THIRD FIVE-YEAR REVIEW REPORT FOR RICHARDSON HILL ROAD SUPERFUND SITE AND FOURTH FIVE-YEAR REVIEW REPORT FOR SIDNEY LANDFILL SUPERFUND SITE DELAWARE COUNTY, NEW YORK

Prepared by

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene
CY	cubic yard
EPA	United States Environmental Protection Agency
ESA	Eastern Stained Area
ESD	Explanation of Significant Differences
FYR	Five-Year Review
HHRA	Human Health Risk Assessment
HI	Hazard Index
HRC	Hydrogen Release Compound ®
ICs	Institutional Controls
MG/KG	milligram per kilogram
MW	monitoring well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RHRL	Richardson Hill Road Landfill
RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSE	remediation system evaluation
RW	Recovery Well
SL	Sidney Landfill
TBC	To-be-considereds
TCE	Trichloroethylene
TSCA	Toxic Substances Control Act
µg/L	micrograms per Liter
UU/UE	unlimited use/ unrestricted exposure
VC	Vinyl Chloride
VOCs	Volatile Organic Compounds

I. 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 the Richardson Hill Road Landfill (RHRL) Superfund site and the Sidney Landfill Superfund site FYRs concurrently because they are located in close proximity to each other and are hydrogeologically interrelated. The FYRs are being conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the third FYR for the RHRL site and the fourth FYR for the Sidney Landfill site. The triggering action for this statutory review is the completion date of the previous RHRL site FYR, which was July 19, 2012 (the completion date of the previous FYR for the Sidney Landfill site was June 3, 2014). These FYRs[1] have been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the sites above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The RHRL and Sidney Landfill sites FYR was led by Pamela Tames the EPA Remedial Project Manager (RPM). Participants included Ed Modica, EPA hydrogeologist, Marion Olsen, EPA human health risk assessor, Mindy Pensak, EPA ecological risk assessor, and Larisa Romanowski, EPA Community Involvement Coordinator. The potentially responsible parties (PRPs) were notified of the initiation of the FYRs. The FYR began on February 23, 2017.

The RHRL is addressed under one operable unit (OU). The Sidney Landfill is also addressed under a single OU. Both OUs are evaluated in this FYR.

Appendix A summarizes the documents, data, and information reviewed in completing this FYR.

Site Background

The RHRL and Sidney Landfill sites are located in a hilly, rural area, approximately 2 miles south of the village of Sidney Center in Delaware County, New York. The 9-acre RHRL site is located on the western side of Richardson Hill Road and on the western side of Herrick Hollow Creek, a north/south stream valley. The 74-acre Sidney Landfill is located north of the RHRL on the eastern side of Richardson Hill Road. The area surrounding the sites consists of a mixture of disturbed land, shrub land, wetland and upland forest. See Figure 1.

The RHRL site consists of two sections designated as the "North Area" and the "South Area." The South Area is composed of an 8-acre landfill (which contained a former waste oil disposal pit), South Pond, and a portion of Herrick Hollow Creek. The North Area is situated about 1,000 feet northeast of the landfill and includes two disposal trenches and a man-made surface water body called North Pond. Both sections

[1] While this document reflects FYRs for both sites, hereinafter, the combined FYRs will be referred to as a single FYR.

of the RHRL site are located on the boundary between the Susquehanna (north) and Delaware River (south) drainage divides.

The Sidney Landfill consists of several discrete disposal areas that accepted hazardous wastes and are referred to as the North Disposal Area (10.8 acres), the Southeast Disposal Area (6.4 acres), the Southwest Disposal Area (1.9 acres), the Alleged Liquid Waste Disposal Area (0.07 acres), the White Goods Disposal Area (0.2 acres), and the Can and Bottle Dump Area (0.44 acres).

Land use is mixed in the vicinity of both landfills and is zoned residential-agricultural. Approximately 40 property owners reside (part-time or permanently) within a one-mile radius of the two sites. All residences within the immediate vicinity of the sites obtain their water from private wells or springs.

History of Contamination

The Richardson Hill Landfill operated from 1964 to 1969 and the Sidney Landfill operated from 1967 to 1972. Both landfills, which were owned and operated by the late Devere Rosa, Jr., accepted municipal waste from the Town of Sidney and commercial wastes from Bendix Corporation. New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) files indicate that both landfills were poorly operated, with improper compaction of waste, poor daily covering, no supervision, and uncontrolled access. When operations at both landfills ceased, the Town of Sidney began sending its waste to a landfill in Chenango County.

Initial Response

Richardson Hill Road Landfill

Based on continuing violations at the RHRL, NYSDOH sought to close it. In 1968, the operator signed an order issued against him by NYSDOH to close the landfill; however, waste disposal did not cease until 1969. In 1985, NYSDOH initiated water supply sampling at several residences near and downgradient of the site. Based upon the results of an EPA-performed site investigation that revealed the presence of polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) in sediment and water samples collected from the waste oil pit and downgradient of the pit, the site was listed on the National Priorities List (NPL) on July 1, 1987.

After the listing of the site on the NPL, EPA entered into an Administrative Order on Consent (AOC), Index Number II CERCLA-70205, with the generator PRPs, Amphenol Corporation and Honeywell International, Inc. (formerly known as AlliedSignal, Inc.),[2] requiring them to perform a remedial investigation and feasibility study (RI/FS) to determine the nature and extent of the contamination at and emanating from the site and to identify and evaluate remedial alternatives.

Sidney Landfill

NYSDEC performed a Phase II investigation of the Sidney Landfill site from 1985 to 1987. In 1985 and 1986, NYSDOH collected groundwater samples from residential wells located near the site and identified

[2] Collectively, both parties are formerly known as Bendix Corporation.

the presence of site contaminants. These efforts lead to the listing of the site on the NPL on March 31, 1989. EPA subsequently sent out 53 information request letters and followed up with 15 letters notifying the PRPs of their liability and requesting that they initiate an RI/FS. Because no good faith offers were received, the investigation was financed by the Superfund.

Appendix B, attached, summarizes the sites' topography and geology/hydrogeology.

FIVE-YEAR REVIEW SUMMARY FORMS

SITE IDENTIFICATION		
Site Name: Richardson Hill Landfill Superfund Site		
EPA ID: NYD980507735		
Region: 2	**State:** NY	**City/County:** Towns of Sidney and Masonville/ Delaware County

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Pamela Tames
Author affiliation: EPA
Review period: 7/14/2012 - 7/14/2017
Date of site inspection: 10/18/2016
Type of review: Statutory
Review number: 3
Triggering action date: 7/19/2012
Due date *(five years after triggering action date)*: 7/19/2017

SITE IDENTIFICATION		
Site Name: Sidney Landfill Superfund Site		
EPA ID: NYD980507677		
Region: 2	**State:** NY	**City/County:** Sidney Center/ Delaware County

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Pamela Tames
Author affiliation: EPA
Review period: 6/4/2014 - 7/19/2017
Date of site inspection: 10/18/2016
Type of review: Statutory
Review number: 4
Triggering action date: 6/3/2014
Due date *(five years after triggering action date)*: 6/3/2019

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Richardson Hill Road Landfill

The PRPs performed an RI/FS from 1988-1997. The results revealed the presence of PCBs and VOCs in site soil, sediment, and overburden and shallow bedrock aquifers.

The Human Health Risk Assessment (HHRA) evaluated contact with groundwater, surface and subsurface soil, sediment, surface water, and air as potential sources of exposure. All of the carcinogenic risks calculated were within the acceptable cancer risk range. However, for non-carcinogenic risks, the results of the baseline risk assessment indicated that the ingestion of drinking water in the current-use scenario and in the future-use scenario resulted in hazard index (HI) greater than the goal of protection (HI = 1.0). These elevated values were caused primarily by VOCs. The potential child trespasser showed a noncancer HI of greater than one for dermal contact with on-site soil, ingestion of South Pond sediment, dermal contact with South Pond sediment, and dermal contact with South Pond surface water. In addition, ingestion of and dermal contact with subsurface soils by utility/maintenance workers also showed Hl values greater than 1. PCBs were the predominant contributor to all of these high HI values.

An ecological risk assessment was conducted and concluded that the presence of PCBs and inorganic compounds in environmental media, at concentrations which present a potential risk, were likely to have some adverse effect on wildlife utilizing the site and its vicinity. If the site was unremediated, contaminants might continue to be released (*e.g.*, via leachate, surface runoff, groundwater discharge) into

the environment. Effects of contaminants could be more pronounced over time as a result of increasing concentrations in the media of concern and bioaccumulation through the food chain.

Sidney Landfill

EPA conducted an RI/FS from 1991 to 1995. Bedrock groundwater samples collected during the RI indicated the presence of VOCs. Three private water supplies sampled during the RI also contained contaminants found in site groundwater; two were found to be above drinking water standards. Surface soils at the site were found to contain elevated concentrations of pesticides, PCBs, and inorganic compounds. Leachate samples identified the presence of VOCs and PCBs.

Based upon the results of the RI, a baseline HHRA was conducted to estimate the risks associated with current and future site conditions. The HHRA evaluated exposure to chemicals of potential concern in spring water and by contact with groundwater, surface and subsurface soil, and sediment and surface water from North Pond. The cancer risks from consumption of spring water and future consumption of groundwater under both scenarios exceeded the EPA's acceptable risk range of 10^{-4} (one in ten thousand) to 10^{-6} (one in a million). Trichloroethylene (TCE) in spring water was the predominant contributor to the total estimated cancer risk. For the consumption of groundwater under a future-use scenario, contributors included ingestion of arsenic, beryllium, and vinyl chloride (VC) and dermal contact with PCBs.

For non-carcinogenic hazards, the results of the baseline risk assessment indicated that the ingestion of drinking water in the current-use scenario and in the future-use scenario resulted in an HI greater than 1. The main chemicals present in spring water that contributed to the HI from exposure to spring water were VOCs, such as TCE, and manganese. Under the current scenario at that time, exposures of adolescent trespasser to surface soil through ingestion and/or dermal contact with soil and dermal contact with on-site leachate exceeded one. The main contributors to the noncancer HI were PCBs. Under the future scenario for residential consumption of groundwater the noncancer HI for the adult and children exceeded one. The main contributors were PCBs, arsenic, and manganese. In addition, ingestion of and dermal contact with subsurface soils by utility/maintenance workers also showed an HI greater than one from exposure to PCBs in subsurface soil in part of the Southeast Disposal Area.

An ecological risk assessment concluded that the presence of PCBs and inorganic compounds in environmental media, at concentrations which present a potential risk, were likely to have some adverse effect on wildlife utilizing the site and its vicinity. This assessment also concluded that if the site was left unremediated, contaminants might continue to be released (*e.g.*, via leachate, surface runoff, groundwater discharge) into the environment; effects of contaminants could be more pronounced over time as a result of increasing concentrations in the media of concern and bioaccumulation through the food chain.

Response Actions

Richardson Hill Road Landfill

In 1993, in response to a fish kill in South Pond attributable to the seep of contaminants from the oil disposal pit, EPA issued an AOC, Index Number II CERCLA-93-0214 to PRPs. The work performed included the excavation of approximately 2,200 cubic yards (cy) of contaminated sediments from South Pond (temporarily stored on-site in lined storage cells until the completion of the remedy implementation),

the installation of seep interceptor collection basins upgradient of South Pond, and a sediment trap weir system at the outlet of South Pond to prevent the downstream migration of contaminated sediments.

EPA also issued in 1993 a Unilateral Administrative Order, Index Number II CERCLA-93-0217 to the generator PRPs. Pursuant to the order, the Respondents installed whole-house water treatment systems on two private water supplies which showed site-related contamination above drinking water standards.

Based upon the results of the RI/FS, a Record of Decision (ROD) was signed in September 1997.

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. The RAOs for the remedy selected in the ROD were as follows:

- Reduce/eliminate contaminant leaching to groundwater;
- Control surface water runoff and erosion;
- Mitigate the off-site migration of contaminated groundwater;
- Restore groundwater quality to levels which meet state and federal drinking-water standards;
- Prevent human contact with contaminated soils, sediments, and groundwater; and
- Minimize exposure of fish and wildlife to contaminants in surface water, sediments, and soils.

The remedy selected in the ROD, included the following elements:

- Excavating contaminated waste material and soil exceeding NYSDEC's Soil Cleanup Objectives in the North and South Areas (other than the landfill). Clean fill would be used as backfill in the excavated areas;
- Based upon pre-design sampling of soil in the area to be capped (primarily, in the vicinity of the former waste oil disposal pit), soil with PCB concentrations which equal or exceed 500 milligrams per kilogram (mg/kg) would be excavated and sent off-site for treatment/disposal at a TSCA-compliant facility;
- Excavating and/or dredging sediments exceeding 1 mg/kg PCB from south Pond and excavating and/or dredging sediments exceeding 1 mg/kg PCB in downstream areas for approximately 2,400 ft. A monitoring plan for those areas further downstream would be developed during the design phase. All excavated/dredged sediments would be dewatered, as necessary. Any wetlands impacted by remedial activities would be fully restored;
- Installation of an outlet control/sediment trap downgradient of South Pond to minimize migration of contaminated sediment further downstream from the Main Beaver Pond;
- All excavated/dredged waste materials, soils, and sediments would be subjected to Resource Conservation and Recovery Act (RCRA) hazardous waste characteristic testing. Those waste materials, soils, and sediments that do not pass the RCRA characteristic testing would be sent off-site for treatment/disposal at a RCRA-compliant facility. Those waste materials, soils, and sediments that pass the RCRA characteristic testing and have PCB concentrations which equal or exceed 500 mg/kg would be sent off-site for treatment/disposal at a Toxic Substances Control Act (TSCA)-compliant facility. Those waste materials, soils, and sediments that pass the RCRA characteristic testing and have PCB concentrations less than 50 mg/kg would be consolidated on

the on-site landfill; those with PCB concentrations between 50-500 mg/kg would be placed in a TSCA-compliant landfill constructed adjacent to the existing landfill.

- Following the consolidation of the excavated/dredged waste materials, soil, and sediments with PCB concentrations less than 50 mg/kg onto the existing landfill, a New York State 6 NYCRR Part 360 or equivalent closure cap would be constructed;
- Construction of a fence around the landfill;
- Construction of a shallow leachate collection trench, keyed into the top of the bedrock, on the downgradient edge of the cap that will be installed on the existing landfill, and installation of vertical overburden and bedrock extraction wells in the North Area;
- Extraction of contaminated groundwater from the overburden and shallow bedrock in the South Area utilizing the downgradient interceptor trench and in the North Area utilizing extraction wells, and treatment of the extracted contaminated groundwater by air-stripping and activated carbon (or other appropriate treatment), followed by discharge to surface water.
- Taking steps to secure institutional controls (ICs) (the placement of restrictions on the installation and use of groundwater wells at the site and restrictions on the future use of the site in order to protect the integrity of the new TSCA landfill and the cap installed on the existing landfill); and
- Long-term monitoring of groundwater, surface water, fish and sediments to ensure the effectiveness of the selected remedy.

In addition, the whole-house water treatment systems that were installed at the two private residential wells would continue to be maintained by the Respondents.

Sidney Landfill

Based upon the results of the RI/FS, a ROD for the site was signed on September 28, 1995.

The RAOs for the remedy selected in the ROD were as follows:

- Minimize infiltration and the resulting contaminant leaching to groundwater;
- Control surface water runoff and erosion;
- Mitigate the off-site migration of contaminated groundwater;
- Control generation and prevent migration of subsurface landfill gas; and,
- Prevent contact with contaminants in the groundwater.

The remedy selected in the ROD called for the following:

- Excavating and relocating waste from the Can and Bottle Dump Area to the adjacent North Disposal Area;
- Constructing four independent closure caps which are consistent with the requirements of New York State 6 NYCRR Part 360 over the North Disposal Area, the White Goods Disposal and Alleged Liquid Disposal Areas (capped together), the Southeast Disposal Area, and the Southwest Disposal Area, and the construction of four individual chain-link fenced areas;

- Extracting contaminated groundwater from the bedrock aquifer in the vicinity of monitoring well MW-2S (located just east of the North Disposal Area, where floating product was detected), followed by air-stripping or other appropriate treatment, and discharge to surface water;
- Taking steps to secure ICs (the placement of restrictions on the installation and use of groundwater wells at the site and restrictions on the future use of the site in order to protect the integrity of the caps); and,
- Long-term monitoring of groundwater, surface water, and sediments.

The ROD also stated that after the construction of the caps and the extraction and treatment of the contaminated groundwater in the vicinity of monitoring well MW-2S for five years, the results of semiannual bedrock groundwater monitoring would be evaluated using trend analysis and possibly modeling of the bedrock aquifer to determine whether it appeared that the groundwater quality in the bedrock aquifer would be restored to acceptable levels through natural attenuation cost-effectively and within a reasonable time frame. Should the trend analysis and/or modeling show that groundwater quality in the bedrock aquifer would likely not be restored within a reasonable time frame by natural attenuation alone, then site-wide bedrock groundwater extraction and treatment would be implemented.

Status of Implementation

Richardson Hill Road Landfill

Upon lodging of the Consent Decree signed by the PRPs related to the performance of the remedial design and remedial action (RD/RA) for the remedy called for in the ROD by the U.S. District Court in 1999, the RD commenced. The groundwater treatment plant portion of the RD was approved in 2002. The RD for the remainder of the site was approved in 2003.

During the RD, in consideration of the possibility that the PCB-contaminated sediments in Segments 13 to 9 of Herrick Hollow Creek would still need to be removed in the future after years of monitoring, the option of removing these sediments concurrent with the removal of sediments in Segments 21 to 14 was evaluated. Based upon this evaluation, it was determined that if this approach was taken, not only would the potential benefits of the remedy be realized sooner, but cost savings associated with only one mobilization of equipment and the elimination of the long-term monitoring related to all of the contaminated sediments once they are removed, would also be realized. In addition, the Settling Defendants were willing to undertake the additional sediment removal work at that time. As a result, EPA and NYSDEC decided to remove the contaminated sediments in Segments 13 to 9 concurrently with the contaminated sediments in Segments 21 to 14 (i.e. the ¾ mile downstream portion of Herrick Hollow Creek beginning at South Pond). See Figure 3. This decision was documented in a September 2008 Explanation of Significant Differences (ESD).

The excavation and backfilling/restoration of various areas with contaminated soil outside of the landfill footprint (approximately 7,350 cy of soil) was completed in 2004. All of the PCB-contaminated sediments from South Pond, beaver ponds, and Herrick Hollow Creek down to Segment 9 (approximately 28,520 cy) were dry excavated in 2004. All of the excavated soil and sediment outside of the landfill footprint was consolidated on the landfill prior to capping. Also, the sediment trap weir system placed in the Herrick Hollow Creek in 1994 and 1999 was removed in 2004, since all contaminated sediments upstream of the sediment trap weir system were removed. Within the former waste oil pit, approximately 882 tons of soil with PCB contamination equal to or greater than 500 mg/kg were excavated and disposed/treated at an

off-site TSCA facility in 2004. Materials with PCB concentrations between 50-500 mg/kg were placed in the TSCA-cell in the northwestern part of the landfill. A redesigned multilayered 6 NYCRR Part 360 cap was installed over the landfill in 2006. Gas vents were also installed and tied to geocomposite drainage net. Fencing was installed around the site to discourage unauthorized access.

Construction of the groundwater treatment plant and the installation of four North Area recovery wells were completed in 2003. Construction of the groundwater interceptor trench located downgradient of the landfill commenced in 2004; however, the connection to the groundwater water treatment plant was not completed until fall 2006. The groundwater interceptor trench was installed to collect and treat groundwater flowing from the landfill, while also minimizing off-site migration of potentially contaminated groundwater. A recovery well (RW-05) was installed near the south east of the trench in 2009.

The ROD called for groundwater extraction via a collection trench located immediately upgradient of South Pond and recovery extraction wells in the North Area, followed by treatment. In 2004, groundwater contamination was located to the east of South Pond monitoring well cluster MW-12S, MW-12D, and MW-12DD (see Figure 2), which was originally installed as part of the Sidney Landfill site RI, was determined to be more likely attributable to the RHRL site.[3] Because of its location, the groundwater management system called for in the original RD could not address the contamination in this area. In 2006, EPA requested that the PRPs further assess the extent of contamination in the shallow bedrock east of the Richardson Hill Road Landfill groundwater interceptor trench, South Pond, and south of South Pond, define the extent of hydraulic influence of the groundwater interceptor trench, and identify appropriate trench monitoring and operational modifications. The PRPs installed several groundwater monitoring wells downgradient of the monitoring well MW-12 well cluster to assess contaminants observed at MW-12D. In addition, the PRPs installed several monitoring wells near the groundwater interceptor trench to replace previously existing wells that were destroyed or decommissioned as part of the remedial construction. Between August and September 2007, three shallow bedrock monitoring wells (RH-01, RH-02, and RH-03) were installed across the valley to assess the groundwater quality downgradient of the South Pond (Refer to Figure 2). Shortly thereafter, seven additional monitoring wells (RH-04S, RH-05S, RH-05D, RH-06S, RH-06D, RH-07S, and RH-07D) were installed further downgradient and east of the interceptor trench to assess the distribution of contamination in the overburden/bedrock monitoring well pairs. Based on contamination observed in the newly installed monitoring wells, an additional overburden/shallow bedrock monitoring well pair (RH-08S/RH-08D) was installed in January/February 2008 to evaluate contaminants downgradient of the southeastern portion of the interceptor trench. Additionally, three shallow bedrock monitoring wells (RH-09D, RH-10D, and RH-11D) were installed along an east-west transect to evaluate the shallow bedrock downgradient of the RH-01, RH-02, and RH-03 transect.

Due to contaminants observed in the downgradient wells installed in January/February 2008, in July 2008 the PRPs installed two additional monitoring wells (RH-10I and RH-12D) and a recovery well RW-05 at southeast end of the trench to capture contaminants observed beyond the southern limit of the trench. RH-10I was installed within the weathered bedrock zone adjacent to RH-10D. With the installation of the additional wells, the PRPs began a supplemental hydrogeologic investigation which culminated in a report (*Supplemental Hydrogeologic Investigation Report*, O'Brien & Gere, September 2008). The study concluded that although the extraction trench shows some influence in this area, the trench alone would not result in contaminant levels in this area reaching groundwater standards in a reasonable time frame.

[3] This finding was documented in a September 2004 ESD for Sidney Landfill site discussed below.

To address this contamination, it was concluded that a new extraction well (RW-05) needed to be installed southeast of the trench. To protect the nearby wetland from dewatering, the groundwater is extracted at a low rate and on an intermittent basis. This finding was documented in the 2008 ESD.

Sidney Landfill

On July 9, 1996, EPA issued a Unilateral Administrative Order, EPA Index No. II-CERCLA-96-0204 to the PRPs to conduct the RD/RA. The RD was initiated in 1997.

Landfill Caps

The contractor mobilized in June 1999 to implement the landfill caps remedy. During the construction period, 1,200 cy of waste was excavated from the Can and Bottle Dump Area and consolidated onto the North Disposal Area and 6 NYCRR Part 360 caps were installed over the North Disposal Area, Southeast Disposal Area, Southwest Disposal Area, Alleged Liquid Waste Disposal Area, and White Goods Disposal Area.[4] The caps consisted of a 12-inch gas venting layer, a textured 60-mil high density polyethylene geomembrane liner, a 24-inch barrier protection layer, and a six-inch topsoil layer. Each cap was enclosed by a chain-link fence. The cap construction work was completed in November 1999.

Groundwater

The ROD specified that VOCs in the groundwater were to be reduced to cleanup standards by extraction and treatment of groundwater from a "hotspot" near monitoring well MW-2S and by natural attenuation in downgradient areas. As part of a 1998 pre-design investigation, a blasted-bedrock trench was pilot-tested for the purpose of developing design criteria for a trench to be used for groundwater extraction in the "hotspot" area. The blasting created hydraulic interconnectivity between shallow and deep bedrock zones that resulted in dewatering the aquifer zone near monitoring well MW-2S. Consequently, groundwater extraction adjacent to monitoring well MW-2S was no longer possible. In addition, while groundwater contamination in wells downgradient of the former "hotspot" area was still present, aquifer testing results indicated that a hydraulic connection exists between the contaminated downgradient Sidney Landfill site monitoring wells and recovery wells located in the "North Area" portion of the adjacent RHRL site and the RHRL site extraction system is capturing the contaminants from the Sidney Landfill site. Therefore, it was concluded that the downgradient groundwater contamination at the Sidney Landfill site would be addressed utilizing the RHRL site's recovery wells. These findings and conclusions were documented in an ESD approved on September 24, 2004.

[4] The ROD called for four individual caps because the Alleged Liquid Waste Disposal Area and White Goods Disposal Area were going to be combined under one cap. However, during the design phase a determination was made that the best location for an access road would go between the two disposal areas. Therefore, these two areas were capped and fenced independently. This was documented in the design field changes of the RA Report.

Institutional Controls Summary Table

Table 1: Summary of Planned and/or Implemented Institutional Controls

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)
groundwater	Yes	Yes	Adjacent property owners to RHRL and the Sidney Landfill	Restrict installation of ground water wells and ground water use	Environment Easements and Declaration of Restrictive Covenants in the Delaware County Clerk's Office on 1/22/02
Soils	Yes	Yes	Sidney Landfill caps and RHRL cap and TSCA cell	Restrictions on the future use of the site in order to protect the integrity of the caps	Notice to Successors in Title recorded in the Delaware County Clerk's Office on 9/20/07
Vapor Intrusion	Yes	Yes	Adjacent property owners to RHRL and Sidney Landfill	Restrictions on new construction without vapor barriers/mitigation	6/1/17 letters sent to Town of Masonville Town Supervisor and Town of Sidney Code Enforcement Officer/Building Inspector

Subslab soil gas and indoor air evaluations were conducted at four of the seven nearby residences in 2008. The results indicated that no further action for the existing residences was needed. Based on a recommendation from the 2012 and 2014 FYRs, EPA determined that informational instutional controls were necessary for properties adjacent to both sites to ensure new construction required appropriate vapor barriers and/or mitigation system. This decision was formalized in a 12/28/16 ESD.

Systems Operations/Operation & Maintenance

Richardson Hill Landfill

An Operation and Maintenance (O&M) Manual for the site, dated August 2007 and modified in November 2008, includes, among other tasks, the following:

- Inspection and maintenance of the landfill cap, storm water drainage channels around the landfill, and security fencing;
- Regular and routine operation, maintenance, and monitoring activities at the groundwater treatment plant and recovery systems; and

- Regular and routine environmental chemistry monitoring including collection and analysis of weekly and quarterly treatment plant effluent and quarterly groundwater samples.

Long-term groundwater monitoring includes: 27 monitoring wells are analyzed for VOCs on a quarterly basis for VOCs, 12 monitoring wells are analyzed for natural attenuation parameters annually, six wells are analyzed for PCBs quarterly, and 10 wells are analyzed for PCBs annually. Two residential wells are sampled annually for VOCs. Three surface water locations in South Pond are also analyzed annually for PCBs.

Sidney Landfill

An O&M Manual for the site, dated December 1999, includes, among other tasks, the following:

- Each of the five landfill areas is inspected quarterly for debris, litter and/or waste.
- The landfill caps are inspected quarterly for vegetation loss due to erosion or poor grass growth.
- The landfill caps are inspected quarterly for settlement, ponding, and animal burrows;
- The access roads are inspected quarterly for rutting, tree blockage, and settlement;
- The site access gate and the five landfill area security fences are inspected quarterly for operational locks and vandalism;
- The culverts, drainage ditches, and level spreaders are inspected quarterly for sediment buildup or erosion; and,
- The groundwater monitoring wells are inspected quarterly for operational locks, damage, and vandalism.

The 20 monitoring wells are sampled and analyzed for VOCs, three wells are sampled for PCBs and vapor emanating from the thirteen gas vents are measured in the field all on a quarterly basis. In addition, six wells are sampled for routine 6 NYCRR Part 360 parameters.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

III. PROGRESS SINCE THE LAST REVIEW

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

Table 2: **Protectiveness Determinations/Statements from 2012 RHRL and 2014 Sidney Landfill Five-Year Reviews**

Site	Protectiveness Determination	Protectiveness Statement
RHRL	Short-term Protective	The implemented actions at the site protect human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the site to be protective in the long term, additional capture assessment of the groundwater remedy for the eastern portion of the site needs to be performed, the surface water/sediment monitoring program requires modification to ensure detection limits are appropriately sensitive, and ICs related to evaluating the vapor intrusion pathway for new construction overlying the groundwater contaminant plume are needed.
Sidney LF	Short-term Protective	The implemented remedy protects human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the site to be defined as protective in the long term, EPA will need to determine that the contaminated groundwater at the Sidney Landfill is being completely captured; a supplemental water-level data collection effort needs to be implemented in order to provide the data for this determination.

Table 3: **Status of Recommendations from RHRL 2012 and Sidney Landfill 2014 Five-Year Reviews**

Site	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)[5]
RHRL	Inadequate data to perform a capture zone analysis.	A full capture analysis cannot be performed due to insufficient data. Additional monitoring wells downgradient and east of the trench is necessary. After additional monitoring, additional recovery well may need to be installed.	Under Discussion	Additional monitoring wells have not been installed downgradient or east of the trench, therefore this issue has not been addressed and will be included in this FYR..	Click here to enter a date
RHRL	Inadequate surface water and sediment monitoring program	Modify surface water and sediment monitoring program to be more extensive and modify surface water detection limits.	Completed	Additional sediment sampling was performed by the PRPs in 2015 and additional surface water sampling was performed by EPA in 2016.	Sediment: 12/1/2015 Surface Water: 11/20/2016

[5] Planned completion dates for uncompleted actions and actual completion dates for completed actions.

RHRL	No ICs in place to ensure vapor intrusion is investigated if properties overlying the plume are redeveloped	Implement ICs	Completed	A 12/28/16 ESD documented EPA's determination to incorporate into the remedy informational ICs. Letters sent to local building departments	6/1/17
Sidney LF	The Richardson Hill Road Landfill site North Area extraction wells may not be providing complete capture of the contaminated groundwater migrating from the Sidney Landfill.	A supplemental water-level data collection effort is needed to determine the groundwater flow pathways and the completeness of the capture of the groundwater contamination emanating from the Sidney Landfill.	Under Discussion	Additional monitoring of the groundwater has not proven full capture of the plume. More monitoring wells are necessary.	9/30/2015

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On November 14, 2016, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the RHRL Superfund site. The announcement can be found at the following web address:

https://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf.

In addition to this notification, a notice of the commencement of the FYR was sent to local public officials. The notice was provided to the Town and Village of Sidney and the Town of Masonville by email on May 23, 2017, with a request that the notice be posted in the respective municipal offices and on the town webpages. The purpose of the public notice was to inform the community that the EPA would be conducting a FYR to ensure that the remedies implemented at the RHRL and Sidney Landfill sites remain protective of public health and are functioning as designed. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the sites.

Once the FYR is completed, the results will be made available at the site information repositories. The information repositories are maintained at the Sidney Memorial Public Library, 8 River Street, Sidney, New York and the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York. In addition, efforts will be made to reach out to local public officials to inform them of the results. No interviews were conducted during this FYR.

Data Review

Richardson Hill Road Landfill

Groundwater, sediment, fish tissue, and surface water data have been reviewed for the preparation of this report and are discussed below. See Figure 2 for locations of monitoring wells, South Pond and, Herrick Hollow Creek fish sample locations.

Groundwater

Table 4 summarizes the RHRL site-wide groundwater sampling results for TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), and VC from 2012 to 2016. Table 5 summarizes PCB concentrations in groundwater found to exceed the standard during the review period. Effluent data from the groundwater treatment system have been collected since the North Area recovery wells began operation in 2003. The effluent data have met the site-specific discharge limits set by NYSDEC.

Interceptor Trench Monitoring Wells

VOCs have been observed in the series of wells located along Richardson Hill Road between the interceptor trench and South Pond since the start of operation. For the review period, VOC concentrations were generally consistent in each monitoring well, with concentrations fluctuating about an average value, and showing little or no discernable trends.

Average TCE concentrations ranged from a minimum of 2.1 micrograms per liter (µg/L) in monitoring well TMW-6 to a maximum of 142 µg/L in monitoring wells TMW-3. Monitoring wells RH-06D/S and RH-5D showed relatively high average TCE concentrations of 72 to 84 µg/L compared to other wells near the trench. Average cis-1,2-DCE concentrations ranged from a minimum of 1 µg/L in monitoring well TMW-6 to a maximum of 538 µg/L in monitoring well RH-06S. Monitoring wells TMW-3 and RH-08D showed relatively high average cis-1,2-DCE concentrations of 278 µg/L and 122 µg/L, respectively. VC was also reported in several wells, with the higher average concentrations observed in monitoring well RH-06S at 41.3 µg/L, monitoring well TMW-4 at 39 µg/L, and monitoring well RH-5D at 35 µg/L.

It should be noted that while many of the VOC concentrations observed for this review period continue to be above their standards, concentrations have decreased as compared to the previous review period. For example, for monitoring well TMW-03, average concentrations of TCE, cis-1,2-DCE, and VC for the previous review period were 238 µg/L, 871 µg/L, and 97 µg/L, respectively; but have decreased to 142 µg/L, 278 µg/L, and 18 µg/L, respectively for the current review period. Similarly, for monitoring well RH-06S, average concentrations of TCE, cis-1,2-DCE, and VC for the previous review period were 154 µg/L, 1,899 µg/L, and 119 µg/L, respectively; but have decreased to 84 µg/L, 538 µg/L, and 46 µg/L, respectively for the present review period. However, inward gradients are not consistently maintained along the trench and full capture is not provided, particularly in areas next to piezometer pairs SCC-01/TMW-03, SCC-03/TMW-05, SCC-04/TMW-06 and TMW-07/TMW-08. The lack of complete capture would, likely, account for the persistence of VOCs observed in monitoring wells adjacent to and downgradient of the trench.

The interceptor trench monitoring wells, TMW-03, TMW-04, the well pair RH-06S/D, and to a lesser extent, monitoring well RH-08D, have shown periodic detections of PCBs at levels above groundwater standards (ranging from 0.092 µg/L to an estimated 1.44 µg/L). This downgradient groundwater appears

beyond the capture of the trench and will ultimately discharge to South Pond. This may be the cause of the observed PCB concentrations in the sediment along the western edge of the South Pond.

Downgradient Monitoring Wells along Herrick Creek

As part of a supplemental hydrogeologic investigation of the RHRL site conducted in 2008, a series of monitoring wells were installed just south of the interceptor trench and centered about Herrick Hollow Creek to monitor downgradient groundwater in the shallow bedrock.

Water-quality results indicate that the highest VOC concentrations were observed in the well transect closest to the southern end of the trench, particularly in the well screened closest to the Creek, monitoring well RH-02, where the average TCE concentration for this review period is 37 µg/L and that of cis-1,2-DCE is 215 µg/L. VOCs were also reported in the wells on either side of monitoring well RH-02, but at lower concentrations, 8.8 µg/L of TCE and 45 µg/L of cis-1,2-DEC in well RH-01, and 15 µg/L of TCE and 112 µg/L of cis-1,2-DCE in well RH-03.

In the well transect located approximately 1,200 feet downgradient from the first transect (southward), VOC concentrations have been consistently reported as "not detected," except for monitoring well RH-10I, where the average TCE concentration for the period is 1.4 µg/L and that of cis-1,2-DCE is 3.2 µg/L. In monitoring well RH-12D, located approximately 4,200 feet downgradient of the first transect, average the TCE concentration for the period is 1.4 µg/L and that of cis-1,2-DCE is 2.8 µg/L.

VOC concentrations in these "downgradient" monitoring wells were generally consistent in each well over the review period, with concentrations fluctuating about an average value and showing slight downward trends or no discernable trends. VOC concentrations that were observed above standards are limited to wells in the first transect area nearest the trench. Further downgradient, VOCs were not detected or were detected at levels below standards.

The VOC concentrations observed in "downgradient" monitoring wells for this review period also represent decreased concentrations compared to the previous review period. For example, for monitoring well RH-02, average concentrations of TCE and cis-1,2-DCE for the previous review period were 53 µg/L and 416 µg/L respectively; but have decreased to 36 µg/L and 211 µg/L, respectively for the present review period.

Seventeen wells are also analyzed for PCBs. PCBs are typically found in just three of these wells, RH-06S, RH-06D and RH-08D, where the concentrations typically hover around the NYSDEC Class GA groundwater standard of 0.09 µg/L for PCBs. The highest level, 1.44J µg/L, found in RH-06S in August 2015, has since dropped to 0.8 µg/L in November 2016. PCBs not been found in wells TMW-03 and TMW-04 since 2014.

Residential Wells

Residential drinking water wells are sampled on an annual basis. The wells are located approximately a mile downgradient of South Pond, adjacent to Herricks Creek. Sampling results for the wells in the monitoring plan can be found in Table 6 (designated as H-well and D-well). Based on the data, there is no exposure to site contaminants in the private drinking wells above the state and federal drinking water standards.

Sediment and Surface Water Samples

Surface water/sediment samples are collected annually at three locations along the western slope of South Pond. PCBs have not been detected in the surface water above the detection limit of 0.05 µg/L. The results from the sediment sampling did, however, show low-level PCB contamination, but below the cleanup level of 1 mg/kg (see Table 7). Potentially, the restored sediments were affected by PCB-contaminated groundwater situated between the groundwater trench and South Pond that was present prior to the initiation of trench operations.

Fish Samples

Fish, surface water, and sediment samples were collected and analyzed for PCBs in South Pond and at five locations along Herrick Hollow Creek in 2012 by NYSDEC and in 2016 by EPA. The fish tissue sampling results are shown in Table 8 and the locations in Figure 3. At each location, creek chub were collected; in addition, pumpkin seed were collected from location HC-1 and brook trout were collected from location HC-6. Fish tissue data collected following the sediment remediation in 2008 show significant decreases in concentrations, with an overall continued decrease in tissue concentration in 2012. Sample data from 2016 show higher concentrations, in both the creek chub and pumpkin seed from the South Pond (in comparison to 2012) and slightly higher concentrations of PCBs in fish tissue from sample location HC-3, while data from location HC-2, HC-4 and HC-5 remain relatively consistent. At the furthest downstream location, HC-6, creek chub concentrations have decreased, while brook trout concentrations have increased.

Sidney Landfill

Quarterly groundwater sampling was initiated in November 2001. Table 9 summarizes the Sidney Landfill site-wide groundwater sampling results for TCE, cis-1,2-DCE, and VC for the review period (refer to Figure 4 for locations of the monitoring wells). Table 10 summarizes PCB concentrations in groundwater found to exceed the standard for this review period. The following summarizes these sample results:

Disposal Area Monitoring Wells

During the review period, VOC concentrations were generally consistent in each monitoring well, with concentrations fluctuating about an average value, and showing little or no discernable trends. For monitoring wells in the former "hotspot" area (MW-2S, MW-2D, MW-14S, MW-15SR, MW-15D, and MW-16S), groundwater quality data show TCE ranging from not detected to 230 µg/L, cis-1,2-DCE ranging from not detected to 14 µg/L, and VC ranging from not detected to less than 1 µg/L. The lowest average TCE concentrations were found in monitoring well MW-2D at 2.2 µg/L and the highest were found in monitoring well MW-15R at 62 µg/L. VOC concentrations in the former "hotspot" area continue to be equal to or less than concentrations found at the remainder of the site.

Beyond the former "hotspot" area and adjacent to Richardson Hill Road, the greatest concentrations of VOCs for the Sidney Landfill were observed in monitoring wells located downgradient of the North Disposal Area. In monitoring well MW-6S, the average concentrations of TCE, cis-1,2-DCE, and VC, were 98 µg/L, 94 µg/L and 25 µg/L, respectively. Similarly, in monitoring well MW 6D, average concentrations of 301 µg/L, 302 µg/L, and 7 µg/L were found for TCE, cis-1,2-DCE and VC, respectively. The maximum concentrations of 490 µg/L of TCE and 500 µg/L of cis-1,2-DCE were reported in monitoring well MW-6D, whereas the maximum concentration of 42 µg/L of VC was reported in

monitoring well MW-6S. However, in wells located downgradient of the monitoring well MW-6 cluster, VOC concentrations were significantly lower.

The VOC levels observed for this review period are less than those found during the RI. However, the results are relatively similar to the last review period and are indicative of a stable plume. The VOC plume is approximately 2,500 feet long and 1,700 feet wide.

Quarterly groundwater PCB sampling is limited to monitoring wells MW-2S, MW-6S, and MW-16S and concentrations that exceed standards have ranged from an estimated 0.65 µg/L to 9.9 µg/L, an estimated 3.8 µg/L to 12 µg/L, and an estimated 0.34 to 1.2 µg/L, respectively.

In 2010, NYSDEC sampled a seep observed along the unnamed tributary north of North Pond, located west of the site and over 200 feet north of the monitoring well MW-7 cluster. The results showed cis-1,2-DCE concentrations of approximately 15 µg/L, which is above the regulatory standard. This suggests that part of the plume may be migrating to the north. Site piezometric data indicate that the hydraulic gradient in the northern part of the North Area recovery system (near RW-01) is directed away from Sidney Landfill and the hydraulic gradient at the southern end is directed away from the southernmost well (RW-4) to the south. The installation of additional groundwater monitoring wells is necessary to complete the capture analysis and fully understand groundwater flow in the area.

Site Inspection

The inspection of the two sites was conducted on October 18, 2016. In attendance were Ms. Tames of EPA, James Drumm and Corbin Gosier of NYSDEC, and Ronald Chiarello of O'Brien & Gere, the PRPs' consultant. The purpose of the inspection was to assess the protectiveness of the remedy. The caps appeared to be stable and the treatment system was operating. A section of the RHRL cap had recently been revegetated and appeared to be in good condition. Although inspection reports frequently report vandalized fences, the fences were in good condition on the date of the inspection.

V. TECHNICAL ASSESSMENT

QUESTION A: *Is the remedy functioning as intended by the decision documents?*

Question A Summary

Richardson Hill Road Landfill

The ROD, as modified by the 2008 and 2016 ESDs, called for, among other things, the excavation of contaminated soils and sediment, consolidation of the removed material on-site and/or disposal off-site, installation of a landfill cap, construction of an on-site TSCA disposal cell, construction of a groundwater extraction/treatment system, excavation of PCB/VOC contaminated sediments in South Pond and Herrick Hollow Creek, and ICs to restrict groundwater use, protect the integrity of the caps, and prevent exposure to vapor intrusion. All construction activities have been completed. The excavation and containment of the contaminated soils and sediments have mitigated the human health and ecological risks posed by these materials. Additional monitoring wells are needed to show full capture of the plume by the trench and recovery wells.

Landfill

Approximately 7,350 cy of contaminated waste materials and soils were excavated from the North and South Areas of the site and from the waste oil pit on the landfill. Contaminated materials were disposed of according to RCRA/TSCA standards. Excavated materials that exceeded 500 mg/kg of PCB were disposed of at a TSCA-compliant site. Materials with PCB concentrations between 50-500 mg/kg were placed in a TSCA-cell constructed at the northwestern part of the landfill. The TSCA-cell was constructed with a double composite liner and the cell area is demarked in as-built drawings. A multilayered 6NYCRR Part 360 cap has been successfully installed over the landfill and is stabilized. Gas vents installed and tied to geo-composite drainage net are functioning. Institutional controls protect the TSCA landfill by restricting future use. Restrictions were also placed on installation and use of groundwater wells at the site. A fence was installed around the landfill to discourage unauthorized access and is in good repair.

Sediment Excavation & Restoration

Approximately 28,520 cy of sediments contaminated with PCBs greater than 1 mg/kg were excavated and dredged from South Pond and Herricks Hollow Creek. Confirmatory sampling indicated that the extent of soil and sediment removal was adequate in eliminating threat from contaminated materials to human health and environment. Wetland and floodplain areas disturbed by excavation of sediment (8.6 acres) were restored.

Sediment/surface water samples are taken annually at three locations along the west flank of South Pond. The most recent results from surface water sampling show PCBs below the detection limit (0.05 µg/L). Results from sediment sampling show levels of PCB to be below the cleanup criteria of 1 mg/kg, although low-level PCB contamination was found in the sediment. It is likely that the restored sediments may have been slightly affected by PCB-contaminated groundwater that was already in place between the trench and South Pond subsequent to the initiation of trench operations. Groundwater in this area discharges to the Pond at a very low velocity due to depressed hydraulic gradients caused by trench operations. Nevertheless, sampling results reflect major improvement over pre-remedial conditions and show that water quality is not declining.

Groundwater Extraction Systems

The groundwater capture/treatment system consists of an interceptor trench located adjacent to the landfill, four recovery wells located in the North Area, a singular recovery well (RW-05) installed near the south end of the trench, and a water treatment plant that serves all of the recovery wells and the trench (North Area Recovery Wells are discussed in more detail under “Sidney Landfill”).

Records show that the sump pumps and conveyance lines are treated and maintained so that the intake rates are up to design specifications. The hydraulic heads measured in piezometers within and adjacent to the interceptor trench show that the trench generally exerts hydraulic control by depressing the water table levels in the formation outside the trench. However, inward gradients are not consistently maintained along the trench and full capture is not provided, particularly in areas next to piezometer pairs SCC-01/TMW-03, SCC-03/TMW-05, SCC-04/TMW-06 and TMW-07/TMW-08. The lack of complete capture would, likely, account for the persistence of VOCs observed in monitoring wells adjacent to and downgradient of the trench. Water quality data for this review period show that TCE and cis-1,2-DCE are frequently found in wells adjacent to South Pond and downgradient of the southern end of the trench, many at levels above groundwater quality standards, although levels have decreased relative to 2008.

Extraction well RW-05 was designed to address VOC groundwater contamination observed at monitoring wells RH-03 and RH-04 near the south end of the trench. Based on hydraulic and water-quality data, it appears that the well is providing capture of contaminated groundwater in this area. However, because contamination has been observed in monitoring wells further south of RH-03 and RH-04, it is unclear whether or not contamination is migrating around the southern end of the extraction system.

The operational assessment of the treatment facility indicates that the intake rates were well within design capacity of 100 gallons per minute. The processing assembly has successfully treated site-related contaminants to NYSDEC discharge limits.

An institutional control in the form of a Notice to Successors-in-Title accompanies the deed and alerts prospective buyers of the site property of the fact that there are restrictions on the future use of the property and explains those restrictions. This notice in combination with other site control measures, such as signage and fencing, provides adequate site use restrictions and results in an exposure pathway that is not complete. Potential exposures to methane gas have also been addressed through the establishment of a passive gas system on the landfill.

Environmental Restriction Easements and Declaration of Restrictive Covenants that run with the land were entered into between the property owners adjacent to the site and the PRPs. These easements provide for restrictions on groundwater consumption at the two properties where treatment systems were installed in 1993 pursuant to the RHRL site Administrative Order on Consent to address groundwater contamination related to the RHRL site. The residence located on the western side of the Richardson Hill Road was determined to be structurally unstable and was demolished by the owner in 2008. This is the property where the North Area extraction wells and the groundwater treatment plant are located. The water treatment system at the other residence on the eastern side of Richardson Hill Road still exists.

EPA determined that to ensure the protectiveness of the remedy, ICs were required to restrict new construction in this area unless there is an evaluation of the vapor intrusion pathway and appropriate mitigation, if necessary, is implemented. Letters were sent to the Town of Masonville Town Supervisor and Town of Sidney Code Enforcement Officer/Building Inspector notifying them of the ICs on the site and requesting that EPA be contacted if a new structure is to be constructed on or in the vicinity of the landfill. EPA will periodically send such letters as reminders.

Sidney Landfill

The ROD, as modified by a 2004 ESD, called for excavation and relocation of waste from the Can and Bottle Dump Area, construction of four separate engineered caps and enclosure with chain linked fences, extraction of contaminated groundwater from the bedrock aquifer in the vicinity of well MW-2S utilizing the RHLF North Area recovery well battery, followed by appropriate treatment and discharge to surface water, and natural attenuation of VOCs in groundwater in downgradient areas, ICs to restrict groundwater use, protect the integrity of the caps, and prevent exposure to vapor intrusion, and long-term monitoring to evaluate the quality of groundwater, surface water, and sediments. Additional monitoring wells are needed to show full capture of the plume by the recovery wells.

Landfill Caps

Approximately 1,200 cy of waste material was excavated from Can & Bottle Dump Area and relocated to the adjacent North Disposal Area. Caps were constructed on the four disposal areas in accord with the New York State 6 NYCRR Part 360 design standard and included a gas vent layer and geo-membrane liner. Based on the most recent maintenance records, the caps are stabilized and in good repair with no settlement. Gas vents are functioning. Culverts and drainage ditches are clear of sediment buildup. Monitoring wells are in good condition. Fences are generally in good repair, although they undergo periodic vandalism.

North Area Recovery Wells

The North Area Recovery Wells are part of the RHRL site. However, the hydraulic control generated by the wellfield affects the contaminated groundwater beneath the Sidney Landfill disposal areas east of the wellfield. An evaluation of extraction well performance in the North Area (recovery wells RW-1, RW-2, RW-3, and RW-4) indicated that the wells continue to generate sufficient drawdown to meet the performance objective of having at least one foot of drawdown in North Area monitoring wells compared to non-pumping conditions. While the North Area recovery wells are functioning as designed for the RHRL site, based on the assessment of the Optimization Evaluation of the RHRL and Sidney Landfill sites (Tetra Tech GEO, April 2012), it was concluded that the extraction wells may not provide complete capture of the contaminated groundwater migrating from the western portion of the Sidney Landfill. The Evaluation observed that the Sidney Landfill is situated on a flow divide where contaminated groundwater can migrate in diverging directions away from the landfill. Site piezometric data indicate that the hydraulic gradient in the northern part of the North Area recovery system (near RW-01) is directed away from Sidney Landfill and the hydraulic gradient at the southern end is directed away from the southernmost well (RW-4) to the south. Furthermore, NYSDEC had identified seeps at the bottom of the hill to the north near monitoring well MW-7 that are impacted with VOC contamination above standards, suggesting that a portion of the plume may be migrating to the north. Persistent VOC contamination in the groundwater beyond the capture area indicates incomplete capture and that a more detailed characterization of the aquifer is needed to address the issue. Specifically, supplemental water-level data collection is needed to determine more definitively the groundwater flow pathways and the completeness of the capture of the groundwater contamination emanating from the Sidney. The installation of additional monitoring wells is necessary to complete this action.

Groundwater quality at Sidney Landfill is evaluated on a quarterly basis for VOCs, PCBs, and natural attenuation parameters. Over the review period, VOCs were detected at relatively low to moderate levels and appear to be stable and consistent with historic patterns. The VOC concentrations fluctuate about an average value, but have shown no discernable trends. In the former “hot spot” area, the concentrations of TCE were highest in monitoring well MW-15SR, where concentrations fluctuate about a 72 µg/L average for this review period. TCE concentrations in other wells in this area show TCE levels about an order of magnitude lower than that of monitoring well MW-15SR. The highest concentrations of TCE in the landfill have been detected in monitoring well MW-6D, located near the west boundary of the landfill, where TCE concentrations are reported to fluctuate about a 300 µg/L average. PCBs are analyzed quarterly in three wells. The highest levels of PCBs in 2016 were 9.9 µg/L in MW-02S, 10.0 µg/L in MW-06S and 1.2 µg/L in MW-16S. The 2016 reported levels in MW-06S and MW-16S are similar to previous reports but the level reported for MW-02S was higher than previously reported and may have been affected by high turbidity and below normal groundwater elevations. Monitored natural attenuation (MNA) parameters are monitored biennually in the two wells, MW-6S and MW-8D, which have the requisite geo-chemistry to support bio-degradation of VOCs. The calculated Biodegradation Weighting Factor was over the desired level of 15 for both MW-06S and MW-16S at 21 and 18, respectively.

QUESTION B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Question B Summary

Richardson Hill Landfill

There have been no changes in the physical conditions of the site over the past five years that would change the protectiveness of the remedy. Soil and groundwater use at the site are not expected to change during the next five years, the period of time considered in this review. The risk assessment considered the mixed land use in the vicinity of the site that is zoned residential-agricultural and is not expected to change in the next five years. Direct contact exposures at the site were interrupted through the installation of the cap. The capping of the landfill interrupts potential ingestion and direct contact with contaminated soil. The fence around the site limits potential direct contact by trespassers. Subslab soil gas and indoor air evaluations were conducted at four of the seven nearby residences in 2008. Based upon the results, it was concluded that no further action was needed. An IC was established to restrict potential future building in the area unless there is an evaluation of the vapor intrusion pathway and appropriate mitigation, if necessary, is implemented.

Sidney Landfill

The landfill caps portion of the remedy has significantly reduced the risk to potential receptors (adolescent trespasser and on-site utility workers) from direct contact with the contaminated soils and has reduced the sources of groundwater contamination. Soil and groundwater use at the site have not changed during the past five years and are not expected to change during the next five years. The land use considerations and potential exposure pathways considered in the HHRA are not expected to change over the next five years.

The receptors and exposure pathways considered in the HHRA remain valid. The remedial actions to address the soil contamination with a cap provide a barrier to exposure to site contaminants through direct contact. Inspection reports indicate that the fences are vandalized (cut) on a regular basis, coinciding with hunting season. As a result, the fences require repair on a regular basis. Monitoring and repair of the fences will continue.

Groundwater use has not changed during the past five years and is not expected to change during the next five years. The land-use considerations (residential) and potential exposure pathways considered in the baseline HHRA are still valid. At the time of the ROD, Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act were selected as the groundwater Applicable or Relevant and Appropriate Requirements. The MCLs at that time are consistent with the current MCLs and remain protective.

In addition, the Environmental Easements and the Notice to Successors in Title restrict drilling groundwater wells.

Previous FYRs summarized evaluations of the vapor intrusion pathway. In 2008, sampling was conducted at two residences located adjacent to the site and the concentrations were found to be below the Vapor Intrusion Screening Levels and further sampling was not recommended.

As was noted above, based upon the results of subslab soil gas and indoor air evaluations conducted at four nearby residences in 2008 led to the conclusion that no further action was needed. An IC was established to restrict potential future building in the area unless there is an evaluation of the vapor intrusion pathway and appropriate mitigation, if necessary, is implemented.

Common Conclusions

Changes in Standards and To-Be-Considereds. There have been no changes to the groundwater drinking water standards and TBCs for chemicals at either sites.

Changes in Toxicity Values. There have been no changes in toxicity values for contaminants at both sites since the last FYR. Currently, the Integrated Risk Information System is updating the toxicity value for PCBs for noncancer, inorganic arsenic, and manganese. Any changes in the toxicity values will be addressed in the next FYR.

Changes in Risk Assessment Methodologies. In 2014, the standard default exposure assumptions used in risk assessments were updated. However, these changes do not alter the original risk assessment conclusions and the protectiveness of the remedies at both sites.

Changes in Exposure Pathways. There are no changes in the exposure pathways from the original risk assessments.

QUESTION C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

Based on the evaluation of the potential human exposures at the two sites, there is no new information that could call into question the protectiveness of the remedies.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
NA

Issues and Recommendations Identified in the Five-Year Review:

Site: Sidney Landfill (OU1)	**Issue Category: Remedy Performance**
	Issue: The RHRL site North Area extraction wells may not be providing complete capture of the contaminated groundwater migrating from the Sidney Landfill site.
	Recommendation: A Supplemental water-level data collection effort is needed to determine the groundwater flow pathways and the completeness of the capture of

	the groundwater contamination emanating from the Sidney Landfill. The installation of additional monitoring wells is necessary to complete this action.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	6/30/2018

Site: RHRL (OU1)	**Issue Category: Remedy Performance**			
	Issue: Inadequate data to perform a capture zone analysis.			
	Recommendation: A Supplemental water-level data collection effort is needed to determine the groundwater flow pathways. The installation of additional monitoring wells downgradient and east of the trench is necessary to complete this action. Following an analysis of the new data, the installation of an additional recovery well may be necessary.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	6/30/2018

VII. PROTECTIVNESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: RHRL	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The implemented actions at the **RHRL** site protect human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the RHRL site to be protective in the long term, additional capture assessment of the groundwater remedy for the eastern portion of the site needs to be performed.		

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date

Protectiveness Statement:
The implemented actions at the **RHRL** site protect human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the RHRL site to be protective in the long term, additional capture assessment of the groundwater remedy for the eastern portion of the site needs to be performed.

Protectiveness Statement(s)		
Operable Unit: Sidney Landfill	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date

Protectiveness Statement:

The implemented actions at the **Sidney Landfill** site protect human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the Sidney Landfill site to be protective in the long term, installation of additional monitoring wells and a supplemental water-level data collection effort need to be implemented in order to provide the data to assess plume capture.

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date

Protectiveness Statement: The implemented actions at the **Sidney Landfill** site protect human health and the environment in the short term because the wastes have been consolidated and capped and the groundwater is not impacting residences downgradient of the site. In order for the Sidney Landfill site to be protective in the long term, installation of additional monitoring wells and a supplemental water-level data collection effort need to be implemented in order to provide the data to assess plume capture.

VIII. NEXT REVIEW

The next FYR report for the Richardson Hill Landfill and Sidney Landfill Superfund Sites is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Documents, Data, and Information Reviewed in Completing the Five-Year-Review	
Document Title, Author	**Submittal Date**
Record of Decision, Sidney Landfill, EPA	1995
Record of Decision, RHRL, EPA	1997
Explanation of Significant Differences, Sidney Landfill, EPA	2004
Explanation of Significant Differences, RHRL, EPA	2008
Optimization Review, Sidney and RHRLs, ORD, EPA	2012
RHRL Site 2012 Annual Operations & Maintenance Summary Report, OBG	2012
RHRL Site 2013 Annual Operations & Maintenance Summary Report, OBG	2013
2012 Contaminant Trackdown Study Field Investigation Report, NYSDEC	2014
Sidney Landfill Site Inspection & Monitoring Program 2014 Annual Report, OBG	2014
RHRL Site 2014 Annual Operations & Maintenance Summary Report, OBG	2014
Sidney Landfill Site Inspection & Monitoring Program 2015 Annual Report, OBG	2015
RHRL Site 2015 Annual Operations & Maintenance Summary Report, OBG	2015
Localized Sediment Evaluation Report, RHRL, OBG;	2016
Sidney Landfill Site Inspection & Monitoring Program 2016 Annual Report, OBG	2016
RHRL Site 2016 Annual Operations & Maintenance Summary Report, OBG	2016
Explanation of Significant Differences, RHRL, EPA	2017
2016 Fish, Sediment and Surface Water Sampling Report for RHRL, EPA	2017
EPA guidance for conducting FYRs and other guidance and regulations to determine if any new Applicable or Relevant and Appropriate Requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD	

APPENDIX B –SITES' GEOLOGY/HYDROGEOLOGY

Richardson Hill Road Landfill Site

The surficial geology of the region is dominated by Pleistocene-age glacial and recent alluvial sediments. The subsurface geology of the site is characterized by unconsolidated glacial deposits overlying bedrock. The unconsolidated deposits consist of soil mixed with municipal refuse in the landfill underlain by a dense reddish brown to gray glacial till. Bedrock beneath the till consists of interbedded layers of shale, siltstone, and sandstone. The depth to bedrock varies from 18 feet to 39 feet and depth to bedrock is less in the center of the valley along Richardson Hill Road. Bedrock elevations at the site decrease from west to east toward South Pond.

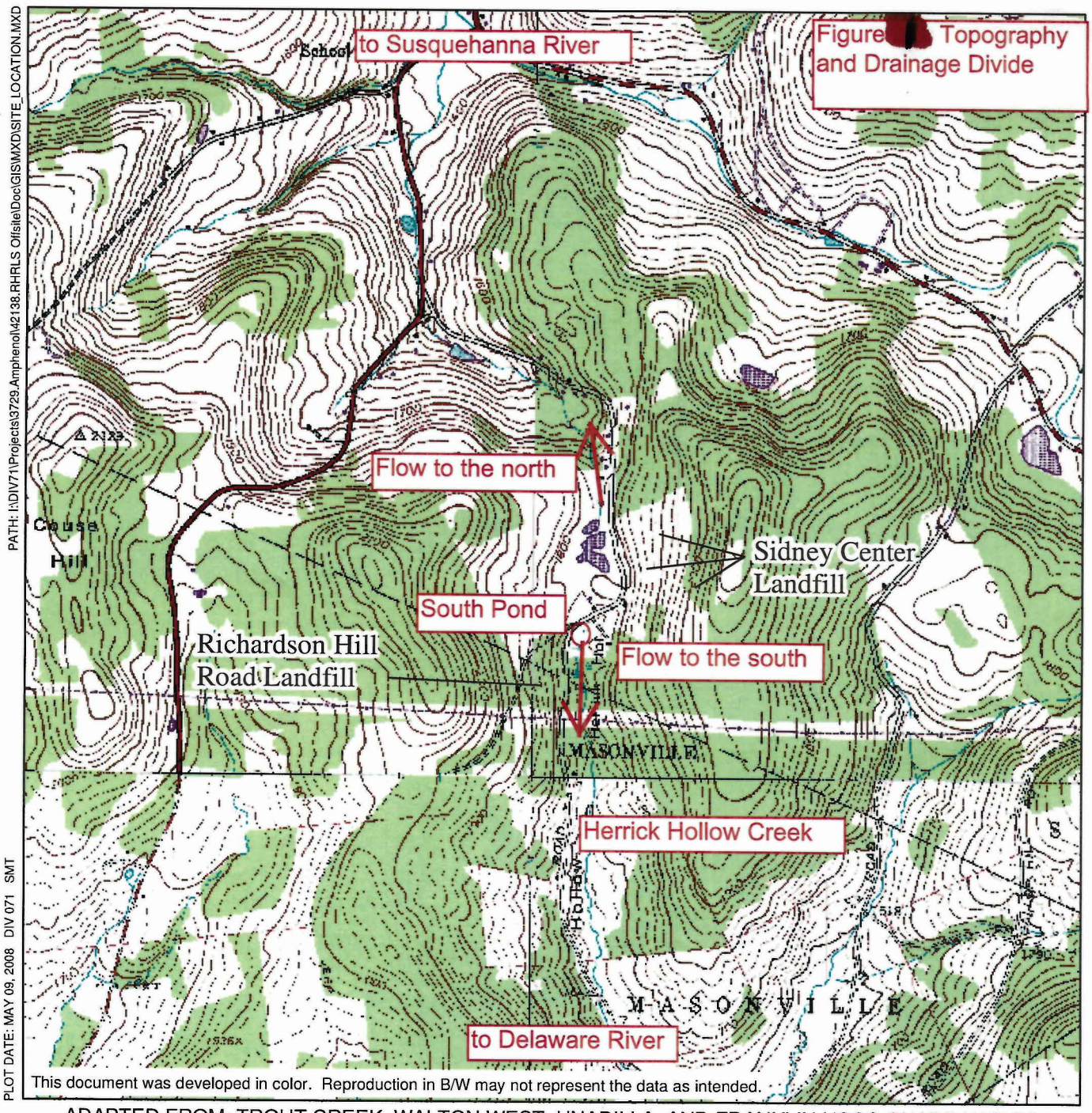
Groundwater exists at the site in the overburden, shallow bedrock (18 to 70 feet), and the deeper bedrock (greater than 70 feet). The overburden and shallow bedrock flow regimes appear to be hydraulically connected and isolated from the deeper bedrock groundwater flow system. Groundwater in the overburden and shallow bedrock flows toward the center of the valley, east toward South Pond and generally follows the site topography. Groundwater in the North Area flow to the north toward the North Pond.

Sidney Landfill

The geology of the bedrock beneath the site is predominately non-marine, massive, gray sandstones interbedded with siltstone and varying-colored shales. The bedrock at the site consists of alternating sequences of sandstone and siltstone/shale which have a shallow dip of approximately 2 to 3 degrees to the east. The dominant fracture orientation within the exposed bedrock strikes approximately northeast to southwest. A secondary fracture set strikes approximately east to west.

The unconsolidated deposits of the site, glacial till, are generally unsaturated across the site. Saturation of the glacial till deposits only occurs at the base of Richardson Hill, along the valley floor. Typically, a downward vertical hydraulic gradient exists between the unconsolidated deposits and the underlying bedrock. The majority of the groundwater flow at the site is within the fractured bedrock underlying the unsaturated unconsolidated deposits. The groundwater flow within the bedrock occurs primarily along bedding planes and fractures, with minimal flow within the primary porosity of the bedrock.

APPENDIX C –FIGURES



ADAPTED FROM: TROUT CREEK, WALTON WEST, UNADILLA, AND FRANKLIN USGS QUADRANGLES

QUADRANGLE LOCATION

RICHARDSON HILL ROAD LANDFILL SITE
SIDNEY, NEW YORK

SITE LOCATION

0 1,000 2,000 4,000 6,000 8,000

Feet

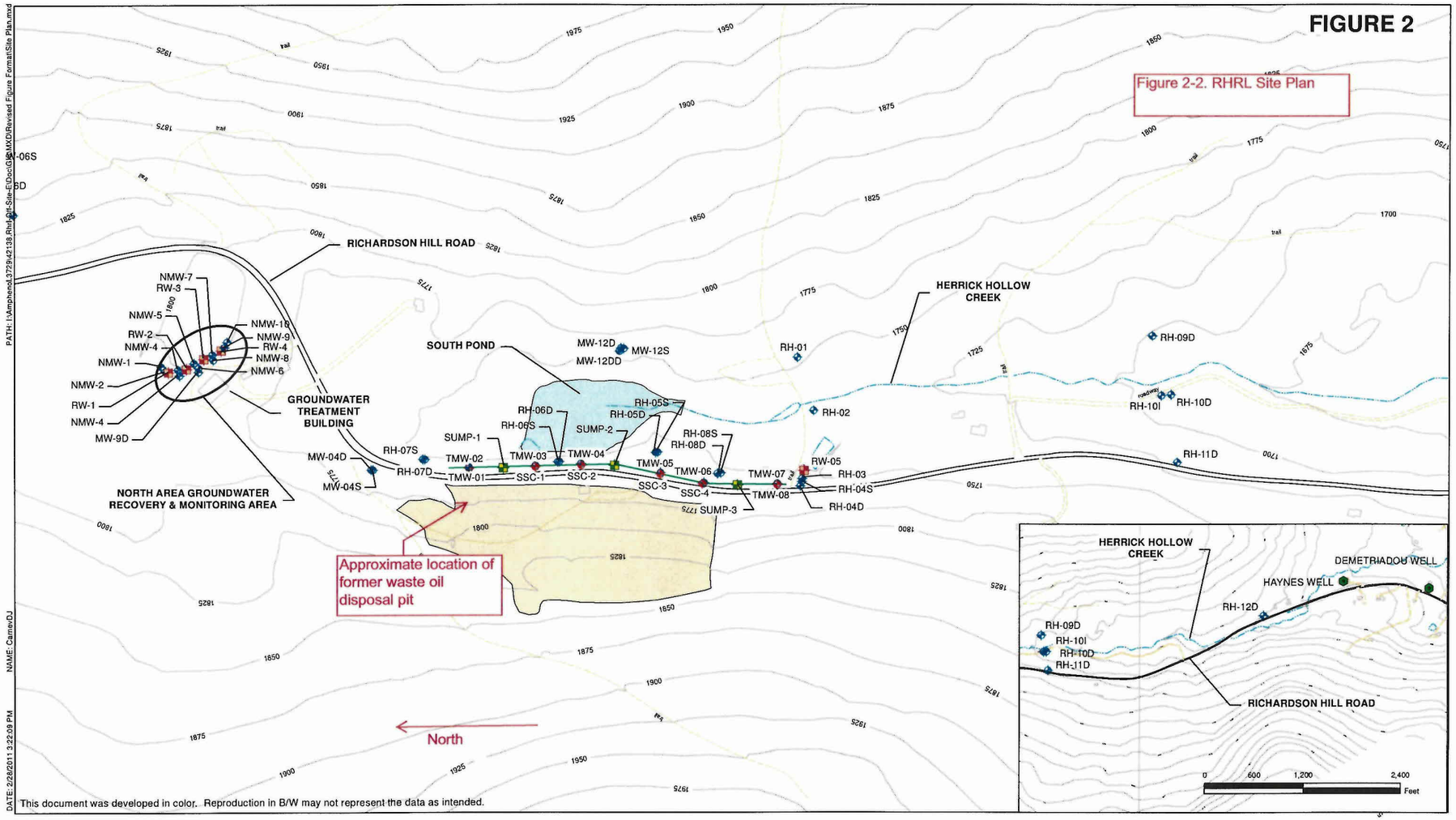
O'BRIEN & GERE

FILE NO. 3729/42138
AUGUST 2008

1:24,000

FIGURE 2

Figure 2-2. RHRL Site Plan



This document was developed in color. Reproduction in B/W may not represent the data as intended.

PATH: I:\Amphenol\3729\42138.RhnA-Qtr-Site-EIDocs\GIS\MXD\Revised Figure Format\Site Plan.mxd
NAME: CamevDJ
DATE: 2/28/2011 3:22:09 PM

LEGEND

- DUAL-ZONE TRENCH
- MONITORING WELL
- HOMEOWNER WELL
- MONITORING WELL
- RECOVERY WELL
- SUMP
- GROUNDWATER RECOVERY TRENCH
- CAPPED LANDFILL

RICHARDSON HILL ROAD LANDFILL SITE
SIDNEY CENTER, NEW YORK

0 150 300 600 900 1,200
Feet

SITE PLAN

FEBRUARY 2010
3729/42138

O'BRIEN & GERE

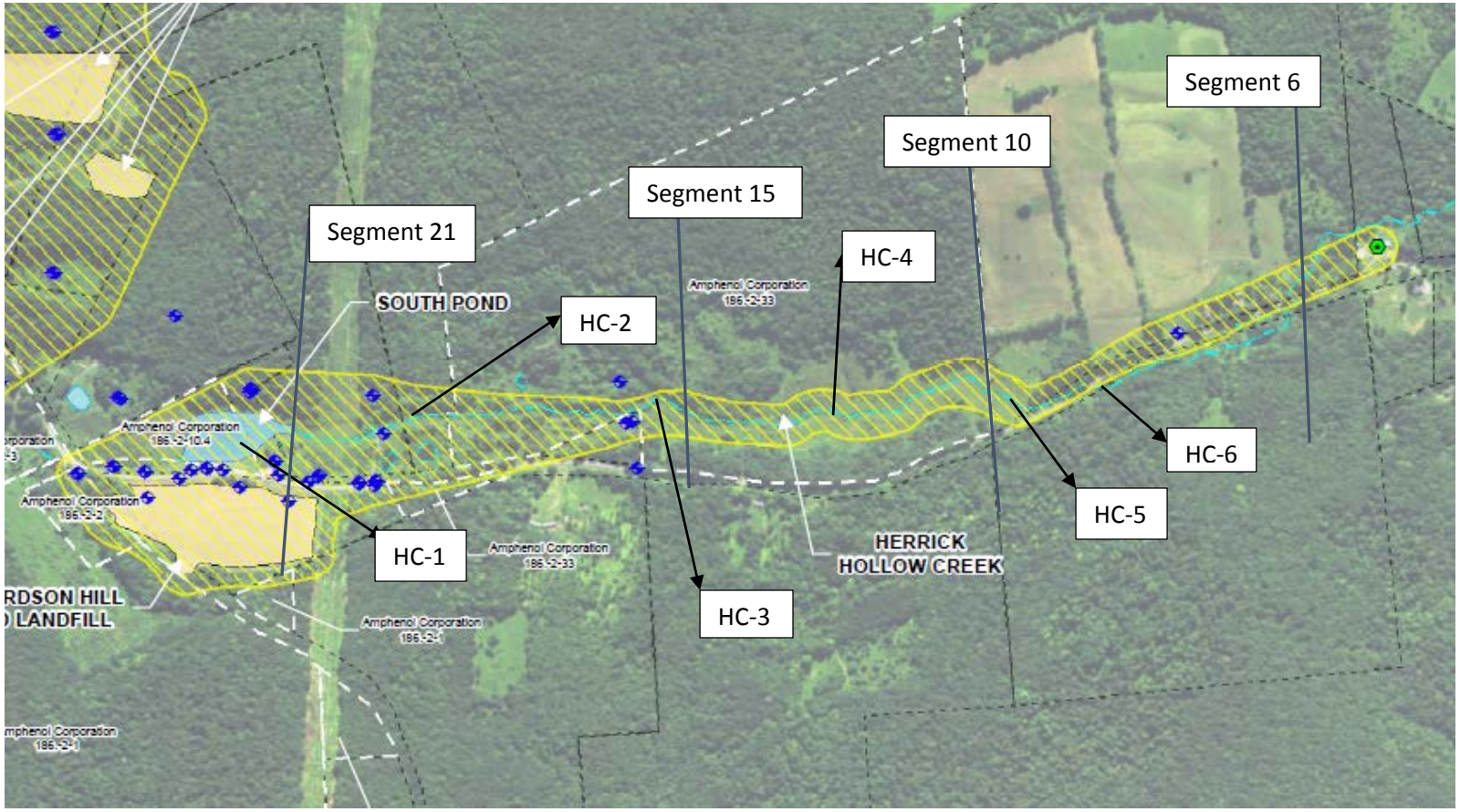


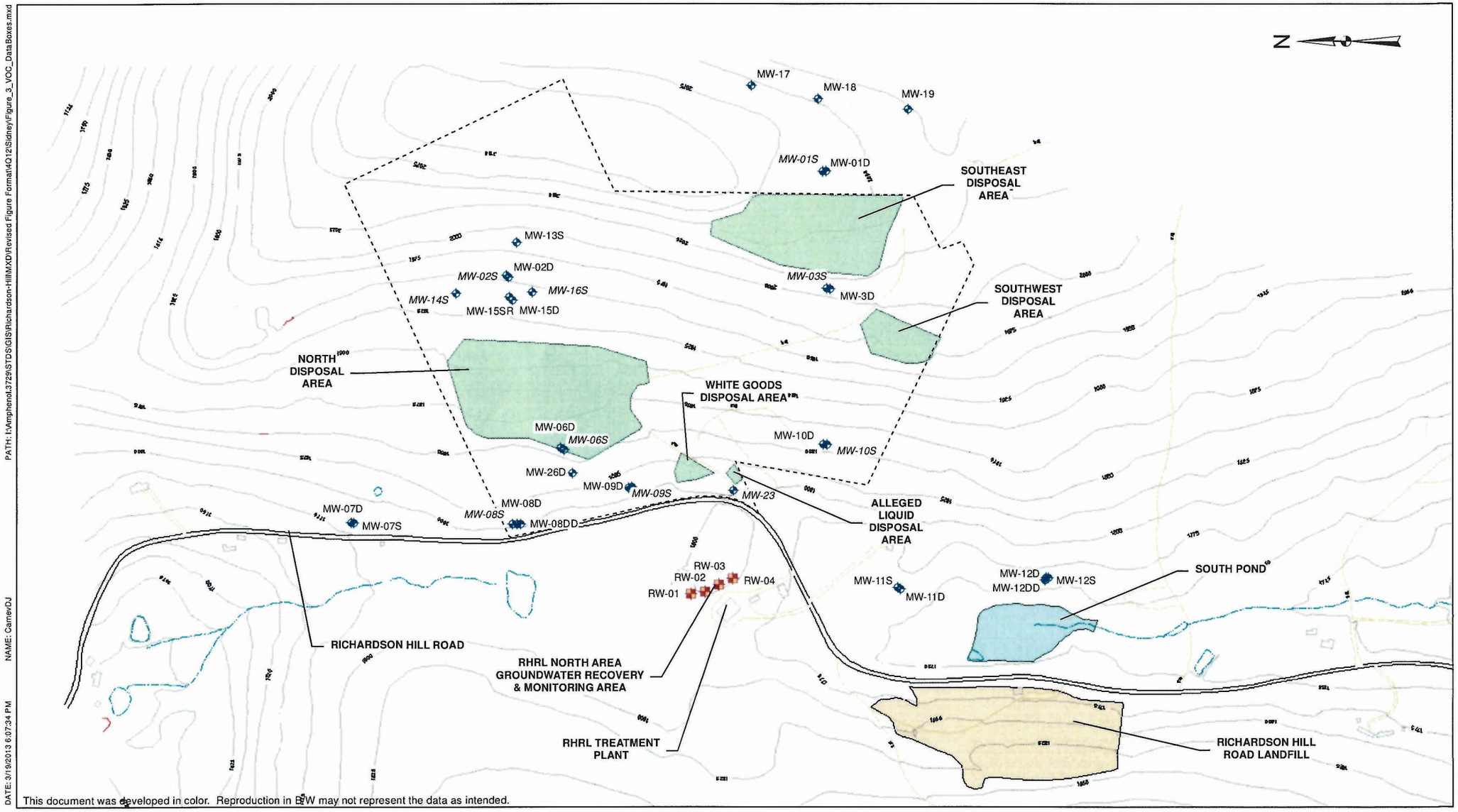
FIGURE 3 – Fish Sampling and Sediment Segment Locations – South Pond and Herrick Hollow Creek

HC-1 to HC-6 – Fish Sampling Locations

Segment 6 to Segment 21 – Sediment Segment Locations

All locations shown are approximate

FIGURE 4



LEGEND

- MONITORING WELL
- RECOVERY WELL
- SIDNEY LANDFILL PROPERTY BOUNDARY
- DISPOSAL AREAS

SIDNEY LANDFILL ENVIRONMENTAL
MONITORING PROGRAM
SIDNEY CENTER, NEW YORK

0 200 400 800 1,200 1,600
Feet

SITE PLAN

MARCH 2012
3729/42138

O'BRIEN & GERE

APPENDIX D –TABLES

Table 4: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Richardson Hill Road Landfill Site (unfiltered).																					
TCE (µg/L)																					
Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Well cluster east of South Pond	MW-12S	<0.5	<0.5	17	<0.5	<0.5	<0.5	2.1	<0.5	0.66	<0.5	29	41 J+	6.3	<0.5	0.75	57	<0.5	<0.5	60	45
	MW-12D	4.9	5.4	6.7	5.8	6.5	4.8	6.2	4.2	4.5	4.5	4.8	4.4	4	3.9	3.8	4.3	3.5	3.4	2.6	2.8
	MW-12DD	0.9	<0.5	0.42 J	0.84	<0.5	0.44 J	1.9	4.2	1.4	1.8	0.68	1.3	2.2	1.7	3.1	0.85	6	6.5	5.6	6
Transect 1	RH-01	8	8.2	36	6.3	4.5	13	35	15	23	14 J	0.8	0.77 J+	1.2	2.3	1.2	1.7	0.73	0.99	1.4	2.3
	RH-02	36	34	45	32	35	32	48	36	32	37	43	34	35	32	39	48	31	34	38	36
	RH-03	15	14	17	12	18	15 J	19	13	16	15	19	16	13	12	17	18	13	13	14	16
	RH-04S	1.9	2.1	3.6	3.1	3.1	2.6	2.7 J	2.3	2.2	2.6 J	2.9	2.4	1.9	2.3	2.6	3.7	2.7	2.6	2.5	2.8
	RH-04D	14	12	14	12	15	12	14 J	11	11	11	9	9	10	12	8.6	13	7.6	9.1	5.5	6.8
Transect 2	RH-09D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-10I	2.1	1.8	2.2	2.2	2.3	2.1	2.5	<0.5	2.1	2	2.2	0.81	0.59	0.82	0.96 NJ	0.84	<0.5	0.59	0.64	0.67
	RH-10D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-11D	0.34 J	<0.5	<0.5	<0.5	0.34 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Transect 3	RH-12D	1.5	1.4	1.1	1.8	1.8	1.6	0.82 J	<0.5	1.2	1.6	<0.5	1.8	0.92	2.4	0.92	1.3	2.6	1.8	2.1	<1.6
Wells along Inter-ceptor Trench	RH-05S	17	13	16	18	20	16	16 J	13	16	13	19	19	16	12	13	17	13	10	11	12
	RH-05D	72	85	60	65	72	68	56 J	61	57	93	64	62	56	95	60	74	73	100	65	59
	RH-06S	66	110	48	81	69	90	110 J	120	88	70	72	99 J+	62	100	94	120	120	45	55	54
	RH-06D	83	45	71	95	100	110	81 J	83	55	74 J	60	56	57	55	52	68	50	120	65	70
	RH-07S	5.1	3.9	10	7.8	7.4	6.3	11 J	6.6	6.6	2.9	8.3	8.8	7.5	7	8.1	11	7.2	5.1	9	10
	RH-07D	2.5	1.2	1.2	2.9	3	2.7	3 J	2.2	2.7	2.7	2.6	2.1	0.96	1.6	1.5	2.4	1.2	1.3	0.88	1
	RH-08S	2.8	1.8	3.2	2.8	2.7	2.8	3	<1	2.8	2.2	2.8	2.8 J+	3.4	2.4	2.5	3	1.3	1.5	1.5	1.6
	RH-08D	32	29	41	34	43	32	41	29	28	40 J	32	18	25	<2.5	26	28	39	28	34	35
	TMW-2	87	45	79	71	85	90	86	56	58	74 J	78	80 J	81	93	100	35	74	80	75	100
	TMW-3	160	2.5	140	170	160	180	180	94	170	160	180	160	140	160	160	190	99	110	110	110
	TMW-4	<2.5	<2.5	<2.5	3	1.9	4.3	2.6	<1	<12	2	1.3	3	15	5	1.8	1.3	0.97	1.5	1.4	0.3 J
	TMW-5	11	11	15	10	12	12	14	10	11	6.1	11	11	9.3	8	7.9	14	10	8.4	9.6	7.3
	TMW-6	2.4	2.7	4.7	3.3 J	2.4	2.8	4.2	<0.5	1.9	1.3	3.4	3.5	1.9	0.66	0.86	2	1.2	<0.5	1.2	1.3
	TMW-7	8	6.3	9.8	12	9.9	12	12	9.4	8	9.8 J	10	9.2	8.1	8.2	10	9.6	12	12	9.7	9.2

NS No sample collected due to low water level

J Estimated concentration

J+ Estimated biased high

N Detection is tentative in identification

< Below detection limit

Table 4: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Richardson Hill Road Landfill Site (unfiltered).																					
cis-1,2 DCE (µg/L)																					
Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Well Cluster east of South Pond	MW-12S	<0.5	<0.5	11	<0.5	<0.5	<0.5	0.57	<0.5	<0.5	<0.5	18	34 J+	2.5	<0.5	<0.5	51	<0.5	<0.5	54	52
	MW-12D	50	49	54	53	48	38	44	42	30	40	37	31	32	24	23	25	22	17	13	15
	MW-12DD	8.4	0.69	1.7	9.2	2.2	3.7	17	48	10	18	2.1	4.6	12	10	19	4.3	57	57	54	59
Transect 1	RH-01	52	45	190	45	28	66	140	79	94	47 J	6.2	5 J+	15	20	12	16	6.4	8.8	11	18
	RH-02	250	240	250	210	210	220	230	210	170	170	240	230	230	190	200	250	190	180	210	230
	RH-03	140	140	140	140	130	110	120	110	98	110	120	110	110	69	110	140	74	45	100	130
	RH-04S	2.4	2.4	1.9	2.1	2.1	1.8	2.3	1.6	1.5	1.8 J	2.3	2	1.2	1.1	2.3	1.9	2.5	1.3	1.8	1.8
	RH-04D	72	78	97	85	82	81	92	85	46	66	43	38	77	62	36	70	11	47	13	13
Transect 2	RH-09D	<0.5	<0.5	0.52	<0.5	<0.5	0.4 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-10I	5.6	4.6	5.5	5.5	4.9	4.3	4.8	4.5	3.8	4.8	1.1	1.6	1.4	1.6	2.2	2.2	<0.5	1.7	1.8	1.7
	RH-10D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-11D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Transect 3	RH-12D	3.2	2.9	2.1	4	3.3	2.9	1.4 J	2.6	1.8	2.9	1.1	2.1	1.9	4.6	1.8	2.4	4.6	2.7	4	3
Wells along Inter-ceptor Trench	RH-05S	25	20	29	23	25	22	19	19	17	18	30	24	22	16	14	18	13	9.1	11	11
	RH-05D	340	400	210	230	340	250	220	230	150	290	190	180	190	320	200	250	250	330	210	200
	RH-06S	810	670	420	450	520	500	1000	770	560	550	660	510 J+	410	470	520	570	320	330	300	410
	RH-06D	130	94	110	170	120	160	80	120	61	120 J	90	56	86	79	61	83	62	51	110	100
	RH-07S	0.49 J	<0.5	1	1.2	<0.5	1	<0.5	0.57	0.48 J	<0.5	<0.5	0.51	0.54	<0.5	0.66	0.75	0.52	<0.5	0.74	0.77
	RH-07D	2.5	0.8	1.1	2.9	2.6	2.4	2.2	2.4	2.4	2.8	2.6	2.1	0.8	1.1	1.6	2.3	0.91	<0.5	0.67	0.72
	RH-08S	47	33	66	48	47	44	50	40	40	36	50	53 J+	49	31	35	53	21	17	32	42
	RH-08D	130	140	180	160	140	110	120	120	100	100 J	130	120	130	98	100	150	100	85	110	120
	TMW-2	59	21	29	28	41	47	31	18	18	35 J	35	36	44	43	34	7.8	26	26	27	39
	TMW-3	490	8.7	290	270	330	330	220	130	230	290	290	250	350	330	330	290	330	270	310	220
	TMW-4	60	2.6	30	78	30	50 E	47	42	54	42	21	43	190	77	29	32	20	8.7	11	5.9
	TMW-5	38	33	45	23	29	30	26	27	20	10	24	20	16	13	12	20	12	8.8	9	7.8
	TMW-6	1.6	2	3.1	2.3 J	0.9	1.5	2	<0.5	0.7	<0.5	1.9	1.5	0.81	<0.5	<0.5	0.51	0.43 J	<0.5	<0.5	0.33 J
	TMW-7	26	24	12	27	17	91	21	43	11	91 J	12	20	15	19	28	22	79	47	21	23

NS No sample collected due to low water level

J Estimated concentration

J+ Estimated biased high

N Detection is tentative in identification

< Below detection limit

Table 4: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Richardson Hill Road Landfill Site (unfiltered).																					
VC (µg/L)																					
Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Well Cluster east of South Pond	MW-12S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<01	<1
	MW-12D	<2.5	<2.5	<2.5	<2.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MW-12DD	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	0.84 J	0.72 J
Transect 1	RH-01	<2.5	<2.5	<5	<2.5	<1	<1	<1	<2.5	<1	<1	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-02	<10	<10	<12	<12	<12	<2.5	<5	<5	<2.5	<2.5	<2.5	<5	<2.5	<0.5	<5	<5	<5	<5	<5	<5
	RH-03	12	11	14	<5	13	9.4	18	11	7.4	6.8	9	9 NJ	6	<2.5	6	10	<1	<2.5	7.5	9.6
	RH-04S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 J	<0.5 J	<0.5	<0.5 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-04D	4.9	6.2	9.6	9.6	10	9.3	10	11	4.6	7.2	6.8	5.4	9.4	6.4	3.9	10	0.95	8.7	2.4	2
Transect 2	RH-09D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-10I	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-10D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-11D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Transect 3	RH-12D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Wells along Inter-ceptor Trench	RH-05S	1.4	0.8	1.3	<1	1.9	1	0.58	1	1.1	0.77	2.1	0.53	<0.5	<0.5	0.59	0.49 J	0.44 J	<0.5	<0.5	<0.5
	RH-05D	42	45	26	42	42	30	36	34	23	29	34	36	27	26	33	42	46	32	46	35
	RH-06S	43	44	24 J	<25	27	32	78	55	28	60	60	58 J+	54	48	51	56	36	<1	63	87
	RH-06D	<5	<5	<5	<5	<5	<2.5	<5	<2.5	1	<2.5 J	<2.5	<2.5	<1	<1	<1	<1	<1	<12	<5	<5
	RH-07S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-07D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	RH-08S	8.2	4.6	12	9.6	12	8.6	20	10	10	7	13	17 J+	14	8.4	11	15	5.9	6.7	10	12
	RH-08D	12	10	15	<5	13	8.5	<2.5	13	12	9.2 J	16	<2.5	20	<2.5	14	31	12	22	17	17
	TMW-2	<2.5	<2.5	<2.5	<2.5	<2.5	<1	2	<1	<12	<1	1.3 NJ	<1	1.1	2	<1	<1	<1	<1	<1	<2.5
	TMW-3	22 J	<0.5	15	12	14	14	23	5.5	15	13	18	23	37	17	16	25	21	19	37	18
	TMW-4	33	1.7	49	75	19	26	64	34	42	23	45	110	120	51	32	70	21	9.3	12	8.3
	TMW-5	<1	<1	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TMW-6	<0.5	<0.5	<0.5	<0.5 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TMW-7	<1	<0.5	<0.5	<1	<1	4.4	<2.5	<1	<0.5	4 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.6	<1	<1	<0.5

NS No sample collected due to low water level

J Estimated concentration

J+ Estimated biased high

N Detection is tentative in identification

< Below detection limit

Table 5: PCB (Arochlor 1242) Exceedences in Groundwater near RHRL Interceptor Trench, µg/L (unfiltered)																
	2012				2013				2014				2015		2016	
Well No	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	Aug	May	Nov
RH-06S		**0.754**		**0.807**	**1.01**		**0.719 P**			**0.864 JP**		**0.976**	**1.09**	**1.44 J**		**0.8**
RH-06D				**0.224**	**0.086J**		**0.101 P**			**0.111 JP**					**0.753 J**	
RH-08D					**0.096**						**0.115**	**0.126**			**0.108 J**	**0.1**
TMW-03	**0.121**	**0.206**	**0.155**	**0.167**							**0.213**					
TMW-04	**0.124 P**	**0.155**	**0.186**	**0.166**		**0.117**	**0.148 P**	**0.135 P**	**0.125 P**	**0.092 JP**	**0.237**	**0.147**				

Blank cell indicates no sample available or sample obtained and analyzed as non detect

P > % between primary and secondary column, lower of two values reported

J Estimated concentration

The NYSDEC Class GA Groundwater Standard for PCBs is 0.09.

The following wells were also sampled but were below the groundwater standard and/or non-detect:

RH-04S. RH-04D,RH-05S, RH-05D, RH-07S, RH-07D, RH-08S, TMW-02, TMW-05, TMW-06, TMW-07 and RW-05

Table 6: Private Well Data (wells located south of RH-12D)						
Well	Chemical (µg/L)	Sample Date				
		May 2012	Aug 2013	Aug 2014	Aug 2015	Nov 2016
H- Well	TCE	0.67	<0.5 J	0.82	0.66	1
	cDCE	1.2	1.5	1.4	1.1	1.1
D-Well	TCE	<0.5	<0.5	<0.5	<0.5	<0.5
	cDCE	<0.5	<0.5	<0.5	<0.5	<0.5

J estimated concentration

< below detection limit at indicated value

Table 7: PCB (Aroclor 1248) in Sediment on South Pond, µg/kg					
Sample location	sampling date				
	Aug 2012	Aug 2013	Aug 2014	Aug 2015	Aug 2016
SED-01	40 U	**46 P**	**23 J**	**16 J**	<41
SED-02	40 U	**92 P**	**65**	**35 J**	<44
SED-03	**210**	**150**	<41	**20 J**	<44

J Estimated concentration

U Not detected above value indicated

P > % between primary and secondary column, lower of two values reported

< Below detection limit

Table 8: Fish Tissue Data at the Richardson Hill Road Landfill Site								
			Sampling Agency/Company					
			PRPs (June 2008)		NYSDEC (October 2012)		EPA (October 2016)	
Sample Location		Species	# of fish in Sample	Total PCBs (mg/kg)	# of fish in Sample	Total PCBs (mg/kg)	# of fish in Sample	Total PCBs (mg/kg)
South Pond HC-1		Creek Chub	3	2.800	1	0.716	1	1.723
		Creek Chub	6	2.000	1	0.327	1	3.095
		Creek Chub			1	0.213	1	1.007
		Creek Chub			1	0.616	1	0.385
		Creek Chub			1	0.198	1	0.681
		Pumkinseed	7	5.420				
Herrick Hollow Creek HC-2		Creek Chub	1	8.200	1	0.235	1	0.406J
		Creek Chub	1	8.000	1	0.207	1	0.150J
		Creek Chub	2	0.820	1	0.147	1	0.114J
		Creek Chub	4	0.720	1	0.187	1	0.299J
		Creek Chub			1	0.345	1	0.203J
Herrick Hollow Creek HC-3		Creek Chub	3	0.490	1	0.124	1	0.0518J
		Creek Chub	5	0.550	1	0.110	1	0.247
		Creek Chub			1	0.182	1	0.261
		Creek Chub			1	0.110	1	0.365
		Creek Chub			1	0.129		
Herrick Hollow Creek HC-4		Creek Chub	5	0.460	1	0.138	1	0.162
		Creek Chub	5	0.400	1	0.164	1	0.141
		Creek Chub			1	0.064	1	0.066J
		Creek Chub			1	0.092	1	0.0613J
		Creek Chub			1	0.190	1	0.151J
Herrick Hollow Creek HC-5		Creek Chub	4	0.400	1	0.140	1	0.165J
		Creek Chub	5	0.420	1	0.156	1	0.070J
		Creek Chub	4	0.800	1	0.108	1	0.319
		Creek Chub	1	2.210	1	0.384	1	0.240J
		Creek Chub			1	0.172		
Herrick Hollow Creek HC-6		Creek Chub	3	0.730	1	0.335	1	0.075J
		Creek Chub			1	0.086	1	0.084J
		Creek Chub			1	0.317	1	0.308
		Creek Chub			1	0.324	1	0.149
		Creek Chub			1	0.342		
		Brook Trout	1	1.420	1	0.612	1	0.830
		Brook Trout	1	1.420	1	0.473	1	0.590
		Brook Trout	1	3.600	1	0.515	1	0.580
		Brook Trout			1	0.485		
		Brook Trout			1	0.381		

Table 9: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Sidney Landfill Site (unfiltered).

TCE (µg/L)

Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Hot Spot Area	MW-2S	5.8	3.5	--	3.4	4.5	4.7	4.3	<3.5	4.3	2.2	2.2	3	NS	1.8	3.7	2.4	4.2	1.6	12	6.1
	MW-2D	3.3	<1	2.2	3.5	3.8	1.9	3.5	<1.9	2.4	2	2.5	2.4	2	2	1.5	2	2.1	1.6	1.5	1.4
	MW-14S	4.9	4.7	6.2	3.9	3.3	4.7	4.2	<5	4.3	4.5	5.5	4.5	4.8	4.1	3.9	5.4	4.4	4.8	6.5	6.2
	MW-15SR	9.2	12	230	39	26	35	26	53	120	42	140	110	120	39	86	120	57	45	58	60
	MW-15D	3.3	3.1	3.3	3.7	3.8	3.9	5.7	<4.4	8.4	5.5	16	10	5.6	4.7	8.9	9	6.4	6.7	10	14
	MW-16S	11	5.9	16	6.4	11	6.6	17	15	16	16	12	23	14	9.1	16	22	17	7.4	12	18
Road Area	MW-6S	86	61	68 J	61	56	120	120	94	130	100	92 J	120	150 J	87 F1	160 F1	100 F1	140 J	110 J	36	75
	MW-6D	340	220	100	200	490	430	420	440	480	430	380	200	270	340	160	180	310	140	180	130
	MW-8S	13	12	9.6	11	11	13	12	12	12	12	10	13	9.4	9.9	14	14	15	11	8.1	11
	MW-8D	11	9.8	10	11	6.6	9.6	10	12	11	9.1	10	11	9.4	8.9	11	11	10	9.5	8.9	11
	MW-9S	13	15	20	17	15	16	11	17	16	14	16	19	16	14	13	18	16	15	14	15
	MW-23	4.2	4.1	7.4	6.3	4.4	5.8	5.8	8.5	5.3	4.7	7.2	11	7.7	4.7	5.7	8.8	5.8	5.6	5.5	9.1
	MW-26D	2.5	1.8	2.1	NS	1.8	2.3	2.2	<2	1.8	1.7	1.9	2.6	1.8	1.7	1.9	2.2	1.7	1.4	1.4	1.5
SE Corner	MW-1D	25	34	20	28	30	30	19	26	22	17	14	19	17	14	15	14	22	24	19	14
	MW-3S	22	29	25	26	13	26	20	26	35	35	21	21	27	31	17	22	36	26	12	20
	MW-17	3.1	2.5	1.2	2.6	2	3.4	2.7	<4.6	3.4	3.5	3.5	4.6	2.7	3.6	2.7	4.8	2.9	3.1	1.8	1.8
	MW-18	2.9	2.4	1.7	2.7	2.3	1.7	1.9	<1.9	2.7	2.2	2.8	3.3	2.7	2.3	2.6	2.7	2.5	2.3	2	7.1
	MW-19	4.5	4	7.4	4.8	3.7	5.1	5.6	6.4	5	4.4	6.6	7.4	6.3	4.2	5	7.1	5	4.5	6.5	7.1

-- No sample data available

NS No sample collected due to low water level

J Estimated concentration

F1 MS and/MSD outside acceptance limit

< Below detection limit

^ Instrument related QC is outside limits

Table 9: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Sidney Landfill Site (unfiltered).																					
cis-1,2, DCE (µg/L)																					
Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Hot Spot Area	MW-2S	1.2	4.9	--	2.7	5.5	1.7	<1	<1	2.6	<1	<1	<1	NS	1.7	1.4	<1	1.8	1.2	1.1	<1
	MW-2D	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-14S	1.1	1.2	1.1	<1	<1	0.92 J	0.93 J	<1	1.6	1	0.9	0.91	<1	1.3	1.1	0.94 J	1.2	1.1	0.9 J	0.88J
	MW-15SR	1.3	1	22	1.2	1.1	3.7	<1	<4.7	11	2.1	14	8.5	13	3.5	7.8	10	4.3	4.8	6.4	5
	MW-15D	1	0.91 J	0.86 J	1.1	1.1	1.1	1.7	<1	1.7	1.6	2.8	1.5	1.4	1.1	1.4	1.3	0.96 J	1.6	2.4	2.3
	MW-16S	1.5	<1	1	0.97 J	1.5	<1	<1	<1	<1	<1	1.4	1.6	1.3	<1	<1	1.4	0.89 J	<1	<1	0.83J
Road Area	MW-6S	68	88	110 J	76	72	89	88	130 J	100	85	120	100	130	89	99	110	100 J	92	69	110
	MW-6D	310	220	94	190	500	410	430	460	470	420	340	190	330	330	150	170	330	140	260	160
	MW-8S	29	27	26	31	31	36	32	34	41	36	31	32	29	35	36	35	37	29	27	33
	MW-8D	24	20	21	23	18	20	21	26	23	20	21	23	19	19	24	22	22	20	20	25
	MW-9S	2.2	2.3	3	2.5	2.3	2.7	<1	<2.8	3.1	2.4	2.9	3.3	2.9	2.2	2.5	3	2.4	2.5	2.5	3.1
	MW-23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.1	0.94 J	<1	<1	0.92 J	<1	<1	<1	1.1
	MW-26D	9.7	7.5	7.2	NS	6.2	7.8	6.2	7.6	5.7	6.1	6.2	6.9	5.7	6	5.7	6.4	5.4	4.4	4.7	5.2
SE Corner	MW-1D	30	38	24	35	37	32	23	28	26	20	15	23	21	17	15	15	28	28	26	19
	MW-3S	12	14	17	13	6.2	13	11	13	17	17	16	9.7	15	14	8.7	8.3	14	11	11	9.3
	MW-17	3.7	2.6	1.7	2.4	2.1	4	5.2	2.3	4	4.5	4.5	5.8	3.3	4.1	4.3	6.7	4.3	4.2	3.3	2.5
	MW-18	5.9	5.1	3.7	5.6	4.8	3.7	3.5	<3.8	5.1	4.7	4.3	6.3	4.9	4.6	4.5	3.9	4.6	4.3	3.7	9.7
	MW-19	6.7	5.5	12	7.6	5.3	6	6.5	7.7	6	6	9.6	8.3	9.1	5.7	5.9	8.7	6.3	5.3	10	9.7

-- No sample data available

NS No sample collected due to low water level

J Estimated concentration

F1 MS and/MSD outside acceptance limit

< Below detection limit

^ Instrument related QC is outside limits

Table 9: TCE, cis-1,2-DCE, and VC Concentrations Detected in Groundwater from 2012-2016 at Sidney Landfill Site (unfiltered).																					
VC (µg/L)																					
Wells		2012				2013				2014				2015				2016			
		Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov
Hot Spot Area	MW-2S	<1	<1	NS	<1	0.98 J	<1	<1	<1	<1	<1	<1	<1	--	<1	<1	<1	<1	<1	<1	<1
	MW-2D	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-14S	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-15SR	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<2	<2	<1	<1	<2
	MW-15D	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-16S	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Road Area	MW-6S	18	22	29	26	18	25	19	32	25	21	17 J	30	42	21	27	30^	25	25	17	28
	MW-6D	8.9	5.2	3.5	4.2	9.9	14	7.5 J	9.5	9.5	7.8	<8	4.7	4.3	7.5	2.6	4.8^	10 ^	<4	4.1	4.3
	MW-8S	5.5	5.9	4.6	7.1	5.9	9.1	5.6	5.6	9.9	7.7	5	5.4	3.2	7.1	7	7.6^	10 ^	5.3	4.9	5.6
	MW-8D	7.7	6.7	6.2	8.3	1.5	6.8	5.1	7.2	7.2	5.4	5.1	5.4	5.3	5.6	6	6.4	5.8	6.1	4.4	6.1
	MW-9S	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-26D	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
SE Corner	MW-1D	1.7	4.6	<1	1.9	1.4	1.7	<1	1.2	0.96 J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-3S	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-17	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-18	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	MW-19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

-- No sample data available

NS No sample collected due to low water level

J Estimated concentration

F1 MS and/MSD outside acceptance limit

< Below detection limit

^ Instrument related QC is outside limits

Table 10: PCB Exceedences in Groundwater Sidney Landfill, µg/L (unfiltered)																				
		2012				2013				2014				2015				2016		
Well No	Arochlor	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Mar	May	Aug	Nov	Feb	May	Aug	Nov
MW-02S	1232																	**2 J+**			
	1242	**2.7**	**3**		**0.88 J**	**1.1. NJ**		**1.4 J**	**0.82**	**1**	**1.3**									**9.9**	
	1248						**2 J**						**2.3**		**0.65 J+**	**5.6**		**1.4 J+**	**2.5**		**8.5J**
MW-06S	1016								**2.7**												
	1232	**13**			**10 J**		**9.5 J**	**8.4 J**			**11**	**8.3 J**	**6.2**		**12**	**9.5**	**5.3**	**9.9**		**7**	
	1242		**7.1**	**5.1**		**7.7 J**				**8.1**				**5.3**					**3.8 J-**		**6**
	1248		**2.2 J**																		
MW-16S	1242	**0.49**	**0.83**	**0.41 J**	**0.8 J**			**0.34 J**		**0.56**						**0.68**	**0.6**		**0.6**	**0.72**	**1.2**
	1248		**0.78**				**0.53 J**						**0.41 J**	**0.37 J**	**0.67 J+**			**0.59**			

Blank cell indicates no sample available or sample obtained and analyzed as non detect

N Detection is tentative in identification

J Estimated concentration

J +/- Estimated biased high/low