Ossining Gas Works DPW Site Brownfield Cleanup Program Ossining, Westchester County Site No. C360172 February 2025



Prepared by Division of Environmental Remediation New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Ossining Gas Works DPW Site Brownfield Cleanup Program Ossining, Westchester County Site No. C360172 February 2025

Statement of Purpose and Basis

This document presents the remedy for the Ossining Gas Works DPW brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Ossining Gas Works DPW Site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Green Remediation/Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and

 Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise[™] (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

All soils in the upper two feet which exceed the restricted residential or protection of groundwater soil cleanup objectives (RRSCOs or PoGWSCOs) will be excavated and transported off-site for disposal.

All on-site soils below two feet in areas which are not part of the in-situ solidification (ISS) treatment, as described in remedial element 5, which exceed the PoGWSCOs will be excavated and transported off-site for disposal. Approximately 440 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that soil cleanup objectives (SCOs) for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify the Department, submit the sample results and, and in consultation with the Department, determine if further remedial excavation is necessary. Excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

Excavation of site soils to a depth of 5 feet below grade will be completed in portions of the site to accommodate the ISS treatment described in remedy element 5. Approximately 8,600 cubic yards of soil will be excavated to facilitate ISS implementation. All soils excavated within the ISS treatment areas which exceed RRSCOs or PoGWSCOs will be disposed of off-site at a permitted facility.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, regulations, and facility-specific permits.

3. Backfill

On-site soil which does not exceed the RRSCOs or PoGWSCOs may be used below the cover system described in remedy element 4 to backfill the excavation to the extent that a sufficient volume of on-site soil is available. This material should not be used within 1 foot of the groundwater table.

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

The site will be re-graded to accommodate installation of a cover system as described in remedy element 4.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the RRSCOs, to allow for future restricted residential use of the site. Where a soil cover is to be used, it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. A building and its foundation are considered suitable cover to protect the ISS monolith. Where a building and its foundation are considered part of the site cover, the ISS design should include considerations for drainage between the ISS and building foundation and the potential need to design the ISS for a higher strength. If the ISS monolith extends beyond the building footprint, the

design shall include a soil cover consisting of a minimum of four feet of soil for that portion. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use outside the ISS monolith area. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

5. In-Situ Solidification

ISS will be implemented in areas as indicated on Figure 2.1, with the final extent of ISS to be confirmed during the design phase of the remedy. An approximately 5-foot soil cut will need to be excavated in the areas ISS will be applied to contain the ISS spoils and increased soil volume created by the soil mixing. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying reagents or other binding reagents using an excavator or augers. Often Portland Cement is used as the primary binder, although less carbon-intensive amendments will be considered. The soil and binding reagents are mixed to produce a solidified mass resulting in a low permeability monolith. Prior to the full implementation of this technology, bench-scale laboratory testing and on-site pilot scale studies will be consist of collecting soil from source area and mixing with a variety of amendments and doses in a controlled atmosphere followed by testing resulting hydraulic conductivity and unconfined-compressive strength. Pilot tests will then be conducted using successful amendment mixes from the bench test prior to full scale design.

Typical design requirements are that solidified mass would produce a hydraulic conductivity (K) of 1.0 X 10-6 cm/sec or less and would also result in an unconfined compressive strength of 50 psi, or higher for areas that will be below the planned building development. The solidified mass will then be covered with a cover system as described in remedy element 4 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

6. Coal Tar Recovery

Installation and operation of coal tar recovery wells is planned along the western site boundary and north of the Sing Sing Kill west of the former gas holder footprint to remove potentially mobile coal tar from the subsurface. Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they may be converted to automated collection.

7. Monitored Natural Attenuation

Groundwater contamination remaining after active remediation detailed in remedy element 2 and remedy element 5 will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and for MNA

indicators, which will provide an understanding of the biological activity breaking down the contamination. Reports of the attenuation will be provided at 5 and 10 years, and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property designated by the non-roadway tax parcel which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property, defined by the tax parcel, for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.
- 9. Site Management Plan

A Site Management Plan is required, which includes the following:

a. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: Environmental Easement and all local use restrictions discussed in remedy element 8 above, and

Engineering Controls: The cover system as discussed in remedy element 4, coal tar recovery wells as discussed in remedy element 6, and monitoring wells.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision should redevelopment occur to ensure no soil exceeding PoGWSCOs will remain below storm water retention basin or infiltration structures;
- descriptions of the provisions of the environmental easement including any land use, groundwater, or surface water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of coal tar recovery well performance to assess the performance and effectiveness of the remedy;
- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a contingency to address contamination should the rate of coal tar recovery be unsatisfactory; and
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system. The plan includes, but is not limited to:

- procedures for operating and maintaining the system; and
- compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

2/24/2025 Date

Sarah Saucier

Sarah Saucier, Director Remedial Bureau C

DECISION DOCUMENT

Ossining Gas Works DPW Site Ossining, Westchester County Site No. C360172 February 2025

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

DECInfo Locator - Web Application https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C360172_

Ossining Public Library Attn: Karen LaRocca-Fels 53 Croton Avenue Ossining, NY 10562 Phone: (914) 941-2416

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Site Description

The site is located in the Village of Ossining, New York. The site is in a mixed-use commercial, residential, and industrial neighborhood. Central Avenue and a Consolidated Edison Company of New York, Inc. (Consolidated Edison) substation are located north of the site. Water Street, a residential structure and commercial structures are located west of the site. Main Street and residential dwellings are located south of the site. Residential properties are located east of the site.

Site Features

The site is located within a fenced area and consists of four lots in the Village of Ossining. The Sing Sing Kill, which runs through the center of the site has been excluded from the site as it is underwater land. The Sing Sing Kill runs west to the Hudson River, which is approximately 0.189 miles west of the site. A retaining wall is present along the western portion of the Sing Sing Kill side walls. Additionally, steep, nearly vertical bedrock walls run along areas of the Sing Sing Kill. The site is located in a flood zone and the eastern portion of the site is undeveloped.

All buildings and structures on the site have been demolished. The site is mostly covered with asphalt and concrete pads.

Current Zoning and Land Use

The site is currently located in the PW-b: Central Waterfront - Transient Oriented Subdistrict. This zoning district permits recreational, open space, commercial, business, and residential uses. The site is currently vacant. The area south of Sing Sing Kill is mostly covered with asphalt and concrete pads. The area north of the Sing Sing Kill is mostly covered with asphalt.

Past Use of the Site

Lot 26

Sanborn maps between January 1881 and August 1924 reveal multiple buildings were present on this small lot. Historical documents are unclear about the use of these buildings, but these buildings were likely ancillary buildings for the Manufactured Gas Plant (MGP) operations as Consolidated Edison's predecessors, Northern Westchester Lighting Company and then Westchester Lighting Gas Manufacturing Co., appear to have commenced ownership of this lot in 1860. Consolidated Edison sold this lot, and the remaining lots that make up the site, to the Village of Ossining in late 1957. The lot appears to have remained vacant until 1971, when a portion of a building is present on the lot, the remaining portion of the building was present on Lot 27. Historic documents suggest the building appears to have been used originally for truck repair by the Ossining Department of Public Works (ODPW) as of 1971, then for truck and general equipment storage later.

Lot 27

In 1868, the Issac Terwillinger Sash and Blind Shop occupied the lot. Historical documentation is unclear as to the exact nature of this business, but later occupants suggest the business may have been associated with the lumber yard present on the lot from approximately July 1886 until August 1924. The name of the company also suggests that it was a lumber-based operation to make windows and doors. Records indicate the sale from Anna Terwillinger to Northern Westchester Lighting Company occurred in Fall of 1923. Between 1930 and 1942, based on Sanborn maps, multiple buildings, gas holders, and oil tanks were present on the lot. Some of the buildings were used for storage related to the production of manufactured gas. In 1949, no buildings remained on the lot, and by 1954, all above ground portions of all gas holders and tanks were removed from this lot. New buildings were present on the lot in 1960, and in 1971, a portion of a building was present on the lot with the other portion of the building on lot 26. As of 1971, the lot appears to be operated by the ODPW for truck repair, storage, and general storage. In May 2002, the lot contained two adjacent truck repair/storage buildings and associated paved areas. Road salt was stored on the lot during winter months. Historically, there was a petroleum bulk storage (PBS) facility used by ODPW to fuel vehicles that was present on this lot, based on interviews with ODPW staff who recalled the location of the fueling facility. The PBS facility was closed in 2005 according to closure documentation from Westchester County.

Lot 28

Lot 28 was historically occupied by Ossining Heat, Light and Power Company and Sing Sing Gas Manufacturing Company dating back as far back as of 1901 and then later by Northern Westchester Lighting Company and Westchester Lighting Gas Manufacturing Co., the predecessors of Consolidated Edison of New York, Inc., which conducted MGP operations from approximately the mid-1800's until 1929. During that period, the MGP experienced changes in the type and size of production. Maps from January 1881 until November 1897 show the operation initially consisted of a single gas holder as well as a coal gas production building. Over time, additional gas holders and buildings were added

to this lot. On-site buildings contained retorts, purification facilities, boilers, gas meters, generator houses, and storage tanks. Other buildings were used as tenement buildings, a carpenter shop, dwellings, storage, and other miscellaneous uses associated with the MGP. In 1901, the MGP began producing carbureted water in conjunction with coal gas production. In 1904, the operations transitioned into carbureted gas production exclusively. In 1926, the MGP was placed on standby. Between 1926 and 1942, some of the on-site buildings were removed. In 1943, the MGP retired from service and other portions of the MGP were removed after this time. In 1959, the buildings remaining on the lot were switched to natural gas. Maps from 1971 depict multiple small buildings on this lot but then later all buildings were demolished, and this lot was mostly paved. The lot is currently vacant.

Lot 29

Between January 1881 and August 1924, multiple buildings were present on this lot. The deed suggests Northern Westchester Lighting Company acquired lot 29 in early 1922. Historical documents are unclear about the use of these buildings. The known occupants during that period (Terwilliger & Allison Gasn. Doors) suggest that the buildings were associated with the lumber yard operations present on Lot 27. The lot is depicted as vacant between 1924 and 1949. The lot was later used by the ODPW for storage.

Site Geology and Hydrogeology

Surface elevations at the site range from approximately 15 feet above mean sea level (amsl) along North Water Street to 50 feet amsl along Main Street. Site soils consist of a 2 to 18-foot-thick fill layer consisting of reworked soil and fill with building remnants, underlain by areas of a sand and gravel layer, silt and clay/peat layer, and/or glacial deposits, all ranging in thickness from 8 to 28 feet. Bedrock, classified as metamorphic schist, is present at depths ranging from 15 feet-below ground surface (ft-bgs) to greater than 40 ft-bgs. There are outcroppings of exposed bedrock in several locations on the site.

Groundwater was encountered at the site between 5 and 8 ft-bgs. Groundwater flows west-southwest towards the Hudson River. Most on-site surface drainage currently flows to the Sing Sing Kill, which flows through the site about 5 feet lower than the surrounding asphalt cover.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives which restrict the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) were evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Applicant does not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

In August 2002, Consolidated Edison entered into a multi-site Voluntary Cleanup Agreement Con Edison VCA), Index No. D2-0003-02-08 to remediate a number of its predecessors; former MGP sites. The former Ossining Gas Works Site Operable Units OU) 1-3 was identified in the Con Edison VCA as DEC Site No. V00568. In 2018, as was done statewide for all VCAs, the Con Edison VCA was terminated. The Con Edison VCA was replaced by a multi-site Consent Order (Consent Order No. 0-20180516-519), with the former Ossining Gas Works Site identified as Site No. 360172 in the Order. Pursuant to terms in the Order, as amended in 2021, Consolidated Edison is permitted to request the DEC terminate the Order with respect to the portion of OU-1 that constitutes the BCP Site, as shown in the Survey in Exhibit B, in order to allow the remediation of this portion of OU-1 to proceed through the BCP, which will facilitate a remedy in conjunction with the Requestor's proposed development plan. The remaining portions of the former Ossining Gas Works Site No. 360172, including the portion of OU-1 that is not part of the BCP Site and is still owned by Consolidated Edison, and OU-2 all remain subject to the Consent Order, with OU-3 previously redeveloped under the BCP.

SECTION 6: SITE CONTAMINATION

6.1: <u>Summary of the Remedial Investigation</u>

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or wastes identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- sediment
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: <u>http://www.dec.ny.gov/regulations/61794.html</u>

6.1.2: <u>RI Results</u>

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminants of concern identified at this site are:

polycyclic aromatic hydrocarbons (PAHS), total	chrysene
coal tar	cyanides(soluble cyanide salts)
benzene, toluene, ethylbenzene and xylenes (BTEX)	1,3,5-trimethylbenzene
naphthalene	1,2,4-trimethylbenzene
acenaphthene	benzo(k)fluoranthene
benzo(a)anthracene	mercury
benzo(a)pyrene	arsenic
benzo(b)fluoranthene	lead
dibenz[a,h]anthracene	phenanthrene
indeno(1,2,3-cd)pyrene	fluorene
pyrene	phenol

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Soil, sediments, groundwater, and soil vapor samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyl (PCBs), pesticides, per- and polyfluoroalkyl substances (PFAS), and cyanide. Based upon these investigations, the primary contaminants of concern are VOCs and SVOCs in soil, groundwater, and soil vapor.

Soil:

MGP coal tar in the form of non-aqueous phase liquid (NAPL) was observed in soils and at the top of bedrock adjacent to the Sing Sing Kill and the former gas holders, ranging from 5 to 47-feet below ground surface (bgs).

Benzene was detected in soil at concentrations up to 1,600 ppm, exceeding the restricted residential soil cleanup objective (RRSCO) of 4.8 ppm and the protection of groundwater SCO (PoGWSCO) of 0.06 ppm; toluene was found as high as 3,000 ppm, exceeding the RRSCO of 100 ppm and the PoGWSCO of 1 ppm; ethylbenzene was found as high as 3,500 ppm, exceeding the RRSCO of 41 ppm and PoGWSCO of 1 ppm; total xylene was found as high as 3,400 ppm, exceeding the RRSCO of 100 ppm and the PoGWSCO of 100 ppm and the PoGWSCO of 1.6 ppm.

1,3,5-trimethylbenzene was detected up to 61 ppm and 1,2,4-trimethylbenzene was detected up to 190 ppm, exceeding the RRSCO of 52 ppm for both compounds, as well as their respective PoGWSCOs of 8.4 ppm and 3.6 ppm.

Total polycyclic aromatic hydrocarbon (PAH) contamination was detected up to 6,280 ppm. Naphthalene was detected up to 6,500 ppm, exceeding the RRSCO of 100 ppm and PoGWSCO of 12 ppm. Benzo(a)anthracene was detected up to 65 ppm, exceeding the RRSCO and PoGWSCO of 1 ppm. Benzo(a)pyrene was detected up to 51 ppm, exceeding the RRSCO of 1 ppm and the PGWSCO of 22 ppm. Benzo(b)fluoranthene was detected up to 60 ppm, exceeding the RRSCO of 1 ppm and the PGWSCO of 1 ppm and the PoGWSCO of 1.7 ppm. Benzo(k)fluoranthene was detected up to 16 ppm, exceeding the RRSCO of 3.9 ppm and PoGWSCO of 1.7 ppm. Chrysene was detected up to 57 ppm, exceeding the RRSCO of 3.9 ppm and PoGWSCO of 1 ppm. Dibenzo(a,h)anthracene was detected up to 7 ppm, exceeding the RRSCO of 0.33 ppm. Indeno(1,2,3-cd)pyrene was detected up to 36 ppm.

Total mercury was detected up to 2.3 ppm, exceeding the RRSCO of 0.81 ppm. Total arsenic was detected up to 31.5 ppm, exceeding the RRSCO of 16 ppm.

Cyanide was detected in only one location at 46 ppm, exceeding the RRSCO of 27 ppm and the PoGWSCO of 40 ppm.

Pesticides and PCBs were not detected above their RRSCOs.

PFAS was not detected in soil samples.

Based on the available environmental data, there are no off-site impacts in soil related to this site.

Groundwater:

VOCs, SVOCs, metals, cyanide, and PFAS were detected in groundwater above the ambient water quality standards (AWQS).

Benzene was detected up to 7.9 parts per billion (ppb), exceeding the AWQS of 1 ppb, ethylbenzene was detected up to 100 ppb, total xylenes were detected up to 55 ppb, isopropylbenzene was detected up to 7.3 ppb, 1,3,5 trimethylbenzene was detected up to 9.9 ppb, and 1,2,4 trimethylbenzene was detected up to 36 ppb, all exceeding their AWQS of 5 ppb. Naphthalene was detected up to 1,200 ppb, exceeding the AWQS of 10 ppb.

Acenaphthene was detected up to 140 ppb, exceeding the AWQS of 10 ppb. Benzo(a)anthracene was detected up to 22 ppb, benzo(a)pyrene was detected up to 16 ppb, benzo(b)fluoranthene was detected up to 11 ppb, benzo(k)fluoranthene was detected up to 13 ppb, and indeno(1,2,3-cd)pyrene was detected up to 7.2 ppb, all exceeding the AWQS of 0.002 ppb. Fluorene was detected up to 66 ppb, exceeding the AWQS of 50 ppb. Phenanthrene was detected up to 150 ppb and pyrene was detected up to 68 ppb, both exceeding the AWQS of 50 ppb. Phenol was detected up to 4.6 ppb, exceeding the AWQS of 1 ppb.

Total cyanide was detected up to 435 ppb, exceeding the AWQS of 200 ppb. Lead was detected up to 81.58 ppb, exceeding the AWQS of 25 ppb.

PFAS, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported at concentrations of up to 104 and 83.9 parts per trillion (ppt), exceeding the 6.7 ppt and 2.7 ppt respective water quality guidance values. 1,4-dioxane was detected up to 0.062 ppb, which is below the 0.35 ppb water quality guidance value.

Pesticides and PCBs were not detected above their AWQS.

Based on the available environmental data, groundwater contamination will likely migrate off-site, west-southwest, until the source area of the contamination is remediated.

Soil Vapor:

In November 2019, soil vapor intrusion samples (i.e., collocated indoor air and sub-slab samples) were collected from off-site locations, and later in June 2021, additional soil gas samples were collected on-site.

During the 2019 off-site soil vapor intrusion sampling event, benzene was detected in sub-slab and indoor air samples up to 5.8 micrograms per meter cubed (ug/m3) and 0.83 ug/m3, respectively. Toluene was detected in sub-slab and indoor air samples up to 10 ug/m3 and 5.2 ug/m3, respectively. Ethylbenzene was detected in sub-slab and indoor air samples up to 6.6 ug/m3 and 0.72 ug/m3, respectively. Total xylene was detected in indoor air and sub-slab samples up to 34.1 ug/m3 and 3.55 ug/m3, respectively. Tetrachloroethene (PCE) was detected in sub-slab and indoor air samples up to 18 ug/m3 and 0.18 ug/m3, respectively. Trichloroethene (TCE) was detected in sub-slab samples up to 0.29 ug/m3 and not present in indoor air samples. Cis-1,2-dichloroethene (DCE) was detected in sub-slab samples. Vinyl chloride was not detected in sub-slab or indoor air samples. When this data is compared to the NYS Department of Health Soil Vapor Intrusion Guidance Values, no further action is recommended.

Based upon the June 2021 sampling event, PCE was detected in soil gas samples, not collected from beneath a building slab, up to 116 micrograms per meter cubed (ug/m3) near the northwest property boundary. TCE was detected up to 12.7 ug/m3, DCE was detected up to 99.5 ug/m3, and vinyl chloride was detected up 246 ug/m3 in soil gas samples not collected from beneath a building slab. TCE, DCE and vinyl chloride were detected in a soil gas sample collected from the former south building footprint, this sample was collected from a central location on-site and not near the site perimeter and was not a sub-slab sample.

During the on-site sampling event, benzene was detected up to 191 ug/m3, toluene was detected up to 104 ug/m3, ethylbenzene was detected up to 23.3 ug/m3, and total xylene was detected up to 169.1 ug/m3 in soil gas samples. All detections were from samples

collected along the south and southwest perimeter of the site and not collected from beneath a building slab.

Based on the environmental data from the off-site samples collected in November 2019, soil vapor intrusion from site contamination is not a concern for off-site buildings.

Sediments:

Total polycyclic aromatic hydrocarbons (PAHs) were detected up to 7,270 ppb, exceeding the Class B sediment guidance value of 4,000 ppb.

Based upon an assessment completed by Fish and Wildlife, the detections of PAHs in off-site sediments are within an acceptable range to be addressed by natural attenuation and do not require additional remedial action.

6.4: <u>Summary of Human Exposure Pathways</u>

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Site access is restricted by fencing. In addition, a majority of the site is covered by either asphalt or structure foundations so contact with contaminated soils is not likely. Drinking contaminated groundwater is not expected because the area is served by public water. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern, however, may be a potential concern for future on-site buildings. Environmental sampling indicates soil vapor intrusion from site contamination is not a concern for off-site buildings.

6.5: <u>Summary of the Remediation Objectives</u>

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

<u>Soil</u>

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

<u>Soil Vapor</u>

RAOs for Public Health Protection

• Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Soil Excavation, ISS, NAPL Recovery, MNA, Site Cover and Site Management remedy.

The elements of the selected remedy, as shown in Figures 2.1 - 2.4, are as follows:

1. Green Remediation/Remedial Design

A remedial design program will be implemented to provide the details necessary for the

construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise[™] (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

All soils in the upper two feet which exceed the restricted residential or protection of groundwater soil cleanup objectives (RRSCOs or PoGWSCOs) will be excavated and transported off-site for disposal.

All on-site soils below two feet in areas which are not part of the in-situ solidification (ISS) treatment, as described in remedial element 5, which exceed the PoGWSCOs will be excavated and transported off-site for disposal. Approximately 440 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that soil cleanup objectives (SCOs) for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify the Department, submit the sample results and, and in consultation with the Department, determine if further remedial excavation is necessary. Excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

Excavation of site soils to a depth of 5 feet below grade will be completed in portions of the site to accommodate the ISS treatment described in remedy element 5. Approximately 8,600 cubic yards of soil will be excavated to facilitate ISS implementation. All soils excavated within the ISS treatment areas which exceed RRSCOs or PoGWSCOs will be disposed of off-site at a permitted facility.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, regulations, and facility-specific permits.

3. Backfill

On-site soil which does not exceed the RRSCOs or PoGWSCOs may be used below the cover system described in remedy element 4 to backfill the excavation to the extent that a sufficient volume of on-site soil is available. This material should not be used within 1 foot of the groundwater table.

Backfill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

The site will be re-graded to accommodate installation of a cover system as described in remedy element 4.

4. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will

exceed the RRSCOs, to allow for future restricted residential use of the site. Where a soil cover is to be used, it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil to ensure the underlying monolith remains below the frost line and protected from the freeze-thaw cycle. A building and its foundation are considered suitable cover to protect the ISS monolith. Where a building and its foundation are considered part of the site cover, the ISS design should include considerations for drainage between the ISS and building foundation and the potential need to design the ISS for a higher strength. If the ISS monolith extends beyond the building footprint, the design shall include a soil cover consisting of a minimum of four feet of soil for that portion. Consistent with the remainder of the site cover, the upper two feet will meet the SCOs for restricted residential use outside the ISS monolith area. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

5. In-Situ Solidification

ISS will be implemented in areas as indicated on Figure 2.1, with the final extent of ISS to be confirmed during the design phase of the remedy. An approximately 5-foot soil cut will need to be excavated in the areas ISS will be applied to contain the ISS spoils and increased soil volume created by the soil mixing. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying reagents or other binding reagents using an excavator or augers. Often Portland Cement is used as the primary binder, although less carbon-intensive amendments will be considered. The soil and binding reagents are mixed to produce a solidified mass resulting in a low permeability monolith. Prior to the full implementation of this technology, bench-scale laboratory testing and on-site pilot scale studies will be consist of collecting soil from source area and mixing with a variety of amendments and doses in a controlled atmosphere followed by testing resulting hydraulic conductivity and unconfined-compressive strength. Pilot tests will then be conducted using successful amendment mixes from the bench test prior to full scale design.

Typical design requirements are that solidified mass would produce a hydraulic conductivity (K) of 1.0 X 10-6 cm/sec or less and would also result in an unconfined compressive strength of 50 psi, or higher for areas that will be below the planned building development. The solidified mass will then be covered with a cover system as described in remedy element 4 to prevent direct exposure to the solidified mass. The resulting solid

matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

6. Coal Tar Recovery

Installation and operation of coal tar recovery wells is planned along the western site boundary and north of the Sing Sing Kill west of the former gas holder footprint to remove potentially mobile coal tar from the subsurface. Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they may be converted to automated collection.

7. Monitored Natural Attenuation

Groundwater contamination remaining after active remediation detailed in remedy element 2 and remedy element 5 will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and for MNA indicators, which will provide an understanding of the biological activity breaking down the contamination. Reports of the attenuation will be provided at 5 and 10 years, and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property designated by the non-roadway tax parcel which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property, defined by the tax parcel, for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

9. Site Management Plan

A Site Management Plan is required, which includes the following:

a. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: Environmental Easement and all local use restrictions discussed in remedy element 8 above, and

Engineering Controls: The cover system as discussed in remedy element 4, coal tar recovery wells as discussed in remedy element 6, and monitoring wells.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision should redevelopment occur to ensure no soil exceeding PoGWSCOs will remain below storm water retention basin or infiltration structures;
- descriptions of the provisions of the environmental easement including any land use, groundwater, or surface water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of coal tar recovery well performance to assess the performance and effectiveness of the remedy;
- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a contingency to address contamination should the rate of coal tar recovery be unsatisfactory; and
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system. The plan includes, but is not limited to:

- procedures for operating and maintaining the system; and
- compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.



Site No. C360172 Ossining Gas Works DPW Site Ossining, Westchester, NY

190 380

95

0



							JMR	by
	LEGEND:	OPERABLE UNIT OUTLINE EXISTING STRUCTURE WATER TREE HISTORICAL MGP STRUCTURE ISS TREATMENT AREA AND DEPTH FROM EXISTING GRADE (FT)	APG	CCM		DTED	224	rev date description
		POST REMEDIATION MONITORING WELLS - PROPOSED LOCATION	by:	by:		e: AS NO	: 11/19/20	
A MAIN							959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050	
				OSSINING, NY		14 166 15S TREATMENT PLAN		
			dra		10.	2	.1	



LEGEND: OPERABLE UNIT OUTLINE EXISTING STRUCTURE WATER mmmmm TREE HISTORICAL MGP STRUCTURE EXCAVATION AREA AND DEPTH FROM EXISTING GRADE (FT) 5.0' ISS TREATMENT AREA WITH INITIAL 5' EXCAVATION FROM EXISTING GRADE (FT) _____ 16' BCP BOUNDARY MAN

	GEOTECHNICAL ENVIRONMENTAL SITE CIVI 959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9056
PROPOSED RESIDENTIAL DEVELOPMENT OSSINING DPW SITE OSSINING, NY	e: EXCAVATION PLAN
job no. drawing no	± 11498



© SESI CONSULTING ENGINEERS 2025 This drawing and all information contained here on is proprietary information of SESI CONSULTING ENGINEERS and may not be copied or reproduced, either in whole or in part, by any method, without written permission of SESI CONSULTING ENGINEERS.

REFERENCE

SITE AND PROPOSED BUILDING LAYOUT TAKEN FROM "ALTERNATIVE ANALYSIS REPORT" PREPARED BY ARCADIC DESIGN AND CONSULTANCY.

	dwg by: AG chk by: FD scale: AS NOTED date: 2/14/2025	
ID: TAINING WALL ITER P BOUNDARY ISTING LANDSCAPE ISTING ROCK ILDING RD SURFACE REAM	SECTION AND A CONSULTING ENGINEERS GEOTECHNICAL ENVIRONMENTAL SITE CIVIL 959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050	
SCALE: 1"=80'	project: PROPOSED RESIDENTIAL DEVELOPMENT OSSINING DPW SITE OSSINING, NY itle: COMBINED COVER SYSTEM PLAN	
0 80 160	job no: <u>11498</u> drawing no: FIG-2.3	
	1 of 1	



\ENVIRONMENTAL BASE\DECISION DOCUMENTS\11498.DWG.BASE NAPL RECOVERY.DWG 02/20/25 04:22:11PM, alan.ward, LAYOUT.GI

CAD\11498\CAD\ENVIRONMENTAL BASE\DECISION