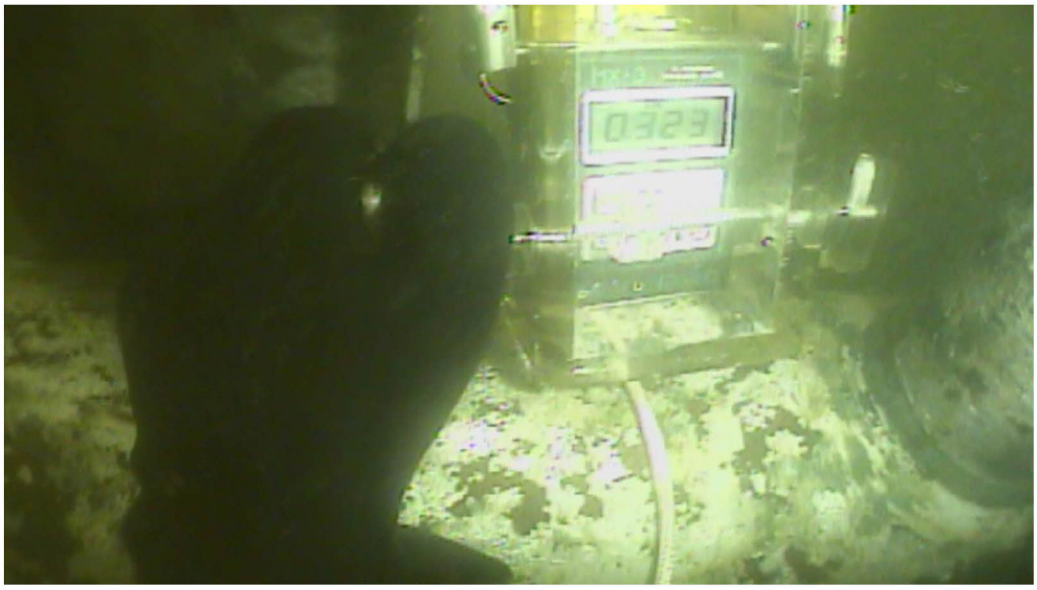

Figure 5- UT Thickness Measuring Tool

Figure 6 - Above water of 8" pipe welded to horizontal support

Figure 7 - Above water view of vertical channel support welded into horizontal support

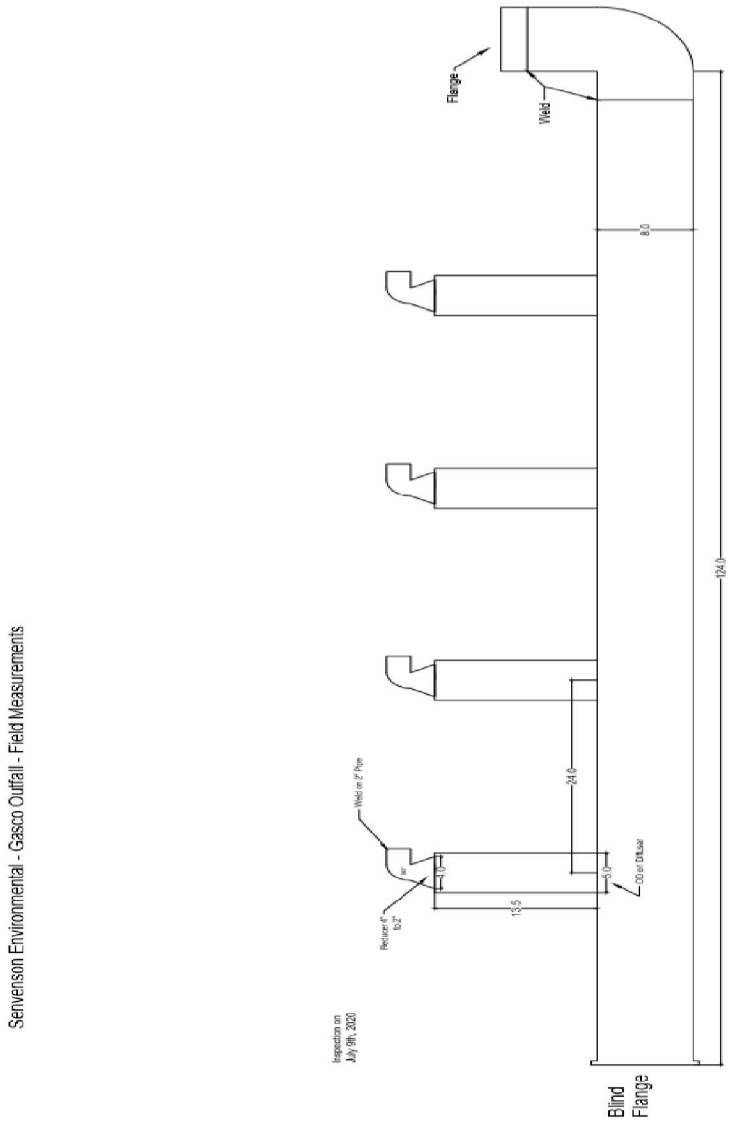

Figure 8 – Diffuser Section Field Measurements

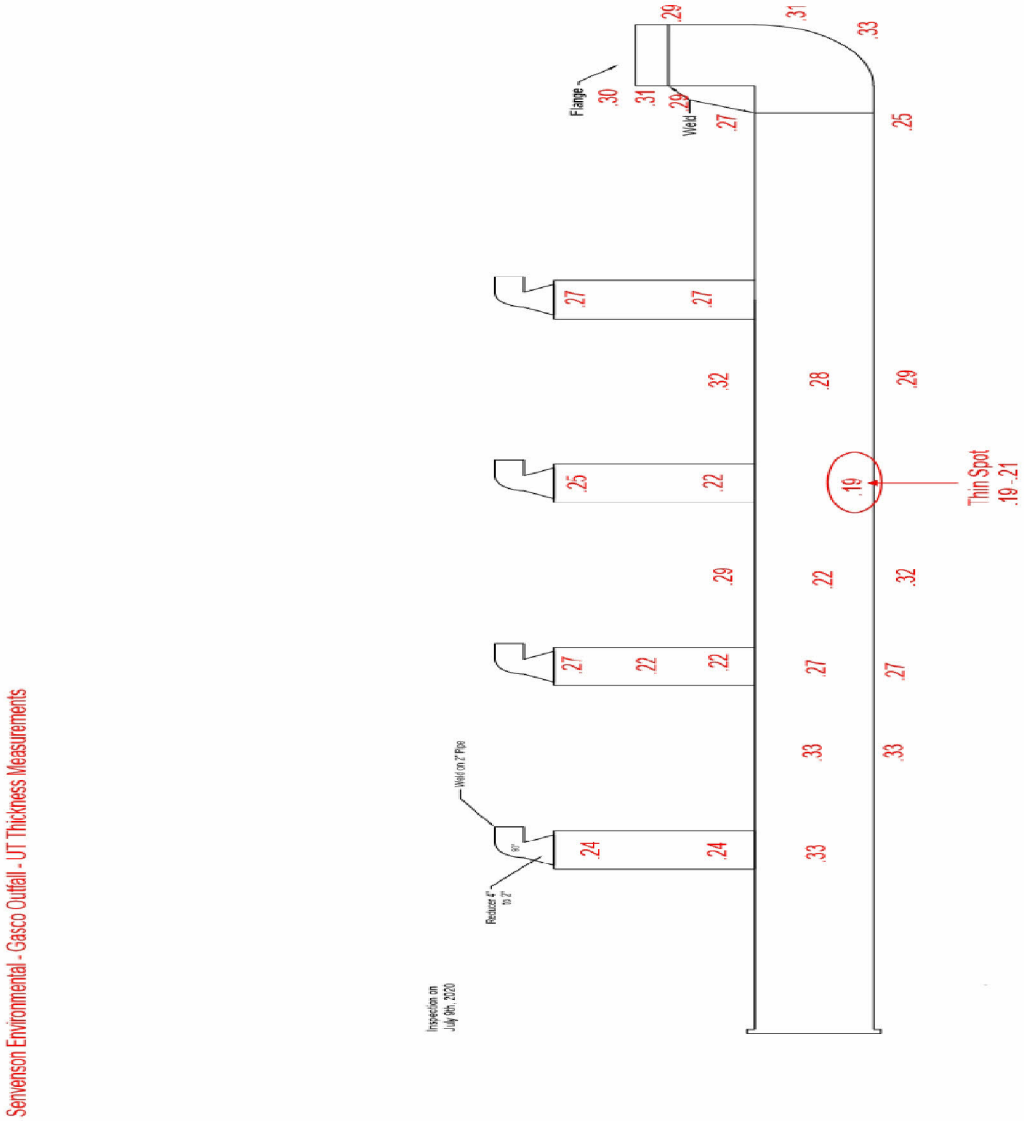

Figure 9 – Diffuser Section UT Thickness Measurements