DECISION DOCUMENT

Ekonol Polyester Resins
Brownfield Cleanup Program
NIAGARA FALLS, Niagara County
Site No. C932173
March 2025

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

DECLARATION STATEMENT - DECISION DOCUMENT

Ekonol Polyester Resins
Brownfield Cleanup Program
NIAGARA FALLS, Niagara County
Site No. C932173
March 2025

Statement of Purpose and Basis

This document presents the remedy for the Ekonol Polyester Resins site a 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 (NYSDEC) for the Ekonol Polyester Resins site and the public's input to the proposed remedy presented by NYSDEC.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. 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 GSR 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, including maximizing the planting of trees, shrubs, and other carbon dioxide sinks in redevelopment;
- 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 GSR 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.

To evaluate the remedy with respect to GSR principles as part of the remedial design program, a BMP assessment and an environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise (TM) (available in the Sustainable Remediation Forum [SURF] library), or a similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use estimation, and goals for the project related to these GSR metrics, as well as goals 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, including implementation of BMPs, to achieve the GSR goals. Further, progress with respect to GSR 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. Cover System: A site cover exists and will be maintained to allow for industrial use of the site. Any site redevelopment will maintain the existing site cover, which currently consists of pavement and concrete. Where a soil cover is to be used it will be a minimum of one foot 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).

3. Enhanced Bioremediation: Continued operation, maintenance, and monitoring of the on-site passive bioreactor wall to treat chlorinated VOCs in overburden groundwater. This wall was installed in 2011 under the Voluntary Cleanup Program and is described in Section 3.

In-situ enhanced biodegradation will be employed on-site to treat chlorinated VOCs in upper bedrock groundwater at selected bedrock injection wells. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the injection of a soluble organic carbon substrate. The appropriate bioremediation amendment and method of injection will be determined during the remedial design.

Groundwater contamination of the on-site and off-site plume will be monitored for site related contamination and also for natural attenuation indicator parameters that will provide an understanding of the biological activity breaking down the contaminants. 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, but it is currently anticipated that injections within the on-site and off-site plume would be the expected contingency remedial action.

4. Vapor Mitigation: Continued operation of the off-site sub-slab depressurization system in the St. Gobain office area to prevent the migration of sub-slab soil vapor from soil and groundwater into the building. This system was installed in 2010 under the Voluntary Cleanup Program and is described in Section 3.

5. Institutional Controls: Imposition of an institutional control in the form of an Environmental Easement for the controlled property that will:

(a) Require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
(b) Allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
(c) 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
(d) Require compliance with the NYSDEC approved Site Management Plan.

6. 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 engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in Paragraph 5 above; and
- Engineering Controls: The site cover system discussed in Paragraph 2 above, the passive bioreactor wall discussed in Paragraph 3 above, and the sub-slab depressurization system discussed in Paragraph 4 above.

This plan includes, but may not be limited to:

- An Excavation Plan that details the provisions for management of future excavations in areas of remaining contamination;
- A provision for the evaluation of the potential for soil vapor intrusion for any buildings occupied or constructed on-site or in off-site areas affected by site contaminants, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- Descriptions of the provisions of the Environmental Easement including any land use and groundwater use restrictions;
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and NYSDEC notification; and
- The steps necessary for periodic reviews and certification of the institutional and 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 sub-slab soil vapor, indoor air and/or sub-slab pressure testing to assess the performance and effectiveness of the sub-slab depressurization system, and groundwater monitoring of the on-site and off-site plume to assess the effectiveness of in-situ groundwater treatment. Enhancements to the sub-slab depressurization system and additional groundwater injections will be completed as necessary;
- Monitoring for soil vapor intrusion for any buildings occupied or constructed on-site or in off-site areas affected by site contaminants, as may be required by the Institutional and Engineering Control Plan discussed above; and
- A schedule of monitoring and frequency of submittals to the NYSDEC.

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

- Procedures for operating and maintaining the remedy;
- Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- Maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC access to the site and O&M records.

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.

michael cruden Digitally signed by michael cruden Date: 2025.03.31 09:02:33 -04'00'

Date

Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

Ekonol Polyester Resins
NIAGARA FALLS, Niagara County
Site No. C932173
March 2025

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (NYSDEC), 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/or 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.

NYSDEC 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

NYSDEC 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 NYSDEC 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=C932173

Niagara Falls Public Library
Attn: Sarah Potwin
1425 Main Street
Niagara Falls, NY 14303
Phone: (716) 286-4911

Receive Site Citizen Participation Information By Email

Please note that NYSDEC'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

Location:
The 1.006-acre Ekonol Polyester Resins site is located within an operating facility at 6600 Walmore Road in the Town of Wheatfield, Niagara County. It is a portion of a larger 55.1-acre property (parent property) that is bordered by the Niagara Falls Air Reserve Station to the north, Walmore Road and vacant land to the east, the former Bell Aerospace - Textron (932052) facility and Niagara Falls Boulevard (NYS Route 62) to the south and the Niagara Falls International Airport to the west. The Niagara River is located approximately three miles south of the site.

Site Features:
The site is located immediately south of the Ekonol Polyester Resins Building 4, which is located on the northeastern portion of the parent property. The site surface is currently asphalt and concrete and has been primarily used for parking and equipment storage for the nearby manufacturing facility. The topography of the site is relatively flat.

Current Zoning and Land Use:
The parent property is zoned for industrial use and is an active manufacturing facility. Building 4, adjacent to the BCP Site, is used for storage, manufacturing and offices. The main building of the parent property is used for manufacturing. Residential properties are located southeast of the parent property, while commercial properties are located east of Walmore Road. The active Niagara Falls International Airport and the Niagara Falls Air Reserve Station are adjacent to the parent property to the west and north.

The reasonably anticipated future use of the site is industrial/manufacturing.

Historic Uses:
The off-site Building 4 was historically (and is currently) used for production of a polyester resin that is used as a spray-on coating for turbine engines. The Carborundum Company opened operations at the polyester resins facility in May 1963. A series of corporate ownership changes (sales and mergers) occurred over the next several decades, including sale of the property at 6600 Walmore Road. Operations of the polyester resins facility was maintained by the Carborundum Company (operating as a subsidiary under the umbrella of British Petroleum) up until 1996 when operations were sold to Saint-Gobain, the current operator.

An approximately 7800-gallon underground concrete tank was utilized by the Ekonol Polyester Resins facility from the mid-1970s through 1999 for the collection of wastewater rinsate from the floor drains inside the process area of the plant. This tank was constructed of reinforced concrete walls, approximately 9.5 inches thick, and was approximately 18 feet long, 6 feet wide, and 9 feet deep. This tank was removed in October 1999 under NYSDEC oversight. During tank removal, trichloroethene in soil was detected at concentrations ranging from 1.2 to 200 parts per million (ppm), while cis-1,2-dichloroethene concentrations ranged from 2.9 to 100 ppm. Phenols were detected at concentrations ranging from 4.5 to 12.0 ppm.

Following tank removal, additional excavation was completed under NYSDEC oversight to remove contaminated soils surrounding the tank. Approximately 180 cubic yards of material were removed from an excavation that was approximately 29 feet long, 16 feet wide and 12.7 feet deep (top of the bedrock surface).

Remedial History:
In 2000, a Phase I Site Characterization Study was completed to determine the extent of organic compounds and metals in soil and groundwater in the vicinity of the former tank. Soil borings, soil sampling, temporary well installations, and groundwater sampling were completed during this study. Analytical results indicated that soil and groundwater was contaminated with volatile organic compounds (VOCs) and phenols.

In 2001, a Phase II Site Characterization Study was completed to address NYSDEC comments on the Phase I Site Characterization Report. Soil borings, soil sampling, overburden and bedrock well installation, and groundwater sampling were completed during this study. Analytical results did not document additional soil contamination, while groundwater (overburden and bedrock) was contaminated with VOCs and phenols.

Based upon these two studies, BP America Inc., a former owner of Ekonol, applied to NYSDEC's Voluntary Cleanup Program (VCP) in April 2003 and was accepted into the program in September 2003.

In 2003, a Phase III Site Characterization Study was completed and included bedrock well installation, packer testing, and groundwater sampling to investigate impacts to groundwater in bedrock. The results indicated that the groundwater plume was defined to the north, west, and northeast, but that additional data was needed to the east across Walmore Road and to the south within the parent property boundary.

In 2004, a Supplemental Phase III Site Characterization Study was completed and included installation of temporary off-site bedrock wells, installation of two additional off-site groundwater wells, and two rounds of groundwater sampling from all site related wells.

In July 2006, the NYSDEC approved the Remedial Alternatives Report. This report recommended in situ injections of either emulsified zero valent iron (EZVI) or other compounds for treatment of groundwater within the fractured bedrock. Bench scale testing using bedrock cores was conducted in 2006 and 2007. In June 2007, a report was issued that indicated successful treatment of site contaminants with an emulsified carbon substrate (vegetable oil). In

August 2007, a pilot study work plan was approved by the NYSDEC for the injection of the carbon substrate, followed by injections of commercially available bacteria (bio-augmentation) to further degrade the bedrock groundwater contaminants. The Pilot Study was performed in 2008, and subsequent groundwater performance monitoring was conducted in 2008 and 2009.

In 2009, the property owner completed a soil vapor intrusion investigation in the office area of the adjacent St. Gobain building, which was located adjacent to the VCP site. This investigation identified tetrachloroethene in sub-slab soil vapor that required mitigation due to the potential threat of vapor intrusion. In the Fall of 2010 the applicant installed a sub-slab depressurization system (SSDS) consisting of one suction point centrally located within the office area of the St. Gobain building. The SSDS began operation in November 2010 and has operated continuously since that time.

In 2010, the NYSDEC drafted a Proposed Decision Document under the VCP that proposed a remedy for the site that included a passive bioreactor for the treatment of overburden groundwater by enhancing the degradation of the contaminants. The trenches were designed to create a preferential pathway for overburden groundwater flow with groundwater-mulch contact enhancing natural biodegradation of site contaminants. The proposed remedy for bedrock groundwater included injections of emulsified vegetable oil into the bedrock aquifer, with long-term groundwater monitoring to assess if additional injections were necessary.

The Proposed Decision Document was never issued as the VCP applicant elected to complete the proposed remedy as Interim Remedial Measures (IRMs). The IRMs were implemented in overburden and bedrock between 2010 and 2011.

In 2012, a Construction Completion Report was prepared for the overburden bioreactor and bedrock enhanced reductive dechlorination IRMs. The report was prepared in accordance with DER-10, was submitted to NYSDEC, and was approved.

Following completion of the IRMs, long-term groundwater monitoring was completed, and performance monitoring reports were prepared from 2012 through Spring 2018. The VCP was terminated, however, before the project could be completed, and the site transitioned into the BCP at that time.

The BCP Remedial Investigation (RI) was completed in 2020. The Final RI Report was submitted in December 2021 and has been approved. The draft Alternatives Analysis Report (AAR) was submitted in April 2024.

Geology and Hydrogeology:
The site is underlain by approximately 12 to 14 feet of unconsolidated materials consisting of a thin layer of fill overlying native reddish-brown silts and clays. Fine to coarse sand and fine to coarse gravel was found at the interface with the bedrock surface. South of the BCP Site, unconsolidated material ranges up to 18.7 feet in thickness.

Depth to overburden groundwater at the site ranges from 1.37 feet to 11.59 feet below ground surface (bgs). Overburden groundwater flow is to the south-southwest toward the Niagara River.

Bedrock at the site was encountered at depths ranging from 12.5 to 18.7 feet bgs and consists of light to dark gray dolostone of the Lockport Group. This formation is consistent throughout its thickness and contains many weathered bedding planes. A fracture/rubble zone was encountered at depths ranging from 20.25 feet to 29.70 feet bgs.

Depth to upper bedrock groundwater at the site ranges from 5.53 feet to 12.62 feet bgs. Bedrock groundwater flows primarily through the nearly horizontal bedding plane fractures. The regional groundwater flow direction is to the south-southwest. However, at the site upper bedrock groundwater flow is to the south-southeast with mounding observed over the area of the former tank, likely in response to more rapid recharge of upper bedrock groundwater through the more permeable backfill of the former tank area.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

NYSDEC 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 (or an alternative) that restrict(s) the use of the site to industrial use as described in Part 375-1.8(g) were/was 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 Participant. The Applicant has an obligation to address on-site and off-site contamination. Accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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 waste(s) 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
- indoor air
- sub-slab 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. NYSDEC 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: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

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 contaminant(s) of concern identified at this site is/are:

trichloroethene (TCE)	1,1,1-trichloroethane
1,2-dichloroethene	1,1-dichloroethane
vinyl chloride	phenol

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion
- indoor air

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.

During the Remedial Investigation completed under the BCP in 2018, samples for analysis were collected from subsurface soil, groundwater, indoor air, and outdoor air. Surface soil was not sampled since the entire site is paved. Subsurface soil (2.0-12.8 feet depth) was analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. Overburden and upper bedrock groundwater was analyzed for VOCs, SVOCs, pesticides, PCBs, metals, PFAS, and 1,4-dioxane. Indoor air and outdoor air were analyzed for VOCs. These investigations determined that chlorinated VOCs [trichloroethene (TCE), total 1,2-dichloroethene (DCE), vinyl chloride, 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA)], and phenol are the principal contaminants of concern at the site.

Remedial Investigation Results:

Subsurface Soil:
Twenty-nine (29) subsurface soil samples have been collected from the site. No concentrations of VOCs, SVOCs, pesticides, PCBs, metals, PFAS, or 1,4-dioxane exceeded the NYSDEC Part 375 Industrial Use Soil Cleanup Objectives. Three (3) VOCs and one (1) SVOC, however, exceeded the NYSDEC Part 375 Protection of Groundwater SCOs. These contaminants (with the number of exceedances, highest concentrations, Protection of Groundwater Soil Cleanup Objectives (PGWSCOs), and Industrial Use Soil Cleanup Objectives (ISCOs) are summarized as follows:

TCE (9 samples; 39.0 parts per million (ppm); PGWSCO = 0.47 ppm; ISCO = 300 ppm);
cis-1,2-DCE (17 samples; 290 ppm; SCO = 0.25 ppm; ISCO = 1,000 ppm);
VC (1 sample; 1.6 ppm; SCO = 0.02 ppm; ISCO = 27 ppm); and
Phenol (2 samples; 49.0 ppm; SCO = 0.33 ppm; ISCO = 1,000 ppm).

Overburden Groundwater:
Following the installation of the passive bioreactor in June 2011 to treat overburden groundwater contamination, thirty-three (33) overburden monitoring wells have been sampled to provide information related to the performance of the bioreactor. Twenty-two (22) sampling events have

been completed to date, the last occurring in September 2020 during the BCP Remedial Investigation. Eighteen (18) overburden groundwater samples were collected in 2020 from on-site and off-site wells to evaluate the effectiveness of the Overburden Groundwater IRM. The highest 2020 post-IRM concentrations of contaminants in overburden groundwater (with the number of exceedances, highest concentrations, and Groundwater Standards) include the following:

TCE (4 samples; 1,100 ug/L; Groundwater Standard = 5 ug/L);
cis-1,2-DCE (13 samples; 160,000 ug/L; Groundwater Standard = 5 ug/L);
trans-1,2-DCE (8 samples; 1,200 ug/L; Groundwater Standard = 5 ug/L);
1,1-DCA (1 sample; 15 ug/L; Groundwater Standard = 5 ug/L); and
Vinyl Chloride (14 samples; 14,000 ug/L; Groundwater Standard = 2 ug/L).

These results document a drastic reduction in contaminant concentrations throughout the overburden groundwater plume since the IRM was implemented, though several contaminants remain significantly above their Groundwater Standards. The highest concentrations of contaminants in post-IRM overburden groundwater were detected in wells closest to the former underground concrete tank, and progressively decreased in downgradient wells south of the source area. Overburden groundwater results also documented that off-site migration is occurring, although overburden groundwater contamination is confined to the parent property. As stated above, overburden groundwater flow is to the south-southwest toward the Niagara River.

Upper Bedrock Groundwater:
Following the completion of the upper bedrock injection program in June 2011 to treat upper bedrock groundwater contamination, forty-five (45) upper bedrock monitoring wells have been sampled to provide information related to the performance of the injections. Twenty-two (22) sampling events have been completed to date, the last occurring in September 2020 during the BCP Remedial Investigation. Twenty-five (25) upper bedrock groundwater samples were collected in 2020 from on-site and off-site wells to evaluate the effectiveness of the Upper Bedrock Groundwater IRM. The highest 2020 post-IRM concentrations of contaminants in upper bedrock groundwater (with the number of exceedances, highest concentrations, and Groundwater Standards) include the following:

TCE (15 samples; 21,000 ug/L; Groundwater Standard = 5 ug/L);
1,1,1-TCA (11 samples; 3,800 ug/L; Groundwater Standard = 5 ug/L);
cis-1,2-DCE (24 samples; 350,000 ug/L; Groundwater Standard = 5 ug/L);
trans-1,2-DCE (8 samples; 820 ug/L; Groundwater Standard = 5 ug/L);
1,1-DCA (13 samples; 600 ug/L; Groundwater Standard = 5 ug/L);
Vinyl Chloride (23 samples; 32,000 ug/L; Groundwater Standard = 2 ug/L); and
Phenol (4 samples; 6,000 ug/L; Groundwater Standard = 1 ug/L).

These results document a drastic reduction in TCE and 1,1,1-TCA concentrations with a concomitant increase in cis-1,2-DCE, 1,1-DCA and vinyl chloride, indicating that the parent products (TCE and 1,1,1-TCA) are breaking down into daughter products (DCE, DCA and vinyl chloride). The breakdown of the parent products, however, appears to be occurring more rapidly

than the breakdown of the daughter products. The highest concentrations of contaminants in post-IRM upper bedrock groundwater were detected in wells closest to the former underground concrete tank, and progressively decreased in downgradient wells south of the source area. Upper bedrock groundwater results also documented that off-site migration is occurring, although upper bedrock groundwater contamination is confined to the parent property. As stated above, upper bedrock groundwater flow is to the south-southeast with mounding observed over the area of the former tank.

Indoor and Outdoor Air:
A sub-slab depressurization system was installed in November 2010 within the office area of the St. Gobain building and has operated continuously since that time. In April 2021 two (2) indoor air samples from the office area of the St. Gobain building were collected with the SSDS running normally and analyzed for VOCs. TCE was the only chlorinated VOC detected in indoor air (with the number of detections and highest concentrations):

TCE (1 sample; 0.21 ug/m3).

In April 2021 one (1) outdoor air sample was also collected and analyzed for VOCs. No chlorinated VOCs were detected in this sample.

6.4: Summary of Human Exposure Pathways

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.*

Access to the property is restricted by a fence. People who enter the site may come into contact with site-related soil and groundwater contamination if they dig below the surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater and/or soil may move into the soil vapor (air spaces within the soil), which in turn may move into 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. A sub-slab depressurization system was installed in a portion of an off-site building to prevent vapors beneath the slab from entering the building. An evaluation of the potential for soil vapor intrusion to occur will be completed for the off-site areas or if the current use of the site changes.

6.5: Summary of the Remediation Objectives

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.
- Remove the source of ground or surface water contamination.

Soil

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.

Soil Vapor

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 Maintain IRMs, Maintain Site Cover, In-Situ Groundwater Treatment, MNA of Plume remedy.

The elements of the selected remedy, as shown in Figure 2, are as follows:

1. 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 GSR 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, including maximizing the planting of trees, shrubs, and other carbon dioxide sinks in redevelopment;
- 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 GSR 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.

To evaluate the remedy with respect to GSR principles as part of the remedial design program, a BMP assessment and an environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise (TM) (available in the Sustainable Remediation Forum [SURF] library), or a similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use estimation, and goals for the project related to these GSR metrics, as well as goals 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, including implementation of BMPs, to achieve the GSR goals. Further, progress with respect to GSR 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. Cover System: A site cover exists and will be maintained to allow for industrial use of the site. Any site redevelopment will maintain the existing site cover, which currently consists of pavement and concrete. Where a soil cover is to be used it will be a minimum of one foot 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).

3. Enhanced Bioremediation: Continued operation, maintenance, and monitoring of the on-site passive bioreactor wall to treat chlorinated VOCs in overburden groundwater. This wall was installed in 2011 under the Voluntary Cleanup Program and is described in Section 3.

In-situ enhanced biodegradation will be employed on-site to treat chlorinated VOCs in upper bedrock groundwater at selected bedrock injection wells. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the injection of a soluble organic carbon substrate. The appropriate bioremediation amendment and method of injection will be determined during the remedial design.

Groundwater contamination of the on-site and off-site plume will be monitored for site related contamination and also for natural attenuation indicator parameters that will provide an understanding of the biological activity breaking down the contaminants. 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, but it is currently anticipated that injections within the on-site and off-site plume would be the expected contingency remedial action.

4. Vapor Mitigation: Continued operation of the off-site sub-slab depressurization system in the St. Gobain office area to prevent the migration of sub-slab soil vapor from soil and groundwater into the building. This system was installed in 2010 under the Voluntary Cleanup Program and is described in Section 3.

5. Institutional Controls: Imposition of an institutional control in the form of an Environmental Easement for the controlled property that will:

(a) Require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
(b) Allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
(c) 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
(d) Require compliance with the NYSDEC approved Site Management Plan.

6. 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 engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in Paragraph 5 above; and

- Engineering Controls: The site cover system discussed in Paragraph 2 above, the passive bioreactor wall discussed in Paragraph 3 above, and the sub-slab depressurization system discussed in Paragraph 4 above.

This plan includes, but may not be limited to:

- An Excavation Plan that details the provisions for management of future excavations in areas of remaining contamination;
- A provision for the evaluation of the potential for soil vapor intrusion for any buildings occupied or constructed on-site or in off-site areas affected by site contaminants, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- Descriptions of the provisions of the Environmental Easement including any land use and groundwater use restrictions;
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and NYSDEC notification; and
- The steps necessary for periodic reviews and certification of the institutional and 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 sub-slab soil vapor, indoor air and/or sub-slab pressure testing to assess the performance and effectiveness of the sub-slab depressurization system, and groundwater monitoring of the on-site and off-site plume to assess the effectiveness of in-situ groundwater treatment. Enhancements to the sub-slab depressurization system and additional groundwater injections will be completed as necessary;
- Monitoring for soil vapor intrusion for any buildings occupied or constructed on-site or in off-site areas affected by site contaminants, as may be required by the Institutional and Engineering Control Plan discussed above; and
- A schedule of monitoring and frequency of submittals to the NYSDEC.

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

- Procedures for operating and maintaining the remedy;
- Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- Maintaining site access controls and NYSDEC notification; and
- providing the NYSDEC access to the site and O&M records.