FIFTH FIVE-YEAR REVIEW REPORT
TYSON'S DUMP SUPERFUND SITE
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

Prepared by

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	applicable or relevant and appropriate requirement
BTAG	Biological Technical Assistance Group
BTEX	benzene, toluene, ethylbenzene, and xylene
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
COC	contaminant of concern
CSM	conceptual site model
DNAPL	dense nonaqueous phase liquid
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Difference
EW	extraction well
FS	Feasibility Study
FYR	Five-Year Review
GAC	granular activated carbon
GWTP	groundwater treatment plant
HGL	HydroGeoLogic, Inc.
IC	institutional control
LTM	long term monitoring
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/L	milligrams per liter
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NAPL	non-aqueous phase liquid
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Recourses
PCE	tetrachloroethene
PCOR	Preliminary Close-Out Report
PLC	programmable logic controller
PRP	potentially responsible party
RAGS	Risk Assessment Guidance for Superfund
RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
Site	Tyson's Dump Superfund Site

SVE	soil vapor extraction
TBC	to-be-considered
TCE	trichloroethene
TCP	trichloropropane
UU/UE	unlimited use and unrestricted exposure
VOC	volatile organic compound
WSCS	Wet Soil Cover System

1.0 INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 Code of Federal Regulations [CFR] Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Tyson's Dump Superfund Site (Site). The triggering action for this statutory review is the completion date of the previous FYR, September 26, 2014. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site was divided into five Operable Units (OUs) as follows:

- OU1 – onsite area that encompasses the lagoons;
- OU2 – contaminated groundwater in the bedrock aquifer up to the south bank of the Schuylkill River;
- OU3 – contaminated groundwater that has migrated beneath and as far as the north bank of the Schuylkill River;
- OU4 – contaminated groundwater on the north side of the Schuylkill River; and
- OU5 – lagoon area covered by the Wet Soil Cover System (WSCS).

All OUs are included in this FYR, however, the OUs identified at the Site cannot be evaluated individually for protectiveness due to significant overlap in the remedy components between OUs. Therefore, only a Site-wide protectiveness statement will be made for this FYR.

The FYR was led by EPA Remedial Project Managers (RPMs) Andrew Haneiko and Josh Barber. Participants included Kathy Davies, EPA Hydrogeologist; Jeff Tuttle and Kimberly Plank, EPA Biological Technical Assistance Group (BTAG); Lavar Thomas, EPA Community Involvement Coordinator (CIC); Patricia Flores-Brown, Air Protection Division EPA; Colin Wade, Pennsylvania Department of Environmental Protection (PADEP) Project Officer; Fred Geolz, BASF Corporation/Potentially Responsible Party (PRP); Gerry Kirkpatrick and Dominic Taurino, Environmental Standards (PRP contractor); and Misty Kauffman (HydroGeoLogic, Inc. [HGL], EPA contractor). The review began on October 17, 2018.

SITE BACKGROUND

The Site is located in Upper Merion Township, Montgomery County, Pennsylvania (Figure 1). The Site is a 4-acre property that formerly was used as a sandstone quarry. The quarry operations excavated several bowl-like depressions into a bedrock terrace adjacent to the Schuylkill River. The Tyson's Dump was owned and operated by Franklin P. Tyson and Fast Pollution Treatment

Inc. After the quarry was abandoned, the property was used to dispose of septic and chemical waste from 1962 to 1970. The liquid and sludge wastes were hauled to the Site in bulk tank trucks and disposed of in these bowl-like depressions, forming unlined lagoons. The PRPs for the Site include Ciba-Geigy Corp., Wyeth Labs Inc., Essex Group Inc., and SmithKline Beckman Corp. The Site is currently owned by BASF Corporation.

The Site is bordered to the east and west by unnamed tributaries to the Schuylkill River, to the south by a steep 100-foot quarry wall, to the north by a railroad switching yard and the Schuylkill River and its floodplain, and to the south and west by a residential neighborhood. Barbadoes Island is located in the middle of the Schuylkill River in the area adjacent to the Site and was once the location of a coal-fired electric power generating station operated by the Philadelphia Electric Company. The island is currently used for storage of building supplies and is owned by Barbadoes 83, LLC.

The direction of groundwater flow from the Site is north toward the Schuylkill River. Groundwater exists in the bedrock aquifer which has been divided into three zones at varying depths (shallow, intermediate, and deep aquifers). The Schuylkill River to the north of the Site acts as a discharge point for shallow groundwater. The bedrock aquifer is part of the Stockton Formation, which, in the vicinity of the Site, is predominantly sandstone. The bedrock aquifer has fractures that act as conduits for groundwater flow.

The Schuylkill River is a primary source of drinking water for Norristown and Philadelphia. The water intakes for Norristown are 2,000 feet downriver from the Site. The Schuylkill River is also used for recreation, boating, and fishing. Generally, groundwater is not used as a potable water source, with the exception of wells located in Norristown, which is north of the Site. The Schuylkill River is between the Site and Norristown. An estimated 26,000 people live in the residential area surrounding the Site.

FIVE-YEAR REVIEW SUMMARY FORM

Site Name: Tyson's Dump Superfund Site		
EPA ID: PAD980692024		
Region: 3	**State:** PA	**City/County:** Upper Merion Township, Montgomery County

National Priorities List (NPL) Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:**
Author name (Federal or State Project Manager): Andrew Haneiko and Josh Barber
Author affiliation: U.S. EPA Region 3
Review period: October 2018 through August 2019
Date of site inspection: 05/07/2019
Type of review: Statutory
Review number: 5
Triggering action date: 09/26/2014
Due date ***(five years after triggering action date)***: 09/26/2019

2.0 RESPONSE ACTION SUMMARY

BASIS FOR TAKING ACTION

The Pennsylvania Department of Environmental Resources (PADER), the predecessor to PADEP, ordered the Site closed in 1973. During closure, the lagoons were emptied of standing water, backfilled, and vegetated. Contaminated soils remained in the lagoons. The property was regularly used by trespassers for motor biking.

In January 1983, EPA investigated a citizen's complaint about noxious odors emanating from the Site. The investigation indicated that the soils in the lagoon area were contaminated with volatile organic compounds (VOCs), including trichloropropane (TCP), xylenes, and toluene.

In March and April of 1983, EPA implemented interim response actions to prevent the threat to public health posed by contaminant releases to the environment from the unsecured Site. These actions included a security fence to eliminate uncontrolled access to the Site; leachate collection and carbon adsorption treatment system to prevent uncontrolled contaminant discharges to the Schuylkill River; runoff diversions to divert uncontained runoff from the lagoon area; an air

stripping system to remove volatile organics from the leachate; and an extent of contamination survey to determine the need for additional interim response actions.

The Site was proposed for inclusion on the National Priorities List (NPL) on September 8, 1983 and was placed on the list on September 21, 1984.

A series of Remedial Investigations (RIs) and Feasibility Studies (FSs) were completed beginning as early as 1983 and ending in 1995. The RI and FS reports documented high concentrations of VOCs, the most prevalent being TCP, in Site groundwater. It was found that contaminants in the lagoons had migrated to the groundwater aquifer that discharged directly to the Schuylkill River, resulting in an exposure pathway. Additionally, the deep aquifer, consisting of fractured bedrock, was contaminated with dense nonaqueous phase liquids (DNAPLs). DNAPL was observed in groundwater wells on the south side of the Schuylkill River and in wells on Barbadoes Island, indicating that the contaminants had traveled from the Site beneath the Schuylkill River. The DNAPL within the deep bedrock aquifer cannot be accessed and readily removed with current technology and acts as a long-term source of groundwater contamination.

RESPONSE ACTIONS

For the purposes of managing the cleanup of the Site, EPA established the following OUs at the Site:

- OU1 – onsite area that encompasses the lagoons;
- OU2 – contaminated groundwater in the bedrock aquifer up to the south bank of the Schuylkill River;
- OU3 – contaminated groundwater that has migrated beneath and as far as the north bank of the Schuylkill River;
- OU4 – contaminated groundwater on the north side of the Schuylkill River; and
- OU5 – lagoon area covered by the WSCS.

EPA issued the following decision documents describing the Selected Remedy for the Site, as described below:

- December 21, 1984 Record of Decision (ROD) (OU1);
- March 31, 1988 ROD Amendment (OU1);
- September 30, 1988 ROD (OU2);
- September 28, 1990 ROD (OU3 and OU4);
- July 20, 1996 ROD Amendment (OU5); and
- August 16, 2012 Explanation of Significant Differences (ESD)

Remedial Action Objectives (RAOs) were not formally established by the decision documents, however a summary of the inferred goals of the Selected Remedy are as follows:

- Prevent direct contact and ingestion exposure risks from the contaminated lagoon area soils and effectively eliminate VOC vapor emissions, thereby eliminating inhalation exposure risks;
- Eliminate the continued generation and off-site migration of leachate from the former lagoons;
- Prevent the continued contamination of both shallow and deep groundwater zones;
- Recover and treat groundwater discharging to the Schuylkill River to levels protective of human health and the environment;
- Capture groundwater affected by Site-related compounds emanating from sources on the south side of the Schuylkill River and beneath Barbadoes Island;
- Contain the dissolved plume immediately overlying DNAPL sources; and
- Restore the other contaminated portion of the aquifer to its beneficial use. The point of compliance extended throughout the contaminated plume outside the areas overlying known or suspected DNAPL sources.

The final Selected Remedy for the Site consists of the following components:

- Soil vapor extraction (SVE) to treat lagoon area soils. 50 parts per billion (micrograms per kilogram [µg/kg]) was established for four indicator organic compounds (1,2,3-TCP, benzene, trichloroethene [TCE], and tetrachloroethene [PCE]), with specific soil cleanup criteria established for other contaminants;
- Installation of a WSCS over the lagoon area;
- Continued operation of the existing leachate collection system installed during the interim response action;
- Installation and operation of groundwater recovery systems to address deep and shallow groundwater;
- Monitoring of groundwater and surface water; and
- Institutional controls (ICs) to upgrade and extend the perimeter security fence to restrict unauthorized access, file deed restrictions, obtain easement agreements, and restrict groundwater use on Barbadoes Island and on the north side of the Schuylkill River.

Performance standards and cleanup levels for the various remedy components are shown in Tables 1 through 3.

Table 1. Air Discharge Regulation Established Limits

Compound	Air Toxic Substances (ATGS) ($\mu g/m^3$)
Benzene	12.5
Chloroform	4.35
1,2-Dichloroethane (total)	3.85
Methylene Chloride	24.2
Tetrachloroethene	172
Trichloroethene	76.9
Phenol	461

Table 2. Surface Water Discharge Limits

Compound	Treated Groundwater Effluent Cleanup Level (µg/L)
Aniline	100
Benzene	212
Chlorobenzene	16100
Chloroform*	61.1
Cis-1,3-Dichloropropene	4530
Cresol	22400
1,3-Dichlorobenzene	NA
1,4 Dichlorobenzene	NA
1,2-Dichlorobenzene	NA
1,1-Dichloroethane	37400
1,2-Dichloroethene (total)	2810
1,2-Dichloropropane	495
2,4-Dimethylphenol	NA
Di-n-butyl phthalate	28100
Ethylbenzene	450
Methylene Chloride	224
4-Methyl-2-pentanone	12000
Napthalene	NA
Nitrobenzene	6370000
N-Nitrosodiphenylamine	227
PCE	257
Toluene	4500000
1,2,4-Trichlorobenzene	5620
TCE	868
1,2,3-TCP	600
Phenol	30
Total Xylenes	500

Effluent limits for each compound from the groundwater treatment plant (GWTP) were evaluated based on National Pollutant Discharge Elimination System (NPDES) limitations.

The cleanup levels for the groundwater treatment system were based on the partial consent decree between EPA and the PRPs. In total, cleanup levels were established for 52 compounds in the 1988 ROD. For those compounds with no established limits, cleanup goals were developed based on risk-based concentrations (RBCs) for humans (Table 3). The 1990 ROD established groundwater cleanup levels for Contaminants of Concern (COCs) as the lowest of EPA Maximum Contaminant Levels (MCLs), non-zero Maximum Contaminant Level Goals (MCLGs), or background levels (Table 3). Subsequent to the issuance of the 1990 ROD, the Commonwealth of Pennsylvania repealed its groundwater cleanup level of natural background and established a new cleanup level set forth in the Pennsylvania Land Recycling and Environmental Remediation Standards Act, 35 P.S. §§ 6026.101 et seq. (July 18, 1995) (Act 2). Additionally, some of the COCs established in the 1990 ROD are no longer detected at the Site. The list of COCs and associated cleanup levels should be revised to more accurately reflect current Site conditions and current groundwater ARARs.

The 1990 ROD states that if it was demonstrated that it was technically impracticable to achieve the groundwater cleanup levels, EPA, in consultation with PADEP, would issue a ROD amendment or an ESD to document the alternate groundwater goals. The presence of a large volume of DNAPL at depth in the fractured bedrock aquifer made it impossible to reasonably consider any alternative for aquifer restoration with technologies available at the time.

Table 3. Groundwater Cleanup Levels

Compound	Groundwater Cleanup Level (mg/L)		
	1988 ROD Risk-Based	1990 ROD Clean-up Levels	
		MCL	MCLG
Anilene	0.13	NE*	NE
Anthracene	7	NE	NE
Benzene	0.00022	0.005	0
Benzoic Acid	0.07	NE	NE
Bis(2-ethylhexyl) phthalate	0.51	NE	NE
2-Butanone	1.8	NE	NE
Chlorobenzene	0.06	0.1	0.1
2-Chloronapthalene	0.11	NE	NE
2-Chlorophenol	0.10	NE	NE
Chrysene	0.0000015	NE	NE
Cycloheptatriene	0.020	NE	NE
Cyclohexanone	23	NE	NE
Di-n-butyl phthalate	3.5	NE	NE
Dioctylphthalate	0.63	NE	NE
2,4-Dimethylphenol	0.28	NE	NE
N,N-Dimethyi-1,3-propanediamine	0.65	NE	NE
Dodecane	3.9	NE	NE
Ethylbenzene	0.68	0.7	0.7
1-Ethyl-2methylbenzene	0.12	NE	NE
Fluoranthene	0.21	NE	NE
Hexadecane	22	NE	NE
Hexadecanoic acid	0.02	NE	NE
Methylene Chloride (Dichloromethane)	0.0016	0.005	0
2-Methylenaphthalene	0.53	NE	NE
N-Methylphenol/4-Methylphenol	1	NE	NE
4-Methyl-2-Pentanone	1.8	NE	NE
N-Nitrosodiphenylamine	0.0071	NE	NE
Naphthalene	0.62	NE	NE
Nitrobenzene	0.018	NE	NE
1,1-Oxybis (2-Ethoxyetnane)	0.85	NE	NE
Phenanthrene	0.25	NE	NE
Phenol	3.5	NE	NE

Compound	Groundwater Cleanup Level (mg/L)		
Pyrene	0.70	NE	NE
Tetrachlorethane	0.00023	NE	NE
Tetramethylurea	0.76	NE	NE
Toluene	2	1	1
1,2,4-Trichlorobenzene	0.23	0.07	0.07
1,3,5-Trichlorobenzene	0.23	NE	NE
TCE	0.0011	0.005	0
1,2,3-TCP	0.00035	NE	NE
1,2,4-Trimethylbenzene	3	NE	NE
Tridecane	0.41	NE	NE
Undecane	0,18	NE	NE
o-Xylene	0.12	10	10
1,1-Dichloroethane	0.007	NE	NE
Trans-1,2-dichloroethene (Dichloroethylene)	0.07	0.1	0.1
1,2-Dichloropropane	0.006	0.005	0
1,2-Dichlorobenzene (o-Dichloropropane)	0.62	0.6	0.6
1,4-Dichlorobenzene (p-Dichlorobenzene)	0.075	0.075	0.075
Chloroform	0.1	NE	NE
Cis-1,3-Dichloropropene	0.875	NE	NE

* *NE = Not Established*

STATUS OF IMPLEMENTATION

On June 20, 1988, the PRPs entered into a Consent Decree (CD) (Civil Action No. 84-2663) with EPA to address the contamination at the Site. The CD required the PRPs to install a soil vapor extraction (SVE) system and groundwater recovery wells to capture and treat contaminated groundwater, excavate sediment and soil from the tributary that had received effluent from an air stripper that was installed during the initial response, and perform operation and maintenance (O&M).

Soil Vapor Extraction Remedy

The SVE system operated from November 1988 to September 1996. During that time approximately 200,000 pounds of VOCs were removed from the soils in the lagoon area. However, it became apparent the SVE system would not achieve the cleanup goals established in the ROD in a timely and cost-effective way, as it had reached a low asymptotic limit of mass removal. The SVE system was dismantled during late 1996 and early 1997 with EPA approval.

Wet Soil Cover Remedy

Construction of the WSCS was completed in August 1997. A series of 10 terraces exist on the Site (Figure 7), each with the WSCS constructed on top. The WSCS remedy includes the following components from top to bottom (Figure 8):

- A vegetated cover;
- A barrier layer of low permeable soil material to be maintained at saturated conditions by either natural precipitation or irrigation to control and eliminate the upward migration of vapors; and
- A vent layer of high permeable material to control lateral migration of vapors.

Water in the vegetated cover percolates through and saturates the low permeability layer through either precipitation or irrigation to create a wet soil barrier layer to control and virtually eliminate upward migration of VOC vapors from the lower layers of the lagoon area soils. The vent layer consisting of high permeable material was constructed to provide a base layer at proper grade for the top two components of the WSCS and control the lateral migration of vapors, if necessary.

Water levels within the barrier layer are monitored daily to ensure that saturation conditions are maintained at all times. Water sprinklers are present on each terrace and are used to supplement natural precipitation to maintain saturation of the barrier layer. The irrigation system can be turned on manually when additional water is needed. There is overland flow of water from seeps and the oversaturation of the WSCS terraces. This overland flow is not contaminated by the Site and, therefore, poses no risk to ecological receptors.

Groundwater Extraction and Treatment Remedy

The 1984 ROD for OU1 recommended that additional investigative activities be conducted in support of the off-site RI/FS. This RI/FS work included a detailed investigation of the Schuylkill River and installation of wells on the north side of the river. The results of the report indicated that much of the Site contamination, specifically DNAPLs, were in the underlying bedrock aquifer. It also indicated that the dissolved portion of the DNAPL was discharging into the Schuylkill River.

In 1989, seven groundwater extraction wells were installed along the south bank of the Schuylkill River to prevent contaminated shallow groundwater from entering the Schuylkill River. Extracted groundwater is treated in the on-site GWTP, which has two 20,000-pound GAC units. The GWTP was installed in 1996 and replaced the air stripper system that was installed as an interim response action. Treated groundwater is discharged to the Schuylkill River in compliance with NPDES permit equivalency requirements (Table 2). Additional extraction wells were installed in 1991 to augment the original seven-well system. There are currently 13 shallow extraction wells along the south bank of the Schuylkill River to prevent contaminated groundwater from discharging to the river. In 2017, the PRPs conducted a Remedial System Evaluation and determined (with EPA approval) that six of the extraction wells could be turned off. Data is still being collected to evaluate the impacts of these wells being shut down.

In response to the 1990 OU3 ROD, the PRPs completed additional groundwater studies on the deep aquifer. The results indicated that contaminated groundwater had migrated beneath Barbadoes Island under the Schuylkill River to the north bank of the river. The study determined that additional extraction wells were necessary to contain the contaminated groundwater plume in the deep aquifer. Deep extraction well DB-14 (Figure 2) was installed in December 1997. This well recovers contaminated groundwater from the deep aquifer and is treated through the GWTP.

EPA documented the construction completion in a Preliminary Close-Out Report (PCOR) dated December 22, 1997.

IC Summary

ICs are required to restrict Site access and prevent groundwater usage within the affected aquifer. Multiple physical and legal restrictions are in place to ensure that the ICs implemented as part of the soil and groundwater remedies are being enforced. These include a Montgomery County ordinance established in 1997 that regulates the permitting of new and existing individual water supplies, Delaware River Basin Commission required permits for withdrawal of more than 10,000 gallons of water per day, property easements for land access, deed restrictions that allow the Upper Merion Township to restrict or prohibit future construction at the Site, and fencing that surrounds the Site boundary to restrict access (Table 4).

Table 4. Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Lagoon area soil and WSCS	Yes	Yes	5-800-0247-300-7	Restrict access to Site to prevent exposure to lagoon area soils and to maintain the integrity of the WSCS.	Deed Restrictions
Groundwater	Yes	Yes	Groundwater Contaminant Plume	Prevent installation of wells in the groundwater contaminant plume.	Montgomery County and Delaware River Basin Commission Regulations, 1997.

SYSTEMS OPERATIONS/OPERATION & MAINTENANCE

Operation and maintenance (O&M) is performed by the primary PRP, BASF Corporation and their contractor, Environmental Standards. O&M activities include operation of the groundwater recovery system and the GWTP, and maintenance of the WSCS.

The influent and effluent from the GWTP before discharge to the Schuylkill River are sampled and analyzed for 1,2,3-TCP, xylenes, aniline, phenol, methylene chloride, and vinyl chloride as required by the Commonwealth of Pennsylvania. The contaminants present in the discharge water are compared to the NPDES permit equivalency limits. This sampling was originally conducted on a monthly basis, but in 2001 it was modified to quarterly and in 2007 to semiannually based on monitoring results demonstrating consistent and successful treatment of groundwater.

Surface water samples are collected from the Schuylkill River to monitor contaminant levels. Four locations are sampled in order to evaluate the effectiveness of the GWTP: at the water company's primary and backup water sources (river flume and river crib intakes), mid-channel downgradient of the Site, and upstream from the Site (Figure 3). Similar to the other monitoring elements, river monitoring was reduced from monthly to quarterly in 2001, and to semiannually in 2007.

Groundwater samples are collected from Site monitoring wells and the extraction wells to monitor the extent of groundwater contamination and ensure capture of groundwater contaminants. The monitoring frequency has been modified several times and currently requires an annual sampling event. Different monitoring wells are sampled on the following 3-year rotation:

- 1st year: DB-011, DB-013, DB-014, NW-026S, NW-26I, CW-004-1, CW-004-2, CW-004-3, CW-004-4, WN-4S, WN-4I, WN-4D, WN-6I, WN-6S, WN-6D, WN-10S, WN-10I, WN-10D, and WN-10XD;
- 2nd year: DB-008, DB-013, DB-014, WN-2S, WN-2I, WN-5S, WN-5I, WN-5D, WN-8S, WN-8D, NW-20S, NW-20I, NW-20D, and MW-13; and
- 3rd year: DB-008, DB-013, DB-014, NW-024I, and NW-024D.

The monitoring well program was modified to sample wells that had not been sampled in recent years and in 2018, with EPA approval, six extraction wells were idled as part with system optimization. The six idled wells will continue to be sampled.

Regular inspections are conducted and samples are collected to monitor performance of the WSCS. The vegetative cover as well as soil erosion and surface water controls are inspected on a weekly basis. The cover is mowed twice a year, and corrective actions are taken to address any issues, such as improper drainage, burrow holes, erosion, ponding, and adverse changes in the soil conditions. Depending on the component, inspections of the irrigation system are conducted at either a weekly or monthly interval. Shallow piezometers are continually controlled by a programmable logic controller (PLC) to monitor the saturated zone thickness. When necessary, the PLC turns on the irrigation system to maintain at least 4 inches of saturated soils on the WSCS.

Historically, flux density monitoring for each terrace of the wet soil cover was conducted semiannually to evaluate the emission rate, if any, of 1,2,3-TCP vapors at the surface. Then, in 2011, EPA reduced the flux density monitoring to once every 5 years based on the consistent dataset showing that emissions from the WSCS were minimal and not presenting a risk to human health. In 2018, EPA, PADEP, and BASF, determined that flux monitoring would not be required based on the consistent data showing that emissions from the WSCS were minimal. In lieu of flux monitoring, additional detailed records will be kept the ensure and demonstrate that the WSCS is adequately saturated to prevent vapor emissions.

3.0 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the **last** FYR as well as the recommendations from the **last** FYR and the current status of those recommendations.

The protectiveness statement from the 2014 FYR is included below:

Table 5: Protectiveness Determinations/Statements from the 2014 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Short-term Protective	The remedies at the Tyson's Dump Superfund Site are protective of human health and the environment in the short-term. All remedies are being implemented in accordance with their

		respective decision documents. The groundwater extraction system is effectively containing and treating the groundwater contaminant plume. Substantial amounts of DNAPL have been removed from the bedrock aquifer. The WSCS is preventing exposure to contaminated soils and vapors in the lagoon area. Institutional controls are in place to prevent exposure to site-related contaminants in groundwater. All nearby residents are on a public water supply. Additional groundwater sampling west of the lagoons and south of WN-4S is needed to fully delineate the boundary of groundwater contamination. In order for the remedies to be protective in the long-term, the delineation of contaminated groundwater south of WN-4S and west of the Site must be completed. After the additional data is collected and evaluated by EPA and PADEP, EPA will determine if a vapor intrusion evaluation is necessary. If a vapor intrusion risk is found to exist, a response action will be selected to address the risk consistent with CERCLA and the NCP. EPA expects that the remedies implemented at the Site will be fully protective of human health and the environment once the remedial action objectives have been met.

Table 6. Status of Recommendations from the 2014 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
OU2	The extent of groundwater contamination south of monitoring well WN-4S and to the west of the Site lagoon area near the residential development is not fully delineated. If groundwater contamination is present near the residential development, this may present a potential vapor intrusion exposure pathway that requires evaluation.	Conduct groundwater sampling west of the lagoons and south of WN-4S to fully delineate the boundary of groundwater contamination. Groundwater data will be used to determine if a vapor intrusion evaluation is necessary.	Completed	Three additional groundwater wells were installed near the residential development. The groundwater from these wells was analyzed and groundwater flow was evaluated. Based on the groundwater quality and flow direction of the new wells, there is no potential for vapor intrusion in the near residences.	3/25/2015

4.0 FIVE-YEAR REVIEW PROCESS

COMMUNITY NOTIFICATION, INVOLVEMENT & SITE INTERVIEWS

A public notice was posted in *The Times Herald* on May 20, 2019 (Attachment 4), stating that there was a FYR underway and inviting the public to submit any comments to the EPA. The results

of the review and the report will be made available at the Site information repository located at Upper Merion Township Library, 175 West Valley Forge Road, King of Prussia, PA 19406-1851.

DATA REVIEW

Risks at the Site are almost entirely attributable to 1,2,3-TCP, and this compound is considered an indicator compound for the Site. Therefore, the data review is focused on the extent of 1,2,3-TCP contamination at the Site. Not all of the COCs listed in the 1988 and 1990 RODs are currently monitored, and some of the listed COCs are reported only as tentatively identified compounds in laboratory analyses. Additionally, the groundwater cleanup levels selected in the 1990 ROD were MCLs, non-zero MCLGs, or natural background, whichever is lower for each COC. Subsequent to the issuance of the 1990 ROD, the Commonwealth of Pennsylvania established new groundwater cleanup levels under Act 2. The list of COCs and associated cleanup levels should be revised to more accurately reflect current Site conditions and current groundwater ARARs.

Long term monitoring (LTM) of the Site has been ongoing since 1998. Components of the monitoring program include collection of groundwater samples from monitoring wells, analysis of the GWTP influent and effluent, surface water monitoring, and vapor flux below and within the WSCS.

Groundwater Monitoring

The conceptual site model (CSM) was updated in 2017. Hydraulic testing confirmed that the first-encountered groundwater occurs in the Stockton Formation bedrock and flows primarily along bedding plane and associated fractures toward the Schuylkill River. The fractures in the shallow bedrock are hydraulically connected and typically represent unconfined hydraulic conditions. The groundwater in this zone discharges to the Schuylkill River under static, non-pumping conditions, but is intercepted by the operation of the groundwater extraction system.

The groundwater data review includes groundwater data collected in 2015, 2016, 2017 and 2018. At the time of this FYR Report, 2019 annual monitoring data had not been collected. Annual samples are collected from wells on the south side of the Schuylkill River and Barbadoes Island (Figure 2). During this monitoring period, samples were not collected north of the Schuylkill River. The sample locations are on a 3-year rotation. In addition to the annual sampling, the PRP collected additional groundwater samples over the winter of 2017/2018. These samples were collected to supplement the shallow bedrock aquifer data, and to provide data on wells that had not been sampled for a long period. The monitoring well samples are analyzed for VOCs to determine the hydraulic control of the groundwater extraction system and the extent of contaminated groundwater.

Additionally, in 2016 and 2017, the PRPs conducted hydraulic study and packer testing to better understand the subsurface geology, hydrogeologic conditions, and groundwater quality by evaluating the complex movement of groundwater and contaminants in fractured bedrock and assessing the current horizontal and vertical distribution of contaminants at the Site.

During this monitoring period, the following VOCs have been detected at least once in monitoring or extraction wells: acetone, benzene, 2-butanone, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, cis-1,3-dichloropropane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dichloropropane, ethylbenzene, 4-methyl-2-pentanone, methylene chloride, 1,1,2,2-tetrachloroethane, PCE, toluene, trans-1,2-dichloroethene, trans-1,3-dichloropropane, TCE, 1,2,3-

TCP, vinyl chloride, and xylenes (total). 1,2,3-TCP, the primary site-related compound, is consistently detected in monitoring wells on both the north and south side of the Schuylkill River and on Barbadoes Island.

The groundwater extraction wells are located on the south side of the Schuylkill River between the former Site and the river. Several of the shallow extraction wells consistently show high levels of 1,2,3-TCP (Figure 4). During this monitoring period, EW-011 and EW-002 had the highest TCP levels in shallow extraction wells. The highest 1,2,3-TCP detection in extraction wells (EW) during the annual monitoring events was 7,300 micrograms per liter (µg/L) in EW-002 in 2016. In general, concentrations of 1,2,3-TCP in EW wells have decreased over the monitoring period. For example, the concentration of 1,2,3-TCP in EW-002 decreased from a high of 7,300 µg/L in 2016 to 590 µg/L in 2018; and in EW-004 the 1,2,3-TCP concentration decreased from 580 µg/L in 2015 to 3 µg/L in 2018. In EW-011, the 1,2,3-TCP concentration decreased from 8,300 µg/L in 2015 to 1,100 µg/L in 2018. No significant increases in 1,2,3-TCP concentrations in extraction wells were noted in the annual monitoring events (Figure 6).

In 2016, packer testing of the EWs was performed. During the packer testing, some of the intervals in the EWs had much higher concentrations of 1,2,3-TCP than the concentrations noted during the annual monitoring events. For example, the 1,2,3-TCP in EW-002 were 210,000 µg/L (98-108 feet), 18,000 µg/L (115-125 feet), and 10,000 µg/L (125-175 feet). The highest 1,2,3-TCP concentration detected in EW-011 was 20,000 µg/L in the 90-100 feet interval. In EW-003, packer testing results showed a 1,2,3-TCP of 23,000 µg/L in the 155-165 feet interval, and in EW-004 the highest 1,2,3-TCP concentration was found in the 104 to 119 feet interval (5,300 µg/L).

On the south side of the Schuylkill River, the highest detected 1,2,3-TCP concentrations during this reporting period were in monitoring wells WN-10XD (220,000 µg/L) and WN-4D (380,000 µg/L) (Figure 4). There are several monitoring wells and deep bedrock wells on Barbadoes Island that were sampled in 2016 (Figure 5). The highest 1,2,3-TCP concentration on Barbadoes Island was detected in DB-011 at 1,100,000 µg/L. DB-013 was sampled each year during this monitoring period, and the 1,2,3-TCP concentration was 4,500 µg/L in 2016, with a spike in concentration to 7,700 µg/L in 2017, then it was back down to 4,100 µg/L in 2018. No wells north of the Schuylkill River were sampled during this monitoring period.

Deep extraction well DB-014 is located on the south side of the Schuylkill River and is monitored on a yearly basis. During this reporting period, DB-014 has not shown any concentrations of 1,2,3-TCP above the laboratory detection limit. A downward trend for 1,2,3-TCP (as well as other COCs) in DB-014 began in 2011 and has continued. BASF will continue to monitor the concentrations at DB-014 to better understand this trend. However, deep monitoring well DB-013, located on Barbadoes Island, has seen an increase in several COC concentrations beginning in 2016.

A summary of 1,2,3-TCP concentrations in monitoring wells sampled between 2015 and 2018 is presented in the Table 7 below.

Table 7.
1,2,3-TCP Concentrations (µg/L) in Wells Sampled from 2015 through 2018

Well ID	1,2,3-TCP Concentration (µg/L)			
	2015	2016	2017	2018
Deep Bedrock Wells (DB)				
DB-008	3	NS	2	1
DB-011	NS	1,100,000	NS	NS
DB-013	4500	7000	7700	4100
DB-014 (Extraction Well)	<1	<1	<1	<5
Monitoring Wells (MW)				
MW-13	NS	NS	180	NS
MW-14	NS	NS	NS	29
MW-21	NS	NS	<1	NS
MW-22	NS	NS	<1	NS
Nested Wells (NW)/Well Nests (WN)				
NW-19S	NS	NS	NS	5
NW-19I	NS	NS	NS	3
NW-19D	NS	NS	NS	<1
NW-24I	<1	NS	NS	<5
NW-24D	<1	NS	NS	<5
NW-26S	NS	26	NS	NS
NW-26I	NS	880	NS	NS
WN-2S	NS	NS	74	NS
WN-2I	NS	NS	<1	NS
WN-3I	NS	NS	NS	180,000
WN-3D	NS	NS	NS	69
WN-4S	NS	39	NS	NS
WN-4I	NS	28	NS	NS
WN-4D	NS	380,000	NS	NS
WN-5S	NS	NS	42	NS
WN-5I	NS	NS	15	NS
WN-5D	NS	NS	18	NS
WN-6S	NS	3,400	NS	NS
WN-6I	NS	33,000	NS	NS
WN-6D	NS	530	NS	NS
WN-7S	NS	NS	<1	NS
WN-7I	NS	NS	15	NS
WN-7D	NS	NS	5	NS
WN-8S	NS	NS	24	NS
WN-8I	NS	NS	3,000	NS
WN-8D	NS	NS	24	NS
WN-10S	NS	6	NS	NS
WN-10I	NS	5,200	NS	NS
WN-10D	NS	4,400	NS	NS
WN-10XD	NS	220,000	NS	NS
WN-11S	NS	NS	NS	3,000
WN-11I	NS	NS	NS	810
WN-11D	NS	NS	NS	9
WN-20S	NS	NS	<1	NS
WN-20I	NS	NS	19	NS
WN-20D	NS	NS	<1	NS
Shallow Extraction Wells (EW)				
EW-001	17	24	4	10
EW-002	6400	7,300	2400	590
EW-003	39	130	73	37

Well ID	1,2,3-TCP Concentration (µg/L)			
	2015	2016	2017	2018
EW-004	580	400	440	3
EW-005	27	28	120	35
EW-006	<1	2	<1	<5
EW-007	<1	<1	2	2
EW-008	160	180	170	110
EW-009	680	320	190	110
EW-010	42	350	57	98
EW-011	8300	3,000	1000	1100
EW-012	34	4	6	6
EW-013	6	4	<1	11
Cored Wells (CW)				
CW-004-1	NS	450	NS	NS
CW-004-2	NS	3,400	NS	NS
CW-004-3	NS	920	NS	NS
CW-004-4	NS	50	NS	NS

NS – Not Sampled

The results of the hydrogeologic testing in 2016 and 2017 showed that bedding plane fractures dominate the groundwater flow pathways, and the packer testing identified zones within extraction wells with a higher mass of contamination. This information can be used in the future to target the high mass zones for extraction. The analytical results of discrete interval samples collected in 2017 using Snap samplers indicated that the predominantly detected VOCs are benzene, toluene, ethylbenzene, and xylene (BTEX), chloropropanes (1,2,3-TCP and 1,2-dichloropropane), and chlorinated ethenes (PCE, TCE, and vinyl chloride). Chlorobenzene was also detected at concentrations as high as a part per million (milligrams per liter [mg/L]).

DNAPL has been noted in well WN-3I during periodic monitoring efforts. To assess the persistence of the DNAPL, a bail-down test was conducted to remove the DNAPL and monitor the rate of DNAPL return during 2016-2017 hydraulic testing. The DNAPL in the well was initially measured at a thickness of approximately 1.89 feet. Monitoring for the DNAPL thickness after the initial removal at well WN-3I indicate that a limited amount (less than 0.02 feet) of DNAPL returned during the following months of monitoring.

Specific analytes detected in the DNAPL include:

- 1,2,3-TCP at 432,000 mg/L
- Xylene (total) at 302,000 mg/L
- Toluene at 57,400 mg/L
- Ethylbenzene at 44,500 mg/L
- PCE at 7,400 mg/L
- Chlorobenzene at 4,430 mg/L
- TCE at 919 mg/L
- Benzene at 316 (J) mg/L

Treatment Plant Monitoring

Groundwater collected from the extraction wells is treated in the GWTP using two 20,000-pound GAC units. During this monitoring period, on average 59,419,000 gallons of water were treated annually, and a total of 2,936 pounds of VOCs were removed. To ensure that the GWTP is

functioning properly, six chemicals are monitored: 1,2,3-TCP, xylenes, aniline, phenol, methylene chloride, and vinyl chloride. In the past five years, only vinyl chloride has been detected in the effluent samples. The highest vinyl chloride concentration detected in GWTP effluent was 4 µg/L in 2015. The MCL for vinyl chloride is 2 µg/L. Although the NPDES permit equivalency limits require that the final discharge be monitored for vinyl chloride, the permit does not set a limit for vinyl chloride. The primary COC at the Site, 1,2,3-TCP, has consistently been removed by the GAC treatment system. Based on data collected from the influent and effluent, the GWTP is removing more than 99 percent of contaminants before its discharge to the Schuylkill River.

Surface Water Monitoring

Surface water samples are collected from the Schuylkill River on a semiannual basis from four different locations (Figure 3): upstream of the Site, downstream of the Site, from the river crib, and flume intakes (both downstream of the Site). The latter two points represent the primary and backup sources for the Pennsylvania American Water Company treatment facility. For the monitoring period 2015 through 2018, no contaminants were detected in surface water at concentrations greater than the National Ambient Water Quality Criteria for Human Health or the GWTP established effluent limits from the 1988 ROD.

Sump Monitoring

Some of the irrigation water for the WSCS migrates into the shallow aquifer and is collected in a seep and trench system. The intercepted water drains to two sump pits at the east and west end of the trench. During this monitoring period, the collected water was pumped to the GWTP. However, in 2017, EPA approved the discharge of this water directly to surface water due to the low level of contamination in the water. The PRP plans to start discharging the seep water directly to surface water in 2019 but will continue to sample quarterly.

In 2018, samples were collected quarterly from the East and West Sumps of the seep and trench system. These samples have shown consistently very low levels of site contaminants. PCE, 1,2,3-TCP, and xylenes have been detected in the sump samples; however, the levels are well below the discharge limits established by the NPDES permit equivalency limits.

5.0 SITE INSPECTION

The inspection of the Site was conducted on May 7, 2019. In attendance were Andrew Haneiko, EPA RPM, Colin Wade, PADEP Project Manager, Tim Cherry and Bonnie McClennen, PADEP Solid Waste Supervisors, Kevin Bauer and Jim Converse, PADEP Waste Management Program, Kyle Schmeck and Tori McQueen, Montgomery County Office of Public Health, and Misty Kauffman and Chris Wolfe, HGL. The purpose of the inspection was to assess the protectiveness of the remedy.

During the inspection the site team visited the lagoon area, monitoring wells, extraction wells, and the groundwater treatment building. The lagoon area is grass covered and generally undisturbed. Monitoring and extraction wells are numbered, secured, and generally in good condition. The groundwater treatment building is secured and fenced. The groundwater treatment equipment is in good condition. The effluent (treated groundwater) is discharged through a submerged pipe into the Schuylkill River.

A site inspection checklist and site photos are included in Attachment 1 and 2.

6.0 TECHNICAL ASSESSMENT

QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

Question A Summary:

Yes. The review of the decision documents, monitoring reports, and applicable or relevant and appropriate requirements (ARARs) indicate that the remedies selected for soil and groundwater are functioning as intended.

As shown by the data review, and as prescribed in the Selected Remedy, the groundwater extraction wells coupled with the GWTP are effectively containing and treating contaminated groundwater in both the shallow and deep aquifers and have greatly minimized, if not completely eliminated, any discharge of contaminated groundwater to the Schuylkill River. Releases of VOC gases from the lagoon area have been mitigated by the installation of the WSCS.

During this reporting period, several investigations have been conducted to improve and optimize the treatment systems. A Hydraulic Study was conducted in and identified zones within extraction wells with a higher mass of contamination. This information can be used in the future to target the high mass zones for extraction.

Modifications to the monitoring of the WSCS have been approved by EPA and will be implemented in 2019. Instead of conducting flux monitoring to verify the proper performance of the WSCS, monitoring of soil saturation will be utilized. The flux monitoring has consistently shown very low concentrations of Site COCs. The new procedure will ensure that the WSCS is properly saturated to prevent emission of vapors from the former lagoon soils.

Two sumps are part of the Seep System. Recent sampling data indicates that all COCs are below the surface water effluent limits established in the 1988 ROD and have been for several years. In consultation with PADEP, EPA approved of bypassing the Site groundwater treatment system and allowing for direct discharge of the collected raw water from the two seep sumps directly to surface water. Sampling of the two seep sumps shall continue on a quarterly basis unless an alternate sampling schedule is approved by EPA.

Currently the groundwater treatment system consists of two 20,000-gallon GAC units. These units will be replaced in summer/fall 2019 with two smaller units (10,000 gallon) to improve the efficiency of the system. O&M of both the WSCS and GWTP have been successful with minimal issues.

Multiple physical and legal restrictions are in place to ensure that the ICs implemented as part of the soil and groundwater remedies are being enforced. These include a Montgomery County ordnance established in 1997 that regulates the permitting of new and existing individual water supplies, Delaware River Basin Commission required permits for withdrawal of more than 10,000 gallons of water per day, property easements for land access, deed restrictions that allow the Upper

Merion Township to restrict or prohibit future construction at the Site, and fencing that surrounds the Site boundary to restrict access. There have been no violations of these restrictions.

QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND RAOs USED AT THE TIME OF THE REMEDY SELECTION STILL VALID?

No. Although the RAOs are still valid, some of the exposure assumptions, toxicity data and cleanup levels have changed since the time of remedy selection. However, these changes do not impact the protectiveness of the remedy. The GWTP and WSCS are effectively controlling the Site contamination and ICs are in place to prevent exposure to contaminated groundwater. Since the time of the ROD, Site conditions and surrounding land use have not changed significantly. No new receptors or contaminant sources have been identified.

A list of ARARs from the 1988, 1990, and 1996 RODs is included in Attachment 3. No new standards or to-be-considered (TBC) requirements affecting the current protectiveness of the remedy have been implemented. However, some of the toxicity values and drinking water standards have been revised. These changes in standards do not affect the current protectiveness of the Site.

As mentioned above, toxicity values for some Site contaminants have been revised since finalization of the decision documents. For example, 1,2,3-TCP was not regulated by the EPA until 2013. Currently the Regional Screening Level (RSL) for 1,2,3-TCP in tap water is 7.5×10^{-4} µg/L. Changes in these toxicity values do not affect the short-term protectiveness of the remedies, as the groundwater contamination is being contained and no one is or will be consuming groundwater. Furthermore, no ROD requirements or regulatory standards for surface or drinking water have been exceeded in the GWTP effluent.

There have been significant changes in EPA's risk assessment guidance since the original risk assessment was performed for the 1988 ROD, in which groundwater cleanup levels were established. EPA's current risk assessment methodology, the *Risk Assessment Guidance for Superfund (RAGS) (EPA, 1989),* was not introduced until 1989, and it has been updated several times. These changes do not affect the short-term protectiveness of the groundwater remedy, as there are no known current exposures to Site contaminants above chemical-specific cleanup levels, and ICs prevent future exposure to human receptors. Changes in risk assessment methodology and guidance do not affect the WSCS, as it has been demonstrated to be working effectively at mitigating the release of vapors to the atmosphere.

The groundwater cleanup levels selected in the 1990 ROD were MCLs, non-zero MCLGs, or natural background, whichever is lower for each COC. Subsequent to the issuance of the 1990 ROD, the Commonwealth of Pennsylvania repealed its groundwater cleanup level of natural background and established a new cleanup level under Act 2. Additionally, some of the COCs established in the 1990 ROD are no longer detected at the Site. The list of COCs and associated cleanup levels should be revised to more accurately reflect current Site conditions and current groundwater ARARs.

Due to the presence of multiple COCs at the Site, once the groundwater cleanup levels for each Site COC has been achieved, the groundwater may nonetheless present an unacceptable cumulative risk. Therefore, the Selected Remedy should be revised to include a requirement for a

cumulative risk evaluation of the groundwater after groundwater cleanup levels have been met. The cumulative risk evaluation will take into account risks posed by all Site related COCs in accordance with the NCP at 40 C.F.R. § 300.430 (e)(2)(i).

The remedy is progressing as expected and is controlling the migration of contaminants from the Site. Although the levels of contamination in many wells is still very high, progress has been made in reducing the Site contamination in groundwater as evidenced by the declining concentrations of TCP in the monitoring and extraction wells. The WSCS is effectively preventing direct contact or ingestion of contaminants and controlling the vapors emanating from the former lagoons.

QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

No. There is no other information that calls into question the protectiveness of the remedy.

7.0 ISSUES/RECOMMENDATIONS

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1, OU2, OU4, OU5

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 3	**Issue Category: Other**			
	Issue: The groundwater cleanup levels in the 1990 ROD are the federal MCLs, non-zero MCLGs, or natural background concentrations, whichever is more stringent. Subsequent to the issuance of the ROD, the Commonwealth of Pennsylvania repealed its groundwater cleanup level of natural background and established a new cleanup level under Act 2. Therefore, the Pennsylvania background regulations are no longer considered ARARs.			
	Recommendation: Modify the Selected Remedy for the Site to reflect this change in groundwater ARARs and select PADEP Act 2 MSCs, EPA non-zero MCLGs, MCLs, or calculated risk-based concentrations as the groundwater cleanup levels for Site COCs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2020

OU(s): 3	**Issue Category: Other**
	Issue: Due to the presence of multiple COCs at the Site, once the groundwater cleanup levels for each Site COC has been achieved, the groundwater may nonetheless present an unacceptable cumulative risk.

	Recommendation: Modify the Selected Remedy for the Site to include a cumulative risk evaluation once all groundwater cleanup levels have been met for all Site COCs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2020

OTHER FINDINGS

- The groundwater extraction and treatment system should be evaluated to determine if current optimizations are adequate to achieve groundwater cleanup levels throughout the contamination plume;
- In the 1990 ROD effluent limits for each compound from the GWTP were evaluated based on NPDES limitations. Discharge limitations for a number of COCs have changed since the time of the selected remedy. The PRP should submit new Industrial NPDES permit application to PADEP so that PADEP can review, and if necessary, revise the surface water discharge limits.

8.0 PROTECTIVENESS STATEMENT

Although OUs are identified at the Site, they cannot be evaluated individually for protectiveness due to significant overlap in the remedy components between OUs. Therefore, only a Site-wide protectiveness statement will be made for this FYR.

Protectiveness Determination:
Short-term Protective

Protectiveness Statement:
The Selected Remedy at the Site is currently protective of human health and the environment. The GWTP is containing and treating the contaminated groundwater. As shown by the surface water and GWTP discharge analytical results, surface water is not being contaminated. The WSCS is preventing exposure to contaminated soils and vapors in the lagoon area. ICs are in place to prevent exposure to Site-related contaminants in groundwater. All nearby residents are on a public water supply.

However, in order for the remedy to be protective in the long term, the following actions need to be taken:

- The groundwater cleanup levels in the 1990 ROD should be updated to select PADEP Act 2 MSCs, EPA non-zero MCLGs, EPA MCLs, or calculated risk-based concentrations as groundwater cleanup levels for Site COCs; and

- The Selected Remedy in the 1990 ROD should be modified to include a cumulative risk evaluation once all groundwater cleanup levels have been met for all Site COCs.

9.0 NEXT REVIEW

The next FYR Report for the Site is required five years from the signature date of this review.

APPENDIX A - REFERENCE LIST

CH2M Hill, Inc. 2017. Summary Report for the Hydraulic Testing and Groundwater Sampling at the Tyson's Dump Superfund Site. May.

Environmental Protection Agency (EPA), 1984. Record of Decision (ROD) for The Tyson's Dump Superfund Site. December, 21.

EPA, 1988. ROD Amendment for Tyson's Dump Superfund Site. March 31.

EPA, 1988. ROD for Tyson's Dump Superfund Site. September 30.

EPA, 1989. Risk Assessment Guidance for Superfund. December.

EPA, 1990. ROD for Tyson's Dump Superfund Site. September 28.

EPA, 1996. ROD Amendment for Tyson's Dump Superfund Site. July 20.

EPA, 2014. Fourth Five Year Review for Tyson's Dump Superfund Site. September 26.

EPA, 2012. Explanation of Significant Difference for Tyson's Dump Superfund Site. August 16.

Environmental Standards, 2015. Semiannual Monitoring Report, January to June 2015, BASF Corporation, Upper Merion Township, Montgomery County, PA. July 24.

Environmental Standards, 2015. 2015 Annual Monitoring Report, Site-wide Monitoring Program, BASF Corporation, Upper Merion Township, Montgomery County, PA. December.

Environmental Standards, 2016. Semiannual Monitoring Report, July to December 2015, BASF Corporation, Upper Merion Township, Montgomery County, PA. January 19.

Environmental Standards, 2016. Semiannual Monitoring Report, January to June 2016, BASF Corporation, Upper Merion Township, Montgomery County, PA. July 8.

Environmental Standards, 2017. 2016 Annual Monitoring Report, Site-wide Monitoring Program, BASF Corporation, Upper Merion Township, Montgomery County, PA. March 17.

Environmental Standards, 2017. Semiannual Monitoring Report, July to December 2016, BASF Corporation, Upper Merion Township, Montgomery County, PA. March 17.

Environmental Standards, 2017. Semiannual Monitoring Report, January to June 2017, BASF Corporation, Upper Merion Township, Montgomery County, PA. July 24.

Environmental Standards, 2018. 2017 Annual Monitoring Report, Site-wide Monitoring Program, BASF Corporation, Upper Merion Township, Montgomery County, PA. February 15.

Environmental Standards. 2018. Shallow Bedrock Aquifer Groundwater Recovery System Update and Optimization Report, Tyson's Dump Superfund Site. July 24.

Environmental Standards, 2019. 2018 Annual Monitoring Report, Site-wide Monitoring Program,

BASF Corporation, Upper Merion Township, Montgomery County, PA. March 18.

NUS Corporation, 1983. Remedial Action Master Plan and Remedial Investigation/Feasibility Study Work Plan for Tyson's Dump Site. July.

APPENDIX B – CHRONOLOGY OF SITE EVENTS

Event	Date
Property is used for disposal of septic and chemical waste.	1962–1970
The state orders the facility closed.	1973
EPA investigates a citizen's complaint about foul odors, discolored soils, and visible waste on ground surface.	1983
EPA installs leachate collection and air stripper systems.	March 1983
EPA conducts a series of investigations to characterize the nature and extent of contamination at the Site.	1983–1985
A RI/FS of the on-site area is conducted by the PRPs.	August 1984
Tyson's Dump is placed on NPL.	9/21/1984
OU1 ROD signed by EPA	12/21/1984
An Administrative Order on Consent requiring the PRPs to conduct an RI/FS at the off-site area is signed by EPA, the state, and the PRPs.	5/27/1986
An Administrative Order on Consent requiring the PRPs to conduct operation and maintenance (O&M) of an air stripper system.	4/03/1987
The PRPs submit an FS Report for lagoon area soils and groundwater.	6/15/1987
The PRPs submit an RI report for the off-site area.	7/29/1987
OU1 ROD amendment issued by EPA – SVE for lagoon area soils.	3/31/1988
A partial consent decree to implement a ROD amendment for SVE of lagoon soils, installation of groundwater recovery wells, and O&M of systems is signed by EPA, the state, and PRPs.	6/22/1988
The ROD for OU2, which provides for the operation of a GWTP and an associated groundwater recovery system (extraction wells) to prevent groundwater discharge to Schuylkill River, is signed by EPA.	9/30/1988
Remedial Action for SVE system is conducted by the PRPs.	1988
Construction of the GWTP and recovery system is completed.	1989
The PRPs submit an RI report addendum for groundwater in the deep aquifer.	May 1990
The PRP submit an FS report addendum for groundwater in the deep aquifer.	September 1990
The ROD for OU3, deep aquifer groundwater, is issued by EPA.	9/28/1990
The RI for off-site contamination is completed by the PRPs.	1991–1995
A ROD amendment for OU5, which requires emplacement of a wet soil cover to replace the SVE system for lagoon soils, is issued by EPA.	7/20/1996
The SVE system is dismantled.	1996–1997
The wet soil cover over the lagoons is constructed.	1997
An additional deep groundwater extraction well is installed and the treatment system becomes fully operational.	October – December 1997
The Preliminary Close-Out Report is signed.	12/22/1997
The first FYR is conducted by EPA.	9/30/1999
The second FYR is conducted by EPA.	9/27/2004
The third FYR is conducted by EPA.	9/28/2009

An ESD for OU3 regarding the change of the deep extraction well location from Barbadoes Island to south of the Schuylkill River is issued by EPA.	8/16/2012
The fourth FYR is conducted by EPA.	9/26/2014

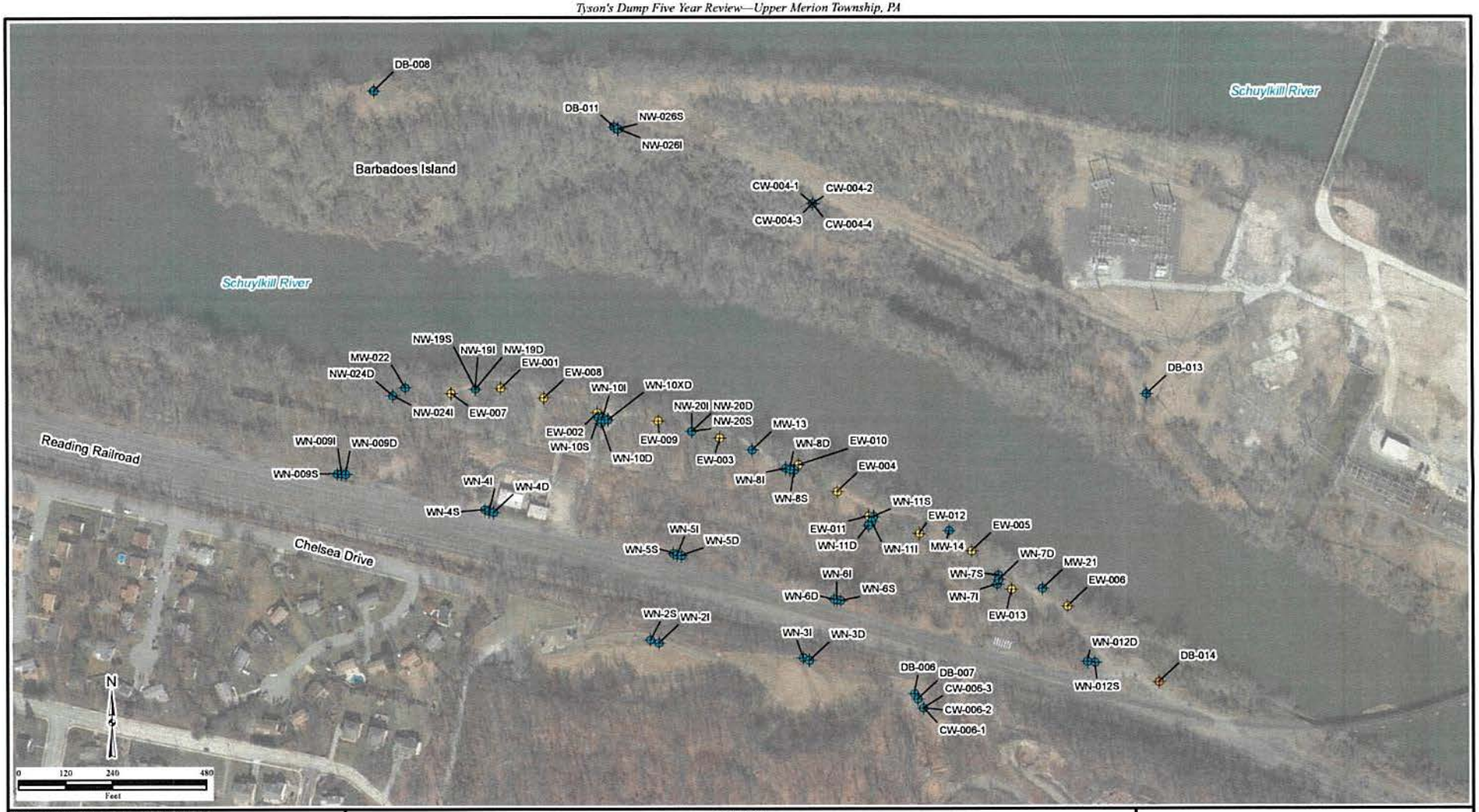
gst-srv-01 hgl\gis Tysons_Dump 5yr_Review (1)SiteLocation.mxd
Source: HGL, Environmental Standards

ArcGIS Online Imagery

Legend

- Site Location
- Road
- Tyson's Dump

Figure 1
Site Location

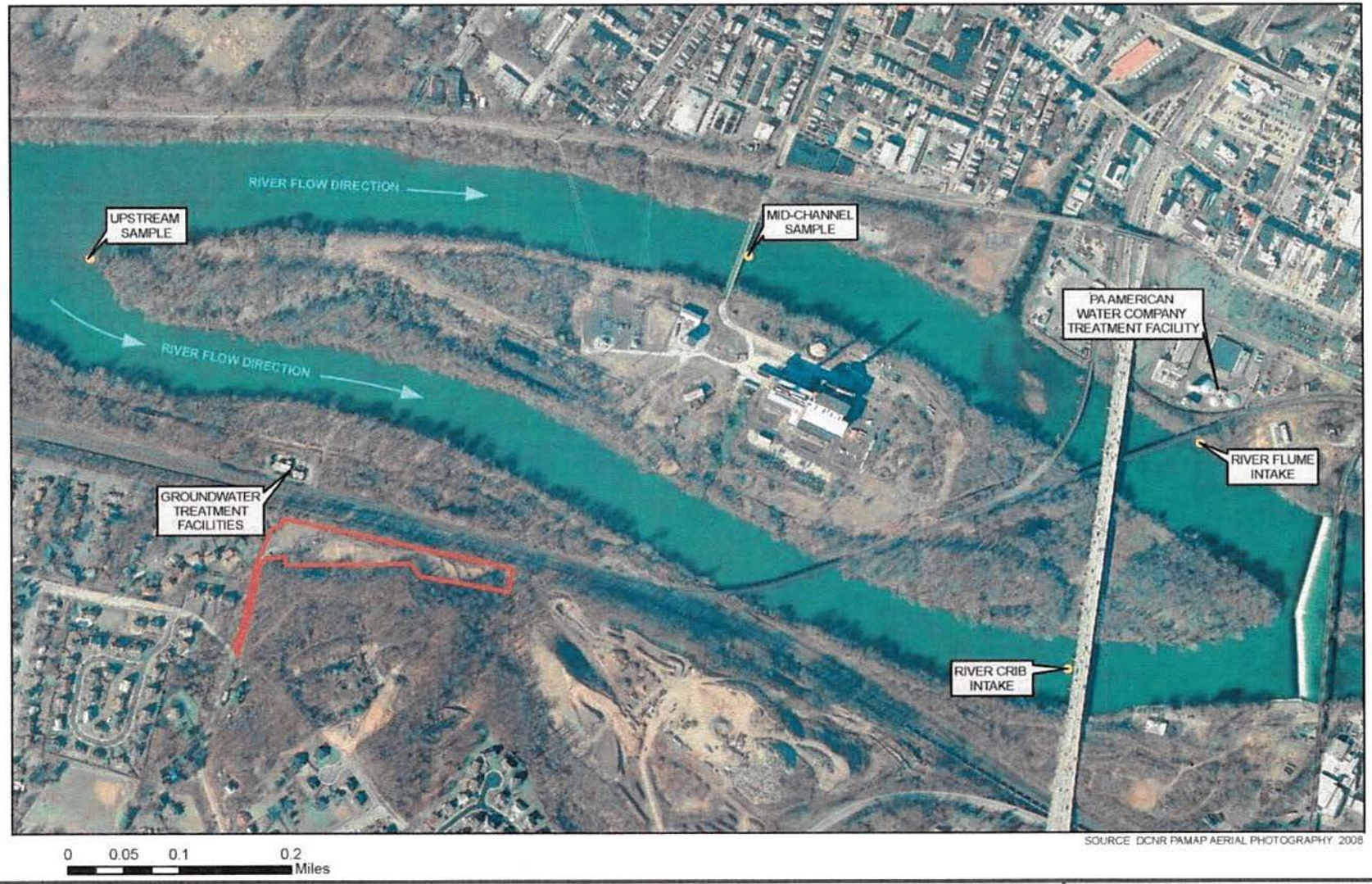


\\gst-srv-01\HGLGIS\Tysons_Dump\5yr_Review_2019\(02)Wells.mxd
4/3/2019 TH
Source: HGL Environmental Standards
ArcGIS Online Imagery

Legend

- Monitoring Well
- Shallow Monitoring Well
- Deep Extraction Well

Figure 2
Well Locations



\\gst-srv-01\hglgis\Tysons_Dump\5yr_Review (3)Surf_Water_Samples.cdr
Source: Environmental Standards 2012

Legend

- Approximate Sample Location
- Approximate Site Location

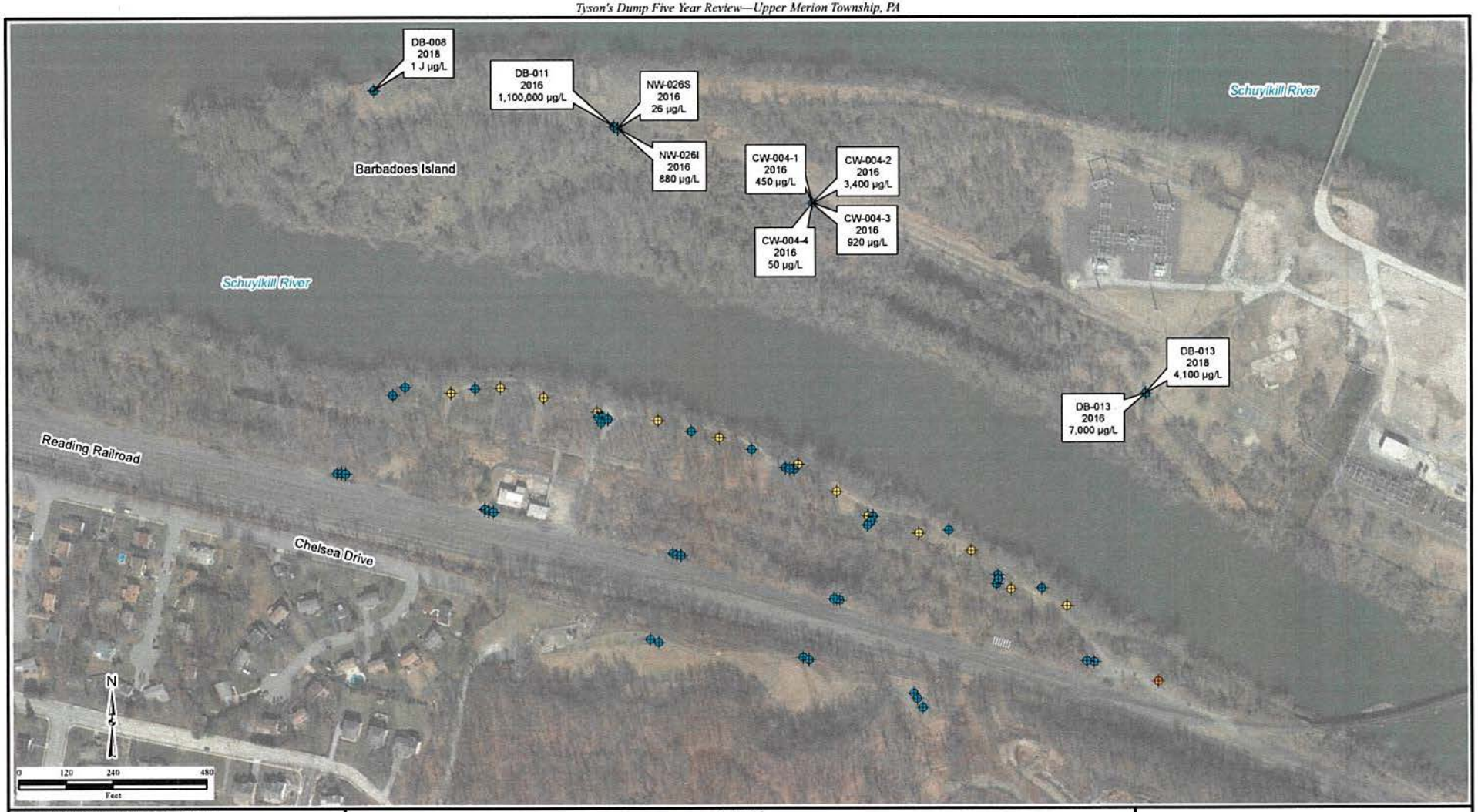
Figure 3
Surface Water Sample Locations in the Schuylkill River

\\gst-srv-01\hgis\Tysons_Dump\5yr_Review_2019
(04)TCP_South.cdr
4/3/2019 TH
Source: Environmental Standards, Inc.

Legend

- STAFF GAUGE LOCATION
- 2017 MONITORING WELL LOCATION (NOT TO BE SAMPLED)
- 2017 MONITORING WELL LOCATION (SAMPLED)
- SHALLOW EXTRACTION WELL LOCATION
- DEEP EXTRACTION WELL LOCATION

Figure 4
1,2,3-Trichloropropane Concentrations
South of the Schuylkill River



\\gst-srv-01\HGL\GIS\Tysons_Dump\5yr_Review_2019\(05)TCP_Barbadoes.mxd
4/3/2019 TH
Source: HGL, Environmental Standards ArcGIS Online Imagery

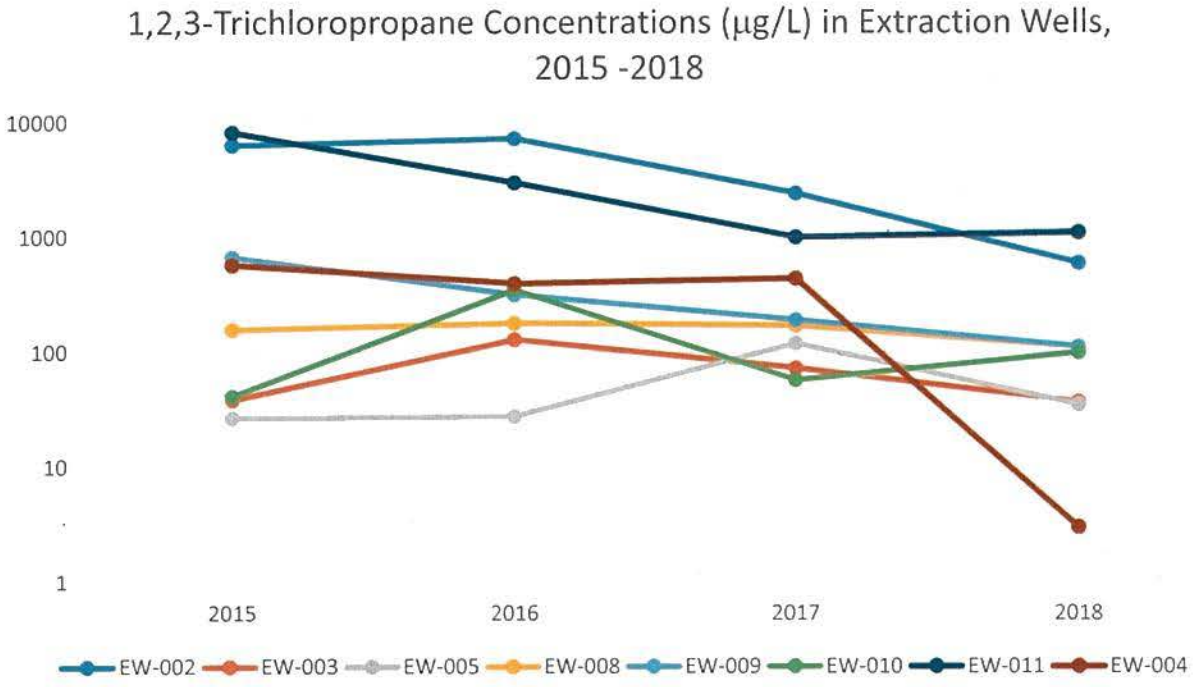
Legend

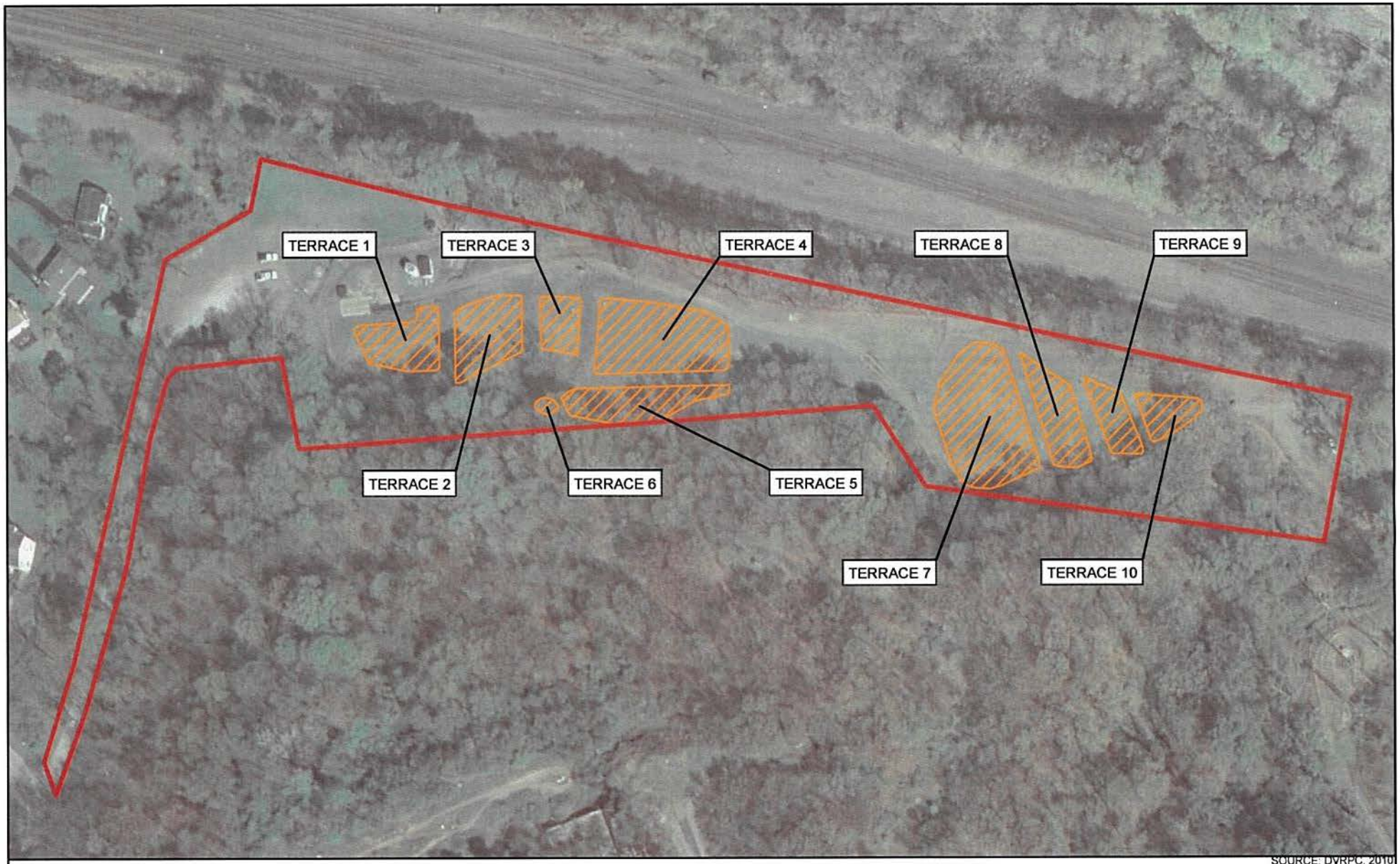
- Monitoring Well
- Shallow Monitoring Well
- Deep Extraction Well

Note:
µg/L=micrograms per liter

Figure 5
1,2,3-Trichloropropane Concentrations on Barbadoes Island

Figure 6. 1,2,3-TCE Concentrations in Extraction Wells





SOURCE: DVRPC, 2010

Legend

- SITE BOUNDARY
- WET SOIL COVER TERRACE

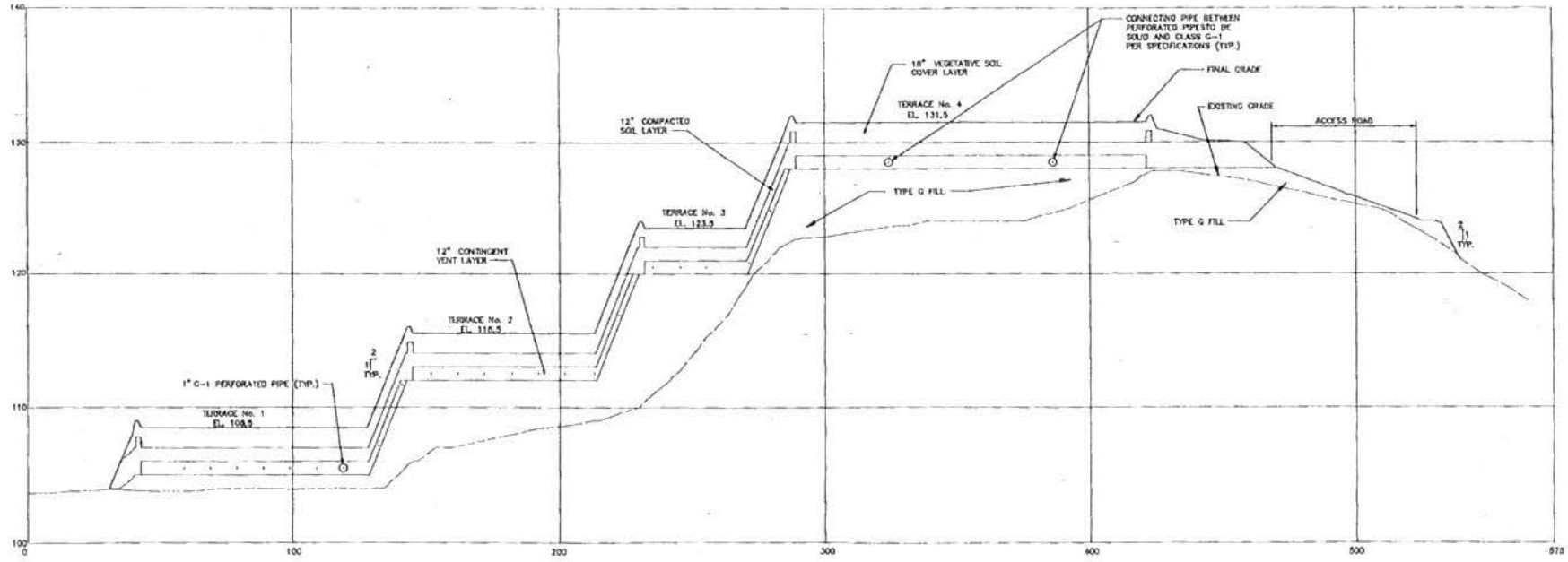
N

0 50 100 200 Feet

CREATION DATE: MAY 22, 2019	PROJECT NO: 20198509.A		FIGURE 7: WET SOIL COVER TERRACE LOCATIONS
ENVIRONMENTAL STANDARDS	DRAWN BY: JRW	APPRV'D BY: GLK	
	CHEK'D BY: JPK	REVISION: 0	TYSON'S SUPERFUND SITE UPPER MERION TOWNSHIP, PENNSYLVANIA

W:\BASF\Tyson's Site Management\20115812\FIGURES\GIS\2013 GW\Flux_SampleLocaMap.mxd

Figure 8. Wet Soil Cover Profile of Terraces 1 through 4



SECTION 9/107

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
				1/97	CONSTRUCTION BID
				12/96	AGENCY REVIEW

SMITH TECHNOLOGY CORPORATION
One Plymouth Meeting
Plymouth Meeting, PA 19462
©1996 SMITH TECHNOLOGY CORPORATION

DESIGN ENGR.	TJB	APPROVED
DRAWN BY	FB	
PROJECT ENGR.	TJB	APPROVED
PROJECT MGR.	JOB	
CHECKED BY	HKH	DATE 1/17/97

SEAL: COMMONWEALTH OF PENNSYLVANIA, REGISTERED PROFESSIONAL ENGINEER, HAROLD KIRK HORSTMAN

CIBA SPECIALTY CHEMICALS
TYSON 5 SITE
WET SOIL COVER SYSTEM
UPPER MERION TOWNSHIP, PENNSYLVANIA

WEST LAGOON CROSS-SECTION

SCALE	AS NOTED
PROJECT NO.	00-8129-0302
DRAWING NO.	112
SHEET	1 OF 1

Attachment 1 – Site Inspection Checklist

I. SITE INFORMATION	
Site name: Tyson's Dump	**Date of inspection: 05/07/2019**
Location and Region: Upper Merion Twnship/ R3	**EPA ID: PAD980692024**
Agency, office, or company leading the five-year review: EPA Region 3	**Weather/temperature: Mostly Sunny, 75F**

Remedy Includes: (Check all that apply)

- x Landfill cover/containment
- x Access controls
- x Institutional controls
- x Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____
- ☐ Monitored natural attenuation
- x Groundwater containment
- ☐ Vertical barrier walls

Attachments: x Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Dominic Taurino (Name) O&M Manager (Title) 05/07/2019 (Date)
   Interviewed x at site ☐ at office ☐ by phone Phone no. 215-629-6801
   Problems, suggestions; ☐ Report attached No problems identified.

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency PA DEP
Contact Colin Wade (Name) | Envt Protection Specialist (Title) | 05/07/2019 (Date) | 484-250-5722 (Phone no.)
Problems; suggestions; ☐ Report attached No problems identified.

Agency Montgomery County Department of Health
Contact Kyle Schmeck (Name) | Dir. Of WQ Mgmt. (Title) | 05/07/2019 (Date) | 610-278-5117 (Phone no.)
Problems; suggestions; ☐ Report attached No problems identified

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone no.)
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone no.)
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - x O&M manual — x Readily available — x Up to date — ☐ N/A
   - x As-built drawings — x Readily available — x Up to date — ☐ N/A
   - x Maintenance logs — x Readily available — x Up to date — ☐ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — x Readily available — x Up to date — ☐ N/A
   - x Contingency plan/emergency response plan — x Readily available — x Up to date — ☐ N/A

   Remarks_____

3. **O&M and OSHA Training Records** — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — x N/A
   - x Effluent discharge — x Readily available — x Up to date — ☐ N/A
   - x Waste disposal, POTW — x Readily available — x Up to date — ☐ N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — x N/A

   Remarks_____

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — x N/A

   Remarks_____

7. **Groundwater Monitoring Records** — x Readily available — x Up to date — ☐ N/A

   Remarks Included in semi-annual and annual monitoring reports.

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — x N/A

   Remarks_____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — x N/A
   - x Water (effluent) — x Readily available — x Up to date — ☐ N/A

   Remarks Annual monitoring reports.

10. **Daily Access/Security Logs** — x Readily available — x Up to date — ☐ N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
x PRP in-house x Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
x Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured x N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks Signs and fencing in place.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No x N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No x N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Visual, self reporting.

Frequency Daily

Responsible party/agency BASF and EISCO

Contact Fred Goelz (Name) EHS Specialist (Title) _____ (Date) 973-245-5267 (Phone no.)

Reporting is up-to-date x Yes ☐ No ☐ N/A

Reports are verified by the lead agency x Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met x Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No x N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map x No vandalism evident

Remarks

2. **Land use changes on site** x N/A

Remarks

3. **Land use changes off site** ☐ N/A

Remarks Land use has not changed.

VI. GENERAL SITE CONDITIONS

A. Roads x Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map x Roads adequate ☐ N/A

Remarks

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS x Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map x Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Cracks** ☐ Location shown on site map x Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map x Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ☐ Location shown on site map x Holes not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** x Grass x Cover properly established x No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks Sprinklers working day of inspection._____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks Wet soil cap system._____
   _____

7. **Bulges** ☐ Location shown on site map x Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

8. **Wet Areas/Water Damage** x Wet areas/water damage not evident
- ☐ Wet areas ☐ Location shown on site map Areal extent_____
- ☐ Ponding ☐ Location shown on site map Areal extent_____
- ☐ Seeps ☐ Location shown on site map Areal extent_____
- ☐ Soft subgrade ☐ Location shown on site map Areal extent_____

Remarks Areas that are supposed to be wet, were adequately wet.

9. **Slope Instability** ☐ Slides ☐ Location shown on site map x No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable x N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels x Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map x No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map x No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map x No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map x No evidence of undercutting
Areal extent_____ Depth_____
Remarks No undercutting for wet soil cap. Far eastern perimeter being undercut by stream during storm events.

5. **Obstructions** Type_____ x No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
x No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks Area well maintained.

D. Cover Penetrations x Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
x N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance x N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
x Properly secured/locked x Functioning x Routinely sampled x Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance x N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed x N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable x N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks_____

F. Cover Drainage Layer ☐ Applicable x N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable x N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable x N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge x Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map x Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   x Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map x Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** x Functioning ☐ N/A
   Remarks Observed discharge pipe in river._____

VIII. VERTICAL BARRIER WALLS ☐ Applicable x N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES x Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines x Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
x Good condition☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
x Readily available ☐ Good condition☐ Requires upgrade ☐ Needs to be provided
Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable x N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition☐ Needs Maintenance
Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition☐ Requires upgrade ☐ Needs to be provided
Remarks_____

C. Treatment System x Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   x Good condition ☐ Needs Maintenance
   x Sampling ports properly marked and functional
   x Sampling/maintenance log displayed and up to date
   x Equipment properly identified
   x Quantity of groundwater treated annually Approx. 60,000,000 gallons (2018)
   ☐ Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A x Good condition ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A x Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A x Good condition ☐ Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   ☐ N/A x Good condition (esp. roof and doorways) ☐ Needs repair
   x Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   x Properly secured/locked x Functioning x Routinely sampled x Good condition
   x All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   x Is routinely submitted on time x Is of acceptable quality

2. Monitoring data suggests:
   x Groundwater plume is effectively contained x Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance x N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The remedy is functioning as designed and is effective in containing contaminated groundwater and reducing contaminant mass. ICs are in place which control exposure pathways.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
The Site is well run and maintained.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

N/A

D. Opportunities for Optimization

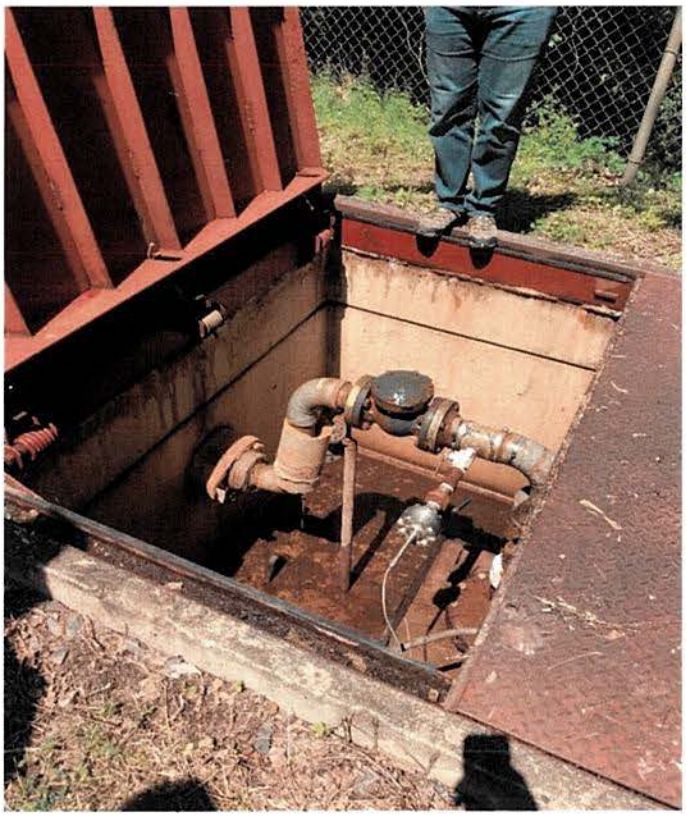
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Attachment 2 – Site Photos

Picture 1. Groundwater treatment building

Picture 2. Granular activated carbon unit (20,000 pound)

Picture 3. Groundwater treatment plant discharge to Schuylkill River



Picture 4. Monitoring well DB-014

Picture 5. Wet soil cover, Terrace 7, sprinklers operating

Attachment 3 – ARARs Tables

1988 ROD Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered for the Tyson's Dump Site

Citation	Requirement	Comments
ARARs		
Safe Drinking Water Act Maximum Contaminant Levels (MCLs)	Comply with MCLs	The contaminated groundwater in the shallow and deep site aquifer does not currently meet MCLs.
Clean Water Act	- Wetlands Impact - Ambient Water Quality Criteria (AWQC)	Wetlands portion was met when remedial action was constructed. AWQC are currently being met by the remedy.
Executive Order 11988 – Protection of Floodplains 40 CFR 6, Appendix A	Action to avoid adverse effects, minimizes potential harm, restore and preserve natural and beneficial value	ARAR met when remedial action was constructed.
State Ambient Air Quality Guidelines for Air Toxic Substances (ATGS)	Satisfy guidelines	ATGS standards available at the time of remedy selection were documented in the ROD and are being met.
PADER Discharge Limits for Treated Groundwater	Meet limits established by PADER	Discharge standards available at the time of remedy selection were documented in the ROD and are being met.

1990 ROD Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered for the Tyson's Dump Site

Citation	Requirement	Comments
ARARs		
25 PA Code § 264.90 through 264.100	"Background" quality for ground water remediation	Extraction of groundwater will continue until background, the MCLs or non-zero MCLGs are achieved. Background levels have not been established to date.
25 PA Code §123.1, 123.2, 123.31 and 123.41	Pennsylvania air quality standards for establishing air emission limitations for fugitive, odor, and visible emissions	Requirements are still applicable and being met.
25 PA Code §121.7 and 127.11	Pennsylvania Air Quality Standards Prohibition of Air Pollution Establishes air emission control	Requirements are still applicable and being met.
25 PA Code § 92.1 through 92.79	National Pollutant Discharge Elimination System (NPDES) for treated groundwater discharge	This requirement is still applicable. The GWTP is consistently meeting NPDES requirements

Citation	Requirement	Comments
25 PA Code §93.1 through 93.9	Establish water quality standards	Discharge standards available at the time of remedy selection were documented in the ROD and are being met.
25 PA Code §269.22 and 269.33	Prohibits sitting of treatment facilities in the 100-year floodplain and in wetland areas, respectively	ARAR met when remedial action was constructed.
25 PA Code §Section 105.1 through 105.423	Regulates water obstruction, encroachments, and wetlands	ARAR met when remedial action was constructed.
Pennsylvania Scenic Rivers Act and 25 PA Code § 269.50	Requirements for constructing a facility within a protected river corridor	ARAR met when remedial action was constructed.
25 PA Code §260 though 265 and §270	Regulates hazardous waste generation, transportation, storage and treatment	Requirement is still applicable.
25 PA Code § 75.21 through 75.38	Regulates residual waste generation, transportation, storage and treatment	Requirement is still applicable. Waste generated from the GWTP system is handled pursuant to regulation.
29 CFR Parts 1910 and 1926	Occupational Health and Safety Act	Requirements are applicable to all response activities

1996 ROD Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered for the Tyson's Dump Site

Citation	Requirement	Comments
ARARs		
40 CFR §264.14	Security requirements will be followed through completion of the construction of the cap	ARAR met when remedial action was constructed.
40 CFR §264.97 and §264.98	Groundwater Monitoring Requirements	Requirements are still applicable.
40 CFR §264.111-.112, 264.114, 264.117-118	Hazardous Waste Landfill regulations concerning closure and post-closure activities	Requirements are still applicable.
40 CFR §264.302 and .310	Cap construction and operation cap design requirements	ARAR met when remedial action was constructed.
40 CFR §258.60	Long-term monitoring requirements	Requirements are still applicable.

Attachment 4 – Press Release

Norristown Times Herald - 05/20/2019 Copy Reduced to 50% from original to fit letter page

killer

FROM PAGE 1

her vehicle while being chased by a male suspect," Whitemarsh Detective Stephen Kerns and county Detective William Mitchell alleged in the arrest affidavit, adding Crawley is observed attacking the woman with a stabbing motion.

The video surveillance showed that several of Stith's coworkers appeared on the parking lot and attempted to render aid to her as she lay injured on the ground, a knife protruding from her back, court papers indicate.

"A Chevrolet Avalanche SUV is then observed driving over the area of the victim on three occasions while the vehicle circled the parking lot," detectives alleged, adding coworkers witnessed the horrific attack.

Investigators said they found the driver's side window of Stith's sedan had been smashed.

"Scene evidence inside the Toyota indicates the victim was initially attacked inside the driver side of the car and escaped through the passenger door. Detectives also located a single knife, a knife handle and hammer at the scene," detectives wrote in the arrest affidavit.

Crawley, according to court documents, spoke by cellphone with a woman after the alleged attack and stated, "I stabbed her and then I ran over her with the truck. I am going to kill myself." Crawley allegedly told the woman that "voices in his head made him do it," according to the arrest affidavit.

Crawley later called his mother at 2:31 a.m. and told her, "Mom, I'm sorry I killed her," according to the arrest affidavit.

Authorities alleged Crawley fled the scene in the blue Chevrolet Avalanche SUV and was spotted several hours later by state police traveling on the westbound Pennsylvania Turnpike in Somerset County. As troopers approached the vehicle, Crawley reportedly set himself on fire inside the vehicle and he spent several weeks in hospitals recovering from burns, according to court documents.

The investigation further revealed that on May 23 Crawley was arrested by state police in Montour County following an assault of Stith during which she was strangled, according to the arrest affidavit. On July 18, Crawley pleaded guilty to a charge of simple assault, court papers indicated.

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foot middle school building, on the same property, behind the existing school. Once the new school building is complete, the existing building will be demolished and a new parking lot and playing fields will be constructed on the site of the old school. Council Chairman Marty Higgins said the township has spent quite a bit of time meeting and coordinating with school officials to ensure use of an access road situated on township property. The road would be used primarily for school buses.

In related news, the governing body unanimously awarded a paving and milling overlay bid to Glasgow, Inc. in the amount of $304,400. The company will undertake paving and milling in the neighborhood from Germantown Pike to Township Line Road between Sheffield Drive and Arch Road this summer.

Lastly, the 28th annual Plymouth Township Day will be held on June 1 from 11 a.m. to 3 p.m. at East Plymouth Valley Park, 900 Germantown Pike. The day features food and recreational activities, as well as informational vendors. For more information, visit: https://www.plymouthtownship.org/event/plymouth-township-day-3/.

EPA PUBLIC NOTICE

EPA REVIEWS CLEANUP

TYSONS DUMP SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) is reviewing the cleanup that was conducted at the Tysons Dump Superfund Site located in Upper Merion Township, Pennsylvania. EPA inspects sites regularly to ensure that cleanups conducted remain protective of public health and the environment. EPA's previous review of the site in 2014 concluded that the remedy was working as designed and is protective. Findings from the current review will be available in August 2019.

To access detailed site information, including the review report once finalized, visit: https://www.epa.gov/superfund/tysons

For questions or to provide site-related information for the review, contact: Laver Thomas, EPA Community Involvement Coordinator, at 215-814-5535 or thomas.laver@epa.gov