

**FIFTH FIVE-YEAR REVIEW REPORT FOR
SOUTH JERSEY CLOTHING COMPANY AND GARDEN STATE CLEANERS SUPERFUND SITES
ATLANTIC COUNTY, NEW JERSEY**



Prepared by

**U.S. Environmental Protection Agency
Region 2
New York, New York**

JOHN PRINCE Digitally signed by JOHN PRINCE
Date: 2024.06.28 11:05:44 -04'00'

June 28, 2024

**Pat Evangelista, Director
Superfund and Emergency Management Division**

Date

Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS	2
I. INTRODUCTION	3
FIVE-YEAR REVIEW SUMMARY FORM	4
II. RESPONSE ACTION SUMMARY	4
Basis for Taking Action	4
Response Actions	5
<i>Remedy Selection</i>	5
Status of Implementation	6
System Operations/Operation and Maintenance	8
IC Summary Table	Error! Bookmark not defined.
III. PROGRESS SINCE THE LAST REVIEW	9
Progress Since Last Five-Year Review	9
IV. FIVE-YEAR REVIEW PROCESS	9
Community Notification, Involvement & Site Interviews	10
Data Review	10
Site Inspection	12
V. TECHNICAL ASSESSMENT	12
QUESTION A: Is the remedy functioning as intended by the decision documents?	12
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?	13
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?	14
Technical Assessment Summary	Error! Bookmark not defined.
VI. ISSUES/RECOMMENDATIONS	14
VII. PROTECTIVNESS STATEMENT	15
VIII. NEXT REVIEW	15
REFERENCE LIST	16
APPENDIX A	17
APPENDIX B.	22

LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
ERH	Electrical Resistivity Heating
FYR	Five-Year Review
GSC	Garden State Cleaners
GSC/SJCC	Garden State Cleaners/South Jersey Clothing Company
ICs	Institutional Controls
LTRA	Long Term Remedial Action
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
ROD	Record of Decision
RPM	Remedial Project Manager
SJCC	South Jersey Clothing Company
TBC	To be considered
TCE	Trichloroethylene
VOCs	Volatile Organic Compounds

I. INTRODUCTION

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

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

This is the fifth FYR for the South Jersey Clothing Company and Garden State Cleaners Superfund Sites (SJCC/GSC or sites). The triggering action for this policy review is the fourth FYR, which was signed on September 25, 2019. The FYR has been prepared due to the fact that the remedial action will not leave hazardous substances, pollutants or contaminants on the sites above levels that allow for unlimited use and unrestricted exposure but requires five or more years to complete. The sites consist of two operable units (OUs). OU1 is soils and OU2 is groundwater; however, only OU2 is subject to this FYR as the remedial goals for OU1 have been attained, thus allowing unlimited use/unrestricted exposure.

The South Jersey Clothing Company and Garden State Cleaners Superfund sites FYR was led by Brian Quinn, the Remedial Project Manager. Participants included Dr. John Mason, hydrogeologist; Dr. Lora Smith, human health risk assessor; Dr. Abigail DeBofsky, ecological risk assessor; and Natalie Loney, community involvement coordinator. The review began on October 30, 2023.

Site Background

The South Jersey Clothing Company (SJCC) site is a 1.2-acre property located on the northwest corner of Central and Atlantic Avenues in Minotola, Buena Borough, New Jersey, approximately 30 miles southeast of Philadelphia, Pennsylvania. SJCC was a dry cleaner that operated from the 1940s to the 1980s and is now bankrupt and no longer exists. A line of the Central Railroad of New Jersey runs adjacent to the northwest property boundary of SJCC.

The Garden State Cleaners (GSC) site is located on Summer Road, approximately 500 feet south of SJCC. From 1966 until 2011, GSC operated a dry-cleaning business on the property. The GSC building was demolished in 2011 and the property is vacant. The GSC property occupies an area of approximately 3,000 square feet.

The land hydraulically downgradient of the sites is occupied primarily by residences and small businesses. A recreational area lies adjacent to the Cleary Junior High School (Cleary School), located approximately 2,000 feet south of the sites. The land surrounding Buena Borough is primarily agricultural. Buena Borough is one of 56 South Jersey municipalities that are included within the New Jersey Pinelands National Reserve. Part of the borough is also included in the state-designated Pinelands Area. Currently, a groundwater extraction and treatment system is located on the former SJCC property.

FIVE-YEAR REVIEW SUMMARY FORM

II.

SITE IDENTIFICATION		
Site Name: South Jersey Clothing Company and Garden State Cleaners		
EPA ID: NJD980766828/NJD053280160		
Region: 2	State: NJ	City/County: Town of Minotola, Buena Borough, Atlantic County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Have the sites achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: State		
Author name (Federal or State Project Manager): Brian Quinn		
Author affiliation: EPA		
Review period: 10/30/2023 – 5/1/2024		
Date of sites inspection: 11/28/2023		
Type of review: Policy		
Review number: 5		
Triggering action date: 9/25/2019		
Due date (five years after triggering action date): 9/25/2024		

RESPONSE ACTION SUMMARY

Basis for Taking Action

On July 5, 1988, EPA sent a Special Notice letter to both SJCC and GSC notifying the companies of EPA’s intent to conduct the necessary remedial action/feasibility study (RI/FS). SJCC declined the opportunity to participate in the RI work and GSC did not reply to the notice letter. In November 1989, EPA began a federally funded RI/FS at the sites. These activities were combined due to the proximity of SJCC and GSC to one another. The purpose of the RI/FS was to determine the nature and extent of contamination associated with the sites.

RI fieldwork was conducted in two phases: from December 1989 through February 1990, and from January 1991 through April 1991. Phase I of the RI included primarily surface and subsurface soil sampling, shallow and intermediate monitoring well installation, and groundwater sampling. Phase II included shallow soil sampling, intermediate and deep monitoring well installation, and groundwater sampling activities.

The investigation revealed soil contamination extending from the northwest corner of the SJCC manufacturing building to the adjacent railroad bed. According to information obtained from New Jersey Department of

Environmental Protection (NJDEP) files, this was the same area where the wastes were reported to have been disposed.

In addition, EPA identified extensive volatile organic compound (VOC) contamination (primarily trichloroethylene (TCE) and tetrachloroethylene (PCE)) in the upper portion of the groundwater aquifer underlying the sites. This contamination was found to be migrating in a southeasterly direction approximately 3,500 feet from the sites, and downward into the intermediate-depth aquifer. A total of seven VOCs detected in the groundwater samples exceeded the state and federal maximum contaminant levels (MCLs) for drinking water.

A risk assessment was conducted and concluded that present and future risks associated with exposure to surface soils at the GSC property and future use of contaminated groundwater from the sites posed an unacceptable risk to human health. An environmental evaluation was also conducted as part of the baseline risk assessment. The evaluation concluded that the threat to biological resources posed by the sites appears to be minimal.

Response Actions

Remedy Selection

A Record of Decision (ROD) was issued by EPA on September 26, 1991. The following remedial action objectives (RAOs) were established for the sites:

- Restore the contaminated groundwater to levels below federal and state MCLs.
- Restore the groundwater to its beneficial use, which is a drinking water aquifer.
- Achieve cleanup levels of 1 part per million (ppm) each for PCE and TCE in contaminated soils on the sites.

These goals would be achieved by the following remedial action components:

- Extraction of contaminated groundwater above the cleanup standards;
- Treatment of the extracted groundwater via air stripping and carbon adsorption;
- ReInjection of the treated groundwater upgradient from the sites;
- Appropriate environmental monitoring to ensure the effectiveness of the remedy; and
- In-situ vapor extraction (SVE) of soil contaminated with VOCs.

A ROD Amendment was issued on September 29, 2010, to address continuing sources of groundwater contamination at the sites which were not sufficiently addressed during the previous remedial actions. The RAOs were maintained from the 1991 ROD for this amendment with the addition of one additional RAO:

- Reduce or eliminate further contaminant migration to the groundwater.

The major components of the amended remedy were:

- Excavation of contaminated soil, where practicable;
- In-situ treatment of deeper soil and clay lenses with technologies such as chemical oxidation or enhanced soil vapor extraction, when excavation is impracticable;
- Treatment of any volatile organic compounds removed by the in-situ treatment process at the on-site groundwater treatment plant, where appropriate; and
- Acquisition and demolition of a building at the Garden State Cleaners site.

In 2021, an explanation of significant differences (ESD) was signed to add a groundwater institutional control, in the form of a Classification Exception Area (CEA)/Well Restriction Area (WRA) to the OU2 remedy.

Status of Implementation

The remedial design (RD) and remedial action (RA) phases of the project were broken into operable units. The SVE soil remedy for the sites was designated as OU1 and the groundwater remedy as OU2.

SVE Remedy

Since SJCC had conducted a limited SVE remedy near a ruptured storage tank in 1989, the GSC SVE system was designed first. In August 1993, the U.S. Army Corps of Engineers (USACE) completed a design of a small-scale SVE system for the GSC site. Construction of the GSC SVE system was completed in spring 1994. The system operated from June 1994 through March 1995, when EPA determined that the cleanup goals for the GSC site were met. Remedy completion at the GSC site was documented with the approval of a Remedial Action Report on September 13, 1995.

Due to the similarity in soil conditions between the sites, USACE used the data obtained from the SVE system at GSC as the basis of design for the system at the SJCC. Construction activities at the SJCC were completed in 1999. The SVE system at SJCC operated from February 1999 through February 2001, when EPA determined that the soil cleanup goals for the SJCC site were met.

Groundwater Remedy

The design for the groundwater extraction and treatment system (OU2) was completed in August 1995. A Remedial Action contract was awarded on October 18, 1995 and work to demolish the SJCC building, to allow for treatment plant construction, was completed by May 1997. Construction of the groundwater treatment system was completed in January 1999, which included the installation and operation of a groundwater extraction, treatment and discharge system to remediate the groundwater contamination at the sites. As originally constructed, the system consisted of 15 extraction wells in the shallow and intermediate aquifer zones pumping at a rate of 510 gallons per minute (gpm) and 12 injection wells.

Remediation System Evaluation

To address the issues identified in the first FYR conducted in March 2004, EPA conducted a Remediation System Evaluation (RSE) at the sites. In April 2005, a RSE report was developed to evaluate ways to enhance remediation, improve reporting and data management. The RSE findings included the following items.

- The groundwater extraction system was not capturing the leading edge of the contaminant plume. The RSE recommended that additional extraction wells be installed near 1501 Central Avenue and Vine Road.
- Soil gas verification sampling should be done at both the GSC site and the SJCC site to make sure adequate mass has been removed from the vadose zone.

Treated groundwater was being recharged to the subsurface; however, the limited capacity of the injection system was limiting the volume of water that could be treated.

As a result of the findings in the RSE, in 2007 and 2008, EPA collected soil gas and membrane interface probe (MIP) samples at both the SJCC site and GSC site. In 2009, EPA collected soil samples beneath the GSC

building. The confirmation samples at SJCC were collected to the depth of the wells, and it was found that remaining contamination was deeper than the depth of the wells. The purpose of this investigation was to determine if residual source areas were still present in the subsurface soils at the sites, and if so, to delineate the nature and extent of the contamination. These investigations confirmed that elevated levels of PCE remained in the subsurface soils at the GSC property, and elevated PCE and TCE levels remained in the subsurface soils on the SJCC property. The investigations showed that there was residual contamination that was deeper than the SVE treatment zone, approximately 17 to 32 feet below surface.

In addition, 12 new injection wells were installed to replace the wells damaged from bacteria fouling. In 2007 and 2008, reinjection capacity of the groundwater treatment system increased by nearly 100 gallons per minute, by installing an injection trench and redeveloping three of the least damaged/inoperable injection wells.

In 2006, EPA completed a study that delineated the extent and depth of the contaminants in the aquifer, and identified optimal locations for additional extraction wells. The study demonstrated that capture of the downgradient plume could be achieved by installing additional extraction wells in the intermediate aquifer zone between Martinelli Avenue and Wheat Road, and in the deep aquifer zone between Wheat Road and Vine Road. Subsequently, wells EW-12A, EW-16, and EW-18 were installed and put into service. In 2009, two additional extraction wells were installed, one at SJCC (EW-20) and one adjacent to GSC (EW-17), to address groundwater impacted by deeper soil contamination on the properties. In 2013, an additional extraction well, EW-21, was installed to enhance capture of the intermediate depth plume in the vicinity of the Cleary School.

2010 ROD Amendment

Based on the findings noted above, a ROD amendment was issued in 2010. The amended remedy included acquisition of the GSC property and demolition of the GSC building, and excavation of contaminated soil at each of the sites. It also included in-situ treatment of soil that could not be practicably excavated due to depth and proximity to the groundwater treatment plant at SJCC. The RDs for the GSC building demolition and soil excavations were completed in July 2011. The GSC building demolition took place in August 2011 and soil excavation at the sites was completed in September 2011. Completion of the remedial actions were documented in remedial action reports approved on September 29 and 30, 2011, for the GSC building demolition and soil excavations, respectively. EPA evaluated options for source reduction in areas where excavation was not feasible and selected in-situ thermal remediation using electrical resistivity heating (ERH) to remediate the residual source area. The Remedial Design/Performance Work Statement for in-situ soil treatment of the remaining soil contamination at SJCC was completed in October 2012. This work was implemented from June 2016 through March 2017.

During the ERH work, the subsurface source area treatment zone was heated to an average temperature of 100 degrees Celsius from October to December 2016. An estimated mass of 1,180 pounds of VOCs was removed during the thermal remediation activities. Groundwater trends in monitoring wells EW-20, NMW-1S, and OW-41, located immediately downgradient of the ERH activities and in the source area behind the SJCC groundwater treatment plant showed significant decreases of PCE and TCE concentrations during the ERH operating period. Thermal treatment activities resulted in about 95 percent reduction of vadose zone contamination.

IC Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	SJCC/GSC site	Maintaining the State of New Jersey groundwater use restrictions until such time as water quality standards are met	Classification Exception Area/Well Restriction Area, 2005. Updated in 2020.

System Operations/Operation and Maintenance

Since September 27, 2000, EPA has performed a long-term response action (LTRA) to operate and maintain a groundwater extraction and treatment system at the sites. Severson Environmental Services performed LTRA activities from September 2000 to September 2010. LTRA activities were originally scheduled to be transferred to NJDEP for operation and maintenance activities in 2010. However, as discussed above, EPA noted in the first FYR report for the sites in 2004 that the groundwater contamination had migrated into a deeper aquifer zone and traveled almost a half-mile farther downgradient than when the 1991 ROD was issued. In September 2010, a ROD amendment was issued to address remaining soil contamination that acted as a source of contamination to the deeper aquifer. The ROD amendment called for utilizing in-situ technologies, such as chemical oxidation or enhanced soil vapor extraction, when excavation is impracticable, and resetting the LTRA timeframe to begin in September 2010.

In the early 2000s, NJDEP installed point of entry treatment (POET) systems on two downgradient residential wells, R-1731 and R-2960, where sampling indicated PCE concentrations exceeding MCLs. These wells were monitored semiannually by EPA beginning in 2000. In 2020, EPA installed and sampled three new monitoring wells (MW-1, MW-2 and MW-3) to confirm the extent of the groundwater plume. In September 2020, EPA transferred responsibility for the LTRA to NJDEP to allow for the continued cleanup of the remaining sources of groundwater contamination. Monitoring has continued semiannually by NJDEP since this time. In the fall of 2022, sampling of the two residential wells showed no detection of PCE in the wells.

Vapor Intrusion

Since April 2004, EPA conducted a soil vapor intrusion (SVI) investigation of properties that were located above the groundwater plume to evaluate the potential for indoor air contamination. In 2006, EPA collected sub-slab soil gas samples and indoor air samples from 19 residential and commercial properties. In 2018, EPA performed multiple rounds of sub-slab soil gas and indoor air samples on several properties. The main areas of concern for vapor intrusion are the properties that are adjacent to the SJCC site and the GSC site, where groundwater is shallowest. Elevated readings were detected in sub-slab samples from four properties in close proximity to the sites. Concentrations were detected at levels slightly above EPA's vapor intrusion screening level criteria, at 14 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for TCE and $3.7 \mu\text{g}/\text{m}^3$ for PCE, in the subslab of one property adjacent to SJCC. Indoor air was not impacted in the homes sampled. NJDEP has informed EPA that

it will sample the four properties in the fall of 2024, for PCE and TCE, to determine if continued monitoring of the properties is warranted.

Climate Change

Potential impacts to the sites due to climate change were assessed, and the performance of the remedy may be impacted in the future by increased temperatures and/or wildfires (**Appendix B**). However, there have not been any significant impacts to the site from storms or heat-related events, other than temporary power outages. Future remedial decisions will take into account the potential for increasing temperatures and /or wildfires.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last five-year review as well as the recommendations from the last five-year review and the current status of those recommendations.

Table 2: Protectiveness Determinations/Statements from the 2019 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The soil remedy at South Jersey Clothing Company and Garden State Cleaners currently protects human health and the environment.
2	Short-term Protective	The groundwater remedy at South Jersey Clothing Company and Garden State Cleaners is protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, the downgradient leading edge of the plume needs to be characterized and capture by the extraction system needs to be demonstrated.
Sitewide	Short-term Protective	The remedies at South Jersey Clothing Company and Garden State Cleaners are protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, the downgradient leading edge of the plume needs to be characterized and full capture by the extraction system needs to be demonstrated.

Table 3: Status of Recommendations from the 2019 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
2	Downgradient plume capture not fully characterized	Install downgradient monitoring wells to further delineate the downgradient portion of the plume and demonstrate capture.	Completed	New downgradient monitoring wells were installed and sampled by EPA. However, delineation of the downgradient portion of the plume has not been achieved. See Sections IV, V and VI below for additional discussion.	9/15/2020

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On August 7, 2023, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands, including the site. The announcement can be found at the following web address:

<https://www.epa.gov/superfund/R2-fiveyearreviews>.

In addition to this notification, the EPA Community Involvement Coordinator (CIC) for the sites, Natalie Loney, posted a public notice on the EPA site webpages www.epa.gov/superfund/garden-state-cleaners and www.epa.gov/superfund/south-jersey-clothing, and provided the notice to the Boro of Buena by email on June 27, 2024 with a request that the notice be posted in municipal offices and on the Boro webpages. This notice indicated that a FYR would be conducted at the Garden State Cleaners/South Jersey Clothing Company sites to ensure that the cleanup at the sites continues to be protective of human health and the environment. Once the FYR is completed, the results will be made available at the following repositories: 290 Broadway, 18th Floor, New York, New York 10007 and Borough of Buena Municipal Building locates at 616 Central Avenue, Minotola, New Jersey. In addition, the final report will be posted on the following websites: www.epa.gov/superfund/garden-state-cleaners and www.epa.gov/superfund/south-jersey-clothing. Efforts will be made to reach out to local public officials to inform them of the results.

Data Review

The groundwater sampling program consists of 17 monitoring wells and extraction wells sampled on a semi-annual basis; 39 monitoring wells, extraction wells, and residential wells sampled on an annual basis; and 34 monitoring wells sampled on a biennial basis. Influent, intermediate, and effluent process liquid samples are collected from the extraction and treatment system to monitor system performance and refine operating conditions. Samples are analyzed to verify compliance with the requirements of the New Jersey Pollutant Discharge Elimination System - Discharge to Ground Water Permit Equivalency and compared to the NJDEP Groundwater Quality Standards NJAC 7:9C and the 2010 ROD amendment.

Groundwater Treatment System Performance

In September 2020, EPA transferred responsibility for operation of the groundwater extraction and treatment system to NJDEP. NJDEP operations reports indicate that 167.1 million gallons of groundwater were treated during the last full year of the review period (July 2022-June 2023). Approximately 0.84 pounds of PCE and approximately 1.68 pounds of TCE were removed during this time. Operations reports from 2018 through 2023 indicate that the amount of TCE and PCE being removed by the system is decreasing over time.

Groundwater Monitoring Well Data

Groundwater contours in the shallow, intermediate and deep wells indicate that groundwater flow is towards the south. Shallow and intermediate extraction wells appear to create an inward gradient in the northern and central parts of the plume. Deep wells further downgradient generally indicate an inward gradient around extraction wells EW-12A and EW-18. However, the radius of influence of these extraction wells does not reach the leading edge of the plume.

The concentrations of PCE in groundwater collected from samples in October 2022 from wells in and around the former source area range from non-detect in wells EWS-2 and EWS-15, to 48.4 µg/L in monitoring well OW-41. PCE was also detected slightly above its regulatory standard further downgradient of the source area in

monitoring well EW-17, at a concentration of 1.6 µg/L. PCE concentrations fluctuated across the review period within OW-40, the most impacted downgradient well: PCE spiked to 100 µg/L (April 2019) at the beginning of the review period, and subsequently declined to 50.5 µg/L (April 2023) at this location (Figure 4). This well is outside of the influence of the extraction network. In August 2020, in order to improve delineation of the downgradient plume, EPA installed three monitoring wells along Vine Rd: MW-1, MW-2 and MW-3. In September 2020, EPA sampled the new wells. The results identified 3.66 µg/L of PCE in MW-1. In early 2024, NJDEP added these wells to their annual sampling schedule and the wells were sampled in February 2024. During this sampling event PCE and TCE were detected in MW-1 at 20.9 and 3.5 µg/L, respectively. EPA recommends semi-annual sampling of MW-1, MW-2 and MW-3 for future sampling events.

Sampling of the source area in October 2022 indicated that TCE concentrations ranged from non-detect in EWS-2 and EWS-15, to 37.2 µg/L in SJCC-2. SJCC-2, the most impacted well historically, has exhibited a gradual, but unsteady decline in TCE concentrations since the implementation of the thermal remedy in 2016 (Figure 3). The 2022 observation at SJCC-2 represents a decline following an observed high concentration of 120 µg/L TCE in April 2019, as well as the 160 µg/L maximum observed during the previous review period (April 2014, April 2015; see Figure 3). In order to confirm declining concentrations, monitoring frequency at SJCC-2 was increased to semiannual following the TCE detections in 2019. One detection of vinyl chloride (78.3 µg/L) occurred at this location in 2021, potentially indicative of the degradation of chlorinated ethenes in the vicinity. During the January-June 2023 monitoring event, TCE was also detected at monitoring wells located further downgradient and within the leading edge of the plume at a maximum concentration of 19.2 µg/L in monitoring well OW-40. During the February 2024 sampling, TCE was detected at 3.5 µg/L, above the NJDEP groundwater quality standard of 1 µg/L.

All residents in the vicinity of and 4,000 feet downgradient of the sites obtain their drinking water from the municipal water system. However, some residences just south of Wheat Road obtain water from private wells. The additional source removal and groundwater treatment plant optimization activities have resulted in a decreasing trend in contaminant concentrations at a majority of these residences. In total, 12 residential wells are routinely sampled as a part of the monitoring program, and four residential wells have POET systems installed. During the current review period, two residential wells which were sampled prior to any treatment system reported concentrations of PCE above the NJDEP GWQS of 1 ppb. Well R108, located adjacent to extraction well EW-18, reported a maximum PCE concentration of 45.4 µg/L (October 2022). R1731, located on the east side of S Central Ave between Louis Dr and Vine Rd, reported a maximum PCE concentration of 2.3 µg/L in April 2019, during the previous review period which was a decline from 17 µg/L in 2014. No regulatory exceedances of COCs were detected at this well during the current review period.

Analytical Summary

Groundwater data indicate that groundwater contaminant concentrations have decreased since the implementation of the thermal remediation activities at SJCC, however, COC concentrations still remain above regulatory standards in the source area, in one residential well (R-108) and in monitoring wells downgradient. Groundwater contours indicate that the southern portion of the plume is not being captured and that it appears to be migrating.

Three monitoring wells were installed in September 2020 to aid in determining if the monitoring network is capturing the leading edge of the plume downgradient of these residential wells. Monitoring wells MW-1, MW-2 and MW-3 were sampled in February 2024 and MW-2 and MW-3 were non-detect for PCE and TCE. However, MW-1 had exceedances of PCE (20.9 µg/L) and TCE (3.5 µg/L). EPA recommends a private drinking well survey be conducted downgradient of these wells to determine if more potable wells should be added to the sampling program and to ensure that there is no need for another extraction well downgradient.

Site Inspection

The inspection of the Site was conducted on November 28, 2023. In attendance was Brian Quinn, the EPA Remedial Project Manager. The purpose of the inspection was to assess the protectiveness of the remedy. No issues of concern were identified. The plant operators are on-site part time and remotely connected the rest of the time. The treatment plant is secured by fencing and all visitors are required to sign in.

V. TECHNICAL ASSESSMENT

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

Summary of Data Review

Groundwater analytical data indicate that concentrations of the site contaminants of concern within the core of the plume have decreased significantly, predominantly as a result of the installation and activation of the new extraction wells installed in 2007 and the additional source removal activities using in-situ ERH conducted in 2016. Groundwater quality data from monitoring wells generally show decreases in VOCs in wells immediately downgradient of the ERH work within the source area behind the groundwater treatment plant.

The 2014 and 2019 FYRs noted that the downgradient extent of the plume had not been fully characterized. During this FYR period, TCE and PCE concentrations appear to have spiked and subsequently decreased in monitoring wells located on the leading edge of the plume (notably at monitoring well OW-40). The wells installed by EPA in 2020 (MW-1, MW-2, MW-3) have been added to the NJDEP long-term monitoring plan. However, groundwater elevation contour maps do not show complete capture of the deeper portion of the plume (e.g., at OW-40) and the distal margin of the monitoring network at MW-1 within the downgradient portion of the plume records contamination above the MCLs. Continued monitoring and a review of the extraction network configuration and performance should be performed to confirm plume capture between the source area and EW-18. A survey of private wells downgradient of MW-1 initially to Oak Road is also recommended (see *Issues/Recommendations*).

Early Indicators of Potential Issues

Any maintenance performed at the groundwater treatment plant is routine in nature and commensurate with the age of the plant and length of operation. If the treatment plant were to cease operation for maintenance reasons, most residents would not be impacted as their drinking water is provided by a municipal water supply. Those residents that are downgradient of the municipal water line have POET systems installed by the NJDEP, and their wells are routinely monitored. However, a private drinking well survey should be conducted downgradient of these wells to determine if more drinking water wells should be added to the sampling program and to ensure that there is no need for another extraction well downgradient.

Implementation of Institutional Controls and Other Measures

In 2005, NJDEP established a CEA and later updated it in 2020 for the sites to restrict groundwater use within the area of the plume.

Expected Progress Towards Meeting RAOs

Based on the information reviewed during this FYR, it appears that the remedy is primarily functioning as intended as a significant portion of the contaminant plume has been cut off by the extraction wells. As noted in the data review section, however, the southern portion of the plume is beyond the capture zone of the extraction

network. During investigation activities, complete delineation of the downgradient portion of the plume was prevented by numerous property access issues. Therefore, some uncertainty remains with respect to the delineation of the full groundwater plume. Continued sampling of monitoring wells installed by EPA in September 2020 will help close data gaps and increase the level of confidence that the plume has been fully delineated. A survey and potential sampling of private wells at the distal plume margin will ensure no exposures are occurring.

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

Human Health Risk

The 1991 ROD was issued prior to the Risk Assessment Guidance for Superfund used currently by EPA. However, the process that was used remains valid. Contaminants of concern identified in the ROD and ROD amendment at the sites were TCE and PCE in soil and groundwater. There have been no changes in toxicity values for the COCs in the last five years.

At the time of the ROD, public health concerns at the sites included: ingestion, inhalation and dermal contact with ambient air, surface soil and groundwater by adult workers, residents, trespassers and customers, adolescent residents and trespassers, and child residents.

Exposure pathways that resulted in unacceptable cancer risk or noncancer hazard included:

- Future adult workers, on-site residents, off-site residents, and trespassers exposed to groundwater.
- Future on-site residents exposed to surface soil at the Garden State Cleaners site.
- Future on-site adolescent and child residents exposed to surface soil.
- Future on- and off-site residents exposed to groundwater via ingestion.

The 1991 ROD remedy was partially successful in removing the pathway for direct contact with contaminated soil. The 2010 ROD Amendment for source removal on the GSC property has eliminated the remaining direct contact risk to soils beneath the GSC building and ERH activities have eliminated the remaining source area contamination to groundwater at the SJCC site. Most residents in the vicinity of and 4,000 feet downgradient of the sites obtain their drinking water from the municipal water system. However, some residences downgradient of the extraction system just south of Wheat Road obtain water from private wells. Four residents have POET wells installed by NJDEP, but only two residents' wells are monitored as part of the groundwater monitoring program. The other two residential POET wells were removed from sampling due to non-detect results. The additional source removal and groundwater treatment plant optimization has resulted in a decreasing trend in contaminant concentrations at a majority of the residences. Further, there is a CEA in place to restrict groundwater use in the vicinity of the plume which was updated in 2020. However, since COC concentrations have been elevated at the distal margin of the plume, a private drinking well survey is needed further downgradient of these wells to further evaluate whether the drinking water pathway remains incomplete.

SVI is evaluated when soils and/or groundwater are known or suspected to contain VOCs. Since residences were located above groundwater contaminated with VOCs, primarily TCE and PCE, further investigation into the SVI exposure pathway was conducted as result of a recommendation in the first (2004) FYR. During the last round of SVI sampling in February of 2019, only the treatment plant property and one location where access was denied were proposed for additional monitoring. Since then, additional source area remediation has been completed and it is anticipated that SVI concentrations have also decreased. These properties will be targeted for sampling in late 2024, during the heating season to confirm a decrease in SVI concentrations. While

additional source removals were performed at both properties and current sub-slab concentration trends for TCE and PCE appear to be substantially decreasing, any future construction on these properties would need to be done with consideration of the potential for vapor intrusion, based on the most recent groundwater data.

The 1991 ROD remedy, as implemented, was successful in removing the pathway for direct contact with contaminated soil. However, since soil contamination on the sites remained a source of groundwater contamination at the time of the ROD amendment, EPA selected impact to groundwater soil remediation standards as cleanup goals. In July 2010, at EPA’s request, NJDEP performed modeling which determined a site-specific soil cleanup goal of 1 ppm for PCE and TCE, consistent with the original ROD cleanup levels, was appropriate. Implementation of the ROD amendment has accelerated the remediation of soils and as a result, groundwater. Continued groundwater monitoring will confirm achievement of RAOs.

Ecological Risk

Although the ecological risk assessment (environmental evaluation) screening and toxicity values used to support the ROD may not necessarily reflect the current values, the treatment of contaminated soils with VOCs greater than 1 ppm (PCE and TCE) through the use of a soil vapor extraction system, which included a surface cover, eliminated any potential risk from surface soil contaminants to terrestrial receptors. Further, there is no concern that ecological receptors will be impacted by the groundwater to surface water pathway. Therefore, the RAOs used at the time of the remedy selection are still valid and are protective of ecological receptors.

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

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations	
OU(s) without Issues/Recommendations Identified in the Five-Year Review:	
None	

Issues and Recommendations Identified in the Five-Year Review:	
---	--

OU(s): 2	Issue Category: Remedy Performance			
	Issue: Sampling of downgradient well MW-1 shows an exceedance of both PCE and TCE above MCLs.			
	Recommendation: Continue to sample downgradient wells MW-1, MW-2 and MW-3 on a semi-annual basis and perform a private drinking well survey downgradient of these wells to evaluate if exposure to site-related contaminants in groundwater is occurring. Based on this information, review the extraction well network configuration and performance to improve plume capture.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date

Yes	Yes	State	EPA	6/30/2025
-----	-----	-------	-----	-----------

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Planned Addendum Completion Date:</i> 6/30/2025
<p><i>Protectiveness Statement:</i> A protectiveness determination for the remedy at the South Jersey Clothing/Garden State Cleaners sites cannot be made until further information is obtained. Further information will be obtained by performing a private well survey downgradient of the leading edge of the plume to evaluate whether exposure to contaminants not captured by the extraction well network is occurring. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.</p>		
Sitewide Protectiveness Statement		
<p><i>Protectiveness Determination:</i> Protectiveness Deferred</p>		
<p><i>Protectiveness Statement:</i> A protectiveness determination for the remedy at the South Jersey Clothing/Garden State Cleaners sites cannot be made until further information is obtained. Further information will be obtained by performing a private well survey downgradient of the leading edge of the plume to evaluate whether exposure to contaminants not captured by the extraction well network is occurring. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.</p>		

VIII. NEXT REVIEW

The next FYR report for the SJCC/GSC Superfund Sites is required five years from the completion date of this review.

REFERENCE LIST

Record of Decision	September 1991
Record of Decision Amendment	September 2010
2019 Five-Year Review	July 2014
Semi-Annual Compliance Reports	2018-2023
Soil vapor intrusion monitoring data	February 2019
TCE & PCE groundwater concentration trends through 2018	January 2019
Final Remedial Action Completion Report for In-Situ Thermal Remediation	March 2017

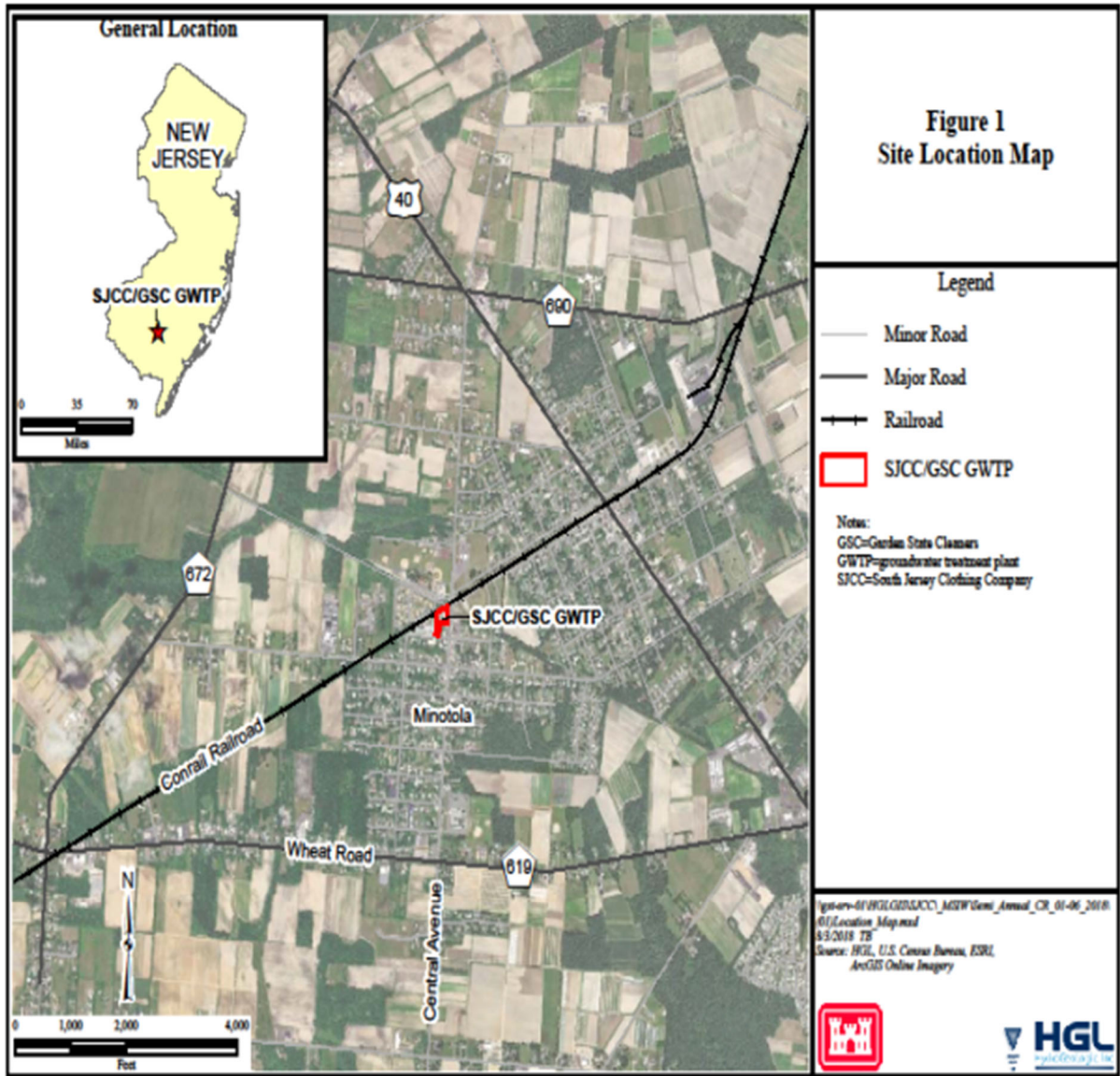
APPENDIX A

Site map

Total VOC Isoconcentration Map May 2018

SJCC-2 TCE Concentration Trend Figure

PCE and TCE in Well OW-40



HGL—Semi-Annual Compliance Report January through June 2018—SJCC/GSC Superfund Site, NJ

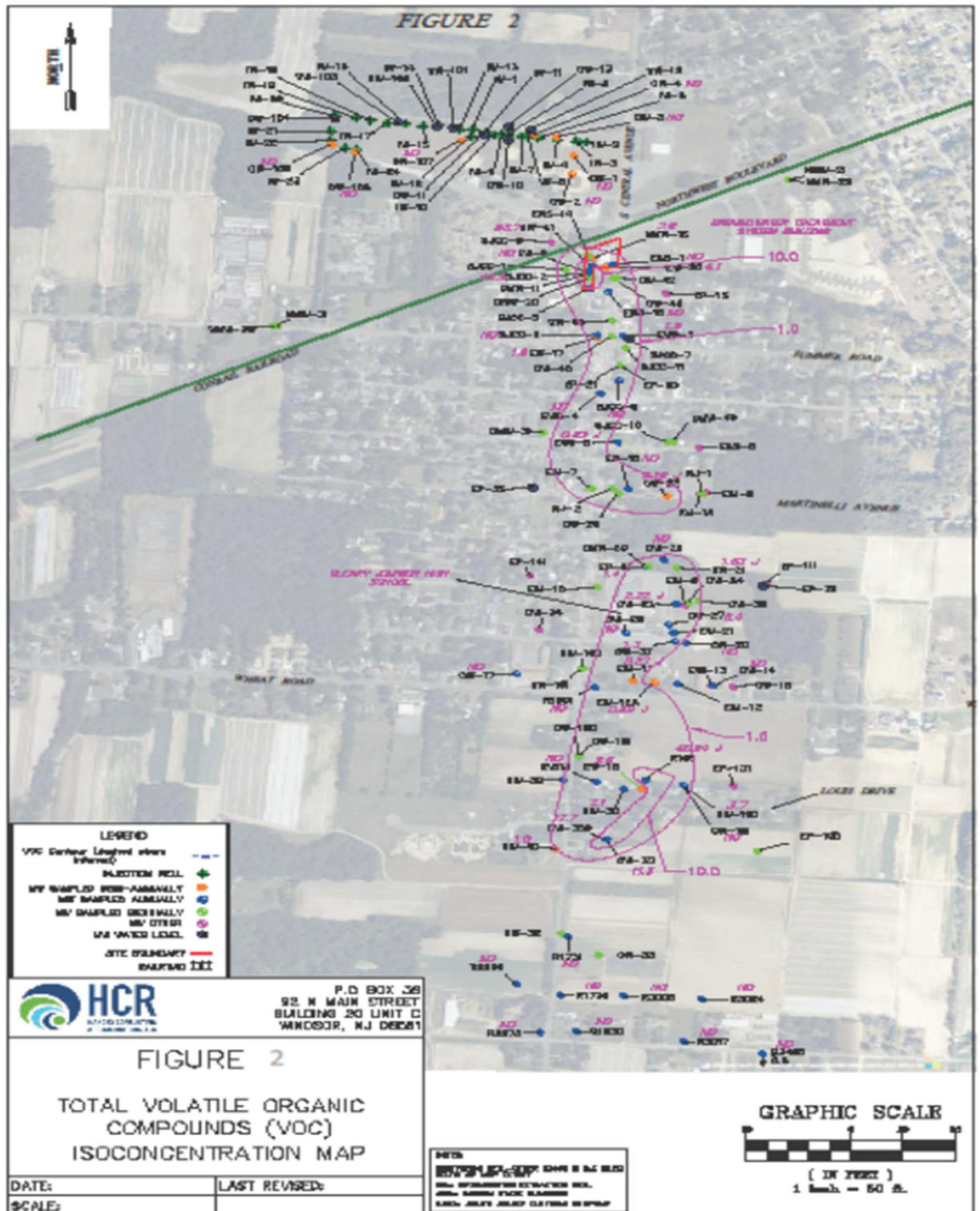


FIGURE 3

SJCC-2 TCE

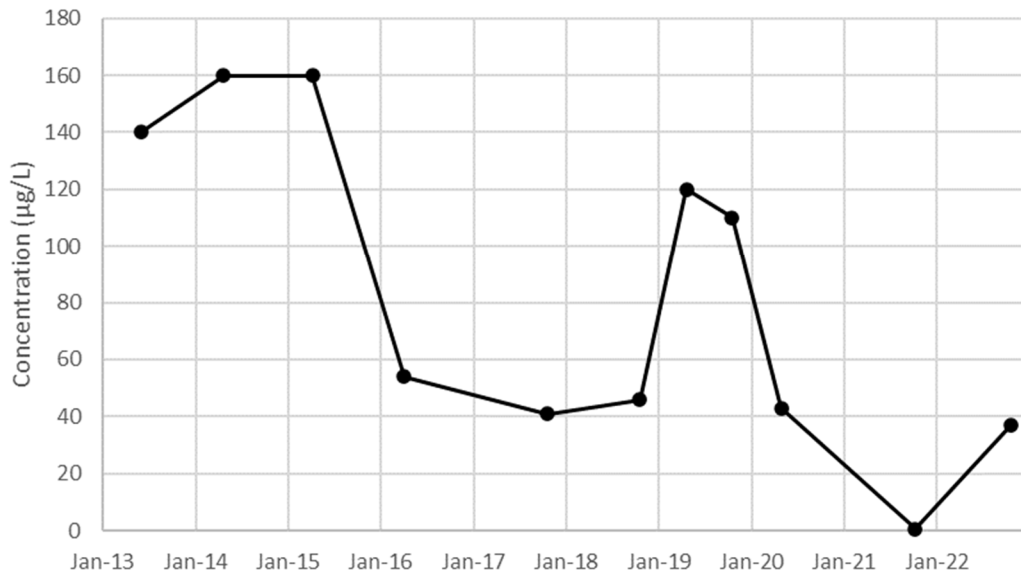
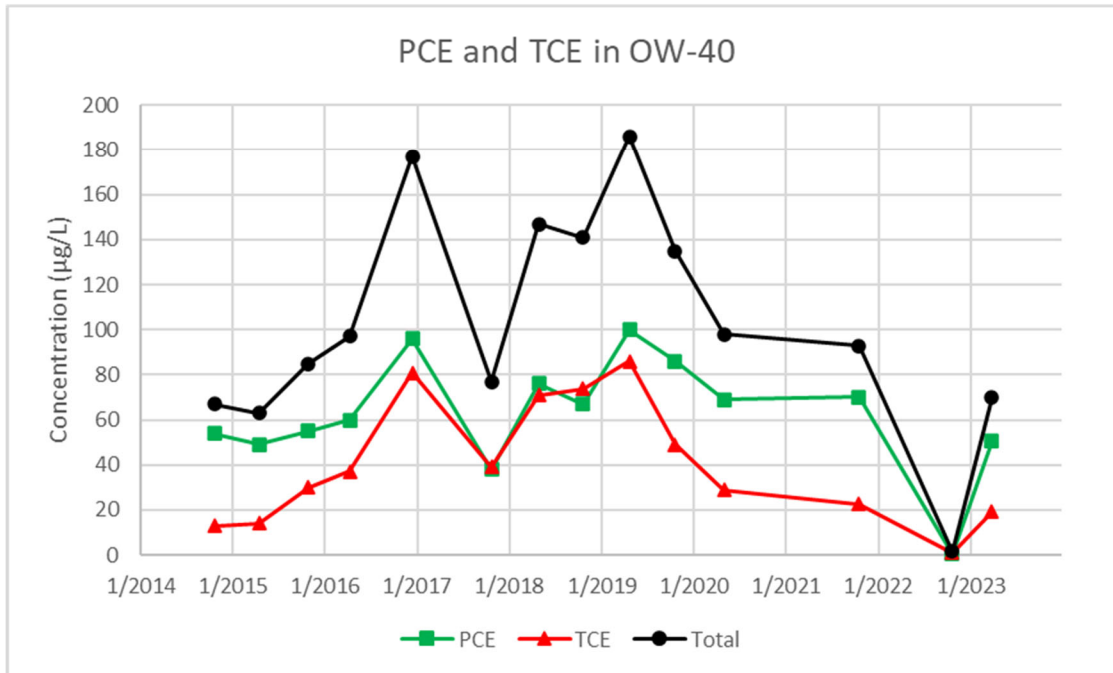


Figure 4



Appendix B – Climate Change Analysis

In accordance with the Region 2 Guidance for Incorporating Climate Change Considerations, two climate change tools were used to evaluate the South Jersey Clothing Company and Garden State Cleaners Superfund sites. Screenshots from each of the tools assessed are included here.

The first tool used to assess Buena Borough was Risk Factor at the site properties, which indicates a low flood risk in the vicinity of the site (Figure B-1). Overall, Buena Borough has a minor risk of flooding over the next 30 years, which means that flooding is likely to impact the day-to-day life in the community. However, approximately 49 percent of Buena Borough has some risk of being affected by wildfires over the next 30 years (Figure B-2). There is also a severe risk of heat risk due to rising temperatures (Figure B-3).

The second tool utilized was The Climate Explorer. According to this tool, average daily temperatures are projected to increase by approximately 7 to 8 degrees by 2090 (Figure B-4). Total precipitation, however, is expected to remain largely constant (Figure B-5).

Based on the information above, potential site impacts due to climate change were assessed and the performance of the remedy may be impacted in the future by increased temperatures and/or wildfires. There have not been any significant impacts to the sites from storms or heat related issues, other than temporary power outages. Future remedial decisions will take into account the potential for increasing temperatures and /or wildfires.

Figure B-1 – Risk Factor Flooding Output

Does Buena have Flood Risk?

Minor



There are **100 properties** in **Buena** that have greater than a **26%** chance of being severely affected by flooding over the next 30 years. This represents **10%** of all properties in Buena.

In addition to property damage, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area.

Overall, **Buena** has a **minor risk of flooding** over the next 30 years, which means flooding is likely to impact day-to-day life within the community. This is based on the level of risk the properties face rather than the proportion of properties with risk.

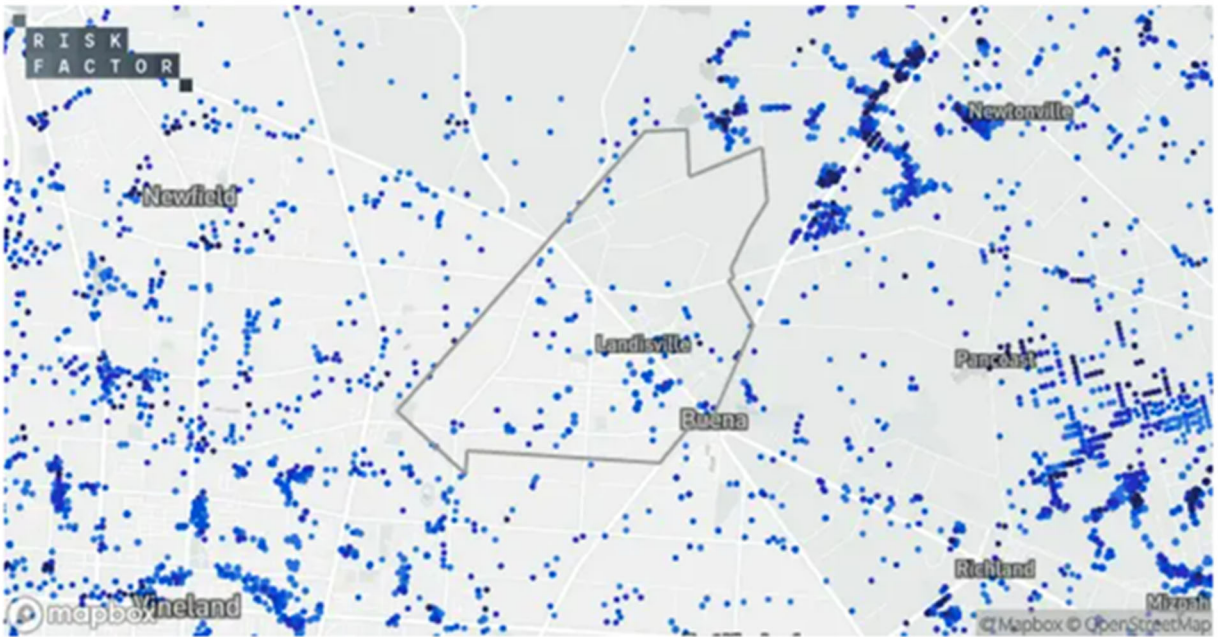


Figure B-2 – Risk Factor Fire Impact

Moderate

FIRE FACTOR

There are **909 properties** in **Buena** that have some risk of being affected by wildfire over the next 30 years. This represents **49%** of all properties in Buena.

In addition to damaging properties, wildfire can also cut off access to utilities, emergency services, impact evacuation routes, and may impact the overall economic well-being of an area. Overall, **Buena** has a **moderate risk of wildfire** over the next 30 years. This is based on the level of risk the properties face rather than the proportion of properties with risk.



Figure B-3 – Risk Factor Heat Index Impact

Does Buena have Heat Risk?

Severe
HEAT FACTOR
Buena has **severe risk** from heat. This is due to "feels like" temperatures increasing, and because **65%** of homes in Buena have a severe Heat Factor®.



Minimal Minor Moderate Major Severe Extreme

Figure B-4 – Average Temperature for Buena Borough

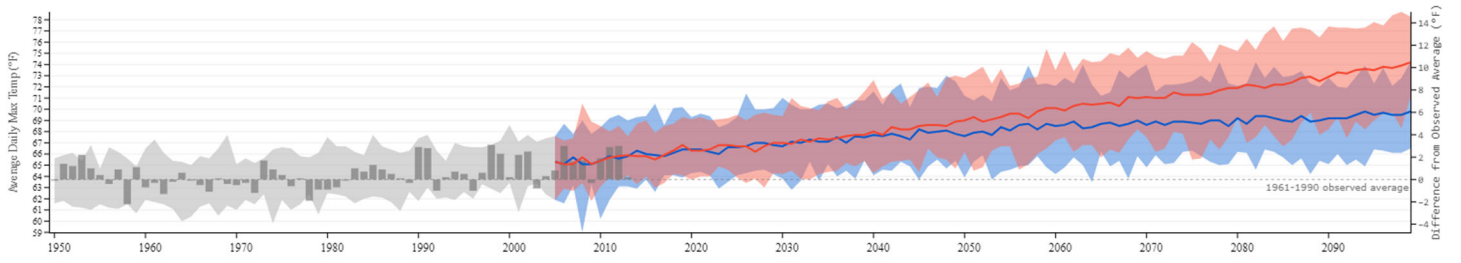


Figure B-5 - Average Annual Precipitation for Buena Borough

