



Evergreen Resources Management
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Wilmington, DE 19803

January 29, 2021

Mr. C. David Brown, Ph.D., P.G
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, Pennsylvania 19401

**RE: Philadelphia Refinery Remediation Program
Groundwater Remediation Status Report, Second Half 2020
Primary Facility ID 780190**

Dear Mr. Brown:

This semi-annual report summarizes Operation & Maintenance (O&M) work completed at the Philadelphia Energy Solutions Refining & Marketing LLC (PESRM) Philadelphia facility (facility) and the Sunoco Partners Marketing and Terminals L.P. (SPMT) Belmont Terminal between July 1, 2020 and December 31, 2020. Detailed information regarding O&M activity is included in the attached tables for the PESRM facility and Belmont Terminal as prepared by Stantec Consulting Services Inc. (Stantec). This letter summarizes the information detailed in the tables plus additional activities under the "Work Plan for Site Wide Approach under the One Cleanup Program" (Site Wide Approach) such as investigations of the various Areas of Interest (AOIs).

In compliance with the 2003 Consent Order and Agreement (CO&A) entered into between Sunoco Inc. (R&M) (Sunoco) and the Pennsylvania Department of Environmental Protection (PADEP) for the PESRM facility located at 3144 Passyunk Avenue in Philadelphia, Pennsylvania, Sunoco has completed site characterization activities for all AOIs. The facility has since entered into the Pennsylvania One Cleanup Program. On November 30, 2011, Sunoco submitted a Site Wide Approach to the PADEP and the United States Environmental Protection Agency (USEPA). The Site Wide Approach clarified the technical method beyond the CO&A and provided an anticipated schedule for future Act 2 submissions with respect to the Philadelphia Refinery remediation program. Effective December 30, 2013, Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) assumed Sunoco legacy remediation liabilities with respect to the PESRM facility. All remediation of Sunoco's/Atlantic's historic environmental liabilities at the PESRM facility and Belmont Terminal will be managed moving forward by Evergreen. As described in the 2012 Buyer-Seller Agreement, environmental liabilities following the September 8, 2012 purchase and transfer of the Philadelphia Refinery to PESRM are managed by PESRM. On June 26, 2019, PESRM announced the closure of the former refining facility. As of June 26, 2020, Hilco Redevelopment Partners (HRP) completed its purchase of PESRM. HRP plans to redevelop the site as an industrial park and has no plans to operate the site as a refinery. A 2020 amendment to the Buyer-Seller Agreement lays out an updated schedule for Act 2 submissions designed to accommodate the planned site redevelopment. Reports that are scheduled to be submitted in 2021 are the Public Comment Remedial Investigation Report (RIR), RIR Addendum for Area of Interest (AOI) 4, RIR Addendum for AOI 9, and Sitewide Fate and Transport Remedial Investigation Report.

Evergreen will continue to submit the required documentation and implement remedial obligations for Evergreen's remediation program. Supplemental characterization data obtained following an approved AOI RIR or Site Characterization Report (SCR) will be incorporated in a future Act 2 deliverable. Evergreen will submit a Groundwater Remediation Status Report with the O&M summary, figures, tables, and Act 2 submittal updates on an annual basis coinciding with the annual groundwater gauging and monitoring. On the alternating six-month interval, Evergreen will submit an abbreviated Groundwater Remediation Status Report detailing the O&M summary with limited tables and without figures.

AOI 1 – Point Breeze Refinery No. 1 Tank Farm and No. 2 Tank Farm; and Belmont Terminal

Consent Order / Characterization Status

Sunoco submitted to the PADEP and the USEPA a SCR for AOI 1 dated June 30, 2005. Based on comments received by the PADEP with regard to the AOI 1 SCR, Sunoco prepared and submitted to the PADEP a revised SCR for AOI 1 dated July 17, 2006. The recommendations in the AOI 1 report were to supplement the existing remediation system along the northwestern portion of the Belmont Terminal and southeastern portion of the No. 2 Tank Farm. Sunoco has implemented these actions as detailed in previous reports. In addition, Sunoco provided the PADEP a Remedial Action Plan (RAP) for AOI 1 in January 2008. As a result of the 26th Street North Remediation System study and the S-50 Area (26th Street South) investigation, an addendum to the RAP was considered necessary. In December 2008, a RAP Addendum for AOI 1 was submitted to address the 26th Street North Remediation System data analysis and the 26th Street South investigation and subsequent remedial actions. Evergreen submitted a revised AOI 1 RIR on August 5, 2016 which was approved by the PADEP on November 1, 2016. Note that Belmont Terminal is currently considered a separate site from a regulatory perspective and was formally entered into the Act 2 program separately from AOI 1 and rest of the PESRM facility by the submission of a Notice to Remediate in 2014.

Evergreen conducted characterization activities at the Belmont Terminal in 2020 including a site-wide geophysics survey (electrical resistivity imaging) to aid in developing a high resolution conceptual site model. Soil borings and monitoring wells are currently being installed to confirm output from the geophysical survey. The activities are being conducted to aid in providing additional characterization information to be utilized as part of future modeling efforts for the refinery facility.

Belmont Terminal Remediation System – Operation During the Second Half of 2020

The Belmont Terminal Remediation System consists of two components including the Frontage Road System and the Loading Rack System.

On August 30, 2012, the Frontage Road System was turned off and will remain offline unless there are significant increases in light non-aqueous phase liquid (LNAPL) in the recovery wells. The recovery wells were gauged on July 17, 2020 and December 31, 2020, and no LNAPL was observed.

The Loading Rack System consists of five dual-phase pumping systems (RW-4, RW-22, RW-23, RW-24, and RW-25). Each recovery well contains separate pumps controlled by density floats and conductivity probes to pump groundwater and LNAPL. Recovered groundwater is discharged to an onsite process sewer. LNAPL thicknesses are monitored, and pumps are turned on/off as needed based on recoverable LNAPL accumulations in each recovery well. The recovered LNAPL is stored in a 5,000-gallon holding tank, the contents of which are pumped out and managed on an as needed basis. During the reporting period the pumps in RW-4, RW-24, and RW-25 were active.

The Loading Rack System was operational during the reporting period. System performance and operational status for the Loading Rack System can be found in **Appendix 1**. A total of 318,254 gallons of groundwater and 245 gallons of LNAPL was recovered by this system during the second half of 2020.

Shunk Street Sewer Ventilation System and Biofilter – Operation During the Second Half of 2020

The Shunk Street system draws air from the Shunk Street sewer through a nearby manhole and through three parallel biomass treatment beds. The remediation system removes VOCs from the effluent air stream by sorption and degradation via passage through treatment beds containing biofilter media. Treated air is discharged to the atmosphere and monitored through the use of field photoionization detectors (PIDs).

The system remained operational during the reporting period. Details of the Shunk Street Sewer Ventilation System and Biofilter operational status during the second half of 2020 can be found in **Appendix 1**.

26th Street North Remediation System - Operation During the Second Half of 2020

The 26th Street North Remediation System was modified in 2015 to increase the overall effectiveness of the system and was restarted on October 12, 2015. The four-inch diameter recovery wells (S-180, S-181, S-182, S-183, S-184, S-185, S-186, S-187, S-188, S-189, S-190, S-191, and S-192) were replaced with six-inch diameter recovery wells. Additionally, RW-400 and RW-402 are connected to the system for a total of fifteen recovery wells.

Within each well, a QED Environmental Systems Model AP-4+T AutoPump was installed to recover groundwater and LNAPL. Each recovery well contains a two-inch diameter lateral discharge line that connects to a four-inch high density polyethylene (HDPE) trunk line, which transfers the total fluids to an onsite process sewer. The pumps utilize compressed air, which is supplied by a Kaeser rotary screw air compressor. A one-inch diameter air line runs to each recovery well and is reduced to a 3/8-inch diameter line in each well vault at the pneumatic pump.

From October 26, 2020 through October 30 a performance evaluation was conducted at the 26th Street North Remediation System to evaluate the total fluids content and pumping flow rate. It was determined that the system pumped 7.3 gallons per minute (gpm) total fluids with all recovery well pumps operating. Additionally, less than 0.02% of the fluids were LNAPL. The results of this test are used to estimate fluids recovery volumes from the 26th Street North Remediation System starting in October 2020.

The 26th Street North Remediation System was operational during the reporting period. Details for the 26th Street Sewer North Remediation System performance data and operational status can be found in **Appendix 1**. A total of 4,933,541 gallons of total fluids was recovered by this system during the second half of 2020.

26th Street and Packer Avenue Sewers Biofilter Remediation System – Operation During the Second Half of 2020

The 26th Street and Packer Avenue Sewers Biofilter Remediation System was designed to ventilate/extract petroleum hydrocarbon vapors from the Packer Avenue/Pollock Street and 26th Street Intercepting Sewers, and remove volatile organic compounds (VOCs) from the effluent air stream by sorption and biological degradation via passage through a humidifier (when needed) and treatment beds containing biofilter media. Treated air is monitored and discharged to the atmosphere and monitored through the use of field photoionization detectors (PIDs).

The 26th Street and Packer Avenue Sewers Biofilter System was upgraded including replacing the compost beds, repairing the duct work, and replacing or repairing the fans. The system was restarted on June 6, 2016 for final stages of startup and system startup was completed on November 10, 2016. The system was operational during the second half of 2020. Details for the 26th Street and Packer Avenue Sewer Biofilter System performance data and operational status can be found in **Appendix 1**.

AOI 2 – Point Breeze Refinery

Consent Order / Characterization Status

The AOI 2 SCR/RIR was submitted to the PADEP and the USEPA on September 29, 2010. A revised RIR was completed in July 2017. PADEP approved the report on October 18, 2017.

Pollock Street West End Remediation System – Operation During the Second Half of 2020

During October 2011, heavier than usual quantities of oil were observed within the Pollock Street sewer outfall. As a result, Sunoco completed the expansion of the existing vertical recovery well remediation system in the vicinity of the Pollock Street sewer outfall in February 2012. The system, referred to as the Pollock Street West End System, consisted of a total of ten 4-inch diameter recovery wells on the east side of River Road and twenty 6-inch diameter recovery wells on the west side of River Road. Groundwater and LNAPL was removed from select recovery wells using pneumatic submersible pumps. All liquids were processed through an oil/water separator (OWS) and water was discharged to a refinery process sewer (S-10 Sump). LNAPL was recovered in a 550-gallon tank and then managed by the PESRM facility. A report describing the details of the investigation and remediation performed in response to the oil observed in the Pollock Street sewer outfall was submitted to the PADEP and the USEPA on June 29, 2012.

The Pollock Street West End Remediation System was turned off December 19, 2016 to evaluate LNAPL recharge. The system remained off during the second half of 2020.

Pollock Street Horizontal Well Remediation System – Operation During the Second Half of 2020

The Pollock Street Horizontal Well Remediation System consists of HW-1, HW-2, and HW-3. HW-1 was installed in July 2004 along the north side of the Pollock Street sewer from approximately RW-103 to approximately 100 feet west of RW-101. HW-2 and HW-3 were installed from approximately RW-103 to the intersection of Pollock Street and 16th Street in the second quarter of 2006. Groundwater and LNAPL from HW-1 and HW-2 discharge directly into a Benzene National Emission Standard for Hazardous Air Pollutants (NESHAP) controlled sewer, whereas groundwater and LNAPL from HW-3 discharge directly into an onsite process sewer.

Totalizers were installed in HW-1 and HW-2 on May 25, 2013 and July 6, 2015 respectively. Historically, due to fouling of flow meters, the estimated flow rate for HW-3 as determined by pump testing was 15.38 gallons per minute (gpm) derived from pump testing conducted in March 2011.

In October 2020, performance testing was performed to evaluate the total fluids content and pumping flow rate. It was determined that HW-3 pumped 2.1 gpm total fluids with the pneumatically operated double diaphragm pump. Additionally, approximately 0.03% of the fluids were LNAPL. The HW-3 observed recovery flow rate will be used for reporting purposes starting in October 2020.

The Pollock Street Horizontal Well Remediation System was operational during the second half of 2020. System performance data and operational status can be found in **Appendix 1**. The flow totals include activities from June 29 through December 28, 2020 due to the days which site activities occurred. A total of 5,723,292 gallons of total fluids was recovered by the Pollock Street Horizontal Well Remediation System during the reporting period.

Pollock Street Sewer Outfall – Operation During the Second Half of 2020

The Pollock Street Sewer outfall is checked for product accumulations or sheening. LNAPL will be handled by Evergreen contractors with spill control equipment to minimize or prevent releases to the Schuylkill River. Evergreen has continued to maintain a skimmer system located in the tide gate area. The skimmer discharges to a refinery process sewer (S-13 Sump). The skimmer will be activated if recoverable quantities of LNAPL are observed at the tide gate area. Except for the completion of preventative maintenance and equipment testing, the outfall skimmer remained off for the second half of 2020 due to the absence of recoverable oil in the outfall.

AOI 3 – Point Breeze Refinery, Impoundment Area

There are no Evergreen groundwater or LNAPL remediation systems active in this area. The AOI 3 SCR/RIR was submitted to the PADEP and the USEPA on September 27, 2010. The SCR/RIR stated that given the limited occurrence and mobility of LNAPL observed in RW-2, the former remediation system in this area will remain offline. A revised RIR for AOI 3 was submitted March 20, 2017 and approved on June 14, 2017. The disposition of remediation systems in AOI 3 will be revisited in the Site Wide Cleanup Plan.

LNAPL was identified in S-414 and significant increases in LNAPL thicknesses were observed in two wells (S-283 and S-382) during the annual sitewide gauging in June 2018. PES was notified of the observations and an underground product line was determined to have released reformate from the UDEX feed line that runs from the 860 Unit in the Point Breeze Refinery to the Girard Point Refinery. PESRM is conducting LNAPL remediation in this area.

AOI 4 – Point Breeze Refinery, No. 4 Tank Farm Area

Consent Order / Characterization Status

Sunoco submitted an SCR to the PADEP and the USEPA for AOI 4 on August 24, 2006. A repackaged SCR/RIR was submitted to the agencies on October 16, 2013. A “Disapproval of Remedial Investigation Report” was received from the PADEP on January 16, 2014. A revised RIR was submitted on March 24, 2017. The revised RIR was disapproved by the PADEP in a letter dated June 21, 2017 due to lack of offsite wells. In 2018, five additional monitoring wells (S-374, S-375, S-376, S-377, and S-378) were installed offsite adjacent to the Penrose Avenue Remediation System. Evaluation of these wells is conducted during quarterly groundwater gauging events. A geophysics survey was conducted in February 2020 to further investigate the subsurface conditions near the Penrose Remediation System and offsite. Additional monitoring wells and soil borings were installed from July to August 2020 to confirm output from the geophysical survey. Based on initial data collected from the new wells, more complex sampling has been performed including petroleum forensics and compound specific isotope analysis (CSIA). A RIR Addendum will be submitted in 2021 to summarize available offsite information.

Penrose Avenue Remediation System – Operation During the Second Half of 2020

Following characterization of AOI 4, Sunoco installed a remediation system on the southern border of AOI 4. This system is permitted for discharge to the Philadelphia Water Department (PWD) and by Philadelphia Air Management Services (AMS). Installation of the Penrose Avenue Remediation System was completed in

December 2012. Following minor modifications to the system to facilitate water discharge monitoring in accordance with the PWD groundwater discharge permit, the system was started on March 20, 2013. LNAPL thicknesses are monitored and pumps are turned on/off as needed based on recoverable LNAPL accumulations in each recovery well. On February 21, 2018 pumps were installed in S-221, S-236, and S-237 to address LNAPL in those wells.

On March 10, 2020, the groundwater remediation system was taken out of service pending the PWD discharge permit approval. The permit was later renewed by PWD; however, the system remained off this reporting period as Evergreen evaluates the data collected in 2020.

The installation of an in-situ Submerged Oxygen Curtain (iSOC) was initiated during the second half of 2018. The system consists of seven oxygen injection points located in RW-706, RW-709, RW-711, RW-712, RW-713, RW-714, and RW-715 with the purpose of creating an oxygen barrier to accelerate the natural degradation of petroleum hydrocarbons. The iSOC system was turned off April 7, 2020 and remained off during this reporting period. After completion of the site characterization activities, site conditions and remedial alternatives will be evaluated for this area.

S-30 Remediation System – Operation During the Second Half of 2020

The S-30 Remediation System consists of a LNAPL pump, probe assembly, and control panel. The recovered LNAPL is stored in a 2,500-gallon holding tank, the contents of which are managed by the PESRM facility on an as needed basis. The system was operational during the second half of 2020. System performance data and operational status can be found in **Appendix 1**. A total of 63 gallons of LNAPL was recovered by the S-30 Remediation System during the reporting period.

AOI 5 – Girard Point Refinery, South Tank Field

Consent Order / Characterization Status

There are no operational groundwater or LNAPL remediation systems in AOI 5. A SCR/RIR/Cleanup Plan was submitted to the PADEP and the USEPA on December 13, 2011. Sunoco received a RIR/Cleanup Plan disapproval letter from the PADEP on March 15, 2012. A revised RIR was submitted on January 16, 2016 and was approved by the PADEP on May 2, 2017.

AOI 6 – Girard Point Refinery, Chemicals Processing Area

Consent Order / Characterization Status

A SCR for AOI 6 was submitted to the PADEP and the USEPA on September 29, 2006. A repackaged SCR/RIR was submitted to the agencies on September 3, 2013. PADEP issued a disapproval letter on November 27, 2013. A revised RIR was submitted on November 21, 2017 and was approved by the PADEP on February 26, 2018.

27 Pump House Area

The total fluids remediation system that existed in the area of 27 Pump House was turned off September 20, 2010 due to absence of recoverable LNAPL. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. Based on limited recoverable LNAPL

in the proximal wells, passive remediation was discontinued on January 26, 2015, and the equipment was subsequently removed. Due to continued presence of elevated benzene concentrations in soil and groundwater in this area, remediation alternatives are being evaluated.

AOI 7 – Girard Point Refinery, Fuels Processing Area

Consent Order / Characterization Status

A repackaged AOI 7 SCR/RIR was submitted to the PADEP and the USEPA on February 29, 2012. A RIR Addendum was submitted to the agencies on September 19, 2013. On December 18, 2013, Sunoco received comments on the RIR Addendum from the PADEP. These comments were addressed in the revised RIR that was submitted June 9, 2017. The RIR was approved in correspondence dated August 30, 2017.

3 Separator Remediation System – Operation During the Second Half of 2020

On July 12, 2011, Sunoco reported a hydrocarbon sheen on the Schuylkill River to the National Response Center. The sheen was directly adjacent to the Girard Point Refinery No. 3 Separator. In response to the sheen on the river, Sunoco investigated the source of hydrocarbons to the river through the installation of monitoring wells and exploratory excavation around a process sewer junction box associated with the 137 Crude Unit and the No. 3 Separator. The monitoring wells demonstrated measurable oil on the water table and the exploratory excavation revealed integrity issues with the junction box. The junction box and associated bulkhead penetration were sealed with concrete.

Construction of a ten recovery well hydraulic control system was completed on August 23, 2012 and included RW-801, RW-802, RW-803, RW-804, RW-805, RW-806, RW-807, RW-808, RW-809, and RW-810. Groundwater and LNAPL are extracted using pneumatic submersible pumps and total fluids pass through an OWS. Water is discharged to an onsite process sewer. LNAPL is recovered in a 1,100-gallon holding tank and managed by the PESRM facility. In 2013, PESRM assumed primary responsibility for the 3 Separator System due to newer PESRM releases from the sewer system, which connects the 137 Crude Unit to the No. 4 Separator, in the vicinity of the No. 3 Separator.

The 3 Separator Remediation System was operational during the second half of 2020. System operation details and performance data for the system can be found in **Appendix 1**. A total of 1,478,800 gallons of groundwater and 103 gallons of LNAPL were recovered by the 3 Separator Remediation System during the second half of 2020.

AOI 8 – Point Breeze Refinery, North Yard

Consent Order / Characterization Status

An SCR was submitted to the PADEP on September 30, 2008. A repackaged SCR/RIR incorporating the PADEP's comments was submitted to the PADEP and the USEPA on January 31, 2012. Comments from the PADEP on the SCR/RIR were received by email on July 7, 2012. A revised RIR dated December 21, 2017 was submitted to the PADEP. PADEP issued an approval letter on March 22, 2018.

Northern/Verizon Area

Maiden Lane Remediation System

The northern boundary of AOI 8 near the South District Work Center of Verizon Pennsylvania, LLC (Verizon SDWC) property was evaluated for offsite impacts and system installation. A test well (N-157) was installed in 2017, and a

well performance test was conducted to evaluate the feasibility of LNAPL recovery as a remedial option near the adjacent Verizon SDWC property. During the second half of 2019, a horizontal well (HW-4) was installed in this area along the refinery property boundary for the purpose of groundwater and LNAPL recovery. A total fluids groundwater remediation system has been installed and became fully operational in 2021. All liquids are processed through an OWS. Groundwater is discharged to a PWD sewer and LNAPL is recovered in a 550-gallon holding tank and managed by the PESRM facility. Recovery information will be summarized in the next semi-annual report.

PGW Border Remediation System – Operation During the Second Half of 2020

The PGW Border Remediation System was replaced during the second half of 2019. Evergreen installed 30 new recovery wells and new remediation system equipment which allow groundwater and LNAPL recovery along the PGW border in the area of the former remediation system. The PGW Border Remediation System began operation in February 2020. A total of 31 recovery wells are connected to the system and each recovery well is equipped with a QED AP-4 pneumatic pump to recover groundwater and LNAPL. All liquids are processed through an OWS, and water is discharged to a refinery process sewer. LNAPL is recovered in a 550-gallon tank and then managed by the PESRM facility.

The PGW Border Remediation System was operational during the second half of 2020. System operation details and performance data for the system can be found in **Appendix 1**. A total of 1,774,150 gallons of groundwater and 1,046 gallons of LNAPL were recovered by the PGW Border Remediation System during the second half of 2020.

Jackson Street Sewer Remediation System – Operation During the Second Half of 2020

The Jackson Street Sewer Remediation System consists of two components, an inactive total fluids system with submersible pumps that formerly recovered groundwater and LNAPL (Jackson Street System) and a vapor suppression water curtain installed in the Jackson Street Sewer Remediation System (Jackson Street Water Curtain).

Due to limited LNAPL presence, the Jackson Street System was taken offline and equipment subsequently removed. The Jackson Street System will remain off unless there are significant increases in LNAPL in the proximal wells.

The Jackson Street Water Curtain was operational during the second half of 2020 and is monitored weekly. Vapor readings are collected at the water curtain and at the intercepting chamber connection to the 26th Street Sewer. System data and operational status for the second half of 2020 is included in **Appendix 1**.

Evergreen will continue to operate the Jackson Street Water Curtain and report performance information in semi-annual Philadelphia Refinery Groundwater Remediation Status Reports. To assess the need for continued operation of the water curtain, an evaluation of the vapor in the Jackson Street Sewer is being conducted in the first quarter of 2021. Details regarding plans to maintain this vapor mitigation system will be included in a future Act 2 deliverable.

Sunoco agreed at a July 30, 2009 meeting to sample the air in the sewer onsite and offsite following notification from the PADEP of a neighborhood (28th and McKean Streets) complaint. No complaints regarding sewer odors were received during the second half of 2020.

AOI 9 – Schuylkill River Tank Farm

There are no operational groundwater or LNAPL remediation systems in AOI 9. A SCR was submitted to the PADEP and the USEPA on October 30, 2009. A revised RIR was submitted to the agencies in December 2015. The RIR was disapproved, and a RIR Addendum to address the deficiencies was submitted on February 8, 2017. On April 18, 2018 the PADEP disapproved the RIR Addendum due to lack of offsite wells. Evergreen has obtained information from existing offsite wells, and five additional wells (S-146SRTF, S-147SRTF, S-148SRTF, S-149SRTF, and S-150SRTF) were installed in October 2018 along Essington Avenue, west of the Schuylkill River Tank Farm, to evaluate offsite groundwater conditions. A RIR Addendum will be submitted in 2021 to summarize available offsite information.

AOI 10 – Point Breeze Refinery, West Yard

There are no operational groundwater or LNAPL remediation systems in AOI 10. A SCR/RIR was submitted to the PADEP and the USEPA on June 29, 2011. Approval of the RIR was received from the PADEP on January 6, 2012. An ecological assessment was conducted in 2015 and 2016, and an Ecological Risk Assessment Report was submitted in June 2016, which was approved on November 10, 2016.

A Solid Waste Management Unit (SWMU) closure letter which addressed past disposal areas located in AOI 10 and AOI 8 (SWMU 1 and SWMU 2, respectively) was submitted to the USEPA on February 16, 2016. On November 29, 2016, the USEPA issued a response letter approving no further investigation or remediation required for SWMU 2 and denying the no further action request for SWMU 1. Evergreen collected additional information in 2017 to address the USEPA letter as well as the 2016 PADEP comments on the 2011 SCR/RIR and the Ecological Risk Assessment Report. A follow-up SWMU closure letter will be submitted to address SWMU 1 along with all other SWMUs previously identified at the facility to request concurrence that no further investigation is required, and acknowledge if any SWMUs require continued long-term stewardship.

AOI 11 – Lower Aquifer

The SCR/RIR was submitted to the PADEP and the USEPA on September 12, 2011. Sunoco received comments to the report by email on December 9, 2011. A Final Report was submitted to the agencies on June 21, 2013 which included activities to address the SCR/RIR disapproval. Sunoco received a “Disapproval of Final Report” from the PADEP dated September 26, 2013. Subsequent collection and reporting of characterization information from the lower aquifer wells across the facility has been incorporated into the other AOI RI Reports submitted to date.

Groundwater Monitoring

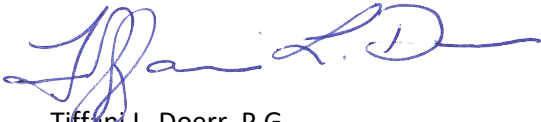
The current monitoring program consists of groundwater and LNAPL gauging and sampling of select monitoring wells. The wells are generally selected to monitor LNAPL thicknesses and determine hydraulic effects of targeted remediation systems. Sitewide well gauging events are also conducted to identify the presence of LNAPL and determine groundwater flow patterns. Annual sitewide groundwater sampling has historically been performed in the second quarter in conjunction with annual sitewide gauging; however, this year the monitoring program was postponed pending the completion of characterization activities and change of facility ownership. The groundwater sampling schedule will be flexible depending on the fate of the facility and remediation goals.

Liquid level measurements collected during the third quarter of 2020 are provided in **Table 1**. The fourth quarter 2020 liquid level measurements are provided in **Table 2**. The LNAPL thicknesses in these wells will be tracked to determine if changes are due to natural conditions such as seasonal groundwater fluctuation or other factors.

Please contact me at (302) 477-1305 or tldoerr@evergreenresmgt.com with any questions or comments.

Best Regards,

Evergreen Resources Management Operations



Tiffani L. Doerr, P.G.
Project Manager

Enclosures:

Table 1 – Third Quarter 2020 Gauging Data

Table 2 – Fourth Quarter 2020 Gauging Data

Appendix 1 – Remediation System Recovery Data

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File: ENFOS

TABLES

Table 1
Third Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 1	PZ-401	08-Jul-20	20.37	20.41	0.04	3.35	Static	
AOI 1	PZ-402	08-Jul-20	20.17	20.76	0.59	3.10	Static	
AOI 1	RW-401	08-Jul-20	21.29	21.58	0.29	3.42	Static	
AOI 1	RW-402	08-Jul-20	---	22.42	---	-0.71	Pumping	
AOI 1	RW-406	08-Jul-20	23.50	24.15	0.65	4.96	Static	
AOI 1	S-82	08-Jul-20	23.54	23.85	0.31	3.69	Static	
AOI 1	S-83	08-Jul-20	20.36	20.59	0.23	2.93	Static	
AOI 1	S-125	08-Jul-20	22.80	22.91	0.11	3.17	Static	
AOI 1	S-180	08-Jul-20	---	19.05	---	3.15	Pumping	
AOI 1	S-181	08-Jul-20	---	21.05	---	1.81	Pumping	
AOI 1	S-182	08-Jul-20	---	21.43	---	1.57	Pumping	
AOI 1	S-183	08-Jul-20	---	21.45	---	2.03	Pumping	
AOI 1	S-184	08-Jul-20	---	26.40	---	-2.92	Pumping	
AOI 1	S-185	08-Jul-20	---	18.78	---	5.10	Pumping	
AOI 1	S-186	08-Jul-20	---	22.95	---	1.41	Pumping	
AOI 1	S-187	08-Jul-20	---	21.22	---	3.29	Pumping	
AOI 1	S-188	08-Jul-20	---	24.72	---	0.10	Pumping	
AOI 1	S-189	08-Jul-20	---	24.65	---	1.14	Pumping	
AOI 1	S-190	08-Jul-20	---	24.55	---	1.02	Pumping	
AOI 1	S-191	08-Jul-20	---	22.45	---	3.38	Pumping	
AOI 1	S-192	08-Jul-20	---	24.35	---	1.67	Pumping	
AOI 1	S-274	08-Jul-20	---	23.01	---	4.36	Static	
AOI 1	S-275	08-Jul-20	---	23.21	---	3.36	Static	
AOI 1	S-276	08-Jul-20	23.18	23.82	0.64	3.28	Static	
AOI 1	S-277	08-Jul-20	22.39	23.18	0.79	3.15	Static	
AOI 2	RW-100	09-Jul-20	18.58	19.88	1.30	1.97	Static	
AOI 2	RW-101	09-Jul-20	18.95	18.95	<0.01	0.83	Static	
AOI 2	RW-102	09-Jul-20	15.50	15.84	0.34	1.93	Static	
AOI 2	RW-103	09-Jul-20	---	18.65	---	1.36	Static	
AOI 2	RW-105	09-Jul-20	8.04	8.05	0.01	0.64	Static	
AOI 2	RW-117	09-Jul-20	7.97	8.19	0.22	1.78	Static	
AOI 2	RW-118	09-Jul-20	---	10.02	---	1.80	Static	
AOI 2	RW-119	09-Jul-20	---	11.07	---	1.78	Static	
AOI 2	RW-120	09-Jul-20	---	11.89	---	1.69	Static	
AOI 2	RW-122	09-Jul-20	---	9.20	---	1.04	Static	
AOI 2	RW-124	09-Jul-20	---	7.20	---	1.96	Static	
AOI 2	RW-128	09-Jul-20	7.43	7.44	0.01	1.00	Static	
AOI 2	S-53	09-Jul-20	---	19.12	---	2.56	Static	
AOI 2	S-63	09-Jul-20	20.16	20.17	0.01	1.11	Static	
AOI 2	S-65	09-Jul-20	---	8.40	---	2.22	Static	
AOI 2	S-92	09-Jul-20	---	11.00	---	9.07	Static	
AOI 2	S-93	09-Jul-20	17.05	17.25	0.20	1.17	Static	
AOI 2	S-130	09-Jul-20	---	18.20	---	4.28	Static	
AOI 2	S-131	09-Jul-20	---	16.26	---	2.50	Static	
AOI 2	S-135	09-Jul-20	21.90	21.99	0.09	1.28	Static	
AOI 2	S-141	09-Jul-20	---	21.10	---	0.82	Static	
AOI 2	S-142	09-Jul-20	---	20.50	---	-0.66	Static	
AOI 2	S-156	09-Jul-20	---	18.80	---	2.04	Static	

Table 1
Third Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 2	S-157	09-Jul-20	---	17.80	---	2.14	Static	
AOI 2	S-159	09-Jul-20	---	17.10	---	1.77	Static	
AOI 2	S-174	09-Jul-20	9.90	10.00	0.10	9.71	Static	
AOI 2	S-254	09-Jul-20	19.16	19.21	0.05	1.71	Static	
AOI 2	S-303	09-Jul-20	---	14.20	---	8.39	Static	
AOI 2	S-304	09-Jul-20	13.40	13.88	0.48	10.73	Static	
AOI 2	S-315	09-Jul-20	---	19.95	---	0.52	Static	
AOI 2	S-346	09-Jul-20	18.19	18.43	0.24	1.26	Static	
AOI 2	S-347	09-Jul-20	17.84	18.82	0.98	1.15	Static	
AOI 2	S-348	09-Jul-20	15.70	15.84	0.14	3.87	Static	
AOI 2	S-349	09-Jul-20	16.50	16.80	0.30	2.08	Static	
AOI 2	S-406	09-Jul-20	9.93	10.01	0.08	2.26	Static	
AOI 4	RW-700	08-Jul-20	---	17.25	---	0.76	Static	
AOI 4	RW-701	08-Jul-20	---	17.41	---	0.86	Static	
AOI 4	RW-702	08-Jul-20	---	20.52	---	0.44	Static	
AOI 4	RW-703	08-Jul-20	---	19.83	---	0.79	Static	
AOI 4	RW-704	08-Jul-20	---	18.79	---	1.44	Static	
AOI 4	RW-705	08-Jul-20	---	15.15	---	0.77	Static	
AOI 4	RW-706	08-Jul-20	---	15.12	---	0.77	Static	
AOI 4	RW-707	08-Jul-20	---	15.49	---	0.80	Static	
AOI 4	RW-708	08-Jul-20	---	14.46	---	1.03	Static	
AOI 4	RW-709	08-Jul-20	---	14.55	---	0.75	Static	
AOI 4	RW-710	08-Jul-20	---	15.34	---	0.54	Static	
AOI 4	RW-711	08-Jul-20	---	14.63	---	0.86	Static	
AOI 4	RW-712	08-Jul-20	---	14.78	---	0.78	Static	
AOI 4	RW-713	08-Jul-20	---	14.19	---	0.83	Static	
AOI 4	RW-714	08-Jul-20	---	14.40	---	0.81	Static	
AOI 4	RW-715	08-Jul-20	---	14.54	---	0.83	Static	
AOI 4	RW-716	08-Jul-20	---	14.74	---	0.81	Static	
AOI 4	RW-717	08-Jul-20	---	14.79	---	0.82	Static	
AOI 4	S-26	08-Jul-20	---	19.87	---	0.89	Static	
AOI 4	S-124	08-Jul-20	22.39	22.39	<0.01	0.82	Static	
AOI 4	S-221	08-Jul-20	22.07	22.63	0.56	0.86	Static	
AOI 4	S-233	08-Jul-20	20.23	20.54	0.31	4.09	Static	
AOI 4	S-235	08-Jul-20	22.29	22.44	0.15	0.81	Static	
AOI 4	S-236	08-Jul-20	22.17	22.21	0.04	0.80	Static	
AOI 4	S-237	08-Jul-20	22.06	22.27	0.21	0.73	Static	
AOI 4	S-238	08-Jul-20	---	22.06	---	0.86	Static	
AOI 4	S-240	08-Jul-20	22.85	24.77	1.92	0.81	Static	
AOI 4	S-241	08-Jul-20	25.13	26.73	1.60	0.78	Static	
AOI 4	S-244	08-Jul-20	---	21.06	---	0.88	Static	
AOI 4	S-278	08-Jul-20	---	20.13	---	0.90	Static	
AOI 4	S-279	08-Jul-20	25.08	25.54	0.46	1.25	Static	
AOI 4	S-373	08-Jul-20	20.12	20.13	0.01	0.65	Static	
AOI 4	S-376	08-Jul-20	14.67	15.61	0.94	0.85	Static	
AOI 7	RW-801	02-Jul-20	---	16.25	---	-9.98	Pumping	
AOI 7	RW-802	02-Jul-20	---	19.41	---	-13.71	Pumping	
AOI 7	RW-803	02-Jul-20	---	22.54	---	-16.76	Pumping	

Table 1
Third Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 7	RW-804	02-Jul-20	---	20.05	---	-14.27	Pumping	
AOI 7	RW-805	02-Jul-20	---	17.82	---	-12.07	Pumping	
AOI 7	RW-806	02-Jul-20	---	20.57	---	-15.16	Pumping	
AOI 7	RW-807	02-Jul-20	---	17.93	---	-11.09	Pumping	
AOI 7	RW-808	02-Jul-20	---	18.09	---	-12.01	Pumping	
AOI 7	RW-809	02-Jul-20	---	19.68	---	-13.13	Pumping	
AOI 7	RW-810	02-Jul-20	12.85	12.85	<0.01	-6.40	Pumping	
AOI 8	N-47	07-Jul-20	20.05	20.40	0.35	11.83	Static	
AOI 8	N-48	07-Jul-20	22.41	23.45	1.04	8.74	Static	
AOI 8	N-49	07-Jul-20	25.09	26.64	1.55	8.45	Static	
AOI 8	N-51	07-Jul-20	23.07	25.31	2.24	8.55	Static	
AOI 8	N-127	07-Jul-20	24.74	25.93	1.19	8.56	Static	
AOI 8	N-129	07-Jul-20	19.52	22.17	2.65	9.12	Static	
AOI 8	N-130	07-Jul-20	20.85	21.56	0.71	10.60	Static	
AOI 8	N-137	13-Jul-20	17.73	18.12	0.39	7.80	Static	
AOI 8	N-138	13-Jul-20	27.43	27.79	0.36	7.79	Static	
AOI 8	N-139	13-Jul-20	27.18	27.59	0.41	7.73	Static	
AOI 8	N-142	13-Jul-20	26.83	27.29	0.46	7.66	Static	
AOI 8	N-144	13-Jul-20	---	26.29	---	7.99	Static	
AOI 8	N-145	13-Jul-20	18.11	24.14	6.03	6.65	Static	
AOI 8	N-146	13-Jul-20	17.82	18.08	0.26	8.47	Static	
AOI 8	N-151	07-Jul-20	19.19	21.41	2.22	9.77	Static	
AOI 8	N-155	13-Jul-20	---	26.58	---	7.69	Static	
AOI 8	N-157	13-Jul-20	27.76	28.20	0.44	7.69	Static	
AOI 8	N-158	07-Jul-20	20.62	28.45	7.83	9.76	Static	
AOI 8	N-159	07-Jul-20	21.46	28.32	6.86	8.94	Static	
AOI 8	PZ-201	07-Jul-20	---	22.61	---	9.67	Static	
AOI 8	PZ-202	07-Jul-20	---	22.34	---	11.05	Static	
AOI 8	PZ-203	07-Jul-20	---	20.53	---	13.58	Static	
AOI 8	PZ-204	07-Jul-20	---	22.45	---	6.43	Static	
AOI 8	RW-201	07-Jul-20	23.46	23.51	0.05	8.52	Static	
AOI 8	RW-202	07-Jul-20	---	22.10	---	7.41	Static	
AOI 8	RW-203	07-Jul-20	23.16	23.81	0.65	7.87	Static	
AOI 8	RW-204	07-Jul-20	20.54	20.95	0.41	8.57	Static	
AOI 8	RW-205	07-Jul-20	19.92	21.22	1.30	9.63	Static	
AOI 8	RW-206	07-Jul-20	---	22.85	---	6.17	Pumping	
AOI 8	RW-207	07-Jul-20	---	24.95	---	4.86	Pumping	
AOI 8	RW-208	07-Jul-20	---	24.45	---	5.08	Pumping	
AOI 8	RW-209	07-Jul-20	---	23.30	---	5.83	Pumping	
AOI 8	RW-210	07-Jul-20	---	23.90	---	5.00	Pumping	
AOI 8	RW-211	07-Jul-20	---	22.40	---	6.48	Pumping	
AOI 8	RW-212	07-Jul-20	---	22.00	---	6.87	Pumping	
AOI 8	RW-213	07-Jul-20	---	21.55	---	6.81	Pumping	
AOI 8	RW-214	07-Jul-20	---	22.90	---	6.26	Pumping	
AOI 8	RW-215	07-Jul-20	---	22.60	---	6.15	Pumping	
AOI 8	RW-216	07-Jul-20	---	21.60	---	6.62	Pumping	
AOI 8	RW-217	07-Jul-20	---	22.50	---	5.60	Pumping	
AOI 8	RW-218	07-Jul-20	---	22.40	---	5.62	Pumping	

Table 1
Third Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 8	RW-219	07-Jul-20	---	20.70	---	6.72	Pumping	
AOI 8	RW-220	07-Jul-20	---	19.90	---	7.60	Pumping	
AOI 8	RW-221	07-Jul-20	---	19.70	---	7.94	Pumping	
AOI 8	RW-222	07-Jul-20	---	19.90	---	8.20	Pumping	
AOI 8	RW-223	07-Jul-20	---	24.00	---	5.52	Pumping	
AOI 8	RW-224	07-Jul-20	---	25.00	---	5.16	Pumping	
AOI 8	RW-225	07-Jul-20	---	24.65	---	5.29	Pumping	
AOI 8	RW-226	07-Jul-20	---	19.85	---	7.72	Pumping	
AOI 8	RW-227	07-Jul-20	---	19.90	---	7.28	Pumping	
AOI 8	RW-228	07-Jul-20	---	18.90	---	8.25	Pumping	
AOI 8	RW-229	07-Jul-20	---	20.15	---	7.75	Pumping	
AOI 8	RW-230	07-Jul-20	---	19.25	---	8.77	Pumping	
AOI 8	RW-231	07-Jul-20	---	17.60	---	9.23	Pumping	
AOI 8	RW-232	07-Jul-20	---	16.35	---	5.68	Pumping	
AOI 8	RW-233	07-Jul-20	---	8.70	---	12.38	Pumping	
AOI 8	RW-234	07-Jul-20	---	19.40	---	9.24	Pumping	
AOI 8	RW-235	07-Jul-20	---	18.30	---	9.79	Pumping	
AOI 8	RW-236	07-Jul-20	---	18.90	---	8.31	Pumping	
BELMONT	MW-26	17-Jul-20	23.00	23.39	0.39	3.66	Static	
BELMONT	MW-27	17-Jul-20	24.74	25.70	0.96	3.72	Static	
BELMONT	MW-28	17-Jul-20	24.96	24.98	0.02	3.82	Static	
BELMONT	MW-29	17-Jul-20	25.05	26.08	1.03	3.71	Static	
BELMONT	MW-40	08-Jul-20	24.11	24.37	0.26	3.72	Static	
BELMONT	MW-40	17-Jul-20	24.11	24.37	0.26	3.72	Static	
BELMONT	MW-41	08-Jul-20	---	24.42	---	2.93	Static	
BELMONT	MW-41	17-Jul-20	---	24.42	---	2.93	Static	
BELMONT	OW-16	17-Jul-20	---	27.39	---	3.99	Static	
BELMONT	RW-1	17-Jul-20	---	25.74	---	3.81	Static	
BELMONT	RW-4	17-Jul-20	---	28.46	---	1.99	Pumping	
BELMONT	RW-6	17-Jul-20	---	27.05	---	4.01	Static	
BELMONT	RW-7	17-Jul-20	---	24.28	---	3.93	Static	
BELMONT	RW-15	17-Jul-20	---	27.03	---	3.02	Static	
BELMONT	RW-21	17-Jul-20	---	25.31	---	3.55	Static	
BELMONT	RW-22	17-Jul-20	---	23.12	---	3.91	Static	
BELMONT	RW-23	17-Jul-20	23.18	23.36	0.18	3.91	Static	
BELMONT	RW-24	17-Jul-20	24.78	25.21	0.43	2.30	Pumping	
BELMONT	RW-25	17-Jul-20	---	29.40	---	0.75	Pumping	
BELMONT	RW-26	17-Jul-20	---	25.83	---	3.38	Static	
BELMONT	RW-27	17-Jul-20	---	26.37	---	3.34	Static	
BELMONT	RW-28	17-Jul-20	---	24.96	---	4.78	Static	
BELMONT	RW-29	17-Jul-20	---	26.05	---	3.39	Static	
BELMONT	RW-30	17-Jul-20	---	25.80	---	3.59	Static	
BELMONT	RW-31	17-Jul-20	---	25.73	---	3.65	Static	
BELMONT	RW-32	17-Jul-20	---	22.28	---	6.77	Static	
BELMONT	RW-400	08-Jul-20	---	22.42	---	5.77	Pumping	
BELMONT	RW-400	17-Jul-20	---	22.42	---	5.77	Pumping	
BELMONT	S-75	08-Jul-20	---	27.57	---	3.66	Static	
BELMONT	S-75	17-Jul-20	---	27.57	---	3.66	Static	

Table 1
Third Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
BELMONT	S-76	17-Jul-20	27.35	27.50	0.15	3.66	Static	

Notes:

For product thickness <0.01 ft, the corrected groundwater elevation was calculated using 0.01 foot.

LNAPL = Light non-aqueous phase liquid

ft = Feet

btoc = Below top of casing

NAVD 88 = North American Vertical Datum of 1988

--- = LNAPL not present

Table 2
Fourth Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 1	PZ-401	16-Dec-20	---	19.85	---	3.88	Static	
AOI 1	PZ-402	16-Dec-20	19.46	19.77	0.31	3.87	Static	
AOI 1	RW-401	16-Dec-20	20.78	21.14	0.36	3.92	Static	
AOI 1	RW-402	16-Dec-20	---	19.90	---	1.81	Pumping	
AOI 1	RW-406	16-Dec-20	22.97	23.06	0.09	5.60	Static	
AOI 1	S-82	16-Dec-20	23.13	23.15	0.02	4.16	Static	
AOI 1	S-83	16-Dec-20	19.64	19.77	0.13	3.66	Static	
AOI 1	S-125	16-Dec-20	22.01	22.08	0.07	3.97	Static	
AOI 1	S-180	16-Dec-20	---	20.00	---	2.20	Static	
AOI 1	S-181	16-Dec-20	---	20.70	---	2.16	Pumping	
AOI 1	S-182	16-Dec-20	19.05	19.11	0.06	3.94	Pumping	
AOI 1	S-183	16-Dec-20	---	21.45	---	2.03	Pumping	
AOI 1	S-184	16-Dec-20	---	22.20	---	1.28	Pumping	
AOI 1	S-185	16-Dec-20	---	21.75	---	2.13	Pumping	
AOI 1	S-186	16-Dec-20	---	21.40	---	2.96	Pumping	
AOI 1	S-187	16-Dec-20	---	21.60	---	2.91	Pumping	
AOI 1	S-188	16-Dec-20	---	22.40	---	2.42	Pumping	
AOI 1	S-189	16-Dec-20	---	22.80	---	2.99	Pumping	
AOI 1	S-190	16-Dec-20	---	22.90	---	2.67	Pumping	
AOI 1	S-191	16-Dec-20	---	23.20	---	2.63	Pumping	
AOI 1	S-192	16-Dec-20	---	23.80	---	2.22	Pumping	
AOI 1	S-274	16-Dec-20	---	23.06	---	4.31	Static	
AOI 1	S-275	16-Dec-20	---	22.10	---	4.47	Static	
AOI 1	S-276	16-Dec-20	22.19	22.95	0.76	4.24	Static	
AOI 1	S-277	16-Dec-20	22.15	22.85	0.70	3.41	Static	
AOI 2	RW-100	11-Dec-20	18.53	18.74	0.21	2.17	Static	
AOI 2	RW-101	11-Dec-20	18.79	18.83	0.04	0.98	Static	
AOI 2	RW-102	11-Dec-20	14.79	14.80	0.01	2.68	Static	
AOI 2	RW-103	11-Dec-20	17.98	17.99	0.01	2.03	Static	
AOI 2	RW-105	11-Dec-20	8.07	8.09	0.02	0.61	Static	
AOI 2	RW-117	11-Dec-20	7.91	7.92	0.01	1.87	Static	
AOI 2	RW-118	11-Dec-20	---	10.01	---	1.81	Static	
AOI 2	RW-119	11-Dec-20	11.09	11.11	0.02	1.76	Static	
AOI 2	RW-120	11-Dec-20	---	11.26	---	2.32	Static	
AOI 2	RW-122	11-Dec-20	---	8.47	---	1.77	Static	
AOI 2	RW-124	11-Dec-20	---	7.24	---	1.92	Static	
AOI 2	RW-128	11-Dec-20	7.37	7.41	0.04	1.05	Static	
AOI 2	S-53	11-Dec-20	---	18.22	---	3.46	Static	
AOI 2	S-63	11-Dec-20	19.07	19.35	0.28	2.16	Static	
AOI 2	S-65	11-Dec-20	9.29	9.29	<0.01	1.34	Static	
AOI 2	S-92	11-Dec-20	10.50	10.51	0.01	9.57	Static	
AOI 2	S-93	11-Dec-20	16.48	16.48	<0.01	1.78	Static	
AOI 2	S-130	11-Dec-20	19.23	19.25	0.02	3.25	Static	
AOI 2	S-131	11-Dec-20	---	14.72	---	4.04	Static	
AOI 2	S-135	11-Dec-20	20.61	21.53	0.92	2.45	Static	
AOI 2	S-141	11-Dec-20	19.78	19.79	0.01	2.14	Static	
AOI 2	S-142	11-Dec-20	20.06	20.07	0.01	-0.22	Static	
AOI 2	S-156	11-Dec-20	---	18.05	---	2.79	Static	
AOI 2	S-157	11-Dec-20	16.68	17.42	0.74	3.16	Static	
AOI 2	S-159	11-Dec-20	---	16.29	---	2.58	Static	
AOI 2	S-174	11-Dec-20	9.73	9.74	0.01	9.89	Static	
AOI 2	S-175	11-Dec-20	16.85	16.85	<0.01	3.19	Static	
AOI 2	S-254	11-Dec-20	19.18	19.49	0.31	1.66	Static	
AOI 2	S-303	11-Dec-20	20.49	20.70	0.21	2.08	Static	
AOI 2	S-304	11-Dec-20	13.06	13.67	0.61	11.06	Static	
AOI 2	S-315	11-Dec-20	19.10	19.15	0.05	1.36	Static	
AOI 2	S-346	11-Dec-20	17.94	18.23	0.29	1.51	Static	
AOI 2	S-347	11-Dec-20	---	17.62	---	1.51	Static	
AOI 2	S-348	11-Dec-20	14.19	14.19	<0.01	5.40	Static	
AOI 2	S-349	11-Dec-20	15.91	16.06	0.15	2.68	Static	

Table 2
Fourth Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 2	S-406	11-Dec-20	---	9.82	---	2.38	Static	
AOI 4	RW-700	30-Dec-20	---	15.14	---	2.87	Static	
AOI 4	RW-701	30-Dec-20	---	15.09	---	3.18	Static	
AOI 4	RW-702	30-Dec-20	---	18.96	---	2.00	Static	
AOI 4	RW-703	30-Dec-20	16.74	17.34	0.60	3.81	Static	
AOI 4	RW-704	30-Dec-20	---	19.09	---	1.14	Static	
AOI 4	RW-705	30-Dec-20	---	13.32	---	2.60	Static	
AOI 4	RW-706	30-Dec-20	---	13.84	---	2.05	Static	
AOI 4	RW-707	30-Dec-20	---	14.25	---	2.04	Static	
AOI 4	RW-708	30-Dec-20	---	13.38	---	2.11	Static	
AOI 4	RW-709	30-Dec-20	---	15.17	---	0.13	Static	
AOI 4	RW-710	30-Dec-20	---	14.06	---	1.82	Static	
AOI 4	RW-711	30-Dec-20	---	13.32	---	2.17	Static	
AOI 4	RW-712	30-Dec-20	---	13.43	---	2.13	Static	
AOI 4	RW-713	30-Dec-20	---	12.86	---	2.16	Static	
AOI 4	RW-714	30-Dec-20	---	13.01	---	2.20	Static	
AOI 4	RW-715	30-Dec-20	---	13.18	---	2.19	Static	
AOI 4	RW-716	30-Dec-20	---	13.32	---	2.23	Static	
AOI 4	RW-717	30-Dec-20	---	13.33	---	2.28	Static	
AOI 4	S-26	30-Dec-20	---	18.72	---	2.04	Static	
AOI 4	S-30	29-Dec-20	22.03	22.12	0.09	1.09	Pumping	
AOI 4	S-124	30-Dec-20	21.03	21.06	0.03	2.16	Static	
AOI 4	S-221	30-Dec-20	18.73	19.18	0.45	4.21	Static	
AOI 4	S-233	30-Dec-20	18.94	19.16	0.22	5.39	Static	
AOI 4	S-235	30-Dec-20	20.96	20.99	0.03	2.16	Static	
AOI 4	S-236	30-Dec-20	20.93	20.93	<0.01	2.05	Static	
AOI 4	S-237	30-Dec-20	NA	NA	NA	NA	Static	Obstruction at 12 feet btoc
AOI 4	S-238	30-Dec-20	20.76	20.78	0.02	2.15	Static	
AOI 4	S-240	30-Dec-20	21.87	22.29	0.42	1.95	Static	
AOI 4	S-241	30-Dec-20	23.85	25.77	1.92	2.03	Static	
AOI 4	S-244	30-Dec-20	---	12.62	---	9.32	Static	
AOI 4	S-278	30-Dec-20	---	18.79	---	2.24	Static	
AOI 4	S-279	30-Dec-20	23.92	24.18	0.26	2.43	Static	
AOI 4	S-373	30-Dec-20	18.93	18.99	0.06	1.83	Static	
AOI 4	S-376	30-Dec-20	13.54	13.72	0.18	2.08	Static	
AOI 7	RW-801	11-Dec-20	---	18.10	---	-11.83	Pumping	
AOI 7	RW-802	11-Dec-20	---	19.55	---	-13.85	Pumping	
AOI 7	RW-803	11-Dec-20	---	19.50	---	-13.72	Pumping	
AOI 7	RW-804	11-Dec-20	---	19.10	---	-13.32	Pumping	
AOI 7	RW-805	11-Dec-20	---	18.00	---	-12.25	Pumping	
AOI 7	RW-806	11-Dec-20	---	19.60	---	-14.19	Pumping	
AOI 7	RW-807	11-Dec-20	---	18.00	---	-11.16	Pumping	
AOI 7	RW-808	11-Dec-20	---	18.00	---	-11.92	Pumping	
AOI 7	RW-809	11-Dec-20	---	20.30	---	-13.75	Pumping	
AOI 7	RW-810	11-Dec-20	---	15.10	---	-8.66	Pumping	
AOI 8	N-47	17-Dec-20	19.66	20.11	0.45	12.21	Static	
AOI 8	N-48	17-Dec-20	21.10	21.68	0.58	10.09	Static	
AOI 8	N-49	17-Dec-20	24.01	25.21	1.20	9.57	Static	
AOI 8	N-51	17-Dec-20	21.95	23.09	1.14	9.79	Static	
AOI 8	N-127	17-Dec-20	23.65	24.28	0.63	9.72	Static	
AOI 8	N-129	17-Dec-20	18.39	19.04	0.65	10.44	Static	
AOI 8	N-130	17-Dec-20	19.83	20.53	0.70	11.62	Static	
AOI 8	N-137	30-Dec-20	17.04	17.06	0.02	8.55	Static	
AOI 8	N-138	30-Dec-20	26.72	26.88	0.16	8.54	Static	
AOI 8	N-139	30-Dec-20	26.55	26.80	0.25	8.39	Static	
AOI 8	N-142	30-Dec-20	25.97	26.50	0.53	8.51	Static	
AOI 8	N-144	30-Dec-20	---	25.47	---	8.81	Static	
AOI 8	N-145	30-Dec-20	17.51	17.52	0.01	8.48	Static	
AOI 8	N-146	30-Dec-20	16.63	17.71	1.08	9.58	Static	
AOI 8	N-151	17-Dec-20	17.35	17.93	0.58	11.76	Static	

Table 2
Fourth Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
AOI 8	N-155	30-Dec-20	---	25.66	---	8.61	Static	
AOI 8	N-157	30-Dec-20	27.03	27.31	0.28	8.45	Static	
AOI 8	N-158	17-Dec-20	19.03	29.26	10.23	11.11	Static	
AOI 8	N-159	17-Dec-20	20.20	26.14	5.94	10.31	Static	
AOI 8	PGW-MW-24	30-Dec-20	---	25.71	---	10.95	Static	
AOI 8	PZ-201	17-Dec-20	---	20.03	---	12.25	Static	
AOI 8	PZ-202	17-Dec-20	21.65	21.66	0.01	11.74	Static	
AOI 8	PZ-203	17-Dec-20	---	19.92	---	14.19	Static	
AOI 8	PZ-204	17-Dec-20	19.53	20.11	0.58	9.29	Static	
AOI 8	RW-201	17-Dec-20	22.31	22.34	0.03	9.68	Static	
AOI 8	RW-202	17-Dec-20	---	20.99	---	8.52	Static	
AOI 8	RW-203	17-Dec-20	22.15	22.32	0.17	8.93	Static	
AOI 8	RW-204	17-Dec-20	19.71	20.35	0.64	9.38	Static	
AOI 8	RW-205	17-Dec-20	18.70	20.64	1.94	10.80	Static	
AOI 8	RW-206	17-Dec-20	---	22.85	---	6.17	Pumping	
AOI 8	RW-207	17-Dec-20	---	24.95	---	4.86	Pumping	
AOI 8	RW-208	17-Dec-20	---	24.45	---	5.08	Pumping	
AOI 8	RW-209	17-Dec-20	---	23.30	---	5.83	Pumping	
AOI 8	RW-210	17-Dec-20	---	23.90	---	5.00	Pumping	
AOI 8	RW-211	17-Dec-20	---	22.40	---	6.48	Pumping	
AOI 8	RW-212	17-Dec-20	---	22.00	---	6.87	Pumping	
AOI 8	RW-213	17-Dec-20	---	21.55	---	6.81	Pumping	
AOI 8	RW-214	17-Dec-20	---	22.90	---	6.26	Pumping	
AOI 8	RW-215	17-Dec-20	---	22.60	---	6.15	Pumping	
AOI 8	RW-216	17-Dec-20	---	22.50	---	5.72	Pumping	
AOI 8	RW-217	17-Dec-20	---	22.40	---	5.70	Pumping	
AOI 8	RW-218	17-Dec-20	---	22.70	---	5.32	Pumping	
AOI 8	RW-219	17-Dec-20	---	19.90	---	7.52	Pumping	
AOI 8	RW-220	17-Dec-20	---	24.01	---	3.49	Pumping	
AOI 8	RW-221	17-Dec-20	---	25.00	---	2.64	Pumping	
AOI 8	RW-222	17-Dec-20	---	24.65	---	3.45	Pumping	
AOI 8	RW-223	17-Dec-20	---	24.00	---	5.52	Pumping	
AOI 8	RW-224	17-Dec-20	---	25.00	---	5.16	Pumping	
AOI 8	RW-225	17-Dec-20	---	24.65	---	5.29	Pumping	
AOI 8	RW-226	17-Dec-20	---	19.85	---	7.72	Pumping	
AOI 8	RW-227	17-Dec-20	---	19.90	---	7.28	Pumping	
AOI 8	RW-228	17-Dec-20	---	18.90	---	8.25	Pumping	
AOI 8	RW-229	17-Dec-20	---	20.15	---	7.75	Pumping	
AOI 8	RW-230	17-Dec-20	---	17.60	---	10.42	Pumping	
AOI 8	RW-231	17-Dec-20	---	17.62	---	9.21	Pumping	
AOI 8	RW-232	17-Dec-20	---	16.35	---	5.68	Pumping	
AOI 8	RW-233	17-Dec-20	---	8.70	---	12.38	Pumping	
AOI 8	RW-234	17-Dec-20	---	19.41	---	9.23	Pumping	
AOI 8	RW-235	17-Dec-20	---	18.30	---	9.79	Pumping	
AOI 8	RW-236	17-Dec-20	---	18.90	---	8.31	Pumping	
BELMONT	MW-26	31-Dec-20	21.88	22.29	0.41	4.77	Static	
BELMONT	MW-27	31-Dec-20	23.62	23.94	0.32	4.97	Static	
BELMONT	MW-28	31-Dec-20	23.21	23.21	<0.01	5.58	Static	
BELMONT	MW-29	31-Dec-20	23.48	23.69	0.21	5.43	Static	
BELMONT	MW-40	31-Dec-20	23.25	23.49	0.24	4.59	Static	
BELMONT	MW-41	31-Dec-20	---	22.65	---	4.70	Static	
BELMONT	OW-16	31-Dec-20	26.54	26.65	0.11	4.82	Static	
BELMONT	RW-1	31-Dec-20	---	24.98	---	4.57	Static	
BELMONT	RW-4	31-Dec-20	25.59	25.83	0.24	4.81	Static	
BELMONT	RW-6	31-Dec-20	---	26.33	---	4.73	Static	
BELMONT	RW-7	31-Dec-20	---	23.46	---	4.75	Static	
BELMONT	RW-15	31-Dec-20	---	26.42	---	3.63	Static	
BELMONT	RW-21	31-Dec-20	---	24.37	---	4.49	Static	
BELMONT	RW-22	31-Dec-20	---	22.28	---	4.75	Static	
BELMONT	RW-23	31-Dec-20	22.35	22.39	0.04	4.77	Static	

Table 2
Fourth Quarter 2020 Gauging Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Well ID	Date	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	Apparent LNAPL Thickness (feet)	Corrected Groundwater Elevation (ft NAVD 88)	Static or Pumping	Comments
BELMONT	RW-24	31-Dec-20	22.58	22.59	0.01	4.59	Static	
BELMONT	RW-25	31-Dec-20	---	25.41	---	4.74	Static	
BELMONT	RW-26	31-Dec-20	---	24.40	---	4.81	Static	
BELMONT	RW-27	31-Dec-20	---	25.68	---	4.03	Static	
BELMONT	RW-28	31-Dec-20	---	24.03	---	5.71	Static	
BELMONT	RW-29	31-Dec-20	---	25.45	---	3.99	Static	
BELMONT	RW-30	31-Dec-20	---	25.31	---	4.08	Static	
BELMONT	RW-31	31-Dec-20	---	25.29	---	4.09	Static	
BELMONT	RW-32	31-Dec-20	---	16.72	---	12.33	Static	
BELMONT	RW-400	16-Dec-20	---	25.35	---	2.84	Pumping	
BELMONT	S-75	31-Dec-20	---	26.67	---	4.56	Static	
BELMONT	S-76	31-Dec-20	26.57	26.72	0.15	4.44	Static	
PGW	PGW-MW-22	30-Dec-20	---	26.34	---	10.67	Static	
PGW	PGW-MW-25	30-Dec-20	24.96	24.98	0.02	10.97	Static	viscous LNAPL
PGW	PGW-MW-30	30-Dec-20	19.33	21.07	1.74	14.26	Static	
PGW	PGW-MW-31	30-Dec-20	23.45	24.38	0.93	11.61	Static	
PGW	PGW-MW-33	30-Dec-20	24.13	24.15	0.02	11.60	Static	
PGW	PGW-MW-34	30-Dec-20	---	24.64	---	11.16	Static	
PGW	PGW-MW-37	30-Dec-20	25.03	25.05	0.02	10.83	Static	
PGW	PGW-MW-42R	30-Dec-20	---	21.20	---	11.91	Static	
PGW	PGW-MW-45	30-Dec-20	---	21.71	---	13.03	Static	

Notes:

For product thickness <0.01 ft, the corrected groundwater elevation was calculated using 0.01 foot.

LNAPL = Light non-aqueous phase liquid

ft = Feet

btoc = Below top of casing

NAVD 88 = North American Vertical Datum of 1988

--- = LNAPL not present

NA = Not Accessible, Not Applicable, or Not Available

APPENDIX 1

Remediation System Recovery Data

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Groundwater and LNAPL Recovery Systems Operational Data
Belmont Terminal
Loading Rack Remediation System
Second Half 2020

Date	Total Flow (gallons)	Period Total Flow (gallons)	Average Flow Rate (gpm)	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
1-Jul-20	105,416,388	99,213	11.48	0.0	255,418
10-Jul-20	105,546,600	130,212	10.05	0.0	255,418
17-Jul-20	105,553,757	7,157	0.71	23.8	255,442
23-Jul-20	105,560,162	6,405	0.74	18.0	255,460
31-Jul-20	105,568,311	8,149	0.71	6.1	255,466
6-Aug-20	105,574,388	6,077	0.70	6.1	255,472
13-Aug-20	105,581,041	6,653	0.66	0.0	255,472
20-Aug-20	105,585,515	4,474	0.44	12.2	255,484
28-Aug-20	105,587,335	1,820	0.16	31.0	255,515
4-Sep-20	105,588,235	900	0.09	25.0	255,540
11-Sep-20	105,588,434	199	0.02	6.4	255,547
18-Sep-20	105,591,488	3,054	0.30	6.3	255,553
24-Sep-20	105,597,616	6,128	0.71	0.0	255,553
2-Oct-20	105,605,689	8,073	0.70	12.7	255,566
9-Oct-20	105,611,851	6,162	0.61	19.3	255,585
16-Oct-20	105,615,596	3,745	0.37	19.3	255,604
22-Oct-20	105,619,341	3,745	0.43	19.6	255,624
28-Oct-20	105,622,910	3,569	0.41	13.1	255,637
6-Nov-20	105,629,043	6,133	0.47	13.2	255,650
13-Nov-20	105,633,726	4,683	0.46	13.2	255,663
20-Nov-20	105,635,429	1,703	0.17	0.0	255,663
25-Nov-20	105,635,429	0	0.00	0.0	255,663
2-Dec-20	105,635,429	0	0.00	0.0	255,663
9-Dec-20	105,635,429	0	0.00	0.0	255,663
16-Dec-20	105,635,429	0	0.00	0.0	255,663
23-Dec-20	105,635,429	0	0.00	0.0	255,663
31-Dec-20	105,635,429	0	0.00	0.0	255,663

	Total Flow (gallons)	LNAPL Recovered in Period (gallons)
Second Half 2020 Totals	318,254	245

Notes:

gpm: gallons per minute

LNAPL: Light Non-Aqueous Phase Liquid

The Belmont Terminal Remediation System consists of the Loading Rack system (RW-4 and RW-21 through RW-25) and the Frontage Road system (RW-15 and RW-26 through RW-32). Both systems have a dedicated totalizer.

On August 30, 2012, the Frontage Road system was turned off and remained off for the reporting period. The system will remain offline unless there is a significant increase of LNAPL in the recovery wells. The recovery wells were routinely gauged, and no product was detected during the reporting period.

The Loading Rack system was operational during the reporting period with the following exceptions:

On August 17, due to absence of recoverable LNAPL, the pumps at RW-4 and RW-25 were turned off.

On September 11, the system flow meter was not operational, the flow meter was cleaned and returned to service.

On November 20, the groundwater recovery pump in RW-24 was not operational. The pump was removed for maintenance and the system was taken out of service pending pump replacement. The system was off for the remainder of the reporting period.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
AOI 1: Shunk Street Sewer Ventilation System and Biofilter
pH Data

Second Half 2020

Date	Leachate pH	Biofilter Treatment Cell - Soil pH		
		Cell 1	Cell 2	Cell 3
23-Jul-20	6.45	NM	NM	NM
28-Aug-20	6.63	5.98	6.17	6.46
24-Sep-20	6.89	NM	NM	NM
22-Oct-20	6.64	NM	NM	NM
4-Dec-20	6.44	6.12	6.25	6.33
23-Dec-20	6.68	NM	NM	NM

NOTES:

Leachate pH readings are collected on a monthly basis.

Media pH readings are collected on a quarterly basis.

NM = Not Measured

The system was operational for the reporting period.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
AOI 1: Shunk Street Sewer Ventilation System and Biofilter
Organic Vapor Concentrations
Second Half 2020

Date	Flow Rate (CFM)	Sewer Air PID (ppm)	Total Flow PID (ppm)	Treatment Cell Effluent PID (ppm)			Treatment Cell Media Temperature (°F)		
				Cell #1	Cell #2	Cell #3	Cell #1	Cell #2	Cell #3
7/1/2020	3600	2.00	2.00	0.00	0.00	0.00	84	84	84
7/10/2020	3600	2.00	2.00	0.00	0.00	0.00	76	76	76
7/17/2020	3200	2.00	2.00	0.00	0.00	0.00	78	78	78
7/23/2020	3200	2.00	2.00	0.00	0.00	0.00	86	86	86
7/31/2020	3300	2.00	2.00	0.00	0.00	0.00	78	78	78
8/6/2020	3250	1.00	1.00	0.00	0.00	0.00	80	80	80
8/13/2020	3200	2.00	2.00	0.00	0.00	0.00	82	82	82
8/20/2020	3170	1.00	1.00	0.00	0.00	0.00	80	80	80
8/28/2020	3170	2.00	2.00	0.00	0.00	0.00	90	90	90
9/4/2020	3170	2.00	2.00	0.00	0.00	0.00	84	84	84
9/11/2020	3170	1.00	1.00	0.00	0.00	0.00	82	82	82
9/18/2020	3350	2.00	2.00	0.00	0.00	0.00	78	78	78
9/24/2020	3300	2.00	2.00	0.00	0.00	0.00	78	78	78
10/2/2020	3300	1.00	1.00	0.00	0.00	0.00	80	80	80
10/9/2020	3300	2.00	2.00	0.00	0.00	0.00	80	80	80
10/16/2020	3300	2.00	2.00	0.00	0.00	0.00	80	80	80
10/22/2020	3100	2.00	2.00	0.00	0.00	0.00	74	74	74
10/28/2020	3100	1.00	1.00	0.00	0.00	0.00	72	72	72
11/6/2020	3200	2.00	2.00	0.00	0.00	0.00	76	76	76
11/13/2020	3200	1.00	1.00	0.00	0.00	0.00	76	76	76
11/20/2020	3200	1.00	1.00	0.00	0.00	0.00	70	70	70
11/25/2020	3200	1.00	1.00	0.00	0.00	0.00	70	70	70
12/4/2020	3200	1.00	1.00	0.00	0.00	0.00	62	62	62
12/9/2020	3200	1.00	1.00	0.00	0.00	0.00	62	62	62
12/18/2020	3200	1.00	1.00	0.00	0.00	0.00	62	62	62
12/23/2020	3200	1.00	1.00	0.00	0.00	0.00	62	62	62
12/31/2020	3000	2.00	2.00	0.00	0.00	0.00	60	60	60

Notes:

CFM = cubic feet per minute

PID = Photoionization Detector

ppm = parts per million

°F = Degrees Fahrenheit

Vapor concentrations are collected using a MultiRAE Lite Photoionization Detector (PID).

The Sewer Air reading is collected from the Shunk Street sewer air stream only.

The air stripper was taken offline on June 17, 2004; therefore, the Total Flow is equal to the Sewer Air reading.

The system was operational during the reporting period.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Total Fluids Recovery System Operational Data
AOI 1: 26th Street North Remediation System
Second Half 2020

Date	Total Flow (gallons)	Period Total Flow (gallons)	System Flow Rate (gpm)
3-Jul-20	127,445,119	314,294	31.18
7-Jul-20	127,712,614	267,494	46.44
13-Jul-20	128,048,018	335,405	38.82
20-Jul-20	128,388,924	340,906	33.82
30-Jul-20	128,911,788	522,864	36.31
5-Aug-20	129,202,351	290,563	33.63
14-Aug-20	129,623,033	420,682	32.46
17-Aug-20	129,763,260	140,227	32.46
28-Aug-20	130,070,873	307,613	19.42
2-Sep-20	130,273,409	202,536	28.13
9-Sep-20	130,547,988	274,579	27.24
17-Sep-20	130,859,489	311,501	27.04
24-Sep-20	131,159,470	299,981	29.76
1-Oct-20	131,233,054	73,584	7.3
8-Oct-20	131,306,638	73,584	7.3
16-Oct-20	131,390,734	84,096	7.3
21-Oct-20	131,443,294	52,560	7.3
28-Oct-20	131,516,878	73,584	7.3
30-Oct-20	131,537,902	21,024	7.3
6-Nov-20	131,611,486	73,584	7.3
13-Nov-20	131,685,070	73,584	7.3
18-Nov-20	131,737,630	52,560	7.3
24-Nov-20	131,800,702	63,072	7.3
4-Dec-20	131,905,822	105,120	7.3
11-Dec-20	131,979,406	73,584	7.3
16-Dec-20	132,031,966	52,560	7.3
23-Dec-20	132,047,086	15,120	1.5
29-Dec-20	132,064,366	17,280	2.0

	Total Flow (gallons)
Second Half 2020 Totals	4,933,541

Notes:

gpm: gallons per minute

LNAPL: Light Non-Aqueous Phase Liquid

The Total Flow includes historical totals from former recovery wells RW-400 through RW-406 including 9,149 gallons of LNAPL. The system discharges directly to a process sewer; therefore, the volume of recoverable LNAPL cannot be quantified.

The 26th Street North Remediation system consists of 20 total fluids recovery wells [15 active wells onsite along 26th Street (S-180, S-181, S-182, S-183, S-184, S-185, S-186, S-187, S-188, S-189, S-190, S-191, S-192, RW-400, & RW-402) and five inactive wells offsite on CSX property (S-193, S-194, S-265, S-267, & S-268)]. The offsite wells on the CSX property have not been activated. The system discharges directly to a process sewer; therefore, the volume of recoverable LNAPL cannot be quantified.

The system was operational for the reporting period with the following exceptions:

On July 13, the pumps in S-184 and S-188 were not operational. S-188 pump was cleaned and returned to service. S-184 pump was removed for maintenance.

On July 20, the pump in S-191 was not operational. S-191 pump was cleaned and returned to service. S-184 pump was reinstalled and returned to service.

On August 14, the pumps in S-185, S-188, and S-190 were not operational. S-188 and S-190 pumps were adjusted and returned to service. S-185 pump was removed for maintenance.

On August 17, the remediation system pumps were turned off to adjust pump intake elevations. The system was returned to service.

On September 2, the pump was reinstalled in S-185 and returned to service. S-180, S-189 and S-190 pumps were not operational. The pumps were adjusted and returned to service.

On October 21, the pump in S-190 was not operational. The pump was cleaned and returned to service.

On October 26 through October 30, a performance evaluation test was completed on the system.

On December 16, the system operation was modified to limit pumping to S-402, S-181, and S-183 to focus pumping on an area with observed LNAPL.

On December 29, the pump in S-184 was returned to service due to proximity to other operating recovery wells.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
AOI 1: 26th Street & Packer Avenue Sewers Biofilter Remediation System
pH Data
Second Half 2020

Date	Leachate pH	Biofilter Bed - Soil pH			
		Cell 1	Cell 2	Cell 3	Cell 4
21-Jul-20	6.55	NM	NM	NM	NM
27-Aug-20	6.56	6.92	6.55	NM	NM
23-Sep-20	6.72	NM	NM	NM	NM
21-Oct-20	6.88	NM	NM	NM	NM
30-Nov-20	6.67	6.52	6.73	NM	NM
23-Dec-20	7.02	NM	NM	NM	NM

Notes:

Media pH readings are collected on a quarterly basis.

NM: not measured

Cells 3 and 4 were shut off June 18, 2010 and remained off for the reporting period as they are not currently needed for vapor treatment.

The system was operational during the reporting period with the following exceptions:

On September 11, the belt in Blower #1 was damaged. The belt was replaced and the blower was returned to service.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
AOI 1: 26th Street & Packer Avenue Sewers Biofilter Remediation System
Organic Vapor Concentrations

Second Half 2020

Date	Biofilter Influent			Biofilter Effluent							
	Packer Ave. (ppm)	26 th Street (ppm)	ST-1 (Combined Influent) (ppm)	Cell-1N	Cell-1S	Cell-2N	Cell-2S	Cell-3N	Cell-3S	Cell-4N	Cell-4S
7/2/2020	0.0	0.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
7/10/2020	1.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
7/16/2020	0.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
7/21/2020	0.0	0.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
7/30/2020	1.0	1.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
8/7/2020	1.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
8/12/2020	1.0	1.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
8/19/2020	2.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
8/27/2020	2.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
9/3/2020	0.0	0.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
9/9/2020	0.0	0.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
9/16/2020	2.0	1.0	3	0.0	0.0	0.0	0.0	NA	NA	NA	NA
9/23/2020	2.0	2.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
10/1/2020	1.0	1.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
10/8/2020	3.0	3.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
10/14/2020	3.0	3.0	3	0.0	0.0	0.0	0.0	NA	NA	NA	NA
10/21/2020	0.0	0.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
10/28/2020	0.0	0.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
11/4/2020	1.0	1.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
11/11/2020	1.0	1.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
11/19/2020	1.0	1.0	2	0.0	0.0	0.0	0.0	NA	NA	NA	NA
11/25/2020	1.0	0.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
12/1/2020	0.0	1.0	0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
12/9/2020	1.0	0.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
12/16/2020	1.0	0.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
12/23/2020	1.0	0.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA
12/29/2020	0.0	0.0	1	0.0	0.0	0.0	0.0	NA	NA	NA	NA

Notes:

ppm: parts per million

NA: Not applicable

Vapor concentrations are collected using a MultiRAE Lite Photoionization Detector (PID).

The system was operational during the reporting period with the following exceptions:

On September 11, the belt in Blower #1 was damaged. The belt was replaced and the blower was returned to service.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
LNAPL Recovery System Operational Data
AOI 4: S-30 Remediation System
Second Half 2020

Date	S-30	
	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
8-Jul-20	3.3	40,263
16-Jul-20	0.0	40,263
21-Jul-20	3.2	40,266
30-Jul-20	0.0	40,266
4-Aug-20	3.4	40,269
12-Aug-20	6.7	40,276
19-Aug-20	3.5	40,280
27-Aug-20	0.0	40,280
3-Sep-20	7.0	40,287
9-Sep-20	3.5	40,290
16-Sep-20	0.0	40,290
23-Sep-20	0.0	40,290
1-Oct-20	7.2	40,297
8-Oct-20	3.7	40,301
14-Oct-20	0.0	40,301
21-Oct-20	0.0	40,301
28-Oct-20	7.4	40,308
4-Nov-20	3.8	40,312
11-Nov-20	0.0	40,312
19-Nov-20	0.0	40,312
24-Nov-20	0.0	40,312
1-Dec-20	2.6	40,315
9-Dec-20	0.0	40,315
16-Dec-20	0.0	40,315
23-Dec-20	7.7	40,322
29-Dec-20	0.0	40,322

LNAPL Recovered
(gallons)
Second Half 2020 Totals **63**

NOTES:

LNAPL: Light Non-Aqueous Phase Liquid

There is no groundwater recovery at S-30; it is a product skimming system only.

During the reporting period the S-30 Remediation System was operational.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Recovery System Operational Data
AOI 7: 3 Separator Remediation System
Second Half 2020

Date	Total Flow (gallons)	Period Total Flow (gallons)	Calculated System Flow Rate (gpm)	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
7-Jul-20	27,148,578	53,100	4.61	0.0	113,972.5
13-Jul-20	27,207,778	59,200	6.85	0.0	113,972.5
20-Jul-20	27,303,278	95,500	9.47	5.5	113,978.0
29-Jul-20	27,390,678	87,400	6.74	0.0	113,978.0
3-Aug-20	27,435,178	44,500	6.18	1.5	113,979.5
11-Aug-20	27,548,578	113,400	9.84	9.2	113,988.7
18-Aug-20	27,614,278	65,700	6.52	1.6	113,990.3
25-Aug-20	27,668,578	54,300	5.39	0.0	113,990.3
1-Sep-20	27,713,978	45,400	4.50	0.0	113,990.3
9-Sep-20	27,757,478	43,500	3.78	0.0	113,990.3
14-Sep-20	27,785,778	28,300	3.93	0.0	113,990.3
21-Sep-20	27,821,978	36,200	3.59	0.0	113,990.3
28-Sep-20	27,860,278	38,300	3.80	0.0	113,990.3
6-Oct-20	27,931,478	71,200	6.18	0.0	113,990.3
12-Oct-20	27,976,378	44,900	5.20	3.2	113,993.5
19-Oct-20	28,051,278	74,900	7.43	0.0	113,993.5
26-Oct-20	28,092,178	40,900	4.06	0.0	113,993.5
2-Nov-20	28,142,278	50,100	4.97	0.0	113,993.5
9-Nov-20	28,197,178	54,900	5.45	32.8	114,026.3
17-Nov-20	28,252,078	54,900	4.77	0.0	114,026.3
24-Nov-20	28,304,078	52,000	5.16	0.0	114,026.3
30-Nov-20	28,366,328	62,250	7.20	0.0	114,026.3
7-Dec-20	28,428,578	62,250	6.18	0.0	114,026.3
14-Dec-20	28,475,878	47,300	4.69	0.0	114,026.3
23-Dec-20	28,534,878	59,000	4.55	0.0	114,026.3
28-Dec-20	28,574,278	39,400	5.47	49.1	114,075.4

	Total Flow (gallons)	LNAPL Recovered (gallons)
Second Half 2020 Totals	1,478,800	103

Notes:

gpm: gallons per minute

LNAPL: Light Non-Aqueous Phase Liquid

The 3 Separator Remediation System is a hydraulic control system constructed of ten recovery wells (RW-801 through RW-810) which was started on August 23, 2012. Groundwater and LNAPL are extracted using pneumatic submersible pumps, and total fluids pass through an oil/water separator (OWS). Water is discharged to an onsite process sewer, and LNAPL is recovered in a tank and recycled by the former PES Facility/PES Complex.

The system was operational for the reporting period with the following exceptions:

On July 15, the pumps in RW-805 and RW-810 were removed for maintenance.

On July 29, pumps were reinstalled in RW-805 and RW-810 and returned to service.

On September 23, the system was taken out of service while replacing fittings in each recovery well manifold. The system was returned to service after completion.

On September 28, the RW-810 manifold was cleaned. The pump in RW-810 was not operational. The RW-810 pump was cleaned and returned to service.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Recovery System Operational Data
AOI 7: 3 Separator Remediation System
Second Half 2020

Date	Total Flow (gallons)	Period Total Flow (gallons)	Calculated System Flow Rate (gpm)	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
7-Jul-20	27,148,578	53,100	4.61	0.0	113,972.5
13-Jul-20	27,207,778	59,200	6.85	0.0	113,972.5
20-Jul-20	27,303,278	95,500	9.47	5.5	113,978.0
29-Jul-20	27,390,678	87,400	6.74	0.0	113,978.0
3-Aug-20	27,435,178	44,500	6.18	1.5	113,979.5
11-Aug-20	27,548,578	113,400	9.84	9.2	113,988.7
18-Aug-20	27,614,278	65,700	6.52	1.6	113,990.3
25-Aug-20	27,668,578	54,300	5.39	0.0	113,990.3
1-Sep-20	27,713,978	45,400	4.50	0.0	113,990.3
9-Sep-20	27,757,478	43,500	3.78	0.0	113,990.3
14-Sep-20	27,785,778	28,300	3.93	0.0	113,990.3
21-Sep-20	27,821,978	36,200	3.59	0.0	113,990.3
28-Sep-20	27,860,278	38,300	3.80	0.0	113,990.3
6-Oct-20	27,931,478	71,200	6.18	0.0	113,990.3
12-Oct-20	27,976,378	44,900	5.20	3.2	113,993.5
19-Oct-20	28,051,278	74,900	7.43	0.0	113,993.5
26-Oct-20	28,092,178	40,900	4.06	0.0	113,993.5
2-Nov-20	28,142,278	50,100	4.97	0.0	113,993.5
9-Nov-20	28,197,178	54,900	5.45	32.8	114,026.3
17-Nov-20	28,252,078	54,900	4.77	0.0	114,026.3
24-Nov-20	28,304,078	52,000	5.16	0.0	114,026.3
30-Nov-20	28,366,328	62,250	7.20	0.0	114,026.3
7-Dec-20	28,428,578	62,250	6.18	0.0	114,026.3
14-Dec-20	28,475,878	47,300	4.69	0.0	114,026.3
23-Dec-20	28,534,878	59,000	4.55	0.0	114,026.3
28-Dec-20	28,574,278	39,400	5.47	49.1	114,075.4

	Total Flow (gallons)	LNAPL Recovered (gallons)
Second Half 2020 Totals	1,478,800	103

Notes:

gpm: gallons per minute

LNAPL: Light Non-Aqueous Phase Liquid

The 3 Separator Remediation System is a hydraulic control system constructed of ten recovery wells (RW-801 through RW-810) which was started on August 23, 2012. Groundwater and LNAPL are extracted using pneumatic submersible pumps, and total fluids pass through an oil/water separator (OWS). Water is discharged to an onsite process sewer, and LNAPL is recovered in a tank and recycled by the former PES Facility/PES Complex.

The system was operational for the reporting period with the following exceptions:

On July 15, the pumps in RW-805 and RW-810 were removed for maintenance.

On July 29, pumps were reinstalled in RW-805 and RW-810 and returned to service.

On September 23, the system was taken out of service while replacing fittings in each recovery well manifold. The system was returned to service after completion.

On September 28, the RW-810 manifold was cleaned. The pump in RW-810 was not operational. The RW-810 pump was cleaned and returned to service.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
AOI 8: Jackson Street Water Curtain
Second Half 2020

Date	PID readings (ppm)			Comments
	Blower	Water Curtain	Interceptor Chamber	
09-Jan-20	NA	0.0	0.0	
16-Jan-20	NA	0.0	0.0	
07-Jul-20	NA	0.0	0.0	
13-Jul-20	NA	0.0	0.0	
22-Jul-20	NA	0.0	0.0	
29-Jul-20	NA	0.0	0.0	
06-Aug-20	NA	0.0	0.0	
11-Aug-20	NA	0.0	0.0	
17-Aug-20	NA	0.0	0.0	
25-Aug-20	NA	0.0	0.0	
01-Sep-20	NA	0.0	0.0	
09-Sep-20	NA	0.0	0.0	
18-Sep-20	NA	0.0	0.0	
22-Sep-20	NA	0.0	0.0	
30-Sep-20	NA	0.0	0.0	
09-Oct-20	NA	0.0	0.0	
16-Oct-20	NA	0.0	0.0	
19-Oct-20	NA	0.0	0.0	
26-Oct-20	NA	0.0	0.0	
04-Nov-20	NA	0.0	0.0	
13-Nov-20	NA	0.0	0.0	
13-Nov-20	NA	0.0	0.0	
24-Nov-20	NA	0.0	0.0	
04-Dec-20	NA	0.0	0.0	
11-Dec-20	NA	0.0	0.0	
15-Dec-20	NA	0.0	0.0	
23-Dec-20	NA	0.0	0.0	
30-Dec-20	NA	0.0	0.0	

NOTES:

PID: Photoionization detector

ppm: parts per million

NA: Not Available (PID readings are not collected at the blower.)

Vapor concentrations are collected using a MultiRAE Lite PID.

The totalizer was removed on December 11, 2009.

The system was operational for the reporting period.

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Groundwater and LNAPL Recovery System Operational Data
AOI 8: PGW Border Remediation System
Second Half 2020

Date	Period Total Flow (gallons)	Total Flow (gallons)*	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
07-Jul-20	109,570	1,632,790	143.4	2,217.9
14-Jul-20	85,220	1,742,360	38.1	1,853.9
22-Jul-20	51,480	1,827,580	40.2	1,896.1
27-Jul-20	76,080	1,879,060	25.1	1,926.8
04-Aug-20	111,040	1,955,140	0.0	2,217.9
10-Aug-20	82,380	2,066,180	82.2	1,853.9
17-Aug-20	92,590	2,148,560	29.8	1,896.1
25-Aug-20	82,930	2,241,150	36.1	1,926.8
01-Sep-20	82,930	2,324,080	42.2	2,217.9
10-Sep-20	97,310	2,421,390	36.8	1,853.9
15-Sep-20	51,690	2,473,080	25.3	1,896.1
22-Sep-20	60,690	2,533,770	62.1	1,926.8
30-Sep-20	74,560	2,608,330	17.0	2,217.9
07-Oct-20	54,570	2,662,900	16.2	1,853.9
16-Oct-20	37,100	2,700,000	21.9	1,896.1
19-Oct-20	34,870	2,734,870	23.2	1,926.8
27-Oct-20	84,950	2,819,820	62.3	2,217.9
04-Nov-20	92,630	2,912,450	23.1	1,853.9
13-Nov-20	68,730	2,981,180	59.2	1,896.1
19-Nov-20	44,910	3,026,090	26.7	1,926.8
25-Nov-20	47,710	3,073,800	40.0	2,217.9
04-Dec-20	67,130	3,140,930	55.8	1,853.9
11-Dec-20	65,210	3,206,140	39.4	1,896.1
15-Dec-20	760	3,206,900	0.0	1,926.8
23-Dec-20	94,330	3,301,230	25.2	2,217.9
30-Dec-20	22,780	3,324,010	75.0	1,853.9

	Total Flow (gallons)	LNAPL Recovered (gallons)
Second Half 2020 Totals	1,774,150	1,046

Note:

LNAPL: Light Non-Aqueous Phase Liquid

The PGW Border Remediation System consisting of 31 recovery wells was started on February 20, 2020. Groundwater and LNAPL are extracted using pneumatic pumps, and total fluids pass through an oil/water separator (OWS). The groundwater is discharged to a facility process sewer and LNAPL is recovered in a 550-gallon storage tank.

* The reported total flow includes recovered fluids from the system start on February 20, 2020 and does not include recovered groundwater and LNAPL from the previous PGW Remediation System.

The system was operational for the reporting period with the following exceptions:

On September 22, the system transfer pump was not operating causing the system to shut off due to a high water alarm. Troubleshooting was conducted on the transfer pump and the system was returned to service.

On September 30, the pumps in RW-206, RW-207, RW-216, RW-223, RW-224, and RW-232 were not operating. RW-206, RW-216, RW-223, RW-224, and RW-232 pumps were cleaned and returned to service. RW-207 pump was removed for further maintenance.

On October 7, the pump for RW-207 was reinstalled and the well was returned to service.

On December 11, the system was taken out of service while transfer pump modifications were made.

On December 15, the system was restarted and returned to service.

On December 30, the system was inoperable due to a high water alarm at the OWS. Maintenance was conducted to the system transfer pump and the system was returned to service.