REVISED JOHNSON LAKE, UPLAND SOURCE CONTROL REVIEW REPORT

OWENS BROCKWAY GLASS CONTAINER, INC.

5850 NE 92ND DRIVE
PORTLAND, OREGON

ECSI # 2086

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Prepared for:
DEPARTMENT OF ENVIRONMENTAL QUALITY
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

Prepared by:
DALTON, OLMSTED & FUGLEVAND, INC.
2601 Cherry Ave, Suite 300
Bremerton, Washington 98310

DOF DALTON OLMSTED FUGLEVAND

DALTON OLMSTED FUGLEVAND

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ACRONYMS AND ABBREVIATIONS

AST .... Above Ground Storage Tank

BMP .... Best Management Practice

BOD_5 .... Biological Oxygen Demand (5 day test)

DEQ .... Oregon Department of Environmental Quality

DOF .... Dalton, Olmsted & Fuglevand, Inc.

ISGP .... Industrial Stormwater General Permit

Owens .... Owens Brockway Glass Container, Inc.

NPDES... National Pollution Discharge Elimination System

PAHs .... Polycyclic Aromatic Hydrocarbons

PCBs .... Polychlorinated Biphenyls

PPM .... Part Per Million

ROD .... Record of Decision

SVOCs .... Semi-Volatile Organic Compounds

SWPCP .... Stormwater Pollution Control Plan

TPH .... Total Petroleum Hydrocarbons

TSS .... Total Suspended Solids

VCP .... Voluntary Cleanup Program

1.0 INTRODUCTION

1.1 Purpose

Dalton, Olmsted & Fuglevand, Inc. (DOF) has prepared this report on behalf of Owens Brockway Glass Container, Inc. (Owens). The Oregon Department of Environmental Quality (DEQ) has requested a "Draft Johnson Lake, Upland Source Control Review Report" to address DEQ concerns there is potential that upland sources of contamination, particularly from uncontrolled stormwater, are contributing to recontamination of the previously remediated Johnson Lake.

1.2 Site Description

Owens owns and operates a glass manufacturing plant located at 5850 NE 92nd Drive, Portland, Oregon (the "Property"). The Property is approximately 43 acres in size and located on the south shore of Johnson Lake (Figure 2.1). Johnson Lake extends over 18 acres and is directly connected to the Whitaker Slough, which in turn flows to the Columbia Slough. Johnson Lake is bounded to the south by the Property and to the west and east by other industrial facilities. The Property and Johnson Lake are collectively referred to as the "Site".

Johnson Lake receives stormwater discharge from the Property via four different outfalls, as described in Section 2. The lake also receives stormwater discharge from the City of Portland's street stormwater runoff, which enters the lake via a swale adjacent to Owen's Outfall 6 swale, and from a discharge pipe on the east side of the lake, which discharges stormwater from the Myer's Container property (Figure 2.1).

1.3 Regulatory Framework

1.3.1 STORMWATER

Owens is required to operate under the 1200-Z National Pollutant Discharge Elimination System Industrial Stormwater Discharge General Permit (ISGP) issued by the Oregon Department of Environmental Quality (DEQ 2021a).

Under the previous ISGP, which was effective August 1, 2017 (DEQ 2017), and has since been replaced by the current ISGP, which became effective July 1, 2021 (DEQ 2021a), Owens was required to collect stormwater discharge samples from each outfall on their Property (Outfalls 2, 4, 5, 6, and 8) and compare the results to the benchmark levels in Schedule B of the ISGP.

The primary contaminants of concern identified from this sampling were phosphorous and E. coli at Outfall 2, and total suspended solids (TSS) at Outfall 6. Additional contaminants analyzed for under the 2017 ISGP include oil and grease, copper, lead, zinc, iron, and BOD_5. Owens' has not taken samples from the additional two known stormwater outfalls to Johnson Lake (Figure 2.1) that are owned by others (City of Portland outfall and outfall from Myers Drum property).

1.3.2 JOHNSON LAKE SEDIMENTS

Previously, sediments in Johnson Lake were found to contain polychlorinated biphenyls (PCBs), as described in the Johnson Lake Investigation Work Plan (ARCADIS 2004a), Site Investigation Report (ARCADIS 2004b), and Johnson Lake Risk Assessment (Environ and ARCADIS 2004). Based on the previous investigations and a Feasibility study prepared in 2006, Oregon Department of Environmental Quality (DEQ) selected a final remedy for the Site in the Record of Decision dated October 2007 (DEQ 2007) and Record Decision Amendment dated July 2009 (DEQ 2009b). The 2007 Record of Decision and the 2009 Amendment are referred to collectively in this document as the ROD. Owens completed the implementation of the remedial actions described in the ROD and received a No Further Action Letter on February 25, 2014 (DEQ 2014).

In a letter dated December 2, 2021, DEQ has specifically requested a summary of work completed for the stormwater discharges that are currently out of compliance with the permit levels (DEQ 2021b). Owens' discharges *are not currently out of compliance with permit levels*; however, they did exceed the 2nd year Geometric Mean Benchmark Evaluation in 2019 (henceforth referred to as the 2019 Benchmark Evaluation) which resulted in a Tier II Corrective Action for TSS at Outfall 6 as well as phosphorous and e-coli at Outfall 2. Site-specific contaminants of interest from previous source investigations include metals (arsenic, lead, and cadmium), PCBs, and PAHs (Arcadis 2004b). However, the facility is not required to monitor for these contaminants as part of their ROD or their ISGP permit and therefore no additional data for these are included in this report.

1.4 Source Control Objective

The objective of this stormwater source control review is to summarize the work that has been completed or is in the process of being completed on the Property with regards to the stormwater exceedances that triggered the Tier II Corrective Action and determine whether additional source control measures are needed at this time based on the review of existing data.

Per the request in the December 2, 2021, DEQ letter, this report will focus on previous investigations and NPDES stormwater monitoring data for the outfalls that had benchmark exceedances in the 2019 Benchmark Evaluation (Outfalls 2 and 6).

DOF did not compile or review sampling data for other off-Property potential sources of contamination to Johnson Lake for this report, including the east outfall from the Myers Container property and the City's stormwater outfall that is adjacent to Outfall 6 on the Property.

1.5 Report Organization

This report generally follows DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ 2009a), and is organized into the following sections:

2.0 – Site Background

3.0 – Potential Sources and Contaminants of Interest

4.0 – Ongoing Stormwater Management Measures

5.0 – Data Collection and Interpretation

2.0 SITE BACKGROUND

2.1 OI Property Stormwater Conveyance System

The Property includes buildings, parking areas, outdoor materials storage, and landscaped areas (including two bioswales).

Approximately 62 percent of the 43-acre property is impervious as it is covered by buildings or pavement. Stormwater routinely discharges from the Property through 5 different discharge points (outfalls 2, 4, 5, 6 and 8), with occasional discharges from one additional outfall (outfall 7) [Figure 2.2]. These outfalls, which all originate on Owens' Property, but do not all drain to Johnson Lake, are discussed further below. Additional outfalls that drain to Johnson Lake from other sources are not discussed.

The majority of the stormwater from the Property discharges to Johnson Lake via Owens' outfalls 2, 4, 5, and 6. Outfall 7 is located on the eastern edge of the Property and only discharges when the spill containment valve is manually opened and it connects to an ODOT stormwater line, and ultimately to the Columbia Slough. Outfall 8 is located in the southwest area of the property and stormwater from this area is conveyed to the City's Municipal Separate Storm Sewer System which discharges to the Columbia Slough.

Outfalls 4, 5, and 8 are routinely sampled per the ISGP, but they receive stormwater from mostly non-industrial areas of the Property and they haven't had any benchmark exceedances in recent years. As such they are not the focus of this report.

This report focuses on Outfalls 2 and 6, which drain the most active industrial areas with contaminant sources exposed to stormwater at the facility and had benchmark exceedances in the 2019 Benchmark Evaluation.

2.1.1 OUTFALL 2

Outfall 2 is located on the eastern portion of the Property, and includes drainage from the former Outfalls 1 and 3. Outfall 2 receives stormwater from Drainage Basin B (Figure 2.2), which is a large drainage area (approximately 11.2 acres) that occupies the mid-eastern portion of the Property and includes Buildings 1, 2, 5, 6, 7A, 7B, 8, 20, 34, and 38, the recycling storage areas, multiple cullet bunkers, two 21,500-gallon LPG Above Ground Storage Tanks (ASTs), and the surrounding paved surfaces (including two employee parking lots and portions of Glass Plant Road). This drainage area surrounds a gravel lined transformer yard (approximately 7,000 square feet).

Stormwater from this area is directed to catch basins that flow to a StormGate Separator™ sedimentation vault, where solids are allowed to settle out. The stormwater then flows into a vegetated bioswale, which is approximately 540 feet in length. Stormwater that does not infiltrate within the bioswale footprint flows through the bioswale, which has a series of check dams to allow for longer retention time, prior to flowing into Johnson Lake. The upland area of the bioswale was previously remediated as part of the Voluntary Cleanup Program (VCP) cleanup action, which is discussed further in Section 2.3.

Additional source control and treatment measures are currently being constructed within the drainage basin for Outfall 2, which are discussed in more detail in Section 4 of this report.

2.1.2 OUTFALL 6

Outfall 6 is located on the western edge of the facility. This outfall receives stormwater from the western portion of Drainage Basin A (Figure 2.2), which is approximately 14.6 acres in size and includes buildings 3, 27, 30, 31, and 37, truck loading docks, a 1000-gallon liquefied petroleum gas (LPG) AST, and the surrounding paved surfaces. Stormwater from this area is directed to a series of catch basins to underground stormwater piping that leads to a stormwater sedimentation vault and then to the Outfall 6 swale. Some additional stormwater from NE Glass Plant Rd also flows to the stormwater sedimentation vault prior to discharge into the Outfall 6 swale. The swale associated with Outfall 6 increases stormwater retention time and infiltration prior to discharge to Johnson Lake.

The Outfall 6 swale was constructed with an adjacent swale that was built to treat runoff from the City's former stormwater Outfall #84, with a drainage basin that is located between NE Killingsworth St and Columbia Blvd from NE 97th Ave to 92nd Dr in Portland, Oregon. The two swales are separated by a berm (Sung 2007).

2.2 Property Ownership and Operating History

The Owens facility was established in 1956 on previously undeveloped or agricultural land. The facility currently consists of 16 major buildings including five large structures (three warehouses and two buildings housing glass manufacturing operations). The facility also includes an exterior process yard containing the transformer yard, batch house (Building 6), compressor room (Building 5), and cooling towers; recycled glass processing storage center northeast of Building 1; surrounding asphalt parking; service and storage areas; and landscaped areas (including a baseball field north of Building 1). Material handling locations include the Redemption Center (Building 34), multiple outdoor storage bunkers, and the batch house (Building 6). (Figure 2.2)

All glass manufacturing, inspecting, and packaging operations take place under cover, with the exception of the raw cullet storage. The glass manufacturing process involves the melting of sand, limestone, soda ash, and reclaimed crushed glass (cullet) to form new glass containers. Raw materials are measured and mixed in the batch house (Building 6) and are then conveyed (under cover) to one of two large furnaces (melters) in Building 1. The unmelted batch initially floats in a pool of molten glass and gradually melts as it moves through the furnace at approximately 2,700°F. After melting, the glass is conditioned in refiners and distributed to individual forming machines, which mold the glass into containers. The containers then pass through a Lehr oven for annealing. Various quality control tests are performed on the finished product before it is packaged for shipment or storage in warehouses. The Owens facility produces up to a million containers per day.

2.3 Regulatory History

2.3.1 PCB'S IN JOHNSON LAKE SEDIMENTS

Elevated levels of PCBs were identified in Johnson Lake during the 1994-1995 sediment investigation of the Columbia Slough. Johnson Lake is located immediately north of and partially owned by Owens.

Subsequent investigations identified PCBs in adjacent soil on the Owens property and elevated levels of PCBs throughout the lake sediment with higher concentration locations on the southern shoreline. Elevated concentrations of metals and PAHs were also detected in the portion of the lake receiving stormwater runoff and historical settling pond overflow from the Owens facility. Owens entered the VCP by signing a Letter Agreement on September 18, 1997. (DEQ 2012)

Owens conducted a sediment investigation in 1998 under VCP oversight to verify PCB sediment contamination near the outfall draining Owens transformer yard. The investigation results verified low concentrations of PCBs (< 1 ppm) in sediments near the outfall. DEQ requested that Owens complete an Upland Source Investigation to determine if there is an active source of PCBs at the facility that impacts Johnson Lake sediments. The upland investigation was completed, and no significant ongoing sources of PCBs were found, however, PCBs detected in the drainage pathway to Johnson Lake indicated a historical source of contamination, likely from the old transformers. In summer 2002, DEQ indicated that Owens was likely the primary source of contamination to Johnson Lake, but that there was also clear contribution via the outfall at the east end of the lake extending under I-205 from the Myers Container property. DEQ directed Owens to conduct an investigation of Johnson Lake as well as to complete an investigation of upland contamination. The investigation and risk assessment were completed in 2005. (DEQ 2012)

The Record of Decision (ROD) was issued in 2007 (DEQ 2007), and then after additional PCB sampling, was amended and reissued in 2009 (DEQ 2009b).

In 2009-2010 Owens removed PCB-contaminated soil and created a swale for stormwater detention in the impacted area (current Outfall 2). In 2011/2012 Owens placed a minimum 6-inch cap of clean sand/sediment over the majority of the lake sediment. A portion of the lake at the west end was not capped to encourage mussel recolonization within the lake. As part of Owens' Consent Judgment with DEQ, they settled their liability for the Property's contribution to sediment contamination in the Whitaker Slough.

A Certification of Completion was filed with the court in January 2014 (DEQ 2014a). DEQ issued a no further action (NFA) determination for this Property in February 2014 (DEQ 2014b). Monitoring activities described in the DEQ-approved Remediation Operations and Maintenance Plan (DOF 2012) included a cap inspection to be performed for the first five years post-construction (2013-2017), a fish-tissue study performed at five and ten years post-construction (2017 and 2022), and semiannual visual swale inspections, which are ongoing.

As part of the monitoring, Owens is required to perform fish tissue sampling for PCBs in years' 5 and 10 per the DEQ approved *Remediation Operations and Maintenance Plan (O&M Plan)* (DOF 2012a). This sampling was last done in 2017 and is scheduled to take place this year (2022). In a letter from DEQ dated December 2, 2021, DEQ requested that in addition to the fish tissue sampling plan, Owens prepare a *Draft Johnson Lake, Upland Source Control Review Report* which details the summary of work completed for the stormwater discharges that previously received a Tier II Corrective Action (DEQ 2021b).

2.3.2 STORMWATER

Owens has been operating under the ISGP program since 2001. Per Schedule A.11 of the previous ISGP, permit registrants were to evaluate the sampling results collected during the second monitoring year of permit coverage and determine if the geometric mean of the qualifying samples collected at each monitored discharge point exceeded any applicable statewide benchmarks in Schedule A.9 of the ISGP. Owens previously collected the discharge samples and determined that some of the samples geometric means exceeded the benchmarks in Schedule A.9 of the ISGP in the 2nd year Geometric Mean Benchmark Evaluation in 2019 (hereafter referred to as the 2019 Benchmark Evaluation). The pollutants of concern with geometric means that exceeded permit benchmarks at respective outfalls include:

- Outfall 2 – Phosphorus and E. coli
- Outfall 6 – Total Suspended Solids (TSS)

As a result of the 2019 Benchmark Evaluation, in compliance with the ISGP, Owens had an Engineering Evaluation of the Property performed. After the initial engineering evaluation, interim actions were performed while final corrective measures were evaluated. Proposed control measures for the exceedances were designed and submitted for review by the City of Portland in the *Tier II Engineering Evaluation* (DOF 2021a), which was approved by the City of Portland on April 23, 2021. Initial control measures were installed as an interim action in May 2020, and additional improvements are ongoing, targeted for completion by the end of May 2022.

Per the ISGP, if a qualifying sample result exceeds any applicable statewide benchmark (including TSS or phosphorus), a Tier 1 corrective action must occur, which includes an investigation of elevated pollutant levels and a review of the SWPCP to ensure all control measures are implemented properly. Owens' is currently exempt from Tier 1 corrective actions for phosphorus at Outfall 2 under the current permit until their Tier II corrective actions from the previous permit are implemented.

3.0 POTENTIAL SOURCES AND CONTAMINANTS OF INTEREST

3.1 Potential Contaminant Sources

DEQ requested a source control evaluation due to concerns about potential upland sources of contamination, particularly from uncontrolled stormwater could be contributing to recontamination of the previously remediated Johnson Lake (DEQ 2021b). Johnson Lake receives stormwater from industrial and administrative sources on Property as well as industrial and municipal sources off Property.

The Site was issued a NFA determination (DEQ 2014) after source removal and remediation was completed as part of the ROD (DEQ 2009). As a result, since then stormwater on Property has been managed and controlled in compliance with the requirements of the ISGP with the addition of the semi-Long Term Monitoring Requirements as noted under the NFA determination (DEQ 2014b).

3.1.1 ON PROPERTY CONTAMINANT SOURCES

Potential pollutants on the Property that could reach and contaminate stormwater are described below. Table 1 summarizes the potential pollutants at the Property relative to Outfalls 2 and 6.

- Metals include copper, lead, and zinc. These metals are present in and may become available from sources such as buildings, fencing, vehicles, equipment, and paint.
- Industrial chemicals include anhydrous ammonia (used as a delivery mechanism for emissions control of a manufacturing process).
- Raw components include those used in the manufacturing of glass such as sand, limestone, soda ash (i.e., sodium carbonate), and reclaimed crushed glass (cullet).
- Petroleum hydrocarbons may become available from vehicle/equipment refueling or vehicle/equipment leaks or from lubricating oils and grease.
- Nutrients and organic material, such as phosphorus and nitrogen may become available from food and beverage debris among the cullet stockpiles.
- Gross pollutants generally consist of litter (e.g., human derived trash, such as, paper, plastic, metal, and glass), debris (e.g., organic material including leaves, branches, seeds, twigs, and grass clippings), and coarse sediments (inorganic breakdown products from soils, pavement or building materials).
- Materials resulting from trespass or actions of trespassers generally consist of human waste, animal waste, vehicular fluids, trash, debris, and miscellaneous drug paraphernalia brought onto the site.

Table 3.1. Potential on Property Contaminant Sources for Outfalls 2 and 6

Outfall	Potential Pollutant	Source/Activity
2	Metals	Vehicle traffic/parking; building roofs
	Industrial chemicals	Anhydrous Ammonia
	Raw components	Sand, limestone, soda ash, cullet
	Petroleum hydrocarbons	Equipment leaks
	Nutrients and organic material	Cullet storage areas, organic material in swale (leaves, etc.)
	Gross pollutants	Litter, debris, coarse sediment
6	Metals	Truck loading docks; vehicle traffic/parking; building roofs
	Petroleum Hydrocarbons	Vehicle/equipment refueling
	Nutrients and organic material	Cullet storage areas, organic material in swale (leaves, etc.)
	Gross pollutants	Litter, debris, coarse sediment

3.1.2 OFF PROPERTY CONTAMINANT SOURCES

A summary of potential off Property contaminant sources is provided with contaminants of concern based on general references, no comprehensive review has been completed of offsite sources.

- City of Portland's street stormwater runoff, which enters the lake via a swale adjacent to Owen's Outfall 6 swale (Figure 2.1),
  - Potential contaminants of concern- metals, nutrients, pH, suspended solids, TPH, PCBs, pesticides, and PAHs (City of Portland 2016).
- Stormwater from the Myer's Container property from a discharge pipe on the east side of the lake (Figure 2.1).
  - Potential contaminants of concern- metals, TPH, PCBs, suspended solids, and SVOCs (DEQ 2014c).
- Stormwater and potentially wastewater from homeless encampments along NE Glass Plant Road, in the areas between outfall 006 and outfall 005, on the Northern Shore of Johnson Lake and adjacent to the Whitaker Slough.
  - Potential contaminants of concern- metals, oil, suspended solids, sanitary waste, and hazardous waste (Iboshi 2021, Sparling 2021).

3.2 Outfall Sediment Data

No outfall sediment data was evaluated for this report. Owens is currently not required to collect outfall sediment samples.

3.3 Stormwater Data

Historical stormwater sampling results for the NPDES permit discharge locations at on Property Outfalls were screened against the NPDES discharge levels and Columbia Slough-specific upland source control values. A summary of these results is shown in Section 4.

3.4 Contaminants of Interest

DEQ requested data on contaminants that are currently out of compliance with the permit levels in their letter dated December 2, 2021 (DEQ 2021b), but subsequently requested additional data in their comment letter dated March 29, 2022 (DEQ 2022). This report originally included data for phosphorus, e-coli, and total suspended solids (since these were the contaminants that had previously exceeded benchmarks and triggered a Tier II investigation and corrective action in 2019.). Tables have been updated to provide historical sample results for oil and grease, copper, lead, zinc, iron, TSS, phosphorous, e-coli, and BOD_5.Site-specific contaminants of interest from previous source investigations include metals (arsenic, lead, and cadmium), PCBs, and PAHs (Arcadis 2004b). However, the facility is not required to monitor for these contaminants as part of their ROD or their ISGP permit and therefore no additional data for these are included in this report.

4.0 ONGOING STORMWATER MANAGEMENT MEASURES

As a result of the 2019 Benchmark Evaluation detailed in the Tier II Engineering Evaluation, Owens' retained DOF to perform an Engineering Evaluation of the Property and design control measures for the exceedances.

4.1 Outfall 2

An investigation of the phosphorus benchmark exceedances in stormwater discharge from Outfall 2 showed that the likely source was the outdoor cullet storage. The following two control measures were selected for the Property, and approved by the City of Portland in a letter dated April 23, 2021, and shown on Figure 4.1:

1) *Source Control – Structure to Cover Raw Materials* – A portion of the outdoor long-term cullet storage is now covered by tarps, so they are no longer exposed to stormwater. This was implemented in May 2020. A permanent structure is currently being constructed over a portion of the short-term cullet storage area and is expected to be completed in May 2022. The combination of these two measures should reduce the amount of phosphorus at Outfall 2 by up to 50%, based on the footprint of cullet and what will no longer be exposed to stormwater.
2) *Stormwater Treatment System* – At catch basin 11, which receives the majority of the stormwater adjacent to the remaining uncovered cullet piles, a Modular Wetland system will be installed. The system is designed to target both dissolved and suspended phosphorus. Construction and installation of this system is currently being done and is expected to be completed in May 2022.

4.2 Outfall 6

The investigation of the exceedances of Total Suspended Solids (TSS) at Outfall 6 determined that the likely cause of the high TSS was from clean soil stockpiles of import material located in the drainage that were there during the construction of a new transformer site. Prior to the Tier II report, the facility had already made updates to the swale, including removal of the soil stockpiles, and the addition of six (6) rock check dams in the swale, north of the concrete weir located within the swale, and a rock apron just prior to the discharge point into Johnson Lake (Figure 2.2). These updates allow for stormwater to move more slowly through the swale, allowing for a longer settling time for solids. It was determined that no further corrective measures were needed for this outfall.

Previous sampling of the lake under the VCP and during construction of the swale did not indicate that there were any historical (Sung 2007, DEQ 2014) sources of PCBs connected with this outfall. No known sources or activities that may include PCBs discharge to this outfall. Outdoor site use in the drainage basin above Outfall 6 are administrative parking, truck traffic and parking, and the loading docks for the facility (Figure 2.2).

4.3 Stormwater Best Management Practices

In addition to the control measures described above, Owens has an extensive list of other site controls that they employ onsite to prevent contaminants from entering the stormwater system, including stormwater best management practices (BMPs), spill prevention and response procedures, preventative maintenance, and employee education. A detailed list of the BMPs utilized by Owens is included as Table 4.1. More detail on these controls can be found in Owens' Stormwater Pollution Control Plan (DOF 2021b).

5.0 DATA COLLECTION AND INTERPRETATION

5.1 Sampling

5.1.1 NPDES MONITORING

Stormwater sampling for this report was performed by Owens and DOF personnel and followed the guidelines for NPDES stormwater sampling laid out in the ISGP. Stormwater samples from each monitoring point are collected and analyzed at least four times per year. Two samples are collected between July 1st and December 31st, and two samples are collected between January 1st and June 30th for each permit year. All grab samples are collected at least 14 calendar days apart.

Owens aims to monitor the discharge during the first 12 hours of the discharge event, which is a measurable storm event resulting in an actual discharge from a site. The facility is not required to sample outside of regular business hours or during unsafe conditions. Regular business hours are from 8 am to 5 pm on weekdays.

Table 5.1 shows the analytical methods, holding times, sample containers, detection limits, and other information for the stormwater sampling.

5.1.2 OTHER DATA

DOF also reviewed the following documents:

- Owens' SWPCP
- Engineering evaluations dated May 2012 and December 2014, and January 2021

From the Tier II Engineering Evaluation (DOF 2021a), sampling around the Property that was performed in 2014, 2016 and 2021 showed that total phosphorus was highest at Catch Basin 11, which is located in the center of the cullet storage area. This was the basis for installing treatment at Catch Basin 11, versus installing a larger system further downstream.

5.2 Data Summary

Stormwater sample results from the NPDES monitoring are shown in Tables 5.2-5.6. Figures 5.1 and 5.2 show the trends for TSS and phosphorus in Outfalls 2 and 6. Data was compared to benchmarks for the NPDES permit (note that the benchmark for TSS was just lowered in this last permit update, effective July 1, 2021). There were no Screening Level Values (SLVs) from the *DEQ Guidance for Evaluating the Stormwater Pathway at Upland Sites* for either parameter.

5.3 Data Interpretation

Based on the monitoring data, it appears that TSS and phosphorus are not ongoing issues for Outfall 6 (phosphorus was not part of the Tier II Corrective Action for Outfall 6 and there has not been an exceedance of the phosphorus benchmark at this outfall since 2017). There has been a recent benchmark exceedance at Outfall 6 and Outfall 2 for TSS, but per Owens' Tier I report, the likely source of the increased TSS was from dislodged soil within the swales during swale maintenance that occurred that same month. TSS at Outfall 2 has not consistently exceeded benchmarks and was not part of the 2019 Tier II Corrective Action. The ongoing issue has been phosphorus at Outfall 2, but this will be addressed by completion of the additional corrective actions, as detailed in the 2019 Tier II Engineering Evaluation (DOF 2021a). Both swales were built with clean material after the documented source of PCBs (previous transformers) was removed from the Property.

6.0 SOURCES CONTROL MEASURES

6.1 Source Control and Treatment Implementation

As described in Section 4.0 of this report, source control and additional treatment measures for the Outfall 2 drainage basin are currently being implemented. Construction started in January of this year and is expected to be completed by May 2022. These measures were designed specifically to address phosphorus exceedances and the need for additional source control measures are not anticipated to meet stormwater benchmarks at this outfall.

6.2 Spills to the Waterway

6.2.1 SPILLS FROM OWENS

The only reportable spill since the remediation of Johnson Lake in 2012 occurred in September of 2018 when a post to the sub-station caught fire in the Outfall 2 drainage area (no buildings or transformers caught fire) and a portion of the water used to extinguish the fire flowed into Johnson Lake via Outfall 2. Owens followed all proper procedures and immediately reported this to DEQ. Owens' emergency contractor (NRC Environmental) responded to the spill and removed approximately 60,000 gallons of water from the site via a vac truck. An estimated 32,000 gallons of water flowed into the swale at Outfall 2. Per a request from the City of Portland, Owens personnel sampled the water that was discharged to the swale at both the upstream end of the swale and downstream at MP-002 and had the samples analyzed for metals. The results of this sampling, screened against the SLV screening values for stormwater for non-Portland Harbor sites, are included as Table 6.1. Documentation from the time of the fire is provided in Attachment B (a letter to DEQ summarizing the response and the Oregon Emergency Reporting System [OERS] notes [*OERS Report #2018-2097]*).

6.2.2 OTHER KNOWN SPILLS TO JOHNSON LAKE

In 2012, personnel from Owens reported that an observed turbid plume was occurring at the east outfall of Johnson Lake, which flows under I-205 from Myers' container property. The sediments within the culvert were deemed potentially impacted by PCBs and Myers was ordered to clean out the culvert pipe by DEQ. Removal work for this order was performed by Bravo Environmental and was observed by DOF personnel on behalf of Owens. At the end of the cleanout process each day, Bravo removed a sandbag berm that was placed downstream of the culvert during the work, and a turbid plume and oil sheen was observed entering Johnson Lake. (DOF 2012b, Attachment A)

7.0 SOURCE CONTROL EVALUATION

An investigation into the likely sources of high phosphorus within the Outfall 2 drainage basin has already been performed and has been summarized in tables attached to the Tier II Engineering Evaluation (DOF 2021a). These investigations have shown that the highest contributors of phosphorus in this area is likely the glass cullet that is kept stockpiled outdoors, with additional phosphorus coming from the swale itself due to breakdown of leaves and other organic matter, which are common sources of nutrients (Upper Midwest Water Science Center 2019).

Owens is currently working to address the cullet piles by building a permanent structure over a portion of the short-term cullet storage area. When completed, the footprint of the structure will be approximately 8,000 square feet. They have already hired contractors to tarp a large portion of the long-term storage of cullet, which was effective as of May 2020. It is estimated that the combination of the permanent structure and the tarped piles will cover approximately 50% of the cullet that was previously exposed to stormwater.

8.0 FINDINGS AND CONCLUSIONS

Based on a review of the existing stormwater NPDES monitoring data as well as a review of the documents associated with the VCP cleanup action that occurred in 2009-2012, the following conclusions were made.

1. Existing and potential facility-related contaminant sources have been identified and characterized.
    - Sources for phosphorus in Drainage Basin B have been linked to the glass cullet piles
    - Additional phosphorus in Drainage Basin B could be coming from breakdown of organic materials in of the Outfall 2 swale, which is common contributor of nutrients such as phosphorus to stormwater.
2. Contaminant sources are being controlled to the extent feasible.
    - Suspended solids have not historically been an issue at Outfall 2. Only one sample has exceeded the permit benchmark for TSS of the last four samples analyzed. This exceedance occurred in December of 2021 and based on a site investigation by facility personnel was likely due to dislodged soil in the swale from swale maintenance activities. The most recent samples, taken in February and March 2022, did not exceed the permit benchmark.
    - Two samples from December 2021 and February 2022 analyzed for TSS at Outfall 6 have exceeded the permit benchmark. Prior to these samples, TSS hasn't exceeded the benchmark since April of 2019. In response to these recent exceedances, Owens' personnel are adding bio-bags/straw wattles around the five catch basins within the unpaved gravel lot north of Building 31, which is the primary source of TSS for this drainage basin. This corrective action is detailed in a Tier I report (Owens 2022). The most recent sample (March 2022) for TSS was below benchmarks.
    - Owens is currently constructing a permanent cover over a portion of the short-term cullet storage, which would eliminate this portion of material from contacting stormwater. This will help reduce the phosphorus along with other contaminants from entering the stormwater system. Construction is expected to be completed in May 2022.
    - Owens is also currently constructing an underground modular wetland to provide additional treatment to the highest impact area in Drainage Basin B, which will also serve to reduce contaminant loading, including phosphorus and TSS, to the Outfall 2 swale. Construction is expected to be completed in May 2022.
    - Outfall 2 already contains a sedimentation vault and a swale to allow for suspended solids to settle out prior to discharge to Johnson Lake. TSS was not part of the Tier II Corrective Action for Outfall 2.
    - The Outfall 2 and Outfall 6 swales are routinely maintained quarterly to reduce the quantity of organic debris within the swales.

- The facility has already made updates to the Outfall 6 swale to reduce suspended solids from entering Johnson Lake via stormwater. These measures were implemented in the fall of 2019, and since then only two stormwater samples (out of 11 samples taken) has exceeded the permit benchmark.
- The facility will continue monitoring for TSS and Phosphorus per the NPDES permit requirements.
- There are no known ongoing sources of PCBs at the Property.

3. Adequate measures are in place to ensure source control and good stormwater management measures occur in the future to meet stormwater benchmarks at their outfalls.
   - The facility is installing City approved source control and treatment of stormwater for Drainage Basin B, which flows to Johnson Lake via Outfall 2.
   - As part of a recent Tier 1 Corrective Action, Owens' personnel are adding bio-bags/straw wattles around the five catch basins within the unpaved gravel lot north of Building 31 to try and reduce TSS at Outfall 6.
   - The facility has already improved other discharge points and believe regular housekeeping will be sufficient to stay compliant with permit water quality discharge requirements at the other monitoring locations.

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DALTON OLMSTED FUGLEVAND

Tables

Table 4.1. Best Management Practices
Owens-Brockway Glass Container Inc., Plant No. 21

BMP Type		Control	Frequency
Containment	1	Concrete curb in place at the unused overhead door opening on the north side of Building 1 near the Heil separator to prevent seepage onto the parking lot.	-
	2	126,000 gallon fuel oil tank (averages less than 40,000 gallons, stored) is completely contained with in an 8-foot high earthen berm designed to adequate capacity.	-
	3	Hazardous waste accumulation is indoors and has double containment.	-
	4	Secondary containment on liquid caustic soda tank.	-
Oil & Grease	1	Compressor blow down water and minor leakage from compressed air piping is controlled by a containment area east of the compressor room which pumps water to oil/water separator in the furnace basement.	-
	2	Rental compressors are filled from fuel nozzle located on south compressor room wall eliminating the fuel transfer in drums and inherent spillage. A supply of absorbent pads is maintained in the compressor room for use in the event of a spill.	Supply checked monthly
	3	Sedimentation manholes and sediment vaults servicing the Outfall 2 drainage basins has oil separation capabilities.	-
	4	Absorbent pads or booms service the fuel oil tank area to remove oil sheen from strormwater (if present) before it is manually discharged.	Supply checked monthly
Waste Chemicals and Material Disposal	1	Used oil and waste anti-freeze are accumulated in properly labeled drums, stored indoors, and transported for off-site disposal or recycling by a vendor.	-
	2	Used drums are returned to vendors whenever possible. Drums not returnable are rinsed in the basement where the water goes into the furnace basement oil/water separator and crushed for scrap metal recycling.	-
	3	Parts washing solvents (degreasers) are recycled using a contract service.	-
	4	Use of cleaning agents is restricted to prevent discharge to storm water.	-
	5	Diverted non-contact cooling water bleed to cullet/sanitary waste water system.	-
	6	Discontinued use of non-contact cooling water chemicals which contained zinc or chlorine.	-
Debris Control	1	An acrylic coating over the galvanized roof over Building 20 reduces zinc debris runoff.	-
	2	Galvalume® roofing replaces the galvanized NE end of the Robinson Ventilator and a portion of the galvanized roof over Building 1 to reduce zinc debris runoff.	-

BMP Type		Control	Frequency
Stormwater Diversion	1	The factory cullet water system has been modified to minimize potential contact with stormwater. Factory cullet is transferred into hoppers with drainage holes to allow all cullet water to drain to the cullet basement prior to storing cullet outdoors on the pile.	-
	2	Diverted runoff from Outfall #3 to StormGate Separator on Outfall 2.	-
Erosion and Sediment Control	1	Bio-bags protect five catch basins.	Inspected monthly
	2	Cleanway Filters are installed in 16 catch basins.	Inspected monthly
	3	Debris screens are installed in 3 catch basins.	Inspected monthly
	4	A modular wetland is installed at CB11	Inspected monthly
	5	Sedimentation manholes and sediment vaults servicing the Outfall 2 and Outfall 6 drainage basins are designed to remove heavy metals and large size particles prior to discharge. System maintained every 6-12 months.	Inspected monthly
	6	Gate valves servicing the Outfall 2 and Outfall 6 drainage basins are designed to control flow in case of hazardous spills.	Inspected monthly
	7	Sedimentation boxes at the Outfall 2 discharge points capture additional heavy particles.	Inspected monthly
	8	Bio-swales servicing the Outfall 2 and Outfall 6 drainage basins are designed to trap pollutants through infiltration	Inspected monthly
	9	Rock check dams are installed in both bio-swales in order to give the stormwater a longer retention time to filter out solids	Inspected monthly
Covering Activities	1	Feed hopper for trash compactor is covered.	-
	2	Glass manufacturing operations are conducted indoors.	-
	3	Hazardous materials are stored under roof in designated storage areas.	-
	4	Forklift maintenance area is covered with a roof.	-
	5	The truck batch unloading area is covered with a roof.	-
	6	The tin recovered material mixing operation is contained indoors.	-
	7	Tin recovered material is stored indoors until shipped for reclamation.	-
	8	Outdoor vehicle washing is prohibited.	-

Table 4.1. Best Management Practices
Owens-Brockway Glass Container Inc., Plant No. 21

Housekeeping	1	Site sweeping operations, including area near the batch house, soda ash storage area, cullet storage area, and raw material unloading areas.	2 x week by facility staff, 2 X month by contractor
	2	Outdoor batch storage hoppers covered with tarps to contain loose material.	-
	3	Glass Plant Road is closed to traffic unrelated to Owens-Brockway.	-
	4	Outdoor uncovered trash hoppers have been eliminated.	-
	5	Waste profile developed at Hillsboro Land fill for oily debris and have covered drop box on site to handle this waste stream more effectively. This drop box contains a lining to prevent seepage.	-
	6	Central vacuum system installed for improved housekeeping in the Batch House.	-
	7	The Facility manages its cullet inventory to minimize the tons of cullet stored on site to minimize exposure.	-

Table 5.1. Laboratory Analytical Methods, Sample Containers, and Holding Times

Parameter	TSS	Phosphorus
Test Method	USEPA 160.2	USEPA 365.1-365.2-365.4
Detection Limits	1 mg/L	4 ug/L
Sample Container	1 L HDPE	1 L HDPE
Preservative	Unpreserved	H_2SO_4
Holding Time	7 days	28 days

Table 5.2. NPDES Stormwater Monitoring Data for Outfall 2

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	002	002	002	002	002	002	002	002	002	002
3/21/22	7.7	27	NA	0.012	0.026	0.131	55	0.23	3	1
02/28/22	7.7	26	NA	0.007	0.027	0.107	62	0.11	ND (2.00)	1.4
12/15/21	7.9	42	NA	0.018	0.027	0.115	548	0.41	ND (2.00)	2.1
11/29/21	7.8	ND (2.50)	NA	0.017	0.006	0.053	64	0.36	ND (2.00)	1.1
03/22/21	W	W	W	W	W	W	236	0.15	W	W
02/03/21	W	W	W	W	W	W	1203	0.13	W	W
01/08/21	W	W	W	W	W	W	219	0.43	W	W
12/21/20	W	W	W	W	W	W	196	0.30	W	W
11/18/20	W	W	W	W	W	W	687	0.40	W	W
04/01/20	W	W	W	W	W	W	24	0.25	W	0.3
12/13/19	W	W	W	W	W	W	46	0.38	W	1.2
11/19/19	W	W	W	W	W	W	2420	0.34	W	0.5
04/05/19	W	9	W	0.015	W	0.071	770	0.14	W	1.0
02/14/19	W	130	W	0.022	W	0.316	2420	0.31	W	2.7
11/28/18	W	35	W	0.025	W	0.142	1203	0.29	W	5.7
10/31/18	W	ND (2.50)	W	0.018	W	0.045	57	0.21	W	0.8
03/23/18	7.9	75	ND (1.51)	0.009	0.012	0.077	770	0.12	ND (2.00)	NS

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	002	002	002	002	002	002	002	002	002	002
01/25/18	8.4	102	ND (5.68)	0.034	0.048	0.213	2420	0.41	3	3.7
12/04/17	7.9	7	ND (5.15)	0.017	0.004	0.052	12	0.20	ND (2.00)	NA
10/20/17	8.1	12	ND (7.09)	0.021	0.012	0.072	1986	0.37	ND (2.00)	2.3
04/13/17	7.0	W	W	W	W	W	49	0.12	W	0.3
02/23/17	8.2	W	W	W	W	W	167	0.19	W	NS
12/20/16	9.1	W	W	W	W	W	2420	0.16	W	1.1
11/09/16	7.9	W	W	W	W	W	411	0.97	W	3.6
06/23/16	7.6	W	W	W	W	W	2420	0.20	W	NA
02/18/16	7.0	W	W	W	W	W	137	0.21	W	1.7
11/19/15	7.8	W	W	W	W	W	980	0.36	W	1.3
09/02/15	7.3	W	W	W	W	W	2420	0.66	W	NA
05/12/15	9.0	W	W	W	W	W	2420	0.35	W	NA
02/02/15	8.1	W	W	W	W	W	1986	0.30	W	NA
10/31/14	7.1	4	ND (6.21)	0.030	ND (0.01)	0.091	2420	0.66	4	1.7
09/24/14	7.2	20	ND (5.99)	0.062	0.045	0.116	2420	1.45	15	2.6
04/24/14	9.2	50	ND (4.95)	0.011	0.026	0.112	1986	0.22	ND (2)	NA
02/18/14	8.3	14	ND (5.08)	0.034	0.026	0.127	28	0.53	ND (2)	NA
09/25/13	7.9	8	ND (9.62)	0.024	0.008	0.085	345	0.49	ND (2)	NA

NA - Not Analyzed

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	002	002	002	002	002	002	002	002	002	002

ND - Non Detect

W - Monitoring Waiver

Table 5.3. NPDES Stormwater Monitoring Data for Outfall 4

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	004	004	004	004	004	004	004	004	004	004
3/21/22	7.3	5	NA	0.002	0.003	0.032	6	ND (0.05)	ND (2.00)	0.15
02/28/22	7.3	24	NA	0.004	0.006	0.045	5	0.06	ND (2.00)	0.9
12/15/21	7.5	ND (2.50)	NA	0.002	0.003	0.027	32	ND (0.05)	ND (2.00)	0.1
10/05/21	7.5	11	NA	0.003	0.002	0.027	61	ND (0.05)	3	ND (0.200)
03/22/21	W	W	W	W	W	W	W	W	W	W
02/03/21	W	W	W	W	W	W	W	W	W	W
01/08/21	W	W	W	W	W	W	W	W	W	W
12/21/20	W	W	W	W	W	W	W	W	W	W
11/18/20	W	W	W	W	W	W	W	W	W	W
04/01/20	W	W	W	W	W	W	W	W	W	W
12/13/19	W	W	W	W	W	W	W	W	W	W
11/19/19	W	W	W	W	W	W	W	W	W	W
04/05/19	7.6	W	W	W	W	W	W	W	W	1.2
02/14/19	7.2	W	W	W	W	W	W	W	W	0.9
11/30/18	7.7	W	W	W	W	W	W	W	W	0.7
11/02/18	7.6	W	W	W	W	W	W	W	W	0.1
03/23/18	8.0	5	ND (1.40)	0.003	0.004	0.047	365	ND (0.05)	ND (2.00)	NA
01/25/18	7.8	34	ND (5.68)	ND (0.004)	0.006	0.044	291	0.08	ND (2.00)	NA

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	004	004	004	004	004	004	004	004	004	004
12/19/17	8.6	31	ND (5.52)	0.006	0.005	0.069	11	0.10	ND (2.00)	2.7
11/17/17	6.5	3	ND (7.04)	ND (0.004)	0.003	0.055	62	ND (0.05)	ND (2.00)	0.2
04/13/17	W	W	W	W	W	W	W	W	W	NA
02/23/17	W	W	W	W	W	W	W	W	W	NA
12/20/16	W	W	W	W	W	W	W	W	W	NA
11/09/16	W	W	W	W	W	W	W	W	W	NA
06/23/16	W	W	W	W	W	W	W	W	W	NA
02/18/16	6.9	41	W	W	W	W	84	W	W	1.6
11/19/15	7.2	5	W	W	W	W	236	W	W	0.4
09/02/15	6.8	ND (2.00)	W	W	W	W	91	W	W	NA
05/12/15	6.2	37	W	W	W	W	79	W	W	NA
02/02/15	6.1	5	W	W	W	W	3	W	W	NA
10/31/14	6.2	15	ND (6.58)	0.007	0.005	0.055	727	0.06	ND (2)	0.3
09/24/14	9.4	10	ND (5.81)	0.018	0.021	0.254	1986	0.07	3	0.9
04/24/14	6.6	68	ND (4.76)	ND (0.005)	0.002	0.048	579	ND (0.05)	ND (2)	NA
02/18/14	6.0	58	ND (4.81)	0.006	0.009	0.066	3	0.06	ND (2)	NA
12/20/13	7.1	48	ND (5.03)	0.007	0.005	0.090	50	0.11	ND (2)	NA

NA - Not Analyzed
ND - Non Detect
W - Monitoring Waiver

Table 5.4. NPDES Stormwater Monitoring Data for Outfall 5

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD5	Iron
	005	005	005	005	005	005	005	005	005	005
3/21/22	6.8	3	NA	0.001	0.001	0.028	1	0.07	ND (2.00)	0.11
02/28/22	7.5	221	NA	0.003	0.003	0.024	3	0.09	ND (2.00)	1.6
12/15/21	8.1	ND (2.50)	NA	0.001	0.001	0.025	23	0.05	ND (2.00)	0.1
10/05/21	7.5	19	NA	0.002	0.001	0.019	155	0.07	ND (2.00)	0.4
03/22/21	W	W	W	W	W	W	W	W	W	W
02/03/21	W	W	W	W	W	W	W	W	W	W
01/08/21	W	W	W	W	W	W	W	W	W	W
12/21/20	W	W	W	W	W	W	W	W	W	W
11/18/20	W	W	W	W	W	W	W	W	W	W
04/01/20	W	W	W	W	W	W	W	W	W	W
12/13/19	W	W	W	W	W	W	W	W	W	W
11/19/19	W	W	W	W	W	W	W	W	W	W
04/05/19	7.4	W	W	W	W	W	W	W	W	0.4
02/14/19	7.6	W	W	W	W	W	W	W	W	0.2
11/30/18	8.3	W	W	W	W	W	W	W	W	0.2
11/02/18	8.5	W	W	W	W	W	W	W	W	0.3
03/23/18	7.9	6	ND (2.31)	ND (0.002)	ND (0.0008)	0.052	42	ND (0.05)	ND (2.00)	NA
01/25/18	7.9	15	ND (6.17)	ND (0.004)	0.002	0.024	17	ND (0.05)	ND (2.00)	NA
12/19/17	8.9	ND (2.00)	ND (5.32)	ND (0.004)	0.001	ND (0.02)	3	0.08	ND (2.00)	0.2
11/17/17	6.8	8	ND (7.04)	ND (0.004)	0.003	0.048	4	0.09	ND (2.00)	0.2

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD5	Iron
	005	005	005	005	005	005	005	005	005	005
05/05/17	W	W	W	W	W	W	W	W	W	0.1
04/13/17	W	W	W	W	W	W	W	W	W	0.1
12/20/16	W	W	W	W	W	W	W	W	W	NA
11/09/16	W	W	W	W	W	W	W	W	W	NA
06/23/16	W	W	W	W	W	W	W	W	W	NA
02/18/16	7.5	W	W	W	W	W	6	W	W	0.8
11/19/15	6.8	W	W	W	W	W	27	W	W	1.0
09/02/15	6.4	W	W	W	W	W	649	W	W	NA
05/12/15	6.1	W	W	W	W	W	75	W	W	NA
02/02/15	6.1	W	W	W	W	W	5	W	W	NA
10/31/14	6.3	6	ND (5.52)	0.004	ND (0.004)	0.085	121	ND (0.05)	ND (2)	0.2
09/24/14	5.6	13	ND (5.56)	0.005	0.001	0.053	2420	0.10	ND (2)	0.6
04/24/14	6.8	11	ND (5.62)	ND (0.005)	0.001	0.075	172	0.14	ND (2)	NA
02/18/14	6.9	18	ND (5.03)	ND (0.005)	0.002	0.045	1	ND (0.05)	ND (2)	NA
12/20/13	6.8	60	ND (4.98)	ND (0.005)	0.002	0.040	59	0.12	ND (2)	NA

NA - Not Analyzed

ND - Non Detect

W - Monitoring Waiver

Table 5.5. NPDES Stormwater Monitoring Data for Outfall 6

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	006	006	006	006	006	006	006	006	006	006
3/21/22	6.6	22	NA	0.004	0.002	0.058	472	0.10	ND (2.00)	0.7
02/28/22	6.8	257	NA	0.023	0.018	0.268	12	0.33	2	9.6
12/15/21	8.9	64	NA	0.007	0.004	0.120	770	0.13	3	2.2
10/05/21	7.6	29	NA	0.009	0.003	0.076	1120	0.11	4	1.2
03/22/21	W	26	W	W	W	W	10	W	W	W
02/03/21	W	19	W	W	W	W	46	W	W	W
01/08/21	W	8	W	W	W	W	23	W	W	W
12/21/20	W	10	W	W	W	W	25	W	W	W
11/18/20	W	21	W	W	W	W	62	W	W	W
04/01/20	W	10	W	W	W	W	7	W	W	0.9
12/13/19	W	18	W	W	W	W	88	W	W	0.8
11/19/19	W	21	W	W	W	W	238	W	W	0.7
04/05/19	7.6	71	W	W	W	W	15	W	W	2.8
02/14/19	8.0	88	W	W	W	W	57	W	W	4.1
12/18/18	7.6	84	W	W	W	W	214	W	W	3.1
03/23/18	8.0	42	ND (1.36)	0.007	0.003	0.067	66	0.09	ND (2.00)	NS
01/25/18	8.2	22	ND (5.10)	0.005	0.002	0.051	980	0.05	ND (2.00)	1.0
12/19/17	8.8	91	ND (5.26)	0.015	0.007	0.136	921	0.21	2	NS
10/20/17	7.9	8	ND (3.55)	0.006	0.002	0.058	2420	0.08	2	0.8

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	006	006	006	006	006	006	006	006	006	006
05/05/17	7.6	W	W	W	W	W	W	W	W	6.8
02/23/17	W	W	W	W	W	W	W	W	W	NS
12/20/16	W	W	W	W	W	W	W	W	W	NS
11/09/16	W	W	W	W	W	W	W	W	W	NS
06/23/16	W	W	W	W	W	W	W	W	W	NS
02/18/16	7.4	56	W	W	W	W	71	0.13	W	2.3
11/19/15	6.9	32	W	W	W	W	291	0.10	W	1.1
09/02/15	6.4	ND (20.0)	W	W	W	W	2420	0.18	W	NS
05/12/15	6.3	15	W	W	W	W	326	0.06	W	NS
02/02/15	5.6	262	W	W	W	W	147	0.05	W	NS
10/31/14	6.3	79	ND (6.13)	0.138	0.007	0.087	921	0.26	ND (2.00)	5.5
09/24/14	6.2	63	ND (5.68)	0.101	0.002	0.060	2420	0.31	6	2.1
04/24/14	8.3	96	ND	0.006	0.000	0.050	1300	ND	ND (2.00)	NS
02/18/14	6.9	45	ND	0.011	0.010	0.090	210	0.15	ND (2.00)	NS

NA - Not Analyzed

ND - Non Detect

W - Monitoring Waiver

Table 5.6. NPDES Stormwater Monitoring Data for Outfall 8

Sample Date	pH (s.u.)	Total Suspended Solids	Total Oil & Grease	Total Copper	Total Lead	Total Zinc	E. coli	Total Phosphorus	BOD_5	Iron
	008	008	008	008	008	008	008	008	008	008
3/21/22	8.6	ND (2.00)	NA	0.002	0.002	0.041	ND (1)	ND (0.05)	ND (2.00)	ND (0.05)
02/28/22	7.4	4	NA	0.001	0.002	0.011	1	ND (0.050)	ND (2.00)	0.1
12/15/21	8.6	7	NA	0.001	0.003	0.040	1	ND (0.050)	ND (2.00)	0.1
10/05/21	7.2	ND (2.00)	NA	0.002	0.002	0.027	20	ND (0.050)	ND (2.00)	0.0
03/22/21	8.4	7	ND (2.70)	0.003	0.003	0.018	1	ND (0.05)	3	0.4
02/03/21	8.8	10	ND (2.69)	0.003	0.007	0.018	<1	ND (0.05)	ND (2.00)	0.5
01/08/21	7.9	3	NS	ND (.002)	0.004	0.014	1	ND (0.05)	ND (2.00)	0.1
12/21/20	7.1	ND (2.00)	NS	ND (.002)	0.003	0.013	1	ND (0.05)	ND (2.00)	0.1
11/18/20	7.0	3	ND (2.70)	0.002	0.004	0.017	10	ND (0.05)	ND (2.00)	0.3
04/01/20	7.6	9	2.77	0.012	0.006	0.084	2	ND (.05)	4	0.3
12/20/19	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0
12/13/19	7.6	2	ND (1.3)	ND (.002)	0.002	0.019	2	ND (.05)	ND (2.0)	NA

NA - Not Analyzed

ND - Non Detect

W - Monitoring Waiver

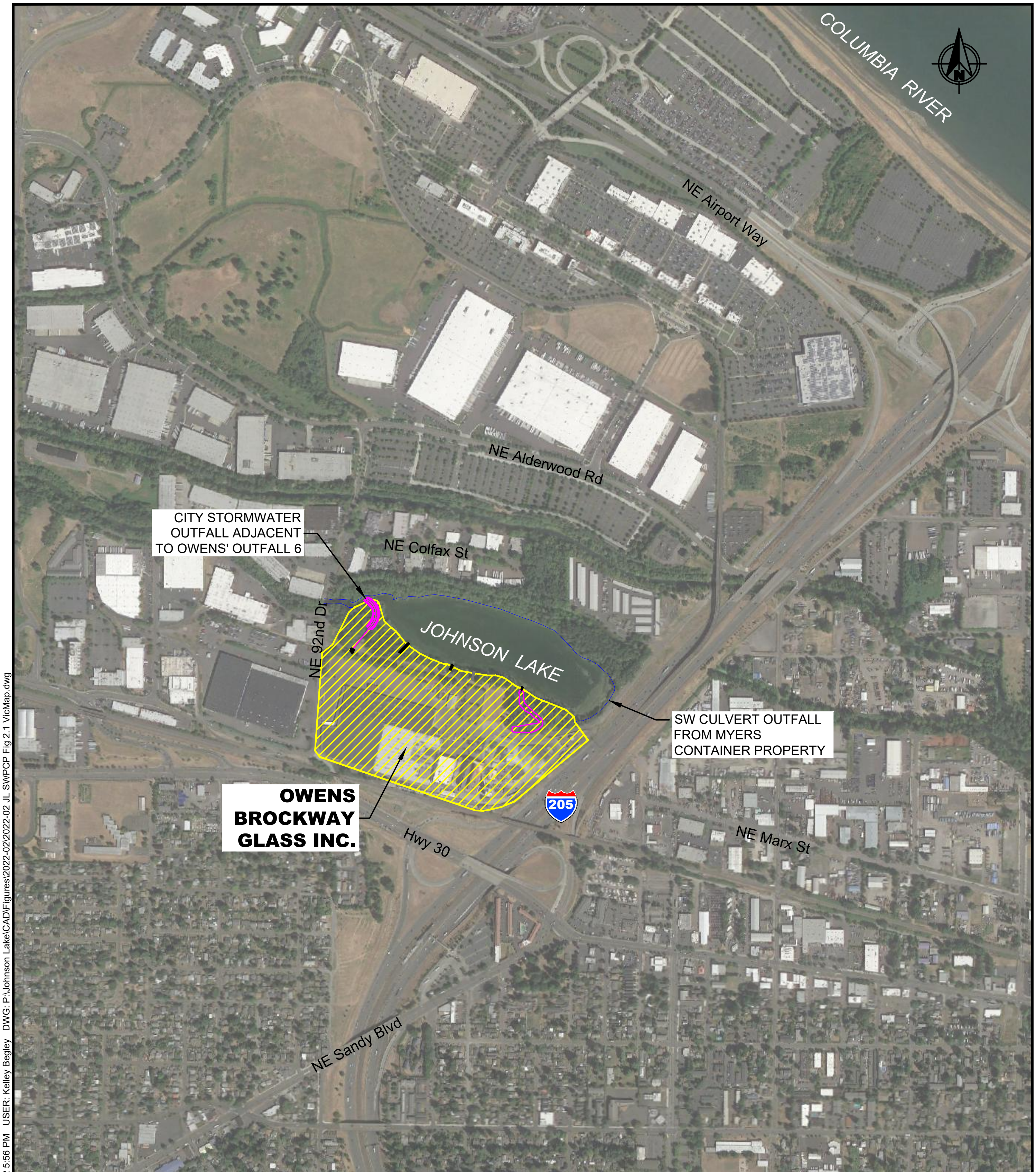
Table 6.1 Sample results from fire suppression water taken 9/10/2018.

	Screening Value	MP-002 9/10/18	Upstream OF 2 9/10/18
Metals	**ug/l**	**ug/l**	**ug/l**
Aluminum	87	NA	NA
Antimony	640	<2	<2
Arsenic	0.14	**5.8**	<2
Arsenic III	190	NA	NA
Cadmium	0.094	<0.8	<0.8
Chromium, total	--	<6	<6.0
Chromium, hexavalent	11	NA	NA
Copper	2.7	**16.1**	**9.2**
Lead	0.54	**4**	**7.7**
Manganese	100	NA	NA
Mercury	0.77	<0.2	<0.2
Methyl Mercury	0.0028	NA	NA
Nickel	16	5	<4
Selenium	5	<20	<20
Silver	0.12	<2	<2
Zinc	36	29.1	**56.9**
Perchlorate	--	NA	NA
Cyanide	5.2	NA	NA

NA - Not analyzed

< - less than detection limit

Figures



PLOT TIME: 2/8/2022 5:58 PM MOD TIME: 2/8/2022 5:56 PM USER: Kelley Begley DWG: P:\Johnson Lake\CAD\Figures\2022-02\2022-02 JL SWPCP Fig 2.1 VicMap.dwg

NOTE:
1. Aerial Background Image from Google Earth Pro, dated 08/13/2021. Use for visual reference only.

0 1000
Scale in Feet

Owens Brockway Glass Inc.
9710 N.E. Glass Plant Road - Portland, Oregon

VICINITY MAP

DOF DALTON OLMSTED FUGLEVAND

FIGURE 2.1

02/08/2022

NOTES:

1. This map recreated from figure titled "Owens-Illinois Brockway Glass - Stormwater Site Specific Map" in July 21, 2009 report by StormwaterRx, LLC. All piping and basins approximate, based on Owens Site Stormwater Map, 8/21/01 and Weddle Surveying, Inc. September 24, 2009 investigative survey.
2. Aerial Background Image from Google Earth Pro, dated 08/13/2020. Use for visual reference only.

Owens Brockway Glass Inc.
9710 N.E. Glass Plant Road - Portland, Oregon

STORMWATER SITE SPECIFIC MAP

DOF DALTON OLMSTED FUGLEVAND

FIGURE 2.2

02/08/2022

Legend

Temporary Covering (long-term storage)

Approximate Location of Permanent Structure (short-term storage) (under construction)

Approximate Location of Underground Modular Wetland (under construction)

N

0 60 120
Scale in Feet

NOTE:
1. Aerial Background Image from Google Earth Pro, dated 08/13/2021. For visual reference only.

Owens Brockway Glass Inc.
9710 N.E. Glass Plant Road - Portland, Oregon

SOURCE CONTROL AND TREATMENT

DOF DALTON OLMSTED FUGLEVAND

FIGURE 4.1

02/08/2022

PLOT TIME: 2/8/2022 5:58 PM MOD TIME: 2/8/2022 5:56 PM USER: Kelley Begley DWG: P:\Johnson Lake\CAD\Figures\2022-02\2022-02 JL SWPCP Fig 4.1 Source Control.dwg

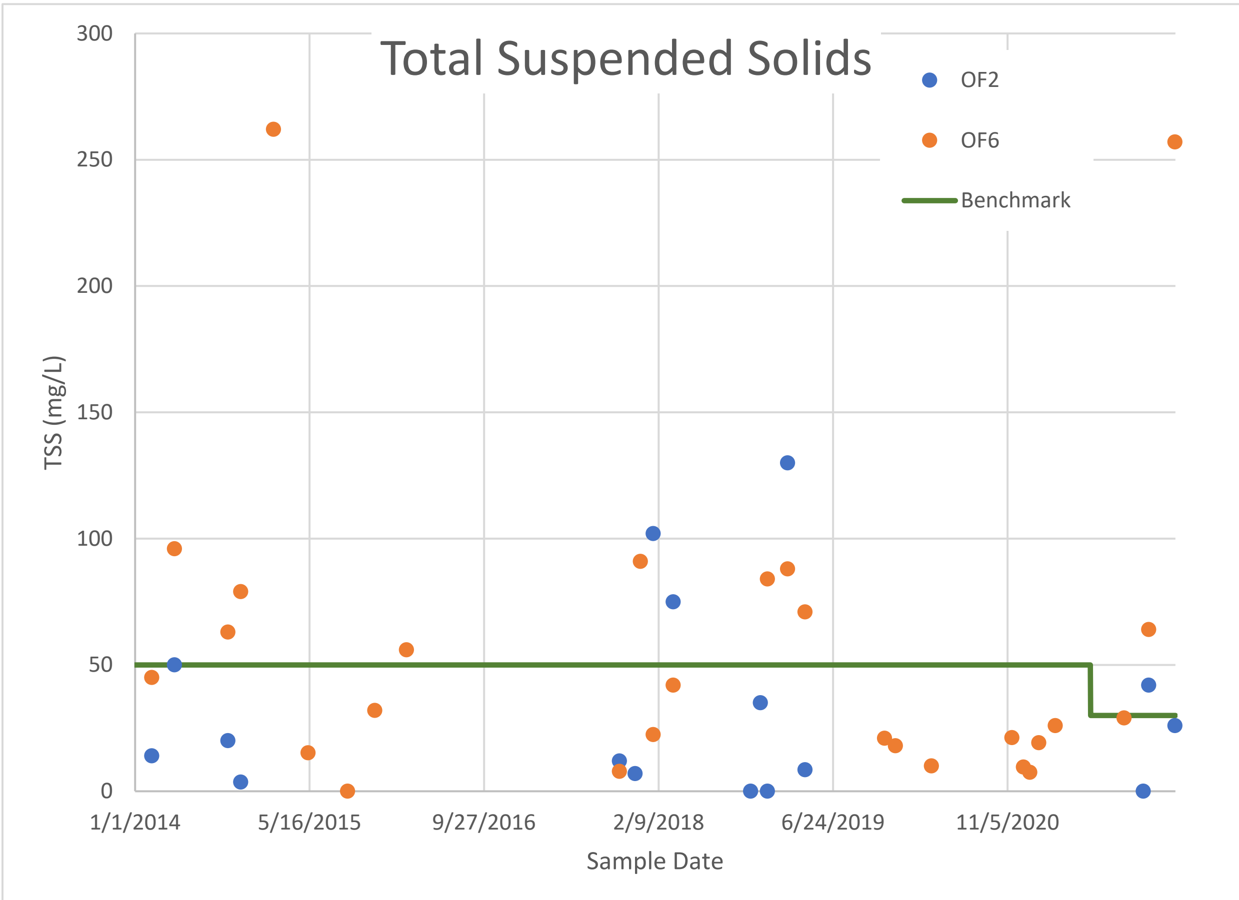


Figure 5.1 Total Suspended Solids from Outfalls 2 and 6 from NPDES monitoring data compared to statewide benchmarks.

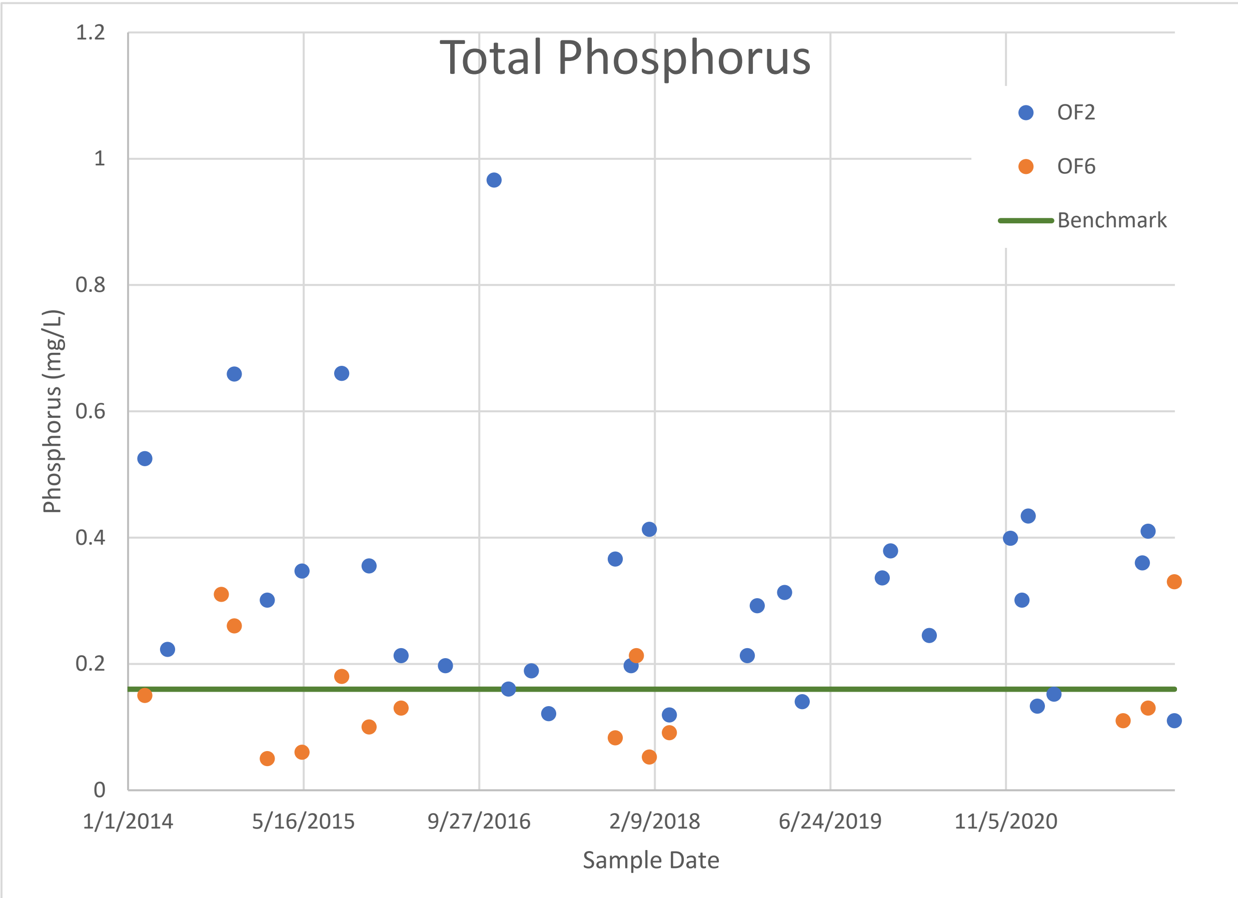


Figure 5.2 Phosphorus from Outfalls 2 and 6 from NPDES monitoring data compared to statewide benchmarks.

DOF DALTON OLMSTED FUGLEVAND

Attachment A

This memorandum chronologically documents the removal of potentially impacted sediments from the storm water culvert that discharges into the east end of Johnson Lake (JL). This culvert is referred to as Outfall #1. This work was started on Nov 1, 2012 and completed on Nov 7, 2012. The work was performed by Bravo Environmental (Bravo). DOF personnel were onsite during this work to observe the work on behalf of Owens.

The purpose of cleaning the storm water culvert was to remove potentially impacted sediments that were located in the culvert. Sediment from the culvert were previously observed by DOF personnel (as a turbid plume) being transported into Johnson Lake during and after rain events. DOF personnel issued a memorandum dated Feb 27, 2012 that documented sampling and analysis of sediments located within the Johnson Lake end of the culvert.

November 1, 2012

DOF representative arrived at the site during an ongoing storm event and observed a large sediment plume entering Johnson Lake from the culvert as shown in Figure P-1. Sediment plume persisted for several hours until storm event was finished. Bravo arrived onsite and mobilized a 25 yard roll-off box that was staged on Glass Plant Rd. No other work performed by Bravo this day.

November 2, 2012

Rain for Rent mobilized a water treatment plant (WTP) onto Myers Container property near the culvert inlet, east of I-205. Bravo mobilized a vac-truck and jet-truck to Glass Plant Rd near the west end of the culvert where it discharges into Johnson Lake. Laborers constructed a sandbag berm, approximately three feet downstream of the culvert, to help control sediment flowing out of the culvert during the sediment removal process. A four inch pump was then used to pump the standing water out of the area upstream of the sand bag berm and the culvert. Discharge from this pump was directed into JL. During this time a turbidity plume was observed entering JL from the pumps discharge pipe. The dewatering process took approximately two minutes after which the pump was turned off. A sump, approximately a foot deep and two feet in diameter, was constructed between the sandbag berm and the culvert. The sump was constructed by using a shovel to loosen the soil while the vac-truck removed the material for disposal. A jet hose was then used to suspend the sediment within the culvert. The vac-truck removed the sediment and water from the culvert through the 25 yard roll-off sediment box staged on Glass Plant Rd until the vac-truck tank was full. The vac-truck discharged the water in its tank into the WTP for processing. When the vac-truck returned the four inch pump was again used to remove standing water from the culvert and discharged the water into JL. The pump was run for approximately 60 seconds. A turbidity plume was again observed entering JL from the pump discharge pipe during this time. The culvert cleanout continued until early afternoon when work was stopped due to the inability to process any more water for the day through the WTP. DEQ representative, Tom Gainer, was onsite to observe cleanout process in the afternoon prior to the shutdown. The sandbag berm was removed at the end of the shift. A turbidity plume and oil sheen (shown in Figure P-2) was observed entering JL after the sandbag berm was removed.

November 5, 2012

Bravo reconstructed the sandbag berm. Similar to the previous day, the standing water in the culvert was then pumped into JL (see Figure P-3) using the four inch pump. The dewatering process took approximately 7 minutes during which time a turbidity plume was again observed entering the lake from the pumps discharge pipe as shown in Figure P-4. DOF representative was informed that WTP not plumbed correctly; reducing the plant's capacity. The WTP was replumbed prior to the restart of the culvert cleanout. Culvert cleanout continued throughout the morning. Work was stopped to empty the sediment box and to refill the jet-truck's water tank. Prior to the restart of the culvert cleanout in the afternoon the four inch pump was again used to remove standing water that had collected in the culvert by again pumping the water into JL. The dewatering process took approximately 60 seconds during that time a plume was again observed entering the lake. At the end of the shift the berm was removed and an oil sheen was again observed entering JL from the outfall. This completed cleaning of the western portion of the culvert (pending video inspection).

November 6, 2012

DOF representative arrived onsite and observed oil sheen was still present near the JL end of the outfall. The eastern half of the culvert was reported by Bravo to be angled slightly downward towards the inlet on Myers Container property. To clean this half of the culvert Bravo moved the vac-truck and jet-truck onto Myers' property. The sediment was then suspended using the water jet and the vac-truck removed from the sediment at the culvert inlet. During this time the west end of the culvert was checked for flow by the DOF representative. Turbid water was observed entering JL from the culvert at that time. No significant turbidity was observed prior to the start of the cleanout. Figure P-5 is a photo of the west end of the culvert prior to the cleanout and Figure P-6 is the same location after the cleanout had started. No berm was constructed between JL and the culvert outlet prior to the start of the clean out to prevent turbid water from entering JL during the clean out of the eastern portion of the culvert. The removal of sediment from the culvert was completed at approximately 19:00 (pending video inspection of culvert).

November 7, 2012

DOF representative arrived onsite and noted that little to no water coming from the west end of the culvert. Bravo constructed a berm between the culvert and JL. The four inch pump was again used to dewater the culvert by pumping the standing water from behind the berm and from within the culvert into JL. No plume was observed entering JL from the pump discharge. A lateral launch pipeline closed circuit video camera with transponder was placed in the culvert at the outfall (see Figure P-10) to inspect and record the condition of the culvert after the cleanup was complete. The video inspection verified that the bulk of the sediment within the culvert had been removed with only trace amounts of sediment remaining. Upon completion of the video inspection Bravo demobilized their equipment and personnel.

Figures:

P-1: Turbidity plume observed extending approximately 75 feet out into Johnson Lake from storm water outfall.

P-2: Sheen was observed at the outfall entering Johnson Lake.

P-3: Water pump discharge from the storm water outfall into Johnson Lake.

P-4: Turbidity plume observed in Johnson Lake after water in culvert was pumped into the lake from the culvert.

P-5: Stormwater runoff into Johnson Lake before the clean out of the eastern portion of the culvert had started.

P-6: Highly turbid water observed entering Johnson Lake during the clean out of the eastern portion of the culvert.

P-7: Storm water culvert inlet located on Myers Container property east of I205.

P-8: Storm water runoff on Myers Container property to culvert inlet observed during a rain event.

P-9: Vac-truck, jet-truck, and sediment roll-off box staged on Glass Plant Rd east of Johnson Lake.

P-10: Remote controlled wheel camera unit enters the culvert to perform post cleanup inspection.

DOF DALTON OLMSTED FUGLEVAND

Attachment B

Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6945
TTY 711

September 11, 2018

Ashleigh Henry
Owens-Illinois Glass Plant
9710 NE Glass Plant Road
Portland, Oregon 97220

Re: Oil Spill
OERS No. 2018-2097

Dear Ms. Henry:

On September 10, 2018 the Department of Environmental Quality (DEQ) received a report of a spill of machine oil from the Owens-Illinois Glass facility in Portland, Oregon. Therefore, you are requested to take and/or continue all containment and cleanup actions possible to prevent the spread of the spill to public waters, groundwater or soils beyond the original spill site.

In accordance with Oregon Administrative Rules (OAR) 340-142-0090 (copy attached), you are required to submit a written report describing the spill and subsequent clean-up efforts. Pursuant to our discussion on-site today, please submit a copy of the internal report you will be generating to meet that requirement. We ask you to submit this information no later than October 11, 2018. Please submit the report to:

Please note that the DEQ email system cannot handle files larger than 8mb in size. Files in excess of that size should be split into smaller ones, or the information can be sent to me by regular mail to:

Mike Greenburg, DEQ, 700 NE Multnomah Street, Suite 600, Portland, OR, 97232-4100

Please note that responsible parties are required to pay costs incurred by DEQ for oversight of the investigation and cleanup of the spill or release (Oregon Revised Statutes 465.255). DEQ oversight costs include direct and indirect costs. Direct costs include site-specific expenses and legal costs. Indirect costs are those general management and support costs of the DEQ allocable to oversee this cleanup and not charged as direct, site-specific costs.

If you have any questions about this request, please contact me at (503) 229-5153.

Sincerely,

Michael Greenburg
State On-Scene Coordinator

Enclosures: OAR 340-142

General Information

OERS #	2018-2097
OERS Staff	Fawcett, Keelyn
File Name	Owens-Illinois Glass
Incident Status	Closed
Incident Report Required	☐

Report

Reported On Date	09/10/2018
Reported On Time	1535
DEQ Contact	Kimberlee Van Patten
Reporting Party	Ashleigh Henry - Owens-Illinois Glass ≠
Reporting Party Phone	503-849-3112

Fund Code

Fund Code	46125

Spill Location

Enter the information known regarding the location of the incident.

Address	9710 NE Glass Plant Rd
City	Portland
State	OR
Zip Code	97220
County	Multnomah
Latitude (Decimal Degrees)	45.564086
Longitude (Decimal Degrees)	-122.566222

Release

Material	Release Source	Quantity Released	Unit of Measure	Media Affected	Edit
Wastewater (Non-Sewage)	Business	Unknown	Gallons	Surface Water	

Add Release Details

Release Date 09/10/2018

Release Time 0630

Activity Material Storage

Cause Equipment Failure

Weather

Description of Release

Owens-Illinois Glass reported an unknown amount of process water discharged to Johnson Lake/Columbia Slough due to power outage. The majority of the water is clean city water and then mixed with oily discharge. The discharge will be ongoing until the oil water separator can catch up. They will be contacting a contractor for remediation, which they intend to collect the water in containers until it can be processed and returned to the system. Ashley can also be reached at the office/567-336-6429

Responsible Party

Organization Owens Illinois Glass Plant

Name Henry, Ashleigh,,Portland,OR

Work Phone: 567-336-3429 Cellular Phone: 503-849-3112
Primary Email: ashleigh.henry@o-i.com Other:

Incident Notifications

Performed By	Contact Method	Time of Contact	Date of Contact	Contact Organization	Phone Number	Edit

Add Incident Notifications

Tracking Tasks

This section reflects any Tracking Tasks related to this Incident.

Task Date	Task Time	Reporting Organization	Person Reporting Tracking Task	Tracking Task Description	Edit
11/19/2018	1440	Oregon Department of Environmental Quality	Greenburg	Discussed the incident with Tiffany YELTON-BRAM w/ NWR Water Quality. They are not considering any enforcement action due to the event being beyond reasonable control.	
11/19/2018	1000	Oregon Department of Environmental Quality	Greenburg	From: Jeremy Buck Sent: Monday, November 19, 2018 9:55 AM To: GREENBURG Michael J Subject: RE: [EXTERNAL] Owens Illinois Fire - Analytical Results Ok that's good to know that no transformers with fluids were involved in the fire. No need to analyze for PCBs unless there's a reason for it. Thanks for the update, I greatly appreciate it. -Jeremy From: GREENBURG Michael J Sent: Monday, November 19, 2018 9:17 AM To: 'Jeremy Buck' Subject: RE: [EXTERNAL] Owens Illinois Fire - Analytical Results The fire was in the rigging in their old substation (in the wood supports and suspension insulators), and caused them to shut down the electricity to the plant, but there were no transformers or other electrical equipment with fluids involved and no firefighting water or other discharge from the substation. With the power off the cooling water (city water) from the glass furnaces could no longer be processed by their treatment system and eventually built up and flowed out of the glass processing area and to the swale and lake. The next time I talk about sampling for a response I will make certain to discuss parameters and collection methods in more detail. From: Jeremy Buck Sent: Thursday, November 15, 2018 5:47 PM To: GREENBURG Michael J Subject: RE: [EXTERNAL] Owens Illinois Fire - Analytical Results Thanks Mike. Probably no PAHs unless it got heated, and with the fire I wasn't sure. Also, I think it was a transformer fire, so the PCBs were a potential but maybe it was mostly a non-PCB transformer. This certainly seems to be a small incident and not much got into the lake, so I don't think it's worth pursuing for us, but there were plenty of waterbirds using the lake so just wanted to have a chemical backup to confirm what I saw. I'm also just thinking of how I can be more helpful next time around. -Jeremy From: GREENBURG Michael J Sent: Thursday, November 15, 2018 3:44 PM To: 'Jeremy Buck' Subject: RE: [EXTERNAL] Owens Illinois Fire - Analytical Results The samples were collected by Ashleigh Henry, Owens Illinois' environmental staff-person. She collected them using her regular surface water monitoring methods, which included acidification of the sample. I was not aware of the limitations of the samples at the time, and my on-scene presence was well after the flow had been stopped. We tried later to see if there was enough residual sample to run additional tests on despite the acidification, but there was not sufficient volume. The oil is food-grade that is applied to the melted glass conveyances to keep the glass from sticking. It would not be expected to contain PAHs or PCBs. The contractor did not collect additional samples since they did not need them for waste profiling (based on knowledge of process). I would have preferred to have the data regardless just to be able to close this without a data gap. From: Jeremy Buck Sent: Wednesday, November 14, 2018 12:11 PM To: GREENBURG Michael J Subject: RE: [EXTERNAL] Owens Illinois Fire - Analytical Results Hmmm…I expected they would collect enough water for PAHs and PCBs, the key components we were interested in. Are there any data on those constituents available? That would be a serious gap in data quality objectives if those data were missing solely because the samples were collected incorrectly. I assume contractors collected the samples? Thanks -Jeremy From: GREENBURG Michael J Sent: Friday, November 9, 2018 2:12 PM To: 'Jeremy Buck' Subject: [EXTERNAL] Owens Illinois Fire - Analytical Results Jeremy, I was unable to navigate your agency's phone system when I tried to call you regarding this. Attached are the results for metals analysis from this incident. There was some light sheen observed entering Johnson Lake and NRC had contained that with boom and picked it up with	

Add a Tracking Task

Attachments

This section contains any files that are attached to this form. For example, these could include recovery plans, images, floor plans, and any other type of file related to this form. The file must be viewable with a web browser..

Attachment Name	Attachment Description	Delete
Metals Analytical Results		
Events Summary Letter		
Photolog for site visit 9-11-18		
Q-Time		

[Spill Letter]

[NRC 1224220]

[OERS Report]

Add Attachment

System Supplied Information

Last Updated By	Michael Greenburg (mgreenburg) ≠
Last Updated	11/19/2018 3:20:14 PM ≠