NATURAL RESOURCE DAMAGES PREASSESSMENT SCREEN for the Richardson Hill Road Landfill Site, Towns of Sidney and Masonville, Delaware County, New York

The United States Department of the Interior and the State of New York in their capacity as the Trustees of Natural Resources

February 2010

EXECUTIVE SUMMARY

The Department of the Interior, as represented by the U.S. Fish and Wildlife Service, and the State of New York, as represented by the New York State Department of Environmental Conservation, as Trustees for natural resources, have conducted a Natural Resource Damages Preassessment Screen for the Richardson Hill Road Landfill Site (Site). Fish and wildlife resources at the Site that may be injured by hazardous substances include brook trout, smallmouth bass, northern leopard frogs, red-spotted newts, mallards, great blue herons, mink and red fox. We have concluded that hazardous substances at the Site have injured natural resources. Injuries include, but are not limited to:

- Concentrations of hazardous substances in groundwater (e.g., arsenic, lead, polychlorinated biphenyls (PCBs), 1,2-dichloroethene, trichloroethane) have exceeded NYSDEC groundwater human health standards (Class GA) for a water source.

- The New York State Department of Health has issued a health advisory for Herrick Hollow Creek for PCBs in brook trout.

- Exceedances of the Food and Drug Administration's PCB tolerance levels for fish (2 ppm) have occurred. Fish from the Site have been found to contain 2.5 – 33 ppm PCBs.

- There are or have been concentrations of substances, including arsenic, copper, lead, nickel, and PCBs, in sediment from the Site in excess of sediment quality guidelines.

- There are or have been concentrations of substances, including 1,1,1-trichloroethane, manganese, aluminum, PCBs, and trichloroethene, in surface waters which exceed levels set by Federal or State regulatory agencies.

- There have been adverse changes in the viability of biological resources. Hazardous substance release has been determined to be solely or significantly responsible for fish and amphibian mortality in 1993. Toxicity tests performed using Site water indicated toxicity to fathead minnows. The PCB concentrations in fish from the Site (5-33 ppm) are similar to or exceed PCB concentrations in fish associated with adverse effects.

Following a review of information described in this Preassessment Screen, the Trustees have made a preliminary determination that the criteria specified in 43 CFR Part 11 (Natural Resource Damage Assessments) have been met. The Trustees have further determined that there is a reasonable probability of making a successful claim for damages to natural resources associated with the Richardson Hill Road Landfill Site and its affected environment over which the Trustees have trusteeship. Therefore, the Trustees have determined that an assessment of Richardson Hill Road Landfill natural resource damages is warranted.

I. INTRODUCTION, AUTHORITIES, AND DELEGATIONS

This Preassessment Screen concerns potential claims authorized by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) 42 U.S.C. Section 9607 *et seq*., the Oil Pollution Act of 1990 (OPA) 33 U.S.C. Section 2701 *et seq.*, and the Clean Water Act (CWA) 33 U.S.C. Section 1251 *et seq.* for damages pertaining to injured natural resources associated with the Richardson Hill Road Landfill Site in the Towns of Sidney and Masonville, Delaware County, New York.

On the basis of a review of relevant information gathered to date, the U.S. Department of the Interior (DOI), acting through the U.S. Fish and Wildlife Service (USFWS), and the State of New York, acting through the New York State Department of Conservation (NYSDEC), jointly referred to as the Trustees, have concluded that there is a reasonable probability that a successful claim for damages to natural resources within their respective trusteeships can be made in this case.

This determination was prepared by the Trustees for natural resources under the authority of Section 107(f) of CERCLA, as amended, 42 U.S.C. Section 9607(f), the National Contingency Plan, Title 40 Code of Federal Regulations (CFR), Part 300, the DOI Natural Resource Damage Assessment Regulations, 43 CFR Part 11, and other applicable Federal and State regulations and directives which serve to designate Federal, State, and Tribal natural resource trustees and which authorize recovery of natural resource damages.

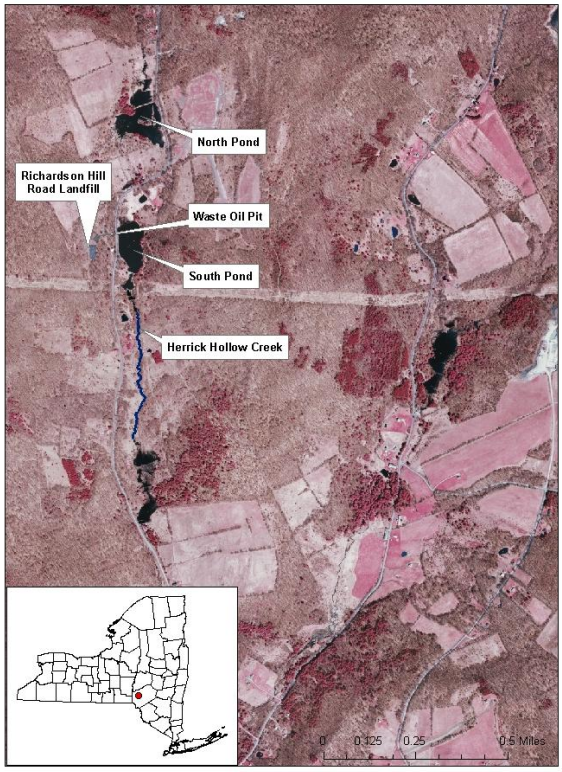
The first step in developing a natural resource damage claim is preparation of a Preassessment Screen. The purpose of a Preassessment Screen is to provide a review of readily available information on hazardous substance releases and potential impacts of those releases on natural resources under the trusteeship of Federal and State authorities. The review should ensure there is a reasonable probability of making a successful claim against the parties responsible for releasing hazardous substances into the environment. In this case, the Trustees have determined that:

(1) A discharge of oil or a release of a hazardous substance has occurred;
(2) Natural resources for which the Trustees may assert trusteeship under CERCLA, OPA, CWA, or State statutory law and common law claims have been or are likely to have been adversely affected by the discharge or release;
(3) The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury to those natural resources;
(4) Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost; and
(5) Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

II. INFORMATION ON SITE AND DISCHARGE OR RELEASE

A. Richardson Hill Road Landfill Site

Figure 1. Site and State location maps.



The Richardson Hill Road Landfill Site (Site) is a hazardous waste disposal site located in the Towns of Sidney and Masonville in Delaware County, New York. The Site is situated on the west side of Richardson Hill Road and consists of two areas designated as the North Area and the South Area (Figure 1). The South Area contains an 8-acre landfill, South Pond, including its associated wetlands, and a portion of Herrick Hollow Creek and its wetlands and floodplain. Surface water from the landfill in the South Area drains into South Pond through a drainage ditch. Water from South Pond flows into Herrick Hollow Creek, which drains into Trout Creek and then into the Cannonsville Reservoir, part of the New York City drinking water supply. The Cannonsville Reservoir lies within the west branch of the Delaware River.

The North Area is about 1,000 feet northeast of the landfill. This area consists of two 70 feet by 70 feet disposal trenches and North Pond. The North Area straddles the drainage divide between the Susquehanna and Delaware River basins, with most of the surface water draining into the Delaware River. Water from the North Pond also drains into Carr's Creek, a tributary of the Susquehanna River.

The areas around the Site are surrounded by wetland vegetation, scrub-shrub wetland, forested wetland, and upland forests. Herrick Hollow Creek supports adjacent wetlands and floodplains.

Bendix Corporation purchased the Site in 1964. From 1964 through 1969, town wastes, including spent oils from the Scintilla Division of Bendix Corporation, were disposed at the landfill (USEPA 1997). The 1997 U.S. Environmental Protection Agency (USEPA) Record of Decision (ROD) and 5-year review conducted by the U.S. Environmental Protection Agency indicated that the Richardson Hill Road Landfill was poorly managed during its operation (USEPA 1997, 2007). According to the New York State Department of Health (NYSDOH) there was improper compaction of waste, poor daily covering, no supervision, and uncontrolled access to the Site. The NYSDOH sought to close the landfill based on continuing violations and issued an order to cease operations on October 31, 1968. Waste disposal at the Site stopped in 1969 (USEPA 1997).

In 1981, water and sediment samples were collected by Fred C. Hart Associates, Inc., for the USEPA. These samples indicated the presence of polychlorinated biphenyls (PCBs),

trichloroethylene (TCE), and vinyl chloride at the Site (USEPA 1993). On July 1, 1987, the Site was listed on the USEPA National Priorities List (NPL).

A Remedial Investigation (RI) of the Site was conducted from 1988 to 1996 to determine the nature and extent of the contamination at and emanating from the Site. The RI and a subsequent Feasibility Study (FS) were conducted by Amphenol Corporation and AlliedSignal, Inc., pursuant to an Administrative Order of Consent (AOC) issued by the USEPA. An additional AOC was issued by the USEPA in 1993 in response to a fish and amphibian kill that took place in South Pond in 1993, attributable to a seep of contaminants from the Site (USEPA 1993, ERT 1993). The results of the RI indicated a presence of hazardous substances, including PCBs and volatile organic compounds (VOCs) in Site soil, sediment, overburden, and in the shallow bedrock aquifer (USEPA 2007). The VOCs were predominantly trichloroethene, toluene, ethylbenzene, xylene, tetrachloroethylene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), and their breakdown products, 1,2-dichloroethene (1,2-DCE), 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride (USEPA 2007).

The ROD called for excavation of contaminated waste and soil, capping of soil, dredging in the South Pond and areas downstream in Herrick Hollow Creek for 2,400 feet, installation of sediment traps, construction of fences and leachate trenches, extraction of groundwater, and long-term monitoring of groundwater, surface water, fish, and sediments (USEPA 1997).

Between 1996 and 2004, various efforts were undertaken to remediate the South Pond, North Pond, landfill and portions of Herrick Hollow Creek and associated floodplains. Initial remedial activities in Herrick Hollow Creek contributed to an unstable stream channel that was severely damaged by storms during the following years. In 2007-2008, additional work was performed to restore Herrick Hollow Creek and associated wetlands.

B. Damages Excluded from Liability under CERCLA or CWA

The DOI regulations in 43 CFR section 11.24 provide that the Natural Resource Trustees must determine whether the damages being considered are barred by specific defenses or exclusions from liability under CERCLA or CWA. The Trustees have determined that their damage claim is not barred by such defenses or exclusions from liability. Specifically, 43 CFR Section 11.24 requires the Trustees to determine whether the damages:

> (i) result from the discharge or release were specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement or other comparable environmental analysis, that the decision to grant the permit or license authorizes such commitment of natural resources, and that the facility or project was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian Tribe occurring pursuant to a Federal permit or license, the issuance of that permit or license was not inconsistent with the fiduciary duty of the United States with respect to such Indian Tribe; or

(ii) result from the release of a hazardous substance from which the damages have resulted have occurred wholly before the enactment of CERCLA; or

(iii) result from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. section 135-135k; or

(iv) result from any other Federally permitted release, as defined in section 101 (10) of CERCLA; or

(v) result from a release or threatened release of recycled oil from a service station dealer described in section 107(a)(3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported, or otherwise managed in compliance with regulations or standards promulgated pursuant to section 3014 of the Solid Waste Disposal Act and other applicable authorities.

III. PRELIMINARY IDENTIFICATION OF RESOURCES POTENTIALLY AT RISK

A. Potentially Affected Resources

Numerous trust resources at the Site and adjacent ecosystems have potentially been affected by the releases of hazardous substances (Table 1). Tables 2 - 6 list concentrations of PCBs, metals, and volatile organic compounds (VOCs) found in the different media around the Site.

The Site and adjacent areas provide habitat for fish, such as fathead minnows (*Pimephales promelas*), and largemouth bass (*Micropterus salmoides*), amphibians such as the northern leopard frog (*Rana pipiens*), and red-spotted newt (*Notophthalmus viridescens*) (ERT 1993). Herrick Hollow Creek supports a diverse benthic invertebrate population, numerous species of amphibians, a self-sustaining brook trout (*Salvelinus fontinalis*) fishery, and waterfowl feeding and nesting sites. The wetlands support species such as mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), great blue herons (*Ardea herodias*), tree swallows (*Tachycineta bicolor*), and cedar waxwings (*Bombycilla cedrorum*) (Malcolm Pirnie 1995).

A variety of mammalian species use the habitat along the ponds and Herrick Hollow Creek. These species include whitetail deer (*Odocoileus virginianus*), beaver (*Castor canadensis*), cottontail rabbit (*Sylvilagus floridanus*), mink (*Mustela vison*), and red fox (*Vulpes vulpes*). For a more detailed list of fish and wildlife that rely on Site resources for breeding, feeding, burrowing, nesting, and other purposes, see Table 1.

B. Exposed Areas

Areas presently identified into which oil and hazardous substances have been released include Herrick Hollow Creek, North Pond, South Pond, other surface waters, groundwater, sediment, wetlands, and associated uplands of the Site.

C. Preliminary Identification of Pathways

Contamination leaching from a variety of locations within the Site has migrated through numerous pathways to potentially adversely affect the biota of Herrick Hollow Creek, North Pond, South Pond and associated ecosystems. The suspected primary pathways for injury to Trust resources include surface water transport, groundwater discharge, overland runoff and sedimentation, airborne transport and atmospheric fallout of particulates, and entry into the food chain.

D. Concentrations of Hazardous Substances

Groundwater at the Richardson Hill Road Landfill Site has been contaminated with hazardous substances that exceed NYSDEC groundwater human health standards (Class GA) for a water source. Those substances detected in excess of groundwater standards include arsenic, mercury, lead, nickel, manganese, PCBs, 1,2-dichloroethene, trichloroethane, 1,1-dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane, trichloroethane, toluene, and xylene. A more complete listing of chemicals detected in groundwater at the Site is presented in Table 2.

Sediment sampling from the Site revealed high concentrations of arsenic, lead, and PCBs (O'Brien and Gere 1996; USEPA 1997). Maximum arsenic concentrations of 35.2 parts per million (ppm) exceeded the probable effects concentration (PEC) for arsenic of 33 ppm. The PEC is defined as the concentration above which effects to sediment dwelling organisms are likely to be observed (MacDonald et al. 2000). The maximum lead concentration in sediment (380 ppm) exceeded the PEC of 128 ppm. Shacklette and Boerngen (1984) estimated that background concentrations of arsenic and lead in upstate New York soils were approximately 4 and 15 ppm, respectively. The maximum PCB concentration of 1,300 ppm detected in South Pond sediment exceeded the PEC for PCBs of 0.676 ppm, as well as the PCB extreme effects concentration (EEC) by several orders of magnitude. The North Pond sediment had generally lower concentrations of PCBs (maximum concentration of 0.37 ppm) (O'Brien and Gere 1997), with barium up to 442 ppm, cadmium at 2.9 ppm, copper at 44.6 ppm and arsenic at 21.4 ppm (USEPA 1997). PCB concentrations of up to 6.6 parts per million (ppm) were detected in sediments up to 7,500 feet downstream of the South Pond (O'Brien and Gere 1996). A summary of sediment data is presented in Table 3.

Surface water sampled within the Site contained concentrations of PCBs that exceeded NYSDEC and USEPA water quality criteria for PCBs (Table 4). Surface waters sampled in 1995 contained concentrations of PCBs from 0 to 4.6 ppb (mean concentration of 1.77 ppb). Other chemicals and metals of concern included 1,1,1-trichloroethane, 1,2-dichloroethene, trichloroethene, vinyl chloride, arsenic, and manganese (USEPA 1997; O'Brien and Gere 1996).

Surface and sub-surface soils were sampled at the Site in the waste oil pit and around the drainage ditch. The results indicated that the waste oil pit contained the highest levels of contamination from PCBs and heavy metals. PCBs exceeded sediment threshold concentrations in both surface and sub-surface soil. PCB-1248 concentrations ranged from 0.08 ppm to 480

ppm in surface soils and from 0.13 ppm to 14,000 ppm in sub-surface soils. Zinc concentrations in sub-surface soil (64.3-413 ppm) exceeded the threshold effects concentration (TEC) of 121 ppm and approached the PEC for zinc of 459 ppm (Table 5).

In 1993, the USEPA responded to a reported fish kill in the South Pond and documented numerous dead and dying minnows and newts. PCB concentrations in minnow tissue ranged from 2.5-18.0 ppm and newt tissue ranged from 12.9-18.2 ppm wet weight (ww). The tissues also contained a variety of VOCs such as trichlorofluoromethane, methylene chloride, 2-butanone, benzene, toluene, and xylene (ERT 1993).

Toxicity tests were performed using water samples collected from six sampling locations associated with the 1993 fish and amphibian mortality. A 7-day larval fathead minnow assay with mortality as the endpoint was conducted in 1993. The results of this test indicated that the seeps #2 and #3 at the South Pond were toxic and the seep at the Sidney Landfill demonstrated toxicity. One of the seeps produced 30% mortality by the third day of the test and 58% mortality by the seventh day. The second most toxic seep sample produced 30% mortality by the seventh day (ERT 1993).

Young-of-the-year fish collected in the South Pond in 1995 as part of the ecological risk assessment contained PCB concentrations between 6.2 ppm to 8.4 ppm. Adult fish collected from South Pond and downstream had PCB concentrations from 5.6 ppm to 33 ppm (O'Brien and Gere 1997).

IV. PREASSESSMENT SCREEN CRITERIA

Title 43 CFR §11.23(e) notes five criteria that must be met before proceeding with a natural resource damage assessment. The criteria are as follows:

− A discharge of oil or a release of a hazardous substance has occurred.

− Natural resources for which the Trustees may assert trusteeship under CERCLA, OPA, CWA, or state statutory law and common law claims have been or are likely to have been adversely affected by the discharge or release.

− The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury, as that term is used in this part, to those natural resources.

− Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.

− Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

These criteria are satisfied for the discharge of oil and releases of hazardous substances covered by this Preassessment Screen, as follows:

Criteria #1: Discharges of oil and releases of hazardous substances have occurred.

There have been releases of oil and hazardous substances, as defined by OPA, CERCLA, and the CWA. Oil and hazardous substances which have been released into wetlands, streams, and other habitat from the Site include, but are not limited to, the following:

- Inorganics, including lead, zinc, mercury, arsenic, and manganese;
- PCBs; and
- VOCs, including trichloroethene, dichloroethene (DCE), tetrachloroethene (PCE), and breakdown products such as vinyl chloride.

Liability for damages to natural resources as a result of oil is addressed in OPA. The substances identified above have been determined to be hazardous pursuant to CERCLA 42 U.S.C. §9602(a) and its implementing regulations 40 CFR §302.4, as well as the CWA 33 U.S.C. §1251 *et seq.* These substances have been released into the assessment area from the Richardson Hill Road Landfill Site. These contaminants have entered the water column and accumulated in the sediments and biota of the Richardson Hill Road Landfill Site, including the North Pond, South Pond, Herrick Hollow Creek, and their adjacent ecosystems.

Criteria #2: Natural resources for which the Trustees may assert trusteeship under CERCLA, OPA, CWA, or state statutory law and common law claims have been or are likely to have been adversely affected by the releases.

Natural resources under Trusteeship that are in the assessment area that have been or are likely to have been adversely affected by releases of hazardous substances include, but are not limited to, surface water (including sediments), groundwater, and biological resources (43 CFR §11.14z). Soil, sediment, surface water, groundwater resources, and biota have been contaminated with substances such as PCBs, 1,2-dichloroethene, toluene, ethylbenzene, xylene, and heavy metals (USEPA 1997). The surface water and groundwater within the assessment area have been impacted by concentrations of PCBs, VOCs, and aluminum that exceed NYSDEC aquatic life and/or human health criteria. Sediment concentrations of arsenic, copper, lead, nickel, and PCBs have exceeded TEC and/or PEC sediment thresholds.

Biological resources within the assessment area that have been potentially adversely impacted include migratory birds, benthic invertebrates, amphibians, fish, and their supporting habitats. A seep of contaminants from the Site was either the sole or a major contributor to fish and amphibian mortality in April of 1993 (ERT 1993).

The surface waters and sediments provide feeding, breeding, and nursery habitat for invertebrate, amphibian, and fish species. Wildlife such as waterfowl, herons, tree swallows, and mammals that feed within the assessment area may potentially have been impacted by releases of hazardous

substances. The ecological risk assessment conducted as a part of the RI for the Site showed elevated risk for two of the modeled species (great blue heron and mink) (USEPA 1997). A hazard quotient (HQ) of greater than one indicates the level at which deleterious effects may occur. The HQ model for the great blue heron estimated HQs for PCBs and zinc of 2.8 and 1.2, respectively. The HQs for mink for aluminum, arsenic, and PCBs were 93, 9.1, and 3.2, respectively (USEPA 1997).

Criteria #3: The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury to those natural resources.

43 CFR §11.14 (v) defines injury as "a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge or release of a hazardous substance, or exposure to a product of reactions resulting from such discharge or release...."

The quantity and concentration of the discharged oil or released hazardous substances have potentially injured natural resources within Site. Likely injuries to the natural resources within the assessment area may include:

1. The NYSDOH has issued a health advisory for Herrick Hollow Creek for PCBs in brook trout;
2. Exceedances of the Food and Drug Administration's (FDA) PCB tolerance levels for fish (2 ppm) have occurred;
3. There are concentrations of substances in excess of groundwater standards, as established by Federal or State laws in groundwater that was potable before the discharge or release;
4. There are or have been concentrations of substances in excess of sediment quality guidelines;
5. There are or have been concentrations of substances in surface waters which exceeded levels set by Federal or State regulatory agencies; and
6. There have been adverse changes in the viability of biological resources.

These injuries are discussed below in greater detail. These biological responses satisfy the acceptance criteria for injury in accordance with 43 CFR Part 11.

1. New York State human health consumption advisories for brook trout from Herrick Hollow Creek:

Herrick Hollow Creek is the subject of a NYSDOH health advisory based on elevated concentrations of PCBs. The advisory provides that fish from these waters should not be eaten by women of childbearing age or by children under the age of 15. With regard to other persons, the advisory warns against consumption of brook trout from Herrick Hollow Creek (NYSDOH 2008).

The NYSDOH advisories limiting and/or banning consumption of these organisms constitute an injury to a biological resource in accordance with 43 CFR §11.62(f)(1)(iii).

2. Exceedances of FDA tolerance levels for fish:

Concentrations of PCBs in fish species collected from South Pond have exceeded the applicable USFDA tolerance level for PCBs (see Table 6). The Federal Food, Drug and Cosmetic Act authorizes the USFDA to set tolerances for poisonous or deleterious substance in human food, including fish or shellfish. The tolerances are enforceable standards specifying the maximum amount of a substance that can be legally present in the food. The tolerance guideline for PCBs in fish is 2 ppm (USFDA 2003).

The following are examples of exceedances of USFDA PCB tolerance levels in fish from the Site:

- Young of the year fish sampled in 1995 as part of the Ecological Risk Assessment contained PCB concentrations of 6.2 – 8.4 ppm, with adult fish containing 5.6 – 33 ppm (O'Brien and Gere 1997).
- A caged fish study found that fathead minnows placed in the South Pond accumulated 9 – 13 ppm PCBs after 34 days of exposure (ERT 1993).

These exceedances of USFDA tolerance levels constitute injuries pursuant to Title 43 CFR §11.62(f)(1)(ii).

3. Concentrations of substances in excess of groundwater standards as established by Federal or State laws, in groundwater that was potable before the discharge or release:

Groundwater throughout the Site has been contaminated with hazardous substances. These substances include, but are not limited to, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, arsenic, lead, manganese, mercury, nickel, PCB Aroclor 1248, tetrachloroethene, toluene, trichloroethane, xylene, and trans-1,2-dichloroethene. Many of the VOCs released on the Site exceeded the NYSDEC principal organic contaminant standard for groundwater of 5 ppb. See Table 2 for a list of exceedances of the NYSDEC standards. Concentrations of heavy metals and PCBs exceeded NYSDEC standards. Hazardous substances in groundwater in excess of the NYSDEC groundwater standards constitutes an injury to natural resources pursuant to 43 CFR part 11.62 (c)(1)(i).

4. Concentrations of substances in excess of sediment quality guidelines as established by Federal or State laws:

Sediment concentrations of certain hazardous substances exceeded recommended thresholds for sediment quality in freshwater ecosystems (MacDonald *et al.* 2000). These substances include, but are not limited to arsenic, copper, lead, nickel, and PCBs. Table 3 lists the exceedances of sediment quality guidelines.

5. Concentrations of substances in surface waters which exceed levels set by Federal or State regulatory agencies:

Surface waters in North Pond, South Pond, and Herrick Hollow Creek have been contaminated with concentrations of hazardous substances which exceed Federal and State guidelines (USEPA 2004 and NYSDEC 2000). These substances include, but are not limited to, 1,1,1-trichloroethane, manganese, aluminum, PCBs, trichloroethene, and vinyl chloride. Table 4 lists the analytes and their exceedances of NYSDEC and/or USEPA guidelines.

6. Adverse changes in the viability of biological resources:

Hazardous chemicals have been discharged into North Pond, South Pond, and Herrick Hollow Creek. Hazardous substance release has been determined to be solely or significantly responsible for fish and amphibian mortality in 1993 (ERT 1993). Toxicity tests performed using Site water indicated toxicity to fathead minnows. The PCB concentrations in fish from the Site (5-33 ppm) are similar to or exceed PCB concentrations in fish associated with adverse effects. Bengtsson et al. (1980) reported PCB-induced inhibition of reproductive development (e.g., spawning effects) in fathead minnows at PCB concentrations of 15 ppm ww. These authors also reported a reduction of hatching time correlated with PCBs in parent fish; higher levels of PCBs caused premature hatching and, therefore, increased fry mortality. At body burdens of 10-30 ppm ww, moderate to severe erosion of the dorsal fin of rainbow trout (*Oncorhynchus mykiss*) was observed in the majority of fish exposed (Thuvander and Carlstein 1991). Rainbow trout suffered pathological effects at PCB body burdens of 1.3 ppm ww, including nephrosis and changes in the liver and spleen (Nebeker et al. 1974). Matta et al. (2001) found an effect on F1 generation growth of minnows at 1.3 ppm PCBs ww. Barron et al. 2000 collected walleye (*Sander vitreus*) from Wisconsin and evaluated a suite of physiological and biomarker responses. Fish with body burdens of 4-9 ppm ww showed a 16-20% increase in the incidence of tumors and lesions. Other immunological parameters were also significantly different from controls.

Criteria #4: Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.

A database exists for North Pond, South Pond, the Landfill, and Herrick Hollow Creek. Available data support the conclusion that contaminants have potentially adversely affected natural resources around the Site and its environment. These data have been collected under monitoring programs initiated for the Richardson Hill Road Landfill Superfund Site (USEPA 2007). A 5-year review was conducted in 2007 and the next review is scheduled for 2012. The Draft Operation and Maintenance Manual for the Site states that groundwater, sediment, fish, leachate, gases, surface water, and overland flow will be monitored quarterly and after major rainfall events (USEPA 1997).

Criteria #5: Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

Response actions will not sufficiently remedy the injury to natural resources without further action. The response actions at the Site were directed toward control of the source at the landfill and removal of contaminants from the South Pond, portions of Herrick Hollow Creek, and associated floodplains. Natural resource services were lost as a result of concentrations of contaminants that have adversely impacted those natural resources prior to remedial actions, and physically disruptive remedial activities such as the dredging of Herrick Hollow Creek and South Pond wetland. Also, there has been loss of use due to the fish advisory for Herrick Hollow Creek. There may also be future losses associated with residual contamination (e.g., PCB concentrations < 1 ppm) and limitations on fully restoring Herrick Hollow Creek and other natural habitats at the Site.

The Trustees do not expect that the remedial measures carried out will fully address the various sources and pathways of exposure of natural resources to PCBs and other Site contaminants, or the injuries resulting from such exposure. Therefore, the Trustees have determined that response actions carried out or currently planned do not or will not sufficiently remedy the injury to the natural resources without further action.

V. PREASSESSMENT SCREEN DETERMINATION

Following a review of information described in this Preassessment Screen, the Trustees have made a preliminary determination that the criteria specified in 43 CFR Part 11 (Natural Resource Damage Assessments) have been met. The Trustees have further determined that there is a reasonable probability of making a successful claim for damages to natural resources associated with the Richardson Hill Road Landfill Site and its affected environment over which the Trustees have trusteeship. Therefore, the Trustees have determined that an assessment of Richardson Hill Road Landfill natural resource damages is warranted.

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Table 1. Wildlife inventory of Richardson Hill Road Landfill and adjacent ecosystems (Malcolm Pirnie, Inc. 1995).

Birds	
Actitis macularia	Spotted Sandpiper
Anas platyrhynchos	Mallard
Archilochus colubris	Ruby-throated Hummingbird
Ardea herodias	Great Blue Heron
Bombycilla cedrorum	Cedar Waxwing
Branta canadensis	Canada Goose
Bubo virginianus	Great Horned Owl
Buteo jamaicensis	Red-tailed Hawk
Carduelis tristis	American Goldfinch
Cathartes aura	Turkey Vulture
Ceryle alcyon	Belted Kingfisher
Dumetella carolinensis	Gray Catbird
Geothlypis trichas	Common Yellowthroat
Hirundo rustica	Barn Swallow
Meleagris gallopavo	Wild Turkey
Melospiza melodia	Song Sparrow
Parus atricapillus	Black-capped Chickadee
Passerina cyanea	Indigo Bunting
Pipilo erythrophthalmus	Rufous-sided Towhee
Sayornis phoebe	Eastern Phoebe
Tachycineta bicolor	Tree Swallow
Turdus migratorius	American Robin
Tyrannus tyrannus	Eastern Kingbird
Mammals	
Castor canadensis	Beaver
Marmota monax	Woodchuck
Odocoileus virginianus	Whitetail Deer
Ondatra zibethicus	Muskrat
Procyon lotor	Raccoon
Sylvilagus palustris	Cottontail Rabbit
Tamias striatus	Eastern Chipmunk
Vulpes vulpes	Red Fox
Mustela vison	Mink
Reptiles/Amphibians	
Notophthalmus viridescens	Red-spotted Newt
Opheodrys vernalis	Smooth Green Snake
Rana catesbeiana	Bullfrog
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana pipiens	Northern Leopard Frog
Thamnophis sirtalis	Common Garter Snake
Fish	
Pimephales promelas	Fathead Minnow
Micropterus salmoides	Largemouth Bass
Salmo gairdneri	Rainbow Trout
Salvelinus fontinalis	Brook Trout
Salmo trutta	Brown Trout

Table 2. Concentrations of contaminants in groundwater compared with NYSDEC groundwater concentration standards (NYSDEC Water Quality Regulations; Surface Water and Groundwater Classifications and Standards, New York State Codes, Rules and Regulations Title 6, Chapter X Parts 700-706 1999) (Source data: O'Brien and Gere 1996).

Analyte	# Samples Analyzed	Minimum (ppb)	Maximum (ppb)	NYSDEC Groundwater Health (water source) Standard (ppb)
Aluminum	17	0.207	46500	Not Available
Arsenic	25	0.014	86	25
Lead	25	0.008	510	25
Manganese	17	0.094	22400	300
Mercury	17	0.0012	3.19	0.7
Nickel	17	0.048	323	100
Zinc	17	0.012	385	Not Available
1,1-Dichloroethane	76	27	390	**5
1,1-Dichloroethene	55	13	100	**5
1,2-Dichloroethene	3	1000	26000	**5
1,2-Dichloroethene (total)	20	2	6800	**5
1,1,1-Trichloroethane	80	6	1300	**5
PCB-1248	56	0.1	560	*0.09
t-1,2-Dichloroethene	54	1	24000	**5
Tetrachloroethene	55	3	68	**5
Toluene	78	7	1800	**5
Trichloroethane	3	450	3800	**5
Trichloroethene	75	1	8400	**5
Xylene	55	24	180	**5

* Standard applies to total PCBs

** Standard is principal organic standard for groundwater

Table 3. Concentrations of PCBs and metals in sediment compared with sediment concentration guidelines from MacDonald *et al.* 2000. (Source data: USEPA 1997; O'Brien and Gere 1996).

Substance	Number Analyzed	Minimum (ppm)	Maximum (ppm)	Sediment guidelines (ppm)	
				TEC	PEC
Aluminum	7	8750	34100	Not Available	
Arsenic	4	6.84	35.2	9.79	33.0
Copper	7	10.6	80.3	31.6	149
PCB-1248	76	0.059	1300	0.060	0.676
Lead	7	32.4	380	65.8	128
Manganese	8	462	2860	Not Available	
Nickel	4	7.25	29.3	22.7	48.6
Zinc	7	66.1	118	121	459

TEC: Threshold Effects Concentration (below which harmful effects unlikely to be observed)
PEC: Probable Effects Concentration (above which harmful effects are likely to be observed)
(MacDonald *et al*. 2000)

Table 4. Surface water contaminant concentrations, compared with NYSDEC (2000) and USEPA (2004) standards. (Source data: USEPA 1997; O'Brien and Gere 1996)

Analyte	Number Analyzed	Minimum (ppb)	Maximum (ppb)	NYSDEC aquatic life (ppb)	NYSDEC human health (ppb)	USEPA (ppb)
1,1,1-Trichloroethane	39	0.5	65	NA	5 H[WS]	NA
Aluminum	7	43.5	723	NA	100 A[C]	87 CCC, 750 CMC Freshwater
PCB-1248	43	0	4.6	1.2×10^{-4} W	0.09 H[WS]	0.014 Freshwater
Manganese	8	1	3010		300 E [WS]	50.0 Drinking water
Trichloroethene	39	1	59	40 H[FC]	5 H[WS]	2.5 Drinking water
Vinyl Chloride	16	0.5	200	NA	NA	0.25 Drinking water

NA – Not Available
W refers to standards to wildlife
H[WS] refers to standards for Health (water source)
H[FC] refers to standards for Health (fish consumption)
E[WS] refers to aesthetic standards (water source)
CMC is the highest concentration of a material to which an aquatic community can be exposed to briefly without resulting in unacceptable effect; CCC is an estimate of the highest concentration of a material to which an aquatic community can be exposed to indefinitely without resulting in unacceptable effect.

Table 5. Surface and sub-surface soil contamination. (Source data: USEPA 1997).

Surface Soil Analyte	Number Analyzed	Minimum (ppm)	Maximum (ppm)
Aluminum	3	12000	15000
Arsenic	3	9	11.5
Lead	3	24	46
Manganese	3	726	1200
Nickel	3	18	26.6
Zinc	2	81	91
Aroclor 1248	34	0.02	480
Sub-surface Soil Analyte	**Number Analyzed**	**Minimum (ppm)**	**Maximum (ppm)**
Aluminum	6	12300	17500
Arsenic	6	3.29	10.9
Lead	6	3.1	136
Manganese	6	277	1450
Mercury	6	0.13	0.13
Nickel	6	22.8	37.0
Zinc	6	64.3	413
Benzene	7	6.6	7.1
1,2-Dichloroethene	7	1.02	23
1,1-Dichloroethene	7	5.6	6
1,1,1-Trichloroethane	7	0.3	6.5
PCB	123	0.08	7000
PCB-1248	14	0.13	14000
Toluene	7	24	110
Trichloroethene	7	2.3	220

Table 6. FDA PCB tolerance levels in fish and levels of PCBs found in fish from the Site (ERT 1993; USEPA 1997).

Specimen	**PCB-1248 (ppm ww)**	**USDA Tolerance level(ppm)**
Newt tissue - 1993	12.9 – 18.2	Not Available
Minnow tissue (South Pond) - 1993	2.5 – 18.0	2
Young-of-year fish South Pond (minnow) - 1995	6.2 - 8.4	2
Adult fish South Pond (minnow) – 1995	5.6 - 33.0	2
Caged fathead minnow South Pond - 1995 (34 day exposure)	9 - 13	2

RICHARDSON HILL ROAD LANDFILL
PREASSESSMENT SCREEN

APPROVALS:

The U.S. Department of the Interior, by its
Authorized Official

By: _____
Name: Mr. Marvin Moriarty
Title: Regional Director, U.S. Fish and Wildlife Service
Date: _____

The State of New York, by its
Authorized Official

By: _____
Name: Mr. Alexander B. Grannis
Title: Commissioner, New York State Department of Environmental Conservation
Date: _____